[원저]

청소년 흡연의 영향 요인

이 홍 자

대구한의대학교 간호학과

- 요 약 -

연구배경 금연 운동이 확산되고 있음에도 불구하고 청소년 흡연이 심각한 수준으로 증가하고 있으며 청소년의 흡연은 성인기 이후의 생활습관으로 형성되어 고혈압, 폐암 등 만성질환의 원인으로 밝혀지고 있다. 청소년 금연교육을 위한 기초자료를 제공하기 위하여 고등학생을 대상으로 청소년의 흡연 경험 및 흡연의도에 영향을 미치는 요인을 분석하고자 하였다.

방 법 조사대상자는 H군에 위치한 5개 고등학교에 재학 중인 학생 전수로서 자기기입식 설문지를 이용하여 조사하였다. 2003년 8월 1일부터 11월 30일까지 자료 수집을 하였으며, 최종 1,167명의 설문지를 통계처리 하였다. 빈도와 백분율, t-test, chi-square test, Pearson's correlation 분석을 하였다.

결 과 대상자의 흡연율은 남자 17.0%, 여자 2.2%이었다. 성별, 학년, 종교, 어머니의 흡연, 형제의 흡연, 친구의 흡연 및 음주 경험에 따라 흡연 경험의 정도에는 유의한 차이를 보였다. 흡연경험에 강한 상관관계를 보인 것은 흡연 의도로 나타났고, 흡연지식, 자기효능 및 자존감 등은 약한 상관관계를 보였다.

결 론 본 연구 결과에서 남학생들은 여전히 높은 흡연율을 보이고 있다. 남학생을 대상으로 하여 흡연을 시도하기 전 빠른 시기에 금연교육프로그램을 실시하는 것이 필요하다. 금연교육의 효과를 높이기 위하여 교육 대상에 흡연학생 및 그들의 부모, 형제, 흡연을 하는 친구를 포함시켜야 하며, 음주의 유해성을 교육내용에 포함시키고, 자존감 향상 프로그램을 병행하는 것이 효과가 있을 것이라고 사료된다. (대한임상건강증진학회지 2007;7(4):229~237)

중심단어 청소년, 흡연, 자존감, 자기효능

INTRODUCTION

Increased attention has recently been paid to the escalation of smoking rates among adolescents. The increase in the number of adolescent smokers is alarming given that individuals experience crucial biological and social changes that influence their health behaviors during adolescent years, and the experience individuals have at this time is highly likely to remain as a habit in their lifetime. Moreover, cigarette smoking can be even more harmful to adolescents because their bodies have not developed completely.[2)]

• 교신저자 : **이 홍 자** 대구한의대학교 간호학과
• 주 소 : 대구 수성구 상동 165번지
• 전 화 : 053-770-2289
• E-mail : leehj57@hanmail.net
• 접 수 일 : 2007년 10월 29일 • 채 택 일 : 2007년 12월 14일

Despite the fact that many adverse effects of smoking have been known to the public for years, smoking rates have continuously increased among high school students in South Korea (Korea, hereafter), and this has been cited as a critical factor influencing adolescents' health.[3)] It is also important to note that while the prevalence smoking rates among Korean adults have actually declined in the last few decades, those of high school students continue to increase during the same period.

To control adolescent smoking, legislation banning tobacco sales to minors (those who are under the age of 18) was enacted in 1995. However, in spite of this effort, it turned out that more than 30% of high school students in Korea smoke in 2003. The increase in the percentage of high school smokers is not neglectable especially given that approximately 25% of all adolescents in the United State

have used tobacco within a year period.[4)]

The average loss of life expectancy, which results from smoking related health problems, is about 22 years for both males and females.[5)] This means that smoking is not only a single most significant threat to the health, but also a "preventable" cause of disease. Moreover, we can substantially decrease health risks in adult life by effectively preventing smoking among high school students. Given this, effective smoking prevention programs specifically designed for adolescent smokers are much needed in Korea. Needless to say, research on high school students' smoking experience and high school students' attitudes toward smoking is more than necessary for the development of such programs.

Some studies have reported that adolescents' attitudes toward smoking and psychosocial factors such as peer group smoking, parental smoking status, self-efficacy, and life satisfaction affect adolescents' smoking behavior. Other have also pointed out that parental smoking status is related to children's smoking behavior.[6,7,8,9)]

According to a social learning theory[10)], some behaviors are learned by observation. Smoking, as health behaviors, is also learned by observation. Children can learn smoking by observing the behaviors of those who share the same environment, namely, their parents, siblings, and friends, and by copying their behaviors and being reinforced consciously or unconsciously. That is, children are more likely to smoke if they are frequently exposed to the environments where their family members or friends smoke. In addition, considering that, in Korea, grandparents usually live with their adult children and grandchildren, it is also important to consider the grandparents' smoking behaviors and their influence on adolescent smoking.

Self-efficacy is also revealed to affect smoking behaviors.[11)] Self-efficacy, a central component of theories of behavior change, is defined as one's confidence in their abilities to perform or succeed in a given situation.[12,13,14)] Self-efficacy is particularly important for smoking behavior.[15,16,17,18)] Smoking intention is also predicted from the self-efficacy. Those who have low self-efficacy are more likely to smoke.

Carvjal and Hanson[19)] stated that self-efficacy, parent smoking, and academic success are the factors that most strongly predict current smoking among middle school students. So far, a number of studies have been conducted in Korea to explore physiological effects of smoking on high school students.[20)] But little is known about psychosocial factors influencing high school students' smoking in Korea.

The present study was designed to test differences and relations between psychosocial factors and smoking status among high school students in South Korea. Four levels of smoking status were considered in this study: non-smoker, past smoker, current irregular smoker and current regular smoker.

The purpose of this study was to identify the psychosocial factors such as general characteristics, knowledge about smoking, self-efficacy, self-esteem which are known to influence smoking and to provide a direction for smoking prevention education. The social learning theory was used to guide this study.

METHODS

1. Subjects

The design of this study is a cross-sectional correlation comparative study. The subjects of this study were 1,167 literate students (589 males; 50.4% and 578 females; 49.6%) from five high schools located in Korea. Out of 1,271 recruited, 1,167 students agreed to participate and filled out the survey questionnaire. The age of the participants ranged from 16 to 18, with a mean of 16.9 (SD =.8).

All five high schools in the district were contacted. Before the participants were contacted, the researchers obtained oral permission by phone from the school principals. Between August 1 and November 30, 2003, the first researcher and assistants visited each classroom at the five schools to meet students. In the introductory meeting, the researcher explained the study while displaying an objective, nonjudgmental attitude toward smoking. Participation in this study was entirely voluntary. The students were given an opportunity to ask any questions related to the study. Participants were assured that the data would be anonymous and confidential. When students agreed, by oral consent, to participate, the questionnaires

were distributed. They were asked to return their completed questionnaires to a desk located at the front of each classroom. Research assistants hired for this study retrieved the questionnaires. As soon as the questionnaires were returned, any information linked to the identity of the participants was removed, and a serial code number was randomly assigned to each questionnaire.

2. Questionnaire

The independent variables included; socio-demographic characteristics, knowledge about smoking, self-efficacy and self-esteem. The dependent variables were the students' smoking status, experience and their intention to smoke. The instruments are presented according to the major variables as follows.

Smoking status, experience and intention : Participants were asked the following question to determine their smoking status. "Have you ever smoked?" They were considered regular smokers if they self-identified as smoking more than six days a week, irregular smokers if they self-identified as smoking less than one day a week, past smokers if they self-identified as used to smoke.

The participants who were regular, irregular and past smokers were classified as having smoking experience. Participants were also asked to determine their intention to smoke in the future. "Will you smoke if you are under stress?" "Will you smoke if your friends suggest it?" and "Will you smoke if you can afford to buy cigarettes?"Participants were considered to have intention if they answered "yes" to more than one question.

The knowledge about smoking questionnaire [KAS][21] consists of 10 items developed to assess the subject's knowledge about cigarette smoking. It has been used in several studies on adolescents' smoking knowledge among Korea, and has been reported to have high content validity and reliability.[21] Participants can respond with three options [agree=1, disagree=0 or I don't know=0]. A total score of each item is calculated for the data analysis. A high score indicates high knowledge about smoking. Cronbach's alpha coefficient for the instrument in this study was .80.

The self-efficacy scale, which was developed and validated by Sherer et al.[22], includes seventeen items of General self-efficacy and six items of Social self-efficacy. Sherer et al. yielded alpha reliability coefficients of .71 and .86 for the internal consistency. Cronbach's alpha coefficients were calculated to determine the reliability of the translated self-efficacy scale. That of this study was .86.

The self-esteem scale, which was developed by Rosenberg[23], includes 10 items. Korean versions of the self-efficacy scale and the self-esteem scale, translated and tested by investigators, were used in this study. Internal consistency of the self-esteem scale measured by Curbow & Someerfield[24] was .87. That of the Korean version was .83.

3. Statistical Analysis

Collected data were processed by SPSS 12.0K for Windows for statistical analysis. The data on socio-demographic characteristics were analyzed using descriptive statistics including frequency, percentage, mean, and standard deviation. Statistical significances of differences between a smoking group and a non smoking group were examined by t-test and chi-square test, respectively. The correlations between the independent variables and smoking experience were analyzed using Pearson's correlation analysis.

RESULTS

1. Socio-demographics and Smoking Status

The demographic variables that were specifically examined in this study were: gender, grade, religion, and family members or friends' smoking status. As shown in Table 1, findings revealed that 57.0% of male respondents had never smoked and 17.0% smoked regularly. While 88.2% of female respondents had never smoked, 2.2% smoked regularly. The smoking status differences between males and females were significant($p<.01$).

As the students got older, the likelihood that they smoke regularly increased. For example, 6.1% of 10th grade students were regular smokers, 10.9% in 11th grade, and 12.2% in 12th grade.

In respect to religion, students who were Catholic or Protestant were less likely to smoke. Students who were

Table 1. Differences in the Level of Smoking Status According to Variables

Variables		Smoking status								p value
		Regular[a](n=113)		Irregular[b](n=47)		Past[c](n=161)		Non[d](n=846)		
Gender	Male	100	(17.0)	39	(6.6)	114	(19.4)	336	(57.0)	.000**
	Female	13	(2.2)	8	(1.4)	47	(8.1)	510	(88.2)	
Grade	10th	24	(6.1)	16	(4.1)	65	(16.6)	287	(73.2)	.013*
	11th	49	(10.9)	17	(3.8)	66	(14.7)	316	(70.5)	
	12th	40	(12.2)	14	(4.3)	30	(9.2)	243	(74.3)	
Religion	Catholic	2	(5.1)	1	(2.6)	6	(15.4)	30	(76.9)	.001**
	Protestant	20	(5.8)	9	(2.6)	55	(16.0)	259	(75.5)	
	Buddhist	19	(10.7)	16	(9.0)	19	(10.7)	123	(69.5)	
	Others	6	(16.7)	3	(8.3)	8	(22.2)	19	(52.8)	
	None	65	(11.4)	18	(3.2)	73	(12.8)	415	(72.7)	
Father's moking	Smoker	61	(10.5)	29	(5.0)	78	(13.4)	412	(71.0)	.261
	Non smoker	52	(8.9)	18	(3.1)	83	(14.1)	434	(73.9)	
Mother's smoking	Smoker	7	(46.7)	1	(6.7)	3	(20.0)	4	(26.7)	.000**
	Non smoker	106	(9.2)	46	(4.0)	158	(13.7)	842	(73.1)	
Grand-father's smoking	Smoker	12	(16.9)	3	(4.2)	11	(15.5)	45	(63.4)	.157
	Non smoker	101	(9.2)	44	(4.0)	150	(13.7)	801	(73.1)	
Grand-mother's smoking	Smoker	10	(33.3)	1	(3.3)	3	(10.0)	16	(53.3)	.002**
	Non smoker	103	(9.1)	46	(4.0)	158	(13.9)	830	(73.0)	
Sibling's smoking	Smoker	24	(25.8)	4	(4.3)	17	(18.3)	48	(51.6)	.000**
	Non smoker	89	(8.3)	43	(4.0)	144	(13.4)	798	(74.3)	
Friend's smoking	Smoker	100	(22.0)	36	(7.9)	93	(20.5)	224	(49.4)	.000**
	Non smoker	13	(1.8)	11	(1.5)	68	(9.5)	622	(87.1)	

a Regular smokers were self-identification and who have smoked regularly more than once a week. b Irregular smokers were who have smoked multiple times, but less than twice a month. c Past smokers were who had ever smoked more than one year ago. d Non smokers were who have never smoked.
*p<.05, **p<.01.

Buddhist were more likely.

In relation to the family or friends' smoking status, students whose mothers or grandmothers were smokers were more likely to smoke than those whose mothers or grandmothers were non-smokers(p<.01). Among the students whose mothers were smokers, 46.7% referred to themselves as regular smokers. Only 9.2% of regular smokers had non-smoking mothers. The students with smoking friends were more likely to smoke. Of students whose friends smoked, 22.0% were regular smokers. Conversely, 1.8% of students who did not have smoking friends were regular smokers.

The factors that were found to significantly influence smoking status included; gender (χ^2=142.31, p<.01), religion (χ^2=9.78, p<.01), mother's smoking (χ^2=16.00, p<.01), grand-mother's smoking (χ^2=5.66, p<.01), sibling's smoking (χ^2=22.09, p<.01), and friends' smoking (χ^2=197.20, p<.01).

2. Factors Associated with Smoking Experience and Intention

Regarding smoking experience and smoking intention, the findings of the differences between these and the independent variables are shown in Table 2 and Table 3. Of students who had low satisfaction with their school performance, 36.0% had smoking experience. Only 28.3% of students with high satisfaction had smoking experience. As for school record, 40.5% of low achievers had smoking experience. Conversely, 26.6% of high achievers had smoking experience. Students who were current drinkers were more likely to smoke than non-drinkers. 44.2% of current drinkers had smoking experience, while only 10.6% of non-drinkers had smoking

Table 2. The Factors Affect Smoking Experience

Variables		Smoking experience				p
		Yes		No		
Satisfaction with school performance	High	66	(28.3)	167	(71.7)	.002**
	Middle	168	(24.2)	526	(75.8)	
	Low	86	(36.0)	153	(64.0)	
School achievement	High	55	(26.6)	144	(72.4)	.000**
	Middle	160	(22.6)	548	(77.4)	
	Low	105	(40.5)	154	(59.5)	
Drinking	Current drinker	198	(44.2)	250	(56.8)	.000**
	Past drinker	73	(28.4)	184	(71.6)	
	Non drinker	49	(10.6)	412	(89.4)	
Knowledge about smoking	Mean(±SD)	7.74	(± 2.84)	8.24	(± 2.20)	.005**
Self-efficacy†	Mean(±SD)	71.28	(±15.21)	73.59	(±11.55)	.014*
Self-esteem‡	Mean(±SD)	25.28	(± 6.87)	27.18	(± 5.51)	.000**

† Values are mean ± standard deviation of 17 item total sum; 5, 4, 3, 2, and 1 represented 'agree a lot'. 'tend to agree', 'average', 'tends to disagree', and 'disagree a lot', respectively.
‡ Values are mean ± standard deviation of 10 item total sum; 4,3,2,and 1 represented 'agree a lot', 'tend to agree', 'tends to disagree', and 'disagree a lot'.
*p<.05, **p<.01

Table 3. The Factors Affecting Smoking Intention

Variables		Smoking intention				p
		Yes		No		
Satisfaction with school performance	High	37	(17.6)	173	(82.4)	.000**
	Middle	95	(14.8)	545	(85.2)	
	Low	62	(28.7)	154	(71.3)	
School achievement	High	28	(15.7)	150	(84.3)	.000**
	Middle	92	(14.0)	563	(86.0)	
	Low	74	(31.8)	159	(68.2)	
Drinking	Current drinker	117	(28.1)	299	(71.9)	.000**
	Past drinker	43	(18.2)	193	(81.8)	
	Non drinker	34	(8.2)	380	(91.8)	
Knowledge about moking	Mean(±SD)	7.33	(± 2.73)	8.30	(± 2.19)	.000**
Self-efficacy	Mean(±SD)	72.62	(±13.57)	73.69	(±11.49)	.258
Self-esteem	Mean(±SD)	25.88	(± 5.96)	27.03	(± 5.76)	.013*

*p<.05, **p<.01

experience.

This sample showed high scores in knowledge about smoking. On the 10-item questionnaire, where the right answer was 1 and the wrong answer was 0, the mean was 8.2(±1.2). The non-smokers had relatively high scores(8.24±2.20) compared to the smokers (7.74±2.84). On the 5-point self-efficacy scale, the mean was 73.5(±1.7), and the range was 60.4 to 82.3. The scores of non-smoking students (73.59±11.55) were higher than those of smoking students (71.28±15.21).

Table 4. Relationship Between Variables and Smoking Experience

	Experience	Intention	Knowledge	Self-efficacy	Self-esteem
Smoking experience	1				
	.				
Smoking intention	.517	1			
	.000**	.			
Knowledge about smoking	.103	.161	1		
	.000**	.000**	.		
Self-efficacy	.083	.035	.073	1	
	.004**	.258	.013	.	
Self-esteem	.134	.076	.070	.620	1
	.000**	.013	.016	.000T**	.

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

The factors that significantly affect smoking experience included: satisfaction with school performance(p<.01), school achievement(p<.01), drinking(p<.01), knowledge about smoking (p<.01), self-efficacy(p<.05) and self-esteem(p<.01). The factors that significantly affect the intention to smoke included: satisfaction with school performance(p<.01), school achievement (p<.01), drinking(p<.01), knowledge about smoking (p<.01) and self-esteem(p<.05).

3. Factors Correlated to Smoking Experience

A correlation analysis was conducted to assess the relationship between the Korean adolescents' smoking experience and the set of variables: intention to smoke, knowledge about smoking, self-efficacy and self-esteem(Table 4).

Smoking experience was highly correlated to smoking intention(r=.51, p<.01). It was also weakly related to school achievement(r=-.16, p<.01), knowledge about smoking(r=.10, p<.01), and self-esteem(r=.13, p<.01).

Those who had a lower score in school achievement, knowledge about smoking and self-esteem tended to smoke more. Although self-efficacy was not significantly related to smoking experience, there was strong interaction of self-esteem and self-efficacy with smoking experience(r=.62, p<.001). Thus, self-efficacy was thought to indirectly affect

smoking experience.

DISCUSSION

The present study explored the relationship among smoking knowledge, family smoking, and smoking behaviors of Korean adolescents. More than 17.0% of the participants in this study are found to smoke. Note that recently reported rates of smoking habits among adolescents vary from 16% to 33% in several large samples.[4] It was also found that smoking rates of male and senior students are higher than those of females and students in lower grades.

It is interesting to note that the findings in this study are rather different from the findings in similar studies whose participant groups are American adolescents. National youth surveys report no overall difference between males and females in smoking prevalence among Asian-American youth in the United States.[25] It seems that no gender difference in smoking rates reflects a loss of cultural constraints regarding smoking among females in the United States. That is, in American culture, the same set of criteria is applied to both males and females regarding smoking, whereas in Korean culture, female smoking is regarded worse than male smoking, possibly due to the influence of Confucianism on Korean culture.

One of the strongest predictors of adolescent smoking has been parental smoking.[26,27] Not surprisingly, in this study, the number of family members who smoke is associated with students' smoking experience. The presence of a mother, grandmother or friend who smokes is also associated with a greater likelihood of smoking among high school students.

When it comes to the relationship between parental smoking and adolescent smoking, it was found that mothers' smoking has a greater impact on adolescent smoking than fathers'. In Korean culture, male smokers are apparently more acceptable than female smokers. When mothers smoke, their children are likely to have more positive attitudes toward smoking and therefore are more likely to start smoking. In this sense, this study suggests that familial impacts on smoking need to be understood in the context of cultural and family influences. Although there is not much directly comparable research, the present findings are consistent with those of Weiss et al.[28], and Crowe et al.[29] In these studies, it was found that smoking habits of Asian-American adolescents were related to the fathers' smoking.

The impact of peer pressure also needs to be understood. One of the findings in this study was that friends' smoking habits create peer pressure, which in turn affects respondents' smoking experience. Smoking is one of the ways in which adolescents seek acceptance from peers. Thus, a smoking education program should include, not only individuals who smoke, but also their parents and friends. Note also that adolescent drinking is associated with elevated risk of smoking experience.[28,30] These studies found out that when students drink, they tend to smoke.

The implications of this study regarding smoking prevention programs are as follows. First, smoking prevention programs specifically designed for Korean high school students are necessary to prevent early smoking. Second, this program should involve students' families and/or friends who influence smoking experience. Third, the programs need to develop strategies to increase self-esteem, self-efficacy and knowledge about the harmful effects of smoking and drinking.

In contrast to the result of other studies[16,17,18], however, the present study did not find strong associations between self-efficacy and students' smoking experience. The methodology of the present study, which uses general self-efficacy scale of Shere's et al., could be one reason for the disparity. Self-efficacy measurement scale of Etter et al. for the smokers[31] will be a better method to measure smoking experience, so it is suggested that future studies should use the Etter et al.'s scale for smokers.

The limitations of the current study are as follows. First, the cross-sectional design of the study does not allow any conclusion about causality. Parent smoking status and attitude may vary, and the data in this study were not sufficient to examine whether parents' current smoking were precursors to students'.

Another limitation is the use of students' self-reports. With respect to the students' smoking, self-report is considered to be reliable and valid as long as total anonymity is guaranteed. However, in the current study, students were answered the questionnaire at their class room, they might be feared whether others find themselves

as smokers. So, it is necessary to keep a guarantee of a completely anonymous environment during the participants are responding to a questionnaire.

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[Abstract]

The Factors Affecting Adolescent Smoking in Korea

Hung Sa Lee

Department of Nursing, Daegu Haany University

Background The smoking rate of high school students keeps increasing, and it has been pointed out as an important factor influencing adolescents' health. The purpose of this study was to determine the psychosocial factors influencing smoking experience of Korean high school students.

Methods The design of this study is a cross-sectional self-administered questionnaire survey. 1,167 high school students in South Korea were recruited during August 1-November 30 in 2003. The independent variables included sociodemographic characteristics, knowledge about smoking, self-efficacy and self-esteem, and the dependent variables were the students' smoking experience and their intention of smoking.

Results The percentage of regular smoker was 17.0% in male, 2.2% in female. The factors significantly affected to smoking were gender(χ^2=142.31, p<.01), grade(χ^2=8.97, p<.05), religion(χ^2=9.78, p<.01), mother's smoking(χ^2=16.00, p<.01), grand-mother's smoking(χ^2=5.66, p<.01), sibling's smoking(χ^2=22.09, p<.01), friends' smoking(χ^2=197.20, p<.01). Intention of smoking(r=.51, p<.01), was strongly correlated to smoking experience. Knowledge about smoking(r=.10, p<.01) and self-esteem(r=.13, p<.01) were also weakly correlated to smoking experience.

Conclusions The findings suggest that the smoking prevention education should involve students' family members and/or friends who influence the students' smoking experience, and the education program should include a strategies to increase self-esteem and self-efficacy. Adolescent's drinking is associated with an elevated risk of smoking experience, so the program also needs to include some contents about the harmful effects of smoking and drinking.

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Key words adolescents, smoking, self-esteem, self-efficacy

• Address for correspondence : **Hung Sa Lee**
Department of Nursing, Daegu Haany University
• T e l : 053-770-2289
• E-mail : leehj57@hanmail.net