

# Age of Initiation and Switching Patterns between Smokeless Tobacco and Cigarettes among College Students in the United States

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**Abstract:** A stratified, random, multi-stage, cluster sample of physical activity classes among 72 colleges and universities throughout the United States yielded 5,894 usable responses (males=2,888; females=3,006). Twenty-three per cent of the students who began smoking before the age of 10 were current smokers, while 61 per cent of those who began using smokeless tobacco before the age of 10 were current smokeless tobacco users. College students were more likely to switch from smokeless tobacco to cigarettes than from smoking cigarettes to smokeless tobacco. (*Am J Public Health* 1989; 79:207-208.)

## Introduction

A great deal of speculation has been focused on the age at which smokeless tobacco users initiate the habit and whether these young dippers and chewers eventually switch to cigarettes or whether the reverse pattern holds: i.e., cigarette smokers switching to smokeless tobacco. In oral testimony before the National Consensus Development Conference, Christen<sup>1</sup> and Hunter<sup>2</sup> testified that young people initiate smokeless tobacco and then switch to cigarette smoking due to the fact that, as users become older, smokeless tobacco becomes more socially unacceptable. Conversely, Glover<sup>3</sup> testified that due to the tremendous publicity surrounding the health hazards of smoking cigarettes, youthful smokers view smokeless tobacco as a safe alternative to cigarettes, and consequently choose to become dippers or chewers after initiating tobacco behavior with cigarettes.

The answers to these questions will require a longitudinal study. However, because the health consequences of tobacco (smoking or smokeless) use are profound, the following national collegiate cross-sectional study using retrospective questions was undertaken.

## Methods

Students at colleges and universities in the United States enrolling 2,000 or more undergraduates were the focus of this study. The US was stratified geographically into eight regions, with one state from each region randomly selected to represent that region:

Central: Ohio  
South Central: Oklahoma  
North Central: Minnesota  
Rocky Mountain: Colorado  
Southwest: Arizona  
Northwest: Oregon  
Northeast: Connecticut  
Southeast: South Carolina

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Thereafter, all colleges and universities in the eight states which met enrollment requirements of 2,000 or more students were contacted requesting their participation. Of the 109 schools contacted, 72 (66 per cent) chose to participate, five declined, two could not administer the questionnaire within the prescribed time, and 30 did not respond to repeated contacts.

In April 1986, at each participating college or university, random physical education activity classes were sampled; irrespective of their major, students were required to take activity classes in 67 of 72 colleges. The activity classes were randomly drawn from the most active classes (weight lifting) to the least active (bowling). The sample closely matched race and gender enrollments of each university population. The chairperson at each of the 72 participating schools was asked to survey approximately 100 subjects in a cluster of two to five classes. Several schools returned less than the 100 surveys requested, and 562 surveys were eliminated for failing to follow instructions or omitting portions of the survey.

The operational definitions for regular users were self-reports of current users using half a pouch (chewers), half a can (dippers), or half a pack (cigarettes) for more than three months. Age of initiation was defined as first age of regular use and not first experimentation.

The survey instrument, a 42-item questionnaire, contained a section soliciting demographic information followed by questions on cigarette smoking and smokeless tobacco use.<sup>4</sup> The data were checked and analyzed with the Statistical Analysis System (SAS), Version 5.

## Results

The sample consisted of approximately equal percentages of male (49 per cent; n=2,888) and female (51 per cent; n=3,006) students. Mean age was 20.8 years. Eighty-six per cent (n=5,069) were White; there were 413 Blacks (7 per cent). Approximately one-third of the subjects were freshmen with decreasing numbers of sophomores, juniors, seniors, and graduate students. One-third of the subjects came from cities with populations greater than 50,000, approximately one-fourth from cities of 30,000-50,000, and the rest in decreasing order were from smaller towns, and rural (<5,000) areas.

The overall prevalence of cigarette smoking was 14 per cent and for smokeless tobacco products 12 per cent. Females were more likely to smoke than males (16 per cent vs 13 per cent) and males were more likely to use smokeless tobacco (22 per cent vs 2 per cent). The age of initiation of tobacco use among college students did not vary a great deal by tobacco type (cigarette vs smokeless products).

Data from questions regarding the age at which college students initiated cigarettes or smokeless tobacco and whether they currently used tobacco products revealed that those who initiated cigarette smoking at an early age were less likely to be current users than early age initiators of smokeless tobacco. In contrast, there was a strong association between age of initiating smokeless tobacco and current

**TABLE 1—Age of Initiation of Tobacco Use vs Current Use of Tobacco by Gender and Tobacco Type**

Age of Initiation (years)	Currently Smoking				Currently Using Smokeless			
	N	%Male	%Female	%Total	N	%Male	%Female	%Total
<10	91	31	14	23	56	60	63	61
10–12	99	42	54	46	78	74	38	71
13–15	247	72	70	71	184	93	50	91
>15	388	84	85	85	389	91	81	90
All	825	70	69	100	707	86	87	86

smoking. Of those who initiated either habit, most began at age 16 or older (Table 1).

While most current smokeless tobacco users do not smoke, those who began using smokeless tobacco prior to the age of 13 were proportionately more likely to be current smokers than those who did so at later ages (Table 2).

Most college students who smoked, did not use smokeless tobacco; however, the likelihood of smokers starting to use smokeless tobacco decreased substantially for those students who began smoking at ages 13–15 and 16 and older when compared with those who began smoking before the age of 10 or between the ages of 10 and 12 (Table 3).

Eighteen per cent of those who had started at any age had also used smokeless tobacco. Twenty-eight per cent of those who had ever used smokeless tobacco had also smoked cigarettes regularly. Among current smokers, 15 per cent occasionally used smokeless tobacco, and among current users of smokeless tobacco, 18 per cent occasionally smoked.

### Discussion

In our survey the age of initiating tobacco use among college students did not vary a great deal by tobacco type (smokeless or smoking), contrary to two statewide studies of students grades 3 through 12 who started to use smokeless tobacco at earlier ages than cigarettes.<sup>4,5</sup> Presumably, the sudden upswing in popularity of smokeless tobacco over the past few years accounts for the difference. As the cohort of young initiators currently in elementary and secondary schools reach college level, the reported age of initiation may

**TABLE 2—Age of Initiation of Smoking and Use of Smokeless Tobacco among College Students Who Started Using Smokeless Tobacco**

Age of Initiating Smokeless (years)	Age of Initiating Smoking								Do Not Smoke	
	<10 yrs		10–12 yrs		13–15 yrs		>15 yrs			
	%	N	%	N	%	N	%	N	%	N
<10	31	18	7	4	2	1	2	1	58	33*
10–12	6	5	22	17	8	6	8	6	56	44
13–15	3	5	3	6	6	11	9	17	79	145
>15	3	12	4	16	5	19	14	54	74	287

\*Rows add to 100%

**TABLE 3—Age of Initiation of Smoking and Use of Smokeless Tobacco among College Students Who Started Smoking**

Age of Initiating Smoking (years)	Age of Initiating Smokeless								Do Not Use Smokeless	
	<10 yrs		10–12 yrs		13–15 yrs		>15 yrs			
	%	N	%	N	%	N	%	N	%	N
<10	15	14	4	4	4	4	9	8	68	62
10–12	3	3	14	14	4	4	12	12	67	66
13–15	0	1	2	5	4	10	6	15	88	215
>15	0	1	1	4	3	12	11	43	85	328

\*Row adds to 100%

change. However, since educational level influences smoking, perhaps these two distinct populations (college vs secondary or elementary) will continue to show differing patterns of use regarding smokeless tobacco.

The smoking data on age of initiation of cigarettes and its relation to current smoking were also contrary to previous research which showed that smokers who initiated smoking earlier were more likely to continue smoking.<sup>6</sup> There is no ready explanation for this discrepancy. However, at the time of this data collection smokeless tobacco was very popular and this, as well as the nature of our sample, may have influenced our findings.

The 1986 Surgeon General's Report<sup>7</sup> and the 1986 Consensus Development Conference<sup>8</sup> were concerned that youngsters were turning to snuff and chewing tobacco as an alternative to cigarette smoking. While this may hold true for younger age groups, our data from college students suggest the switch was from smokeless tobacco to cigarettes. Moreover, most of the persons we surveyed will secure white collar jobs, where smokeless tobacco is not socially acceptable. No effort was made to validate self-reports; since we were interested in switching patterns, validating self-reports may have been less important.

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