

Cigarette Smoking Patterns Among Students Attending a Christian University in Seoul, Korea

Tai Keun Park

*Department of Preventive Medicine, Yonsei University College of Medicine
Seoul, Korea*

To get an estimates of the prevalence of cigarette smoking and the attitudes of the students regarding smoking, questionnaire survey was conducted with 856 students from each class out of 4 different years. Overall, 68.5 percent of male students interviewed were current smokers, as opposed to 7.4 percent of the women students. Most students started smoking before age 20 and smoked only filter-tip cigarettes. Even about half of current smokers consumed not more than 10 cigarettes daily, 55 percent of current smokers inhaled smoke into the chest. Cigarette smokers had a greater prevalence of phlegm production, related to their daily cigarette consumption and a higher average number of bed disability days. Most of the exsmokers stated that they had given up smoking because they feel sick when smoking. The decision to smoke seems mainly depends on a desire to follow the peer group attitudes. With regard to diffusion among college students and probably all high school graduates, a more logically designed prospective study would be necessary.

Key Words: Smoking patterns

The WHO Expert Committee on cigarette smoking stated, "Smoking related diseases are such important causes of disability and premature death in developed countries that the control of cigarette smoking could do more to improve health and prolong life in these countries than any other single action in the whole field of preventive medicine" (WHO Expert Committee 1975).

It is well known that cigarette smoking in

a widespread health hazard. Recently, diseases related to smoking are on the increase in Korea. Cancer of the lung, coronary heart disease, chronic bronchitis and other respiratory diseases are considered as smoking-related and have become common health problems. In the opposite way, the decrease in chronic cough after quitting smoking corresponds to what has been frequently reported in the past. Little information exists about the effects of cessation on the other symptoms regarded as smoking-related (Weiss *et al.* 1963).

In the study in Denmark on heavy smokers and nonsmokers, the mean birth weight of

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nonsmoker's babies was 3695 gm compared with 3355 gm of those of the heavy smokers, a difference of 350 gm. The mean weight of placentas of nonsmokers was 783 gm compared with 660 gm among heavy smokers, a difference of 123 gm (Asmussen I *et al.*, 1975, Asmussen I 1979, Asmussen I 1980).

In a recent study in rural Korea, the percentage of male smokers was 84.8 and that of females was 30.7. The mean age when male smokers started regular smoking was under 20 (Kang PS *et al.*, 1980).

One study in Japan reported that the percentage of adult male smokers declined from an estimated 83.7 percent in 1966 to an estimated 73.1 percent in 1979. The percentage of adult female smokers has been much lower, but it decreased from 18.0 percent in 1966 to 15.4 percent in 1979. Those changes mainly reflected a decrease in older smokers. The percentage of current regular smokers in the 20-29 year group in both sexes showed an increase, particularly in females, because of widespread smoking among Japanese teen agers (Hayashi T. 1980).

More and more people, including current smokers, are becoming aware of increasing deaths due to smoking related diseases, especially lung cancer. Hayashi reported that the total amount of cigarette consumption was about 100-110 billion in 1960, and this increased to more than 300 billion in 1980, about 3 times higher than that in 1960 in Japan.

The objectives of this study were

- 1) to get an estimate of the prevalence of cigarette smoking among university students,
- 2) to analyse the attitudes of the students regarding smoking
- 3) to know the correlations between cigarette smoking patterns with some morbidity features and
- 4) to help in providing baseline data for planning and for evaluating the anti-smoking program.

METHODOLOGY

The cluster class selection was done to assure adequate distribution of age, grade and other classifications of students. Student from each year out of 2 departments were selected. This sample included student from 18-29 years of age out of the 4 different years, however it may not be representative for all students. The total number of students in this sampling was 856. The size of the sample was based on an anticipated smoking prevalence of 65 percent, with an acceptable standard error of 1.25 within 95 per cent confidence limits. Eighty seven questionnaires with incomplete answers and forty one with unclear answers or lies were excluded, and 728 questionnaires were analyzed for tabulation. From the data, 24.2 per cent of the students were women and 60 per cent of the total number were born in large cities and 15.5 per cent from the rural area.

RESULTS

1) Prevalence of cigarette smoking

We can see from Table 1 that the prevalence of current cigarette smoking was found to be increased as the age of the students increased. The prevalence of current smoking was highest among the oldest age group, senior students, male students and the students who were born in cities. The prevalence of former smokers also seems to be increased slightly as the age and grade of the students increased. Overall, 68.5% of male students interviewed were current cigarette smokers, as opposed to 7.4 percent of the women students.

2) Age when smoking started.

Table 2 shows that the percentage of onset of cigarette smoking was markedly high at

Table 1. Percentages of current smokers, former smokers and non-smokers

variables		Total (%)	Current smokers	Former smokers	Non-smokers
Age	19 or lower	85(11.7)	42(49.4)	3(3.5)	40(47.1)
	20	135(18.5)	69(51.1)	8(5.9)	58(43.0)
	21	165(22.7)	83(50.3)	9(5.5)	73(44.2)
	22	146(20.1)	76(52.1)	11(7.5)	59(40.4)
	23	63(8.7)	35(55.5)	6(9.5)	22(34.9)
	24	48(6.6)	28(58.3)	4(8.3)	16(33.3)
	25 or more	84(11.5)	56(66.7)	7(8.3)	21(25.0)
	unknown	2(0.2)	2(100.0)	—	—
Sex	Male	552(75.8)	378(68.5)	43(7.8)	131(23.7)
	Female	176(24.2)	13(7.4)	5(2.8)	158(89.7)
place of birth	large city	437(60.0)	215(49.2)	22(5.0)	200(45.8)
	urban	176(24.0)	109(61.9)	12(6.8)	55(31.3)
	rural	113(15.5)	66(58.4)	13(11.5)	34(30.1)
	unknown	2(0.3)	1(50.0)	1(50.0)	—
Grade	Freshmen	165(22.7)	62(37.6)	6(3.6)	97(58.8)
	Sophomore	218(29.9)	118(53.0)	11(5.0)	89(40.8)
	Junior	146(20.1)	88(60.3)	13(8.9)	45(30.8)
	Senior	199(27.3)	123(61.8)	18(9.0)	58(29.1)
Total		728(100.0)	391(53.7)	48(6.6)	289(39.7)

Table 2. Age when regular smoking began

Age	Current smoker			Former smoker		
	No.	(%)	(Cum.%)	No.	(%)	(Cum.%)
15 or earlier	1	(0.3)	(0.3)	—		
16	5	(1.3)	(1.6)	—		
17	15	(3.8)	(5.4)	8	(16.7)	(16.7)
18	112	(28.6)	(34.0)	11	(22.9)	(39.6)
19	183	(46.8)	(80.8)	18	(37.5)	(77.1)
20 or later	75	(19.2)	(100.0)	11	(22.9)	(100.0)

18-19 years of age. More than 80 per cent started smoking before age 20.

3) Number of cigarettes smoked.

More than 95 per cent of current smokers smoked only filter-tip cigarettes, and this is proportionate with the percentages of the types of cigarettes sold on the market in the

Seoul area. From table 3, we can see that 47 per cent of current smokers consumed not more than 10 cigarettes daily and 8.2 per cent consumed more than 20 cigarettes (1 package) daily. The proportion of former smokers who smoked not more than 10 cigarettes was much higher than that of cur

Table 3. Smoking practices of current and former smokers interviewed, including average daily cigarette consumption and tendency to inhale

	() : %
Total	
	Current smoker 391(53.7)
	Former smoker 48(6.6)
Average no. of cigarettes smoked	
1) 1 – 5/d	74(18.9)
2) 6 – 10/d	109(27.9)
3) 11 – 15/d	84(21.5)
4) 16 – 20/d	92(23.5)
5) more than 20/d	32(8.2)
degree of inhalation	
1) into the mouth only	18(4.6)
2) into the throat	158(40.4)
3) into the chest	215(55.0)

Table 4. Chest symptoms reported by the students interviewed

symptoms	Current smokers (%)	Former smokers (%)	Non-smokers (%)
Cough usually as follows			
Early in the morning	133(34.0)	15(31.3)	46(16.0)
during daytime	43(10.9)	4(8.3)	12(4.2)
during nighttime	78(19.9)	9(18.8)	39(13.5)
no cough	180(46.0)	26(54.2)	197(68.2)
Phlegm usual as follows			
Early in the morning	102(26.1)	11(22.9)	58(20.1)
During daytime	47(12.0)	7(14.6)	6(2.1)
At night	52(13.2)	5(10.4)	21(7.3)
No phlegm	206(52.7)	29(60.4)	208(72.0)
Shortness of breath			
While hurrying or walking up-hill	116(29.7)	12(25.0)	67(23.2)
While walking with same aged friends	21(5.4)	2(4.2)	2(0.7)
While walking at own pace on ground level	4(1.0)	—	
No dyspnea	250(63.9)	34(70.8)	220(76.1)
Total	391	48	289

rent smokers.

Among the current smokers interviewed, 55

per cent answered that they inhaled smoke into the chest and 40.4 per cent inhaled only into

the throat. The former smokers showed the tendency that they inhaled smoke more superficially, mostly into the throat or mouth only.

4) Chest symptoms

This study was not designed to prove the relationships between smoking and illness or disability pattern. Since it is quite natural to think that the smoking could develop some chest symptoms and chest diseases in long period, I just asked about the present subjective symptoms. The questionnaire included several items about the number of days per year that students were absent from college or were confined to their beds. The numbers in table 4 signifies the number of episodes, not the number of students. Early morning cough was reported twice of often by current smokers than by nonsmokers, but the reported rate of early morning phlegm was not very different between the two groups. The proportion of those with shortness of breath while walking with friends of the same age and at their own pace on ground level was much higher among current smokers

5) Restrictions of normal activities

Theoretically, I propose the risk ratios of bed disability days for current smokers and former smokers.

The ratios are defined as follows:

risk ratio of current smoker

$$\frac{\text{no. of bed disability days of current smoker}}{\text{no. of bed disability days of non-smoker}}$$

The average number of bed disability days was 1.14. Among current smokers, the risk will be increased 2.1 times if the current smokers have a cough. The risk ratio of current smokers was 1.99 if they had a cough and 1.20 if not. In case of dyspnea, the risk ratio for the current smoker was 3.32. On the average, the days of restricted activity reported for current smokers exceeded the days reported for never smokers.

Current smokers reported staying in bed a little bit more often than non-smokers as a result of sickness. This trend was pronounced when current smokers had dyspnea. Current smokers also spent more time absent from college than nonsmokers.

Table 5. Days current smokers and non-smokers spent in bed or were absent from school, per-year

Symptoms		Current smoker (days)	Never smoked (days)	Former smoker (days)	Ratio	
					current smoker	former smoker
Cough	no	1.24	1.03	1.05	1.20	1.02
	yes	2.61	1.31	1.05	1.20	1.02
Phlegm	no	1.19	1.08	1.11	1.10	1.03
	yes	2.53	1.40	1.42	1.81	1.01
Dyspnea	no	1.23	1.08	1.10	1.14	1.02
	yes	3.72	1.12	3.20	3.32	2.86
Ratio	cough	2.10	1.27	1.34	1.65	1.06
	phlegm	2.13	1.30	1.28	1.64	0.98
	dyspnea	3.02	1.04	2.91	2.90	2.80

Table 6. Reasons cited by current and former smokers for starting to smoke regularly (age adjusted) by age at beginning

Reasons for starting to smoke	17 or earlier	18	19	20 or later	Total
smoking by close relatives	—	2(1.6)	6(3.0)	8(9.3)	16(3.6)
imitation of peer group	10(34.5)	94(76.4)	111(55.2)	49(57.0)	264(60.1)
sense of increased masculinity	7(24.1)	5(4.1)	25(12.4)	12(14.0)	49(11.2)
sense of greater personal attractiveness	6(20.7)	5(4.1)	16(8.0)	5(5.8)	32(7.2)
others, not clear	6(20.7)	17(13.8)	43(21.4)	12(14.0)	78(17.8)
Total	29(6.6)	123(28.0)	201(45.8)	86(19.6)	439

Table 7. Reasons cited by nonsmokers for never smoking and reasons cited by former smokers for giving up smoking

Reasons	Freshmen	Sophomore	Junior	Senior	Total
Reasons for giving up smoking					
family influence	1(16.7)	—	—	—	1(2.1)
medical advice	—	2(18.2)	2(15.4)	5(27.8)	9(18.8)
felt sick	1(16.7)	1(9.1)	—	—	2(4.2)
reduced capacity for work	—	—	—	1(5.6)	1(2.1)
others, not clear	4(66.7)	8(72.7)	11(84.6)	12(66.7)	35(72.9)
Total	6(12.5)	11(22.9)	13(27.1)	18(37.5)	48
Reasons for never having smoked					
family influence	6(6.2)	4(4.5)	3(6.7)	4(6.9)	17(5.9)
health	12(12.4)	9(10.1)	7(15.6)	11(19.0)	39(13.5)
unfeminine	7(7.2)	6(6.7)	4(8.9)	8(13.8)	25(8.7)
disliked smoking	19(19.6)	14(15.7)	6(13.3)	7(12.1)	46(15.9)
others, not clear	53(54.6)	56(62.9)	25(55.6)	28(48.3)	162(56.1)
Total	97(33.6)	89(30.8)	45(15.6)	58(20.1)	289

6) Motivating reasons

It is sometimes difficult to clearly point out the main reason for the starting of cigarette smoking. For some students, cigarette smoking was thought as natural, spontaneous or in some part due to the job for male adults. The questionnaire included some questions as to why the habit of smoking cigarettes was or was not acquired and why in some cases it was later stopped. Imitation of peer group behavior

seemed to be the predominant reason for starting to smoke at 60.1 percent and this went to 76.4 percent for the students who started smoking at 18 yrs of age. Some students reported that they were compulsorily recommended by peers against their desire. A sense of increased masculinity was listed by 11.2 percent of the students and a sense of greater personal attractiveness by 7.2 percent.

Regarding the reasons for giving up smoking,

from table 7, we can see that medical advice not to smoke was the reason most frequently reported by students, especially senior students. Feeling sick when smoking cigarettes was the next common reason. For the freshmen, family influences and feeling sick played some important role. But totally the family pressures, the feeling of reduced capacity for work or the expensive cost of cigarettes appear to have played very minor roles. About the reasons for never having smoked, family pressure seems to be a meaningful factor for nonsmokers. Dislike of smoking and concern about health played a primary role in 15.9 percent and 13.5 percent. Concern about health regarding smoking seems to increase as the college grade increases. Korean cultures or customs that women cannot smoke in the public seems to be prevailing very strongly in our college atmosphere, because 8.7 percent of students which is over one third of the women students reported they never have smoked just because they were women.

If the percentages of current and former smokers at each age when they began smoking cigarettes are known, the approximate rate of propagation of the habit can be assessed. Figure 1 shows that there was a rapid rate of diffusion among college students from the start of college.

DISCUSSION

C.L. Williams suggested that adolescents can report accurately on their smoking status if sufficient assurance of confidentiality is stressed. And he measured plasma cotinine levels in 137 students, ages 14 to 17 years, as an independent validation of self-reported cigarette smoking status. Ninety five percent of the students who reported daily cigarette smoking had detectable cotinine levels. In contrast,

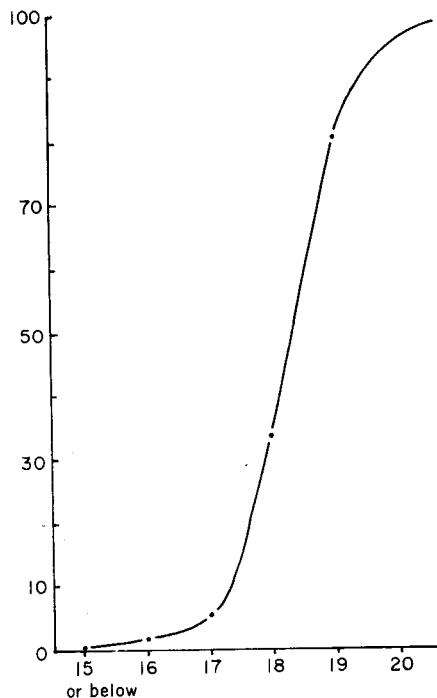


Fig. 1. Age of current and former smokers when they began smoking; (cumulative percentages)

only 2 percent of students who reported that they never smoke cigarettes had detectable levels of plasma cotinine. This implies that questionnaire style survey can get very reliable answers if assurance of confidentiality and unique purpose for baseline study are emphasized.

To determine the chest symptoms, four questions on common respiratory symptoms were answered;

1. Do you bring up phlegm from your chest first thing in the morning during all seasons.
2. Do you get shortness of breath walking with people of your own age on the level ground?
3. Does your chest sound wheezy or whistling on most days (or nights)?
4. Does weather affect your breathing?

A smoking history was taken from all students. A questionnaire included the items about

the age at which smokers and exsmokers started smoking, the duration of smoking, estimated total amount of cigarettes smoked.

A survey of first and second year medical students at Saint Louis University revealed that only 6 percent were current cigarette smokers. This represents a continuation of a downward trend in the percentage of smokers among American medical students as reported in earlier independent surveys (Coe RM *et al.*, 1980).

Previous epidemiologic studies on smoking showed that smokers of low tar/nicotine(T/N) cigarettes had lower mortality rates from total death, coronary heart disease and lung cancer than those who smoked high T/N cigarettes (Hammond EC *et al.*, 1976).

Dr. Oscar Averbach and his colleagues studied the pathologic changes in the tracheobronchial epithelium of 211 men who died in 1955-1960, compared to the changes in 234 men who died between 1970-1977 to confirm the relationship between concentration of T/N in cigarette and lung cancer. Since the content of T/N in cigarette declined in states during the period of 1970's, the smokers in the 1970's had to have smoked cigarettes lower in T/N during the last 10-15 years of their lives than the men who died in the late 1950s (Averbach O *et al.*, 1979). But one more important thing to remember is that the number of cigarettes smoked per day was more important than their T/N content. Smokers of fewer than 20 high T/N cigarettes had lower death rates than those who smoked 1-2 packs of low T/N cigarettes. Students usually remember the number of cigarettes smoked by packs. They reported 1 pack a day or 2 pack in 3 days, which could be easily translated into the number of cigarettes.

Smokers who switch to cigarettes with low Tar and Nicotine usually increase the number they smoke, so there has been great debate

with controversial opinions whether to decrease or maintain the tar and nicotine level in cigarettes. Of the smokers who smoked in 1959 and in 1972, 29 percent of men who increased the T/N level in the cigarettes they smoked increased the number of cigarettes they smoked per day. Among those who smoked cigarettes with decreased T/N levels, 31.5 percent increased the number they smoked per day. (Garfinkel L. 1979) The most important effect of switching to low T/N cigarettes is that it appears to make quitting easier.

It is easy to imagine that a decrease in exposure to cigarette smoke attributable to massive numbers of people quitting smoking, or smoking cigarettes with lower T/N, resulting in less damage to the lungs as shown in recent autopsy studies, will lead to a leveling off and a drop in lung cancer rates in men.

L. Garfinkel stated quite a different study result in that nicotine dependency plays a minor role in determining the smoking habits of those who continue to smoke on a long-term basis. During his 13-year study period, 59 percent of 28,561 smokers used cigarettes with lower T/N levels without changing the number of cigarettes smoked to any important extent. On the other hand, more than 54 percent of the "less than one pack a day" smokers as compared to only 25 percent of the "one pack or more a day" smokers increased the number of cigarettes smoked. (Garfinkel L 1979)

Cigarette smokers had a greater prevalence of phlegm production, related to their daily cigarette consumption; dyspnea was equally common in smokers and nonsmokers.

High-tar cigarette smokers had a higher prevalence of phlegm production than low tar smokers. However, the number of cigarettes was important, since the advantage of smoking low-tar cigarettes was almost lost with more than 20 per day. Among asymptomatic men,

it was revealed that there was more airflow obstruction in smokers than in nonsmokers directly related to cigarette consumption. (Mueller RE 1971) Oversecretion of mucus from tracheobronchial epithelium and obstruction of airways are well known as common chronic lung disorders. Once these disorders develop, there is a steady decline in lung function with or without respiratory symptoms. However most of these disorders are known to be irreversible disabilities. (Burrows B. 1969)

Because of a change from plain to filtered brands and to a general decline in tar yield and because there are more ex-smokers, the absolute number of smokers increases very rapidly. Then the problem lies in how many will quit smoking and how many people will increase the number of cigarettes smoked when the tar yield decreases in each cigarette. In the Seoul area, most students smoke only filtered cigarettes with a high tar and nicotine content.

In the umbilical arteries of smokers there was pronounced thickening of the basement membrane. Smokers placentas were more fibrotic and less flexible than those of non-smokers. The severe structural changes found in the umbilical artery and the fetal capillaries in the placenta were also present in the umbilical veins. Such severe changes both in vessels directing blood to the child, as well as in vessels leading blood away from the child, must also exist within the child. This may lead to vascular-related disease later in the lives of children born to smokers. Such changes seem to be irreversible according to study performed of women who ceased smoking after the third to seventh months of pregnancy (Asmussen I *et al.* 1980).

Most of the exsmokers stated that they had given up smoking because they feel sick when smoking. With regard to diffusion among college students and probably all high school graduates and because of maintenance of a high smoking

prevalence, a more logically designed prospective type study would be necessary from now on. However, lacking periodic surveys of the level of smoking prevalence in the population, I can use the average consumption of cigarettes per student. Still I feel that more sensitive and specific indicators to determine community diffusion of smoking are necessary.

Among the commonly cited factors which influence the processes of diffusion and maintenance, Joly DJ(1975) said that the most notable are; norms of behavior prevailing in different sectors of the community, demographic and socioeconomic characteristics of the individuals involved, commercial advertising, industrial pressures, antismoking campaigns and government policies regarding manufacture and sale. In addition, psychological rewards and nicotine addiction play a substantial role in the persistence of cigarette smoking.

Data shown from this study suggests that the decision to smoke mainly depends on a desire to follow the peer group attitudes. The continuation of the smoking habit depends mainly upon the prevailing patterns of behavior which make cigarette smoking of college students socially acceptable.

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