

Original Investigation

Perceptions of the Relative Harmfulness of Snus Among Norwegian General Practitioners and Their Effect on the Tendency to Recommend Snus in Smoking Cessation

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Abstract

Introduction: Research suggests that health risks associated with the use of Swedish moist snuff (snus) are considerably smaller than health risks associated with cigarette smoking. However, erroneous ideas of approximately equal harm from snus and cigarettes are common in the general population. General practitioners (GPs) have a crucial role in giving information about health and risk to patients, and the objective of this study was to measure their perceptions of the relative harmfulness of cigarettes and snus and how these perceptions related to their tendency to recommend snus as a smoking cessation aid.

Methods: Approximately 900 GPs completed a questionnaire in 2008 (response rate about 45%). Perceived relative risk was measured by the question: "In terms of health risks, how do you think daily use of snus compares to daily use of cigarettes?" Answer categories ranged from "snus is much more harmful" to "snus is much less harmful."

Results: Only 36% of the GPs believed that snus was much less harmful than cigarettes. More than 15% believed that snus was equally or more harmful than cigarettes. GPs who rated snus as much less harmful more often recommended snus as an aid in smoking cessation.

Conclusions: Almost two thirds of the GPs had beliefs about the relative risk of snus and cigarettes that were at odds with scientific consensus. The associated limitations in disseminated information about snus as a possible quitting aid can be understood as an unexploited intervention potential.

Introduction

Tobacco control policies have been one of the most successful public health intervention stories in the developed world over

the last 50 years. Few will doubt their vast importance for reducing smoking prevalences to about a third of their peak levels of up to 70% in the 1950s. However, as commented by several scientists in the tobacco field (e.g., [Augustson & Marcus, 2004](#); [Emery, Gilpin, Ake, Farkas, & Pierce, 2000](#), [Warner & Burns, 2003](#)), in many cultures, the remaining smokers now differ in crucial respects from traditional smokers. According to these researchers, large proportions of the remaining smokers can be described as "inveterate" or hard-core smokers. Characterized by a stronger commitment to their smoking identity and a higher degree of nicotine dependence, it is assumed that their abilities and motivation for quitting are lower. In Norway, the typical smoker now is a middle-aged man with little education and belonging to a lower social stratum ([Lund & Lund, 2005](#)), a situation very different from 30 years ago when smoking was more evenly distributed in all segments of the population. Consequently, smoking has become one of the most important contributors to social inequalities in health in Norway. Developing strategies for equalizing these social differences in health is one of the major goals of Norwegian health policy.

It has been claimed that the characteristics of the smoking population today mean that traditional tobacco control measures are likely to be less effective in reducing smoking prevalence in the future and that new measures may be needed to bring smoking levels further down ([Lund, 2009](#)). Furthermore, it has been suggested that a harm reduction approach might prove beneficial in reducing the major public health problem that smoking still represents ([Warner & Mendez, 2010](#)).

Harm reduction with respect to tobacco use implies informing the public about less harmful tobacco or nicotine products and working toward increased use of safer tobacco or nicotine products at the expense of the more hazardous alternatives. There are similarities between traditional treatment and harm reduction, but unlike the traditional approach, total abstinence from tobacco or nicotine is not required for harm reduction to be considered functional. Instead, to switch over to safer forms of

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nicotine administration is an ambition and has a worth in and of itself. Examples of practical applications of the harm reduction philosophy might be to inform smokers about the possibility of using nicotine replacement therapies (NRTs) in a permanent fashion (i.e., not try to cut down NRT use) or to develop (and make legal) new NRTs with a higher nicotine content that might gratify former smokers better. Also, unlike the traditional way of thinking, replacing cigarettes with tobacco products that are less harmful than cigarettes could be encouraged, especially if other options have failed to lead to smoking cessation.

One such tobacco product is Swedish moist snuff (snus). Norway is, together with Sweden, in the unique situation that snus is a legal product that is permitted to compete on equal terms with cigarettes. In recent years, there has been increasing evidence that snus and cigarettes have a very different impact on users' health (Cogliano et al., 2004; Lee & Hamling, 2009; Royal College of Physicians, 2007; Scientific Committee on Emerging and Newly-Identified Health Risks [SCENIHR], 2008; Timberlake & Zell, 2009). A study based on a modified Delphi design (a method of evaluation by an expert group, which is used when the basis for making a decision is not very robust) concluded that the health risk associated with use of snus was 70%–85% lower for oral cancer and 97%–98% lower for cardiovascular disease (Levy et al., 2004). Also, Gartner et al. (2007) found that the reduction in longevity did not differ significantly between former smokers who had stopped all nicotine use and former smokers who had switched to snus.

The health risks associated with snus use are primarily those of cancer of the esophagus (SCENIHR, 2008). Some studies have also found increased risk for cancer of the pancreas (Boffetta, Hecht, Gray, Gupta, & Straif, 2008; Luo et al., 2007), while others have not found this association (Bertuccio et al., 2011; Sponsiello-Wang, Weitkunat, & Lee, 2008). Furthermore, use of snus has been related to increased risk of fatal outcome for people who already have cardiovascular disease, but there is no certain evidence that it instigates cardiovascular disease in previously healthy individuals (SCENIHR, 2008). Contrary to cigarette smoking, there are no respiratory risks.

A study from Norway exploring adolescents' perceptions of the relative harmfulness of snus and cigarettes has shown that the harmfulness of snus is generally overrated (Overland, Hetland, & Aaroe, 2008). This is not unique to Norway, as similar misunderstandings have also been found to be prevalent in other countries (O'Connor et al., 2007; Peiper, Stone, Vanzyl, & Rodu, 2010). In a study from Sweden, Wikmans and Ramström (2010) found that a majority of daily smokers had exaggerated ideas of the harmfulness of both snus and NRTs.

To achieve the ambition of informing the population about less harmful nicotine and tobacco products and encouraging people to use them, well-informed advisors are needed. A potential group of well-informed advisors are general practitioners (GPs). Not only do they meet smokers as patients on a daily basis but they also have high credibility in the population in health-related questions. It is assumed that GPs know what is good for you and what is not, and advice coming from this group of professionals tends to be taken relatively seriously. In the area of smoking cessation, even a brief advice intervention from GPs has been shown to be effective in promoting smoking cessation, as it generally increases 12 months cessation rates by 1–3 percentage points (Stead, Perera, Bullen, Mant, & Lancaster, 2008).

The foregoing considerations imply that GPs potentially represent a very important channel of information about the relative risks of various tobacco products for smokers and for the population at large. An interesting question in that respect is how well informed GPs are about these risks. Do they have the knowledge necessary to guide their smoking patients about potential harm reduction strategies? Furthermore, it is of interest to find out to what extent they talk to their patients about smoking cessation in general and less harmful products in particular.

This paper presents the results from a survey among GPs in Norway, with the aim to measure the GPs' perceptions of the relative risk potential of cigarettes and snus. Furthermore, we will look at the general level of screening and intervention regarding smoking cessation among Norwegian GP, and whether there is an association between the GPs' beliefs about relative cigarette/snus risk and the strategies they recommend for smoking cessation.

Methods

Procedure and Sample

In May 2008, a questionnaire was mailed to 2,000 GPs, randomly selected by the Research Institute of the Norwegian Medical Association from a list of all 3,860 GPs in Norway. The GPs had the choice of filling in and returning a paper version or answering the survey online. The survey obtained a participation rate of 45%, and the net sample included 904 GPs, of whom 423 (47%) opted for the online response alternative.

Measures

Perceived relative risk of snus and cigarettes was measured by the question: "In terms of health risks, how do you think daily use of snus compares to daily use of cigarettes?" Five answer categories ranged from "snus is much more harmful" to "snus is much less harmful," with a sixth option for those who were "uncertain." In the analyses, this variable was used in its original form for a graphical description of the distribution of opinions (Figure 1) and in a dichotomized version (snus is much less harmful vs. all other opinions) for the other analyses. The "all other opinions" alternative also includes those who were uncertain about the relative risk.

Seven-point Likert scales (*never* to *always*) were used in four questions to approximate how often the GPs would screen for smoking habits among their patients. The questions read: "When you treat patients with no visible signs of tobacco-related symptoms, how often do you ask about smoking habits?" "If it is revealed that a patient uses tobacco, how often is this information recorded in the journal?" "When you treat patients for the first time, how often do you ask about their smoking habits?" and "If you know that your patient is a smoker, how often do you give information about the advantages of quitting?" A sum score was calculated from all four questions and represents the GPs' propensity to screen for and intervene with tobacco use in a logistic regression analysis (Table 1). Furthermore, the answers to each of the last two of these questions were used in a graphical display of the GPs' tendencies to talk with patients about smoking and smoking cessation (Figure 2). For this purpose, answer categories were collapsed into the three values *never or seldom*, *sometimes*, and *often or always*.

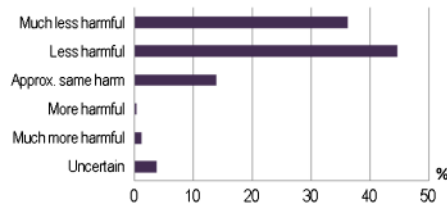


Figure 1. Distribution of general practitioners according to their perceptions of relative risk of snus and cigarettes: In terms of health risks, how do you think daily use of snus compares to daily use of cigarettes? ($N = 891$).

In six questions, the GPs were asked to indicate on a 7-point Likert scale how often they would recommend various quitting aids to their smoking patients. The six types of aids were NRTs, Varenicline, Bupropion, a follow-up appointment with the GP, an appointment with a cessation specialist, and snus. For the purpose of a graphical description (Figure 3), the answers to each question were collapsed into three categories (1–3, *never or seldom*; 4–5, *sometimes*; and 6–7, *often or always*). Additionally, the answers to the snus question were dichotomized (1–3, *never or seldom* and 4–7, *sometimes, often, or always*) for use in other analyses. A reduction into two categories was chosen so as to make the group sizes sufficiently large for analytical purposes.

The variables gender, work experience, smoking, and snus use status were also included in the analyses. The GPs' work experience was calculated as the mean of the scores of the GPs' age and their number of years in practice. Smoking was calculated measured as a dummy variable for current or former smoking (34.7% of the sample) and snus use as a dummy variable for current or former snus use (11.8% of the sample). A bivariate correlation analysis showed that even though there was a significant correlation between snus and smoking status and perceptions of relative risks, it was not so high that multi-collinearity should be a problem (0.093, $p < .006$, for smoking; 0.213, $p < .001$, for snus use).

Analyses

In addition to graphical descriptions of the distributions of risk perceptions, talking to patients about smoking and smoking cessation and the occurrence of recommending various cessation aids, the association between risk perception, and the tendency to recommend snus as a quitting aid were studied using descriptive bivariate analyses. Significance was determined by a

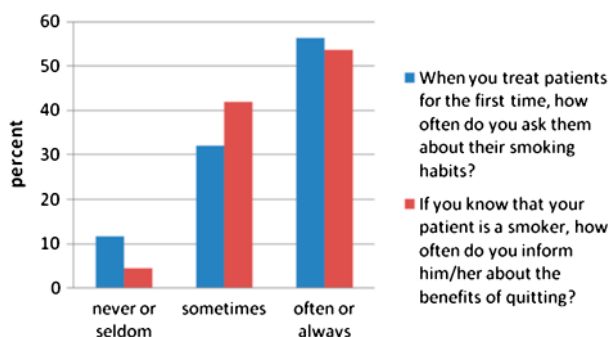


Figure 2. Distribution of general practitioners according to how often they ask new patients about smoking habits ($N = 895$) and talk to smokers about quitting ($N = 890$).

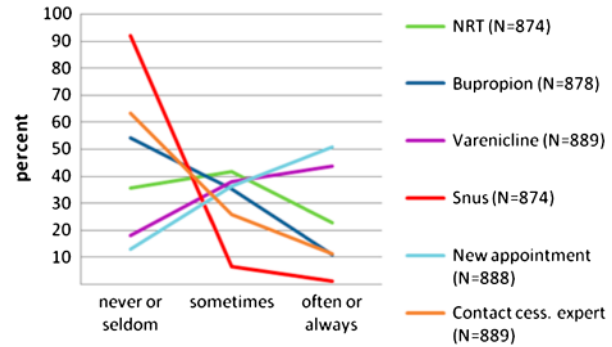


Figure 3. How often the various cessation aids were recommended to smoking patients. NRT = nicotine replacement therapy.

chi-square test, with $p < .05$ as the critical level. Logistic regression was applied to find the OR for recommending snus depending on risk perceptions, controlling for the propensity to screen for tobacco use, personal smoking or snus use, gender and the GP's work experience. There was some variation in the sample sizes in the various analyses due to item nonresponse.

Results

Screening and Intervention by GPs

It was relatively common for GPs to bring up the question of smoking and the benefits of quitting with their patients. More than half of them reported that they would often or always ask new patients about their smoking habits, and more than half would also inform smoking patients about the benefits of quitting (Figure 1). However, when it comes to recommending cessation aids (Figure 2), the picture was somewhat different, not least in the sense that not all cessation aids were equally popular to recommend. Most common was to recommend Varenicline and/or a new appointment, a strategy often or always chosen by 40%–50% of the GPs and sometimes chosen by almost 40% of them. NRTs and/or Bupropion was often or always recommended by approximately 10%–20% of GPs, while 35%–40% of them sometimes recommended it. The least popular alternatives in terms of how often they were employed was to ask the patient to contact a cessation specialist, which more than 60% said they never or seldom did, and to recommend snus. This last option was reported to never or seldom happen by more than 90% of the GPs.

Beliefs About Relative Harm

Very few GPs believed that snus was somewhat more (0.3%) or much more (1.1%) harmful than cigarettes. On the other hand, 13.9% of them thought the harm from the two products was more or less equal, while 3.7% said that they were uncertain (Figure 1). A majority of 81% said that they believed snus to be the less harmful product, but it was more common to believe it to be somewhat less harmful (44.7%) than much less harmful (36.3%).

Associations Between the GPs' Risk Perceptions and How Often They Recommend Snus as a Quitting Aid

There was a significant bivariate association (χ^2 , $p < .001$) between perceptions of relative risk of snus and cigarettes and

the propensity to inform patients about snus as a quitting aid (Table 1). Among those who believed that daily use of snus to be much less harmful than daily smoking, 12.2% ($n = 39$) reported that snus would often or always be included in their information about quitting aids. The corresponding figure for those who did not believe that snus was much less harmful was 5.3% ($n = 29$).

The unadjusted effect of risk perceptions on the probability of recommending snus as a quitting aid often or always was 2.5 (Table 2). When other factors and covariates were controlled for, the OR was reduced to 1.9, but it was still statistically significant. The analysis also showed that women were less likely to recommend snus often or always ($OR = 0.49$) and that GPs who screened for smoking habits tended to recommend snus more often ($OR = 1.1$). The GPs' personal tobacco use status was not a significant predictor and neither was the GPs' work experience.

Discussion

As shown in this paper, tobacco screening and interventions are not uncommon activities for Norwegian GPs. According to our respondents' reports, they regularly ask their patients about their smoking habits and inform them about the benefits of quitting. Findings from the early 2000s indicated that only 25% of GPs screened for smoking if the patient was not already diagnosed with a smoking-related disease (Gallefoss & Drangsholt, 2002; Helgason & Lund, 2002). Even though it is prudent to be careful when comparing results from different investigations directly, the current result that just about 1 in 10 GPs never or almost never would make inquiries concerning smoking when seeing a new patient seems to indicate an improvement in this area over the last few years. Increasing negative attitudes toward smoking in the Norwegian society, with an accompanying denormalization of smoking behavior, might perhaps contribute to explain such a change, as it may have become easier, or feels less intrusive, for GPs to bring the subject up with patients.

In general, the GPs would also relatively often recommend some type of cessation aid, most frequently the pharmaceutical preparation Varenicline or a follow-up appointment. Bupropion or NRTs were also quite often recommended by almost half of

the respondents. The least often recommended route to smoking cessation was to replace cigarettes with a less harmful tobacco product—snus. While more than half of the GPs often recommended some type of cessation aid other than snus, less than 8% of them said that they often recommended snus.

The tendency to recommend snus as a cessation aid was significantly associated with the GPs' beliefs concerning the relative risks of cigarette and snus use. While 12% of those of them who thought snus was much less harmful to health often or always recommended it, only 5% of those who disagreed with this risk assessment would recommend it frequently. In this respect, a key finding in this study was that the majority of the GPs appeared to have beliefs that do not correspond with the current scientific consensus that snus is much less harmful to health than cigarettes. In fact, almost two thirds of the sample disagreed with the idea that snus is a much less harmful product. Given that GPs are health professionals and supposedly experts on health-related risks, such limitations in their awareness of the relative risk of snus and cigarettes are quite surprising. The large proportion of objectively speaking "wrong" answers to the relative risk question can result from deficient knowledge, but other explanations are also possible. Two alternative interpretations to be discussed here are linked to the interpretation of the concept of harm and to the perceived meaning of risk.

The interpretation of harm may have influenced the results if some GPs employed a broader understanding of this concept than what was actually asked for, reading in factors like risk of addiction, risk of dual use, and risk of recruiting new users. For example, some may have associated the question of harm to the effect of nicotine and thus answered that they perceive—correctly—snus and cigarettes to be equally addictive products. One might speculate that such interpretations have been stimulated by the manner in which Norwegian health authorities have communicated the risk profiles of different tobacco products, where all these factors have been included (Lund, 2009).

Potential effects of the perceived meaning of risk have relevance to the extent that risk is understood in terms of the severity of the possible consequences and not in terms of the probability of occurrence (Teigen, 2001). In particular, one of the risks to health from snus use is an increased likelihood of cancer of the

Table 1. Unadjusted and Adjusted ORs for Recommending Snus as a Quitting Aid Sometimes, Often, or Always as Compared With Never or Seldom ($N = 863$)

	Unadjusted			Adjusted		
	Wald	OR	95% CI for OR	Wald	OR	95% CI for OR
Snus is much less harmful	12.78***	2.50	1.51–4.13	5.64*	1.91	1.12–3.26
Sum score screening				5.34*	1.11	1.02–1.21
Current or former smoker				2.30	1.52	0.89–2.62
Current or former snus user				1.71	1.58	0.80–3.14
Work experience				3.31	0.98	0.95–1.00
Woman				4.77*	0.49	0.26–0.93
Constant	229.52***	0.56		17.81***	0.02	
			Nagelkerke $R^2 = .035$, –2 loglikelihood = 464.436			
						Nagelkerke $R^2 = .096$, –2 loglikelihood = 429.139

Note. OR = odds ratio. Dep. var: Recommend snus as quitting aid *often* (1) or *seldom* (0).

* $p < .05$. *** $p < .001$.

Table 2. Bivariate Associations Between the General Practitioners' Risk Perceptions and How Often They Recommend Snus as a Quitting Aid (N = 871)

	Perceptions of relative risk		
	Snus is much less harmful than cigarettes, %	All other perceptions, %	Total
Tendency to recommend snus as cessation aid			
Never or seldom	87.8	94.7	92.2
Sometimes, often or always	12.2	5.3	7.8
Total	100.0	100.0	100.0
N	320	551	871

Note. $\chi^2, p < .001$.

pancreas. The fact that the use of both cigarette and snus increases the chances of contracting this rare but high mortality rate form of cancer (although smoking increases it more) may have led some GPs to report equal harm from the two products.

Turning now to the low occurrence of recommending snus compared with the other cessation aids, it is clear that even this can be understood in several alternative ways. One possibility would be that GPs mostly just react to their patients' questions in this matter, such that if a smoker inquires about the alternative of using snus as an aid to quit smoking, the GP will either express a positive (i.e., "recommend" it) or a negative (i.e., not "recommend" it) view. This might to some extent explain why the tendency to recommend snus was higher among those who thought snus was much less harmful and at the same time account for the low tendency even among them.

Furthermore, it is possible that the acceptance of the logic of harm reduction may have a bearing on this situation. Harm reduction is a new concept within tobacco prevention and delineating information about different tobacco products based on risk profiles has been, and still is, a highly controversial issue in Norway. GPs may feel that it is not within their conscience or their obligation as medical professionals to advise their patients to use a product that is damaging to health, even if it is a less risky alternative. Moreover, it is understandable if GPs are hesitant to promote a commercial tobacco product, as they may worry that they are acting as sales agents for the tobacco industry (in comparison, NRTs are marketed by the pharmaceutical industry, an entity with which GPs have long traditions of cooperation). One should probably also bear in mind that as snus is the more harmful option, it is appropriate to try all other cessation aids before snus is recommended.

Even though there are obvious reasons to be cautious about promoting snus as a general strategy for smoking cessation, it is not necessarily true that the snus alternative is fully exhausted. Framed as a harm reduction issue at least, the poor information about the relative harm to health from regular snus and cigarette use among Norwegian GPs and the fact that their perceptions of this relative risk also influence their tendencies to recommend snus as a cessation aid for their patients, can be understood as an unexploited intervention potential. As commented by [Ramström \(2011\)](#), increased quitting rate among existing smokers is the most efficient way to achieve rapid reductions of the health risks in the smoking population. Furthermore, as most quitting attempts are made

outside of clinical settings ([Chapman & MacKenzie, 2010](#)), accurate information about the relative harmfulness of snus from GPs might be a valuable tool for reaching large numbers of potential quitters who would not contact cessation specialists. The rationale for considering a harm reduction approach beneficial in the current smoking environment is the assumption that there may be considerable shares of highly nicotine-dependent smokers in the remaining smoking population. For this type of smoker, the fast delivery and high doses of nicotine in snus might greatly improve their chances of kicking the cigarette habit.

Using Monte Carlo simulation, [Mejia, Ling, and Glantz \(2011\)](#) suggested that the health benefits from promoting snus as a safer alternative would not be substantial due to widespread dual use, but real-world evidence (e.g., [Frost-Pineda, Appleton, Fisher, Fox, & Gaworski, 2010](#)) fails to support those concerns. Also, the effectiveness of snus in smoking cessation, not controlling for nicotine dependence levels, has been well established in observational studies from Sweden ([Ramström & Foulds, 2006](#)) and the United States ([Rodu & Phillips, 2008](#)). Furthermore, a recent observational study from Norway concluded that the latest quit attempt more often led to smoking cessation among respondents who had aided the process with snus than among those who aided it with NRTs ([Lund, McNeill, & Scheffels, 2010](#)), a result consistent also with Swedish experiences ([Ramström & Foulds, 2006](#)). Another Norwegian study concluded that quitters who aided their quit attempt with snus had a higher success rate than all other quitters ([Lund, Scheffels, & McNeill, 2011](#)). It also deserves mentioning that, despite the limited information about differences in harmfulness, snus is in fact the most commonly chosen cessation aid among both Norwegian and Swedish male cigarette quitters ([Lund, 2009](#); [Ramström & Foulds, 2006](#)), a situation possibly explained by the higher blood nicotine concentration and quicker effect of snus compared with NRTs ([Lunell & Curvall, 2011](#)). Furthermore, as stated by [Kozłowski \(2002\)](#), smokers have a right to be informed about harm reduction options. Also, [Gartner et al. \(2007\)](#) warn that to fail to inform the public about the difference in relative risk between smoking and snus use might lead to public distrust of health messages about tobacco use in general.

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Declaration of Interests

None declared.

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