

Differential Characteristics of Adolescent Smokers and Non-Smokers

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This survey concerning adolescent smoking behavior includes an 82 percent sample of the entire 8th and 11th grades of a rural school. A relatively high incidence of smoking is noted when compared with national statistics. No differences between smokers and non-smokers were found with respect to knowledge of smoking effects, athletic self-perception, or exposure to the smoking behavior of teachers, physicians, dentists, or clergy. Significant differences were found with respect to exposure to the smoking behavior of parents, siblings, and peers. A significant association between smoking males and depression was noted. Efforts are in process to decrease peer smoking exposure by altering school policy. It is predicted that success in decreasing opportunities for exposure will result in a lower incidence of smoking in this population.

Smoking is a common form of drug and health abuse.^{1,2} The prevalence of smoking in the United States has decreased except among teenage girls.³ Efforts to induce the smoker to "kick the habit" have involved behavioral modification and educational programs.⁴⁻⁷ The success rates at one year follow-up have not been favorable, usually less than 20 percent,^{4,6} even though it appears that personal health can be improved.⁸ The prevention of new habits would be a reasonable approach to decrease the prevalence of smoking.

Studies have investigated behavioral, environmental, and constitutional differences between smokers and non-smokers.⁹⁻¹² It was hypothesized

that there are differences between smoking and non-smoking adolescents and that the characteristics of non-smokers could be promoted and those of smokers minimized to lessen the likelihood of a non-smoker initiating the habit. It was presumed that the development of a smoking habit is most likely to occur during adolescence. Therefore it was considered worthwhile to describe characteristics of an adolescent population with respect to smoking behavior. Smokers and non-smokers were characterized as to age, sex, knowledge of smoking effects, exposure to other smokers and non-smokers, depression, and athletic self-image.

Methods

The entire 8th and 11th grade classes in a rural consolidated school district on the northeastern border of Pennsylvania was the sample population. The Health Systems Agency for this area

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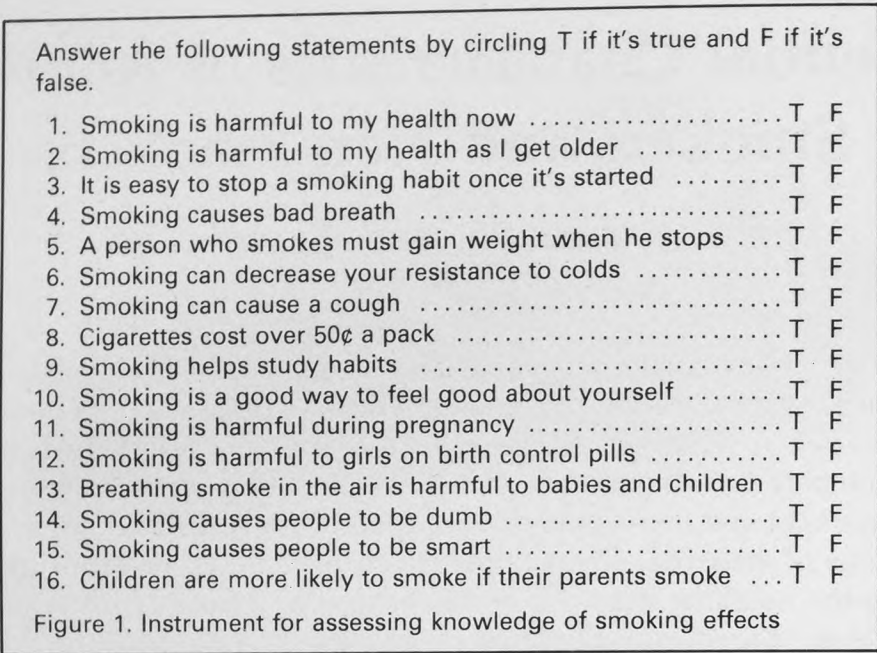


Table 1. Study Population by Age

Age (years)	Number in Study	Percent of Total Population
13	49	21.4
14	45	19.7
15	12	5.2
16	60	26.2
17	54	23.6
18	7	3.1
19	2	0.9
Totals	229	100

(county) has noted an unusually high mortality rate from respiratory diseases. The majority of students come from middle and lower-middle class families, and practically all are Caucasian. The health education portion of the school curriculum is taught only in these grades. The school permits smoking, with parental permission, in a designated area located outside the school building.

In April 1978, a survey questionnaire was administered on a specific date and time to the sample population. There was no attempt to identify respondents, nor was there any follow-up on non-respondents or absentees. The survey instrument asked each respondent to categorize themselves as a daily smoker, occasional smoker, or non-smoker. The instrument defined smoking as the use of "any smoking tobacco." Exposure to smoking behavior of significant others was addressed by the respondents' knowledge of their smoking habits. A response of "I don't know" was interpreted as "no" exposure to smoking by that significant other. In cases where both a "yes" and a "no" were checked, it was considered as a "yes" response. Knowledge of smoking effects was scored as the number of correct answers on the Knowledge Test (Figure 1). Depression was assessed by the score on the Beck Depression Survey. For purpose of analysis, scores were grouped as "not depressed" (0-4) and "depressed" (5 and greater). Whether or not the respondents thought of themselves as "athletic" was asked on a single true/false question. Analysis of the data was by chi-square with Yates correc-

Table 2. Smoking Behavior of Significant Others Correlated with Smoking Behavior by Teens

	All Teens	Males	Females
Parent or guardian	P<.001	NS	P<.001
Sibling	P<.001	P<.001	P<.001
Friend	P<.001	P<.01	P<.001
Teacher	NS	NS	NS
Doctor	NS	NS	NS
Dentist	NS	NS	NS
Clergy	NS	NS	NS

NS=No significant difference for P≤.05

tion factor, except the knowledge scores which were analyzed by t test.

Results

There were a total of 280 students enrolled in the grades surveyed. Of this number 232 questionnaires were returned and 229 were sufficiently complete for analysis (82 percent sample). Table 1 indicates the age distribution of the sample population. Respondents aged 13-14 years accounted for 41 percent of total returns and 33 percent classified themselves as smokers (either daily or occasional smoking). Of the respondents aged 16-17 years (50 percent of total response), 67 percent classified themselves as smokers. This represents a significant difference (P<.01) in smoking behavior based on age. The sample population included 109 (48 percent) males and 119 (52 percent) females. Thirty-five percent of the females admitted to occasional or daily smoking while 27 percent of the males categorized themselves in this manner. This does not represent a significant difference on the basis of sex. The highest possible score on the Knowledge Test was 16 and both non-smokers and smokers scored high with averages of 14 and 13, respectively. There was no significant difference in knowledge of smoking effects according to this instrument.

Teen smokers and non-smokers were compared with respect to their exposure to (knowledge of) the smoking habits of significant others (parents, siblings, friends, teachers, physicians, dentists,

clergy). The statistical comparisons were made by using two by two chi-square frequency distributions. For example, 76 percent (112/147) of teen non-smokers indicated that they have a friend who smokes and 24 percent indicated that they have no friends who smoke (35/147). On the other hand, 100 percent of the teen smokers indicated that they have a friend who smokes (62/62). This reveals a significant association between the smoking behaviors of the respondents and their exposures to the smoking behaviors of their friends (P<.001). Table 2 summarizes the results of the same analytic approach with respect to other individuals who might be expected to influence smoking behavior of teens. The items which show significant correlations (P≤.05) link teens who smoke with exposure to the significant others who smoke as well as teens who do not smoke with exposure to significant others who do not smoke. The majority of respondents (65 percent) indicated that their teacher smoked. Most respondents indicated no knowledge about the smoking behaviors of physicians (74 percent), dentists (76 percent), or clergy (48 percent).

Regarding the question of athletic self-perception, there was no difference between the groups. Sixty-four percent of the non-smokers and 60 percent of the smokers revealed a positive image.

The Beck Depression Survey revealed a significant correlation between depression and teen male smokers and the absence of depression in teen

male non-smokers ($P < .02$). There was no significant correlation between smoking behavior and depression for females.

Discussion

The age distribution of the sample population was bimodal with 41 percent of the students aged 13 to 14 and 50 percent aged 16 to 17 years. Where the comparisons include all ages and both sexes, the results are somewhat skewed to reflect the characteristics of older adolescent females.

The incidence of smoking (31 percent), in this study, is nearly double the national average for adolescents (16 percent) and is closer to the reported levels for adult males (39 percent) and females (29 percent). In this study female smokers outnumbered males (35 percent vs 27 percent) while nationally no difference is observed.³ Both smokers and non-smokers were knowledgeable about adverse effects and other facts about smoking. This may be related to the fact that both grades had received health education during the months immediately preceding this survey. The incidence of smoking before and after health education was not assessed, but it may be concluded that the smokers smoke despite an awareness of the negative effects.

The data indicate that smoking teens had a significantly greater exposure to smoking siblings and friends. This is true for both males and females and agrees with other reports.³ Exposure to the smoking habits of a parent or guardian was significantly associated with the smoking behavior of females but not of males. The habits of authority figures (teachers, physicians, dentists, clergy) had no correlation with the smoking behavior of the teenagers. Most teens indicated no knowledge of the smoking behavior of these others and this may account for the lack of correlation. Logically any attempt to decrease the development of new smokers among adolescents would need to deal with decreasing their exposure to other smokers.

Depression among the smoking teens was significant only in males. Further investigation into the causes of depression and correlation with the extent of the smoking habit may be useful. Improved mental health among teens might be helpful in decreasing dependence on smoking.

Athletic self-perception, as assessed by this study, is unrelated to whether or not these adoles-

cents smoke. However, it may be invalid to assess one's athletic self-perception on the basis of a single true/false question.

Conclusion

This study indicates that adolescents who smoke are likely to have a parent, sibling, or friend who smokes and conversely, those who do not smoke are more likely to have a parent, friend, or sibling who does not smoke. There is no correlation in this study between the smoking behavior of authority figures and smoking behavior of adolescents. Likewise, there is no correlation in this study between athletic self-perception and smoking behavior. Depression is only significantly associated with male adolescents who smoke, and knowledge of smoking effects has no correlation with adolescent smoking behavior on the basis of this survey.

Plans are underway to revise the school's policy regarding smoking by adolescents on school property. It is expected that by decreasing opportunities for peer exposure to smoking, the overall incidence of smoking will decrease. A similar study will be done after the new policies take effect.

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