# Correlates of Smokeless Tobacco Use in a Male Adolescent Population

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**Abstract:** This paper identifies the correlates of smokeless tobacco use in a sample of 1,030 males representative of 7th through 12th grade students of Dane County (Madison), Wisconsin. Variables independently associated with frequent use of smokeless tobacco were: being White; living in other than a two-parent home; performing poorly in school; smoking cigarettes; consuming beer, wine, or hard liquor; and deviant/delinquent behavior. Participation in team sports was associated with some "experimentation" with smokeless products. (*Am J Public Health* 1988; 78:61–63).

*Introduction*

The use of smokeless tobacco products (primarily moist snuff) by adolescent males has shown marked increase in recent years. Regional United States data report 8 to 36 per cent of male high school- and college-age students use smokeless tobacco products regularly.[1,2] Data indicate initiation of first use occurs at a significantly younger age than cigarette smoking.[3–5] In contrast to smoking and other substance abuse, few studies have examined the predictors and correlates of smokeless tobacco use. Onset of smokeless tobacco use is thought to be related to other substance abuse. Associations of smokeless tobacco use with previous cigarette, beer, alcohol, and marijuana use have been cited.[6,7]

In this analysis, we have identified correlates of smokeless tobacco use in a stratified randomly sampled adolescent population in Wisconsin's second most populous county.

*Methods*

In 1985, the Dane County Youth Commission (DCYC) surveyed a random sample of students grades 7 through 12 in Dane County, (Madison) Wisconsin. The survey instrument was an anonymous self-report inventory of youth needs, opinions, and behavior. Many items from the National Youth Survey[8] were included. The survey was administered in classrooms or large group settings using machine-readable answer sheets. In most cases, administration was standardized with one individual providing uniform instructions and supervision. For county-wide analyses, a stratified random sample of 2,181 surveys was chosen from a pool of approximately 9,000 surveys. The final sample was selected to assure that students from each grade in each of 16 school district would be proportionately represented. The maximum sampling error rate is ±2 per cent in the final sample of 2,181 youths from a total county population of approximately 25,000 students in grades 7 through 12. Dropouts, absentees, and institutionalized youths were not sampled.

The overall validity of the present survey was not directly assessed. However, an earlier DCYC survey using similar sampling techniques and content, conducted in 1980, yielded rates of alcohol, tobacco, and other drug use identical to those from a concurrent study of the same population.[9] A small number (0.8 per cent) of the completed surveys were rejected due to major inconsistencies and implausible response patterns. Based on item content, factor analysis, and subsequent reliability analysis, a number of problem behavior indices were created for purposes of data reduction (details available on request to author). Most problem items from which the indices were created used responses weighted from 0 (No Problem) to 5 (Very Serious Problem). These weights were added across items of similar content to create the indices. All indices yielded alpha reliability coefficients of .70 or above with the exception of general health problems (alpha=.64). These problem indices (see Table 1) are scored such that higher scores indicate greater problem severity.

The dependent variable used in this analysis is response to the category "Other Tobacco (snuff, chewing)" on a drug use checklist. Use frequencies were "Not at All" (weighted 0), "Once or Twice" (1), "1–3 Times a Month" (2), "1–3 Times a Week" (3), "4–6 Times a Week" (4), and "Daily" (5). All substance use variables were dichotomized to "None/Experimental Use" and "Occasional/Regular Use" (Table 1). For the regression analyses, the original full range of responses to all ordinal or continuous variables were used. Given the minimal level of smokeless tobacco use among females, only males were included in the regression analyses.

*Results*

Descriptive data on bivariate relations between smokeless tobacco use and other variables are summarized in Table 1. Use of smokeless tobacco was higher in the age groups of 14 or above than among 11–13 year olds. Among occasional or regular users of smokeless products, daily use (four times or more per week) increased with each age group. Whites, students living in family constellations other than two-parent homes, those with below average school performance, those reporting legal involvement, and those reporting occasional/regular use of "gateway drugs" reported occasional/regular use of smokeless tobacco more frequently than did their counterparts.

Table 2 provides the results of a multiple regression analysis. Eight variables emerge from this analysis as associated with frequency of smokeless tobacco use. These include being White (versus non-White); living situation other than two-parent household; poor school performance; higher levels of team sport participation; higher frequencies of use of smoking tobacco, beer or wine, and hard liquor; and higher scores on the deviant and delinquent behavior index. Overall, the full set of variables explained 24.6 per cent of the variance in frequency of smokeless tobacco use.

*Discussion*

As previously reported, male adolescent consumption of smokeless tobacco products in Dane County reflects national trends with regular use increasing from 9 per cent in the 7th grade to 22 per cent in the 12th grade. Daily use increases from 3 per cent in the 7th grade to 15 per cent in the 12th grade.[10] Smokeless tobacco use does not appear to be a unique negative behavior. It is associated with a number of other negative behaviors including family problems; poor

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**TABLE 1—Relations of Demographic and Behavioral Variables to Smokeless Tobacco Use**

| Variables | Smokeless Tobacco Use (% row) None/Experimental | (% row) Occasional/Regular |
|---|---|---|
| Sex | | |
| Male (n = 1030) | 74.5 | 25.5 |
| Female (n = 1136) | 96.7 | 3.3 |
| (NOTE: All subsequent analyses limited to males.) | | |
| Age Groups (years) | | |
| 11–13 | 80.6 | 19.4 (5.8 daily) |
| 14–15 | 72.0 | 28.0 (8.0 daily) |
| 16–18 | 73.4 | 26.6 (15.4 daily) |
| Race | | |
| White | 74.0 | 26.0 |
| Non-white | 80.3 | 19.7 |
| Residence | | |
| Urban/Suburban | 74.0 | 26.0 |
| Small Town/Rural | 75.6 | 24.4 |
| Living Situation | | |
| With Two Parents | 76.4 | 23.6 |
| Other | 70.2 | 29.8 |
| Parent's Education (SES Proxy) | | |
| High School or Less | 74.4 | 25.6 |
| Some College or Technical | 73.5 | 26.5 |
| College Graduate | 74.9 | 25.1 |
| Advanced Degree | 74.1 | 25.9 |
| Job Status | | |
| Not Looking | 79.9 | 20.1 |
| Looking | 68.0 | 32.0 |
| Has Job | 73.1 | 26.9 |
| School Performance | | |
| Above Average | 81.8 | 18.2 |
| Average | 71.0 | 29.0 |
| Below Average | 54.1 | 45.9 |
| Legal Involvement | | |
| None | 79.5 | 20.5 |
| Citations | 59.5 | 40.5 |
| Arrests | 66.7 | 33.3 |
| Individual Sport/Fitness Involvement | | |
| None | 73.1 | 26.9 |
| Occasional/Regular | 75.6 | 24.4 |
| Team Sport Participation | | |
| None | 76.8 | 23.2 |
| Occasional/Regular | 73.6 | 26.4 |
| Frequency of Smoking Tobacco Use | | |
| None/Experimental | 81.4 | 18.6 |
| Occasional/Regular | 49.5 | 50.5 |
| Frequency of Beer and Wine Use | | |
| None/Experimental | 89.0 | 11.0 |
| Occasional/Regular | 56.2 | 43.8 |
| Frequency of Hard Liquor Use | | |
| None/Experimental | 83.8 | 16.2 |
| Occasional/Regular | 50.3 | 49.7 |
| Frequency of Marijuana Use | | |
| None/Experimental | 80.0 | 20.0 |
| Occasional/Regular | 48.9 | 51.1 |
| Problem Behavior Indices | Mean (s.d.) | Mean (s.d.) |
| Quantity-Frequency Alcohol Use | 0.20 (0.9) | 0.62 (1.5) |
| Drug Use Index | 1.28 (3.6) | 3.96 (6.6) |
| Family Problems | 5.30 (6.7) | 7.90 (8.6) |
| School Problems | 13.9 (7.7) | 18.0 (11.0) |
| Job Problems | 3.53 (4.4) | 4.83 (6.0) |
| General Health Problems | 3.56 (4.1) | 5.03 (6.4) |
| Delinquent and Deviant Behavior | 3.49 (4.5) | 7.16 (6.0) |
| Legal Problems | 5.71 (4.6) | 7.79 (5.9) |
| Recreational Problems | 3.40 (4.2) | 4.39 (5.3) |
| Sex-Related Problems | 1.81 (3.9) | 3.90 (7.2) |
| Depression Indicator | 0.86 (1.3) | 1.08 (1.4) |
| Suicidal Ideation Indicator | 0.38 (1.0) | 0.80 (1.5) |

**TABLE 2—Multiple Regression of Frequency of Smokeless Tobacco Use on all Variables**

| Variable | Regression Coefficient | Standard Error |
|---|---|---|
| Age | −.028 | .028 |
| Race (1 = non-White) | −.377 | .161 |
| Residence (1 = rural) | −.092 | .091 |
| Living Situation (1 = not 2 parents) | .234 | .097 |
| Parent's Education (SES Proxy) | .034 | .040 |
| Job Status | .053 | .051 |
| School Performance | −.178 | .054 |
| Legal Involvement | .112 | .085 |
| Individual Sport/Fitness Involvement | −.048 | .039 |
| Team Sport Participation | .173 | .041 |
| Frequency of Smoking Tobacco Use | .129 | .035 |
| Frequency of Beer or Wine Use | .250 | .055 |
| Frequency of Hard Liquor Use | .165 | .063 |
| Frequency of Marijuana Use | .025 | .061 |
| Problem Behavior Indices | | |
| Quantity-Frequency Alcohol Use | −.055 | .057 |
| Drug Use Index | .008 | .020 |
| Family Problems | .003 | .008 |
| School Problems | .010 | .007 |
| Job Problems | .000 | .011 |
| General Health Problems | −.013 | .012 |
| Delinquent and Deviant Behavior | .029 | .013 |
| Legal Problems | −.017 | .012 |
| Recreational Problems | −.007 | .012 |
| Sex-Related Problems | .004 | .011 |
| Depression Indicator | −.023 | .039 |
| Suicidal Ideation Indicator | .033 | .048 |

$R^2 = .246$

school performance; smoking tobacco, beer or wine, and hard liquor; and deviant/delinquent behavior.

The only associated variable inconsistent with a problem behavior pattern is team sport participation. Athletic competition in society is normally judged as positive behavior although this may be a mythical association.[11] Smoking tobacco use was negatively related to team sport participation in this sample. In contrast to cigarette smoking, professional and collegiate athletes are often seen on television using smokeless tobacco during athletic competition.[12] Professional athletes have promoted smokeless tobacco products furthering the athlete-smokeless tobacco connection.

Substance use and abuse of legal and illegal drugs by adolescents have been shown to follow a progressive pattern in linear order of first use. Use of one substance is closely associated with use of another, and this pathway of progression results in a general pattern of deviant or risk-taking adolescent behavior.[13,14] Smokeless tobacco use may be considered a part of this behavior syndrome. In fact, smokeless tobacco may be a new "gateway" substance of abuse when age of first use is taken into account. The average age of first use of smokeless tobacco appears to be 10 to 11 years of age, two to three years younger than first use of cigarettes.[3,5] Exposure to nicotine from smokeless tobacco use is comparable with nicotine exposure from cigarette smoking so nicotine addiction may begin at a very early age.[15]

Smokeless tobacco use should be included in future longitudinal studies that address the question of adolescent drug use patterns.

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## American Academy of Pediatrics Endorses Catastrophic Health Insurance for Children

The American Academy of Pediatrics (AAP) recently issued a policy statement endorsing comprehensive catastrophic health insurance for children. The statement, entitled "Health Care Financing for the Child with Catastrophic Costs," published in the November issue of *Pediatrics*, sets forth recommendations that help ease the extremely high costs of catastrophic medical care for children, and also relieve the fears of parents and their families should medical disaster strike.

The goal of the catastrophic health insurance is to ensure that children receive necessary medical care without devastating their families' financial stability. AAP says the way to pay for this type of care is to share it will all parties involved—families, employers, federal and state governments, and the insurance industry. Issues addressed in the policy statement include:

- Catastrophic health expenses should relate to family income and the cost of medical care.
- Expanded Medicaid eligibility must be part of the solution.
- Benefits packages need to be restructured, making home and community-based care benefits available to chronically ill and disabled children.

The policy, written principally by AAP's Committee on Child Health Financing and Committee on Children with Disabilities, is oriented toward responsible cost containment, and recommends a case management system to ensure effective and efficient use of the health care system. Cost sharing through a coinsurance mechanism is proposed for those families who can afford some of the medical bills. Copies of the policy statement are available from the American Academy of Pediatrics, Division of Communications, 141 Northwest Point Road, P.O. Box 927, Elk Grove Village, IL 60007.