

*The Identification and Analysis of Selected Health Behaviors as Reported by
Korean Adolescents in Seoul

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I. Introduction

Controlling diseases has been one of the major concerns in the history of public health. Humankind has been trying to find causes of diseases from ancient times. The religious and miasmatic theories of disease were the theories that were thought to prevent or control diseases before the development of the microscope around 1650. Until the mid-twentieth century, most of the prevalent diseases were caused by microorganisms, and were infectious. Development of the microscope and immunization technologies have made it possible to prevent many infectious diseases caused by the microorganisms(Rubinson & Alles, 1984). Prevention of infectious diseases has made health professionals put their effort in studying the physical interface between the human body and the natural environment of soils, climate, and habitations. Public health in the 19th century, therefore, focused on hygiene based on sanitation through which the interface between the body and the natural environment was constantly monitored, guarded, and cleansed so as to prevent the transmission of disease across the body boundaries(Armstrong, 1988).

In the early twentieth century, there was a shift in the focus of public health. The new focus was concerned with the space between the social matrix of human bodies characterized by psychosocial attributes. The new perception of health and illness dealt with spaces between human bodies. This space included both physical and social space. This new concept saw individuals as more active physical and social beings. Thoughts concerning physical space between human bodies became focused on personal hygiene. For example, tuberculosis and venereal diseases became social problems, which called for individuals to adopt active ways to protect their health. Public sanitation, therefore, shifted to the personal hygiene of the human body from focusing on the space between human bodies and environment(Armstrong, 1988).

The new public health focus on human body movement demanded education and training to monitor and control human behavior. Recognition of the importance of health behavior and health promotion did not exist until the ideas of personal hygiene were introduced. The very beginning of promoting health behavior started from guiding physical body movements in elementary

school physical education classes and the military. School was the place where children had their bodies managed and transformed, and the military was the place where soldiers were disciplined, a kind of physical movement. Guided and goal oriented physical movements in school and military became the origin of physical fitness. Hygiene education arose from school physical education class, and this was the beginning of health education in the United States(Rubinson & Alles, 1984). The idea of personal hygiene enticed healthy movements, and finally lead to the study of behaviors that were related to health, and promoting health behavior(Armstrong, 1988).

In the mid-twentieth century, as chronic diseases came to be the predominant diseases in western societies, health professionals began to accept the idea that improvement in personal behaviors could prevent chronic diseases and premature death. Sexually transmitted diseases, cancer, heart disease, and deaths caused by automobile accidents could be prevented by changing or modifying individual behaviors(Greene & Simons-Morton, 1984). Since chronic diseases came to be a leading problem in the area of public health in western countries in the mid-twentieth century, public health researchers began to search for ways to prevent the diseases. As researchers found that engaging in a rudiment of behaviors could result in chronic diseases or premature death, public health came to put more effort in behavioral research, health education, and health promotion. Since the behaviors that could have long term undesirable effect on individuals' health are usually formed when individuals are adolescents, health educators have focused on the adolescent population to prevent the development of undesirable behaviors before they are formed. Therefore, there is a need to conduct researches in an attempt to facilitate the development of effective health education programs in schools.

II. Methods of the Study

The purpose of this study was to identify selected self-reported health behaviors of Korean adolescents aged 13-19 who were enrolled in middle and high schools in Seoul, Korea during fall 1992. This study was designed to investigate selected health behaviors that might produce undesirable effects on the health of adolescents in Seoul, Korea. An instrument was developed to gather data regarding adolescent health risk behaviors and other selected health behaviors. Instrumentation in this study was based on the Youth Risk Behavior Survey (YRBS) developed by the Centers for Disease Control (CDC, 1990a & 1990b). For this study, the health risk behaviors selected by the Centers for Disease Control were examined within the Korean cultural context. This study consisted of four steps : focus group I, focus group II, pilot survey, and main study. The focus group I, focus group II, and pilot survey were designed to ensure that a valid instrument was available for this study as well as to make the items in the instrument appropriate for assessing selected health risk behaviors of Korean youth in Seoul. Since the YRBS was not proposed for use in cross-cultural settings, the procedures used in the present study adapted cross-cultural research methods to ensure that the revised instrument was appropriate for Korean adolescents.

The first focus group was held at The Pennsylvania State University following approval from the University's Office for Regulatory Compliance. Individuals in the group were Korean students and a visiting scholar who were attending the university majoring in health related fields. All of the individuals were bilingual. The purpose of the first focus group was to determine if the YRBS was appropriate for use with Korean youth aged 13-19. After reviewing the YRBS, the group members offered suggestions for use of the instrument for Korean adolescents, or for addition of items felt to be missing from the YRBS that might be particularly important for Korean adolescents. The focus group members discussed

each YRBS item and the researcher kept copious notes of the discussion.

Following the first focus group discussion at Penn State, the original YRBS was translated into Korean. The English version and translated version of the instrument were then given to Korean bilinguals who were health professionals in Korea. They were asked to review the translated instrument and the English version so that it could be determined if the translation retained the context of the original question. These people also provided comments about the risk behaviors of Korean youth.

The second focus group was conducted with teachers in Korea who were monolinguals and who dealt with students aged 13-19. This focus group consisted of six middle school teachers and six high school teachers from Seoul. In this focus group, the Korean version of the revised YRBS was used. The same basic procedures used with the Penn State focus group were followed. The Korean version of the initial instrument was also reviewed by selected people in the Department of Education and in the Department of Health and Welfare in Seoul. These persons also offered suggestions for revision of the instrument. The two focus group discussions and suggestions from health professionals in Korea yielded a revised questionnaire consisting 72 items that included demographic information and questions about safety, intended and unintended injuries, smoking, alcohol and drug use, dietary behaviors, weight control and management, physical activities, sexual behavior, sexually transmitted diseases and AIDS, and runaways. This revised instrument was used for the pilot study.

Upon approval of the protocol for use of minors in research in Korea from the Office for Regulatory Compliance at Penn State, and approval of the context and content of the instrument by the dissertation committee, a limited pilot study was conducted using students age 13-19 in selected homerooms from selected schools in Korea. The purpose of the pilot survey was to ensure clarity of expression throughout the instrument, revise

items, test administrative procedures, and develop a basic framework for analysis of the larger data base to be generated in the main study. The revised Youth Risk Behavior Survey was used in the pilot study, and the items were written in Korean. Both questionnaire and computer scanning sheets were used in the pilot study and students were asked to mark their answers on the computer scanning sheets with pencils. Students were also allowed to write some comments regarding the items of the questionnaire that they could not understand or thought to be not relevant to them.

After the basic analysis of the pilot survey, a final version of Youth Risk Behavior Survey questionnaire was developed in Korean. There were items that were deleted from the pilot instrument or added to the instrument, thus the final instrument consisted of 72 items. The main study surveyed students in grade 8 to 12 in the fall of 1992 in Seoul.

A total of 4,747 students in Seoul was surveyed. The main study use a cluster sampling design to select the study population. First Seoul was divided into three regions ; northern, southern, and industrial areas. This helped ensure that a wide range of socioeconomic strata would be included in the study. Schools in each region were categorized as all boys, all girls, or coeducational institutions for both middle and high schools. At the high school level, both general high schools and vocational high schools were included in the main study. Middle schools and high schools in each category in each region were randomly selected. In the schools selected, random homerooms were selected from within each grade level.

The students in the selected classrooms were surveyed. The data were analyzed using descriptive and tabular analyses. The data were also analyzed by category of selected behaviors. Since the frequency of risk behaviors the youth are engaged in were of a particular interest, the frequency distributions of the risk behaviors were reviewed. A chi-square analysis, correlation matrix, and one-way analysis of variance with Scheffé test was used to determine relationships between the risk beha-

vivors and other variables such as age, gender, type of school, academic ability, religion, confidant, and socioeconomic status.

III. Results of the Study

3.1 Attempting Suicide

In some Asian countries like Japan, suicide is a honorable behavior, but it is not in Korea. Suicide is a serious, self-damaging behavior. The survey items about suicide attempts included suicide ideation, making a specific suicide plan, number of suicide attempts, and suicide attempts requiring medical attention. About 52.4% of the respondents reported that they had, at some time, seriously considered attempting suicide. About 31.1% of all students reported that they had made a plan to attempt suicide during the 12 months preceding the survey. About 88.1% of those who had thought about suicide seriously, had planned attempting suicide during the 12 months preceding the survey.

For those who planned attempting suicide during the 12 months preceding the survey, 30.7% actually attempted it. Approximately 12.6% of all students reported attempting suicide during the 12 months preceding the survey. For those who had actually attempted suicide during the 12 months preceding the survey, 12.1% got injured to the extent that medical attention was required.

Male students(2.6%) were significantly($p < .0001$) more likely than female students(1.8%) to have injured themselves to the point of requiring medical attention as a result of suicide attempts. High school students(2.5%) were significantly($p < .05$) more likely than middle school students(1.5%) to have injured themselves. Vocational high school students(2.8%) were significantly ($p < .0001$) more likely than general high school students (2.2%) to have injured themselves to the point of requiring medical attention as a result of a suicide attempt.

High school students(54.9%) were significantly more likely than middle school students(45.5%) to have considered suicide($p < .0001$). The proportion of students

who indicated having considered attempting suicide increased significantly by age group($p < .0001$) or grade level($p < .001$). This may due to increased study pressure among the students, but the data did not provide accurate insights regarding the causation of suicide attempts. The proportion of students who had made a suicide plan during the 12 months preceding the survey were the largest in the first grade of high school(33.8%) (see Table 1). This may due to the environment changes. The proportion of those in third grade in high school who made a suicide plan during the 12 months preceding the survey was also high(32.7%), and this was statistically significant. This may due to the pressure of passing the college entrance examination.

Table 1. Making a Suicide Plan During the 12 Months Preceding the Survey by Grade

Grade	Making a suicide plan	
	N	%
2nd in middle school	89	26.1
3rd in middle school	248	26.5
1st in high school	476	33.8
2nd in high school	410	32.0
3rd in high school	246	32.7
Chi-square=19.3 df=4 p<.001		
Total number of respondents who planned suicide=1,469 (31.1%)		
Total respondents=4,721 missing observations=26		

High school students(32.9%) were significantly($p < .001$) more likely than middle school students(26.4%) to have made a suicide plan during the 12 months preceding the survey. There was no significant difference among general high school and vocational high school students in terms of consideration of attempting suicide across all high school students in Seoul. Vocational high school students(35.2%) were significantly($p < .01$) more likely than general high school students(30.5%) to have made a suicide plan during the 12 months preceding the survey. Females(36.6%) were significantly($p < .001$) more likely than males(25.9%) to have made suicide

plan during the 12 months preceding the survey.

Students from the lower socioeconomic status(68.7%) were significantly more likely than those in upper socioeconomic status(52.3%) to have considered attempting suicide($p<.001$). Relatively lower socioeconomic status could play a role in making adolescents think about ending their lives. Students in the lower socioeconomic status(43.9%) were more likely than those in the upper socioeconomic status(31.8%) to have made a suicide plan during the 12 months preceding the survey($p<.0001$).

A total of 597(12.6%) of the respondents indicated they had actually attempted suicide during the 12 months preceding the survey. High school students(13.6%) were significantly($p<.001$) more likely than middle school students(9.8%) to have actually attempted suicide during the one year preceding the survey. A statistical significance, however, was not found in an actual attempt of suicide by grade level.

As mentioned earlier, vocational high school students were significantly more likely than general high school students to have planned suicide. Among the high school students who made a suicide plan, vocational high school students(36.0%) were significantly($p<.00005$) more likely than general high school students(24.4%) to have actually attempted suicide during the 12 months preceding the survey. This may due to relative socioeconomic inferiority, but further research is needed to find out the main cause of planning and attempting suicide among the adolescents.

Females(16.2%) were significantly($p<.0001$) more likely than males(9.3%) to have actually attempted suicide during the one year preceding the survey. Female students may be under stress more than male students are, but the data did not provide further explanations in terms of the cause of suicide attempts. Students in the lower socioeconomic status(20.0%) were significantly more likely than those in upper socioeconomic status (17.0%) to have actually attempted suicide during the 12 months preceding the survey. Those who felt their

class performance was below the middle of their class were significantly($p<.0001$) more likely than those who thought their classroom performance was above the middle to have attempted suicide during the 12 months preceding the survey(see Table 2). Relatively lower socioeconomic status and lower academic ability may increase stress, or frustration, or may cause depression.

This may increase students' thinking about suicide or planning suicide.

Table 2. Relationship Between Self-Reported Class Performance and Attempting Suicide

Class performance	Number of Suicide attempts			
	None		One or more	
	N	%	N	%
Above the middle	1,938	89.6	224	10.4
Middle	1,812	86.9	273	13.1
Below the middle	344	78.2	96	21.8
Total	4,094	87.3	593	12.7

Chi-square=44.1 df=2 $p<.00001$

Missing observations=60

3.2. Smoking Behaviors

Among the respondents, 44.7% (N=2,111) reported that they had tried smoking, even one or two puffs, during their lifetime. In this study current smokers were defined as those who smoked cigarettes any time during the 30 days preceding the survey. Approximately 23.6% of all students indicated they had smoked cigarettes any time during the 30 days preceding the survey.

3.2.1. Smoking Status by Age

High school students(28.6%) were significantly($p<.00001$) more likely than middle school students(9.8%) to smoke cigarettes during the 30 days preceding the survey(current smokers). There were significant age differences among current smokers(see Table 3). The relative proportion of current smokers increased significantly($p<.00001$) with age and grade. The proportion of current smokers jumped at the age of 16, an age wherein students enter a higher level of school. This may imply that change of environment may entice risky

behavior. For high school students, vocational high school students(36.1%) were significantly($p < .00001$) more likely than general high school students(21.1%) to be current smokers.

Table 3. Smoking Status by Age

Age	Smoking status			
	None		Current smoker	
	N	%	N	%
14 or younger	590	90.8	60	9.2
15	944	83.7	184	16.3
16	900	72.3	345	27.7
17	764	70.2	324	29.8
18 or older	395	66.9	195	33.1
Chi-square=171.8 df=4 p<.00001				

3.2.2. Smoking Status by Gender

For all students, male students(33.6%) were significantly($p < .00001$) more likely than female students(13.0%) to be current smokers. For both males and females, current smoking status varied differently by type of school(all girls, all boys, and coeducational schools) and in both middle and high schools. For female middle school students, however, those in all girls schools(9.6%) were significantly($p < .05$) more likely than those in coeducational schools(5.0%) to be current smokers. For female high school students, those in coeducational schools(18.9%) were significantly($p < .00005$) more likely than those in all girls schools(11.4%) to be current smokers.

On the other hand, current smoking did not significantly vary by type of school for male middle school students. However, for male high school students, those in coeducational schools(44.7%) were significantly more likely than those in all boys schools(37.7%) to be current smokers($p < .005$). Although the data did not provide enough explanation about the relationships among current smoking status, geographic areas, school type and gender, the current smoking prevalence by gender, geographic area, and type of school are discussed in research questions.

3.2.3. Smoking Status by Academic Performance

Current smoking was related to academic performance. Those who were relatively low in academic performance were more likely than those who were above the middle in academic performance to be current smokers(see Table 4), and this was statistically significant ($p < .00001$).

Table 4. Smoking Status by Academic Performance

Academic ability	Smoking status				Row total
	None		Current smoker		
	N	%	N	%	
Above the middle	1,702	79.2	447	20.8	2,149
Middle	1,595	76.9	479	23.1	2,074
Below the middle	260	59.6	176	40.4	436
Chi-square=77.5 df=2 p<.00001					
Number of missing observations=88					

3.2.4. Smoking Status by Religion

Current smoking was related to religion(see Table 5). Protestants and Catholics were less likely than other religion or non-religious persons to be current smokers. Current smoking did not vary by geographic areas of Seoul; northern, southern, and industrial areas.

Table 5. Smoking Status by Religion

Religion	Smoking status				Row total
	None		Current smoker		
	N	%	N	%	
Protestant	1,555	80.3	382	19.7	1,937
Catholic	468	79.9	118	20.1	586
Buddhism	385	73.2	141	26.8	526
Other	47	66.2	24	33.8	71
No religion	1,138	72.0	442	28.0	1,580
Chi-square=44.0 df=4 p<.00001					

3.2.5. Smoking Status by Whom the Students Talk to When They Had Concerns

Current smoking was significantly ($p < .00001$) related to the people to whom the students talk when they have concerns. Current smokers were more likely than those who were not current smokers to talk to their friends about their concerns (see Table 6). Current smokers were less likely than those who were not current smokers to talk to their family members. This may show the possible influence of peer pressure.

Table 6. Smoking Status by Confidant

Confidant	Smoking status			
	None		Current smoker	
	N	%	N	%
Never tell my concerns to others	1,067	29.8	276	24.9
Friends	1,763	49.3	693	62.5
Teachers	22	0.6	8	0.7
Parents	294	8.2	31	2.8
Brothers or sisters	288	8.1	40	3.6
Other relatives	21	0.6	13	1.2
Other than the above	121	3.4	47	4.2
Total	3,576	100.0	1,108	99.9

Chi-square = 101.1 df = 6 $p < .00001$

Number of missing observations = 63

3.2.6. Smoking Status by Socioeconomic Status

Current smoking was significantly related to socioeconomic status. Students who were in lower socioeconomic status (30.1%) were significantly ($p < .00001$) more likely than those in upper (19.4%) and middle (24.1) socioeconomic status to be current smokers.

3.2.7. Smoking Status by Age at Initiation of Smoking

The age at initiation of smoking was significantly ($p < .0001$) different for current smokers. The significant dif-

ferences among age groups were determined using one way analysis of variance. There were peaks in initiation of smoking among current smokers (see Table 7). Of the current smokers, 41.8% indicated that they had smoked a whole cigarette by age 14 and 87.3% had done this by age 16. Only 12.8% of the current smokers started that they first smoked a whole cigarette at or after age 17. The proportion of age of starting smoking jumped at age 11-12 and 13-24. The ages 11-12 and 13-14 are the ages at which students enter middle schools. There was also another big jump at the age 15-16. This age is when most students enter high schools. Entering a higher level of school could be a big environmental change for the youth, and this could stimulate trying smoking. The students, upon entering a higher level of school, become the lowest level in the academic hierarchy in the school, then may be more subject to peer pressure from older students who smoke.

Table 7. Age at Smoking a Whole Cigarette for the First Time for Current Smokers

Starting age	Current smokers	
	N	%
Less than 9	42	3.9
9-10 years old	36	3.3
11-12	81	7.5
13-14	294	27.1
15-16	494	45.5
17	115	10.6
18	24	2.2
Total	1,086	100.1

Total sample subjects = 4,747

For all respondents, 15.5% indicated they smoked cigarettes regularly. Among the current smokers, 56.6% answered that they have smoked cigarettes regularly. The age at starting regular smoking among current smokers jumped greatly at the age of 13-14 and 15-16 (see Table 8). Of the current smokers, 27.3% indicated that they had become a regular smoker at or before age

14. An additional 43.9% indicated they began smoking by age 15 or 16. Only 28.8% of the current smokers indicated that they became a regular smoker at or after age 17. Initiation of regular smoking also seems related to environmental change such as entering a higher level of school.

Table 8. Starting Age of Regular Smoking for Current Smokers

Starting age	Current smokers	
	N	%
Less than 9	4	6.1
9-10 years old	1	1.5
11-12	3	4.5
13-14	10	15.2
15-16	29	43.9
17	15	22.7
18	4	6.1
Total	66	100.0

3.2.8. Amount of Cigarette Smoking

For current smokers, 31.3% smoked 2 to 5 cigarettes per day and 9.8% smoked 20 or more cigarettes per day(see Table 9). About 26% of current smokers smoked more than 11 cigarettes per day but nearly 10% smoked the equivalent of a pack of cigarettes or more per day.

Table 9. Number of Cigarettes Smoked Per Day for Current Smokers

Number of cigarettes per day	Current smokers	
	N	%
Less than 1	127	12.0
1 per day	118	11.2
2 to 5	331	31.3
6 to 10	209	19.8
11 to 20	169	16.0
More than 20	104	9.8
Total	1,058	100.1

Total sample subjects=4,747

3.2.9. Future Smoking Behavior

For all respondents, 3.5% were thinking about trying cigarette smoking during the next 12 months. High school students(3.6%) were significantly($p < .00001$) more likely than middle school students(3.2%) to report that they were thinking about trying cigarette smoking. Those who are in charge of providing health education programs in schools may need to consider prevention of smoking for the students who are thinking about trying smoking. Among the current smokers, 70.4% answered that they had tried to quit smoking during the 6 months preceding the survey, but 29.6% reported that they did not try to quit smoking. This may imply the need for providing health education programs for those who are smokers.

3.3. Drinking Alcohol

Approximately 61.6% of the students indicated that they had consumed at least one drink of alcohol during the 12 months preceding the survey, and 48.8% of the students had at least one drink of alcohol during the 30 days preceding the survey. About 26.6% of the students had 5 or more drinks of alcohol in a row within a few hours.

Male students were significantly($p < .00001$) more likely than female students to have at least one drink of alcohol during the 30 days preceding the survey(see Table 10). High school students were significantly($p < .00001$) more likely than middle school students to have at least one drink of alcohol during the 30 days preceding the survey(see Table 11). For high school students, vocational high school students were significantly($p < .00001$) more likely than general high school students to have consumed alcohol during the 30 days preceding the survey(see Table 12).

There was a statistically significant($p < .005$) relationship between drinking alcohol during the 30 days preceding the survey and geographic area(see Table 13). About 54.3% of those in the industrial area, 49.7% of those in the northern area, and 47.0% of those in the

Table 10. Drinking at Least One Drink of Alcohol During the 30 Days Preceding the Survey by Gender

Drinking	Female		Male	
	N	%	N	%
0 days	1,307	57.2	1,069	43.8
1 or more days	976	42.8	1,372	56.2
Total	2,283	100.0	2,441	100.0

Chi-square = 84.9 df = 1 p < .00001

Table 11. School Levels and Drinking at Least one Drink of Alcohol During the 30 Days Preceding the Survey

Drinking	School level			
	Middle school		High school	
	N	%	N	%
0 days	838	65.8	1,538	44.6
1 or more days	436	34.2	1,912	55.4
Total	1,274	100.0	3,450	100.0

Chi-square = 166.4 df = 1 p < .00001

Table 12. Relationship Between Drinking Alcohol During the 30 Days Preceding the Survey and High School Type

Drinking	School type			
	General high schools		Vocational high schools	
	N	%	N	%
0 days	1,055	62.1	1,302	75.3
1 or more days	645	37.9	428	24.7
Total	1,700	100.0	1,730	100.0

Chi-square = 68.9 df = 1 p < .0001

southern area reported they drank alcohol during the 30 days preceding the survey. These differences may represent the differences of socioeconomic status among the area. The residents in the southern part of Seoul in the present study were relatively higher in socioeconomic status than those in the northern or industrial parts. Students who were in the lower socioeconomic stratum (54.6%) were significantly (p < .005) more likely than those in upper (46.4%) or middle (50.2%) socioeconomic strata to drink alcohol during the 30 days prece-

Table 13. Geographic Area and Drinking at Least One Drink of Alcohol During the 30 Days Preceding the Survey

Drinking	Geographic area of Seoul					
	Northern		Southern		Industrial	
	N	%	N	%	N	%
0 days	1,046	50.3	888	53.0	442	45.7
1 or more	1,035	49.7	788	47.0	525	54.3
Total	2,081	100.0	1,676	100.0	967	100.0

Chi-square = 13.0 df = 2 p < .005

Table 14. Alcohol Consumption by Socioeconomic Status

Drinking	Socioeconomic status					
	Upper		Middle		Lower	
	N	%	N	%	N	%
0 days	731	53.6	1,341	49.8	297	45.4
1 or more	634	46.4	1,351	50.2	357	54.6
Total	1,365	100.0	2,692	100.0	654	100.0

Chi-square = 12.3 df = 2 p < .005

ding the survey (see Table 14).

For female middle school students, those in all girls schools (34.0%) were more likely than those in coeducational schools (30.0%) to drink alcohol during the 30 days preceding the survey, but this was not statistically significant. For male middle school students, students in all boys schools (39.7%) were more likely to drink alcohol than those in coeducational schools (33.9%), but this was not statistically significant. For female high school students, however, those in coeducational schools (49.6%) were significantly (p < .05) more likely than those in all girls schools (44.2%) to drink alcohol during the 30 days preceding the survey. For male high school students, those in coeducational schools (64.9%) were more likely than those in all boys schools (61.7%) to drink alcohol during the 30 days preceding the survey, but this was not statistically significant. Further discussion of drinking behavior by geographic area, gender, and type of school is presented in the discussion of the research questions.

Drinking alcohol during the 30 days preceding the survey was significantly related to the age of the students (see Table 15). Students were more likely to drink alcohol as their age increased. One-way analysis of variance was used to estimate the significant relationships among the different age groups in drinking alcohol during the 30 days preceding the survey (see Table 16). There were significant relationships among the age groups ($p < .0001$). A significant ($p < .0001$) variation in age groups was also found for both females and males.

One-way analysis of variance showed that the age at starting to drink differed significantly ($p < .0001$). For those who stated that they had consumed alcohol during the 30 days preceding the survey, 42.8% had their first drink of alcohol when they were 15-16 years old (see Table 17). The age at initiation of drinking alcohol showed great increase at ages 11-12, 13-14, and 15-16. As with smoking these are the ages when students have environmental changes such as entering higher level

Table 15. Age and Drinking Alcohol During the 30 Days Preceding the Survey

Age	Drinking alcohol			
	0 days		1 or more days	
	N	Row%	N	Row%
14 or younger	466	71.4	187	28.6
15	640	56.7	488	43.3
16	600	48.0	651	52.0
17	457	41.8	635	58.2
18 or older	210	35.5	381	64.5
Chi-square = 220.1 df = 4 p < .00001				

Table 16. One-Way Analysis of Variance for Differences in Prevalence of Current Drinking Alcohol by Age

Source of variation	Sum of squares	DF	Mean squares	F
Among	55.01	4	13.75	57.65*
Within	1,123.69	4,710	0.24	

* $p < .0001$

Table 17. Age at Starting to Drink Alcohol and Drinking Alcohol During the 30 Days Preceding the Survey

Starting age	Drinking	
	N	%
Less than 9	145	6.4
9-20 years old	64	2.8
11-12	155	6.8
13-14	572	25.1
15-16	975	42.8
17	367	16.1
Total	2,278	100.1

of schools, and this could indicate students' encountering peer pressure to drink alcohol.

Drinking alcohol during the 30 days preceding the survey was also significantly ($p < .00001$) related to self-reported academic performance. Those whose self-reported academic performance was low (64.2%) were significantly ($p < .00001$) more likely than those whose self-reported academic performance was high (47.1%), to drink alcohol during the 30 days preceding the survey.

Drinking was significantly ($p < .00001$) related to religion. Protestants (46.0%), Catholics (44.0%), Buddhists (51.6%), and other religions (50.7%) were less likely than those who did not have any religion (55.4%) to drink alcohol during the 30 days preceding the survey. Religion may play a role in dissuading adolescents from drinking.

Those who drank alcohol during the 30 day preceding the survey were more likely than those who were not current drinkers to talk to their friends about their concerns. The drinkers were less likely than those who were not drinkers to talk to their family members. This could be because drinking is not condoned by family members.

About 1/4 of the respondents (26.5%) had 5 or more drinks of alcohol on at least one occasion during the 30 days preceding the survey. Drinking 5 or more drinks of alcohol within a few hours during the 30 days prece-

Table 18. Age and Drinking Alcohol on at Least One Occasion During the 30 Days Preceding the Survey

Age	Drinking alcohol			
	0 days		1 or more days	
	N	Row %	N	Row %
14 or younger	590	90.8	60	9.2
15	924	82.1	201	17.9
16	881	71.1	358	28.9
17	716	65.7	373	34.3
18 or older	339	57.6	250	42.4
Chi-square=256.9 df=4 p<.00001				

ding the survey significantly ($p < .00001$) increased as age increased (see Table 18). High school students (32.0%) were significantly ($p < .00001$) more likely than middle school students (11.9%) to have 5 or more drinks alcohol within a few hours during the 30 days preceding the survey.

Male students (33.6%) were more likely than female students (19.0%) to have 5 or more drinks of alcohol on at least one occasion during the 30 days preceding the survey ($p < .00001$). Being enrolled in all girls schools, all boys schools, or coeducational schools was not significantly related to occasional drinking. For high school students, vocational high school students (38.3%) were more likely than general high school students (25.4%) to drink 5 or more drinks of alcohol during the 30 days preceding the survey.

3.4. Physical Fights

About 29.0% of the respondents reported that they had been in a physical fight during the 12 months preceding the survey. As expected, male students (39.9%) were significantly ($p < .00001$) more likely than female students (17.4%) to have been in a physical fight one or more times during the 12 months preceding the survey.

Physical fights during the 12 months preceding the survey varied significantly among different age groups. Middle school students (34.1%) were significantly ($p < .00001$) more likely than high school students (27.1%) to be involved in a physical fight. High school students may have learned more coping skills in terms of dealing with anger and frustration. For all high school students, vocational high school students (31.3%) were significantly ($p < .00001$) more likely than general high school students (22.9%) to have been in physical fight one or more times during the one year preceding the survey. Vocational high school students may be more aggressive or may engage in more risk taking behaviors than general high school students. General high school students may have more coping skills than vocational high school students. The present data did not provide such information, but further research could focus on coping skills among adolescents. Geographic areas, religion, and socioeconomic status were not significantly related to physical fights.

Physical fights were related to academic performance. Those who were lower in academic performance (40.1%) were significantly ($p < .00001$) more likely than those in the middle (27.7%) or upper (28.0%) levels of their class to have been in the physical fight. Low academic performance may increase psychological stress such as frustration, and may increase risk taking behavior. Being in a physical fight varied significantly by whom the students talk to when they had concerns. Those who indicated they had fought (55.6%) during the 12 months preceding the survey were significantly ($p < .01$) more likely than those who did not fight (51.2%) to talk to friends when they had concerns. This implies risky behaviors may be related to peer pressure as are other risk taking behaviors.

Approximately 45.1% of the respondents reported that when they were last in a physical fight they fought with a friend or someone whom they knew, and 25.4% fought with family members such as parents, a brother or a sister. A large proportion of middle school and high school students fought with acquaintances such as friends or family members, but high school students were significantly ($p < .00001$) more likely than middle school stu-

dents to fight with strangers.

IV Discussion

The most prevalent health risk behaviors identified in the present study were suicide ideation(52.4%) and planning suicide(31.1%), smoking(23.6%), drinking alcohol(49.7), and physical fighting(29.0%). About 34% of the National Adolescent Student Health Survey(American School Health Association, Association for the Advancement of Health Education, & Society for Public Health Education, Inc., 1989) respondents seriously thought about committing suicide, and 14% actually tried to attempt suicide during their lifetime. In the YRBS, 27.3% of the students thought about committing suicide, 16.3% planned suicide, and 8.3% attempted suicide. In the present study, 52.4% of the students seriously thought about attempting suicide, 31.1% of all respondents planned suicide, and 12.6% of all respondents actually attempted suicide during the 12 months preceding the survey.

Among the NASHS respondents, 39% had been in a physical fight during the year preceding the survey. In the YRBS, about 8% of all students had been in a physical fight that resulted in injury during the 30 days preceding the survey. In the present study, 29.0% of the students had been in a physical fight during the 12 months preceding the survey.

In the NASHS, 57% of the students tried cigarettes, and 36% of YRBS respondents were current smokers. In the present study, 23.6% of the respondents were current smokers.

Among the students in NASHS, 42% drank alcohol during the month preceding the survey, and 32% had 5 or more drinks of alcohol in one occasion in the two weeks preceding the survey. In the YRBS, 58.6% used alcohol during the 30 days preceding the survey, and 36.9% had 5 or more drinks of alcohol during the 30 days preceding the survey. In the present study, 49.7% were current drinkers, and 26.5% had 5 or more drinks

of alcohol on one occasion during the 30 days preceding the survey.

One of the limitations of this study was that the causation of risk behaviors had not been fully studied. The independent variables used in the present study such as age, gender, type of school, geographic area, academic status, religion, confidant, and socioeconomic status may not fully explain the cause of the selected health behaviors. The independent variables used in this study may play but a partial effect on students' engaging in risk behaviors. Causation of health risk behaviors, therefore, should be studied in more depth in a Korean cultural context. In addition, the research should be replicated to assess the epidemiological prevalence of the risk behaviors of the youth not only in Seoul but across the nation so that health professionals could develop health education programs that would be provided in schools to help reduce the prevalence of health risk behaviors and perhaps prevent these health risk behaviors. Further study should focus on developing those health education programs and measuring the effectiveness of those health education programs.

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<국문요약>

한국 청소년들의 건강위험행동 실태파악 및 분석

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본 연구의 목적은 한국청소년들의 건강행동실태를 파악하기 위한 것이다. 본 연구의 의의는 미국에서 행해지고 있는 청소년의 건강유지 및 증진과 아울러 성인병이나 조기사망에 대한 역학적인 접근방식을 한국청소년을 대상으로 하여 응용하는 데 있다. 이 연구에 사용된 연구도구는 미국의 Centers for Disease Control에서 청소년의 건강행동을 역학적으로 연구하기 위해 개발한 Youth Risk Behavior Survey를 한국 사회환경의 요구도에 맞게 수정한 것이다. 본 연구는 한국인 청소년들의 건강행동을 조사하기 위한 타당성있는 연구도구를 개발하기 위해 4개의 단계로 구성되어 있다. 두번의 focus group discussion과 pilot test, 그리고 실제조사로 이루어져 있다.

서울지역의 중·고등학생을 대표할 표본추출은 cluster sampling을 사용하였다. Cluster는 본 연구에서 구분한 서울의 지리적인 구역들, 즉 북부, 남부, 그리고 산업지역을 포함했고, 남자학교, 여자학교, 남녀공학학교를 포함했다. 총 38개 중·고교 학생 4,747명이 조사되었다. 약 52.4%의 응답자가 심각하게 자살을 생각해본 적이 있다고 답했다. 그리고 23.6%가 설문조사전 30일 중에 담배를 피운 적이 있다고 응답했으며 49.7%는 설문조사전 30일중에 술을 마신 적이 있다고 답했다. 약 29%가 설문조사전 30일 중에 싸움에 가담한 적이 있다고 응답했다. 본 연구에서 조사된 건강관련행동(건강위험행동 포함)들은 성, 연령, 성적, 사회경제적 위치, 학교 종류, 그리고 서울의 지리적인 구역에 따라 다양하게 나타났다. 남학생이 여학생보다 더 건강위험행동을 나타내었다. 건강위험행동은 나이가 증가함에 따라 증가했다. 사회경제적 위치가 낮다고 응답한 학생들과 학급에서 성적이 하위라고 응답한 학생들의 경우 건강위험행동은 더 많이 나타났다.

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