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Abstract

Background: Tobacco retailers are potential public health partners for tobacco harm reduction (THR). THR is the substitution of highly reduced-risk nicotine products, such as smokeless tobacco (ST) or pharmaceutical nicotine, for cigarettes. The introduction of a Swedish style ST product, du Maurier snus (dMS) (Imperial Tobacco Canada Limited), which was marketed as a THR product, provided a unique opportunity to assess retailers' knowledge. This study examined retailers' knowledge of THR and compliance with recommendations regarding tobacco sales to young adults.

Methods: Male researchers, who may have appeared to be less than 18 years old, visited 60 stores in Edmonton that sold dMS. The researchers asked the retailers questions about dMS and its health risks relative to those from other tobacco products. They also attempted to purchase dMS to ascertain whether retailers would ask for identification to verify that they were at least 18 years old.

Results: Overall, the retailers were only moderately knowledgeable about THR and the differences between dMS and other tobacco products. About half of the retailers correctly indicated that snus is safer than cigarettes; half of whom knew it is safer because it is smoke-free. Fifty percent incorrectly believed that snus causes oral cancer. Less than fifty percent indicated that dMS differs from chewing tobacco because it is in pouches and is used without spitting or chewing (making it more promising for THR). Most (90%) of the retailers asked the researchers for identification when selling dMS.

Conclusion: Tobacco retailers are potentially important sources of information about THR, particularly since there are restrictions on the promotion of all tobacco products (regardless of the actual health risks) in Canada. This study found that many retailers in Edmonton do not know the relative health risks of different tobacco products and are therefore unable to pass on accurate information to smokers.

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Background

The availability of accurate tobacco harm reduction (THR) information at locations where smokers purchase cigarettes is largely unknown but has great public health importance. THR, the substitution of lower risk sources of nicotine for smoking, is a promising intervention for smokers who will not quit nicotine or tobacco entirely (http://www.tobaccoharmreduction.org). Almost all the risk from smoking comes from inhaling the combustion products from burning organic matter, not from nicotine or the tobacco plant itself. It is because of this that non-combustion sources of nicotine, such as smokeless tobacco (ST) and pharmaceutical nicotine products cause roughly $1/100^{th}$ the risk of life-threatening disease from cigarettes [1]. The ability of smokers to make an informed, autonomous choice about whether to keep smoking, switch to less harmful nicotine products, or stop using nicotine entirely, should be based on accurate information about the products, including information about the relative health risks of the different products. Documented misperceptions about THR include the beliefs that: ST poses the same or greater health risks as smoking; ST use causes oral cancer; and smoke is not the source of most of the health risks from smoking [2-8]. Accurate knowledge about ST products is especially important for retailers who interact with customers purchasing tobacco, and may prevent or contribute to the propagation of disinformation. This is particularly true in Canada because of the near prohibition on the manufacturers' ability to communicate accurate health information to their customers other than at the point of sale, and restrictions on the right to free speech that criminalize even private provision of accurate information about tobacco products.

The introduction of a new Swedish style ST product, du Maurier snus (dMS), by Imperial Tobacco Canada Limited (ITC) in 2007 provided a unique opportunity to assess retailers' knowledge of THR and the sale of ST to youth. The marketing strategy for dMS differs from that for other ST products because ITC is marketing it explicitly to their and other companies' cigarette customers as a harm reduction product. Retailers were educated about the product category and provided with a brochure, entitled "What is SNUS" to distribute to adult customers, particularly those purchasing tobacco products. They also received oral briefings by sales representatives of ITC and some of them attended an educational/social event at the time of the product rollout. The dMS product displays were, at the time of the rollout and study, quite prominent (before a recent provincial legal change forced the merchants to hide them [9,10]). The display consists of a small glass refrigerator, usually located beside the cashier.

Our study examined retailers' knowledge of the comparative risks of different tobacco products and other health information about ST; information that they received in oral briefings and written materials about dMS. In addition, we took advantage of the study to also examine compliance with recommendations regarding the sale of tobacco to young adults. According to recommendations from Operation I.D., which provides materials about the sale of tobacco products to youth, retailers should ask individuals who *appear* to be under the age of 25 for identification before selling any tobacco product (http://www.operationid.com/index.html). Anti-harm reduction activists have made almost every claim imaginable about ST, including the claim that promoting it will increase the chance that ST products will be used by minors [11,12].

Most studies regarding the sale of tobacco products to minors focused on cigarettes [13-16], but there are some claims that retailers may be more likely to sell ST products to minors [13,17]. While such claims have no useful scientific basis, come almost exclusively from anti-ST activists (many of whom are well-documented as saying anything negative they can about ST, including documentably false claims [18]), and seem to be of relatively minor importance (why worry so much about minors getting low-risk nicotine products given how many of them choose to and are able to smoke), it is still interesting to investigate.

Methods

At the time of the study, dMS was sold in 219 retail outlets in the Edmonton area. Fifty-two of the outlets were excluded because they were outside the city of Edmonton. A random sample of 60 of the remaining 167 stores in the city of Edmonton was selected. Two male undergraduate students, hereafter referred to as researchers, aged 20 and 21 (greater than the legal age to purchase tobacco in Alberta but sufficiently young-looking that they should have triggered the "check identification if under 25" recommendation), were trained to approach the retailers, ask questions about THR as part of a conversation about dMS, and attempt to purchase dMS. No female students were included because males are well known to be more likely to use ST, and thus appeared more natural. The researchers dressed in casual clothes (e.g., jeans and sweatshirts). Retailers may have a rapport with cigarette customers who they see frequently and may respond differently to those individuals. However, it is possible that the researchers' experiences may be similar to those of young smokers who are interested in reduced harm nicotine products.

In each store, one researcher approached a cash register (often near the refrigerator in which the dMS was stored, allowing a physical reference to the product) and asked the nearest employee a series of questions about the health risks of dMS and THR. The researcher then purchased one container of dMS, showing his Alberta driver's license if he was asked for identification. The researcher completed a data collection form as soon as possible after leaving each retail outlet. The script, data collection form and a de-identified version of the data are available at http://www.tobaccoharmreduction.org/research/retailer.htm

After data collection was completed, the responses to each question were categorized based on the correct answers to each of the questions. These categories are described in the results and discussion section. SAS (version 9.1, SAS Institute, Cary, North Carolina) was used for the sample selection and data analysis.

Retailers' consent was not obtained for this study. Our goal was to observe the retailers' behavior during the course of their normal jobs, and asking for consent would have prevented this. Asking for consent would have necessitated limiting the study to an assessment of the retailers' responses to what they knew was, in effect, an exam, and would have prohibited any assessment of whether retailers' appropriately carding seemingly underage customers. The

retailers were later sent a letter and fact sheet describing the study. The study protocol was reviewed and approved by the Health Research Ethics Board at the University of Alberta.

Results and discussion

Many of the retailers were hesitant to speak with the researchers or did not answer their questions. Retailers working alone were more likely to engage in a conversation with the researchers than if there were other employees or customers in the vicinity. Obviously, if retailers suspected that the researchers were "secret shoppers" (underage youths attempting to purchase tobacco to see if retailers asked them for identification), their interactions with the researchers might have been different than with other young adults. We had no clear indications that this was the case, but it was possible.

Data collection was completed in February and March 2008. One researcher visited 39 stores, while the other visited 21 stores. All visits occurred during weekdays between the hours of 9 am and 5 pm. Most of the outlets were convenience stores. The researchers did not ask questions about dMS or THR in two stores where tobacco company representatives were present. Two retailers refused to answer any questions about the product and an additional four (including one who did not appear to speak English well) did not answer any questions but gave the researchers the dMS brochure. In one store there was a handwritten information sheet about snus on the dMS refrigerator. Retailers' answers to specific questions about dMS and THR are illustrated in Figure 1.

Is snus safer than smoking?

Only about half of the retailers correctly stated that snus is safer than smoking. One retailer stated that it is 99% safer but the rest gave no indication of the magnitude of the risk difference. This is not surprising given the large amount of misinformation about snus in the media at the time of the product launch [10] and potentially confusing information about dMS in the brochure and on the package. The dMS brochure indicates that: 1) "there is no safe tobacco product" (literally true, but highly misleading given how small the risk from ST is compared to smoking [19]); 2) "independent health experts indicate that the use of snus is substantially less risky than cigarette smoking" (the key point, but understated and not sufficiently highlighted); and 3) snus is smoke-free (however, there is no explicit link between the risk reduction and the lack of smoke). In addition, there are four alternating federally mandated warnings that take up half of the front of the packages of dMS; one of them states that "This product is not a safe alternative to cigarettes." This common claim is clearly confusing to consumers and it is likely that retailers are no more sophisticated, mistakenly confusing "not safe" with "not much safer than cigarettes." The common assertion that ST products are not "safe" is counterproductive. (Note that despite the common allegations of anti-harm reduction activists, we are aware of no THR advocates who claim that ST is "safe" (i.e., causes zero risk of disease). Nevertheless, anti-THR activists insist on communicating their claim, about which no one is arguing, presumably because they are aware that it is generally misinterpreted as saying that ST is not safer than cigarettes.)

Only about half of the retailers who were aware that snus is safer attributed the risk reduction to the lack of smoke. One quarter of the retailers who did not believe that snus is safer indicated that it is not safer because it is a tobacco product. This is consistent with previous research which found that smokers often attribute the health risks of cigarettes to things other than the smoke (such as additives, nicotine, or the other natural components of the tobacco itself) [2,4,6]. An additional 19% indicated that it is not safer because it causes oral cancer or mouth diseases.

Does snus cause oral cancer?

Contrary to the widespread misperception among most lay people and even most ostensible experts, the epidemiologic evidence clearly shows that snus and other popular ST products cause very little (too small to measure) or no risk for oral cancer. Fifty percent of the retailers who were asked and answered about the topic told the researchers that snus causes oral cancer. Three retailers did indicate that smoking also causes oral cancer or that snus is less likely to cause oral cancer than smoking. They likely learned this from a talk, given by the last author of this paper, that some merchants attended, because this information is not contained in any of ITC's written material but was emphasized in that talk. Many of the retailers did not respond to this question or were not asked this question because it could not be raised as part of an inconspicuous conversation. Two of the mandated warnings on the dMS package, "This product causes mouth disease" and "This product can cause cancer," may contribute to this common misperception. ST use does cause superficial irritations in many users but these lesions are different than those caused by smoking and very rarely become cancerous [20]. Although the belief that ST causes oral cancer is a common misconception, the epidemiology clearly does *not* indicate that modern western ST products, including snus, cause oral cancer. The majority of cases of oral cancer in North America are attributable to a combination of smoking and alcohol consumption [21].

Is snus different than chewing tobacco?

Most (73%) of the retailers believed that snus is different than chewing tobacco (which is how many of the retailers referred to moist snuff, which was available in most of the stores) and many correctly identified that the differences relate to the use of the product and not the health risks. The epidemiology does not support the claim that the health risks from snus are any different from chewing tobacco or other moist snuff products. Retailers' responses were relatively consistent with the product description on the back of the dMS container: "Snus is a discreet and smoke-free way to enjoy tobacco with no effect on those around you. Snus is a small pouch designed to sit under your upper lip, with no chewing or spitting…" The typical differences between snus and chewing tobacco in terms of usage are that: 1) snus is in sachets instead of loose tobacco, making it neater to use; 2) while placement is up to the individual, snus is typically placed between the upper lip and gum (made possible by the sachet that keeps the product from moving or disbursing), whereas chewing tobacco is typically held in the lower cheek area and loose snuff is usually used between the lower lip and gum; and 3) placement under the upper lip eliminates or minimizes the need to spit. In addition, it is accurate to say that snus is pasteurized, which snus manufacturers sometimes claim reduces its health risks compared

to other ST products, a claim that is plausible but not actually supported by the current evidence [22]. The evidence is not sufficient to distinguish between the low risks of moist snuff (including snus), chewing tobacco, and pharmaceutical nicotine products.

Is snus addictive?

Three-quarters of the retailers believed that snus is addictive, which is stated in the brochure and one of the warnings on the package ("This product is highly addictive."). It is true that snus, like all tobacco products, contains nicotine which is considered to be addictive, and there is little argument with this characterization that reaches beyond the scholarly realm. Thus, it seems reasonable that the retailers should indeed have answered "yes," and this is reasonable shorthand for the accurate observation that many users of nicotine (from any source) become inveterate users. They would not be expected to offer nuances or even know such facts as "addiction" is not actually well-defined [23,24], that many definitions of addictive chemicals do not include nicotine [24], that nicotine consumption may be beneficial for some people [24-26], and that addiction in itself is not necessarily a bad thing.

Researchers' attempts to purchase snus

Snus was purchased in all but three of the stores. Two of the locations did not have any dMS in stock. A retailer who was speaking with a representative from a company that markets a competing ST product when the researcher entered the store claimed that the product was not available even though the dMS was clearly visible to the researcher. A representative from ITC was in one store where snus was purchased.

Table 1 describes the researchers' experiences attempting to purchase dMS in the 58 stores where tobacco company representatives were not present. Most (90%) of the retailers asked the researchers for identification to verify their age. All of the retailers who did not ask for identification either answered the researchers' questions about snus or gave them the brochure. Five retailers who did not ask for identification sold dMS to the researchers. Thirty-nine percent of the retailers who asked for identification did so before answering questions about the product, 41% before the transaction and 20% during the transaction. In one store, the retailer initially questioned the validity of the researcher's identification but upon follow-up did sell dMS to him. The researchers were not given the snus brochure in approximately one-third of the stores (at one-third of which the retailers said that they had run out of the brochures).

Conclusions

In Canada, promotion of low-risk nicotine products as an alternative to smoking depends largely on information provided by retailers. Our study suggests that despite efforts to educate retailers, they lack some combination of the time, knowledge, or analytic sophistication to provide several of the key bits of information needed to explain the value of THR. While some retailers provided useful and accurate information, many did not. Lack of accurate information about THR is not surprising given the rampant misinformation in the popular press [27], and on the internet [18,19]. It is somewhat disappointing, though not necessarily surprising, that

retailers who either received directed education or could have been educated by other staff members on the point shared the popular misperceptions. The misleading or unclear warning statements on ST packages probably contributed to this, and the equivocal claims in the dMS brochure may have also contributed. The results from this study suggest that retailers in Edmonton may be contributing to public misperceptions about THR as much as they are reducing them. This suggests that the restrictions on free speech about THR are more damaging than they might be, since the major remaining source of information is inadequate. The result is that many smokers who might have quit by switching products will never learn about this potentially lifesaving option.

List of abbreviations

ITC – Imperial Tobacco Canada

THR – Tobacco harm reduction

ST – Smokeless tobacco

dMS – du Maurier snus

Competing interests

The authors are interested in encouraging tobacco harm reduction (reducing the morbidity and mortality caused by tobacco use by encouraging smokers to switch to smokeless tobacco). As a result, they have an interest in designing research that explores smokers' access to accurate information about tobacco harm reduction products. In addition to this actual substantial interest, some people believe that conflict of interest stems from (and only from) funding rather than actual worldly goals. To humor these people, we report: Dr. Phillips and his research group (including Dr. Heavner, Mr. Rosenberg and Mr. Tenorio) are partially supported by an unrestricted (completely hands-off) grant to the University of Alberta from U.S. Smokeless Tobacco Company. The grantor is unaware of this manuscript, and thus had no scientific input or other influence on it. Dr. Heavner owns a small amount of stock in Johnson and Johnson. Dr. Phillips has consulted for U.S. Smokeless Tobacco Company in the context of product liability litigation and is a member of British American Tobacco's External Scientific Panel. Imperial Tobacco Canada Limited was not informed of this study until the debriefing letter and fact sheet were sent to the retailers, and had no scientific input or other influence on it.

Author contributions

CVP and KH conceptualized the study and wrote the study protocol. FT and ZR collected the data that were analyzed by KH, FT and ZR. All authors contributed to writing the manuscript and reviewed it.

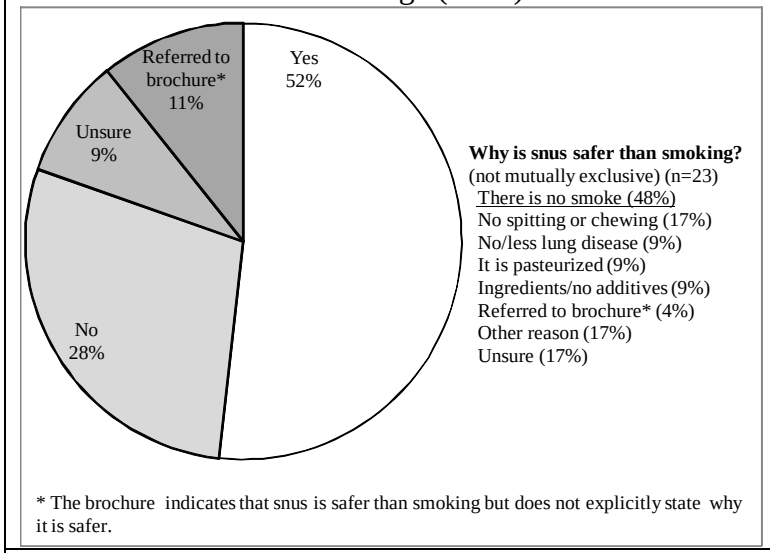
Table 1: Sale of snus to young adults who may appear to be less than 18 years of age (n=58)*

	n	**%**
Researcher purchased snus		
Yes	56	97%
No	2	3%
Retailer asked to see identification		
Yes	52	90%
No	6	10%
Researcher received snus brochure		
Yes, without requesting it	28	48%
Yes, but had to request it	11	19%
Brochures were placed so customers could take them	1	2%
No	18	31%

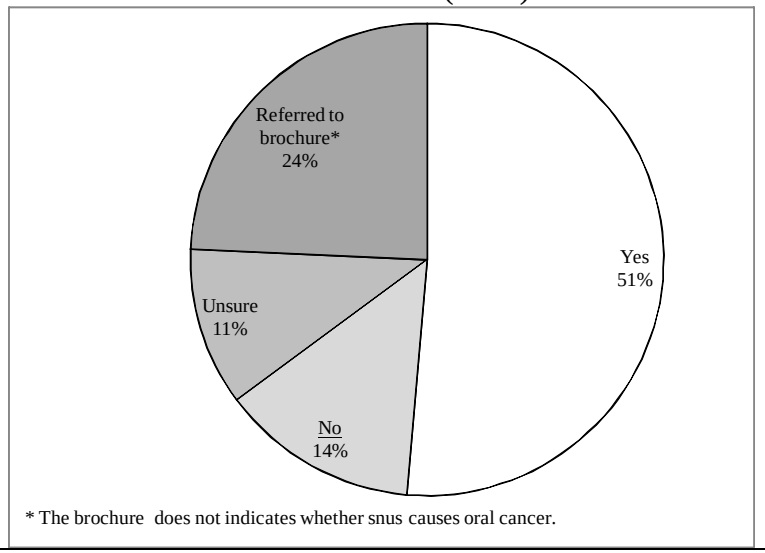
* Excludes the two stores where tobacco company representatives were present. Snus was purchased in one of these stores.

Figure 1: Retailers' knowledge of the differences between snus and other tobacco products and the health risks of snus

1A: Is snus safer than smoking? (n=56)



1B: Does snus cause oral cancer? (n=37)



1C: Is snus the different than chewing tobacco? (n=48)

1D: Is snus addictive? (n=43)

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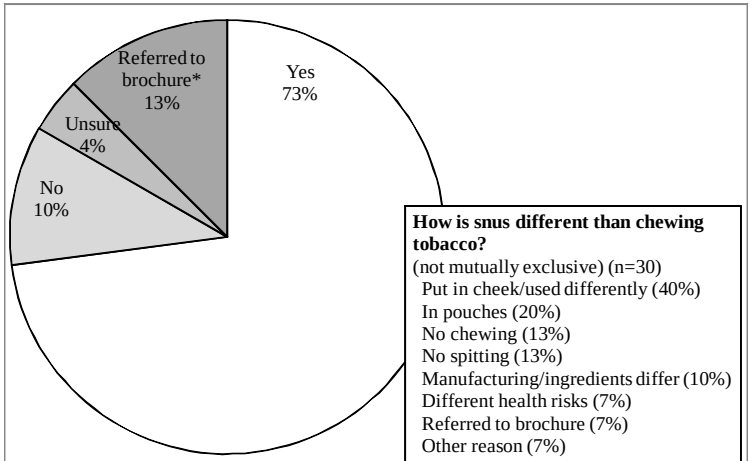
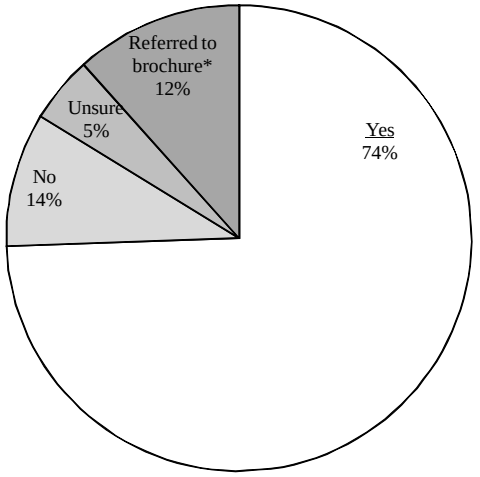


How is snus different than chewing tobacco?
(not mutually exclusive) (n=30)
- Put in cheek/used differently (40%)
- In pouches (20%)
- No chewing (13%)
- No spitting (13%)
- Manufacturing/ingredients differ (10%)
- Different health risks (7%)
- Referred to brochure (7%)
- Other reason (7%)

* The brochure indicates that snus is "chew-free" and "spit-free" but does not explicitly compare it to other smokeless tobacco products.



* The brochure states that snus is addictive.

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