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# Comparison of knowledge, attitudes and behaviour regarding smoking among Estonian and Finnish physicians

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**Summary**

**Objectives:** To compare smoking behaviour, attitudes and opinions towards smoking and smoking cessation among Estonian and Finnish physicians.
**Methods:** A cross-sectional postal survey using a self-administered questionnaire was carried out among 2480 Estonian and 2075 Finnish physicians.
**Results:** Daily smoking prevalence was higher among Estonian physicians than among their Finnish counterparts in both male (18.6% and 6.7%) and female (6.6% and 3.6%). Compared to Estonia, physicians in Finland more often agreed that smoking is very harmful to their health, that trying to convince people to stop smoking is their responsibility and that smoking prevention should be part of the normal and special training of health professionals. In both countries, non-smoking physicians held more unfavourable attitudes towards smoking than those who were smoking.
**Conclusions:** Physicians' own smoking patterns and quitting behaviour are important because physicians serve as models for their patients and play a key role in the reinforcement of smoke-free health facilities. These results remain a challenge to medical educators, especially in Estonia. Estonia needs to improve medical education in terms of motivating physicians to ask about the smoking patterns of their patients and of training medical students and resident physicians to counsel their patients to stop smoking.

**Keywords:** Smoking – Attitudes – Physicians – Estonia – Finland.

Smoking surveys among physicians have proved useful in highlighting the importance of physicians as key agents in anti-smoking campaigns and smoking cessation (Bener et al. 1993; Lancaster et al. 2000; Samuels 1997). It has been reported that when a physician gives advice to quit smoking, the proportion of smokers who manage to give up smoking is increased (Kaetsu et al. 2002; McIlvain et al. 2002; Lancaster et al. 2000). The recent evidence indicates that even brief firm advice to stop smoking can lead to an increase in long-term cessation rates of about 1–2% (Liu & Tang 1998; McEwen & West 2001). However, it is also reported that whether or not a physician advises a patient to stop smoking depends on the smoking status of that particular physician (Kaetsu et al. 2002; Tessier et al. 1993b). There is a risk that the advice of smoking physicians is affected by their individual assessment of the health consequences of smoking, which might not be in accordance with the evidence. This might result in incorrect advice or no advice to patients (Willaing et al. 2003). In addition, there seems to be a relationship between the smoking behaviour of physicians and their medical knowledge and attitudes towards smoking (Kaetsu et al. 2002).

During the last decades the prevalence of smoking among physicians in most developed countries in Europe including Finland has decreased and is lower than among the general population (van Reek & Adriaanse 1991; Willaing et al. 2003). A recent study among Finnish physicians (1995) showed that the prevalence of current smoking (occasional and daily smoking) was 19% among males and 9% among females (Barengo et al. 2004). In 2002 the current smoking prevalence was 28% among the male and 20 % among the female population in Finland (Helakorpi et al. 2002).

At the same time, in countries with transitional economies smoking is often high among physicians, being on the same level as in the general population or even higher (Didilescu & Munteanu 2000; Rogovska 1996). Basic results of the current Estonian study are reported elsewhere (Pärna et al. 2005). Unfortunately, there is no regular or recent data existing on smoking prevalence among Estonian physicians because

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last surveys have been carried out in 1978 and 1982 with the prevalence of smoking among 42 %/41.5 % of the male and 20 %/15.2 % of the female physicians (Väärt et al. 1979; Rahu & Raudsepp 1986). In 2002 the current smoking prevalence was 52 % among the male and 23 % among the female population in Estonia (Kasmel et al. 2003).

The aim of this study was to compare smoking behaviour, attitudes and opinions towards smoking and smoking cessation among Estonian and Finnish physicians.

## Methods

*Subjects*

In Estonia, all physicians (n = 4 140) having a contract with the Management Board were drawn from the database of the Estonian Health Insurance Fund in 2002. In Finland, a systematic random sample (n = 3 000) was taken from the registry of the Finnish Medical Association (FMA) in 2001 by using the personal identity number. The sample was restricted to physicians who were living in Finland and were younger than 65 years. The FMA registry covers basic data from well over 95% of the Finnish physicians. The total number of eligible physicians was 14 854.

*Questionnaire*

A self-administered questionnaire originally developed by the WHO (1998) and modified according to the Estonian and Finnish health care system and their special needs was used in both countries. The questionnaire contained 38 questions about past and present smoking behaviour, attitudes and knowledge of tobacco use and smoking cessation, attitudes towards patients' smoking, and responsibilities of physicians concerning this matter.

Smoking status was determined by the questions: "Do you smoke now?" (no/yes, daily/yes, occasionally), "Have you ever smoked regularly for one year or more?" (yes/no). The respondents were classified as daily smokers, occasional smokers, past smokers, or never smokers.

*Procedure*

The questionnaire was mailed to the physicians. A reminder with a copy of the questionnaire was sent by mail to non-respondent study subjects 4–6 weeks after the initial questionnaire.

*Response*

In Estonia, the sample (n = 4 140) included some persons (n = 89) who were unavailable, retired, deceased, on maternity leave, or working abroad. Of 4 051 potential respondents, 1 253 did not answer and 52 refused. The overall response rate was 67.8% (n = 2 746) (57.2% among males and 70.5% among females). A comparison of the smoking behaviour of early and late respondents showed that the percentage of smokers among the males was about the same (26.0% and 27.2%) in both groups ($p > 0.05$). However, among female smoking physicians the percentage was slightly lower in the former than in the latter group (10.5% and 13.8%) ($p = 0.05$).

In Finland, the response rate was 69.8%. In the first round there were significantly fewer smoking male respondents (20.0%) compared to the second round (28.3%). The two rounds did not reveal any statistically significant differences among female smoking respondents in Finland (8.7% and 10.2%).

*Data analysis*

The data were analysed using the statistical package Stata 8.0. As gender was strongly associated with smoking, the results were analysed separately for males and females. The primary data analysis involved the determination of mean age and standard deviation (SD) of respondents, two-sample test to calculate p value, prevalence rates and the corresponding 95% confidence intervals (CI).

Logistic regression analysis was used to measure the association between the physicians' opinions, attitudes and smoking status by country. Prevalence odds ratios (POR) and the corresponding 95% CI were computed. For the logistic regression analysis smoking status was dichotomised to the current smokers (daily smokers and occasional smokers) and non-smokers (past smokers and never smokers). Multiple category outcome was used (smoker in Estonia; non-smoker in Estonia; smoker in Finland; non-smoker in Finland). Predictor variables about the opinions and attitudes of physicians were dichotomised. Age adjusted PORs were calculated separately for each predictor variable. Before modelling, subjects with missing values were excluded, so each model is based on the different number of subjects. Using the 10-point scale (10 = very harmful) the physicians assessed the harmfulness of smoking to health. Those who had chosen points 8–10 were considered as having agreed with the statement that smoking is very harmful to their health (vs. disagreed, 0–7). Multiple choice questions concerning reasons for not smoking themselves and reasons for not asking about the smoking of their patients were originally dichotomous (important vs. not important). The dichotomous variable (never vs. sometimes or more often) was derived by combining the information on asking the patients about their smoking (never; sometimes; every other patient; often; always). Physicians' attitudes to-

wards smoking cessation counselling (totally agree with the statement; agree; do not know; do not agree; totally do not agree) were dichotomously categorized (agree vs. disagree). Those who answered "I do not know" were dropped from the logistic regression analysis.

As the sample in Finland was restricted to physicians younger than 65 years, 196 over 64-year-old physicians of 2746 eligible Estonian doctors were excluded from the data analysis. Additionally, 70 respondents failed to answer the questions on smoking and were dropped from the analysis. The final sample of 2480 Estonian physicians included six female smokers who did not answer the question about smoking frequency and were excluded when calculating daily and occasional smoking prevalence.

Of 2094 eligible physicians in Finland, five respondents did not point out their gender and 10 failed to report their age. Additionally four did not answer the questions on smoking status and were excluded from the analysis. The final sample size in Finland was 2075.

## Results

Altogether 17% of respondents in Estonia and 45% in Finland were males. The mean age (SD) of the Estonian males was 45.2 (9.9), 45.6 (9.4) that of Finnish males. The mean age (SD) of the females was 46.2 (10.2) and 41.0 (8.7), respectively.

*Smoking prevalence*

Overall, in both countries current smoking prevalence was statistically significantly higher among male physicians than among female physicians. Further, the current smoking prevalence among Estonian physicians was higher than among Finnish physicians (26.3% vs. 21.6% among males and 11.2% vs. 8.9% among females, respectively).

Table 1 shows smoking prevalence among Estonian and Finnish physicians. Male daily smoking prevalence was higher in Estonia than in Finland (18.6% vs. 6.7%). The highest daily smoking prevalence rate among male physicians was in the age group 45–54 in Estonia (21.3%) and in the oldest age group (55–64) in Finland (12.6%). Male occasional smoking prevalence was significantly lower among Estonian physicians compared to the Finnish ones (7.7% vs. 14.9%). In both countries occasional smoking prevalence among males was the highest in the youngest (<35) age group. There were more male past smokers in Finland but more never smokers in Estonia. The percentage of male past smokers increased with age in both countries. The opposite trend was observed among the male never smokers in Finland, but not in Estonia.

Female daily smoking prevalence was higher among Estonian than Finnish physicians (6.6% vs. 3.6%). The daily smoking prevalence rate of female physicians in Estonia was the highest in the age group 35–44 (7.4%) but in Finland in the oldest age group (4.9%). Female occasional smoking prevalence was lower among Estonian physicians compared to the Finnish ones (4.4% vs. 5.3%). In addition, nearly twice as many Finnish female physicians as Estonian ones were classified as past smokers (33.6% vs. 17.2%). In both countries, the proportion of former smokers gradually increased with age among females. The prevalence of female never smokers was higher in Estonian physicians than in Finnish physicians (71.8% vs. 57.4%). Among never smokers, no specific age pattern was observed in both countries.

Among current Finnish smokers 41.0% of male and 55.0% of female doctors claimed to have made at least one attempt to stop smoking. Among Estonian male and female physicians this prevalence was higher (72.0% and 68.4%), POR = 3.86 (95% CI: 2.28–6.54) and POR = 1.87 (95% CI: 1.08–3.23), respectively.

*Harmfulness of smoking*

Compared to Estonia, Finnish physicians more often agreed that smoking is very harmful to their health (Tab. 2). In both countries the own smoking of the physicians downplayed the health hazard of smoking. Estonian physicians did not seem to be fully aware of the harmfulness of smoking compared to Finnish ones.

*Motivation to stop smoking*

In both countries the protection of own health was the prime reason for not smoking (Tab. 3) for both smokers and non-smokers. Avoidance of unpleasant symptoms, setting an example, unpleasantness for those around them, and the opinion of friends or family members were rated as the next most important reasons for not smoking. Pressure from colleagues and saving money were less important in motivating not to smoke.

Avoidance of unpleasant symptoms was less prominent among Finnish smokers than in other categories. No difference was found in setting a good example as a reason for not smoking among male physicians by country and smoking status. The importance of a positive role model among female physicians was associated with non-smoking. A comparison of non-smoking females in both countries revealed that more Finnish physicians supported the importance of setting a good example. Unpleasantness for those around physicians and the

**Table 1** Smoking prevalence among Estonian (2002) and Finnish (2001) physicians, by age and gender (N, %, 95% CI [a])

| | Age group, years | | | | |
|---|---|---|---|---|---|
| | –34 | 35–44 | 45–54 | 55–64 | Total |
| | | | Estonian male | | |
| No of physicians | 61 | 150 | 122 | 81 | 414 |
| Daily smoker | 18.0 ( 9.4–30.0) | 17.3 (11.6–24.4) | 21.3 (14.4–29.6) | 17.3 ( 9.8–27.3) | 18.6 (15.0–22.7) |
| Occasional smoker | 13.1 ( 5.8–24.2) | 6.7 ( 3.2–11.9) | 7.4 ( 3.4–13.5) | 6.2 ( 2.0–13.8) | 7.7 ( 5.3–10.7) |
| Past smoker | 19.7 (10.6–31.8) | 33.3 (25.9–41.5) | 34.4 (26.1–43.6) | 34.6 (24.3–46.0) | 31.9 (27.4–36.6) |
| Never smoker | 49.2 (36.1–62.3) | 42.7 (34.6–51.0) | 36.9 (28.3–46.1) | 42.0 (31.1–53.5) | 41.8 (37.0–46.7) |
| | | | Finnish male | | |
| No of physicians | 147 | 253 | 346 | 199 | 945 |
| Daily smoker | 4.8 ( 1.9– 9.6) | 4.3 ( 2.2– 7.6) | 5.8 ( 3.6– 8.8) | 12.6 ( 8.3–18.0) | 6.7 ( 5.2– 8.4) |
| Occasional smoker | 23.8 (17.2–31.5) | 20.2 (15.4–25.6) | 11.3 ( 8.1–15.1) | 8.0 ( 4.7–12.7) | 14.9 (12.7–17.4) |
| Past smoker | 26.5 (19.6–34.4) | 33.6 (27.8–39.8) | 46.5 (41.2–51.9) | 50.3 (43.1–57.4) | 40.7 (37.6–44.0) |
| Never smoker | 44.9 (36.7–53.3) | 41.9 (35.7–48.2) | 36.4 (31.3–41.7) | 29.1 (22.9–36.0) | 37.7 (34.6–40.8) |
| | | | Estonian female | | |
| No of physicians | 306 | 638 | 622 | 494 | 2 060 |
| Daily smoker | 5.2 ( 3.0– 8.4) | 7.4 ( 5.5– 9.7) | 6.8 ( 4.9– 9.0) | 6.1 ( 4.1– 8.6) | 6.6 ( 5.5– 7.7) |
| Occasional smoker | 4.6 ( 2.5– 7.6) | 5.2 ( 3.6– 7.2) | 4.3 ( 2.9– 6.3) | 3.2 ( 1.9– 5.2) | 4.4 ( 3.5– 5.3) |
| Past smoker | 12.4 ( 8.9–16.6) | 16.5 (13.7–19.6) | 19.0 (16.0–22.3) | 19.0 (15.7–22.8) | 17.2 (15.6–18.9) |
| Never smoker | 77.8 (72.7–82.3) | 71.0 (67.3–74.5) | 69.9 (66.2–73.5) | 71.7 (67.5–75.6) | 71.8 (69.8–73.8) |
| | | | Finnish female | | |
| No of physicians | 308 | 431 | 309 | 82 | 1 130 |
| Daily smoker | 4.5 ( 2.5– 7.5) | 2.6 ( 1.3– 4.5) | 3.9 ( 2.0– 6.7) | 4.9 ( 1.3–12.0) | 3.6 ( 2.6– 4.9) |
| Occasional smoker | 5.8 ( 3.5– 9.1) | 5.3 ( 3.4– 7.9) | 5.8 ( 3.5– 9.1) | 1.2 ( 0.0– 6.6) | 5.3 ( 4.1– 6.8) |
| Past smoker | 31.2 (26.0–36.7) | 31.8 (27.4–36.4) | 36.6 (31.2–42.2) | 41.5 (30.7–52.9) | 33.6 (30.9–36.5) |
| Never smoker | 58.4 (52.7–64.0) | 60.3 (55.5–65.0) | 53.7 (48.0–59.4) | 52.4 (41.1–63.6) | 57.4 (54.5–60.3) |

[a] CI = confidence interval

**Table 2** Agreement (compared to disagreement) with the statement that smoking is very harmful to the health among Estonian (2002) and Finnish (2001) physicians, by smoking status, country and gender

| | Male | | | Female | | |
|---|---|---|---|---|---|---|
| | Agree | | Age adjusted POR [a] (95 % CI [b]) | Agree | | Age adjusted POR (95 % CI) |
| | N | % | | N | % | |
| Smokers in Estonia | 46 | 43.4 | 1 | 96 | 42.5 | 1 |
| Non-smokers in Estonia | 217 | 71.9 | 3.42 ( 2.16– 5.44) | 1380 | 76.0 | 4.29 ( 3.23– 5.71) |
| Smokers in Finland | 178 | 87.3 | 9.17 ( 5.20–16.15) | 92 | 91.1 | 13.38 ( 6.42–27.92) |
| Non-smokers in Finland | 684 | 94.0 | 21.20 (12.91–34.81) | 977 | 96.5 | 36.90 (24.01–56.70) |

[a] POR = prevalence odds ratio
[b] CI = confidence interval

opinion of friends or family members was less important for female smokers in Finland. Pressure from colleagues was less important for Finnish physicians compared to the Estonian ones despite their smoking. Saving money was less prominent among Finnish male smokers but more important among female non-smokers in both countries.

**Table 3** Importance (compared to unimportance) of the following reasons for not smoking among Estonian (2002) and Finnish (2001) physicians, by smoking status, country and gender

| | Male | | | Female | | |
|---|---|---|---|---|---|---|
| | Important | | Age adjusted POR [a] (95 % CI [b]) | Important | | Age adjusted POR (95 % CI) |
| | N | % | | N | % | |
| Protection of my health | | | | | | |
| smokers in Estonia | 78 | 96.3 | 1 | 159 | 97.0 | 1 |
| non-smokers in Estonia | 274 | 93.2 | 0.50 (0.14–1.74) | 1 718 | 96.2 | 0.84 (0.33–2.13) |
| smokers in Finland | 193 | 96.0 | 0.89 (0.23–3.45) | 97 | 98.0 | 1.38 (0.26–7.31) |
| non-smokers in Finland | 688 | 96.4 | 1.06 (0.31–3.60) | 976 | 98.1 | 1.49 (0.55–4.05) |
| Avoidance of unpleasant symptoms | | | | | | |
| smokers in Estonia | 58 | 79.5 | 1 | 133 | 86.4 | 1 |
| non-smokers in Estonia | 256 | 87.4 | 1.75 (0.90–3.41) | 1 517 | 90.6 | 1.56 (0.96–2.55) |
| smokers in Finland | 125 | 63.1 | 0.44 (0.23–0.83) | 72 | 73.5 | 0.43 (0.23–0.83) |
| non-smokers in Finland | 572 | 82.4 | 1.21 (0.67–2.22) | 859 | 89.5 | 1.34 (0.81–2.22) |
| Setting a good example | | | | | | |
| smokers in Estonia | 47 | 64.4 | 1 | 87 | 58.8 | 1 |
| non-smokers in Estonia | 189 | 65.6 | 1.06 (0.62–1.82) | 1 154 | 69.2 | 1.63 (1.16–2.31) |
| smokers in Finland | 129 | 66.2 | 1.10 (0.63–1.94) | 69 | 70.4 | 1.70 (0.99–2.94) |
| non-smokers in Finland | 512 | 74.0 | 1.59 (0.96–2.65) | 785 | 82.0 | 3.24 (2.24–4.69) |
| Unpleasantness for those around me | | | | | | |
| smokers in Estonia | 50 | 68.5 | 1 | 116 | 74.8 | 1 |
| non-smokers in Estonia | 200 | 69.4 | 1.04 (0.60–1.82) | 1 206 | 72.2 | 0.86 (0.59–1.26) |
| smokers in Finland | 116 | 58.9 | 0.65 (0.37–1.16) | 54 | 55.7 | 0.44 (0.26–0.75) |
| non-smokers in Finland | 454 | 66.2 | 0.90 (0.54–1.52) | 706 | 74.9 | 1.03 (0.70–1.53) |
| Opinion of friends or family members | | | | | | |
| smokers in Estonia | 53 | 71.6 | 1 | 112 | 74.2 | 1 |
| non-smokers in Estonia | 200 | 70.2 | 0.93 (0.53–1.65) | 1 264 | 75.6 | 1.11 (0.76–1.63) |
| smokers in Finland | 120 | 60.9 | 0.62 (0.35–1.11) | 58 | 59.2 | 0.50 (0.29–0.86) |
| non-smokers in Finland | 432 | 62.7 | 0.69 (0.40–1.17) | 628 | 67.5 | 0.71 (0.48–1.05) |
| Pressure from colleagues | | | | | | |
| smokers in Estonia | 18 | 25.0 | 1 | 42 | 27.8 | 1 |
| non-smokers in Estonia | 47 | 16.6 | 0.60 (0.32–1.12) | 369 | 22.5 | 0.75 (0.52–1.09) |
| smokers in Finland | 7 | 3.6 | 0.11 (0.04–0.28) | 15 | 15.6 | 0.49 (0.25–0.95) |
| non-smokers in Finland | 47 | 7.0 | 0.22 (0.12–0.41) | 66 | 7.2 | 0.21 (0.13–0.32) |
| Saving money | | | | | | |
| smokers in Estonia | 35 | 47.9 | 1 | 60 | 39.5 | 1 |
| non-smokers in Estonia | 126 | 44.1 | 0.85 (0.51–1.43) | 1 009 | 60.4 | 2.34 (1.67–3.29) |
| smokers in Finland | 52 | 26.7 | 0.39 (0.22–0.68) | 40 | 40.4 | 1.04 (0.62–1.75) |
| non-smokers in Finland | 359 | 52.1 | 1.23 (0.76–2.00) | 604 | 64.0 | 2.74 (1.92–3.89) |

[a] POR = prevalence odds ratio
[b] CI = confidence interval

*Asking about the smoking of one's patients*

Estonian and Finnish male physicians did not reveal any differences in asking their patients during the previous week whether they had smoked (Tab. 4). Among female physicians, significantly more Estonian non-smokers and Finnish physicians tried to assess the smoking status of their patients compared to Estonian smokers.

Compared to Estonian smoking physicians, lack of time as a

**Table 4** Asking during the previous week about smoking of their patients (compared to never asking) among Estonian (2002) and Finnish (2001) physicians, by smoking status, country and gender

| | Male | | | Female | | |
|---|---|---|---|---|---|---|
| | Yes | | Age adjusted POR[a] (95 % CI[b]) | Yes | | Age adjusted POR (95 % CI) |
| | N | % | | N | % | |
| Smokers in Estonia | 81 | 81.0 | 1 | 141 | 69.1 | 1 |
| Non-smokers in Estonia | 260 | 86.1 | 1.44 (0.80–2.63) | 1550 | 85.4 | 2.59 (1.87–3.60) |
| Smokers in Finland | 142 | 78.9 | 0.89 (0.48–1.64) | 70 | 80.5 | 2.02 (1.09–3.74) |
| Non-smokers in Finland | 577 | 86.5 | 1.50 (0.87–2.60) | 780 | 86.9 | 3.26 (2.27–4.67) |

[a] POR = prevalence odds ratio
[b] CI = confidence interval

**Table 5** Agreement with different reasons for not asking about patients' smoking (compared to disagreement) among Estonian (2002) and Finnish (2001) physicians, by own smoking status, country and gender

| | Male | | | Female | | |
|---|---|---|---|---|---|---|
| | Agree | | Age adjusted POR[a] (95 % CI[b]) | Agree | | Age adjusted POR (95 % CI) |
| | N | % | | N | % | |
| Lack of time | | | | | | |
| smokers in Estonia | 21 | 22.3 | 1 | 54 | 30.3 | 1 |
| non-smokers in Estonia | 106 | 37.9 | 2.14 (1.24– 3.70) | 681 | 40.4 | 1.65 (1.18–2.31) |
| smokers in Finland | 78 | 45.1 | 2.78 (1.56– 4.96) | 50 | 59.5 | 3.05 (1.77–5.26) |
| non-smokers in Finland | 368 | 62.1 | 6.03 (3.59–10.14) | 575 | 64.5 | 3.86 (2.72–5.48) |
| Lack of habit | | | | | | |
| smokers in Estonia | 26 | 27.7 | 1 | 52 | 29.2 | 1 |
| non-smokers in Estonia | 77 | 27.5 | 0.99 (0.59–1.67) | 404 | 24.0 | 0.77 (0.55–1.09) |
| smokers in Finland | 18 | 10.4 | 0.30 (0.16–0.59) | 10 | 11.9 | 0.31 (0.15–0.65) |
| non-smokers in Finland | 59 | 9.9 | 0.29 (0.17–0.49) | 56 | 6.3 | 0.15 (0.10–0.23) |
| Wish not to disturb the privacy of a patient | | | | | | |
| smokers in Estonia | 26 | 27.7 | 1 | 52 | 29.2 | 1 |
| non-smokers in Estonia | 47 | 16.8 | 0.54 (0.31–0.94) | 290 | 17.2 | 0.50 (0.35–0.71) |
| smokers in Finland | 39 | 22.5 | 0.79 (0.44–1.42) | 15 | 17.9 | 0.51 (0.27–0.97) |
| non-smokers in Finland | 107 | 18.0 | 0.55 (0.33–0.91) | 108 | 12.1 | 0.33 (0.22–0.48) |
| It is not important because a physician can not influence a patient | | | | | | |
| smokers in Estonia | 17 | 18.1 | 1 | 15 | 8.4 | 1 |
| non-smokers in Estonia | 41 | 14.6 | 0.77 (0.41–1.43) | 158 | 9.4 | 1.08 (0.62–1.89) |
| smokers in Finland | 15 | 8.7 | 0.43 (0.20–0.90) | 6 | 7.1 | 0.90 (0.33–2.41) |
| non-smokers in Finland | 43 | 7.3 | 0.35 (0.19–0.65) | 29 | 3.3 | 0.39 (0.20–0.74) |

[a] POR = prevalence odds ratio
[b] CI = confidence interval

reason for not asking about the smoking of one's patients was more prominent among non-smokers in Estonia and physicians in Finland (Tab. 5). The comparison of non-smokers in two countries revealed that this opinion had more supporters in Finland. Compared to Finnish physicians, lack of habit as a reason for not asking about the smoking of their patients was more prominent among Estonian physicians. In both countries smoking among physicians was associated with the wish not to disturb the privacy of a patient as the reason for not asking about the smoking of their patients. More Estonian male physicians than Finnish colleagues were sure that it is not important to ask this question because a physician has no

**Table 6** Agreement with statements related to smoking counselling (compared to disagreement), among Estonian (2002) and Finnish (2001) physicians, by smoking status, country and gender

| | Male | | | Female | | |
|---|---|---|---|---|---|---|
| | Agree | | Age adjusted POR [a] (95 % CI [b]) | Agree | | Age adjusted POR (95 % CI) |
| | N | % | | N | % | |
| It is the doctors' responsibility to try to convince people to stop smoking | | | | | | |
| smokers in Estonia | 45 | 55.6 | 1 | 88 | 61.1 | 1 |
| non-smokers in Estonia | 159 | 69.4 | 1.84 (1.09– 3.13) | 892 | 70.7 | 1.52 (1.06– 2.18) |
| smokers in Finland | 146 | 83.4 | 4.40 (2.41– 8.03) | 74 | 85.1 | 4.19 (2.11– 8.29) |
| non-smokers in Finland | 608 | 92.0 | 9.12 (5.39–15.43) | 877 | 93.9 | 11.20 (7.24–17.31) |
| My present knowledge are sufficient to enable me to advise a patient who wishes to stop smoking | | | | | | |
| smokers in Estonia | 56 | 81.2 | 1 | 95 | 73.1 | 1 |
| non-smokers in Estonia | 176 | 81.9 | 1.03 (0.51–2.08) | 856 | 74.2 | 1.01 (0.67–1.53) |
| smokers in Finland | 141 | 84.4 | 1.31 (0.62–2.73) | 73 | 81.1 | 1.82 (0.94–3.52) |
| non-smokers in Finland | 463 | 81.7 | 1.02 (0.54–1.94) | 583 | 74.4 | 1.22 (0.80–1.86) |
| Smoking prevention should form part of the normal training of health professionals | | | | | | |
| smokers in Estonia | 54 | 67.5 | 1 | 133 | 82.6 | 1 |
| non-smokers in Estonia | 216 | 84.7 | 2.71 (1.52– 4.85) | 1 396 | 90.5 | 2.01 ( 1.29– 3.13) |
| smokers in Finland | 161 | 88.5 | 3.71 (1.93– 7.14) | 93 | 97.9 | 10.11 (2.34–43.60) |
| non-smokers in Finland | 668 | 96.3 | 12.24 (6.64–22.57) | 962 | 98.2 | 11.52 (6.18–21.48) |
| Health professionals should receive special training on how to help patients who wish to stop smoking | | | | | | |
| smokers in Estonia | 62 | 78.5 | 1 | 137 | 87.3 | 1 |
| non-smokers in Estonia | 208 | 85.6 | 1.69 (0.88–3.24) | 1 478 | 94.1 | 2.34 (1.39–3.91) |
| smokers in Finland | 158 | 93.5 | 4.07 (1.80–9.21) | 87 | 100.0 | 4.71 (2.56–8.66) |
| non-smokers in Finland | 618 | 92.9 | 3.63 (1.96–6.71) | 912 | 97.1 | 0.78 (0.46–1.33) |

[a] POR = prevalence odds ratio
[b] CI = confidence interval

influence over their patients' smoking. Among female physicians only non-smokers in Finland less likely agree with this statement.

*Attitudes towards smoking cessation counselling*

Table 6 shows agreement with four statements related to smoking cessation counselling. Almost all Finnish physicians (less so in Estonia) agreed that it is the doctor's responsibility to try to convince people to stop smoking. Comparing non-smokers between the two countries, non-smoking increased agreement with the above-mentioned statement.

In both countries, the majority of physicians felt their knowledge was sufficient to counsel patients to quit. No statistically significant relationship was found between smoking status and opinion about the sufficiency of knowledge to advise the patient to stop smoking in both countries.

Agreement with the statement that smoking prevention should be part of the normal training of health professionals was strongly correlated with smoking status among physicians in Estonia and male colleagues in Finland. Compared to Estonia, agreement with this statement was more prevalent among Finnish physicians. Finnish non-smokers agreed much more with this statement than Estonian non-smokers.

Compared to Estonian males, Finnish males agreed much more with the necessity to receive special training on how to help patients who wish to stop smoking. Among females, agreement among Estonian non-smokers and Finnish smokers was stronger than in Estonian smokers.

## Discussion

The study focused on the comparison of the prevalence of smoking among Estonian and Finnish physicians and of their attitudes and opinions towards smoking.

The key to comparative research is that data sets should be as similar as possible. This study utilized two sets of data, collected one year apart, using the same methodology, measures, and analyses. However, the average age of female physicians differed in two samples, being higher among Estonians. Al-

though the proportion of males and females was different in the Estonian and Finnish samples, it was proportional to the gender distribution of physicians in both countries.

One shortcoming of this study may be related to the fact that this study relies on self-report. Thus, one cannot rule out the bias of self-presentation. Another factor may be related to the response rate 67.8% in Estonia and 69.8% in Finland. Nevertheless, there is a possibility that initial respondents and initial non-respondents are different from persistent non-respondents. If true, smokers might be over-represented among persistent non-respondents since they might be less likely to fill in a questionnaire about smoking. Thus any non-response bias would likely make the estimate of smoking prevalence an underestimate. In this context it is important to recognize that among Estonian males who are more likely to smoke than females, the response rate was only 57.2%. Furthermore, the smoking prevalence was expected to be higher among Finnish male physicians than found in this study because the percentage of male smokers who responded to the reminder sent to the initial non-respondents was significantly higher in the second round. There was no difference in the prevalence of smoking in the first sample and the subsample among males in Estonia and among females in both countries.

Despite these shortcomings, this study provides valuable information about smoking among physicians in two countries. The prevalence of smoking was higher in male than female physicians in Estonia and Finland. Compared to the Finnish physicians, more male and female doctors smoked in Estonia. In particular, there were more daily smokers in Estonia compared to Finland. As expected, it seems that the countries are going through different stages in their "smoking patterns" (Tessier et al. 1993a). Finland has for many years been subject to intensive anti-smoking campaigns by governmental and non-governmental organizations. In Estonia anti-smoking campaigns are a relatively recent phenomenon and have so far had little governmental support. As these countries are going through differing stages in anti-smoking campaigns, physicians reveal differences in smoking prevalence.

Compared to the general population, significantly fewer physicians smoked in both countries. On the one hand, the prevalence of smoking in Estonia is much lower than in some other countries with transitional economies and is comparable with the "mature" smoking epidemic in western countries, where smoking among physicians has fallen below that of the general population (Didilescu & Munteanu 2000; Rogovska 1996). On the other hand, smoking prevalence in Estonia is higher than in western countries, and there is a long and difficult way to go to decrease smoking prevalence among physicians similar in Finland, where physicians smoke even less than their colleagues in other European countries (Aaslan & Nylenna 1997; Nardini et al. 1998; Tessier et al. 1993b; Willaing et al. 2003).

Though most physicians in Finland appreciated that smoking was very harmful to their health, it is regrettable that many Estonian physicians, especially smoking ones, ignore this opinion. This striking difference in opinions between two countries might be partly attributed to the less advanced climate of medical and public opinion about tobacco in Estonia.

The findings that protection of one's own health is the prime reason for not smoking and that physicians' smoking particularly affects their beliefs about their responsibility to serve as a positive role model are in line with earlier studies (Tessier et al. 1993a; 1993b). The study shows that Finnish female physicians seem more conscious of the importance of their exemplary role than Estonians. This may have something to do with a widespread fear in Estonia to "moralize", to judge, and to influence other people's behaviour.

The overall effect of any preventive measure is its effectiveness in individual cases and the frequency with which it is used in the whole population (Eckert & Junker 2001). Unfortunately, not all physicians asked about the smoking of their patients in this study. Lack of habit as the main reason for not asking about patients' smoking in Estonia could be explained by relatively recent anti-smoking campaigns in the country, which takes time to affect practices and beliefs. At the same time, lack of time was the main reason for not asking about patients' smoking in Finland. Furthermore, a high proportion of Estonian physicians, who did not believe that they could influence a patient and did not yet appreciate their responsibility to counsel smoking patients to quit, may be partly due to the fact that doctors concern themselves primarily with treating their patients rather than protecting them from future diseases. Another factor is lack of confidence in their skills as counsellors. The results of the present study confirm that almost all physicians in both countries appreciated the need to receive training on smoking prevention and cessation counselling. Furthermore, attitudes towards smoking cessation counselling and the necessity to receive training on how to help patients who wish to stop smoking are more favourable in Finland. It seems that those living in transition societies like in Estonia are considered less health-conscious because there have been too many other basic problems, because of the lack of credible health promotion and the long-time atmosphere of a low priority for health. In both countries, smoking physicians appreciated less their responsibility to counsel smoking patients and the need to receive training in this field. Thus, the smoking of physicians is a barrier for qualified participation in smoking-related prevention services that correspond to earlier studies (Kawakami et al. 1997; Willaing et al. 2003).

The life-extending effect of successful smoking cessation ultimately concerns every smoking patient in medical practice (Eckert & Junker 2001). Physicians should ask all their patients whether they smoke, how much they smoke, and whether they are willing to quit. As a subsequent step one should explain to every smoking patient why and to what extent smoking cessation would, for medical reasons, favourably change their future health. This short talk hardly takes more than two minutes (Eckert & Junker 2001). More detailed cessation counselling is required only if the patient is ready to stop (Prochaska et al. 1997; Velicer et al. 1992). Motivating smokers who do not desire to quit appears to be more complicated and calls for special counselling techniques (Eckert & Junker 2001). Physicians should have an ethical obligation to educate their patients about smoking and should not hesitate to routinely advise to quit (Liu & Tang 1998).

In summary, stronger societal pressure of the national health policy as well as enforcement of the tobacco law, enacted in 2001 in Estonia, will support decrease of the prevalence of smoking and change climate of the opinions among Estonian physicians. At the same time reduction in the prevalence of smoking among physicians significantly influences the willingness of society to recognize the health consequences of smoking and perhaps will lead to a decline in the smoking epidemic in the country. Non-smoking physicians are part of that support and have a powerful influence towards the aim of a smoke free health facilities. Taking into account the interface with the public at large, physicians should play a more important and active role in reducing smoking prevalence than they do at present. The attitudes and opinions of physicians towards smoking and smoking cessation counselling in this survey remain a challenge to medical educators, especially in Estonia and to some extent in Finland as well.

In Estonia, medical education needs to be improved in terms of motivating physicians to ask about the smoking of their patients and of training medical students and resident physicians to counsel their smoking patients to stop smoking. International collaboration is of great importance for this development.

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**Zusammenfassung**

**Vergleich der Kenntnisse, Einstellungen und des eigenen Verhaltens bezüglich des Rauchens zwischen der estnischen und der finnischen Ärzteschaft**

**Fragestellung:** Es werden die Unterschiede in den Rauchgewohnheiten, in der Einstellung und den Ansichten über das Rauchen und die Raucherentwöhnung zwischen estnischen und finnischen Ärzten untersucht.

**Methoden:** Eine Querschnittsstudie mit selbstauszufüllendem Fragebogen wurde bei 2480 estnischen und 2075 finnischen Ärzten durchgeführt.

**Resultate:** Die tägliche Rauchprävalenz war sowohl bei den Ärzten (18,6%) als auch bei den Ärztinnen (6,6%) in Estland höher als bei ihren finnischen Kollegen (6,7%) und Kolleginnen (3,6%). Verglichen mit Estland, waren Ärzte in Finnland öfters der Meinung, dass Rauchen sehr schädlich für ihre Gesundheit ist, dass sie dafür verantwortlich sind, ihre Patienten davon zu überzeugen, dass es wichtig ist, aufzuhören zu rauchen, und dass Tabakprävention ein Teil der normalen und speziellen Ausbildung von Gesundheitsfachleuten sein sollte. In beiden Ländern hatten nichtrauchende Ärzte gegenüber dem Rauchen eine stärker ausgeprägte negative Haltung als die rauchenden.

**Schlussfolgerung:** Dem Rauchverhalten der Ärzteschaft selbst kommt wegen deren Vorbildfunktion gegenüber den Patienten eine Schlüsselrolle bei der Erreichung von rauchfreien Gesundheitseinrichtungen zu. Diese Resultate zeigen, dass die medizinische Ausbildung vor allem in Estland betreffend Rauchen noch ein Verbesserungspotential hat. Estland muss die medizinische Ausbildung so verbessern, dass Ärzte mehr motiviert sind, mit ihren Patienten über das Rauchen zu sprechen. Zudem sollten Studierende der medizinischen Fächer aber auch bereits praktizierende Ärzte dahingehend geschult werden, dass sie ihre Patienten stärker zur Raucherentwöhnung motivieren können.

**Résumé**

**Connaissances, attitudes et comportements des médecins estoniens et finlandais envers le tabagisme**

**Objectifs:** Comparer les habitudes de consommation de tabac, les attitudes et les opinions concernant le tabagisme et la cessation tabagique parmi les médecins estoniens et finlandais.

**Méthodes:** Enquête par questionnaire auto administré, auprès de 2480 médecins estoniens et de 2075 médecins finlandais.

**Résultats:** La prévalence du tabagisme était plus élevée parmi les médecins estoniens que parmi leurs collègues finlandais, tant pour les hommes (18,6% et 6,7%) que pour les femmes (6,6% et 3,6%). Les médecins en Finlande ont accepté plus souvent qu'en Estonie l'idée que le tabagisme est très nuisible pour leur santé, qu'il est de leur responsabilité de convaincre les gens de cesser de fumer et que la prévention du tabagisme devrait être un sujet normalement abordé dans la formation des professionnels de la santé. Dans les deux pays, les médecins non-fumeurs avaient une attitude plus défavorable envers le tabagisme que les médecins fumeurs.

**Conclusion:** L'attitude des médecins concernant le tabagisme et la cessation tabagique est importante car ils servent de modèles pour leurs patients et ils jouent un rôle-clé pour assurer que le système de santé offre un environnement sans tabac. L'Estonie surtout a besoin d'améliorer la formation des médecins pour inciter ces derniers à interroger leurs patients sur leurs habitudes tabagiques et pour enseigner aux étudiants et aux internes comment informer leurs patients sur les programmes de cessation tabagique.

**References**

*Aaslan OG, Nylenna M* (1997). Physicians who smoke: a survey of smoking habits and life style of Norwegian physicians. Tidsskrift for Den Norske Laegeforening *117*: 332–7.

*Barengo NC, Sandström PH, Jormanainen, VJ, Myllykangas MT* (2004). Changes in smoking prevalence among Finnish physicians 1990–2001. Eur J Public Health *14*: 201–3.

*Bener A, Gomes J, Anderson JA* (1993). Smoking habits among physicians in two Gulf countries. J R Soc Health *113*: 298–301.

*Didilescu C, Munteanu I* (2000). The prevalence of smoking in physicians in Romania. Pneumologia *49*: 91–4.

*Eckert T, Junker C* (2001). Motivation for smoking cessation: what role do doctors play? Swiss Med Wkly *131*: 521–6.

*Helakorpi S, Patja K, Prättälä R, Aro AR, Uutela A* (2002). Suomalaisen aikuisväestön terveyskäyttäytyminen ja terveys, kevät 2002 [Health behaviour among Finnish adult population, spring 2002]. Helsinki: National Public Health Institute publication B12.

*Kaetsu A, Fukushima T, Moriyama M, Shigematsu T* (2002). Smoking behaviour and related lifestyle variables among physicians in Fukuoka, Japan: a cross sectional study. J Epidemiol *12*: 199–207.

*Kasmel A, Lipand A, Markina A* (2003). Eesti täiskasvanud elanikkonna tervisekäitumise uuring, kevad 2002 [Health behaviour among Estonian adult population, spring 2002]. Tallinn: Eesti Tervisekasvatuse Keskus.

*Kawakami M, Nakamura S, Fumimoto H, Takizawa J, Baba M* (1997). Relation between smoking status of physicians and their enthusiasm to offer smoking cessation advice. Intern Med *36*: 162–5.

*Lancaster T, Stead L, Silagy C, Sowden A* (2000). Effectiveness of interventions to help people stop smoking: findings from the Cochrane Library. BMJ *321*: 355–8.

*Liu JL, Tang J-L* (1998). Doctors are ethically obliged to advise patients to quit smoking. BMJ *317*: 1588.

*McEwen A, West R* (2001). Smoking cessation activities by general practitioners and practice nurses. Tob Control *10*: 27–32.

*McIlvain HE, Backer EL, Crabtree BF, Lacy N* (2002). Physician attitudes and the use of office-based activities for tobacco control. Fam Med *34*: 114–9.

*Nardini S, Bertoletti R, Rastelli V, Donner CF* (1998). The influence of personal tobacco smoking on the clinical practice of Italian chest physicians. Eur Respir J *12*: 1450–3.

*Pärna K, Rahu K, Rahu M* (2005). Smoking habits and attitudes towards smoking among Estonian physicians. Public Health (in press).

*Prochaska JO, Redding CA, Evers KE* (1997). The transtheoretical model and stages of change. In: Glanz K, Lewis FM, Rimer BK, eds. Health behaviour and health education: theory, research, and practice. 2nd ed. San Francisco: Jossey-Bass: 60–84.

*Rahu M, Raudsepp J* (1986). Teine Eesti NSV arstkonna suitsetamislevimuse ankeetküsitlus 1982. aastal [Prevalence study of smoking among Estonian physicians in 1982]. Nõukogude Eesti Tervishoid *65*: 258–61.

*Rogovska I* (1996). Smoking behaviour of medical personnel and students and health consequences of smoking in Latvia: a survey of smoking habits among medical personnel and students and prediction of future smoking related mortality in Latvia (doctoral dissertation). Tampere: University of Tampere.

*Samuels N* (1997). Smoking among hospital doctors in Israel and their attitudes regarding anti-smoking legislation. Public Health *111*: 285–8.

*Tessier J-F, Freour P, Nejjari C, Belougne D, Crofton JW* (1993a). Smoking behaviour and attitudes towards smoking of medical students in Australia, Japan, USA, Russia, and Estonia. Tob Control *2*: 24–9.

*Tessier J-F, Rene L, Nejjari C, Belougne D, Moulin J, Freour P* (1993b). Attitudes and opinions of French general practioners towards tobacco. Tob Control *2*: 226–30.

*Van Reek J, Adriaanse H* (1991). Smoking by physicians in Scandinavia: 1952–1989. Scand J Soc Med *19*: 256–9.

*Velicer WF, Prochaska JO, Rossi JS, Snow MG* (1992). Assessing outcome in smoking cessation studies. Psychol Bull *111*: 23–41.

*Väärt E, Vahtra M, Rahu M, Raudsepp J* (1979). Eesti arstkonna suitsetamishõlmavuse ankeetküsitlus [Prevalence study of smoking among Estonian physicians]. Nõukogude Eesti Tervishoid *58*: 279–81.

WHO (1998). Guidelines for controlling and monitoring the tobacco epidemic. Geneva: WHO.

*Willaing I, Jorgensen T, Iversen L* (2003). How does individual smoking behaviour among hospital staff influence their knowledge of the health consequences of smoking? Scand J Public Health *31*: 149–55.

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