Survey of smokers' reasons for not switching to safer sources of nicotine and their willingness to do so in the future

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Glossary
ST – Smokeless tobacco

Abstract
Despite the risks and the availability of cessation programs and reduced risk nicotine products, approximately 1/5th of North Americans smoke. This study investigated reasons for smokers' resistance to switching to safer nicotine sources. People (n=244) smoking in public areas in Edmonton completed an anonymous survey (2007). 43% had used safer nicotine products (mostly pharmaceutical nicotine) but 75% were willing to consider switching to safer products. Smokers cited similar reasons for not switching to smokeless tobacco and pharmaceutical nicotine. Smokers need accurate information about the risks of different nicotine and tobacco products to counteract misinformation about the health risks.

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Background

Despite massive education campaigns and legal restrictions, the prevalence of habitual nicotine use among adults in Canada and the United States (US) remains at 1/5th to 1/4th of the population, and most use the deadliest source of nicotine, cigarettes (Hammond, 2005; Lee, 2007; Tanuseputro, 2003). Since non-combustion sources of nicotine cause roughly 1/100th the health risks of smoking (http://www.tobaccoharmreduction.org) (Phillips, Rabiu, 2006), persuading smokers who cannot or will not quit using nicotine to switch to alternative sources is almost as beneficial to their health as getting them to quit entirely. But unlike in other countries, such as Sweden, where smokeless tobacco (ST) has largely replaced smoking (Rodu, 2002; Stegmayr, 2005), there has been a very limited shift from smoked to smokeless sources of nicotine in North America. Only 25% and 22% of participants in a nationally representative sample of adult smokers in the United States had ever used nicotine patches and gum, respectively, despite the fact that about 95% of participants were aware of these products (Bansal, 2004).

One of the barriers to smoking cessation via product switching is misinformation about ST and pharmaceutical nicotine products. Most (67%) people in a telephone survey in the United States (Cummings, 2004) and 59.8% of a sample of nurses (Borrelli, 2007) mistakenly believed that nicotine is a cause of cancer. Surveys of smokers and college students in North America found that fewer than 15% realize that ST is less harmful than smoking (O'Connor, 2005; O'Connor, 2007; Smith, 2007). In addition, a study found that most (>=78%) US military recruits believe that switching from smoking to ST does not reduce tobacco users' risk (Haddock, 2004). Many smokers have similar misconceptions about the health risks from using pharmaceutical nicotine products (Bansal, 2004; Cummings, 2004). The present study was designed to specifically investigate smokers' amenability to harm-reducing product switching, including consideration of switching to ST and pharmaceutical nicotine and potential willingness to switch in the future.

Methods

The research team approached smokers in public outdoor areas in Edmonton, Alberta where people were smoking during five days in September 2007. The survey was supposed to precede the start of a harm-reduction-based marketing effort for a new ST product in Edmonton, but due TO delays by the human subjects ethics committee, the survey was conducted shortly after the product rollout. However, there was limited awareness of the new product and a marketing effort occurred weeks and months later. The public outdoor areas included designated smoking areas outside of office buildings, shopping malls, bars, restaurants and construction sites. The researchers approached people who were smoking or starting to smoke. Upon confirming that the potential participant was at least 18 years of age, s/he was given a one page information sheet explaining the survey and their rights as a research participant. People who were eligible and agreed to participate completed a one-page, anonymous, self-administered

survey. (The research team read the survey to people who wished to complete the survey but were visually impaired or indicated that they could not complete a self-administered survey.) The research team defined terms on the survey if the participants indicated that they did not understand them (e.g., snus and medicinal nicotine). Four hundred thirteen adult smokers were approached, 244 of whom completed the survey (response rate: 59%).

The survey assessed participants' use of cigarettes, ST and pharmaceutical nicotine; reasons for not switching to ST or pharmaceutical nicotine for harm reduction; and interest in using hypothetical reduced harm nicotine products. Participants were asked if they would consider switching from smoking to two hypothetical products. Both products provided nicotine in a way that was almost as satisfying as smoking and could be used without anyone noticing. One reduced the health risks by 99% (the reduced risk of modern Western ST products when compared to smoking) and the other by 50% (to gauge whether a very dramatic risk reduction would be needed to convince smokers to switch). The survey and data are available at http://www.tobaccoharmreduction.org/research/smokersurveysept07.htm.

SAS (version 9.1, SAS Institute, Cary, North Carolina) was used for data cleaning and analysis. The univariable analysis included calculation of means, medians and proportions. The bivariable analysis compared reasons why participants did not previously consider switching to ST or pharmaceutical nicotine and variables associated with their willingness to consider the hypothetical reduced risk nicotine products.

Results and Discussion

All participants were observed to smoke before, during, or soon after completing the survey. Their demographic characteristics and their history of using nicotine products are described in Table 1. Overall, 43% of participants had used less harmful nicotine products (mostly pharmaceutical nicotine products). Four people had attempted to use ST as a smoking cessation method. Most participants had previous cessation attempts or stated an expectation of quitting in the future. This survey of current smokers obviously could offer no assessment of successful cessation. Reported average consumption was 15 cigarettes per day. (For participants who entered a range for the number of cigarettes smoked, the midpoint was used. Responses in the unit of packs-per-day were converted by multiplying by 20, though the number of cigarettes per packs in Canada varies.)

Smokers' attitudes towards pharmaceutical nicotine products and ST are described in Table 2. Those who had never considered switching to these products were asked to specify why not. Ten percent of those surveyed had considered switching to ST, and 40% had considered switching to pharmaceutical nicotine products. The reasons given by those who had not considered switching to pharmaceutical nicotine products and ST were similar. The most common reasons GIVEN for not switching to either ST or pharmaceutical nicotine **are** WERE popular fallacies (e.g., that tobacco or nicotine in any form are as harmful as smoking and that ST is more likely to cause oral cancer than smoking). This is consistent with a previous study in

which college students who smoked attributed a mean of 16% of the risks of cigarettes to nicotine and 48% believed that ST definitely causes oral cancer (Geertsema, 2008).

Participants were also asked whether they would consider switching from cigarette use to products that were 50% or 99% less harmful than cigarettes (Figure 1). The majority of the participants (73%) were willing to consider switching to a hypothetical nicotine product that is almost as satisfying as smoking but with 99% less risk than smoking. This is consistent with results from the aforementioned survey of college smokers, in which 64% would consider switching to a product with 1% of the health risks of smoking cigarettes (Geertsema, 2008). This description was intended to describe modern Western ST products; the epidemiology suggests this is a good approximation of the comparative risk. Though there is no useful epidemiology about long-term use of pharmaceutical nicotine, there is no reason to believe it poses greater risk than ST, so this can be used as a best guess about its effects also. Most current pharmaceutical nicotine products are less satisfying substitutes for smoking than ST due to the higher price and slower delivery of nicotine if used as directed. Five people indicated that they were willing to switch to a product that reduced their risks by 50% but not to a 99% reduced risk product, possibly indicating a general innumeracy but possibly suggesting that the quantified reduced risk was misunderstood as the remaining risk, suggesting that care be taken when designing similar questions for future instruments. Few participants indicated that only a 99% (i.e., not a 50%) reduction in risk would be worth considering. Since it is impossible to be confident of how respondents were interpreting the different risks, we do attempt to interpret the answers separately; participants who were willing to consider switching to hypothetical products with either 50% or 99% of the risk of smoking are considered to be willing to consider switching in the remainder of the analysis.

There were several noteworthy differences between the male and female smokers in the sample. Female smokers were less likely to have used ST (5% versus 18%) and more likely to have used pharmaceutical nicotine (43% versus 26%) at least 10 times, compared to males. Likewise, females were more likely to have considered switching to pharmaceutical nicotine than males (47% and 30%, respectively) and less likely to have considered switching to ST (7% and 14%, respectively). Female smokers may be unaware that modern western ST products do not require spitting as 44% had not previously considered using these products because they believed that ST is socially unacceptable or gross, compared to 36% of male smokers.

Males were more likely than females to been deterred from switching to ST in the past because they believed that it is more addictive (19% versus 11%) and more likely to cause oral cancer (39% versus 31%) compared to smoking. Female smokers were more likely than males to consider switching to a reduced harm product (78% versus 70% would consider switching to a hypothetical reduced risk nicotine product); though this disparity is not great, the result is interesting since in Sweden males prove considerably more willing to switch (Rodu, 2002; Stegmayr, 2005). Although no socioeconomic data was collected on the survey, the research team noted that a large proportion of the male smokers appeared to be construction and trades workers and a large proportion of the female smokers worked in downtown office buildings.

The effect of these differences on the variations between the male and female smokers in this sample is unknown.

Participants' reasons for not previously switching to ST were associated with their willingness to consider switching to the hypothetical reduced risk nicotine product (Figure 2). Those who had previously attempted to switch products were more likely to consider switching to the hypothetical product, as were those who had not tried to switch because of misperceptions about the health risks or addiction. There was little association with stating that there were factors other than nicotine the smoker liked about smoking, but a stronger association with stating smoking was important to one's social life (though there were few who said yes to this).

Conclusions

This study suggests that many adult smokers are interested in switching to safer forms of nicotine. The failure to have switched to existing products already, when contrasted with the willingness to switch to a hypothetical reduced risk product, seems largely explained by erroneous beliefs that tobacco and nicotine use are as inherently harmful as smoking, though there was some evidence of dissatisfaction with existing alternatives. It appears that education about health risks and (particularly for women) the discreteness of modern ST products could lead a substantial portion of the smoking population to try switching.

This survey suggests that the barriers to switching are similar for ST and pharmaceutical nicotine. These barriers can be attributed to anti-tobacco activists' messages that conflate smoking, tobacco, and nicotine. Interestingly, though many anti-tobacco activists have tried to overstate the risks of ST (Phillips, 2005; Phillips, Bergen, 2006) while advocating the use of pharmaceutical nicotine, the "quit or die" message about nicotine use seems to have been equally effective in misleading smokers about the risks of both product types.

Despite the misinformation from anti-tobacco extremists, the survey suggests there is still great potential for tobacco harm reduction. Subjects who tried to switch before were not deterred from trying again and may be the most promising targets for encouragement to take this important step to improving their health. Multiple attempts (and period relapses) are common in the adoption of other safer behaviors such as safer sex, increasing physical activity and healthier eating. Anecdotal evidence from Sweden suggests that switching is very often successful as a gradual and non-monotonic process, but that an immediate complete switch seldom happens, something that is probably not known to North American smokers.

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Table 1: Participants' Demographic Characteristics and Usage of Products Containing Nicotine

	n	%
Age		
Mean (95% CI)	38	(36, 40)
Median (range)	39	(18-67)
Male	106	44%
Approximate number of cigarettes currently smoked per day		
Mean (95% CI)	15	(14, 16)
Median (range)	15	(0-50)
Used smokeless tobacco at least 10 times		
Yes	25	11%
No	207	89%
Used pharmaceutical nicotine at least 10 times		
Yes	84	36%
No	152	64%
Ever tried to quit smoking		
Yes	217	90%
No	24	10%
Cessation methods that smokers previous tried[1]		
Stopped all at once ("cold turkey")	163	67%
Gradually decreased the number of cigarettes smoked	120	50%
Counselling or a stop-smoking clinic or program	14	6%
Switched to chewing tobacco or snuff	4	2%
Medicinal nicotine products	84	35%
Zyban / Wellbutrin /Buproprion[2]	61	25%
Other methods	20	8%
Expect to quit smoking within the next 2 years		
Yes	162	71%
No	65	29%

1. Limited to participants who ever tried to quit smoking.
2. Not including medicinal nicotine.

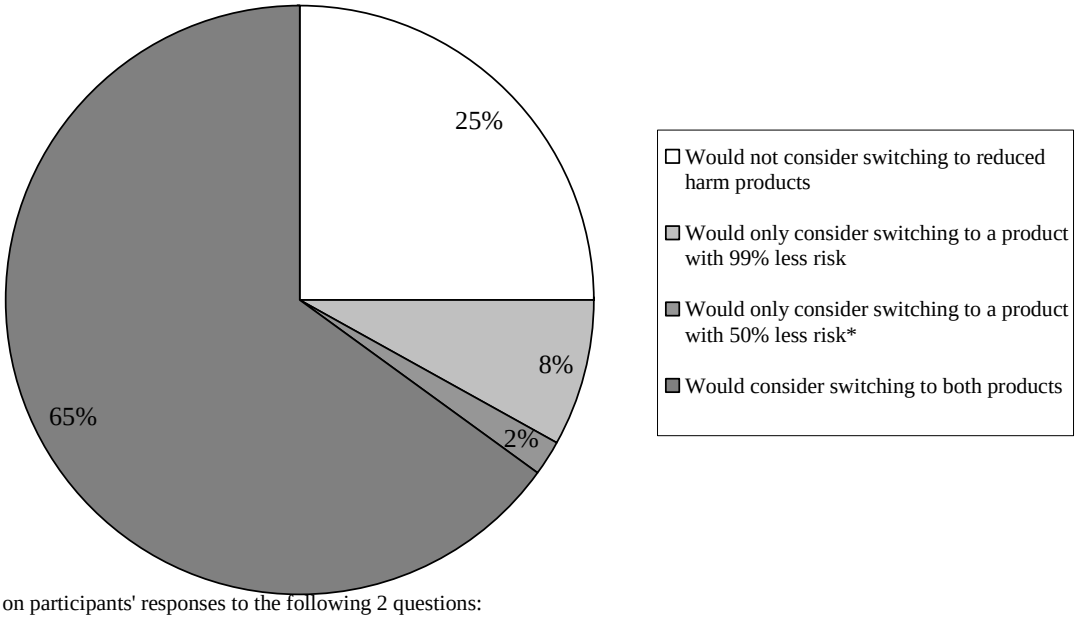
Table 2: Barriers to Using Less Harmful Sources of Nicotine

	Smokeless Tobacco	Pharmaceutical nicotine products	Smokeless tobacco or pharmaceutical nicotine products
	% No	% No	% No
Ever considered quitting smoking, but continuing to use nicotine, by switching from smoking to this product?[1]	90%	60%	56%
Reasons for not considering switching[2]	% Yes	% Yes	% Yes
I believe that using *tobacco* in any form is as bad for you as smoking.	49%	NA	NA
I believe that using *nicotine* in any form is as bad for you as smoking.	42%	43%	51%
I believe that using smokeless tobacco is socially unacceptable or gross (because you have to spit or it makes a mess in your mouth).	41%	NA	NA
There are things I enjoy about smoking besides just getting nicotine.	35%	33%	43%
I believe that smokeless tobacco would increase my risk of oral (mouth) cancer.	34%	NA	NA
I believe that these products are more likely to cause addiction than smoking.	14%	14%	22%
Smokeless tobacco is hard to use.	11%	NA	NA
Smoking is important to my social life.	10%	8%	12%
I tried these products but I did not find them satisfying**.**	3%	9%	11%
The labels on medicinal products say they should only be used for a limited period of time.	NA	6%	NA
Medicinal nicotine products are too expensive.	NA	5%	NA

1. The number of participants who responded to the question about considering quitting smoking, but continuing to use nicotine, by switching from smoking to this product were 236 for smokeless tobacco, 236 for pharmaceutical nicotine products and 234 for smokeless tobacco or pharmaceutical nicotine products?
2. Limited to participants who never considered switching from smoking to this product. 212 participants never considered switching from smoking to this ST, 142 never considered switching from smoking to pharmaceutical nicotine and 131 never considered switching from smoking to either smokeless tobacco or pharmaceutical nicotine.

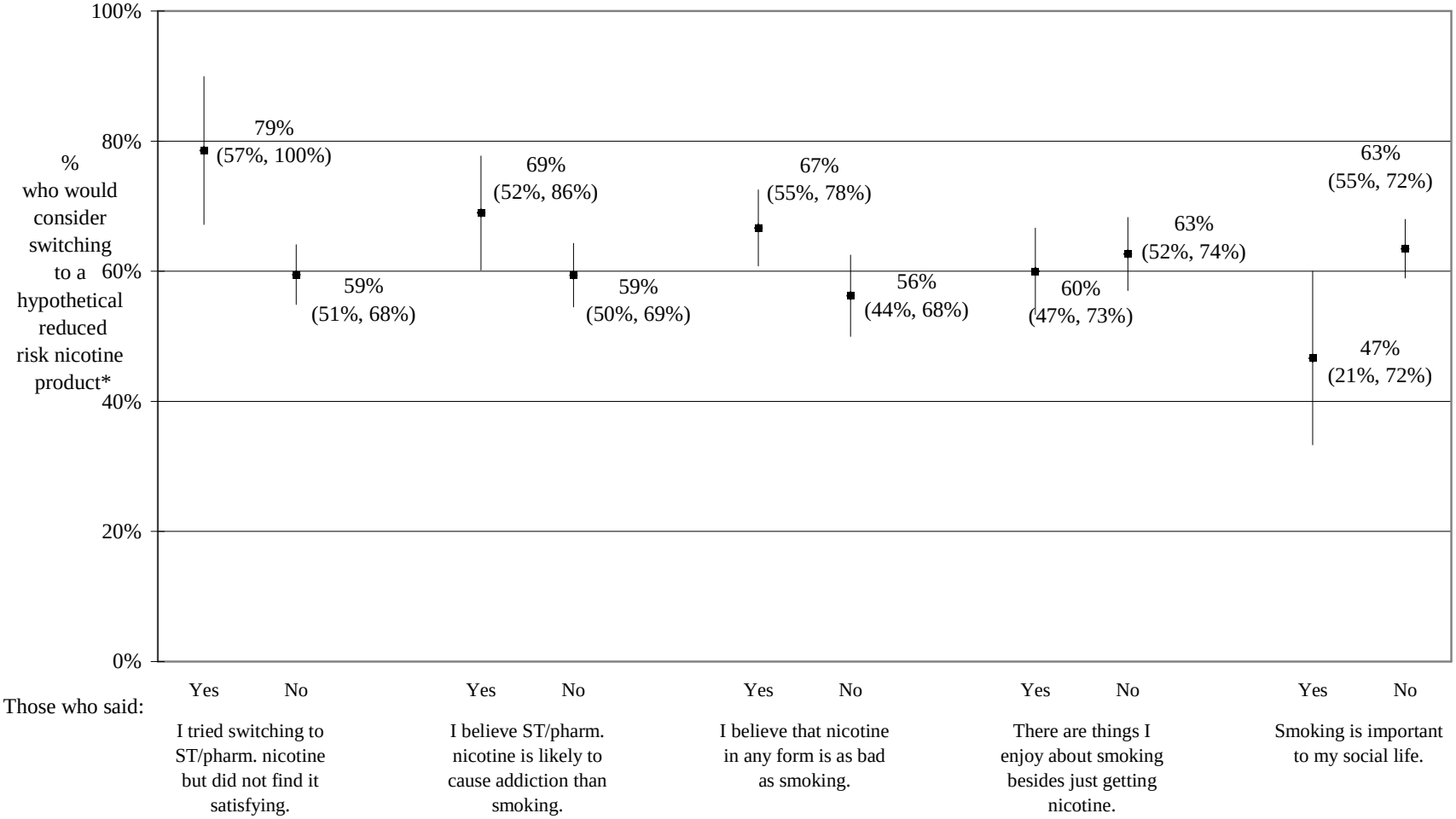
NA – Not applicable.

Figure 1: Willingness to switched to reduced harm nicotine products (n=238)



Based on participants' responses to the following 2 questions:
If a new product provided nicotine in a way that was **almost as satisfying as smoking**, could be used without anyone noticing that you were using it and **reduced your health risks by 50%**, would you consider switching to this product?
If a new product provided nicotine in a way that was **almost as satisfying as smoking**, could be used without anyone noticing that you were using it and **reduced your health risks by 99%**, would you consider switching to this product?
The 2% of participants who would consider switching to a product with 50% less risk but not one with 99% less risk likely did not understand these questions.

Figure 2: Smokers' willingness to switch to reduced risk nicotine products



* Would consider switching to a nicotine product with 50% or 99% of the health risks of cigarettes. Error bars indicate +/- one standard error.

** Limited to 130 smokers who had not previously considered switching to ST or pharmaceutical nicotine.