# Tobacco Use among Young North American Aboriginal Athletes

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## Abstract

*Tobacco use remains a major cause of preventable illness and death in North America. Although reported smoking rates have decreased, they remain high among the young and among Aboriginal people. As part of an oral health promotion project, a convenience sample of 163 Aboriginal athletes participating in the 2002 North American Indigenous Games completed a self-administered questionnaire addressing tobacco use and knowledge of tobacco effects. Mean age of athletes was 19.6 years (SD 7.4); most were male and Canadian citizens. Only 22 participants reported current smoking; past use of tobacco was more common, with 58 reporting a history of smoking. Although age was not associated with current smoking, older athletes were significantly more likely ($p \leq 0.05$) to have smoked. Twenty-three athletes reported ever using smokeless tobacco, with 9 reporting current daily use. Athletes were knowledgeable about tobacco effects on oral health. This study shows substantially lower tobacco use among this group of young Aboriginal athletes than the North American average. These findings suggest that participation in organized sports may be a protective factor against tobacco use in a population known to have high smoking rates.*

***MeSH Key Words:*** *adolescent behavior/psychology; Indians, North American; smoking/prevention & control; sports*

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In North America, tobacco use continues to be a leading cause of preventable illness and death.[1,2] Tobacco use has a direct impact on the oral health of its users, ranging from dry mouth, impaired wound healing and gingival recession to increased risk of dental caries, periodontal disease and oral cancer.[3,4] Direct and indirect annual health-related economic costs associated with tobacco use are estimated at over $157 billion in the United States (2003)[5] and nearing $10 billion in Canada (1992).[6]

Personal practices such as smoking, use of alcohol and drugs, food choices, physical exercise and other lifestyle decisions affect health and well-being.[7] Prevalence of smoking has been shown to be inversely related to socioeconomic status and social status, as indicated by education. People with less than a high school education are almost 3 times more likely than university graduates to be current smokers.[8]

In Canada, self-reported rates of cigarette smoking continue to decline for all age groups.[9] Compared with the national average of 21.7%, prevalence of current smokers in 2001 remained highest among young people: 22.5% for 15–19 year olds and 32.1% among 20–24 year olds.[9] Similarly, in the United States, between 1993 and 2000, substantial reductions in smoking prevalence were reported for all age groups except 18–24 year olds where in 2000 it remained at 31.0%,[10] well above the national average of 23.3%.[11]

Tobacco use among Aboriginal peoples has also been reported to be higher than the national average.[11–16] In 2000, the Centers for Disease Control and Prevention (CDC) in the United States reported that, among racial and ethnic groups, American Indians and Alaska natives had the highest prevalence, with 36% of Aboriginal adults using cigarettes.[11] The 1997 First Nations and Inuit Regional Health Survey reported an even higher prevalence of cigarette smoking among Canadian Aboriginal people, with 62% of First Nations and 72% of Inuit adults 20 years of age and older reporting current use.[17] Increased smoking rates among North American Aboriginal people may be due

to challenges they face related to poverty, education and employment.[17,18]

Tobacco use among Aboriginal youth is also higher than that among their non-Aboriginal counterparts.[13–18] A 1995–96 study of Canadian Aboriginal youth aged 10–14 reported 30% were current smokers, with smoking more common among females, and the proportion of smokers increasing dramatically from age 10 to 14 (from 12% to 51%).[13] Similarly, a 1993 survey of American Indian adolescents aged 13–20 years reported that 50% were current smokers.[15] Child and teen smoking rates for Dene and Inuit Canadians have been reported to be double that of their non-Aboriginal counterparts living in the Northwest Territories.[14] Over 60% of Dene and Inuit males reported smoking, as did 40% of Dene females and 77% of Inuit females. In a study examining the racial and ethnic differences among United States high school seniors,[16] 30% reported smoking in the past 30 days, with the highest rate (46%) among American Indian students.

Most data collection focuses on the most common form of tobacco use, cigarette smoking. There is an alarming absence of current Canadian statistics on smokeless tobacco (chewing or spitting tobacco, snuff or dip). The First Nations and Inuit Regional Health Survey 1997 (Canada) reported a 5% prevalence of smokeless tobacco use among Canadian First Nations and Inuit adults, with 4% reporting snuff use and 1% reporting use of chewing tobacco.[17] The national average in the United States (2001) for current smokeless tobacco use among adults aged 18 and older ranges from 1% (women) to 6% (men), with American Indians and Alaskan native men reporting the highest use at 8%.[5] Rates of smokeless tobacco use among youth have declined slightly since 1998, but this remains the third most prevalent form of tobacco use by middle school and high school students.[19,20] The U.S. National Youth Tobacco Survey (2000) reports smokeless tobacco rates for high school students at 6.6% (11.8% males,1.4% females) and middle school student use at 3.6% (5.7% males).

Aboriginal youth in the United States have higher rates of smokeless tobacco use than their non-Aboriginal counterparts; LeMaster and others[15] noted a rate of 21% among 13–20 year old Aboriginal youth of both genders. Research has also demonstrated a strong correlation between use of smokeless tobacco and cigarette smoking among Canadian middle-school students; children who report current smokeless tobacco use are very likely also to be current smokers.[21]

Experimentation with tobacco typically begins during adolescence, a time well known for the initiation of high-risk health behaviours. The highly addictive nature of nicotine makes patterns of tobacco use initiated during adolescence likely to extend well into adulthood. Studies have shown that the earlier an individual begins daily smoking, the more cigarettes they are likely to smoke and the less likely they are to quit.[22,23] With the use of smokeless tobacco beginning as early as 9–10 years of age for many[21] and most cigarette smokers starting before 18 years of age,[23] it is critical to implement early preventive strategies to discourage tobacco use among youth.

The relation between tobacco use and participation in organized sports has also been studied. Using results of the 1997 Youth Risk Behavior Survey, Melnick[20,24] reported reduced smoking rates but increased smokeless tobacco rates among high school athletes of both sexes, with 83% of female and 41% of male athletes indicating a likeliness to use smokeless tobacco.[24] Highly involved female athletes (membership on 3 or more teams) were 3 times as likely and highly involved male athletes were 64% more likely to use smokeless tobacco than their nonathletic counterparts.[24] Peretti-Watel and others[25] found smoking prevalence among youth depends on the intensity of the sport activity; heavy activity is negatively correlated with daily smoking and moderate activity negatively linked to heavy smoking. In addition, adolescents who play sports that involve a sliding motion (skiing, surfing, windsurfing, skate board, roller-blades) reported a high use of cigarettes as well as alcohol and cannabis.[25]

The purpose of this preliminary study of young Aboriginal athletes participating in contact sports was to determine the prevalence of tobacco use (smoking and chewing) and level of awareness of its effects.

## Materials and Methods

### *Study Population*

An estimated 4,000 Aboriginal youth participated at the 2002 North American Indigenous Games (NAIG) held in Winnipeg, Manitoba. As part of the program, complimentary custom mouthguards were offered to those competing in the following contact sports: boxing, tae kwon do, wrestling and field lacrosse. Unfortunately, the numbers of athletes competing in each of these sports were unavailable. All athletes, including coaches and trainers, participating in these sports were also invited to complete an optional self-administered questionnaire assessing 40 variables related to demographics, mouth protection and tobacco use. This article reports the prevalence of tobacco use and participants' desire to quit and knowledge of oral health risks associated with tobacco use.

### *Consent and Ethical Consideration*

A blanket parental consent for NAIG event programming was obtained as part of the registration process.

### *Survey Tool*

The 4-part, self-administered anonymous questionnaire included a section on demographics and a section on tobacco history. Information gathered on sports-related

***Table 1*** **Frequency distribution of age groups among male and female participants**

| | Age groups | | | |
|---|---|---|---|---|
| | Males; no. (%) | Females; no. (%) | Missing responses | No. of study participants |
| ≤ 14 | 20 (16.7) | 12 (31.6) | 1 | 33 |
| 15–18 | 55 (45.8) | 14 (36.8) | 2 | 71 |
| 19–25 | 23 (19.2) | 4 (10.5) | 0 | 27 |
| ≥ 26 | 22 (18.3) | 8 (21.1) | 2 | 32 |
| **Total** | **120** (100) | **38** (100) | **5** | **163** |

***Table 2*** **Frequency distribution of smoking rates among smokers[a]**

| Smoking rate; cigarettes/day | Smokers; no. (%) |
|---|---|
| 1–5 | 14 (70) |
| 6–10 | 2 (10) |
| 11–20 | 3 (15) |
| > 20 | 1 ( 5) |
| **Total** | **20** |

[a] *Two of the 22 respondents who reported smoking did not answer the question on smoking rates.*

mouth injuries and mouth protection is not reported in this paper. Demographic variables assessed included age, sex, location of residence, contact sport and years of involvement. Tobacco-related variables included current and past smoking history, use of chewing tobacco, frequency of tobacco use, interest in quitting and awareness of the effects of tobacco use. All tobacco history questions, with the exception of frequency of use, allowed only dichotomous responses. All questions were optional and respondents had the choice of refusing to answer any of the questions. Percentages cited are for valid responses, reflecting only the questions answered.

### *Statistical Methods and Analysis*

Data entry and analysis were performed by the authors using EpiInfo 5.0 and SPSS for Windows, release 11.0.1. Frequency distributions were used to summarize data. Potential associations between variables were assessed using chi-square and ANOVA tests.

## Results

### *Study Participants*

Completed questionnaires were obtained from 163 athletes. As shown in **Table 1**, most participants were male; the mean age of participants was 19.6 years (SD 7.4); 80% of participants were under the age of 24. Although participants originated from a wide array of states and provinces, over 80% were from Canada. Of the participants, 162 indicated which sport they were competing in: 49 were registered in boxing, 48 in tae kwon do, 49 in wrestling and 16 in field lacrosse. The mean number of years participating in one of these sports was 6.26 (SD 6.5), with males participating for significantly longer than females: 7.0 years (SD 6.9) and 4.1 years (SD 4.5), respectively ($p < 0.05$).

### *Tobacco History*

#### *Cigarette Smoking*

Twenty-two participants out of 156 (14.1%) reported current smoking. Eighteen of 21 respondents indicated a desire to quit and most smokers reported light smoking, with only one athlete smoking 21 or more cigarettes/day (**Table 2**). Past tobacco use was more common, with 58 out of 152 athletes (38.2%) reporting a history of smoking. Although neither age nor sex was associated with current smoking, older athletes were significantly more likely ($p \leq 0.05$) to have ever smoked (mean age of athletes who have smoked: 21.5 years, SD 8.0; never-smoked: 18.7 years, SD 7.2).

#### *Chewing Tobacco*

Nine athletes out of 153 (5.9%) reported current use of chewing tobacco. Of the 9 users, 6 reported daily use and 3 reported rarely using chewing or spit tobacco. There were no reports of weekly or monthly use by those surveyed. Chewing tobacco users did not differ significantly in age from non-users. There was no significant association between chewing tobacco and cigarette smoking. Similar to cigarette users, the majority of current users of chewing tobacco (6/8 or 75%) indicated a desire to quit using chewing or spit tobacco. Of all athletes surveyed, 23 out of 146 (15.8%) indicated a history of ever using chewing or spit tobacco.

### *Attitudes*

Overall, athletes were well informed about the increased oral health risks of using tobacco (**Table 3**). Most participants correctly indicated an increased risk of gum disease, tooth loss and oral cancer. Over 75% of athletes believed that tobacco use would increase the risk of social rejection. Almost a third of athletes thought chewing tobacco was less harmful than smoking.

## Discussion

The prevalence of current tobacco use (smoking, chewing or spit) was lower among this group of young Aboriginal athletes than the North American average — in fact it was less than half the reported national average for North American youth. Lower smoking rates among young athletes have been previously reported: results of a large 1997 U.S. study of high school students found that female athletes were 29% less likely and male athletes were

**Table 3 Frequency distribution of participants' awareness of the effects of tobacco use**

| Effect of tobacco use | Yes; no. (%) | No; no. (%) | No. of missing responses |
|---|---|---|---|
| Chewing/spit tobacco is less harmful than cigarette smoking | 40 (27.8) | 104 (72.2) | 19 |
| Increased risk for gum disease | 146 (97.3) | 4 (2.7) | 13 |
| Increased risk for tooth loss | 134 (91.8) | 12 (8.2) | 17 |
| Increased risk for oral cancer | 140 (94.0) | 9 (6.0) | 14 |
| Increased risk for social rejection | 110 (75.9) | 35 (24.1) | 18 |

21% less likely to be regular smokers than their nonathletic counterparts.[24]

Self-reporting questionnaires can invite distortion; thus, the participants may have reported only what they perceived would be the "best" response, perhaps not wanting to be viewed as engaging in any unhealthy activity. This convenience sample of volunteer participants drawn from athletes attending the free custom mouthguard clinic may be more focused on healthy lifestyle choices than other athletes participating in the NAIG and thus less likely to use tobacco. Perhaps Aboriginal youth who participate in organized sports enjoy a more enriched personal environment that promotes healthier choices, such as abstinence from tobacco use. Unfortunately, this survey did not gather information on such variables as socioeconomic status, education or presence of supportive family, mentors and coaches to allow further investigation.

Another possible explanation for the low tobacco use rates found in this study may be that involvement in sports may play a "protective role" in this population. Other studies have noted such a relationship; for example, the First Nations Youth Inquiry into tobacco use analyzed factors that may help protect an individual from using tobacco and found that, if involved in sports, an Aboriginal adolescent was 1.5 more resistant (CI 1.3–1.7) to smoking.[13] Participating in contact sports may encourage athletes to adopt a more healthy lifestyle or those playing sports may quickly realize that tobacco use and athletic performance are contrary to the common goal of endurance and thus hamper success at their game.

This study's findings of high reported history of tobacco use (38.2% smoking, 5.9% chewing), but low rates of current use lend some support to this hypothesis. In addition, participating in a sport may have a positive impact on current tobacco users, as the vast majority of current users among this study population are interested in quitting (85.7% smokers, 75% chewing or spit).

There is an alarming absence of current Canadian data available on smokeless tobacco use. Another challenge for those reviewing and comparing statistics on tobacco use in North America is the lack of standardized reporting methods for tobacco use prevalence among countries. Canada and the United States use different categories for age, frequency or amount of tobacco use and measures of central tendency.

North American youth are generally well informed about health issues.[7] Participants in this study were well aware of the increased oral health risks related to tobacco use, with the vast majority relating tobacco use to increased risk for gum disease, tooth loss and oral cancer. Three-quarters of the participants believed that tobacco use would increase their risk of social rejection. With today's rapidly changing policies toward no smoking in public places, it is understandable that these people might feel more isolated and risk social rejection. It is not uncommon for North American smokers to retreat from public buildings to an outdoor smoking area or to go outdoors away from family and friends. With fewer people smoking, individuals must self-ostracize to continue tobacco use habits. Smokeless tobacco use, a less visible habit in public, has not received the same attention in terms of policy changes. Without limitations on its use in public places, potential users and smokers interested in quitting may find smokeless tobacco more appealing than cigarettes.

On a less positive note, almost a third of these athletes thought that chewing tobacco is less harmful than smoking. The commonly held belief that chewing tobacco is a "safe" choice is unfortunate and of concern. Tobacco companies continue to target adolescents and young males with marketing strategies linking smokeless tobacco use with athletic performance and virility.[26] It is not uncommon for professional baseball players to be "spitting" tobacco on national television, adding further support for its use. Specific health promotion strategies must be targeted at this age group to help prevent the use of smokeless tobacco and its ensuing health hazards — nicotine addiction, oral cancer, and other mouth disorders.

Organized sport continues to enjoy increasing popularity among many North American youth. It may be possible to change tobacco use behaviour of young people by including sport programming as an integral component of intervention and prevention programs.

Given the small sample size and convenience sampling approach used in this study, these findings may not be generalizable to all young Aboriginal athletes.

## Conclusion

This study clearly demonstrates an unexpected low rate of young Aboriginal athletes using tobacco. Involvement in sports may contribute to these lower numbers. Results of this preliminary study could be useful in the development

and promotion of community-based athletic programming, particularly for Aboriginal adolescents. More studies are required to explore the positive impact of sport on tobacco use among Aboriginal youth in North America. ➧

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