

Patterns of Smokeless Tobacco Use in a Population of High School Students

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Abstract: We assessed the prevalence of smokeless tobacco use by 901 high school students in two Arkansas communities, and identified factors associated with initiation and maintenance. Results showed that 36.7 per cent of males and 2.2 per cent of females currently used smokeless tobacco. Modal responses indicated that if smokeless tobacco was used at all, it was used with frequency on an almost daily basis. Health professionals need to monitor this phenomenon closely and take appropriate preventive actions. (*Am J Public Health* 1986; 76:190-192.)

Introduction

In contrast to the voluminous literature on the health effects of smoking, relatively little attention has been directed at smokeless tobacco, and the factors that promote its use. Sales of smokeless tobacco have increased 52 per cent in the past seven years.¹ To some people, these products seem like a "less harmful" alternative to smoking,² and an adaptation to the "macho" western image.³

Greer and Poulson found oral lesions in smokeless tobacco users whose average time of exposure was approximately 3.5 hours per day, and whose habit was 3.3 years old.⁴ Smokeless tobacco use has also been linked to suppressed immunologic response,⁵ tooth abrasions and caries,⁴ gingival inflammation,^{4,6} leukoplakia,^{4,7} decreased birth size in infants whose mothers chewed tobacco during pregnancy,⁸⁻¹⁰ cancers of the pharynx,¹¹ esophagus,¹² urinary bladder,¹³ and pancreas,¹⁴ and to multiple primary neoplastic lesions.¹⁵ A synergistic relationship between smokeless tobacco and alcohol may exist.^{2,11}

Despite the known health consequences of tobacco, "chewing" is not viewed by users as particularly dangerous, and is considered less of a "social evil" than smoking by much of the public.^{16,17} Squier declares: "Skillful television and magazine advertising featuring entertainers and sports personalities have transformed a habit previously considered dirty and unsociable into one viewed as attractive and healthful, with a strong youth appeal."¹⁸

We undertook to assess the prevalence and patterns of smokeless tobacco use in a group of high school youth in northwest Arkansas.

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TABLE 1—Patterns of Smokeless Tobacco Use Among High School Students in Northwest Arkansas

	N (%) (n = 162)
Duration of Use (years)	
<1	26 (16.0)*
1-2	35 (21.6)
2-3	26 (16.0)
3-4	22 (13.6)
4-5	28 (17.3)
>5	25 (15.4)
Frequency of Use (days/week)	
≤1	31 (18.2)
2-3	20 (11.8)
4-5	20 (11.8)
6-7	99 (58.2)
Number of Dips/Chews per Day	
1	30 (17.6)
2-3	51 (30.0)
4-5	36 (21.2)
6-7	24 (14.1)
8-9	8 (4.7)
≥10	21 (12.4)

*Percentages may not equal 100 due to rounding.

Methods

Responses to a closed-ended, 26-item inventory were obtained from 901 of approximately 1,160 eligible students in grades 10-12 in two communities of northwest Arkansas. Face validity for the instrument was assessed by three health educators with previous experience in substance abuse research and construction of health behavior inventories. A test/retest reliability procedure over a 12-day period on a separate sample of students (n = 43) produced item agreements ranging from 73 per cent to 100 per cent. Administration occurred in group settings by previously briefed homeroom teachers. Teachers read instructions to students informing them that participation was voluntary, and briefing them about research involving human subjects. No effort was made to contact students absent on the day surveys were distributed. Administration of the inventory and instructions required approximately 25 minutes per classroom.

Results

Of the 901 respondents, 439 (48.7 per cent) were males and 462 (51.3 per cent) were females. Among males, 161 (36.7 per cent) reported current smokeless tobacco use; only 10 females (2.2 per cent) reported regular use. The periods of time over which persons indicated they had used smokeless tobacco varied, and are reported in Table 1. About 46.9 per cent of users had been active for a period of two to five years. Just over 15 per cent reported use longer than five years.

TABLE 2—Prevalence of Smokeless Tobacco Use in Grades 10–12 (n = 901)

Grade Level	10		11		12	
	N	(%)	N	(%)	N	(%)
Users	45	(13.8)	68	(20.6)	58	(23.7)
Nonusers	281	(86.2)	262	(79.4)	187	(76.3)
TOTAL	326	(100.0)	330	(100.0)	245	(100.0)

TABLE 3—Selected Characteristics of Smokeless Tobacco Users Among High School Students in Northwest Arkansas

	N	(%)
<i>Primary Initiation Influence (n = 167)</i>		
Friend	87	(52.1)*
Relative other than Parent	21	(12.6)
Teacher	11	(6.6)
Coach	10	(6.0)
Parent	9	(5.4)
Television Athlete	4	(2.4)
Advertisement	1	(0.6)
Other Factors	24	(14.4)
<i>Primary Reason for Continuance (n = 146)</i>		
Relaxation	56	(38.4)*
Enjoyment	25	(17.1)
Tastes good	23	(15.8)
Friends do it	13	(8.9)
Girl/Boy friend likes it	7	(4.8)
Parent does it	2	(1.4)
Relative other than Parent	1	(0.7)
Other	17	(11.6)
<i>Smoking Status among Users (n = 170)</i>		
Yes	48	(28.2)
No	122	(71.8)
<i>Alcohol Drinking Status among Users (n = 167)</i>		
Yes	118	(70.7)
No	49	(29.3)
<i>Status with Respect to Cessation (n = 163)</i>		
Would like to quit	46	(28.2)
Would not like to quit	117	(71.8)

*Percentages may not equal 100 due to rounding.

The modal response to frequency of use (58.2 per cent) was "six to seven days per week" (Table 1). Another 23.6 per cent reported use two to five days per week. The modal response (30 per cent) to number of dips/chews per day was two to three, but 52.4 per cent reported dipping/chewing more than three times daily.

Data in Table 2 show that the proportion of users increased through the grade levels. Partitioning of the chi square term according to the protocol described by Fleiss¹⁹ revealed the source of significance to be between grades 10 and 11, and 10 and 12. Peer influence was the reason most frequently cited in students' decision to begin using smokeless tobacco (Table 3), but less of a factor in continuance (Table 3). More important self-reported factors given as

TABLE 4—Use Status and Perception of Health Effects of Smokeless Tobacco (n = 884)

	No/Little Effect		Moderate/Great Effect	
	%		%	
Users (n = 155)	35.5		64.5	
Nonusers (n = 729)	13.0		87.0	
TOTAL (n = 884)	17.0		83.0	

reasons for continuing included: relaxation (38.4 per cent), enjoyment (17.1 per cent), and good taste (15.8 per cent).

Users were queried about concurrent use of cigarettes and beverage alcohol (Table 3). There was only a modest level (28.2 per cent) of combined tobacco activity, but 70.7 per cent stated they also used alcohol periodically. Level of cigarette and alcohol use was not assessed.

Subjects' perceptions of the health consequences of dipping and chewing indicated that nonusers were more likely than users to perceive the health consequences of smokeless tobacco as at least moderate (Table 4). Only 31 per cent of the respondents could select the list of specific health consequences associated with dipping and chewing from among six options presented. There were no differences by grade or user status in recognition of these consequences.

We also asked users: "If you could, would you like to stop using smokeless tobacco?" Of the 163 users who replied, 46 (28.2 per cent) reported interest in cessation.

A comparison of these prevalence data to those collected in other geographic regions of the US is difficult because of respondent age differences and other sampling variations. An Ohio study reported 31 per cent of 7th–10th graders in a rural community to be users*; a Nebraska study revealed that 7 per cent of 7th–12th graders dipped snuff or chewed tobacco.²⁰ A report of Denver youth ages 14 to 19 indicated 10.4 per cent to use smokeless tobacco,⁴ while an investigation of high school youth in rural Colorado yielded a figure of 12.6 per cent.²¹ A survey of 7th–12th graders in a southern Wisconsin county revealed that 45 per cent of the boys and 11 per cent of the girls reported having tried chewing tobacco, and that 8 per cent of the boys were daily users.²² A Massachusetts Department of Public Health survey found that 28 per cent of the high school boys reported using smokeless tobacco at least once during the previous 12 months, and that 12 per cent had used it more often.¹ What is evident from these studies is that smokeless tobacco use cannot be defined clearly as an urban vs rural problem, or as one of regional restriction.

Discussion

Our data corroborate beliefs about the popularity of smokeless tobacco in the south, and that use among 10th–12th graders in the communities studied was primarily a male activity.

If each reported "dip" or "chew" were to be held in place for an average of one hour, the reported exposure threshold for oral lesion development could be approached.²¹ The increase in the proportion of users in the grade levels surveyed indicated that initiation still could be occurring. Consequently, the potential for a serious public health problem exists.

Unlike cigarette smoking which was a long established habit before its health consequences were determined, the consumption of smokeless tobacco products is still a developing phenomenon. In regard to this issue, a variety of health professionals are confronted with the challenge of intervening to prevent further adoption of a behavior which, at best, is esthetically displeasing to many people and which, at worst, has potentially life-threatening consequences. Health gains achieved through the decline in the prevalence

*Bonaguro J, Bonaguro EW, Smith EJ: Predictors of smokeless tobacco use. Paper presented at the 111th Annual Meeting of the American Public Health Association, Dallas, Texas, November 1983.

of cigarette smoking could be negated partially by increased use of smokeless tobacco.

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