

Adolescent Smoking Behaviors and the Related Risk Factors in Korea: A Descriptive Literature Review

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I . Introduction

It is well documented that smoking has negative effects not only on human health status but also on socio-economic status of smoking population. Smoking is a serious single factor decreasing health status; in particular, smoking is related to inducing cardiovascular disease, lung cancer, digestive disease, and oral disease. Furthermore, smoking has been reported as a strong risk factor explaining about 30% of cancer incidence (Korean Association of Smoking and Health, 2002). Economic loss of smoking is also enormous in Korea. Medical cost due

to smoking induced diseases covered 63.2% of the Korea national health insurance budget in 1999 (Korean Ministry of Health and Welfare, 2001).

Percentage of current smokers in Korea has been ranked high among OECD affiliated countries. The World Health Organization proclaimed that Korea was in the top level in terms of current smokers among adolescent population under 15 years old. In particular, it was reported that one fourth of the high school male students smoked cigarettes in Korea (Korean Association of Smoking and Health, 2002).

Smoking is a highly addictive behavior that is often initiated during the adolescent

year (Kim, 2004). The more harmonious to human body the smoking behavior the earlier the students start smoking over their lives. Cigarettes make a bad cough, trouble breathing, and more wrinkles to the smoking adolescents from the early age of smoking (Kropp and Halpern-Felsher, 2004). Lung cancer death rate of smoking groups who began smoking under 15 years old is 19 times greater than that of non-smoking group (Kawabata, et al., 1999). Therefore, adolescent smoking status and public effort for reducing adolescent smoking in the country can determined its future public health status. With the significance of adolescent smoking status in the public health perspective and the seriousness of Korean students' smoking status, it is essential to identify the primary factors related to smoking incidence among adolescent population.

Therefore, the purpose of this study was to identify social, psychological and, environmental factors associated with smoking in adolescent population of middle and high school students through descriptive literature review. Research purpose of this study was specifically 1) to realize Korean students' smoking behaviors compared with the students in other countries, and 2) to identify personal, psycho-social, and environmental risk factors inducing students to smoke cigarettes.

II. Methods

The primary research method of this study was descriptive literature review. Concerning Korean adolescent smoking status, A large size data of middle and high school students' smoking status were collected based on the cumulative survey results from the Korean Association of Smoking and Health. The smoking status of Korean adolescence was compared with those of other countries from the international perspective.

Risk factors of adolescent smoking onset were tracked down from comprehensive international literature review written in English language. Most studies have cross-sectional design and the risk factors were divided by personal factor, social factor, and environmental factor. Funded research report, peer-reviewed journal article, and thesis or dissertation were included in Korean reference retrieval and only peer-reviewed journal article was available for English reference retrieval. All retrieved references were published between 1994 and 2003 to overview up-to-date research trends and findings.

The first retrieval was conducted based on academic search engines or databases. 'PubMed' and 'EBSCOhost Academic Premier Search' were the primary search databases used in this study. Key words in

this online search were 'smoking,' 'risk behavior,' 'adolescent,' 'factor,' 'cigarette,' 'teen,' 'youth,' 'school,' and 'student.' A total of 126 studies in EBSCOhost and 106 studies in PubMed were retrieved in the first round web search. I briefly overlooked the abstracts of these studies and excluded the studies of which research participants were not middle school nor high school students. The studies of which research setting was not school were also excluded. I primarily selected cross-sectional research identifying relationships between smoking onset and the other risk factors. Intervention studies for smoking prevention or cessation were not included in this literature retrieval.

A total of 21 studies were finally retrieved in searching process. In summary, the 18 studies were retrieved in terms of the following criteria: (1) The dependent variable was smoking cigarette, (2) study design was primarily cross-sectional, (3) the research setting and participant should be middle to high school and student, (4) Publication type needed to be peer-reviewed journal article written in English language, and (5) the retrieved studies were published for the last 10 years between 1994 and 2003.

III. Results

This study conducted descriptive literature

review of adolescent smoking-related research. Major findings of this comprehensive literature review are described in two parts: Korean adolescent smoking behaviors and the risk factors of smoking cigarette onset in adolescence.

1. Smoking behavior of Korean adolescent population

According to the WHO report, approximately 4 million people died due to direct or indirect effects of smoking cigarettes every year. In case of Korea, the current smokers among male adult population increased up to 80% in 1975 and the smoker rate decreased to 65% in recent days. This Korean smoking rate was at least two times higher than those of other developed countries(Korean Association of Smoking & Health, 2001).

From this significance of Korean smoking status, Korean government have made enormous effort to reduce smoking rate through legal, political, and education approaches(Shin, 1998). Middle and high school students' smoking rate was 10% in 1986, increased up to 30% in 1997, and seemed to be decreased from 1999.

Boys' smoking rate was almost two times higher than girls' smoking rate. In both boy and girl, middle school students' smoking incidence seemed less than that of high school students' smoking incidence.

In the percentage of Korean adolescent smoking in 2002, male high school students smoked approximately every four students (incidence rate: 23.6%) and the smoking rate

of female high school students increased 3 times for the last 12 years (Korean Association of Smoking and Health, 2002). Smoking status of male adult population in

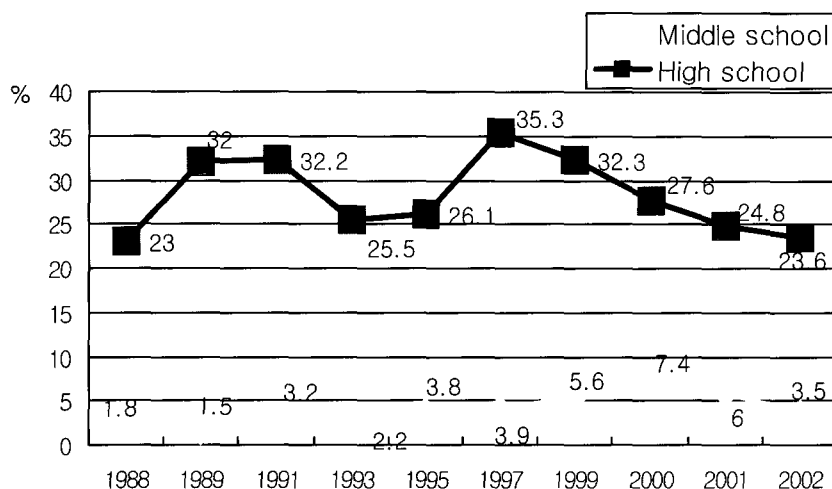


Figure 1. Male adolescent smoking rate in Korea (1988-2002)

Source: Korean Association of Smoking and Health, 2002. [On-line resource] http://www.kash.or.kr/user/0_data_01.htm.

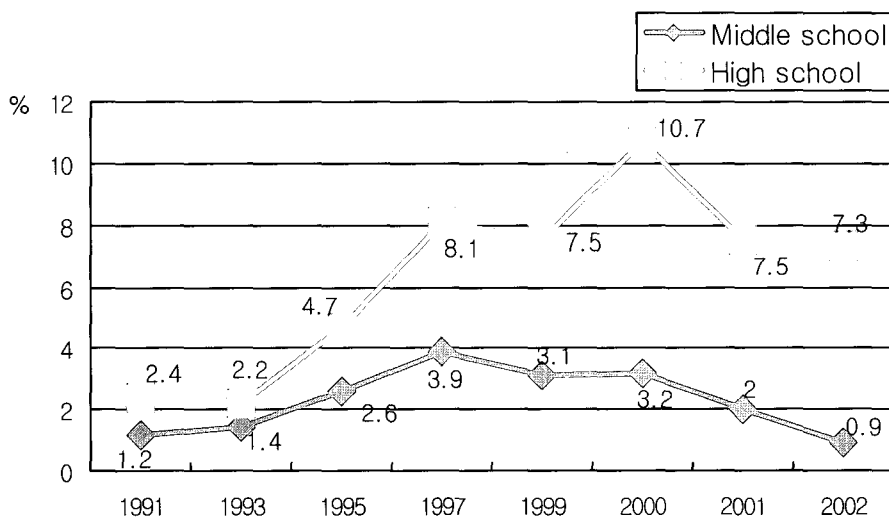


Figure 2. Female adolescent smoking rate in Korea (1988-2002)

Source: Korean Association of Smoking and Health, 2002. [On-line resource] http://www.kash.or.kr/user/0_data_01.htm.

Korea was more serious. Comparing smoking status over countries in the world, Korean male adults smoke more than any other countries in 2000. The current smokers in

Sweden were only 28% and the current smokers in the United States were about 30%; however, Korea had 68% current smoking rate. Such a top level smoking rate of the

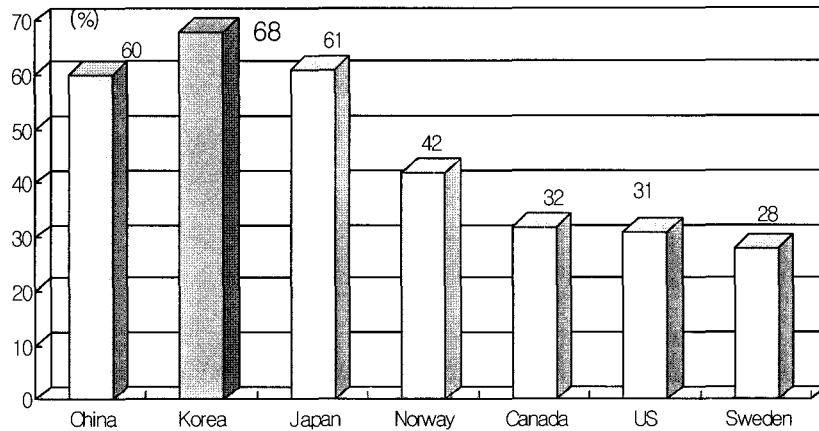


Figure 3. International comparison of smoking rate in male adult population

Source: Korean Association of Smoking and Health, 2001. [On-line resource] http://www.kash.or.kr/user/0_data_01.htm.

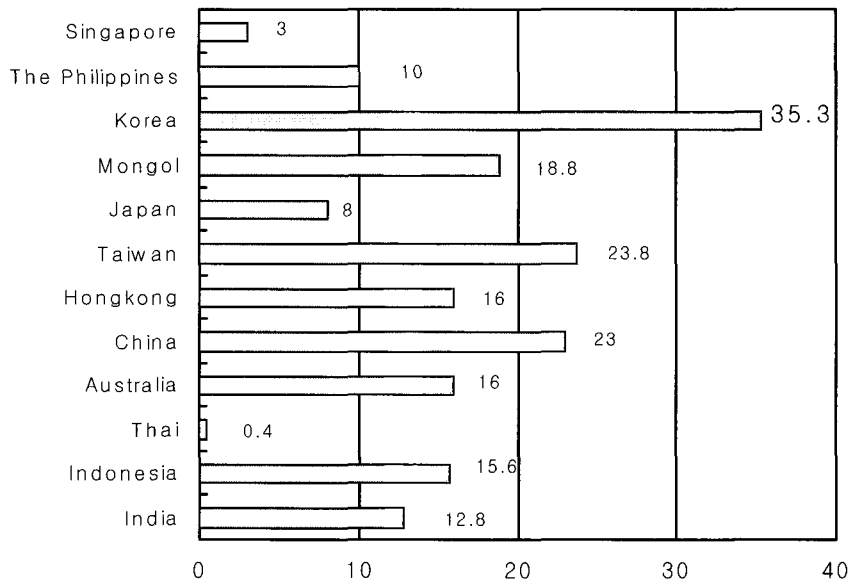


Figure 4. Smoking rate of male adolescence in Asian countries

Source: Korean Association of Smoking and Health, 2001. [On-line resource] http://www.kash.or.kr/user/0_data_01.htm.

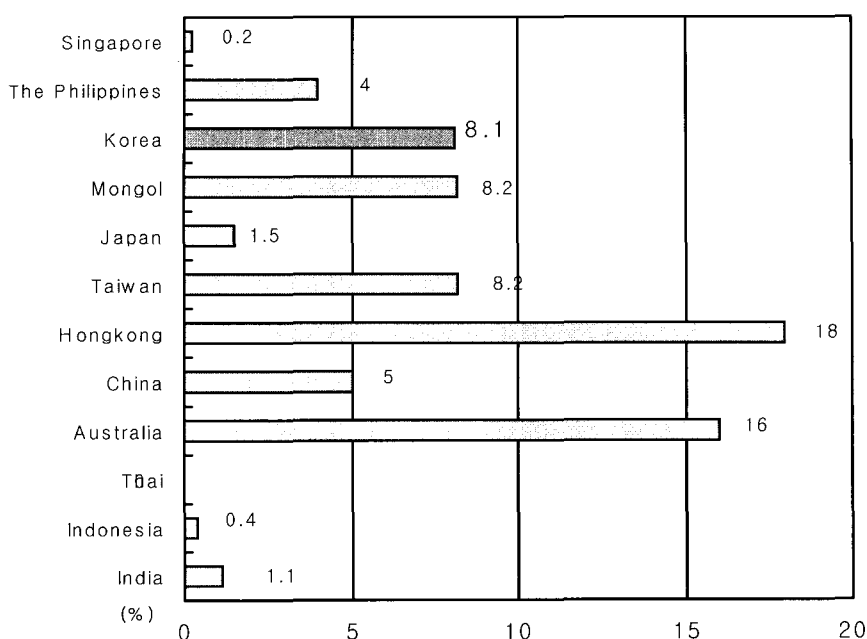


Figure 5. Smoking rate of female adolescence in Asian countries

Source: Korean Association of Smoking and Health, 2001. [On-line resource] http://www.kash.or.kr/user/0_data_01.htm.

Korean adults was also found in the adolescents. Asian students smoked more than Western students. In particular, Korean students' smoking rate was the highest in the world. Smoking rate of Tie was the lowest among Asian countries, which was 0.4%. Smoking rate of Korean adolescence in 2000 was 35.3%.

2. Risk factors related to Adolescent smoking

Risk factors of adolescent smoking incidence were explained by what kinds of social relationships and environments to which the smoking students were exposed. In

this study, risk factors of adolescent smoking were divided by personal factor, friend factor (peer group), family factor, and mass-media factor. The specific findings were as follows.

1) Personal factor

The personal factors included demographic characteristics, personal attitudes on smoking, and personal health behaviors in this study. Sex, ethnicity, and age were frequently researched. As personal attitudes on smoking, self-efficacy of smoking cessation, perception on smoking and willingness of smoking were studied. Drinking alcohol and sexual experience were

Table 1. Personal factors related to adolescent smoking behavior

Personal factors	Moore (1994)	Evans (1995)	Wing (1995)	Chen (1999)	Holowaty (2000)	Alexander (2000)	Sargent (2000)	Carvajal (2002)	Moore (2001)	Olds (2002)	Kropp (2003)
Sex (woman)	NS	*	NS	*							
Ethnicity			*						*	NS	
Age	NS	NS	NS				*				
Low self-efficacy		NS			*						*
Positive attitudes on smoking		NS	*								*
Willingness of smoking		*									
Sexual experience								*			
Drinking alcohol		*				*		*		*	

NS: Not significant, *: $p < 0.05$

related to smoking behaviors <Table 1>.

Men smoked more than women and the sexual difference was larger in high school students than in middle school students. Based on ethnicity, the non-Hispanic White smoked more than other ethnic groups (Castrucci et al., 2002; Everett et al., 2000). Chen and colleagues (1999) conducted the 7-year follow-up study with a large sample size (1,810) of middle and high school students in California, the United States. Boys smoked more than girls and the non-Hispanic white students smoked more than the students with the other ethnic background. The current smokers of the non-Hispanic White were about 30% and the next group was the Hispanic students. Their smoking rate was less than non-Hispanic White group (about 25%). Generally, the students with the Asian

background had lower smoking rate such as Chinese-, Japanese-, and Korean-Americans.

Self-efficacy, willingness, and positive perspective on smoking cigarettes were associated with smoking behavior onset. Carvajal and colleagues (2002) reported that the students with weak self-efficacy smoked 2.1 times more than those with strong self-efficacy in the South Western United States. Ariza-Cardenal and colleagues (2002) also reported that self-efficacy and smoking willingness were significant risk factors of smoking incidence. Students with willingness of smoking practiced smoking 2.5 times more than the others.

Smoking related health behaviors were drinking alcohol and sexual intercourse. Smokers had more experience of drinking alcohol and sexual experience. This finding

implied that smoking behaviors might be the beginning point of adolescent delinquency through drinking alcohol and sexual experience to drug abuse.

2) Friend (peer-group) factor

Eleven studies among 18 studies research friend factor related to smoking. Nine studies of the 11 studies reported significant relationship between friends and smoking. Moore and colleagues (2001) reported that best friends' smoking behaviors stimulated students to smoke 30 times more than non-smokers. The similar smoking behavior in the buddy relationship was also found in Holowaty and colleagues's (2000) study. Alexander and colleagues (2000) studied the popularity of smoking in peer-group. Prevalent smoking behaviors stimulated abstainers to smoke and join in their peer-group. This result was reported in a national study by the Centers for disease control and prevention Center (2000) again. In this US nationwide study, 70% of smokers'

friends were current smokers. Thus, intervention strategies using peer-group behaviors should be effective to adolescent smoking cessation.

Schofield and colleagues (2003) conducted a large self-administered survey on peer and family factors of smoking to the 7414 students in 24 secondary schools, Australia. The survey schools and students were randomly selected. Schofield and colleagues indicated that the students' smoking status were significantly well predicted by their best friends' smoking and the positive perceptions on smoking among their friends were also closely related to the students' current smoking status.

3) Family factor

Family factors related to adolescent smoking behavior were parents' smoking, other family members' smoking, parents' participation on their children's smoking cessation, and parents' anticipation on school performance.

Table 2. Friend (peer-group) factors related to adolescent smoking behavior

Friend factor	Moore (1994)	Evans (1995)	Wing (1995)	Chen (1999)	Holowaty (2000)	Maxiak (2000)	Everett (2000)	Carvajal (2002)	Castrcc (2002)	Ariza-Carden (2002)	Olds (2002)	Schofield (2003)
Friends' smoking	NS	NS	NS	*	*	*	*	*	*	NS	*	*
Smoking popularity in peer-group			NS				*					*

NS: Not significant, *: $p < 0.05$

Most adolescent smoking behavior research included family factors even more than friend factors. However, generally friend effects seemed stronger to students' smoking cigarettes than family effects.

Moore and colleagues (2001) indicated the effects of parents and sibling's smoking were more significant than the other family members or relatives. In Moore's study, students whose parents smoked were 2.5 times more likely to smoking cigarettes than the students whose parents were non-smokers. Carvajal and colleagues (2000) also reported the strong correlation between parent and children's smoking behaviors.

Bothmer and colleagues (2002), Sargent and colleagues (2001), and Wang and colleagues (1995) indicated that the effect of sibling was stronger than the effect of parents on smoking. Sargent (2001) found that the sibling factor described 38.1% of middle school student's smoking status in the United

States. Wang and colleagues (1995) also reported that the students having smoking siblings were 3.5 times more likely to be smokers than the student who siblings were non-smokers.

4) Mass-media factor

Research on mass-media factors related to adolescent smoking was not large while family, friend, and school factors were frequently studied. Smoking scene in favorite or popular advertisement and CF, frequency of smoking scenes in TV shows or CF, warning message of smoking in Poster or advertisement.

Sargent and colleagues (2001) reported the more the students saw the smoking scenes through mass-media the more likely to be smokers. Evans and colleagues (1995) indicated that mass-media was more effective than family or friends on students' smoking status. Therefore, movies, drama, and TV

Table 3. Family factors related to adolescent smoking behavior

Family factor	Moore (1994)	Evans (1995)	Wing (1995)	Robinso (1997)	Chen (1999)	Holowaty (2000)	Maziak (2000)	Sargent (2000)	Castrec (2002)	Olds (2002)
Parents' smoking			NS		*	*	NS	*	NS	
Siblings' smoking				*			*	*	*	
Parents' anticipation on school performance					NS					
Smokers at home			*			*				NS
Social status										
Parents' intervention on behavior						NS	NS			

NS: Not significant, *: $p < 0.05$

Table 4. Mass-media factors related to adolescent smoking behavior

Mass-media factors	Wing (1995)	Arnett (1998)	Sargent (2001)	Bothmer (2002)	Ariza-Carden (2002)
Favorite advertisement	NS		*		
Seeing smoking behavior through mass-media		*			*
Warning notice of smoking				*	

NS: Not significant, *: $p < 0.05$

advertisement should be carefully produced concerning mass-media effects on adolescent behaviors.

IV. Summary

This study conducted descriptive literature review on adolescent smoking and the related factors to realize significance of adolescent smoking onset in Korea and to identify risk factors of smoking incidence. Korean adolescent smoking status was generated based on the cumulated data of the Korean Association of Smoking and Health. Risk factors of adolescent smoking were identified based on 21 studies written in English, with cross-sectional research design and published as a peer-reviewed journal article between 1994 and 2003.

Korean adolescents' smoking status was identified as a serious status compared with other OECD countries. The risk factors related to adolescence smoking identified

from the descriptive literature review were personal factor (self-efficacy, knowledge, attitudes, etc.), friend factor (peer-perception on smoking, best friend's smoking, etc.), family factor (parents' supervision, parents' smoking, parents' smoking perception and knowledge, etc.) and mass-media factor (popular movie stars or singers' smoking etc.). More detailed result summary was as follows.

1. Korean adolescent smoking rate was the highest among OECD affiliated countries; in particular, male adolescent smoking incidence was very serious.
2. Risk factors related to smoking of adolescent population were personal factor, friend factor, family factor, and mass-media factor. Demographic characteristics, attitudes on smoking, and willingness of smoking, and health behaviors were selected as personal factor of smoking.
3. Best friend's smoking was a strong factor of students' smoking set. Prevalent popularity of smoking in

peer-group allowed students to feel free to smoking.

4. Concerning family factor related to smoking status, parents' smoking and sibling's smoking were significant indicators of adolescent smoking status.
5. Seeing smoking behaviors and scenes through films, TV shows, drama, and advertisement was a significant risk factor of adolescent smoking status.

Based on the results of this literature review, smoking cessation program for adolescence should consider personal factor, family factor, friend (peer-group) factor, and mass-media factor from the very beginning status of intervention program building.

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ABSTRACT

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The results were as follows.

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3. Best friend's smoking was a strong factor of students' smoking set. Prevalent popularity of smoking in peer-group allowed students to feel free to smoking.
4. Concerning family factor related to smoking status, parents' smoking and sibling's smoking were significant indicators of adolescent smoking status.
5. Seeing smoking behaviors and scenes through films, TV shows, drama, and advertisement was a significant risk factor of adolescent smoking status.

Key Words: Adolescence, Smoking Behavior, Literature Review, Risk Factors