

MARILIIS PÕLD

Smoking, attitudes towards
smoking behaviour,
and nicotine dependence among
physicians in Estonia:
cross-sectional surveys
1982–2014



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In memory of my mother

CONTENTS

LIST OF ORIGINAL PUBLICATIONS	9
ABBREVIATIONS	10
1. INTRODUCTION	11
2. REVIEW OF THE LITERATURE	12
2.1. Definition of tobacco use and smoking	12
2.2. Measurement of smoking status	12
2.3. Measurement of nicotine dependence	14
2.4. Smoking prevalence globally and in Estonia	15
2.5. Smoking among physicians	17
2.5.1. Physicians' tobacco epidemic	17
2.5.2. Smoking among physicians globally and in Estonia	18
2.6. Attitudes towards smoking behaviour	18
2.6.1. Attitudes towards smoking	18
2.6.2. Addressing patients' smoking	19
2.6.3. Desire to quit smoking among physicians	20
2.7. Nicotine dependence among physicians and the general population	21
2.8. Smoking-related policies in Estonia	22
2.9. Brief summary	23
3. AIMS OF THE RESEARCH	25
4. MATERIALS AND METHODS	26
4.1. Data collection	26
4.2. Study sample and variables	27
4.3. Statistical analysis	31
4.4. Ethics and consent	32
5. RESULTS	33
5.1. Trends in smoking (Paper I)	33
5.2. Physicians' attitudes towards smoking	35
5.2.1. Physicians' views on the causal role of smoking in smoking- related diseases (Paper II)	35
5.2.2. Physicians' attitudes regarding patients' smoking (Paper III).	37
5.2.3. Addressing patients' smoking habits (Paper IV)	39
5.2.4. Desire to quit smoking among physicians (Paper V)	40
5.3. Nicotine dependence (Paper VI)	42
6. DISCUSSION	44
6.1. Trends in smoking	44
6.2. Attitudes towards smoking behaviour	46
6.2.1. Physicians' views on causal roles of smoking in smoking- related diseases	46
6.2.2. Attitudes towards smoking	47

6.2.3. Addressing patients' smoking	48
6.2.4. Desire to quit smoking	50
6.3. Nicotine dependence	53
6.4. Strengths and limitations of the study	54
7. CONCLUSIONS	56
8. PRACTICAL IMPLICATIONS	57
REFERENCES	58
SUMMARY IN ESTONIAN	68
ACKNOWLEDGEMENTS	76
APPENDIX I	77
Questionnaire in 1982	77
APPENDIX II	78
Questionnaire in 2002	78
APPENDIX III	82
Questionnaire in 2014	82
PUBLICATIONS	87
CURRICULUM VITAE	153
ELULOOKIRJELDUS	155

LIST OF ORIGINAL PUBLICATIONS

The thesis is based on the following publications, which are referred to in the text by their Roman numerals (I–VI):

- I Pärna K, Põld M, Ringmets I. Trends in smoking behaviour among Estonian physicians in 1982–2014. *BMC Public Health* 2017;18:55.
- II Pärna K, Põld M, Ringmets I. Physicians' views on the role of smoking in smoking-related diseases: findings from cross-sectional studies from 1982–2014 in Estonia. *Tobacco Induced Diseases* 2017;15:31.
- III Põld 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:e017197.
- IV Põld M, Pärna K. Changes in addressing patients' smoking: cross-sectional data from 2002 and 2014 among physicians in Estonia. *Tobacco Use Insights* 2020;13:1179173X2094926.
- V Põld M, Pärna K. Factors associated with desire to quit smoking among Estonian physicians: Cross-sectional data of 2002 and 2014. *Tobacco Prevention and Cessation* 2018;4:29.
- VI Põld M, Pärna K. Nicotine dependence and factors related to smoking cessation among physicians in Estonia. *International Journal of Environmental Research and Public Health* 2020;17.

Contribution of Mariliis Põld to the original publications:

Papers I and II: participating in drafting and revising the manuscript.

Papers III–VI: performing the statistical analysis, interpretation of the data, drafting and revising the manuscript.

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ABBREVIATIONS

CDC	Centers for Disease Control and Prevention
CI	confidence interval
FCTC	Framework Convention on Tobacco Control
FTND	Fagerström Test for Nicotine Dependence
HSI	Heaviness of Smoking Index
IHD	ischaemic heart disease
ND	nicotine dependence
NIHD	National Institute for Health Development
NS	nikotiinisõltuvus
OR	odds ratio
TAI	Tervise Arengu Instituut
TTFC	time to first cigarette
UV	usaldusvahemik
WHO	World Health Organization

1. INTRODUCTION

The smoking epidemic is considered one of the main public health threats, accounting for about 8 million deaths a year. It is estimated that there are currently more than 1 billion smokers in the world (WHO, 2020a).

Smoking prevalence globally has declined during the last decades. Although there are differences between countries, the decrease in smoking is more prevalent among people with higher education and, furthermore among physicians, who can be considered to represent the higher socioeconomic bracket. However, according to the World Health Organization (WHO), among adults aged over 30 years, more than 10% of all deaths are attributed to tobacco (WHO, 2012). Reducing smoking will result in fewer deaths and less diseases like heart diseases, lung cancer, chronic respiratory diseases and other conditions (WHO, 2009).

Tobacco smoking as a substance use disorder is considered a mental and behavioural disease in International Classification of Diseases (code F17 in ICD-10) (WHO, 2016). With tobacco smoke, more than 4,000 chemical compounds and substances are released, including oxidative gases and heavy metals. Tobacco smoke contains at least 50 carcinogens (Florescu et al., 2009).

Health care institutions have the obligation and opportunity to take the lead in tackling smoking, to reduce consumption of tobacco products and the impact of tobacco on health (Ministry of Social Affairs, 2014). Physicians are viewed as healthy lifestyle models by their patients and communities (Garfinkel, 1976) and are regarded as people from whom smokers would accept advice on smoking cessation (WHO, 2005). However, physicians' own smoking habits and attitudes towards smoking affect the addressing of patients' smoking (Abdullah et al., 2014; Meshefedjian et al., 2010; Pärna, et al., 2005a; Pipe et al., 2009).

Quitting smoking can be challenging because of nicotine dependence (ND). Nicotine is the chemical compound in the tobacco plant. It has been found that tobacco addiction is similar to addiction to drugs such as heroin and cocaine (Hatsukami et al., 2008).

In Estonia, smoking among the general population has been surveyed regularly since 1990. However, among physicians in Estonia, the first survey was conducted already in 1978, followed by surveys in 1982, 2002 and 2014. Until now, no in-depth analysis based on the data from the surveys has not been conducted.

The present study explores physicians' smoking over three decades providing the opportunity to gain insight into the smoking trends, attitudes towards smoking behaviour, the readiness to address patients' smoking and desire to quit smoking among a population that can be considered influential in terms of their profession. The study is also the first in Estonia to explore ND to such an extent.

2. REVIEW OF THE LITERATURE

2.1. Definition of tobacco use and smoking

In the context of the thesis, the terms concerning tobacco use and smoking are used as follows:

Tobacco use	Any habitual use of the tobacco plant leaf and its products; the predominant use of tobacco is by smoke inhalation of cigarettes, pipes, and cigars (Al-Ibrahim & Gross, 1990) but can also include sucking, chewing or snuffing any tobacco product.
Cigarette smoking	The intended use of cigarette regardless of whether any and which means are used (<i>Tobacco Act</i> , 2005).
Daily smoking	Smoking currently at least one cigarette every day (CDC, 2011; NIHD, 2005; WHO, 1998).
Occasional smoking	Less than daily smoking (NIHD, 2005; WHO, 1998)
Current smoking	currently smoking daily or occasionally.
Past (ex-) smoking	Smoking daily previously but not currently (WHO, 1998).
Never smoking	Having never smoked at all or having never smoked daily and having smoked less than 100 cigarettes in lifetime (CDC, 2011; WHO, 1998).
E-cigarette	Electronic cigarette (e-cigarette) is a product related to tobacco product that can be used for consumption of nicotine-containing vapour via a mouthpiece, or any component of that product, including a cartridge, a tank and the device without cartridge or tank (<i>Tobacco Act</i> , 2005).
Nicotine dependence	An addiction to tobacco products caused by the nicotine.

2.2. Measurement of smoking status

Questionnaire-based measurement

There can be different approaches to measuring smoking prevalence or assessing smoking status among the population. The most widely used method is questionnaire-based survey, collecting self-reported data, usually conducted to explore health behaviour or smoking behaviour specifically.

The advantage of questionnaire-based surveys is convenience, for both the researcher and for the respondents. Questionnaire-based surveys are cheaper compared to for example biomarker based studies and provide the opportunity to monitor larger populations (Florescu et al., 2009). By keeping the questions similar, this approach is suitable for assessing long-term trends in health beha-

viour. The WHO has provided example questions and recommends their use so that the answers can be compared (CDC, 2011).

Some of the limitations of collecting self-reported data include a possibility for classification- and recall-bias. The first means that a person might have difficulties determining their own smoking status based on the questions. The recall-bias makes it difficult to assess the quantities of the products used but also some important milestones in smoking behaviour, like initiation of smoking. The more time that has passed from the age of initiation of smoking, the more inconsistently it may be reported (Wellman & O'Loughlin, 2015).

In some cases, the biases can be more common and can lead to underestimation of smoking prevalence. This happens particularly in situations where social desirability is greater (Florescu et al., 2009), such as with children and adolescents, with pregnant women (Pärna et al., 2005c) and patients with conditions that are commonly associated with smoking (lung cancer, asthma, COPD) (Stelmach et al., 2015). Also among groups where setting a good example is important, like teachers and health care professionals.

An important aspect to consider when using questionnaires, is the duration and intensity of smoking. For that, pack-year as a measure can be applied. Pack-year is a unit that describes how much a person has consumed cigarettes during years and is calculated by multiplying the number of years of having smoked by the number of packs of cigarettes smoked per day. A pack is considered to contain 20 cigarettes.

Biomarker-based measurement

Validation of self-reported data is possible when using biomarkers like cotinine, the metabolite of nicotine. Cotinine has a longer half-life (10 hours or more) compared to nicotine, and therefore allows to detect better whether a person has smoked, for example, if it was on the previous day.

Cotinine level has been shown to correlate with cigarettes per day and time to first cigarette in the morning (Muscat et al., 2009; van Overmeire et al., 2016), both of which are important measures of nicotine addiction, as well.

Cotinine can be measured from urine, blood, saliva, and also from hair. By using relevant cut-off points (10–20 ng/mL for serum, 10–25 ng/mL for saliva, 50–200 ng/mL for urine) (Kim, 2016), smokers can be distinguished from non-smokers.

However, there are several limitations for using biomarker-based measurement. As the nicotine metabolism can be altered because of individual differences, the possibility of misclassification exists. For example, a second-hand smoker could be classified as a smoker, or an occasional smoker as a non-smoker. This aspect has been considered an important limitation for using cotinine to validate self-reported smoking status. To overcome this limitation, it is suggested that country-specific or multiple cut-off values of biomarkers for different exposure categories should be provided (Kim, 2016). Another limitation is that biomarkers are not best suited for use in population studies as they are time-consuming methods that require possibly expensive equipment.

Measuring cotinine from hair is non-invasive compared to drawing blood and has been shown to be an effective marker for assessing exposure to environmental tobacco smoke among children. When cotinine levels from children’s hair were used to validate parents’ reports on smoking at home, the results revealed that parents’ reports might not be compatible with the cotinine levels in their children’s hair (Gunay et al., 2020).

Other possibilities

Smoking behaviour among a smaller group can be accessed via direct observation, as well. This is also a time-consuming approach and is more suitable among very small populations for short periods of time. For example, in the United Kingdom, direct observation was used to assess compliance with smoke-free policies in hospitals (Ratschen et al., 2008).

2.3. Measurement of nicotine dependence

In smoking cessation, the treatment decisions are based on knowledge of a person’s ND strength. There are several methods to determine strength of ND; for example, by asking how soon after waking up a person smokes their first cigarette. As a measure, time to first cigarette (TTFC) has great validity (Baker et al., 2007). Quicker TTFC means higher dependence. Another option is the Heaviness of Smoking index (HSI), which has two items – “time to first cigarette upon waking” and “number of cigarettes smoked per day”. This approach is used for example in cases of limited time and resources (Heatherton et al., 1991).

The most widely used instrument to measure ND is Fagerström Test for Nicotine Dependence (FTND) (Heatherton et al., 1991). The test was first introduced as Fagerström Tolerance Questionnaire in 1978 and consisted of eight items. In 1991, the test was revised by the author Karl-Olov Fagerström and his co-authors. From the questionnaire, items concerning inhalation and nicotine rating were removed. The revised version had six items (Heatherton et al., 1991):

<u>Questions</u>	<u>Answers</u>	<u>Points</u>
1. How soon after you wake up do you smoke your first cigarette?	Within 5 minutes	3
	6–30 minutes	2
	31–60 minutes	1
	After 60 minutes	0
2. Do you find it difficult to refrain from smoking in the places where it is forbidden e.g. in church, at the library, in cinema, etc.?	Yes	1
	No	0
3. Which cigarette would you hate most to give up?	The first one in the morning	1
	All others	0

<u>Questions</u>	<u>Answers</u>	<u>Points</u>
4. How many cigarettes/day do you smoke on average?	10 or less	0
	11–20	1
	21–30	2
	31 or more	3
5. Do you smoke more frequently during the first hours after waking than during the rest of the day?	Yes	1
	No	0
6. Do you smoke if you are so ill that you are in bed most of the day?	Yes	1
	No	0

Based on the answers to questions, a score is calculated. However, there are different scoring systems in use, based on whether 0 points can be assigned or not. The above-mentioned scale is provided by the author of the FTND. There, the result in the range of 0–10 can be calculated. Based on the score, ND strength is determined.

In studies, different cut-off points and categorizations are in use to determine ND strength. For example, ND has been determined as low when FTND score is in range 1–4 (Layoun et al., 2017) or 0–5 (Lim et al., 2012). Similarly, high dependence was determined for scores ≥ 5 (Layoun et al., 2017), above 6 (Papadopoulos et al., 2008) or 7 and more (Caponnetto & Polosa, 2008). The present study uses cut-off points as follows: low for the score ≤ 3 , moderate for the score 4–6, high for the score ≥ 7 (Fagerström et al., 2012).

The higher the ND score, the higher the dependence. Higher ND score indicates lower abstinence rates (Fagerström et al., 2012) and more intense withdrawal symptoms (Difranza et al., 2012).

2.4. Smoking prevalence globally and in Estonia

According to WHO data, smoking prevalence in the world has declined during the last decades. In 2007, globally about 31% of men and 11% of women were current cigarette smokers. In 2018, the prevalence was 26% among men and 9% among women.

Currently, smoking prevalence tends to be higher in South-East Asian and Western Pacific regions, where in some cases, up to 75% of men and 50% of women smoke. In Europe, current cigarette smoking prevalence is highest in Eastern and some Western European countries, reaching almost 50% among men and about 35% among women.

Looking at the Estonia's neighbouring countries, in Finland, in 2007, 25% of men and 19% of women were current smokers (Figure 1). In 2018, the prevalence of current smoking was 19% among men and 16% among women. In Latvia, among men, current smoking was 48% in 2007 and 44% in 2018 and among women, 22% and 21%, respectively (WHO, 2020b).



Figure 1. Age-standardized for WHO standard population (Ahmad et al., 2001) prevalence of current cigarette smoking in Estonia (EE), Latvia (LV), Lithuania (LT), Finland (FI) and Sweden (SE), 2007–2018 (WHO, 2020b).

In Estonia, adults smoking behaviour data has been collected since 1990. Among 16–64-year-olds, in 1990, 44% of men and 15% of women were daily smokers (Figure 2). Smoking prevalence was the highest in 1994, when 50% of men and 21% of women were daily smokers. Since 2006, the prevalence of daily smoking has declined steadily from 48% among men and 21% among women to 23% among men and 13% among women by 2018 (NIHD, 2019a).

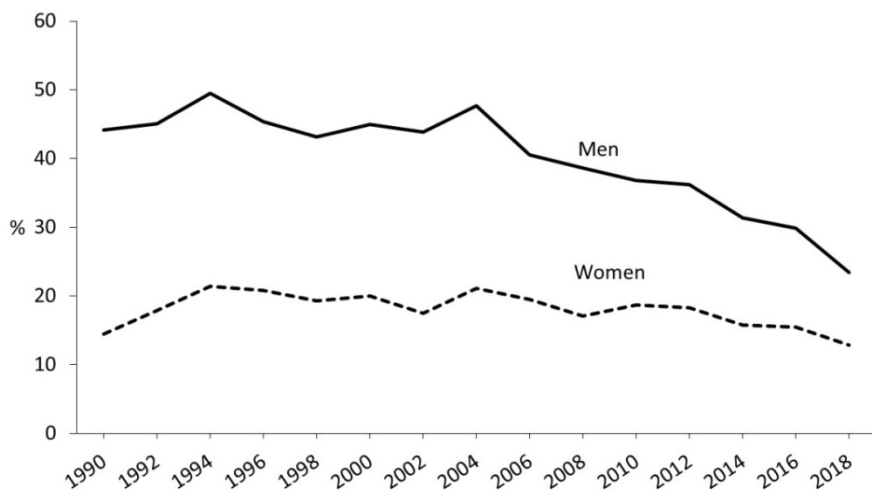


Figure 2. Daily smoking prevalence in Estonia among 16–64-year old adults, 1990–2018 (NIHD, 2019b).

2.5. Smoking among physicians

2.5.1. Physicians' tobacco epidemic

The trends of smoking among physicians could indicate smoking tendencies among the general population. According to the physicians' tobacco epidemic model, physicians take up smoking earlier than the general population (Figure 3) (Davis, 1993). This has been, on one hand, related to the hazards of smoking not yet being evident in the society, and on the other hand, to the higher income of physicians that allows them to spend on tobacco. This is called the immature phase in the model. After some time, when the health risks of smoking become more apparent, the physicians' smoking prevalence begins to decline. This could take several years, as the smoking-attributable diseases could take time to develop. At this time, smoking among the general population is still increasing. The second phase of the model, the mature phase, describes the situation where physicians smoke less than the general population. Sometime after that, smoking among general population will decrease, as well. However, smoking among the general public remain higher than among physicians.

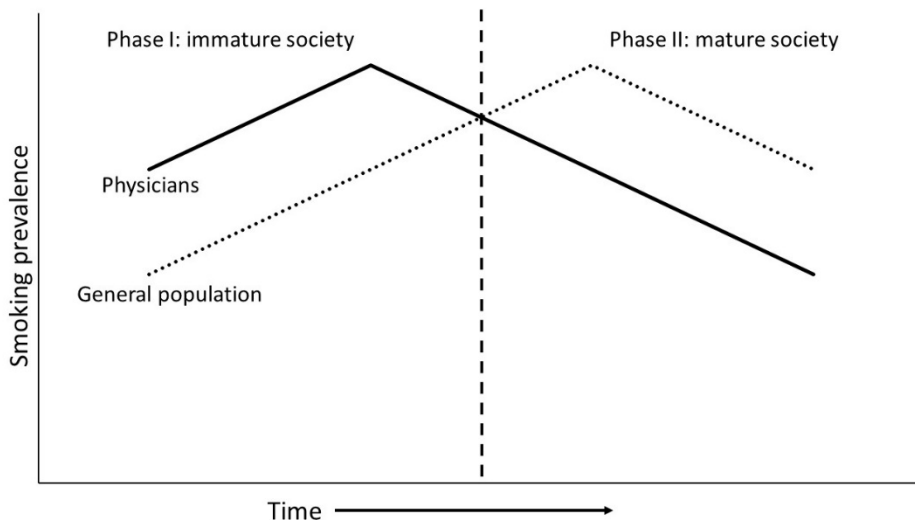


Figure 3. Physicians' tobacco epidemic model, adapted from Davis, 1993.

According to the physicians' tobacco epidemic model, countries like Italy, the Philippines, and Portugal are considered immature (La Vecchia et al., 2000; Ravara et al., 2014; WHO, 1997, 2015). Countries in the second phase can be described as mature and this includes, for example, Finland, Denmark but also Estonia (Pärna et al., 2005d; Smith & Leggat, 2007).

2.5.2. Smoking among physicians globally and in Estonia

Among physicians worldwide, smoking prevalence has declined. The longest study exploring smoking among physicians is the British male doctors' smoking survey that was first started in 1951 (Doll et al., 1994). According to the results, in 1951–1991 smoking prevalence among that population declined from 62% to 18% (Doll et al., 1994).

Among physicians in Australia, in the 1960s about a third of physicians smoked, but in the late 1990s, only 3% smoked (Smith & Leggat, 2008). The lowest prevalence of smoking among physicians has been reported from the United States of America, where in 2000, 2% of physicians smoked (Smith & Leggat, 2007). In 2001, in Denmark, 15% of physicians smoked (Smith & Leggat, 2007) and in Finland, at the beginning of the 2000s, daily smoking prevalence was 7% among men and 4% among women (Barengo et al., 2004).

In developed countries, there are also some exceptions in terms of physicians' smoking, with the prevalence being remarkably higher than elsewhere. For example, in Japan in 2000, 27% of men and 7% of women were smokers. By 2009, prevalence of current smoking among physicians in Japan was 16% among men and 5% among women (Smith & Wada, 2013).

In developing countries, for example in Mexico, at the beginning of 1990s, 61% of physicians smoked. In 2000, the prevalence was about three times lower (21% of men and 16% of women were daily smokers) (Abdullah et al., 2014). In the Philippines, from 1987 to 2009, smoking among physicians decreased from 63% (among men only) to 28% (among both men and women) (WHO, 1997) (Adraneda, 2015).

In Estonia, smoking among physicians has declined since 1978. In 1978, 42% of men and 20% of women were current smokers (Väärt et al., 1979). In 1982, 42% of men and 15% of women were current smokers (Rahu & Raudsepp, 1986). By 2002, the prevalence of current smoking had declined to 26% among men and 11% among women (Pärna et al., 2005a). As smoking among physicians was lower than among the general population, Estonia was a mature country in terms of the tobacco epidemic.

2.6. Attitudes towards smoking behaviour

2.6.1. Attitudes towards smoking

Physicians are regarded as people from whom smokers would accept advice on smoking cessation (WHO, 2005). In former studies among Italian physicians specialising in public health, 80% considered health professionals as behavioural models for patients, and 97% affirmed that health professionals have a role in giving advice or information about smoking cessation (La Torre et al., 2014). In Serbia, 61% of physicians agreed that healthcare professionals serve as role models for their patients and for the public (Stojanovic et al., 2013). In Finland, in 2001, about 80% of non-smoking physicians agreed that setting a good

example is important. Compared to Finnish physicians, Estonian physicians were less conscious of their role as healthy lifestyle exemplars in 2002 (Pärna et al., 2005a).

Physicians who smoke, are less likely to agree that smoking is harmful (Pipe et al., 2009). Furthermore, they underestimate the effects of tobacco smoke on health, and this influences their practice (Meshefedjian et al., 2010; Pärna et al., 2005a; Willaing et al., 2003).

2.6.2. Addressing patients' smoking

Theoretical framework

Physicians should screen all patients for tobacco use, offer advice to quit, and provide assistance and follow-up to patients who are tobacco users (CDC, 2013). In assisting patients to quit smoking, the World Health Organization recommends using the “5 A’s” intervention strategy which was developed for smoking cessation and provides a model that guides the physician through the process of helping a patient quit tobacco. The model involves 5 brief interventions (WHO, 2001) (WHO, 2014):

- Ask (systematically identify all tobacco users at every visit, record smoking status, keep the record up to date);
- Advise (persuade all tobacco users that they need to quit by advising smokers of the benefit of stopping in a personalised and appropriate manner (this may include linking the advice to their clinical condition));
- Assess (assess motivation to stop and readiness to make a quit attempt);
- Assist (help the patient with a quit plan including the offer of support, recommendation to use NRT or bupropion and accurate information and advice about them, referral to a specialist cessation service if necessary);
- Arrange (arrange follow up if possible by scheduling follow-up contacts or a referral to specialist support).

Data on addressing patients' smoking

According to the “5 A’s” model, the first step would be to ask patients about their smoking habits. However, prevalence of addressing patients' smoking vary across countries, and physicians do not know their patients' smoking status (Bryant et al., 2015). For example, in the Netherlands 62%, and in the United Kingdom 98% of general practitioners asked all new patients about their smoking status and did so only during the first visit. Fewer physicians addressed patient smoking routinely (28% of physicians in Belgium, 63% in the United Kingdom) (Stead et al., 2009). In Finland, in the beginning of 2000s, about 80% of physicians asked their patients about smoking at least once during a week. Among physicians in Estonia, the result was similar (Pärna et al., 2005a).

Smoking physicians are less likely to ask patients about smoking, when compared to non-smoking colleagues (Garfinkel, 1976; Kawakami et al., 1997; Mughal et al., 2018; Pipe et al., 2009; Puska et al., 2005; Reile & Pärna, 2018; Stead et al., 2009; Tang et al., 2013).

Finding smoking cessation to be an important task and acknowledging that it is a part of a physician's job, feeling comfortable about giving smoking cessation related information and believing their actions to be effective, increases the chances of a physician addressing patients' smoking. On the other hand, perceiving the discussion of smoking as harmful to the professional relationship, wishing not to invade a patient's privacy, having previous unpleasant experience, but also low confidence in one's own knowledge, decrease the probability that a doctor addresses patients' smoking habits. (Alateeq et al., 2016; Jradi et al., 2015; Stead et al., 2009).

A systematic review conducted among primary care physicians showed that 38% did not believe that discussing smoking would be effective, 18% had unpleasant personal experiences related to the task, 22% had no confidence in their own ability and 16% had no confidence in their knowledge. Few (5% or less) physicians expressed that discussing smoking with patients would be an intrusion of privacy (interfering with patients' personal choice) and that discussing smoking is not justified (Vogt et al., 2005).

In addressing patients' smoking, in addition to personal attitudes, other factors have been shown to play a role. For example, physician's higher age has been associated with higher odds of asking about patients' smoking (Mughal et al., 2018). When looking at medical specialty, general practitioners were more likely to address patients' smoking habits (Meijer et al., 2019).

The contextual factors related to addressing patients' smoking habits are time, training and reimbursement (Stead et al., 2009). Lack of time is the most reported barrier to delivering smoking cessation care (Jradi et al., 2015; Meijer et al., 2019; Vogt et al., 2005) and has been found to be so among physicians in Estonia as well (Pärna et al., 2005a). Having sufficient training affects physicians' confidence in their skills, which then again leads to more actively addressing patients' smoking (Alateeq et al., 2016; Meijer et al., 2019) (Stead et al., 2009).

2.6.3. Desire to quit smoking among physicians

Theoretical framework

Quitting smoking as a behaviour change can demonstrate distinguishable stages, like those in the states-of-change model (Prochaska et al., 1993):

- pre-contemplation (no intention to change in the near future);
- contemplation (awareness of the problem, seriously thinking about overcoming it but have not yet made a commitment to take action);
- preparation (intending to take action, unsuccessful attempts in the past year; small behavioural changes);
- action (behaviour, experiences, environment modification, considerable commitment of time and energy);
- maintenance (preventing relapse, consolidating gains).

Intention or desire to quit precedes a concrete action like a quit attempt.

Data on desire to quit smoking

Greater intention to quit predicts success of a quit attempt (Hyland, 2006). The intention to quit smoking has been associated with several factors. For example, it has been shown to be higher among younger people (Marques-Vidal et al., 2011), among people with higher ND, among those with a higher number (6 and more) of previous quit attempts and among people with higher alcohol consumption (Marques-Vidal et al., 2011; Myung et al., 2012). Higher annual income and higher education was also associated with having an intention to quit (Myung et al., 2012).

Among physicians, in Poland in 2004 about 60% of smoking physicians wished to quit, but in the Czech Republic in 1995 about 75% of smoking physicians had an intention to quit (Abdullah et al., 2014).

2.7. Nicotine dependence among physicians and the general population

Quitting smoking could prove difficult due to ND (DiFranza et al., 2002; Hyland et al., 2004). Nicotine acts on nicotinic cholinergic receptors in the brain to trigger the release of dopamine and other neurotransmitters. Repeated exposure to nicotine results in the development of tolerance and this leads to smoking more often to maintain enhancement of mood and prevention of withdrawal symptoms like irritability, anxiety, depressed mood, difficulty in concentrating, increased appetite, insomnia (Benowitz, 2010; Chawla & Garrison, 2018). As the withdrawal symptoms are unpleasant for the smoker, specific moods and situations are associated with the rewarding effects of nicotine. This reflects the behavioural component of ND and is often the trigger for relapse (Benowitz, 2010).

ND is also associated with factors like the age of tobacco uptake. The earlier the age of initiating smoking, the higher are the chances that a person will become a smoker (Breslau et al., 1993). In addition, desire to quit, more previous quit attempts, and smoking relapses have been found to be associated with higher ND (Zhou et al., 2009).

Data concerning nicotine dependence among physicians is scarce. The available results show that low ND tends to be more prevalent among physicians; for example, in Germany, where in 2018, 65% of physicians had low dependence (HSI score ≤ 2) (Pförringer et al., 2018) and in Spain, in 2015, where about 82% of physicians who smoked had low ND (FTND score ≤ 3) (Juárez-Jiménez et al., 2015). However, in Turkey in 2014, 46% of smoking physicians had low ND (FTND score ≤ 3) (Baltaci et al., 2014).

According to the studies exploring ND in the general population, the lowest scores (2.8 points) have been in Germany (in 1997) and Norway (in 1995), but the highest average scores of 4.6 points were in Sweden (around 2000) and USA (1990s) (Fagerström & Furberg, 2008).

2.8. Smoking-related policies in Estonia

During the last decades, the tobacco policy in Estonia has progressed well and follows international developments. However, in terms of smoking prevention, policies and movements became notably more active at the beginning of the 2000s. Figure 4 illustrates main milestones of smoking-related policies in Estonia. In 2005, Estonia ratified the World Health Organization Framework Convention on Tobacco Control (FCTC) (WHO, 2005). The first version of the current Tobacco Act was adopted in 2005 (*Tobacco Act*, 2005) and has been complemented in most years since. The tobacco policy in Estonia also relies on the “Green Paper on tobacco policy” (Ministry of Social Affairs, 2014) and the “National Health Plan” (Ministry of Social Affairs, 2012).

The Tobacco Act (2005) defines what is a tobacco product and what are the related products. It describes regulations for handling the products, prohibitions, and restrictions on consumption of tobacco products and products related to tobacco products.

In Estonia, smoking is prohibited for example on the premises of children’s welfare institutions and their designated territories, in spaces intended for sports. In the catering establishments, smoking is prohibited since 2005. On the premises of enterprises providing health services, smoking is restricted, meaning that smoking is allowed only in a designated smoking room.

Currently in Estonia most of the national campaigns addressing the promotion of smoking cessation and decrease in tobacco consumption are organized by the National Institute for Health Development (NIHD) which was created in 2004. The institute collects and provides data related to health behaviour of the Estonian population but also manages the websites on tobacco information (tubakainfo.ee) and general health information (terviseinfo.ee), which are valuable resources for the public and for the organizations involved in health promotion.

NIHD also provides information on creating tobacco-free workplaces. Estonia joined the International Network of Health Promoting Hospitals and Health Services in 1999 and currently, most of the hospitals have joined the network. Furthermore, one of the biggest hospitals, Tartu University Hospital, has achieved the Gold Forum membership, which means that a systematic tobacco cessation program, health promotion program, tobacco-free healthcare environment, and tobacco-free culture among healthcare staff had to be achieved.

The first clinic offering smoking cessation treatment in Estonia opened in 1999. To make the services available to the population, the system of counselling services was established in 2005 as a measure to reduce cardiovascular diseases. In the same year, the network of smoking cessation counselling offices was created, based on the network of health promoting hospitals, covering all the counties by the end of the year.

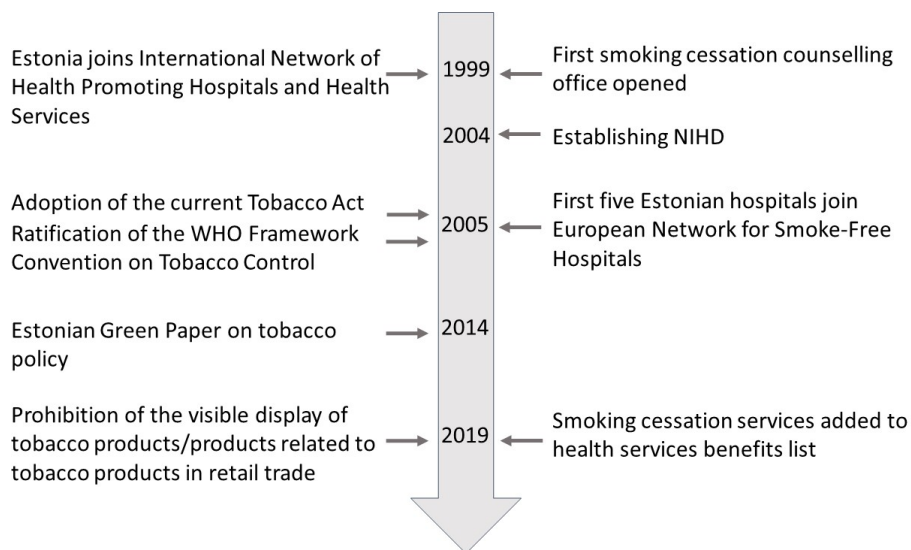


Figure 4. Milestones in smoking-related policies in Estonia, 1999–2019.

Until 2018, the NIHD was responsible for smoking cessation services, but in 2019, smoking cessation services were added to the national health benefits list. This means that national health insurance covers smoking cessation counselling for the insured persons (more than 90% of the population of Estonia is covered by national health insurance), whereas before, the services were financed through other means, for example health promotion projects.

In 2010, the NIHD published the methodological guidelines for the smoking cessation service and in 2012, the guidelines for family physicians were published (Ani & Ingerainen, 2012; NIHD, 2010). Currently, the national clinical guidelines for smoking cessation services are in development under the coordination of the Estonian Health Insurance Fund and the University of Tartu.

Smoking cessation counselling services are free of charge for the patients in Estonia, but pharmacological treatment for smoking cessation is currently not reimbursed. However, it has been suggested that a reimbursement rate of at least 50% should be introduced (Alloja et al., 2019).

2.9. Brief summary

In conclusion, based on the worldwide literature, knowledge of smoking behaviour of the physicians is important as physicians can be considered role models in the society but also because they have the opportunity to influence smoking behaviour among the population.

Smoking survey among physicians in Estonia is the longest regular health survey in the country with the existing database for the years from 1982 to

2014. Until now, in-depth analysis of smoking among physicians over the study years has not been carried out. The present study attempts to fill this gap.

The present study provides the opportunity to gain insight into the smoking trends among physicians thus allowing to compare Estonia with the other countries. The study investigates long-term patterns of attitudes towards smoking behaviour as well as readiness to address patients' smoking to ensure evidence-based continuous development of physicians' training in prevention and decreasing of smoking. Also, the study provides for the first time an overview of ND among daily smoking physicians in Estonia to gain understanding of possible obstacles in smoking cessation among physicians and to further develop smoking cessation services in the country.

3. AIMS OF THE RESEARCH

The general objective of the research was to provide evidence on smoking, attitudes towards smoking behaviour, and nicotine dependence among physicians in Estonia in 1982–2014.

The specific objectives were:

1. to describe trends in smoking among physicians in 1982–2014 (Paper I);
2. to analyse the views of physicians about the role of smoking in smoking-related diseases in 1982–2014 (Paper II);
3. to explore attitudes towards smoking behaviour in 2002 and 2014 (Paper III);
4. to describe frequency of addressing patients' smoking in 2002 and 2014 and to analyse factors related to addressing patients' smoking habits (Paper IV);
5. to explore factors associated with desire to quit smoking among currently smoking physicians in 2002 and 2014 (Paper V);
6. to describe nicotine dependence and to analyse association between nicotine dependence and factors related to smoking cessation among daily smoking physicians in Estonia in 2014 (Paper VI).

4. MATERIALS AND METHODS

4.1. Data collection

The data for the research was drawn from the Estonian physicians' smoking surveys in 1982, 2002 and 2014. All surveys were cross-sectional and relied on self-reported data. Initially, all practicing physicians in Estonia were included in the sample. Every survey year, different databases were used as a data source. Although there was a health care professionals' registry already in 2002, when the study sample was being compiled, the registry was undergoing renewal and was not available.

Table 1 describes the data collection process, initial sample sizes (number of physicians in the according registries), number of respondents (physicians who sent back the questionnaires), crude and corrected response rates of the surveys.

The questionnaires were mailed to physicians' workplace addresses in the first two study years and to home addresses in 2014. There is no information on reminder letters in 1982, but in 2002, a reminder with a copy of the questionnaire was sent to non-respondents 4–6 weeks after the initial questionnaire. In 2014, after 4 weeks, a reminder letter was sent to non-respondents, and after 8 weeks, all the study materials were sent again.

The corrected response rate (excluding the physicians who had retired, had an incorrect address, had left Estonia or had died) was 67.8% in 2002 and 53.1% in 2014. For 1982, corrected response rate is not available.

The survey questionnaire in 1982 (Appendix I) included 17 questions regarding demographics, smoking status, and attribution of the causal role of smoking in smoking-related diseases. The questionnaire used in the 2002 survey (Appendix II) was based on a validated questionnaire developed by the World Health Organization (WHO, 1998). The questionnaire was translated from English using back and forth translation and was adapted according to the Estonian healthcare system. The questions used in 1982 were kept in similar form in 2002 to ensure comparability. In 2002, questions were added to determine desire to quit smoking and attitudes towards smoking. In 2014, the questionnaire (Appendix III) was further supplemented by the six-item Fagerström Test for Nicotine Dependence. The questionnaires asked to name tobacco products used like cigarettes, cigars, pipes, hand-rolled cigarettes. The present study explored cigarette smoking.

Table 1. Data collection in physicians' smoking surveys, 1982–2014

Characteristics	1982	2002	2014
Data source	The database of Ministry of education	The database of Estonian Health Insurance Fund	The database of Estonian health care professional's registry
Questionnaires mailed	Work address	Work address	Home address
Reminder	–	After 4–6 weeks (reminder letter and questionnaire)	After 4 weeks (letter) and 8 weeks (reminder letter and questionnaire)
Initial sample (n)	4704	4140	5666
Respondents (n)	3792 (901 men, 2891 women)	2747 (471 men, 2276 women)	2892 (529 men, 2363 women)
Crude response rate (%)	80.7	66.3	52.0
Corrected* response rate (%)	–	67.8	53.1
Papers	I, II	I–V	I–VI

* Excluding the physicians who were unavailable, had an incorrect address, had left Estonia, or had died.

4.2. Study sample and variables

Trends in smoking behaviour (Paper I)

The study sample consisted of physicians who answered the question concerning smoking status (n=3786 in 1982, n=2735 in 2002, n=2902 in 2014).

The main outcome variable

- smoking status: current (daily, occasional), past, never

Background variables

- age: ≤34, 35–44, 45–54, 55–64, ≥65
- gender: men, women

Smoking-related variable

- age of initiation of smoking (measured in full years).

Views on the causal role of smoking smoking-related diseases (Paper II)

The study sample consisted of physicians who answered to the questions concerning smoking status and to questions regarding causal role of smoking in three smoking-related diseases (ischaemic heart disease (IHD), lung cancer, and chronic bronchitis) (n=3504 in 1982, n=2735 in 2002, n=2902 in 2014).

The main outcome variable

- agreement with the causal role of smoking in three smoking related diseases: agree (a major cause, one of the causes) and disagree (probably not a cause, not a cause, cannot say)

Smoking-related variable

- smoking status: current (daily, occasional), past, never

Background variables:

- age: ≤34, 35–44, 45–54, 55–64, ≥65
- gender: men, women
- ethnicity: Estonian, non-Estonian
- study year: 1982, 2002, 2014.

Physicians' attitudes towards smoking (Paper III)

The study sample involved physicians who were under 65 years of age and who answered the questions regarding smoking status and questions concerning attitudes towards smoking (n=2539 in 2002 and n=2338 in 2014).

The main outcome variables

- agreement with the seven statements concerning attitudes towards smoking:
 - 1) smoking is very harmful to health
 - 2) it is important to reduce smoking among the population
 - 3) to stop smoking is very hard for many people, so it is better for their health to simply continue smoking
 - 4) smoking does not damage my health as long as I follow a healthy lifestyle in other fields
 - 5) as many people have smoked for their whole lives until old age and not become ill, smoking is not as dangerous as experts declare
 - 6) to smoke or not to smoke, that is my personal choice
 - 7) smoking is only dangerous to my health if I smoke more than 10 cigarettes a day
- smoking status: current (daily, occasional), past, never.

Background variables

- age: <45, 45–64
- gender: men, women
- ethnicity: Estonian, non-Estonian
- place of residence: Tallinn (capital of Estonia), other city, and other (non-urban) settlement
- medical specialty: family physician, specialist doctor, dentist
- study year: 2002, 2014.

Addressing patients' smoking (Paper IV)

The study sample consisted of physicians who were under 65 years of age and who answered the question regarding addressing patients' smoking habits (n=2488 in 2002 and n=1791 in 2014).

The main outcome variable

- addressing patients' smoking in last 7 days: never, at least once (sometimes, every other time, often, always)

Variables regarding attitudes towards smoking

- agreement (yes, no, cannot say) that it is the physicians' responsibility to convince people to stop smoking
- agreement (yes, no, cannot say) that physicians should have smoking related materials to give out to patients if needed
- agreement (yes, no, cannot say) that my present knowledge is sufficient to advise a patient who wishes to stop smoking
- agreement (yes, no, cannot say) that smoking prevention should form part of the normal training of health professionals
- agreement (yes, no) that lack of habit is a barrier to addressing patients' smoking
- agreement (yes, no) that lack of time is a barrier to addressing patients' smoking
- agreement (yes, no) that wish to respect patient's privacy is a barrier to addressing patients' smoking

Smoking related variable

- smoking status: current (daily, occasional), past, never

Background variables

- age: measured in full years
- gender: men, women
- ethnicity: Estonian, non-Estonian
- medical specialty: family physician, specialist doctor, dentist
- study year: 2002, 2014.

Desire to quit (Paper V)

The study sample consisted of physicians who were under 65 years of age. The study included currently smoking physicians who answered the question regarding desire to quit smoking (n=322 in 2002, n=189 in 2014).

The main outcome variable

- desire to quit smoking: yes, no, cannot say

Smoking related variables

- smoking status: daily, occasional

- concern about harms of smoking: yes, no
- number of previous quit attempts: none, 1–2, 3–4, 5 or more
- stress as main reason to restart smoking: yes, no
- motivation to quit smoking (one answer from the list, or reason provided by the respondent): personal health problems, material stimulus, wish to set a good example, other reasons (social pressure, family related issues, becoming a parent etc.)

Background variables

- gender: men, women
- age: ≤34, 35–44, 45–54, 55–64
- ethnicity: Estonian, non-Estonian
- place of residence: Tallinn, other city, non-urban
- medical specialty: family physician, specialist doctor, dentist
- study year: 2002, 2014.

Nicotine dependence (Paper VI)

The study included daily smoking physicians who answered questions regarding smoking status and the FTND questions (n=171 in 2014).

The main outcome variable

- ND: low, at-least-moderate (moderate, high) ND

Smoking related variables

- age of initiation of smoking
- desire to quit: yes, no, cannot say
- main motives to quit smoking (one answer from the list, or provided by the respondent): personal health problems, wish to set a good example, other reasons (material stimulus, social pressure, family related issues, becoming a parent etc.), cannot say
- number of previous quit attempts: none, 1–2, 3–3, 5 or more
- stress as the main reason to restart smoking: yes, no

Background variables

- gender: men, women
- age: measured in full years
- ethnicity: Estonian, non-Estonian
- medical specialty: family physician, specialist doctor, dentist, other.

4.3. Statistical analysis

Trends in smoking behaviour (Paper I)

Prevalence of current smoking with corresponding 95% confidence interval (CI) was determined. Age-standardized smoking prevalence rate with the corresponding 95% CI was calculated using European standard population (Ahmad et al., 2001). Mean age of respondents with standard deviation, minimum and maximum value, and mean age of smoking initiation with 95% CI were calculated. To determine significant changes in smoking over time, a non-parametric test for trend was used.

Views on the causal role of smoking (Paper II)

Mean age (with SD, minimum and maximum value) and distribution of respondents by age group and ethnicity was calculated. Age-standardized smoking prevalence rate with the corresponding 95% CI was calculated using European standard population (Ahmad et al., 2001). Prevalence of agreement/disagreement with the statements concerning smoking as a reason for IHD, lung cancer and chronic bronchitis was determined.

To test for associations between agreement with a causal role of smoking in IHD, lung cancer, and chronic bronchitis, and explanatory variables, logistic regression analysis was conducted. Fully adjusted odds ratios with 95% CI were calculated.

Physicians' attitudes towards smoking (Paper III)

Age-standardised prevalence of smoking with corresponding 95% CIs was calculated using European standard population (Ahmad et al., 2001). Mean age (with SD) of respondents was calculated. Distribution (%) of respondents by agreement with the statements concerning attitudes towards smoking and by explanatory variables was calculated. To test for differences in attitudes towards smoking and in explanatory variables between 2002 and 2014, the chi-squared test was used.

To determine association of attitudes towards smoking with smoking status and explanatory variables, logistic regression models were used. Fully adjusted odds ratios with 95% CI were calculated.

Addressing patients' smoking (Paper IV)

Mean age (with SD) of respondents was calculated. To test for differences between mean ages, a t-test was used. Distribution of the sample by explanatory variables was determined. Age-standardized prevalence of addressing patients' smoking habits was calculated along with 95% CI using European standard population (Ahmad et al., 2001).

To analyse association between addressing patients' smoking habits (at least once during last 7 days vs never) and explanatory variables, a fully adjusted logistic regression model was calculated. Fully adjusted odds ratios with 95% CI were calculated.

Desire to quit (Paper V)

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.

Logistic regression analysis was used to determine association between desire to quit smoking and factors related to smoking behaviour. Two models were performed: Model I (adjusted for gender, age, and year) and Model II (adjusted for all explanatory variables). Fully adjusted odds ratios with 95% CI were calculated.

Nicotine dependence (Paper VI)

Mean age of respondents, mean age of smoking initiation and mean FTND score were calculated along with standard deviations (SD). ND was determined based on FTND score (low for the score ≤ 3 , moderate for the score 4–6, high for the score ≥ 7). To test for differences between men and women in the distribution of FTND results and of ND, the Fisher exact test was used. To test for differences between the mean age of smoking initiation among respondents with low and at-least-moderate ND, a t-test was used. To compensate for response-bias, post-stratification weights were used based on gender and 5-year age groups of the sample of physicians in Estonia (Raag & Pärna, 2018)

To determine association of ND (at-least-moderate *vs* low) with factors related to smoking cessation, a logistic regression model was used. The data for men and women was pooled for the analysis, as there was no significant difference between men and women in ND score. Fully adjusted odds ratios with 95% CI were calculated.

In all the papers, data was analysed using the statistical package Stata (Stata).

4.4. Ethics and consent

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). With the survey questionnaire, recipients were sent a cover letter including a description of the study design and how the collected data would be used. The letter explained that participation in the study would be considered to constitute consent. Additional written consent was not obtained. Ethical approval had not been obtained in 1982, since there was no ethical committee in Estonia at that time.

5. RESULTS

5.1. Trends in smoking (Paper I)

The mean age of smoking initiation was 20.4 in 1982 and 19.3 in 2014 for men and 24.5 in 1982 and 20.4 in 2014 for women (Table 2). Compared to 1982, the mean age of smoking initiation was significantly lower in 2014 among women.

Table 2. The mean age and 95% confidence interval for smoking initiation among currently smoking physicians by gender and study year

Study year	Men		Women	
	Mean age	95% CI	Mean age	95% CI
1982	20.4	20.0–20.8	24.5	24.0–25.0
2002	19.9	18.9–20.8	22.3	21.5–23.0
2014	19.3	18.1–20.5	20.4	19.7–21.1

Figure 5 presents the age-standardized (for European population by Ahmad et al., 2001) prevalence of current smoking in 1982, 2002 and 2014. There was a significant decrease of current smoking among both men and women ($p < 0.001$ for trends). Among men, the prevalence of current smoking was 39.7% in 1982 and 14.3% in 2014. Among women, the prevalence of current smoking was 12.2% in 1982 and 5.2% in 2014.

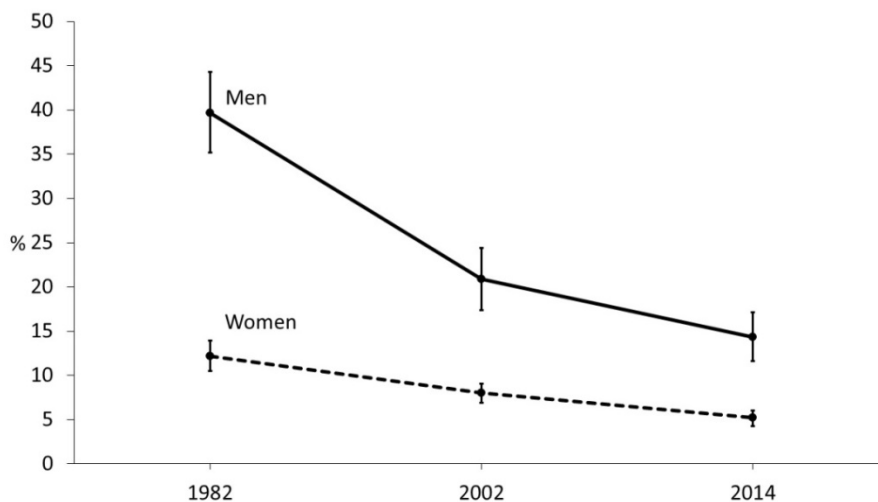


Figure 5. Age-standardized (for European population, by Ahmad et al., 2001) prevalence of current smoking among physicians in Estonia, 1982–2014.

Age-standardized prevalence of daily smoking was 38.3% in 1982, 15.0% in 2002 and 11.7% in 2014 among men and 10.3%, 4.7% and 3.9%, respectively, among women. Age-standardized prevalence of occasional smoking was 1.4% in 1982, 5.9% in 2002 and 2.6% in 2014 among men, 1.9%, 3.3% and 1.2%, respectively, among women. Age-standardized prevalence of past smoking among men increased from 24.2% in 1982 to 28.3% in 2002, and then decreased to 25.0% by 2014. Among women the age-standardized prevalence of past smoking increased from 10.6% in 1982 to 16.3% in 2014. From 1982 to 2014, age-standardized prevalence of physicians who had never smoked increased from 33.3% to 50.8% among men and from 74.4% to 78.5% among women.

The biggest decrease of current smoking among men and women was in those aged ≤ 34 (55.2% and 16.7% for men, 16.7% and 2.8% for women, respectively) and in the age group 35–44 (47.1% and 8.3% for men, 19.5% and 5.1% for women, respectively) ($p < 0.001$ for trends) (Figure 6).

Current smoking decreased significantly among 45–54-year-old and 55–64-year-old men ($p=0.001$ and $p=0.006$, respectively), but increased among men in the oldest age group ($p=0.429$). While in 1982 and 2002 the highest prevalence of current smoking among men was among ≤ 34 -year-old (55.2% and 30.7%, respectively) followed by those aged 35–44 (47.1%) in 1982 and those aged 45–54 (28.0%) in 2002, then in 2014 the highest prevalence was in those aged 55–64 (19.8%), followed by those aged 45–54 (17.3%) and ≤ 34 (16.7%).

Among women, current smoking decreased in the 45–54 age group ($p=0.009$), was stable among 55–64-year-olds ($p=0.751$), and increased in the oldest age group ($p=0.156$). While in 1982 and 2002 the highest prevalence of current smoking among women was in the age group 35–44 (19.5% and 12.3%, respectively) followed by the age group ≤ 34 (16.7%) in 1982 and 45–54 (10.7%) in 2002, then in 2014 the highest prevalence was in their age group 55–64 (8.9%), followed by age groups 45–54 (7.1%) and ≥ 65 (6.4%).

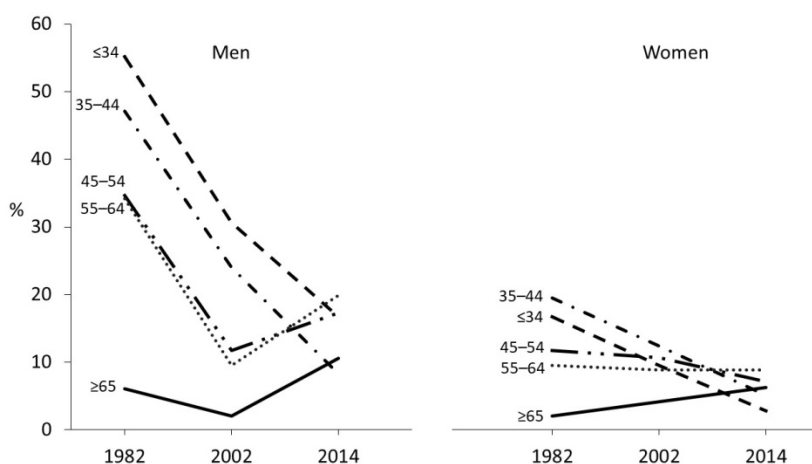


Figure 6. Prevalence of current smoking (%) by gender and age group among physicians in Estonia, 1982–2014.

5.2. Physicians' attitudes towards smoking

5.2.1. Physicians' views on the causal role of smoking in smoking-related diseases (Paper II)

The majority of physicians agreed that smoking is a major cause, or one of the causes of IHD, lung cancer, and chronic bronchitis (Table 3). The prevalence of agreement increased for all conditions. In 1982, the agreement was higher for chronic bronchitis but by 2014, prevalence of agreement was more than 98% for all the conditions.

Table 3. Agreement (%) among physicians that smoking is a major cause or one of the causes in IHD, lung cancer, chronic bronchitis

Smoking-related disease	1982		2002		2014	
	Men	Women	Men	Women	Men	Women
Ischaemic heart disease	84.7	84.1	96.6	96.3	98.5	98.0
Lung cancer	89.8	88.6	98.3	99.1	98.8	99.2
Chronic bronchitis	94.8	93.9	98.8	99.1	99.0	99.2

In fully adjusted logistic regression models (Table 4):

- agreement that smoking is a cause of IHD was significantly associated with ethnicity among men and women, and with smoking status and age among women (Model I);
- agreement that smoking is a cause of lung cancer was significantly associated with smoking status among men and women, and with ethnicity among women only (Model II);
- agreement that smoking is a cause of chronic bronchitis was significantly associated with ethnicity among men and women and with smoking status among women (Model III).

For all the conditions, compared to 1982, agreement was significantly higher in 2002 and 2014.

Table 4. Agreement (vs disagreement) that smoking is the cause of IHD (Model I), lung cancer (Model II), chronic bronchitis (Model III)

Characteristic	Men		Women	
	OR*	95% CI	OR*	95% CI
Study year	Model I: IHD			
2002 vs 1982	4.49	2.61–7.72	5.03	3.91–6.48
2014 vs 1982	10.40	4.95–21.85	9.78	7.04–13.59
Smoking status				
Past vs current	1.16	0.74–1.82	1.66	1.17–2.35
Never vs current	1.43	0.95–2.15	1.63	1.28–2.08
Age				
35–44 vs ≤34	0.96	0.60–1.53	0.96	0.74–1.25
45–54 vs ≤34	1.26	0.76–2.08	0.72	0.56–0.94
55–64 vs ≤34	1.01	0.58–1.76	0.70	0.52–0.96
≥65 vs ≤34	1.00	0.46–2.15	0.56	0.35–0.89
Ethnicity				
Estonian vs Non-Estonian	1.88	1.31–2.69	1.35	1.10–1.64
Study year	Model II: Lung cancer			
2002 vs 1982	5.72	2.72–12.05	12.91	8.27–20.15
2014 vs 1982	7.70	3.25–18.27	16.54	10.06–27.17
Smoking status				
Past vs current	1.90	1.09–3.32	2.29	1.55–3.38
Never vs current	2.31	1.39–3.82	3.71	2.84–4.83
Age				
35–44 vs ≤34	0.58	0.33–1.02	1.41	1.03–1.94
45–54 vs ≤34	1.08	0.57–2.04	0.82	0.60–1.12
55–64 vs ≤34	0.81	0.40–1.63	0.81	0.56–1.19
≥65 vs ≤34	0.74	0.28–1.97	0.66	0.35–1.26
Ethnicity				
Estonian vs Non-Estonian	1.49	0.96–2.30	1.42	1.11–1.82
Study year	Model III: Chronic bronchitis			
2002 vs 1982	3.95	1.65–9.46	6.26	3.95–9.91
2014 vs 1982	5.05	1.91–13.33	8.23	4.89–13.84
Smoking status				
Past vs current	1.38	0.69–2.76	1.68	4.30–10.36
Never vs current	1.88	0.97–3.65	2.11	1.48– 3.01
Age				
35–44 vs ≤34	0.43	0.19–0.96	1.14	0.75–1.73
45–54 vs ≤34	0.72	0.29–1.76	0.74	0.50–1.10
55–64 vs ≤34	0.51	0.20–1.32	0.69	0.43–1.10
≥65 vs ≤34	0.53	0.15–1.88	0.80	0.36–1.77
Ethnicity				
Estonian vs Non-Estonian	1.88	1.08–3.30	1.72	1.27–2.32

* Model for each condition adjusted for study year, smoking status, age, ethnicity.

5.2.2. Physicians' attitudes regarding patients' smoking (Paper III)

Compared to 2002, in 2014, the attitudes towards smoking were less favourable among both men and women. Prevalence of agreement that smoking is harmful to health and that it is important to reduce smoking among the population was higher in 2014 than in 2002. On the other hand, in 2014, agreement that to stop smoking is very hard for many people, so it is better for their health to continue smoking, that smoking does not damage health as long as otherwise healthy lifestyle is followed, that as many people have smoked for their whole lives until old age and not become ill, smoking is not as dangerous as experts declare, that smoking is a personal choice and that smoking is only dangerous if more than 10 cigarettes a day are smoked was lower than in 2002.

According to fully adjusted logistic regression models (Table 5), in 2014 (vs 2002):

- physicians agreed significantly more that smoking is harmful, and it is important to reduce smoking among the population;
- physicians agreed significantly less that to stop smoking is very hard for many people, so it is better for their health to simply continue smoking, and that smoking does not damage person's health as long as they otherwise follow a healthy lifestyle;
- among women only, the agreement that as many people have smoked for their whole lives until old age and not become ill, smoking is not as dangerous as experts declare, that to smoke is a personal choice, and that smoking is only dangerous to health if more than 10 cigarettes a day are smoked decreased significantly.

Agreement with all the statements was associated with smoking status among both, men and women.

Table 5. Association of physicians' attitudes towards smoking (agreed vs disagreed) with study year and smoking status (OR, 95% CI)

Statements	Men		Women	
	OR*	95% CI	OR*	95% CI
Smoking is very harmful to health				
2014 vs 2002	2.13	1.51–3.01	2.81	2.35–3.36
Smokers vs non-smokers	0.27	0.19–0.39	0.22	0.17–0.27
It is important to reduce smoking among the population				
2014 vs 2002	3.86	1.69–8.80	2.96	1.75–5.03
Smokers vs non-smokers	0.41	0.20–0.84	0.27	0.16–0.45
To stop smoking is very hard for many people, so it is better for their health to simply continue smoking				
2014 vs 2002	0.48	0.32–0.72	0.62	0.52–0.74
Smokers vs non-smokers	2.54	1.67–3.86	3.46	2.67–4.49
Smoking does not damage my health as long as I follow a healthy lifestyle in other fields				
2014 vs 2002	0.43	0.23–0.79	0.48	0.36–0.65
Smokers vs non-smokers	6.86	3.90–12.06	4.56	3.29–6.33
As many people have smoked for their whole lives until old age and not become ill, smoking is not as dangerous as experts declare				
2014 vs 2002	0.96	0.63–1.47	0.72	0.59–0.87
Smokers vs non-smokers	5.88	3.83–9.02	3.75	2.88–4.89
To smoke or not to smoke, that is my personal choice				
2014 vs 2002	1.01	0.74–1.38	0.78	0.68–0.89
Smokers vs non-smokers	5.87	3.70–9.30	4.59	3.47–6.08
Smoking is only dangerous to my health if I smoke more than 10 cigarettes a day				
2014 vs 2002	0.60	0.36–1.00	0.51	0.39–0.69
Smokers vs non-smokers	4.77	2.90–7.84	4.32	3.10–6.04

* Adjusted for study year, smoking status, age, ethnicity, place of residence and medical specialty.

5.2.3. Addressing patients' smoking habits (Paper IV)

The prevalence of addressing patients' smoking every other time, often and always was higher in 2014 than in 2002 (Figure 7). In 2002, 15.1% of men and 16.4% women never asked about their patients' smoking habits but in 2014, the prevalence decreased to 10.6% and 10.1%, respectively.

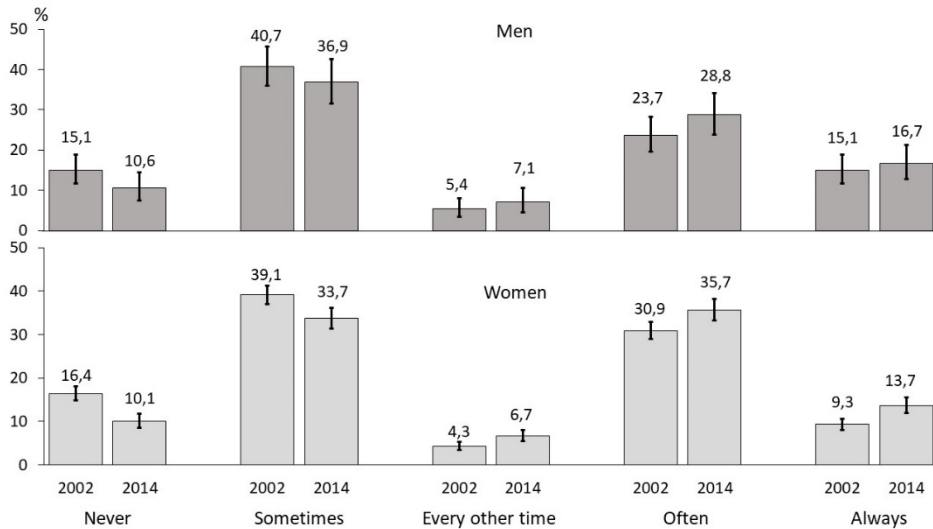


Figure 7. Addressing patients' smoking (%; 95% CI) by physicians in Estonia in 2002 and 2014.

According to the adjusted logistic regression model (Table 6), addressing patients' smoking habits was significantly associated with

- agreeing that it is physicians' responsibility to convince people to stop smoking
- agreeing that physicians should have smoking-related hand-out materials
- physicians' age.

Among women only, addressing patients smoking habits was significantly associated with

- agreeing that their current knowledge is sufficient to advise patients who wish to quit
- being unsure whether smoking prevention should be a part of normal training
- agreeing that lack of time, lack of habit and wish to respect patients' privacy is a barrier to addressing patients' smoking.

Women were significantly more likely to address patients' smoking in 2014 compared to 2002.

Table 6. Addressing patients' smoking (yes vs no) among physicians in Estonia, 2002 and 2014

Variable	Men		Women	
	OR*	95% CI	OR*	95% CI
It is the physicians' responsibility to convince people to stop smoking				
Yes vs no	2.32	1.19–4.54	1.41	1.06–1.88
Cannot say vs no	0.97	0.45–2.10	1.20	0.88–1.65
Physicians should have smoking related materials to give out to patients if needed				
Yes vs no	2.17	1.02–4.62	1.63	1.07–2.48
Cannot say vs no	0.90	0.41–1.99	1.13	0.70–1.83
My current knowledge is sufficient to advise a patient who wishes to stop smoking				
Yes vs no	1.17	0.59–2.30	1.85	1.37–2.49
Cannot say vs no	0.96	0.44–2.08	1.27	0.95–1.71
Smoking prevention should form part of the normal training of health professionals				
Yes vs no	0.94	0.46–1.94	1.28	0.87–1.88
Cannot say vs no	1.00	0.41–2.47	1.66	1.04–2.64
Lack of habit				
Yes vs no	0.31	0.18–0.53	0.41	0.32–0.52
Lack of time				
Yes vs no	1.03	0.59–1.82	1.54	1.20–1.98
Wish to respect patient's privacy				
Yes vs no	0.68	0.35–1.29	0.72	0.55–0.94
Age (continuous variable)	1.04	1.01–1.07	1.02	1.01–1.03
Ethnicity				
Non-Estonian vs Estonian	1.78	0.83–3.78	1.62	1.10–2.38
Medical specialty				
Family physician vs dentist	4.27	0.85–21.53	6.75	4.06–11.23
Specialist doctor vs dentist	1.04	0.48– 2.25	1.55	1.21– 2.00
Smoking status				
Current vs non-smoker	0.67	0.37–1.20	0.44	0.31–0.62
Study year				
2014 vs 2002	1.27	0.67–2.39	1.92	1.44–2.56

* Adjusted for all descriptive variables shown in the table.

5.2.4. Desire to quit smoking among physicians (Paper V)

In 2002, the prevalence of desire to quit smoking among currently smoking physicians was 55.3% and in 2014, 52.9% (Table 7). The proportion of physicians who were not sure about quitting decreased from 30.1% in 2002 to 22.2% by 2014.

Table 7. Desire (%) to quit smoking among currently smoking physicians in Estonia, 2002 and 2014

Desire to quit	2002			2014		
	Men	Women	Total	Men	Women	Total
Yes	52.9	56.2	55.3	59.1	49.6	52.9
No	17.9	13.4	14.6	28.8	22.8	24.9
Cannot say	29.2	30.4	30.1	12.1	27.6	22.2

According to adjusted logistic regression models I and II (Table 8), 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 (only in Model II)
- medical specialty (dentist).

Table 8. Association between desire to quit smoking (yes vs no) and factors related to smoking behaviour among physicians in Estonia, 2002 and 2014

Variable	Model I*		Model II**	
	OR	95% CI	OR	95% CI
Smoking frequency				
Daily vs occasional	1.83	1.24–2.71	1.56	0.87–2.80
Concern about harmfulness of smoking				
Concerned vs not concerned	7.95	4.63–13.66	9.06	4.15–19.74
Number of previous quit attempts				
1–2 vs none	2.37	1.51–3.73	2.22	1.18–4.17
3–4 vs none	9.31	5.06–17.13	10.58	4.51–24.79
5 or more vs none	13.88	6.03–31.95	9.81	3.63–26.49
Motivation to quit smoking				
Material stimulus vs health	0.71	0.26–1.90	0.38	0.08–1.80
Setting a good example vs health	1.46	0.85–2.51	2.38	1.12–5.09
Other vs health	1.05	0.54–2.04	1.99	0.76–5.25
Medical specialty				
Family physician vs specialist doctor	1.58	0.95–2.62	1.88	0.89–4.01
Dentist vs specialist doctor	1.76	1.12–2.76	2.42	1.25–4.69

* Model I adjusted for gender, age and year.

** Model II adjusted for all descriptive variables shown in the table.

5.3. Nicotine dependence (Paper VI)

In the six-item FTND, the answers to five questions did not differ significantly between men and women ($p > 0.05$) (Table 9). Gender difference was found in the question concerning preference of smoking more in the morning than during the rest of the day. Among men 27.4% and among women 11.9% ($p=0.013$) smoked more in the morning than during the rest of the day.

Table 9. Distribution (%) of the results of the six-item FTND with points for calculation of ND score

Questions in FTND	FTND points per answer	Men	Women	P-value	Total
How soon after you wake up do you smoke your first cigarette?					
In 5 minutes	3	15.3	8.0	0.249	11.2
In 6–30 minutes	2	29.8	39.1		35.1
In 31–60 minutes	1	25.7	32.9		29.8
Later	0	29.1	20.0		24.0
How many cigarettes a day do you smoke on average?					
≤10	0	42.2	57.8	0.184	51.1
11–20	1	46.0	34.7		39.6
21–30	2	10.1	6.5		8.1
≥31	3	1.8	1.0		1.3
Do you find it difficult to refrain from smoking in the places where it is forbidden (e.g. on the airplane, in the cinema)?					
Yes	1	13.6	10.2	0.617	11.7
No	0	86.4	89.8		88.3
Which cigarette would you hate most to give up?					
First in the morning	1	44.8	40.9	0.872	42.6
Any other	0	55.2	59.1		57.4
Do you smoke more frequently during the first hours after waking than during the rest of the day?					
Yes	1	28.0	11.6	0.013	18.7
No	0	72.0	88.4		81.3
Do you smoke if you are so ill that you are in bed most of the day?					
Yes	1	24.8	18.4	0.552	21.2
No	0	75.2	81.6		78.8

The mean ND score for daily smoking physicians, calculated using FTND, was 2.8 ± 2.1 (among men 3.2 ± 2.4 , and among women 2.7 ± 2.0 , $p=0.385$).

Almost 40% of daily smoking physicians had moderate or high ND (Table 10). Men and women did not differ significantly in terms of the distribution of ND ($p=0.107$).

Table 10. Distribution (%) of ND among daily smoking physicians in Estonia, 2014

ND (score)	Men	Women	P-value	Total
Low (0–3)	51.6	67.8		60.8
Moderate (4–6)	41.3	26.8	0.107	33.1
High (7–10)	7.1	5.4		6.1

Physicians with low ND had a mean age of smoking initiation of 21.0 ± 5.1 , and physicians with at-least-moderate ND, 18.4 ± 3.3 ($p < 0.001$).

Adjusted logistic regression analysis showed that having at-least-moderate ND was significantly associated with age of smoking initiation (Table 11). When the age of smoking initiation increased by one year, the odds of having at-least-moderate ND was lower.

Table 11. Results of logistic regression analysing factors associated with ND (at-least-moderate vs low) among physicians in Estonia, 2014

Variables	OR*	95% CI
Age of smoking initiation**	0.82	0.72–0.94
Desire to quit		
No vs yes	1.99	0.76–5.21
Cannot say vs yes	0.85	0.31–2.35
Motives to quit		
Wish to set a good example vs health problems	0.77	0.19–3.19
Other vs health problems	2.48	0.59–10.39
Cannot say vs health problems	0.53	0.19–1.49
Previous quit attempts		
1–2 vs none	0.56	0.22–1.40
3–4 vs none	0.70	0.23–2.07
5 and more vs none	0.27	0.05–1.44
Stress as main reason for relapse		
Yes vs no	1.66	0.73–3.77

* Adjusted for all descriptive variables shown in the table).

** Continuous variable.

6. DISCUSSION

This research was conducted to explore smoking, attitudes towards smoking behaviour, and nicotine dependence among physicians in Estonia in 1982–2014. The results showed that smoking prevalence among physicians has declined, but compared to 1982, in 2014 physicians started smoking at an earlier age. Physicians' attitudes towards smoking became more disapproving and physicians addressed patients' smoking habits more often. Physicians who smoked, viewed smoking more favourably and were less likely to address patients' smoking. Physicians reported lack of time as a barrier to asking about their patients' smoking habits. More than half of physicians who currently smoked, expressed the desire to quit. About 40% of daily smoking physicians had moderate or high nicotine dependence. Earlier smoking initiation was associated with higher ND.

6.1. Trends in smoking

Smoking prevalence

According to the study results, the age-standardized (using European population) (Ahmad et al., 2001) prevalence of current smoking among physicians declined by nearly three times from 1982 to 2014 in Estonia. In 1982, about one fifth, but in 2014, less than one tenth of physicians were current smokers. Similar steady decline has been observed in other countries, like Great Britain, Australia, the United States, Finland, and Japan (Barengo et al., 2004; Doll et al., 1994; Pärna et al., 2005a; Smith, 2008; Smith & Leggat, 2008, 2007; Smith & Wada, 2013). The prevalence of current smoking among physicians in Estonia was higher than in most developed countries. The results in 2014 were comparable to results from Australia and the United States in the 1980s (Nelson et al., 1994; Smith & Leggat, 2008).

The age-standardized prevalence of current smoking declined nearly three times among men and more than two times among women in Estonia. Despite the overall decline in smoking, the difference between men and women persisted, with the prevalence being about three times as high among men than among women. Smoking among the general population showed similar tendencies. In Estonia, in 2002, the prevalence of current smoking was 52% among men and 24% among women, and in 2014, 39% among men and 23% among women (NIHD, 2019b). In comparison, among men with higher education, the age-standardized prevalence of current smoking was 39% in 2002 and 22% in 2014 and among women with higher education 21% and 16%, respectively (Pärna et al., 2019). Globally, in Central and Eastern Europe, there are bigger differences between smoking prevalence among men and women than in Western European and Scandinavian countries. Smoking among physicians by gender differs by country as well. In Armenia (Movsisyan et al., 2012) and Japan (Ohida et al., 2012), smoking was more common among men, while in Italy (Zanetti et al., 1998), women smoked at higher rates. In Australia

(Smith & Leggat, 2008, 2007) and the United States (Smith, 2008; Smith & Leggat, 2007), smoking prevalence was almost the same between the sexes. Concerning the present study sample, it has to be noted that in Estonia, more than 70% of physicians are women. On average, in Europe about 50% of physicians are women but in other regions, it's less (for example, about 25% in Africa) (Boniol et al., 2019).

According to the results of the present study, smoking among physicians in Estonia is comparable with the mature smoking epidemic (Davis, 1993). The prevalence of smoking among physicians was much lower than in the general population. Information on physicians' smoking indicates the success of population-based anti-tobacco campaigns. When smoking among physicians is high, it is difficult to convince the public about the harms of smoking (Davis, 1993).

Smoking frequency

Present study results showed that in all three study years, the majority of physicians who smoked currently were daily smokers. Overall, the age-standardized prevalence of daily smoking decreased 3.3 times among men and 2.6 times among women between 1982 and 2014. Compared to women, the age-standardized prevalence of daily smoking was 3.7 times as high among men in 1982, but 3.0 times as high in 2014. The prevalence of never having smoked increased about two times among men and about 1.5 among women.

In Finland, among physicians in 2002, the proportion of daily smoking among current smokers was notably lower than among physicians in Estonia (Pärna et al., 2005a). Unfortunately, there is no later data from Finland to add to the comparison.

Smoking by age groups

In current study, in 1982–2014, among physicians in Estonia, the biggest decline in current smoking was in younger age groups (≤ 34 , 35–44). At the same time, the prevalence of never having smoked also increased in younger age groups. Thus, the decline in smoking among physicians in Estonia was the result of an increase in quitting behaviour and possibly in the higher number of non-smokers becoming physicians. Similarly, the decline in smoking among physicians observed in the United States has been the result of an increase of both quitting behaviour and in the number of non-smokers entering the occupation (Nelson et al., 1994).

The trends of smoking in Estonia reflect the changes in tobacco policies, as the decline in smoking prevalence has been steadier since the middle of the 2000s. This was also the time when Estonia ratified the WHO FCTC (WHO, 2005) and adopted the renewed Tobacco Act that complied with the requirements of the convention.

Initiation of smoking

In present study, compared to 1982, physicians in Estonia, especially women, started smoking at a younger age in 2014. Early age of starting smoking is one of the determinant factors of nicotine dependence and smoking temptation (Breslau et al., 1993). However, the earlier onset did not appear to influence the decline in smoking prevalence. This could be explained by the increasing number of non-smokers entering the occupation. According to the Estonian Health Interview Surveys in 1996 and 2006, the onset of smoking among the adult population showed a similar trend – in 2006 the age of smoking initiation was earlier (Leinsalu et al., 1999; Matsi & Oja, 2009). One explanation of the earlier start of smoking could be the expansion of tobacco companies to the Eastern Europe markets after the collapse of Soviet Union. Chaotic conditions and lack of tobacco control policies allowed for extensive campaigns targeting young people and women in particular (Gilmore & McKee, 2004).

6.2. Attitudes towards smoking behaviour

6.2.1. Physicians' views on causal roles of smoking in smoking-related diseases

In current study, compared to 1982, the proportion of physicians agreeing with the statements that smoking is a cause or one of the causes of IHD, lung cancer and chronic bronchitis, was significantly higher among both men and women in 2002 and 2014. The proportion of physicians who did not consider smoking as a cause in IHD declined from about 15% to about 2% among both men and women. For lung cancer, the decline was from about 10% to 1% and for chronic bronchitis, from 5% to 1%. The results could be attributed to the improvements in physicians' knowledge about the health effects of smoking and a decline in their own smoking over three decades. Medical education and profession appears to have an impact on smoking, as physicians know more about the harmful effects of smoking and they act as role models by their own behaviour in society as well as among their patients (Abdullah et al., 2014; Pipe et al., 2009; WHO, 2005).

Among women, compared to current smokers, past and never smokers agreed significantly more with the attribution of smoking in all three smoking-related diseases. Among men, compared to current smokers, past and never smokers agreed significantly more only with the statement that smoking is a cause of lung cancer. Attribution of a causal role of smoking in smoking-related diseases could be associated with the declining social acceptance of smoking in society, especially with legal restrictions on smoking in public spaces and mass media campaigns (Ministry of Social Affairs, 2014). It has also been shown that compared to non-smokers, smokers systematically underestimate the health consequences of smoking (Lohur & Pärna, 2016; Meshfedjian et al., 2010; Pärna et al., 2005a; Pärna et al., 2005b; Willaing et al., 2003).

Among both men and women, compared to non-Estonians, agreement with the statements that smoking is a cause of IHD and chronic bronchitis was higher among Estonian physicians. Attribution of the role of smoking in lung cancer was higher only among Estonian women. Different attitudes towards the causal role of smoking in smoking-related diseases among Estonians and non-Estonians might be related to different social environments and differences in medical education, as many non-Estonian physicians came to Estonia in adulthood and received their medical education outside Estonia, mainly in Russia. However, as the number of non-Estonians who did not agree that smoking is a cause for smoking-related diseases, was small, the findings should not be overestimated.

It should also be considered that physicians in Estonia have similar educational background in terms of smoking prevention knowledge. Therefore, it can be speculated that differences in opinion regarding smoking are related to a person's own behaviour and the need to justify the risk behaviour.

6.2.2. Attitudes towards smoking

Present study results showed that physicians' attitudes towards smoking were less approving in 2014 compared to 2002 in Estonia. Agreement with the statements that smoking is very harmful and that it is important to reduce smoking among the population was more prevalent in 2014 and less prevalent among smoking physicians. This finding is in accordance with previous results showing that, compared to non-smokers, smoking physicians agree less that smoking is harmful (Pipe et al., 2009). Agreement with the statements, that to stop smoking is very hard for many people, so it is better for their health to simply continue smoking, and that smoking does not damage health as long as otherwise healthy lifestyle is followed, was less prevalent in 2014.

In current study, among women only, significant association was found between agreement with all the statements and study year. Among men, the agreement was significantly associated with study year for four out of seven statements. These findings could be explained by different patterns of smoking behaviour among men and women (Peters et al., 2014; Reid et al., 2009) but also due to the fact that men's behaviour in general is considered to be more risk-prone (Harris et al., 2006). The findings also support the notion that, in Estonia, social acceptability of smoking has decreased, and attention has turned towards prevention and health promotion. This is supported by legal instruments like the Tobacco Act that have set requirements to create a smoke-free environment and reduce the availability of tobacco products in Estonia.

Agreement with all seven statements regarding smoking was significantly associated with smoking status among both men and women. Most drastically, compared to non-smokers, men who smoked, had six times as high odds to agree that smoking is not as dangerous as experts declare, and had seven times as high odds to agree that smoking does not damage health if the person leads

an otherwise healthy lifestyle. For smokers, the beliefs that smoking is not dangerous to health might be because not all persons who smoke will develop adverse effects of smoking like lung cancer or other smoking-related diseases.

The fact that, compared to non-smokers, smoking physicians agreed less that it is important to reduce smoking and believe more that smoking is a person's own choice, demonstrated that physicians who smoke might feel the need for justification of their own behaviour, especially if they have not developed any smoking-related health problems. The findings might also indicate that physicians play down their role in reducing smoking in the population and, with that, fail to seize the opportunity to influence smoking behaviour among the general population.

According to the literature, attitudes towards smoking differ by countries. For example, among Italian physicians, 80% considered health professionals as behavioural models for patients (La Torre et al., 2014). In Serbia, only 61% of physicians agreed that healthcare professionals serve as role models for their patients and public (Stojanovic et al., 2013). Compared to Finnish physicians, Estonian physicians were less conscious of their role as healthy life style exemplars in 2002 (Pärna et al., 2005a). Authors suggested that among physicians in Estonia, there might have been a fear to interfere with other people's behaviour.

It has been shown before, that physicians' beliefs about smoking-related diseases were consistent with medical evidence (Pärna et al. 2005b). However, the results of the present study show that physicians who smoke, may see smoking more favourably. These opinions can affect their smoking cessation activities, as it has been shown that smokers might not anticipate health problems related to smoking (Rahman et al., 2014).

6.2.3. Addressing patients' smoking

According to current study findings, among both men and women, the age-standardized prevalence of addressing patients' smoking habits at least once during the last 7 days was higher in 2014 than in 2002. The change was significant among women only.

Addressing patients' smoking has increased among physicians worldwide. For example, in the USA, it was not common for physicians to address patients' smoking in 1990s and 2000s (Abdullah et al., 2014), but in 2018, 65% of patients were asked about smoking status (Tibuakuu et al., 2019). In Romania in 2011, more than 80% of patients were asked about their smoking status (CDC, 2013). In 2009–2010, in Poland, 57% and in Russia, 45% of patients reported that they were asked if they smoked by a health care provider (CDC, 2013).

In current study, the agreement that it is doctors' responsibility to convince people to stop smoking, that smoking prevention should be part of the normal training and that physicians should have smoking related materials to give out to patients if needed, was significantly higher in 2014 compared to 2002. The

findings indicate the need for more comprehensive training in smoking cessation for physicians. Tobacco control is included in the curriculum of medical students but is covered under different subjects.

According to present study results, the proportion of physicians who agreed that lack of time was a barrier to asking patients about smoking was significantly higher in 2014 compared to 2002. In previous studies, lack of time has been one of the most commonly reported barriers for physicians in addressing patients' smoking habits (Jradi et al., 2015; Meijer et al., 2019; Pipe et al., 2009; Vogt et al., 2005). This creates a challenge for the organization of smoking cessation and other preventative care services.

No significant change between study years was found in the agreement that lack of habit or wish to respect patient's privacy were barriers to addressing patients' smoking. As the agreement with both statements was relatively low, the finding could further support the notion that perceived barriers to addressing patients' smoking are related to practical issues, rather than to physicians' attitudes regarding engaging in preventative services.

Among both men and women, addressing patients' smoking habits was significantly associated with agreeing that it is a doctors' responsibility to convince people to stop smoking, and agreeing that doctors should have smoking-related hand-out materials. This result could be taken as an indication that physicians were ready to intervene.

Physicians' higher age was significantly associated with a higher likelihood of addressing patients' smoking, among both men and women. It has been shown before that senior physicians are more likely to ask about patients' smoking (Mughal et al., 2018). Offering advice on smoking cessation has also been associated with having longer work experience (Alateeq et al., 2016), suggesting that when smoking cessation counselling is needed, the patient should be referred to more experienced physicians.

Among women, addressing patients' smoking was significantly associated with physicians agreeing that their knowledge is sufficient to advise on smoking cessation and that smoking prevention should be part of normal training. This result could be related to women being more willing to address patients' smoking, but also to the possibility that some results remained undetected because of the smaller number of men in the study sample (in the present study sample, more than 80% were women). In both years, the gender distribution of physicians in the study sample was similar to the physicians' gender distribution in Estonia in general.

Also, among women, addressing patients' smoking was significantly associated with perceiving a lack of time and a wish to respect patients' privacy as a barrier to addressing smoking habits. These results reflect physicians' pro-active approach to addressing patients' smoking, which is crucial in overcoming the possible barriers. In addition, the findings indicate that by better organizing smoking cessation services, better conditions can be created for physicians to advise patients on smoking cessation. There are several aspects about smoking cessation services that should be considered. For example, how and when brief

cessation advice should be provided, when to refer to counselling or how these tasks would be best distributed between different levels of health care or within the team of specialists involved in the service provision. In the current study, the sample consisted only of physicians, so there is no information on how much nurses were involved in smoking cessation in different levels of care.

The present study did not explore physicians' views and knowledge about the organization of smoking cessation in Estonia. As the WHO has previously been critical towards tobacco policy in Estonia, expecting a bigger decline in smoking prevalence among the general population, especially among people with secondary or lower education (WHO, 2011), every effort is needed to further reduce smoking among the population.

Among women only, addressing patients' smoking was significantly associated with ethnicity, medical specialty, smoking status, and study year. Physicians' cultural background has been associated with being more likely to provide cessation advice (Mughal et al., 2018). In the context of the present study, however, the possible reasons might be related to other factors, like, for example, age. A more detailed exploration of those aspects is needed to make further conclusions.

Non-smoking women were significantly more likely to ask patients about smoking compared to current smokers. It is well-established, that physicians who are smokers, might more likely fail to address patients' smoking habits (Alajmi et al., 2017; Stead et al., 2009).

Among women only, compared to dentists, family physicians and specialist doctors were significantly more likely to address patients' smoking habits. The most common setting for smoking cessation advice is primary care. Family physicians tend to be more likely to ask patients about smoking (Dülger et al., 2018; Meijer et al., 2019; Stead et al., 2013).

6.2.4. Desire to quit smoking

According to the present study findings, among currently smoking physicians in Estonia, more than half indicated a desire to quit smoking in both 2002 and 2014. The proportions are comparable, for example, to Poland (in 2004, about 60% of physicians intended to quit), but were lower than in the Czech Republic (about 75% of smokers intended to in 1995) (Smit et al., 2014). Even though the proportion of physicians who expressed a desire to quit smoking was similar in both years, the prevalence of daily smokers and the proportion of physicians who did not want to quit was higher in 2014 than 2002. The higher prevalence of daily smokers might indicate that these were people with a stronger ND, who might not be determined to quit or are unable to successfully quit because of the addiction.

Among the general population, the studies show that a half to three quarters of smokers express a desire to quit (Marques-Vidal et al., 2011) (Myung et al., 2012). In Estonia, the prevalence of intention to quit was a little over 60% in 2004, but decreased to 54% by 2018 (NIHD, 2005, 2019a).

Desire to quit has been stated as an important factor in smoking cessation, as it reflects motivation. On the other hand, desire to quit is different from actually intending to quit and has been merely seen to predict quit attempts and not the success of cessation (Prochaska et al., 1993) (Smit et al., 2014). The questionnaire used in this study explored only desire to quit smoking, because the survey focus was on smoking behaviour in general.

In the current study, stress, smoking in proximity and withdrawal symptoms were the most reported reasons to restart smoking. These findings are in accordance with previous results (Al-Turkstani et al., 2016). Smoking in proximity was the second most mentioned reason, but the prevalence of this reason was notably lower in 2014 than in 2002. This finding maybe related to smoking decline in general, but also because smoking in health care establishments is restricted in Estonia.

In present study, the most mentioned motivators for quitting were personal health problems and wishing to set a good example. Previous findings suggested the same – concern for health and wishing to set a good example have been found to be the most important reasons to quit smoking among medical staff but also among the general population (Bennasar Veny et al., 2011; Hyland et al., 2004).

Previous studies have also shown a connection between nicotine dependence and smoking cessation (Al-Turkstani et al., 2016; Hyland et al., 2004; Vangeli et al., 2011). In present study, it was not possible to analyse this association as within Estonian physicians' smoking surveys, nicotine dependence was measured only in 2014.

Among the sample of physicians in Estonia, desire to quit smoking was found to be significantly associated with being concerned about the harmfulness of smoking, number of previous quit attempts and wishing to set a good example. These findings are in accordance with previous studies (Myung et al., 2012; Vangeli et al., 2011). Attempts to quit have been shown to be associated with intention to quit and are considered an important predictor of cessation success (Hyland, 2006; Vangeli et al., 2011). In the present study, compared to respondents who had had no quit attempts, physicians who had had 1–2, 3–4 or 5 and more quit attempts had higher odds to desire to quit. Similarly to previous findings (Myung et al., 2012; Vangeli et al., 2011), Estonian physicians who were concerned about the harmfulness of smoking were more likely to express desire to quit. These associations could indicate that a person is aware of the damaging effect of smoking, is motivated to quit, has tried but failed and so needs cessation support.

None of the reasons for relapse were significantly associated with desire to quit smoking in this study. This might be partly due to small subsamples in the 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 (Myung et al., 2012). The questionnaire used to collect smoking data from the physicians for the current study did not measure alcohol consumption.

In motivators for quitting, only the wish to set a good example was significantly associated with desire to quit among physicians. As physicians are considered role models, it was expected that setting a good example would be a significant finding among Estonian physicians as well. Financial stimulus was not significantly associated with desire to quit in the present study. This was somewhat expected, as physicians can be considered to have a higher socioeconomic status. However, in contrast, among the general population, material incentives have been described as important factors in quitting smoking, and increasing prices of the tobacco products should be prioritized when designing tobacco control programmes (Hill et al., 2014; Hoffman & Tan, 2015).

The association between desire to quit smoking and medical specialty showed that, compared to specialist doctors, dentists had significantly higher odds to desire to quit smoking however, no significant association was found 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 to oral health. The lack of notable difference between family physicians and medical specialists could be explained by the distribution of specialties among physicians. It has been shown elsewhere that, among men, surgeons had the highest prevalence of smoking compared to other specialities (Yao et al., 2009). In the current study sample, about 10% of medical specialists were surgeons.

In present study, desire to quit smoking was not significantly associated with 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 (Caponnetto & Polosa, 2008; Hyland et al., 2004; Marques-Vidal et al., 2011; Piper et al., 2010, 2017; Vangeli et al., 2011). There is a possibility that women have less serious health conditions, which would otherwise motivate to abstain from relapses. However, as men tend to be less active when seeking medical help, their health problems would be more serious, and they are more motivated 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 (Hyland et al., 2004). However, intention to quit has been shown to decrease with increasing age (Vangeli et al., 2011). These findings might reflect a relationship between health issues and quitting smoking, as it has been shown that smoking physicians tend to believe that, as many people have smoked for their whole lives until old age and not become ill, smoking is not as dangerous as experts declare.

In the current study, no association was found between desire to quit smoking and study year. This finding was unexpected, as, 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 (NIHD, 2014) and promote smoking cessation among their staff.

6.3. Nicotine dependence

Results of six-item FTND showed that, among daily smoking physicians in Estonia, about one tenth smoked their first cigarette in 5 minutes after waking up and more than half smoked 10 or less cigarettes a day on average. Most physicians did not find it difficult to refrain from smoking in places where smoking was forbidden, and about 40% said that they would hate the most to give up the first cigarette in the morning. About one fifth smoked more frequently during the first hours after waking in the morning than during the rest of the day and when they were so ill that had to stay in bed for most of the day.

In the present study, the FTND results refer to rather low ND among daily smoking physicians, with an average value of 2.8. About 40% of physicians had moderate or high ND. Surveys among physicians in Germany in 2018 (Pförringer et al., 2018), Spain in 2015 (Juárez-Jiménez et al., 2015) and Turkey in 2014 (Baltacı et al., 2014) presented that low ND scores were found to be most prevalent. Compared to the general population worldwide, Estonian physicians' mean FTND score was similar to those in Germany and Norway (score 2.8 in 1990s) but lower than those in the USA (4.0 in the 1990s) and China (3.1 in 2013) (Fagerström & Furberg, 2008; Kim et al., 2012; Li et al., 2015). Unfortunately, there is no ND data for the general population in Estonia to add to the comparison.

The results of the current study showed that ND was significantly associated with the age of smoking initiation. The earlier the initiation of smoking was, the higher the odds of having higher ND. This result was not surprising, as it is shown elsewhere that people who initiate smoking at a younger age are more likely to become dependent (Ali et al., 2020). Physicians in Estonia who had at-least-moderate ND began smoking approximately three years earlier than those with low ND. The difference of mean age of smoking initiation among physicians with low ND and with at-least-moderate ND was statistically significant. In 2014, physicians in Estonia started smoking at an earlier age than in 1982 or 2002.

In the present study, the ND was not significantly associated with the desire to quit or motives to quit. Surveys conducted in the USA, the UK, Canada and Australia showed that a lower dependence was related to a higher probability of intention to quit (Siahpush et al., 2006). In the current study, compared to physicians who stated personal health problems as the main motive to quit, the odds of having at-least-moderate ND were three times as high among those whose main motives to quit were "other reasons". The group included mainly subgroups of physicians who reported material reasons (increase of the price of tobacco products, material stimulus to quit smoking) and social pressure as the main motives to quit. As the subgroups were very small, the responses were categorized into one group and, therefore, associations between at-least-moderate ND and specific motives to quit could remain undetected.

The present findings showed no significant association between ND and the number of quit attempts or stress as a reason for relapse. However, some of

these factors have been found to be related to ND in previous studies. For example, previous study data reports on the association between work-related stress and smoking intensity among public-sector employees (Kouvonen et al., 2005) and between work-related stress and the use of addictive substances among physicians (Pförringer et al., 2018). These findings would allow to hypothesize that ND could be higher among physicians because the profession is considered to cause higher levels of stress.

More than half of currently smoking Estonian physicians expressed a desire to quit. The results of the present study, however, indicated that smokers might still be facing difficulties to do so and therefore would benefit from cessation counselling specifically tailored to physicians' needs.

It is acknowledged that smoking addiction involves several components. Even though difficulties quitting smoking are related to ND, the latter is far from being the only determinant in the addiction. Further analysis is needed to explore psychosocial, behavioural, contextual and personal aspects of smoking addiction among physicians.

6.4. Strengths and limitations of the study

Strengths of the study

1. The inclusion of all practising physicians gave an excellent opportunity to get a comprehensive overview of smoking behaviour among physicians in Estonia.
2. The similarity of the methodology allowed for comparability and enabled to analyse long-term trends of physicians' smoking behaviour.
3. The gender distribution among respondents was proportional to the overall physician population in Estonia allowing to generalize the findings to all physicians.
4. Physicians are considered a homogenous group in terms of educational background which reduces the effect of possible confounders.
5. The study provided, for the first time, an overview of nicotine dependence among physicians.

Limitations of the study

1. The response rates in the three surveys declined over time, as is the case with postal surveys in most populations worldwide (Cook et al., 2009). Lower response rates can result in bias as non-respondents may systematically differ from respondents.
2. Self-representation bias should be considered, as smokers tend to underestimate the amount smoked (Abdullah et al., 2014). Physicians, knowing more about the devastating effects of smoking than the general population, may be prone to understatement when reporting smoking information.
3. The study data was drawn from self-reported surveys and thus the possibility of recall-bias should be considered.

4. The data of the first study were collected in the Soviet era, and minor changes were made in the study design and questions between studies, so the findings of long-term trends in the study need to be interpreted with caution.
5. The size of some sub-groups per study year was small, and hence, the study estimates might not be as precise as one might wish.
6. The cross-sectional nature of the study does not allow the investigation of causal relationships.

7. CONCLUSIONS

Based on the results of the study, it can be concluded that smoking prevalence among physicians decreased in 1982–2014 in Estonia and physicians' attitudes towards smoking behaviour became more disapproving. More than one third of daily smoking physicians had at-least moderate ND.

The specific conclusions are the following:

1. Smoking prevalence among physicians in Estonia declined from 1982 to 2014 being higher among men over the study period. The biggest decrease in smoking prevalence was among the younger age groups, but physicians started to smoke at an earlier age.
2. Agreement with the statement that smoking is a cause of IHD, lung cancer, and chronic bronchitis increased from 1982 to 2014. The acknowledgement of a causal role of smoking in smoking-related diseases was related to physicians' smoking status.
3. Compared to 2002, physicians' attitudes towards smoking were less approving in 2014. Physicians who smoked viewed smoking more favourably.
4. Compared to 2002, addressing patients' smoking habits was more common in 2014 but the change was significant among women only. Addressing patients' smoking was associated with agreeing that it is physicians' responsibility to convince people to stop smoking and that physicians should have smoking-related hand-out materials among both genders, but with agreeing that lack of time, lack of habit, and wish to respect patients' privacy among women only.
5. In 2002 and 2014, more than half of currently smoking physicians expressed the desire to quit smoking. Desire to quit smoking was associated with concern about the harms of smoking to health, higher number of previous quit attempts, setting a good example, and medical specialty.
6. More than one third of daily smoking physicians had moderate or high ND in 2014. Earlier age of smoking initiation was associated with higher ND.

8. PRACTICAL IMPLICATIONS

The findings of this study are useful for policymakers and institutions involved in organization and development of smoking prevention training and cessation counselling services.

More specific suggestions are the following:

1. A further decline in smoking among Estonian physicians would require smoking cessation services tailored specifically for physicians.
2. Further development of physicians' training in smoking prevention would enable physicians to routinely address patients' smoking.
3. In development of smoking cessation counselling services in Estonia, factors related to addressing smoking habits should be considered. For example, developing best practice guidelines to normalize attending to patients' smoking habits.
4. Smoking cessation counselling could be further organized by introducing a teamwork-based approach and working towards greater involvement of nurses and occupational health specialists in preventive services.
5. On the basis of measuring ND among physicians, similar data should be regularly collected among general population to make smoking cessation interventions more effective in Estonia.
6. Attending to patients' smoking habits could be facilitated for the physicians by considering the possibilities of recording smoking data in a standardized way in patients' health records.

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SUMMARY IN ESTONIAN

Eesti arstide suitsetamine, suhtumine suitsetamiskäitumisse ja nikotiinisõltuvus: läbilõikelised uuringud 1982–2014

Tubaka tarvitamine on üks peamisi haigestumuse ja suremusega seotud tervise riskitegureid maailmas (WHO, 2009) ning on rahvusvahelises haiguste klassifikatsioonis (RHK-10) fikseeritud tubaka tarvitamisest tingitud psüühika- ja käitumishäirete diagnoosina (F17) (WHO, 2016). Suitsetamise vähendamine ja sellest loobumine toob kaasa haigestumise ning surmade vähenemise (WHO, 2009).

Maailma Terviseorganisatsiooni (WHO) andmetel on suitsetamise levimus maailmas viimastel kümnenditel vähenenud. Aastal 2007 suitsetas sigarette umbes 31% meestest ning 11% naistest ning 2018. aastal 26% meestest ja 9% naistest. Euroopas on kõrgeima suitsetamise levimusega Ida-Euroopa riigid, näiteks suitsetas Gruusias ja Armeenias 2018. aastal veel ligi 50% meestest. Soomes suitsetas 2007. aastal 25% meestest ja 19% naistest ning 2018. aastal vastavalt 19% ja 16%. Lätis suitsetas 2007. aastal 48% meestest ja 22% naistest ning 2018. aastal 44% meestest ja 21% naistest (WHO, 2020b).

Eesti 16–64-aastastest täiskasvanutest suitsetas 1990. aastal igapäevaselt 44% meestest ja 15% naistest. Alates 2006. aastast on igapäevasuitsetamise levimus Eesti täiskasvanud rahvastikus pidevalt vähenenud. Aastal 2018 suitsetas igapäevaselt 23% meestest ja 13% naistest (NIHD, 2019b).

Arstidel on ühiskonnas oluline roll suitsetamiskäitumise mõjutajana nii indiviidi, kogukonna kui riigi tasandil (WHO, 2005) ning arstide endi suitsetamisharjumused mõjutavad seda, kas ja kuidas nad pööravad tähelepanu patsientide suitsetamisele (Pipe jt, 2009).

Arstide tubakaepideemia rahvusvahelise mudeli järgi hakkavad ühiskonnas arstid suitsetama enne kui kogurahvastik, mistõttu on mudeli esimeses faasis arstide suitsetamise levimus võrreldes kogurahvastikuga kõrgem. Kui teadlikkus suitsetamisega seotud terviseriskidest kasvab, siis hakkab arstide suitsetamise levimus vähenema, millele mõne aja möödudes järgneb kogurahvastiku suitsetamine, kuid see jääb arstide suitsetamisest kõrgemaks. Selline olukord on iseloomulik mudeli teisele faasile. Arstide tubakaepideemia mudelit kasutatakse ühiskonna küpsuse kirjeldamisel (Davis, 1993). Esimeses faasis olevaid riike nimetatakse suitsetamise põhjal ebaküpseteks (näiteks Filipiinid, Itaalia, Portugal) (La Vecchia jt, 2000; Ravara jt, 2014; WHO, 1997, 2015), teises faasis olevaid küpseteks (näiteks Soome, Taani, Eesti) (Pärna jt, 2005d; Smith & Leggat, 2007).

Maailmas on arstide suitsetamist uuritud pikka aega. Tuntuim arstide suitsetamise uuring on Ühendkuningriigi meesarstide kohortuuring, mida alustati 1951. aastal (Doll, 2004). Ajavahemikul 1951–1991 vähenes Ühendkuningriigi meesarstide suitsetamine 62%-lt 18%-ni (Doll jt, 1994). Ka mujal arenenud riikides on arstide suitsetamise levimus vähenenud. Austraalias suitsetas 1960ndatel ligi 30% arstidest, kuid 1997. aastaks oli see vähenenud 3%-le (Smith & Leggat, 2008). Taanis suitsetas 2000. aastate alguses 15% arstidest (Smith &

Leggat, 2007). Soomes oli 2001. aastal igapäevasuitsetamise levimus meesarstide hulgas ligi 7% ning naisarstide hulgas 4% (Pärna jt, 2005a). Arenenud riikide seas leidub ka erandeid nagu Jaapan, kus 2000. aastal suitsetas 27% mees- ja 7% naisarstidest, ning Prantsusmaa, kus 1998. aastal suitsetas 32% arstidest (Smith & Leggat, 2007).

Arstide suitsetamist Eestis on uuritud neljal korral (aastatel 1978, 1982, 2002 ja 2014), mistõttu saab seda pidada meie riigi üheks pikemaajalisemaks tervise-uuringuks. Aastal 1978 tehtud uuringu andmetel suitsetas 42% mees- ja 20% naisarstidest (Väärt jt, 1979). Selle aja kohta ei ole Eesti kogurahvastiku suitsetamise levimust teada.

Arstid peaksid pöörama tähelepanu patsientide suitsetamisele, soovitama suitsetajatel suitsetamisest loobuda ning vajaduse korral suunama patsiendid edasisele loobumisharjutamisele (CDC, 2013). WHO soovib loobumisharjutamisel juhendada 5A-mudelist: küsi (*ask*); soovita (*advise*); hinda (*assess*); abista (*assist*); korralda (*arrange*) (WHO, 2001). Uuringud näitavad, et patsientidelt suitsetamise kohta küsimise levimus on riikides väga erinev ja sageli puudub arstidel teave patsientide suitsetamisharjumuse kohta (Bryant jt, 2015). Näiteks küsis Hollandis 62% ja Ühendkuningriigis 98% arstidest patsientidelt suitsetamise kohta, kuid nad tegid seda vaid esimesel visiidil. Regulaarselt küsis patsientidelt suitsetamise kohta 28% Belgia ja 63% Ühendkuningriigi arstidest (Stead jt, 2009). Soomes küsis 2000. aastate alguses patsientidelt suitsetamise kohta ligi 80% arstidest. Sarnane tulemus saadi 2002. aastal arstide hulgas Eestis (Pärna jt, 2005a).

Patsientide suitsetamisele tähelepanu pööramist mõjutavad mitmed tegurid, näiteks arstide hoiakud suitsetamise kui riskikäitumise suhtes, kuid ka arstide endi suitsetamine. Kui arst on ise suitsetaja, alahindab ta suitsetamise kahjulikkust (Pipe jt, 2009) ning on väiksem tõenäosus, et ta pöörab tähelepanu patsientide suitsetamiskäitumisele (Garfinkel, 1976; Kawakami jt, 1997; Mughal jt, 2018; Pipe jt, 2009; Puska jt, 2005; Reile & Pärna, 2018; Stead jt, 2009; Tang jt, 2013). Ka arvamus, et teadmised ja oskused ei ole piisavad loobumisharjutamise läbiviimiseks, vähendab tõenäosust, et arst patsiendi suitsetamisharjumust visiitidel käsitleb (Alateeq jt, 2016; Jradi jt, 2015; Stead jt, 2009; Vogt jt, 2005). Lisaks mõjutavad arstide puhul patsientide suitsetamisele tähelepanu pööramist korralduslikud tegurid nagu visiidiks ettenähtud aeg, kuid ka tasustamine (Stead jt, 2009). Ajapuudus on enim nimetatud takistav tegur patsientide nõustamisel suitsetamisest loobumise suhtes (Jradi jt, 2015; Meijer jt, 2019; Vogt jt, 2005).

Uuringute andmetel soovib kogurahvastikus suitsetajate hulgast pool kuni kolmveerand suitsetamisest loobuda (Marques-Vidal jt, 2011; Myung jt, 2012). Arstide hulgas tehtud uuringud näitasid, et 2004. aastal soovis Poolas loobuda 60% suitsetajatest ning 1995. aastal Tšehhis 75% suitsetajatest (Abdullah jt, 2014).

Suitsetamisest loobumist mõjutavad tegurid nagu vanus (Marques-Vidal jt, 2011), sissetulek ja haridus (Myung jt, 2012), ent ka eelnevad loobumiskatsed, alkoholi tarvitamine, nikotiinisõltuvus (NS) (Marques-Vidal jt, 2011; Myung jt,

2012). Tugevam NS on seotud vähesema eduga suitsetamisest loobumisel (Hyland jt, 2004).

Enam levinud NSi mõõtmise meetod on Fagerströmi test. Selle enesekohase küsimustiku tänapäeval kasutatav versioon koosneb kuuest küsimusest. Vastuste põhjal arvutatakse välja nikotiinisõltuvuse tugevuse skoor (vahemikus 0–10 punkti). Erinevates riikides korraldatud uuringute andmeid võrreldes olid 1990ndate keskel ja lõpus Fagerströmi testiga saadud keskmised skoorid madalaimad Saksamaal ja Norras (mõlemal juhul skoor 2,8) ning kõrgeimad Rootsis ja USAs (4,6 punkti) (Fagerström & Furberg, 2008).

Eesmärgid

Uurimistöö üldeesmärk oli anda tõenduspõhine ülevaade Eesti arstide suitsetamisest, suhtumisest suitsetamiskäitumisse ja nikotiinisõltuvusest aastatel 1982–2014.

Töö alaeesmärgid olid järgmised:

1. kirjeldada arstide suitsetamise trendi aastatel 1982–2014 (I artikkel);
2. analüüsida arstide hoiakuid suitsetamise rolli suhtes suitsetamisega seotud haiguste tekkes aastatel 1982–2014 (II artikkel);
3. uurida arstide suhtumist suitsetamiskäitumisse aastatel 2002 ja 2014 (III artikkel);
4. kirjeldada arstide tähelepanu pööramist patsientide suitsetamisele ning analüüsida sellega seotud tegureid aastatel 2002 ja 2014 (IV artikkel);
5. selgitada välja arstide suitsetamisest loobumise soov ja sellega seotud tegurid aastatel 2002 ja 2014 (V artikkel);
6. uurida arstide nikotiinisõltuvust ja sellega seotud tegureid 2014. aastal (VI artikkel).

Metoodika

Töö põhines Eesti arstide 1982., 2002. ja 2014. aasta suitsetamisuuringutel. Valimi moodustasid kõik Eestis töötavad arstid. Andmed koguti postiküsitluse teel. Aastal 1982 oli valimis 4704 töötavat arsti, kelle andmed saadi Haridusministeeriumist. Küsimustikud saadeti arstidele töökoha aadressil. Uuringu kohandamata vastamismäär oli 80,7%.

Aastal 2002 oli valimis 4140 töötavat arsti, kelle andmed saadi Eesti Haigekassa lepingupartnerite andmekogust. Küsimustikud saadeti arstidele töökoha aadressil. Mittevastanutele saadeti meeldetuletuskiri koos küsimustikuga 4–6 nädalat pärast esimese küsimustiku postitamist. Uuringu täpsustamata vastamismäär oli 66,3% ja täpsustatud (välja arvatud olid arstid, kes olid pensionile läinud, kelle aadress oli vale, kes olid Eestist lahkunud või surnud) vastamismäär 67,8%.

Aastal 2014 koostati valim Eesti tervishoiutöötajate registri andmete põhjal. Uuringumaterjalid saadeti arstidele kodusel aadressil, mis saadi nende andmete

linkimisel Eesti rahvastikuregistriga. Uuringusse kaasati arstid, kellel oli rahvastikuregistris täpne kodune aadress. Valimi moodustas 5666 arsti. Mittevastanutele saadeti kuu möödudes meeldetuletuskiri. Järgmise kuu möödudes saadeti mittevastanutele uuesti uuringumaterjalidega ümbrik. Uuringu kohandamata vastamismäär oli 52,0% ja kohandatud vastamismäär 53,1%.

Uuringu küsimustik sisaldas küsimusi soo, rahvuse, töökoha, eriala ja suitsetamisharjumuste kohta. Küsiti ka arstide arvamus suitsetamise ja küsimustikus loetletud haiguste tekke vahelise seose kohta. Aastal 2002 lisati küsimustikku küsimused suitsetamisse kui riskikäitumisse suhtumise, patsientide suitsetamise suhtumise ja suitsetamisest loobumise kohta. Lisaks sisaldas 2014. aasta küsimustik NSi tugevuse määramist võimaldavaid küsimusi.

Arstide suitsetamise trende käsitlevasse artiklisse (I artikkel) kaasati küsimustikud, kus oli vastatud suitsetamise staatust määravatele küsimustele (n=3786 aastal 1982, n=2735 aastal 2002 ja n=2902 aastal 2014). Arvutati Euroopa standardrahvastiku (Ahmad jt, 2001) põhjal vanusele standarditud suitsetamise (igapäeva-, juhu-, endine, mitte kunagi) levimus 95% usaldusvahemikega (UV) ja suitsetamise alustamise keskmine vanus. Suitsetamise levimuse muutuse olulise hindamisel kasutati mitteparameetrilist testi.

Artiklisse, milles käsitleti arstide hoiakuid suitsetamise rolli suhtes suitsetamisega seotud haiguste tekkes (II artikkel), kaasati küsimustikud, kus oli vastatud suitsetamise staatust ja hoiakuid käsitlevatele küsimustele (n=3504 aastal 1982, n=2735 aastal 2002, n=2902 aastal 2014). Euroopa standardrahvastiku (Ahmad jt, 2001) põhjal arvutati vanusele standarditud suitsetamise (igapäeva-, juhu-, endine, mitte kunagi) levimus 95% UVga ning suitsetamise ja haiguste seoste väidetega nõustumise levimus. Seejuures nenditi väidetes, et suitsetamine on peamine põhjus või üks põhjustest südame isheemiatõve, kopsuvähi ja kroonilise bronhiidi tekkes. Seoste hindamiseks väidetega nõustumise ning kirjeldavate tegurite (suitsetamise staatus, vanus, sugu, rahvus, uuringuaasta) vahel kasutati logistilist regressiooni. Arvutati kohandatud šansisuhted 95% UVga.

Arstide suhtumist suitsetamiskäitumisse käsitleva artikli (III artikkel) valimisse kaasati küsimustikud, kus oli vastatud suhtumist kirjeldavatele väidetele ning suitsetamise staatuse määramiseks vajalikele küsimustele. Valimisse kaasati alla 65-aastaste arstide küsimustikud (n=2539 aastal 2002, n=2338 aastal 2014). Arvutati suitsetamiskäitumisse suhtumist kirjeldavate väidetega nõustumise levimus. Kirjeldavate tunnuste (suitsetamise staatus, vanus, sugu, rahvus, elukoht, eriala, uuringuaasta) puhul rühmade erinevuste hindamiseks kasutati hii-ruut-testi. Suitsetamisse suhtumist kirjeldavate väidetega nõustumise ja kirjeldavate tegurite vaheliste seoste hindamiseks kasutati logistilist regressiooni. Arvutati kohandatud šansisuhted 95% UVga.

Patsientide suitsetamisele tähelepanu pööramist käsitleva artikli (IV artikkel) valimisse kaasati alla 65-aastaste arstide küsimustikud, kus oli vastatud patsientidelt suitsetamise küsimise kohta (n=2488 aastal 2002, n=1791 aastal 2014). Patsientidelt suitsetamise kohta küsimise puhul arvutati Euroopa standardrahvastiku (Ahmad jt, 2001) põhjal vanusele standarditud levimus ning

valimi jaotus kirjeldavate tunnuste (suhtumine suitsetamiskäitumisse, suitsetamise kohta küsimist takistavad tegurid, suitsetamise staatus, vanus, sugu, rahvus, eriala, uuringuaasta) järgi. Rühmade erinevuste hindamiseks kasutati hii-ruut-testi. Seoste hindamiseks patsientidelt suitsetamise kohta küsimise ja kirjeldavate tunnuste vahel kasutati logistilist regressiooni. Arvutati kohandatud šansisuhted 95% UVga.

Suitsetamisest loobumise soovi käsitlevasse artiklisse (V artikkel) kaasati alla 65-aastaste suitsetavate arstide küsimustikud, kus oli vastatud suitsetamisest loobumise soovi küsimusele (n=322 aastal 2002, n=189 aastal 2014). Arvutati suitsetamisest loobumise soovi levimus ning valimi jaotus kirjeldavate tunnuste (suitsetamise staatus, hinnang suitsetamise kahjulikkusele, loobumiskatsete arv, stress suitsetamise taasalustamise põhjusena, motivatsioon loobuda, vanus, sugu, rahvus, elukoht, eriala, uuringuaasta) järgi. Seoste hindamiseks loobumissoovi ja kirjeldavate tegurite vahel kasutati logistilist regressiooni. Arvutati kohandatud šansisuhted 95% UVga.

Nikotiinisõltuvust käsitleva artikli (VI artikkel) valimisse kaasati igapäevaselt suitsetavate arstide küsimustikud, kus oli vastatud NSi määrata võimaldavatele küsimustele (n=171 aastal 2014). Arvutati NSi tugevuse skoor Fagerströmi nikotiinisõltuvuse testi järgi. Rühmade erinevuste hindamisel kasutati Fisheri täpset testi ning t-testi. Seoste hindamiseks nikotiinisõltuvuse tugevuse ja kirjeldavate tegurite (suitsetamise alustamise vanus, soov loobuda, motivatsioon loobuda, loobumiskatsete arv, stress suitsetamise taasalustamise põhjusena) vahel kasutati logistilist regressiooni. Arvutati kohandatud šansisuhted 95% UVga.

Kõikides artiklites kasutati andmeanalüüsiks Stata tarkvara (Stata).

Tulemused

Suitsetamise trend aastatel 1982–2014 (I artikkel)

Suitsetamise alustamise keskmine vanus meestel oli 1982. aastal 20,4 ja 2014. aastal 19,3 ning naistel vastavalt 24,5 ja 20,4. Võrreldes 1982. aastaga oli suitsetamise alustamise vanuse muutus naiste hulgas statistiliselt oluline.

Uuringuperioodi jooksul vähenes nii meeste kui naiste suitsetamise levimus oluliselt ($p < 0,001$). 1982. aastal suitsetas 39,7%, 2002. aastal 20,9% ja 2014. aastal 14,3% meestest ning vastavalt 12,2%, 8,0% ja 5,2% naistest. Igapäevaselt suitsetas meestest 1982. aastal 38,3%, 2002. aastal 15,0% ning 2014. aastal 11,7%, naistest vastavalt 10,3%, 4,7% ja 3,9%. Enim vähenes suitsetamise levimus nooremates vanuserühmades (kuni 34-aastaste ja 35–44-aastaste hulgas).

Arstide hoiakud suitsetamise rolli suhtes suitsetamisega seotud haiguste tekkes, 1982–2014 (II artikkel)

Enam kui 80% arstidest nõustus väitega, et suitsetamine on peamine põhjus või üks põhjustest südame isheemiatõve, kopsuvähi ja kroonilise bronhiidi tekkes. Esimesel uuringuaastal oli südame isheemiatõve puhul selle väitega nõustumise

osakaal mõnevõrra väiksem kui kopsuvähi või kroonilise bronhiidi väitega. Aastaks 2014 oli nii südame isheemiatõve, kopsuvähi kui kroonilise bronhiidi puhul nõustumise osakaal enam kui 98% nii meeste kui naiste hulgas.

Kohandatud logistilise regressioonanalüüsi tulemuste kohaselt oli arstide nõustumine väitega, et suitsetamine on südame isheemiatõve põhjus, oluliselt suurem eestlaste (vs. mitte-eestlaste) hulgas. Naistest nõustusid selle väitega oluliselt enam mittersuitsetajad ja endised suitsetajad (vs. praegused suitsetajad), kuid oluliselt väiksem oli nõustumine vanemates vanuserühmades. Väitega, et suitsetamine on peamine põhjus või üks põhjustest kopsuvähi tekkes nõustusid oluliselt enam arstid, kes olid mittersuitsetajad või endised suitsetajad (vs. praegused suitsetajad). Naiste hulgas oli eestlaste (vs. mitte-eestlased) nõustumine oluliselt suurem. Väitega, et suitsetamine on peamine põhjus või üks põhjustest kroonilise bronhiidi tekkes oli eestlaste (vs. mitte-eestlased) hulgas nõustumine oluliselt suurem nii meeste kui naiste hulgas. Nõustumine oli seotud suitsetamise staatusega vaid naiste hulgas. Mittersuitsetajad ja endised suitsetajad (vs. praegused suitsetajad) nõustusid oluliselt rohkem väitega, et suitsetamine on kroonilise bronhiidi põhjus. Kõikide seisundite puhul nõustuti väidetega 2002. ja 2014. aastal oluliselt enam kui 1982. aastal.

Arstide suhtumine suitsetamiskäitumisse, 2002 ja 2014 (III artikkel)

Võrreldes 2002. aastaga oli 2014. aastal arstide suhtumine suitsetamiskäitumisse oluliselt vähem soosiv. Oluliselt enam nõustuti, et suitsetamine on tervisele kahjulik ja suitsetamise vähendamine rahvastikus on oluline.

Oluliselt vähenes nõustumine järgmiste väidetega: 1) kuna suitsetamise lõpetamine on raske, on mõnikord parem suitsetamist jätkata; 2) suitsetamine ei kahjusta tervist, kui inimesel on muus osas tervislik eluviis; 3) kuna paljud inimesed on suitsetanud kogu elu kõrge eani ega ole haigestunud, tähendab see, et suitsetamine ei ole nii ohtlik, kui eksperdid väidavad; 4) suitsetamine on inimese enda asi; 5) suitsetamine on kahjulik vaid siis, kui suitsetatakse üle 10 sigareti päevas. Suitsetavate mees- ja naisarstide (vs. mittersuitsetavad arstid) suhtumine suitsetamisse oli soosivam.

Tähelepanu pööramine patsientide suitsetamisele ja sellega seotud tegurid, 2002 ja 2014 (IV artikkel)

Võrreldes 2002. aastaga oli 2014. aastal suurem nende arstide osakaal, kes küsisid patsientidelt suitsetamise kohta igal teisel korral, sageli või alati. Aastal 2002 ei küsinud 15,1% meestest ja 16,4% naistest mitte kunagi patsientidelt suitsetamise kohta, aastal 2014 vastavalt 10,6% ja 10,1%.

Nii meestel kui naiste hulgas oli tõenäosus küsida patsientidelt suitsetamise kohta oluliselt suurem neil, kes nõustusid (vs. ei nõustunud), et arsti kohustuseks on saada patsient suitsetamisest loobuma ja et arstidel peaks olema suitsetamisteemalisi jaotusmaterjale. Arsti vanuse kasvades suurenes oluliselt patsientidelt suitsetamise kohta küsimise tõenäosus.

Naisarstid, kes nõustusid (vs. ei nõustunud), et nende teadmised on piisavad patsientide nõustamiseks ja et ajapuudus on takistav tegur loobumisenõustamise

puhul küsisid patsientidelt suitsetamise kohta oluliselt sagedamini. Naisarstid, kes nõustusid, et harjumuse puudus ja soov mitte häirida patsiendi privaatsust on takistavad tegurid, küsisid oluliselt vähem patsientide suitsetamise kohta.

Võrreldes 2002. aastaga küsisid naisarstid 2014. aastal patsientidelt suitsetamise kohta oluliselt sagedamini. Vaid naisarstide hulgas oli patsientidelt suitsetamise kohta küsimine oluliselt suurem mitte-eestlaste (vs. eestlased) ning perearstide ja eriarstide (vs. hambaarstid) hulgas. Oluliselt vähem küsisid patsientidelt suitsetamise kohta suitsetavad (vs. mitteduitsetavad) naisarstid.

Suitsetamisest loobumise soov ja sellega seotud tegurid, 2002 ja 2014 (V artikkel)

2002. aastal soovis suitsetamisest loobuda 55,3% arstidest ning 2014. aastal 52,9%. Arstide osakaal, kes ei olnud loobumissoovis kindlad, oli 2002. aastal 30,1% ja 2014. aastal 22,2%.

Soov suitsetamisest loobuda oli oluliselt suurem igapäevaselt suitsetavatel (vs. juhuslikult suitsetavatel) arstidel, samuti neil, kes muretsesid suitsetamise kahjulikkuse pärast (vs. ei muretsenud). Suurem loobumiskatsete arv oli oluliselt seotud suurema sooviga suitsetamisest loobuda. Oluliselt rohkem soovisid suitsetamisest loobuda need arstid, kellele oli tähtis olla heaks eeskujuks. Eriala järgi oli soov loobuda oluliselt suurem hambaarstidel (vs. eriarstid).

Arstide nikotiinisõltuvus ja sellega seotud tegurid 2014. aastal (VI artikkel)

Igapäevaselt suitsetavate arstide hulgas oli keskmine nikotiinisõltuvus Fagerströmi testi järgi $2,8 \pm 2,1$ (meestel $3,2 \pm 2,4$ ja naistel $2,7 \pm 2,0$, $p=0,385$).

Ligi 40%-l igapäevaselt suitsetavatest arstidest oli mõõdukas või tugev NS. Tugev NS oli 7,1%-l mees- ja 5,4%-l naisarstidest. Meeste ja naiste NS oluliselt ei erinenud ($p=0,107$). Madala NSiga arstide suitsetamise alustamise keskmine vanus oli $21,0 \pm 5,1$, kuid vähemalt mõõduka NSiga arstide hulgas $18,4 \pm 3,3$ ($p<0,001$). Suitsetamise varasem alustamine oli oluliselt seotud vähemalt mõõduka NSi tekkega.

Järeldused

Uuringu tulemustest nähtub, et Eesti arstide suitsetamise levimus vähenes aastatel 1982–2014 ning arstide suhtumine suitsetamiskäitumisse muutus vähem soovivaks. Rohkem kui kolmandikul igapäevaselt suitsetavatest arstidest oli vähemalt mõõduka tugevusega NS.

Tööl põhinevad täpsemad järeldused on järgmised:

1. Suitsetamise levimus arstide hulgas vähenes Eestis ajavahemikul 1982–2014 ning kogu uuringuperioodi jooksul oli meeste hulgas kõrgem kui naiste hulgas. Enim vähenes suitsetamise levimus nooremates vanuserühmades, kuid samal ajal hakkasid arstid suitsetama nooremas vanuses.
2. Nõustumine sellega, et suitsetamine on südame isheemiatõve, kopsuvähi ja kroonilise bronhiidi tekkepõhjus suurenes ajavahemikul 1982–2014. Hin-

- angud suitsetamise põhjuslikkusele nende haiguste tekkes olid seotud arstide suitsetamise staatusega.
3. Võrreldes 2002. aastaga olid 2014. aastal arstide hoiakud suitsetamise suhtes vähem soosivad. Suitsetavad arstid suhtusid suitsetamisse leebemalt.
 4. Võrreldes 2002. aastaga küsisid arstid 2014. aastal patsientidelt suitsetamisharjumuse kohta oluliselt sagedamini kuid muutus oli oluline vaid naiste hulgas. Tähelepanu pööramine patsientide suitsetamisele oli suurem nende mees- ja naisarstide hulgas, kes arvasid, et arsti kohustuseks on saada patsient suitsetamisest loobuma ja et arstidel peaks olema suitsetamisteemalisi jaotusmaterjale, kuid vaid naisrste hulgas, kes arvasid, et ajapuudus, harjumuse puudus ja soov mitte häirida patsiendi privaatsust on suitsetamise kohta küsimist takistavad tegurid.
 5. Nii 2002. kui 2014. aastal soovisid enam kui pooled suitsetavatest arstidest suitsetamisest loobuda. Soov suitsetamisest loobuda oli oluliselt seotud muretsemisega suitsetamise tervisekahjulikkuse pärast, eelnenud loobumiskatsete suurema arvuga, sooviga olla heaks eeskujuks ning arsti erialaga.
 6. Rohkem kui kolmandikul igapäevaselt suitsetavatest arstidest oli 2014. aastal mõõdukas või tugev NS. Tugevam NS oli oluliselt seotud suitsetamise alustamisega nooremas vanuses.

Praktilised soovitused

Uuringu tulemused on vajalikud poliitikakujundajatele ja organisatsioonidele, kes tegelevad suitsetamise ennetamise koolituse ning loobumishõustamise teenuste korraldamise ja arendamisega.

Käesoleva uuringu tulemuste põhjal saab teha järgmised ettepanekud:

1. Arstide suitsetamise levimuse edasiseks vähendamiseks tuleb luua spetsiaalselt arstidele suunatud suitsetamisest loobumise teenused.
2. Arstide poolt patsientide suitsetamisele tähelepanu pööramise soodustamiseks tuleb tõhustada suitsetamise ennetamise ja suitsetamisest loobumise nõustamise alal väljaõpet arstidele.
3. Suitsetamisest loobumise nõustamise teenuste arendamisel tuleb arvesse võtta tegureid, mis arstide arvates mõjutavad patsientide suitsetamisele tähelepanu pööramist. Näiteks on vaja luua ravi- või tegevusjuhendid, et soodustada suitsetamise käsitlemist.
4. Suitsetamisest loobumise nõustamise teenuste edasisel arendamisel tuleb rakendada meeskonnatöö põhinevat lähenemist, kaasata ennetavatesse tegevustesse enam meditsiiniõdesid ja töotervishoiuspetsialiste.
5. Arstidel määratud NS põhisel tuleb koguda samalaadset infot kogurahvastikus eesmärgiga muuta suitsetamisest loobumise sekkumised Eestis efektiivsemaks.
6. Arstide suitsetamisest loobumise alase sekkumise soodustamiseks tuleb kasutada suitsetamise staatuse teabe standarditud dokumenteerimist patsiendi haigusloos.

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APPENDIX I

Questionnaire in 1982

ENSV Tervishoiuministeerium

1 Perekonnanimi

Eesnimi

Isanimi

2 Sünniaeg

päev, kuu, aasta

3 Sugu M H

4 Rahvus

5 Asutus

6 Kas Te suitsetate?

Jah (vt. edasi küsimused 7-9, 11 jne.)

ei (vt. edasi küsimused 10 jne.)

7 Kui vanalt Te hakkasite suitsetama?

8 Mida Te suitsetate?

sigarette, paberossa, piipu

9 Mitu suitsetamist Te suitsetate keskmiselt?

Mõned kuu jooksul

PÄEVAS: 1-2; 3-4; 5-9; 10-14;

15-19; 20-39; üle 40

10 Kas Te olete suitsetanud varem enam-vähem püsivalt?

ei; jah mitu aastat

Kuidas on Teile arvestes alljärgnevate haiguste teke seotud suitsetamisega?

	11	12	13	14
	SÜDAME	KOPSU-	KROON.	KOPSU-
	ISHEEMIA-	VÄHK	BRONHIIT	EMFÜSEEM
	TÕBI			
Kindlasti peamine põhjus	1	1	1	1
Üks põhjustest	2	2	2	2
Ei oaks arvata	3	3	3	3
Tõenäoliselt pole põhjus	4	4	4	4
Pole põhjus	5	5	5	5

15 Kas Te põete: südame isheemiatõbe; kroon. bronhiiti;

kopsuemfüseesi

16

17 Erisla

APPENDIX II

Questionnaire in 2002

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Täitke palun lüngad, tõmmake Teie jaoks sobivaimale vastusevariandile ring ümber!

ÜLDANDMED

1. Sünniaeg
päev, kuu, aasta
2. Sugu
1 mees
2 naine
3. Elukoht
1 Tallinn
2 muu linn v.a. Tallinn
3 muu asula, vald, maakond
4. Perekonnaseis
1 abielus / vabaabielus
2 vallaline
3 lahutatud / lahus elav
4 lesk
5. Rahvus
6. Töökoht
7. Amet
8. Eriala
9. Milline on käesoleval ajal Teie hinnang oma tervisele?
1 väga hea
2 üsna hea
3 keskmine
4 üsna halb
5 väga halb

SUITSETAMINE

10. Kas Te suitsetate?
1 jah
2 ei (jätkake küsimusega nr. 14)
11. Kui vanalt Te hakkasite suitsetama?
..... a.
12. Kas Te suitsetate pidevalt (iga päev)?
1 jah
2 ei
13. Mida Te arvate, mis võiks olla Teie suitsetamise peamiseks põhjuseks? Valige vaid üks vastusevariant!
1 mulle meeldib sigareti maik/lõhn
2 see rahustab mind kui olen närvis
3 sigaret ergutab/virgutab
4 tunnen sigaretinälga
5 see kergendab suhtlemist
6 niisama, ei oska erilist põhjust öelda
14. Kas Te olete kunagi suitsetanud enam-vähem pidevalt (regulaarselt vähemalt 1 aasta jooksul)?
1 jah, mitu aastat?
- 2 ei (jätkake küsimusega nr. 16)
15. Kui palju Te suitseta(s)ite keskmiselt päevas? Vastake iga suitsuliigi kohta eraldi.
1 filtriga sigarette tk päevas
2 käsitsi keeratud sigarette tk päevas
3 piipu piibutäit päevas
4 sigareid tk päevas

21. Kas Teie arvates on suitsetamine seotud südame isheemiatõve tekkega?

- 1 kindlasti peamine põhjus
- 2 üks põhjustest
- 3 tõenäoliselt pole põhjus
- 4 pole põhjus
- 5 ei oska arvata

22. Kas Teie arvates on suitsetamine seotud kopsuvähi tekkega?

- 1 kindlasti peamine põhjus
- 2 üks põhjustest
- 3 tõenäoliselt pole põhjus
- 4 pole põhjus
- 5 ei oska arvata

23. Kas Teie arvates on suitsetamine seotud kroonilise bronhiidi tekkega?

- 1 kindlasti peamine põhjus
- 2 üks põhjustest
- 3 tõenäoliselt pole põhjus
- 4 pole põhjus
- 5 ei oska arvata

24. Kas Teie arvates on suitsetamine seotud kopsuemfüseemi tekkega?

- 1 kindlasti peamine põhjus
- 2 üks põhjustest
- 3 tõenäoliselt pole põhjus
- 4 pole põhjus
- 5 ei oska arvata

25. Kas Te põete mõnda järgnevatest haigustest?

- 1 südame isheemiatõbi
- 2 krooniline bronhiit
- 3 kopsuemfüseem

Mittesuitsetajad, jätkake palun küsimusega nr. 31!

SUITSETAMISEST LOOBUMINE

26. Kui Te olete suitsetaja, kas Teid paneb muretsema fakt, et suitsetamine on Teie tervisele kahjulik?

- 1 olen väga murelik
- 2 mõningal määral
- 3 mitte eriti
- 4 üldse mitte
- 5 ei ole sellele mõelnud

27. Kas Te tahaksite loobuda suitsetamisest?

- 1 jah
- 2 ei
- 3 ei oska öelda

28. Mitu korda Te olete tõsiselt üritanud suitsetamist lõpetada?

- 1 mitte kordagi
- 2 1-2 korda
- 3 3-4 korda
- 4 5 korda või rohkem

29. Mida Te peate kõige olulisemaks taassuitsetama hakkamise põhjuseks? Valige üks vastusevariant!

- 1 ülemäärane stress
- 2 tugevad võõrutusnähud
- 3 sotsiaalse toetuse puudumine
- 4 alkoholi tarbimine
- 5 kehakaalu tõus
- 6 suitsetamine lähikonnas
- 7 muu põhjus,

30. Mis motiveeriks Teid suitsetamisest loobuma? Valige üks vastusevariant!

- 1 isiklikud terviseprobleemid
- 2 tubakatoodete hinna tõus
- 3 sotsiaalne surve
- 4 eneseteostus, eeskujuks olla tahtmine
- 5 materiaalne stiimul
- 6 muu põhjus,

TERVISE EDENDAMINE

31. Kui oluliseks Te peate järgmisi väiteid ise mittediagnostikaks olemisel? Vastake igale väitele! (1=oluline, 2=mitteoluline)

- | | | | |
|---|---------------------------------------|---|---|
| 1 | tervise eelistamine | 1 | 2 |
| 2 | ebameeldivate sümptomite vältimine | 1 | 2 |
| 3 | arstide-kolleeegide surve | 1 | 2 |
| 4 | kaasinimestele tekitatav ebameeldivus | 1 | 2 |
| 5 | hea eeskujuga | 1 | 2 |
| 6 | sõprade või pereliikmete arvamus | 1 | 2 |
| 7 | raha säästmine | 1 | 2 |

32. Igal arstil peaks olema piisavalt diagnostikamaterjali, et neid vajadusel patsientidele jagada?

- 1 täiesti samal arvamusel
- 2 küllaltki samal arvamusel
- 3 raske öelda
- 4 küllatki erineval arvamusel
- 5 täiesti erineval arvamusel

33. Minu praegused teadmised ja oskused on piisavad juhiste andmiseks patsientidele, kes soovivad diagnostikast loobuda

- 1 täiesti samal arvamusel
- 2 küllatki samal arvamusel
- 3 raske öelda
- 4 küllatki erineval arvamusel
- 5 täiesti erineval arvamusel

34. Tervishoiutöötajad peaksid saama erikoolitust selles, kuidas aidata patsiente, kes soovivad diagnostikast loobuda.

- 1 täiesti samal arvamusel
- 2 küllatki samal arvamusel
- 3 raske öelda
- 4 küllatki erineval arvamusel
- 5 täiesti erineval arvamusel

35. Diagnostika profülaktika peaks olema osa tervishoiutöötajate põhikoolitusest.

- 1 täiesti samal arvamusel
- 2 küllatki samal arvamusel
- 3 raske öelda
- 4 küllatki erineval arvamusel
- 5 täiesti erineval arvamusel

36. Arsti kohustuseks on saada patsienti diagnostikast loobuma.

- 1 täiesti samal arvamusel
- 2 küllatki samal arvamusel
- 3 raske öelda
- 4 küllatki erineval arvamusel
- 5 täiesti erineval arvamusel

37. Kui sageli Te olete küsinud viimase nädala jooksul Teid visiteerinud patsientidelt nende diagnostikaharjumuse kohta?

- 1 ei kordagi
- 2 mõnikord
- 3 umbes igalt teiselt patsiendilt
- 4 sageli
- 5 alati

38. Missugused järgnevatest teguritest piiravad Teid patsiendi diagnostikast loobumisele tähelepanu pööramist? Võib valida mitu vastusevarianti!

- 1 ajapuudus
- 2 pole harjunud diagnostikast loobumise rääkimisega
- 3 ei soovi häirida patsiendi sellealast privaatsust
- 4 probleem pole oluline, kuna arst ei saa kuidagi mõjutada patsiendi diagnostikaharjumusi
- 5 muu põhjus,

Aitäh ankeedi täitmise eest!

APPENDIX III

Questionnaire in 2014



Epidemioloogiline ja geneetiline tõendus tervishoiutöötajate
suitsetamiskäitumise ja nikotiinisõltuvuse kohta

Palun täitke lüngad, tõmmake Teie jaoks sobivaimale vastusevariandile ring ümber!

ÜLDANDMED

1. Sünniaeg päev kuu aasta
2. Sugu
1 mees
2 naine
3. Peamine elukoht praegu
1 Tallinn
2 muu linn, v.a. Tallinn
3 muu asula, vald, maakond
4 välisriik (täpsustage).....
4. Perekonnaseis
1 abielus / vabaabielus
2 vallaline
3 lahutatud / lahus elav
4 lesk
5. Rahvus
1 eestlane
2 venelane
3 muu
6. Peamine amet praegu
1 esmatasandi arst
2 eriarst
3 hambaarst
4 teadustöötaja
5 administratiivtöötaja
6 muu
7. Eriala
8. Milline on Teie hinnang oma tervisele praegu?
1 väga hea
2 üsna hea
3 keskmine
4 üsna halb
5 väga halb
97 ei oska öelda
98 ei soovi vastata

SUITSETAMINE

9. Kas Te olete kunagi suitsetanud enamvähem pidevalt (regulaarselt vähemalt aasta jooksul)?
1 jah, mitu aastat?
- 2 ei (jätkake küsimusega nr 28)
10. Kui vanalt Te hakkasite esimest korda suitsetama?
..... aastaselt
11. Kas Te praegu suitsetate?
1 jah
2 ei (jätkake küsimusega nr 28)
12. Kas Te praegu suitsetate pidevalt (iga päev)?
1 jah
2 ei (jätkake küsimusega nr 19)
13. Mitu minutit pärast ärkamist Te tõmbate päeva esimese sigareti?
1 5 minuti jooksul
2 6–30 minuti jooksul
3 31–60 minuti jooksul
4 hiljem
14. Mitu sigaretti Te päevas suitsetate (keskmiselt)?
1 kuni 10
2 11–20
3 21–30
4 enam kui 30
15. Kas Teil on raske loobuda suitsetamisest kohtades, kus see on keelatud (näiteks lennukis, kinos)?
1 jah
2 ei
16. Millisest sigarettist on Teil kõige raskem loobuda?
1 esimesest hommikul
2 mõnest teisest
17. Kas Te suitsetate hommikuti rohkem kui ülejäänud ajal päevast?
1 jah
2 ei
18. Kas Te suitsetate kui olete nii haige, et peate jääma voodisse?
1 jah
2 ei

19. Mis liiki tubakatooteid Te tarvitate?

	Tarvitatan praegu	Olen kunagi tarvitatud
a) filtra sigaretid	1	2
b) filtra sigaretid	1	2
c) käsitsi keeratud sigaretid	1	2
d) e-sigaretid	1	2
e) huuletubakas	1	2
f) sigarid	1	2
g) paberossid	1	2
h) piip	1	2
i) vesipiip	1	2
j) muu	1	2

20. Mis võiks Teie arvates olla Teie suitsetamise peamiseks põhjuseks? Valige üks variant!

- 1 mulle meeldib sigareti maik/lõhn
 - 2 see rahustab mind kui olen närvis
 - 3 sigaret ergutab/virgutab
 - 4 tunnen sigaretinälga
 - 5 see kergendab suhtlemist
- 97 ei oska öelda
98 ei soovi vastata

21. Kus Te tööil peamiselt suitsetate? Valige üks variant!

- 1 tööil ma ei suitseta (jätkake küsimusega nr 23)
 - 2 suitsetan selleks ettenähtud ruumis/alal
 - 3 mujal
- 97 ei oska öelda
98 ei soovi vastata

22. Kellega koos Te tööil olles enamasti suitsetate? Valige üks variant!

- 1 üksi
 - 2 töökaaslastega
 - 3 kellegi teisega
- 97 ei oska öelda
98 ei soovi vastata

SUITSETAMISEST LOOBUMINE

23. Kui Te olete suitsetaja, kas Teid paneb muretsema fakt, et suitsetamine on Teie tervisele kahjulik?

- 1 olen väga murelik
 - 2 mõningal määral
 - 3 mitte eriti
 - 4 üldse mitte
 - 5 ei ole sellele mõelnud
- 97 ei oska öelda
98 ei soovi vastata

24. Kas Te tahaksite suitsetamisest loobuda?

- 1 jah
 - 2 ei
- 97 ei oska öelda
98 ei soovi vastata

25. Mitu korda Te olete tõsiselt üritanud suitsetamist lõpetada?

- 1 mitte kordagi
 - 2 1–2 korda
 - 3 3–4 korda
 - 4 5 korda või rohkem
- 97 ei oska öelda
98 ei soovi vastata

26. Mida Te peate kõige olulisemaks uuesti suitsetama hakkamise põhjuseks? Valige üks variant!

- 1 ülemäärane stress
 - 2 tugevad võõrutusnähtud
 - 3 sotsiaalse toetuse puudumine
 - 4 alkoholi tarvitamine
 - 5 kehakaalu tõus
 - 6 suitsetamine lähikonnas
 - 7 muu põhjus
- 97 ei oska öelda
98 ei soovi vastata

27. Mis motiveeriks Teid suitsetamisest loobuma? Valige üks variant!

- 1 isiklikud terviseprobleemid
 - 2 tubakatoote hinna tõus
 - 3 sotsiaalne surve
 - 4 eneseteostus, eeskujuks olla tahtmine
 - 5 materiaalne stiimul
 - 6 muu põhjus
- 97 ei oska öelda
98 ei soovi vastata

HOIAKUD JA SUHTUMISED

28. Kui oluliseks Te peate elanikkonna suitsetamise vähendamisele suunatud tegevusi?

- 1 väga oluliseks
 - 2 küllaltki oluliseks
 - 3 väheoluliseks
 - 4 ebaoluliseks
- 97 ei oska öelda
98 ei soovi vastata

29. Märkige 10 palli skaalal, kui kahjulik on teie arvates suitsetamine tervisele.



30. Järgnevalt on toodud ära mitmed üsna laialt levinud väited. Palun vastake, mil määral Te olete nendega nõus.

	Täielikult nõus	Osaliselt nõus	Pigem pole nõus	Üldse pole nõus	Ei oska öelda	Ei soovi vastata
a) Paljud inimesed on suitsetanud kogu oma elu kuni kõrge eani ega ole haigestunud. Sellest võib järeldada, et suitsetamine pole nii ohtlik kui eksperdid väidavad.	1	2	3	4	97	98
b) Kas inimesed suitsetavad või mitte, on nende enda asi.	1	2	3	4	97	98
c) Paljudele inimestele on suitsetamise lõpetamine nii raske, et nende tervisele on parem, kui nad lihtsalt jätkavad suitsetamist.	1	2	3	4	97	98
d) Suitsetamine ei ole tervisele kahjulik niikaua, kui inimesel on muus suhtes tervislik eluviis.	1	2	3	4	97	98
e) Suitsetamine on tervisele kahjulik vaid siis, kui suitsetada üle 10 sigareti päevas.	1	2	3	4	97	98

31. Kuidas on korraldatud suitsetamine Teie tööruumides?

- 1 töökoht on suitsuvaba
- 2 lubatud vaid selleks eraldatud ruumis/alal
- 3 muu lahendus

97 ei oska öelda
98 ei soovi vastata

32. Kas Te olete rahul suitsetamise korraldusega oma tööruumides?

- 1 täiesti rahul
- 2 osaliselt rahul
- 3 ei ole rahul

97 ei oska öelda
98 ei soovi vastata

33. Kas Teie arvates on suitsetamine seotud südame isheemiatõve tekkega?

- 1 kindlasti peamine põhjus
- 2 üks põhjustest
- 3 tõenäoliselt pole põhjus
- 4 pole põhjus

97 ei oska öelda
98 ei soovi vastata

34. Kas Teie arvates on suitsetamine seotud kopsuvähi tekkega?

- 1 kindlasti peamine põhjus
- 2 üks põhjustest
- 3 tõenäoliselt pole põhjus
- 4 pole põhjus

97 ei oska öelda
98 ei soovi vastata

35. Kas Teie arvates on suitsetamine seotud kroonilise bronhiidi tekkega?

- 1 kindlasti peamine põhjus
- 2 üks põhjustest
- 3 tõenäoliselt pole põhjus
- 4 pole põhjus

97 ei oska öelda
98 ei soovi vastata

36. Kas Teie arvates on suitsetamine seotud kopsuemfüseemi tekkega?

- 1 kindlasti peamine põhjus
- 2 üks põhjustest
- 3 tõenäoliselt pole põhjus
- 4 pole põhjus

97 ei oska öelda
98 ei soovi vastata

37. Kas Te põete mõnda järgnevatest haigustest?

- 1 südame isheemiatõbi
- 2 krooniline bronhiit
- 3 kopsuemfüseem
- 97 ei oska öelda
- 98 ei soovi vastata

TERVISE EDENDAMINE

38. Kas Teie töö võimaldab anda patsientidele tervise edendamise alast teavet?

- 1 jah
- 2 ei (jätkake küsimusega 43)

39. Kas Te oma töös annate patsientidele tervise edendamise alast teavet?

- 1 jah
- 2 ei (jätkake küsimusega 41)

40. Kui sageli Te olete küsinud viimase 7 päeva jooksul oma patsientidelt nende suitsetamis-harjumuse kohta?

- 1 ei kordagi
- 2 mõnikord
- 3 umbes igalt teiselt patsiendilt
- 4 sageli
- 5 alati
- 6 viimasel 7 päeval ei puutunud patsientidega kokku
- 97 ei oska öelda
- 98 ei soovi vastata

41. Minu praegused teadmised ja oskused on piisavad juhiste andmiseks patsientidele, kes soovivad suitsetamisest loobuda.

- 1 täiesti samal arvamusel
- 2 üsna samal arvamusel
- 3 üsna erineval arvamusel
- 4 täiesti erineval arvamusel
- 97 ei oska öelda
- 98 ei soovi vastata

42. Kas järgnevad tegurid piiravad Teil patsiendi tähelepanu suitsetamisele pööramisel? (1=jah, 2=e, 97=e, 98=e ei soovi vastata)

- a) probleem pole oluline 1 2 97 98
- b) ajapuudus 1 2 97 98
- c) pole harjunud suitsetamisest rääkima 1 2 97 98
- d) ei soovi häirida patsiendi privaatsust 1 2 97 98
- e) ei suuda mõjutada patsiendi suitsetamisharjumusi 1 2 97 98
- f) see on kellegi teise tööülesanne 1 2 97 98
- g) muu põhjus 1 2 97 98
-

43. Millised on Teie jaoks olulised mittesuitsetamise põhjendused? Vastake igale väitele! (1=oluline, 2=mitteoluline, 97=e, 98=e ei soovi vastata)

- a) tervise eelistamine 1 2 97 98
- b) ebameeldivate sümptomite vältimine 1 2 97 98
- c) arstide-kolleeegide surve 1 2 97 98
- d) teistele tekitatav ebameeldivus 1 2 97 98
- e) hea eeskuju 1 2 97 98
- f) sõprade või perek liikmete arvamus 1 2 97 98
- g) raha säästmine 1 2 97 98

44. Arstidel peaks olema piisavalt suitsetamisteemalisi materjale, et neid vajadusel patsientidele jagada.

- 1 täiesti samal arvamusel
- 2 üsna samal arvamusel
- 3 üsna erineval arvamusel
- 4 täiesti erineval arvamusel
- 97 ei oska öelda
- 98 ei soovi vastata

45. Suitsetamise profülaktika peaks olema osa tervishoiutöötajate põhikoolitusest.

- 1 täiesti samal arvamusel
- 2 üsna samal arvamusel
- 3 üsna erineval arvamusel
- 4 täiesti erineval arvamusel
- 97 ei oska öelda
- 98 ei soovi vastata

46. Arsti kohustuseks on saada patsienti suitsetamisest loobuma.

- 1 täiesti samal arvamusel
- 2 üsna samal arvamusel
- 3 üsna erineval arvamusel
- 4 täiesti erineval arvamusel
- 97 ei oska öelda
- 98 ei soovi vastata

Täname ankeedi täitmise eest!

PUBLICATIONS

CURRICULUM VITAE

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Education

2017–... University of Tartu, Faculty of Medicine, doctoral studies
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Professional career

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2006–2008 Data entry and review (clinical research), Encorium OÜ

Research

Publications

- Põld M, Pärna K. Nicotine dependence and factors related to smoking cessation among physicians in Estonia. *International Journal of Environmental Research and Public Health* 2020;17. doi:10.3390/ijerph17093217.
- Põld M, Pärna K. Changes in addressing patients' smoking: cross-sectional data from 2002 and 2014 among physicians in Estonia. *Tobacco Use Insights* 2020; 13:1179173X2094926. doi:10.1177/1179173X20949269.
- Põld M, Pärna K. Factors associated with desire to quit smoking among Estonian physicians: Cross-sectional data of 2002 and 2014. *Tobacco Prevention and Cessation* 2018;4:29. doi:10.18332/tpc/93009.
- Pärna K, Põld M, Ringmets I. Trends in smoking behaviour among Estonian physicians in 1982–2014. *BMC Public Health* 2017;18:55. doi:10.1186/s12889-017-4596-x.
- Pärna K, Põld M, Ringmets I. Physicians' views on the role of smoking in smoking-related diseases: findings from cross-sectional studies from 1982–2014 in Estonia. *Tobacco Induced Diseases* 2017;15:31. doi:10.1186/s12971-017-0136-9.
- Põld 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:e017197. doi:10.1136/bmjopen-2017-017197.

During the period of doctoral studies (2017–2021), the research results based on the studies in the dissertation were presented at three international and eight Estonian scientific conferences.

Professional development:

- 12.–16.08.2019 ERASMUS Summer Programme courses “Methods of Public Health Research” and “Methods of Health Services Research”, Erasmus MC Netherlands Institute for Health Sciences, Netherlands.
- 22.–28.07.2018 European Observatory summer school “Quality of care: Improving effectiveness, safety, and responsiveness”, Venice, Italy.

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2008–2015 Tegevusterapeut, SA Tartu Ülikooli Kliinikum
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Teadustöö:

Publikatsioonid

- Pöld M, Pärna K. Nicotine dependence and factors related to smoking cessation among physicians in Estonia. *International Journal of Environmental Research and Public Health* 2020;17. doi:10.3390/ijerph17093217.
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- 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:e017197. doi:10.1136/bmjopen-2017-017197.

Doktoriõppe ajal (vahemikus 2017–2021) esitleti uuringutulemusi doktoritöö teemal kolmel rahvusvahelisel ja kaheksal Eestis toimunud teaduskonverentsil.

Erialane enesetäiendus

- 12.–16.08.2019 ERASMUS Summer Programme “Methods of Public Health Research” (15 tundi) ja “Methods of Health Services Research” (15 tundi), Erasmus MC Netherlands Institute for Health Sciences, Netherlands.
- 22.–28.07.2018 European Observatory summer school “Quality of care: Improving effectiveness, safety, and responsiveness”, Itaalia, Veneetsia.

DISSERTATIONES MEDICINAE UNIVERSITATIS TARTUENSIS

1. **Heidi-Ingrid Maaros.** The natural course of gastric ulcer in connection with chronic gastritis and *Helicobacter pylori*. Tartu, 1991.
2. **Mihkel Zilmer.** Na-pump in normal and tumorous brain tissues: Structural, functional and tumorigenesis aspects. Tartu, 1991.
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14. **Rein Kolk.** Atrial versus ventricular pacing in patients with sick sinus syndrome. Tartu, 1994.
15. **Toomas Podar.** Incidence of childhood onset type 1 diabetes mellitus in Estonia. Tartu, 1994.
16. **Kiira Subi.** The laboratory surveillance of the acute respiratory viral infections in Estonia. Tartu, 1995.
17. **Irja Lutsar.** Infections of the central nervous system in children (epidemiologic, diagnostic and therapeutic aspects, long term outcome). Tartu, 1995.
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