Journal of Urban Health: Bulletin of the New York Academy of Medicine, Vol. 83, No. 6
doi:10.1007/s11524-006-9125-7

High Prevalence of Smoking Among Urban-Dwelling Canadian Men Who Have Sex with Men

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ABSTRACT *A small but consistent literature from the United States suggests increased risk for smoking among lesbians and men who have sex with men (MSM). Few studies have investigated smoking among MSM in other countries where different social norms and restrictions on smoking in public apply. We measured smoking behaviours in a convenience sample of urban-dwelling young Canadian MSM (median age 28 years). We compared the prevalence of smoking among MSM with that among other men in British Columbia (BC) using National Population Health Survey data to compute an age-adjusted standardized prevalence ratio (SPR). Independent predictors of smoking among MSM were identified using adjusted odds ratios (OR) with 95% confidence intervals (CI). Smoking during the previous year was reported by twice as many MSM (54.5% of 354) as other men in BC (25.9%) (SPR=1.94, 95% CI 1.48–2.59), with largest differentials observed among men under 25 years of age. In multivariable analyses, smoking among MSM was significantly associated with younger age (OR 0.94, CI 0.88–1.00 per year), greater number of depressive symptoms (OR 1.12, CI 1.06–1.19 per symptom) and Canadian Aboriginal ethnicity (OR 2.64, CI 1.05–6.60). In summary, MSM in our study were twice as likely to smoke as other men in BC; the greatest differences were observed among the youngest men. The design of effective prevention and cessation programs for MSM will require identification of the age-dependent determinants of smoking initiation, persistence, and attempts to quit.*

KEYWORDS *Homosexuality, Male, Prevalence, Tobacco, Smoking, Substance abuse*

INTRODUCTION

Smoking continues to present a serious health care problem despite ongoing anti-smoking campaigns and introduction of legislation to limit tobacco advertising, prevent smoking in youth, and promote quitting among adults. A Canadian report in 2001 cited tobacco use as "the most important preventable risk factor for respiratory disease" including asthma, chronic obstructive pulmonary disease, and lung cancer.[1] In 1998 more than 26,000 Canadians were killed by these 3 illnesses

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alone, and the direct burden on the health care system through physician, drug, and institutional costs was almost 3.5 billion dollars.[1,2]

Higher rates of smoking among urban-dwelling lesbians and men who have sex with men (MSM) are suggested by a small number of studies, all from the United States.[3–13] A recent review article identified only three reports pertaining to smoking among MSM.[7] Including reports published subsequently,[4,8,9,11–13] only two employed probability sampling to generate representative samples of MSM.[3,5] Different social norms and policies may influence smoking differently outside the United States. In Vancouver, for example, smoking has been prohibited in restaurants, bars and clubs for many years.

Identifying modifiable correlates of smoking among MSM that are amenable to interventions could reduce overall morbidity and mortality in the population. Moreover, reductions in smoking among MSM would mitigate risks for health problems that affect them disproportionately; for example, smoking appears to be a potent yet modifiable cofactor in the development of anal cancer.[14–18] Targeting smoking prevention and cessation initiatives among MSM is difficult since only a handful of studies have investigated correlates of smoking among sexual minorities.[3,4,6,11,13] We undertook the present study to determine the prevalence and correlates of smoking in a community-recruited cohort of urban-dwelling Canadian MSM. We further compared the age-adjusted prevalence of smoking among MSM and other men in British Columbia.

METHODS

We measured smoking in the Vanguard Project, an open prospective cohort study of HIV-1 seroincidence and risk behaviours specific to young MSM. Briefly, eligible men were between 18 and 35 years of age at enrollment, lived in the greater Vancouver region, had not previously tested HIV-positive, and self-identified as gay or bisexual or reported having had sex with other men. Participants were recruited through outreach at gay community events, community health clinics and local physicians, and through gay and mainstream media. At enrollment and annually thereafter, the men completed a self-administered questionnaire covering basic demographics and substance use during the previous year including frequency of tobacco use and numbers of alcoholic drinks consumed during a typical day, week or month, as appropriate. We converted the alcohol responses into a measure of numbers of drinks consumed in a typical week. We also administered the Rosenberg Scale of Self-Esteem[19] and an abbreviated Center for Epidemiological Studies-Depression (CES-D) Scale.[20,21]

In the present cross-sectional analysis, we included only those self-administered surveys completed in 1999 by HIV-1 seronegative Vanguard participants (or, if lacking such a survey, one completed in 1998 or 2000); we applied this restriction so that the data would be comparable with the 1999 Canadian National Population Health Survey (NPHS Cycle 3).

The NPHS is a longitudinal study established in the early 1990s to examine the effects of demographic, behavioural, and economic factors on the health of Canadians. Randomly selected subjects from all ages and geographical areas are administered surveys every two years that assess personal behaviours and health status. The survey includes an item that asks whether respondents smoke daily, occasionally, or never. In 1999, surveys were received from 88.2% of 17,276

eligible individuals.[22] Results were weighted using information provided in the dataset to account for potential sampling bias. For the present analyses, we used data obtained from the 292 NPHS respondents who were British Columbia (BC) residents between the ages of 18 and 39 years. Subjects in both samples were classified as either smokers (daily or occasional) or non-smokers. We compared smoking among MSM and other men in British Columbia using an age-standardized prevalence ratio and 95% confidence interval (CI).

To measure associations of smoking frequency with demographic and behavioural variables, we classified MSM as non-smokers (i.e., no smoking in the previous year), occasional smokers (less than once per day on average), or regular smokers (daily or more on average). Potential correlates of smoking frequency we evaluated included age, ethnicity (Canadian Aboriginal vs. other), education (grouped as: less than high school, high school, college, graduate school), average number of alcoholic drinks consumed per week during the previous year, number of depressive symptoms, and self-esteem score.

Adjusted odds ratios (OR) computed using multivariable logistic regression were used to select variables that best differentiated smokers from non-smokers among MSM in the cohort; only variables significant in univariate analyses (p-value < 0.05) were evaluated. The final multivariable model included only independent predictors of smoking; results were confirmed in both forward and backwards stepwise procedures and the model fit was assessed using a Hosmer–Lemeshow Goodness-of-Fit test.

RESULTS

A total of 354 HIV-1 seronegative Vanguard Project participants completed a questionnaire between 1998 and 2000 and provided information about their smoking behaviour. The median age of these men was 28 (range 18 to 35) years; most had completed high school, 74.0% were Caucasian, and fewer than ten percent were Canadian Aboriginal (Table 1).

Overall, 193 (54.5%) of young MSM reported tobacco use in the previous year; 58 (30.1%) of these men reported smoking less than daily on average, 126 (65.3%) reported at least daily smoking, and the remaining 9 (4.7%) indicated they smoked but did not provide the frequency. Among the 345 men providing complete information, all demographic and behavioural variables tested displayed statistically significant trend associations with smoking frequency (Table 1). In univariate analyses, variables positively associated with smoking frequency included Aboriginal ethnicity, alcohol consumption, and a greater number of depressive symptoms. Variables negatively associated with smoking frequency included age, level of educational attainment, and higher self-esteem scores. In a sub-analysis restricted to smokers, Aboriginal MSM were more likely than non-Aboriginal MSM to report smoking daily ($p = 0.006$) (Table 1).

In univariate analyses, each of these variables was similarly associated with the binary smoking status variable (any smoking during the previous year) (Table 2). In multivariable analyses, smoking during the previous year was positively and independently associated with younger age, a greater number of depressive symptoms, and Aboriginal ethnicity (Table 2).

Among 292 men between the ages of 18 and 39 years old who completed the NPHS survey in 1999, 72 (24.7%) reported smoking during the previous year. After applying sampling weights, the overall smoking prevalence among male British

TABLE 1. Selected demographic and behavioural characteristics of Vanguard cohort participants, overall and by typical smoking frequency during the previous year

Variable	Smoking frequency*			
	Total Cohort (n=345)	Never (n=161)	Less than daily (n=58)	Daily (n=126)
Age†	28 (18,35)	29 (18,35)	28.5 (20,33)	26 (19,35)
Depressive Symptoms Score†	6 (0,28)	4 (0,21)	6 (0,18)	7 (0,28)
Self-Esteem Score†	34 (16,40)	35 (16,40)	33 (18,40)	32 (18,40)
Typical number of Drinks/Week†**	2 (0.2,351)	1.15 (0.02,49)	2.3 (0.02,25)	4.0 (0.1,351)
Canadian Aboriginal Ethnicity#	32 (9.2)	7 (4.4)	2 (3.6)	23 (18.7)
Education#				
<High School	37 (10.8)	8 (5.0)	5 (8.8)	24 (19.4)
High School	133 (38.9)	53 (32.9)	22 (38.6)	58 (46.8)
College	136 (39.8)	77 (47.8)	25 (43.9)	34 (27.4)
Graduate School	36 (10.5)	23 (14.3)	5 (8.8)	8 (6.5)

*Some observations missing. All variables in the table were significantly associated with smoking frequency with smoking frequency in trend tests ($p < 0.001$).

†Median (range).

#Number (%).

**During previous year.

Columbians under the age of 39 was estimated to be 25.9%, compared to an observed prevalence of 54.5% among MSM. Overall, the age-adjusted prevalence of smoking among MSM in the Vanguard cohort was approximately twice that among other young men in British Columbia [age-adjusted standardized prevalence ratio = 1.94 (95% CI: 1.65, 2.28)]. Smoking among MSM was more common than among other males in British Columbia in every age stratum examined; of particular note, absolute differences were greatest among men who were youngest (Figure 1).

TABLE 2. Crude and adjusted odds ratios for smoking* among Vanguard cohort participants

Variable	Crude OR (95% CI)	Adjusted** OR (95% CI)
Age	0.90 (0.85–0.95)	0.94 (0.88–1.00)
Depressive Symptoms Score	1.16 (1.09–1.22)	1.12 (1.06–1.19)
Self Esteem Score	0.92 (0.88–0.97)	
Drinks/week*	1.13 (1.07–1.19)	
Canadian Aboriginal Ethnicity	3.55 (1.49–8.45)	2.64 (1.05–6.60)
Education		
<High School	1.00	
High School	0.42 (0.18–0.98)	
College	0.21 (0.09–0.50)	
Post Graduate	0.16 (0.06–0.44)	

OR, odds ratio; *CI*, confidence interval.

*During the previous year.

**Final model includes only variables independently associated with smoking.

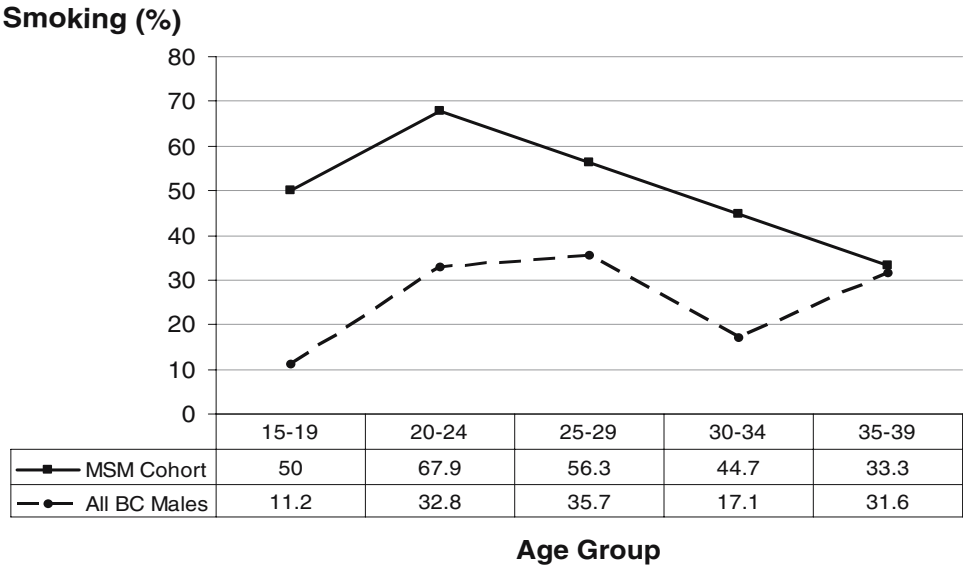

FIGURE 1. Age-specific prevalence of smoking among young men who have sex with men (*MSM*) in the Vanguard Project cohort and among male British Columbian respondents to the 1999 National Population Health Survey.

DISCUSSION

In the present study, we found a highly significant, two-fold higher overall prevalence of smoking in a convenience sample of urban, young adult MSM in Vancouver, compared to other men of similar age in British Columbia. Over half (54.5%) of young MSM in our cohort reported smoking during the previous year, compared to one-fourth of the NPHS survey respondents. In multivariable analyses, smoking among young adult MSM was significantly associated with younger age, a greater number of depressive symptoms, and Canadian Aboriginal status. Similarly, smoking frequency among MSM was positively associated in univariate analyses with each of these variables, and with lower levels of education, more frequent alcohol consumption, and lower self-esteem.

A particularly noteworthy observation in the present study is that the greatest differentials in smoking prevalence between MSM and their heterosexual counterparts were observed among the youngest men. These results are consistent with observations by Tang et al.[4] and remarkably similar to those reported by McKirnan et al.[13] but they stand in contrast to those from a school-based survey that found no difference in smoking at least weekly among adolescent boys who self-identify as heterosexual versus gay or bisexual.[9] The reasons underlying this inconsistency are unclear but may reflect differences among studies in the definition and self-identification of sexual minority status, or in the distribution of participants' age, race-ethnicity, or indicators of socio-economic status. One report suggests that differences in smoking between adult MSM and male heterosexuals are due in part to access to health care insurance and utilisation, depressive symptoms and alcohol consumption.[13]

Longitudinal studies will be required to identify the factors that account for the age dependence of differentials in the prevalence of smoking among MSM and their

heterosexual counterparts. It is possible that gay and bisexual adolescents have a higher propensity to start smoking, compared to other adolescents. Alternatively, the differentials may reflect cohort effects (different secular trends in the age at which MSM versus other youth initiate cigarette smoking). Finally, younger MSM may be relatively successful in their attempts to quit but, having started with a greater prevalence of smoking in early adolescence, end up with a prevalence in young adulthood that is still elevated when compared to their heterosexual counterparts. To address these issues, future studies will likely need to follow cohorts of adolescents for some years because self-identification as gay or bisexual often does not occur until young adulthood.

The dearth of information regarding contemporary determinants of cigarette smoking among MSM is cause for concern. A limited number of correlates of smoking have been examined in the few previous studies of adult MSM; all of these studies were conducted in the United States. Among men solicited from mailing lists provided by gay organizations, 40% reported smoking during the previous year, which was associated with less education.[6] Among bar and telephone-recruited MSM in Oregon and Arizona, 48% of the men reported smoking during the previous month, compared with 29% of the general male population of the U.S. Significant correlates of smoking among MSM included lesser education, depression and alcohol consumption.[3] A population-based survey of lesbian, gay and bisexual adults in California found that smoking was inversely associated with age, education level, income, and white (non-Hispanic) race-ethnicity.[4] Another study from California reported similar associations with age and education level.[11] Most recently, McKirnan et al. compared a convenience sample of MSM in Illinois (37.5% smokers) to local National Health Interview Survey respondents (28.4% smokers);[13] younger age and lesser education were significantly associated with current smoking among MSM while, in contrast, age was not significantly associated with men in the general population sample. Taken together, these studies suggest that younger age and less education are significant correlates of smoking among MSM. However, a much more comprehensive understanding is obviously needed to design and target effective smoking interventions for MSM.

Strengths of the present study include the ability to compute finely age-adjusted expected smoking rates for our cohort based on provincial rather than national survey standards. Further, the availability of cohort study data permitted our identification of correlates of the prevalence and frequency of smoking among young adult MSM. At the same time, limitations of our study require that our results be interpreted with caution. First, population-based data regarding the smoking habits of the general male population within Vancouver were not available for a standard. Previous school-based Youth Risk Behavior Survey results did not suggest important difference in cigarette use among urban, suburban, and rural adolescents.[23] Nevertheless, neither the magnitude nor direction of possible bias in our urban sample can be determined. Although most gay and bisexual men migrate to urban centers,[24] the representativeness of our convenience sample to other MSM in Vancouver is unknown. Finally, smoking behaviours in our study were self-reported and subject to errors in recall and socially desirable responses.

In summary, young adult MSM in our convenience sample were twice as likely to smoke as other men of similar age in British Columbia, with greatest differentials among men who are youngest. Smoking prevention and cessation initiatives are needed for a very broad segment of the MSM community;[11] our results suggest that, within this community, MSM who are youngest and who are ethnic minorities

warrant special attention. Tobacco firms specifically and aggressively promote cigarette smoking among young lesbian, gay and bisexual persons.[25,26] We propose a very specific priority for smoking prevention research: the identification of age-dependent determinants of smoking initiation, persistence and cessation among adolescent and young adult MSM. As this prevention research proceeds, evaluation of innovative pilot projects to promote smoking cessation among MSM will have equal importance.[27]

ACKNOWLEDGMENTS

We thank the Vanguard Project participants and study advisors and staff including Jennifer Adachi, Keith Chan, Marcus Greatheart, Steve Martindale, Mary Lou Miller, Dr. Martin Schechter, Arn Schilder, and Dr. Steffanie Strathdee. We thank the anonymous reviewers for suggestions that improved the manuscript. Drs. Lampinen and Hogg and Ms. Rusch are supported by the Michael Smith Foundation for Health Research.

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