Prevalence of Drug Abuse and Smoking and Dietary Behavior of Male Students at Technical High School

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ABSTRACT

To investigate the relationship between eating behavior and the prevalence of adolescents drug abuse and smoking, this survey was conducted among 349 male students(mean age : 16.0 ±0.9yrs) at technical high schools in Kyunggi-Do. It was shown that 58.7% of total subjects were smoking and 11.2% were abusing drugs. Drug abusers weighed less than non-abusers : especially, student smokers were 2.7kg lighter than non-smokers despite the same height. Although parents' education showed no relationship with drug abuse, educational level of student smokers' fathers was significantly lower than that of non-smokers' fathers. Drug abusers and smokers showed significantly higher incidence of runaway from home, absence from school without notice, and parents' divorce than non-abusers and non-smokers. Drugs abused were sleeping pills(n=20), bonds and butane gas(n=9), marijuana(n=3), tranquilizer(n=3), morphine and cocaine(n=2), and pep pills like amphetamine(n=2). 76.9% of the drug abusers had their first experience in junior high school : and 81% of the smokers started smoking as early as in junior high school. Also, 44% of the smokers reported that they smoke daily. The drug abusers tended to have more irregular eating habits than the non-abusers. The smokers showed irregular mealtime, ate either too fast or too slow, and especially, often skipped lunch or dinner. The drug abusers and smokers took little vegetable in their meals and often ate bread or noodles instead of rice for staples. In addition, they preferred taste to nutrition when they had meals. The smokers tended to ingest smaller amount of calcium source such as milk or dairy food and fish with bone although they consume more volume of total foods than the non-smokers. All subjects took less in calorie, calcium, iron, vitamin A, vitamin E, riboflavin, and folic acid than the Recommended Dietary Allowance. Those findings suggest that drug abuse and smoking cause bad eating habits that influence unbalanced nutritional state. Therefore, nutrition education should be provided to the adolescents so that they can recognize the disadvantages of drug and smoking and its relation to dietary relation. (*Korean J Nutrition* 31(5) : 939~948, 1998)

KEY WORDS : drug abuse · smoking · dietary behavior · adolescents.

INTRODUCTION

Adolescence refers to the time in life when childhood has passed and puberty begins. At this stage of development, the second growth spurt occurs where

a physical growth that had been slowed down since late infancy accelerates as fast as it had been during infancy. Therefore, adolescence is critical for both physical and sexual maturity. Adolescence is a time of high self-consciousness, which results both in increasing self-centeredness and in the increased empathy that comes from understanding the perspective

of another person[1]. Also, one forms self-consciousness, and independence during this emotional convulsion. Furthermore, adolescence is the period of high susceptibility when the urge and curiosity for knowledge is utmost, and one may become rebellious or violent if one finds oneself unable to adjust to the given environment[2].

With such characteristics of adolescence, teenagers during this stage become easily dependent on alcohol, drug, and smoking to get rid of their emotional conflict. Drugs usually have two different usages. Positive usage is medical, where drugs are used to prevent and treat diseases, while the negative drug usage usually results in self-destruction and social problems.

Drug abuse or drug addiction means taking narcotic drugs illegally. World Health Organization defines drug abuse as habitual or random overdose[3]. Drug abuse at an early age can destroy body functions after maturity and habitual use of drugs may cause breakdown of nerve systems and slow down of physical growth and development. In addition, overdose of drugs leads adolescents to frequent absence and low score in school, and makes them have hollow and wild ideas making them more vulnerable to accidents and committing crimes[4].

In Korea, drug abuse began to be considered as a social problem in 1960's and the population of drug abuser, including the teenagers, increased at a high speed during the 80's. Even the kinds of drugs have emerged in variety such as philopon, hemp leaves, bonds, butane gas, etc., which are commonly used by teenagers. The seriousness of teenager drug abuse is clearly shown by the number of teenagers that take glue and butane gas, which tripled from 2,032 in 1989 to 6,277 in 1993[5]. The Ministry of Education conducted urine tests for 30,000 middle and high school students in 1996[6]. They reported that 12 students(0.049%) have been taking medications which are prohibited to be sold legally and 342(1,15%) have been using cabadanoid, benzodiaxephin and barbiturate which cause serious neurologic conditions. In urine test, 1.07% of the male subjects and 0.9% of female subjects showed positive. However, bond and butane gas cannot be detected in urine tests, the above positive rates must be considered to be high and serious. The Ministry of Education decided to include philopon among the items examined[7].

As to smoking, 80% of teenagers have experienced smoking and 44.8% turned out to be habitual smokers. Smoking not only makes people excited and unnecessarily bold but also functions as a barrier to physical growth. Smoking also makes teenagers hang around delinquent teens, which consequently results in social problems[8,9]. Therefore, smoking as well as drug abuse became a serious concern and a big public health problem.

The effects of drugs on nutrition depend on the types of drug, frequency, and period of dosage. Hence, the purpose of this study is to find out the realities of drug abuse, smoking, and dietary behavior of boys at technical high school and to provide teenagers with adequate and right information so that they can be led to sound physical growth and development.

Materials and Methods

1. Subjects

This study was conducted from May 12th to May 27th in 1997 on 500 male students attending technical high schools in Kyunggi-do, by using self-recording questionnaire. Among the returned answer sheets with insincere responses were excluded and the rest 349 sheets were used in this study.

2. Study design

The questionnaire was based on some references done before and was modified by a pilot study with 25 students. The questionnaire was composed of three categories to indicate the subjects' general circumstances, drug dependency including smoking and alcohol drinking, and dietary behavior. Each subject was asked to answer questions by himself. Through these questions, it was possible to know the socioeconomic backgrounds and anthropometric data of the subjects, prevalence and dependency on illegal drugs as well as addictions to cigarettes, alcohol, and coffee, and meal attitude and food consumption. Food and nutrient intakes were measured by the 24-hour dietary recall method, and the amounts of food per serving were decided by the eye-measure of food and dishes[10].

3. Statistical analysis

The research data were separated into two groups, 'Yes' or 'No', according to the subjects' experiences of drug abuse or smoking. Data were analyzed using SPSS-X package. Results were expressed in frequency and percentage, and mean and standard deviations. Statistical differences between the groups were compared by χ^2 or student's t-test.

Results and Discussion

1. General characteristics

Since the selected subjects were all high school students whose ages were 15.9±0.9 years old in average, there was not much difference in the age distribution even when they were separated into two groups by their involvement in smoking or drug ab-

use. The average height and weight of the drug abusers were 168.5±4.7cm and 59.1±9.6kg, respectively, while those of the non-abusers were 169.7±5.9 cm and 59.7±9.8kg, which seems to be almost the same in two groups. Those heights and weights were similar to 170.5cm and 60.7kg which are the average heights and weights for 16-years-old Korean males in 1994[1]. On the contrary, the average height and weight of the smokers were 169.8±5.9cm and 56.9±9.3kg, while those of the non-smokers were 169.4±5.6cm and 59.6±10.4kg, which shows that smokers were roughly 3kg lighter than non-smokers despite their similarity in height.

The general characteristics of the subjects are shown in Table 1. Looking at the education level of the parents, the smokers' fathers had significantly less education than the fathers of the non-smokers, al-

Table 1. General Characteristics of the subjects

Variable	Drug abuse[1]		Smoking[2]		Statistical significance
	No	Yes	No	Yes	
Education level					
Father's		n(%)			
Elementary	41(13.4)	7(17.9)	13(9.2)	35(17.3)	1) N.S.
Junior high	79(25.9)	11(28.2)	21(14.8)	69(34.2)	2) in case
High	173(56.7)	19(48.7)	100(70.4)	92(45.5)	of father's,
College	12(3.9)	2(5.1)	5(5.6)	6(3.0)	χ^2=27.5,
Mother's					p<0.01.
Elementary	61(20.3)	4(10.5)	19(13.6)	46(23.1)	in case of
Junior high	123(40.9)	15(39.5)	58(41.4)	80(40.2)	mother's,
High	113(37.5)	18(47.4)	60(42.9)	71(35.7)	N.S.
College	4(1.3)	1(2.6)	3(2.1)	2(1.0)	
Housing					1) χ^2=14.02,
Own house	298(96.8)	34(87.2)	139(96.5)	193(95.1)	p<0.01.
Room & board	1(0.3)	–	1(0.7)	–	2) N.S.
Relatives	5(1.6)	1(2.6)	1(0.7)	5(2.5)	
Dormitory	2(0.6)	1(2.6)	1(0.7)	2(1.0)	
Self-cooking	2(0.6)	3(7.7)	2(1.4)	3(1.5)	
Family number					
1 – 2	5(1.6)	–	1(0.7)	4(2.0)	1) N.S.
3 – 4	192(61.9)	24(61.5)	91(63.2)	125(61.0)	2) N.S.
5 – 6	99(31.9)	14(35.9)	46(31.9)	67(32.7)	
7+	14(4.5)	1(2.6)	6(1.7)	9(4.4)	
Monthly family income(10,000won)					
↓100	38(13.1)	4(10.5)	18(13.2)	24(12.4)	1) N.S.
100 – 150	115(39.5)	16(42.1)	57(41.9)	74(38.3)	2) N.S.
150 – 200	97(33.3)	14(36.8)	44(32.4)	67(34.7)	
200 – 250	22(7.6)	1(2.6)	9(6.6)	14(7.3)	
250+	19(6.5)	3(7.9)	8(5.9)	14(7.3)	
Total	310(100)	39(100)	144(100)	203(100)	

though no difference was shown in mothers' education level. The number of parents educated below elementary school among the smokers was twice more than that among the non-smokers.

In case of housing status, only 87.2% of the drug abusers lived in their own houses, which is significantly low compared to 96.8% among the non-abusers. However, no difference was shown between smokers and non-smokers. Interestingly, the percentage of students who lived alone and cook by themselves was as high as 7.7% among the drug abusers.

The number of people in a family was mostly 3 - 4 people. In case of monthly family income, over 70% of the subjects fell in a family whose income range was 1,500,000±500,000 won.

When the subjects confronted problems shown as Table 2, 35.9% of the drug-abusers and 43.1% of the non-abusers responded that they do not talk with other people, including their friends, teachers, parents, and siblings, and if they do, they talk with their friends mostly. There were no difference in the people they consult according to the incidence of drug abuse.

As for the smoking group, the rate at which they consult friends was 46.5%, higher than 32.2% of the non-smokers, and the rate at which the smokers consult their parents was 6.9%, significantly lower than the 12.6% of the non-smokers. When divided into

groups of people with incidence of drug abuse or smoking versus people without such incidence, the former group showed higher rate of consulting friends than the latter. As for whether the parents were divorced or not, drug-abusers had more divorced parents than the non-abusers, and smokers had significantly more divorced parents than the non-smokers(Table 2). The percentage of subjects with an experience of runaway was very high among the drug-abusers, and the drug-abusers and the smokers had relatively higher rate of runaway experience than the non-abusers and the non-smokers(p<0.01). In addition, when looking at the incidence of absence from school without notice, the drug-abusers and the smokers showed higher rate of such incidence than the non-abusers and the non-smokers(p<0.01).

2. Drug abusing and dependency

The seriousness of drug-abuse is shown in Table 3. The experience of using diverse types of drugs is presented as following : sleeping pills(20 subjects), bond and butane gas(9), hemp(3), tranquilizers(3), and pep-pills such as amphetamine and philopon(2).

Apart from these, some students mentioned cold and headache pills which cannot be considered as drugs, and thus those pills were excluded from this study. Survey on ages showed that 31 subjects had their first drug in middle school, and 8 people in

Table 2. Personal problems of the subjects

Variable	Drug abuse[1]		Smoking[2]		Statistical significance
	No	Yes	No	Yes	
Consult problems with	n(%)				
Friend	118(38.6)	22(56.4)	46(32.2)	94(46.5)	1) N.S.
Teacher	2(0.7)	–	1(0.7)	1(0.5)	2) χ^2=10.10, p<0.05.
Parents	30(9.8)	2(5.1)	18(12.6)	14(6.9)	
Sibling	23(7.5)	1(2.6)	9(6.3)	15(7.4)	
Consultant	1(0.3)	–	–	1(0.5)	
Nobody	132(43.1)	14(35.9)	69(48.3)	77(38.1)	
Divorce of parents					
Yes	27(8.9)	6(15.8)	6(4.2)	27(13.5)	1) N.S.
No	277(91.9)	32(84.2)	136(95.8)	173(86.5)	2) χ^2=8.19, p<0.01
Runaway from home					
Yes	25(8.1)	16(41.0)	3(2.1)	38(18.5)	1) χ^2=36.14, p<0.01
No	284(91.9)	23(59.0)	140(97.9)	167(81.5)	2) χ^2=21.90, p<0.01
Absence of school without notice					
Yes	46(14.9)	21(53.8)	11(7.7)	56(27.3)	1) χ^2=33.8, p<0.01
No	263(85.1)	18(46.2)	132(92.3)	149(72.7)	2) χ^2=20.87, p<0.01
Total	309(100)	39(100)	143(100)	205(100)	

Table 3. The prevalence of drug abuse among the subjects

Drug	Experience	Age of first experience		Frequency		
	Yes	Middle school	High school	Over once a week	Once a month	1 - 2 times a year
			n			
Narcotics(morphine, heroin, cocaine)	2	2	–	1	–	–
Hemp(marijuana)	3	1	2	–	2	–
Inhalants(bonds, acetone, butane gas)	9	8	1	3	2	4
Tranquilizer	3	3	–	–	–	3
Pep pills(Amphetamine)	2	2	–	–	–	2
Sleeping pills	20	15	5	3	1	15
Total	39	31	8	7	5	24

Table 4. Physical symptoms of drug abuse

Question	Answer		
	No	Yes	No response
		n(%)	
Decrease body weight	26(66.7%)	4(10.3%)	9(23.1%)
Outbreak skin	27(69.2%)	11(28.2%)	1(2.6%)
Lose appetite	28(71.8%)	10(25.6%)	1(2.6%)
Often experience the urge for drugs	28(71.8%)	10(25.6%)	1(2.6%)
Hide the use of drug from family	28(71.8%)	10(25.6%)	1(2.6%)
Often experience anxiety and depression	32(82.1%)	6(15.4%)	1(2.6%)
Can not confront friends easily	32(82.1%)	6(15.4%)	1(2.6%)
Hate other people and want to fight for no reason	31(79.5%)	7(17.9%)	1(2.6%)
Commit crime after drug abuse	33(84.6%)	5(12.8%)	1(2.6%)

high school. This reveals that the drug use mostly started in middle-school. The research done by the Korean Anti-Drug Group in May 1993 on 500 middle and high school students in Inchon area showed that 5.5% of the students inhaled bond and butane gas, 1.4% used marijuana, and 0.8% used philopon[12]. Another research done by the Teen Care Institute in 1993 showed that 3.8% consumed glue and butane gas, 1.2% cocaine, and 0.6% marijuana and 0.6% philopon[13], which indicated that the types of drugs and the quantity of each drug used were similar to this study, and among most of the teenagers.

When the drug abusers were asked 10 questions about the physical and mental symptoms, the numbers and percentages of the subjects answered 'yes' or 'no' are shown in Table 4.

There are three steps towards drug addiction[14]. First step is the "experimental stage", which is led by curiosity and the need to bond with friends. The second step is the "instrumental stage" when the abusers need drug habitually to control their feelings.

The final stage is called the "compulsive stage" where the users become obsessive with the drugs and cannot get by without it[15].

The survey questions of the first and the second stages were asked, and among those that replied 'yes', 28.2%(11 out of 39 respondents) responded that their skin gets rough. Also, 25.6% of these people replied that they lose appetite, think of drugs frequently, and hide their use of drugs from their family. Besides, 8 people answered that they lie to earn money to buy drugs, 7 people hated other people and wanted to fight for no reason, and 5 students said that they committed crimes after abusing drugs.

Therefore, in order to prevent the teenagers from going through the above stages, we must seize the chance to make a precautious intervention.

3. Prevalence and physical symptoms of smoking

Table 5 indicates the prevalence of smoking among the subjects. The highest percentage of the smok-

Table 5. Starting time and frequency of smoking

Starting time of smoking		Frequency of smoking	
	n (%)		n (%)
Elementary school	24 (11.7)	Almost everyday	91 (44.4)
First year in middle	18 (8.8)	2 - 3 times/week	28 (13.7)
Sophomore in middle	44 (21.5)	1 - 2/month	26 (2.7)
Senior in middle	78 (38.0)	1 - 2/year	10 (4.9)
First year in high	39 (19.0)	1 - 2 so far	43 (21.0)
No response	2 (1.0)	No response	7 (3.4)
Total	205 (100)	Total	205 (100)

Table 6. Physical symptoms of smoking

Question	Answer	
	No	Yes
	n (%)	
Sweat and have a headache	186 (90.7)	19 (9.3)
Lose appetite and cannot digest easily	164 (80.0)	41 (20.0)
Vomit and have pain of upper stomach	188 (91.7)	17 (8.3)
Easily catch cold and bronchitis	137 (66.8)	68 (33.2)
Have inflammation of the gum and color of teeth turns yellow	105 (51.2)	100 (48.8)
Feel dizzy and fatigue	143 (69.8)	62 (30.2)
Feel better and comfortable	133 (64.9)	72 (35.1)
Become excited and in ecstasy	170 (82.9)	35 (17.1)
Be nervous and tense	179 (87.3)	26 (12.7)
Lose concentration and become distracted	142 (69.3)	63 (30.7)

ers started smoking in their senior year at middle-school(38.0%), and then, sophomore at middle-school(21.5%), first year at high-school(19.0%), and elementary school(11.7%), successively. When asked how frequently they smoked, 44.4% of the smokers responded that they smoke daily, and 13.7% smoke two to three times a week. However, smokers who have smoked only once or twice was as high as 21.0%. According to the research done on 448,000 smokers in America[16], those who started smoking before the age of 15 showed 2.17 times higher possibility of death than the non-smokers, while those who started smoking between 15 and 18 showed 1.99 times higher possibility of death, and people who started smoking between 20 and 24 showed 1.34 times higher possibility. Also, if a man starts smoking at the age of 25, the likelihood of death before the age of 65 increases from 33% when he smokes 1 to 9 cigarettes a day, 37% when smoking 10 to 19 cigarettes a day, 39% when smoking 20 to 39 cigarettes a day, and 46% when smoking more than 40 cigarettes a day[17].

The physical symptoms of the subjects due to smoking are shown in Table 6. There were many

questions to which more than 30% of the respondents answered "Yes" : 48% of respondents experienced dental disease and discoloration : 35.1% replied that they feel better : 33.2% became more vulnerable to cold and suffer from bronchitis easily : 30.7% replied that they get easily distracted : and 30.2% complain about frequent headache and fatigue. This study shows that smoking is, to a large extent, responsible for a variety of physical symptoms.

Studies of detoxification of smoking suggest that the total amount of cigarettes smoked, the period of smoking, and the age when the smokers first started smoking are the critical factors of the damage caused by smoking[18]. In addition, teenager smokers are more likely to suffer from a cold or a lung disease and tend to skip classes in school three times more than the non-smokers[19].

Nicotine is considered as a habitual addictive narcotic, similar to drugs. If overly dosed with nicotine, a person gets high, just as one does on other narcotics such as heroine, cocaine and philophon, and the addictiveness of the nicotine is even stronger than these narcotics.

Therefore, it is extremely difficult to quit smoking once a person starts smoking and become addicted to nicotine, and thus, young adolescent's smoking is a very serious problem.

The subjects were asked about the physical symptoms of alcohol and coffee in the same way of each 10 questions about drug-abusing and smoking, and the mean scores of the physical symptoms by ranking the answer 'yes' as 1 point and the answer 'no' as 0 point are shown in Table 7. When the physical symptoms from alcohol are observed, the drug-abusers revealed significantly higher average score of 4.0±

2.9 than the non-drug abusers who showed 2.3±2.3. The drug-abusers also showed significantly higher scores of physical symptoms from coffee than the non-abusers. Therefore, it may be concluded that the average scores of physical symptoms for alcohols and coffee are higher among drug-abusers than the non-drug abusers.

Moreover, these scores for alcohols and coffee increased substantially for smokers as well($p < 0.01$). Hence, drug-abuse and smoking increase the physical symptoms from alcohol and coffee and make the body react sensitively to these.

Table 7. Scores of physical symptoms of alcohol and coffee

Variable	Drug-abuse		Smoking	
	No	Yes	No	yes
Alcohol	2.3±2.3[1]	4.0±2.9*	1.4±1.9	3.1±2.5**
Coffee	0.9±1.3	1.5±2.3**	0.9±1.3	1.0±1.6*

1) mean±S.D

*Significantly differs from the 'No' group at $p < 0.05$ level by the student t test.

**Significantly differs from the 'No' group at $p < 0.01$ level by the student t test.

4. Dietary behavior

1) Dietary attitude

The drug abusers and the smokers have less frequent meals than the non-drug abusers and the non-smokers as shown in Table 8. It has also been proved that the majority of the subjects have their meals irregularly, and that the smoking group has more irregular meals compared to the non-smoking group. In the case of the amount of food for each meal,

Table 8. Meal attitude of the subjects

Variable	Drug abuse[1]		Smoking[2]		Statistical significance
	No	Yes	No	Yes	
Meal frequency(#/day)			n(%)		
1	1(0.3)	–	–	1(0.5)	1) $\chi^2 = 8.63$, $p < 0.05$
2	63(20.3)	16(41.0)	24(16.7)	55(26.8)	2) $\chi^2 = 9.58$, $p < 0.05$
3	199(64.2)	18(46.2)	103(71.5)	114(55.6)	
4↑	47(15.2)	5(12.8)	17(11.8)	35(17.1)	
Meal time					
Regularly	90(29.1)	10(25.6)	51(35.7)	49(23.9)	1) N.S.
Whenever feel hunger	206(66.7)	27(69.2)	88(61.5)	145(70.7)	2) $\chi^2 = 6.41$, $p < 0.05$
Often skip	13(4.2)	2(5.1)	4(2.8)	11(5.4)	
Meal volume					
Full	67(21.7)	12(30.8)	29(20.3)	50(24.4)	1) N.S.
Moderate	95(30.7)	13(33.3)	48(33.6)	60(29.3)	2) N.S.
Small, not enough	10(3.2)	1(2.6)	5(3.5)	6(2.9)	
Too much or too small	137(44.3)	13(33.3)	61(42.7)	89(43.4)	
Meal speed					
Fast	152(49.2)	22(56.4)	67(46.9)	107(52.2)	1) $\chi^2 = 7.94$, $p < 0.05$
Moderate	135(43.7)	10(25.6)	67(46.9)	78(38.0)	2) N.S.
Slow	22(7.1)	7(17.9)	9(6.3)	20(9.8)	
Purpose of meal					
To satisfy nutrition	94(30.3)	8(20.5)	49(34.0)	53(25.9)	1) N.S.
To solve hunger	181(58.4)	28(71.8)	79(54.9)	130(63.4)	2) N.S.
To enjoy	12(3.9)	1(2.6)	5(3.5)	8(3.9)	
Habitually	23(7.4)	2(5.1)	11(7.6)	14(6.8)	
Total	310(100)	39(100)	144(100)	205(100)	

there is no attentive difference between the drug-abusing and the non-abusing group. In terms of the amount of time consumed for each meal, the drug-abusing group and the smoking group take either too much or too little time than the average people. As to the purpose of having meals, the majority of subjects have replied that they have meals not because of nutrition but because of hunger without any extensive difference among the different groups. However, the drug-abusing group showed especially high percentage of people(71.8%) who replied that they eat to get rid of hunger. It has been said that the adolescents' eating habits and tastes have a conspicuous impact on the development of their physical growth, nutrition, and health after they reach their adulthood. Thus, as this study has shown, problems with ignorance of a balanced nutrition intake should get attention. Therefore, we must teach the teenagers about the deep relationship between health and nutrition and help them grow healthy.

2) Foods and nutrients intake

As shown in Table 9, the drug abusers consumed less amount in most food groups than the non-abusers. The drug abusers showed the tendency of taking less protein source such as meat, fish and shell fish, eggs, poultry, milk and dairy foods, and legume and its products, while they had significantly more alcohol($p < 0.01$). When the smokers were compared to non-smokers, smokers tended to have more foods than the non-smokers but they consumed less milk and dairy foods and small fishes with bone than the non-smokers. In addition, the smokers showed lower intake of vegetable oil and higher intake of cooked and processed foods($p < 0.01$).

Nutrient intakes by the subjects are shown in Table 10. Average intakes of calorie, calcium, iron, vitamin A, riboflavin, vitamin E, and folic acid were consumed below Recommended Dietary Allowances (RDA)[19] while protein, thiamin, niacin, and vitamin C were consumed over RDA(shown in Fig. 1). All

Table 9. Daily food intake by food groups of the subjects

Food group	Drug abuse		Smoking		Whole subjects
	No	Yes	No	Yes	
		Gram			
Meats	135.6 ± 104.8[1]	126.8 ± 102.0	131.8 ± 96.6	136.6 ± 109.7	134.6 ± 104.4
Fish & shellfishes	90.0 ± 112.3	86.9 ± 110.1	89.4 ± 105.9	89.8 ± 116.2	90.0 ± 112.0
Eggs	47.5 ± 75.4	27.7 ± 43.4	48.7 ± 86.4	42.9 ± 61.4	45.3 ± 72.7
Poultry	15.5 ± 62.1	9.0 ± 36.0	8.4 ± 40.4	19.3 ± 70.0	14.8 ± 60.0
Milk & dairy products	156.1 ± 199.7	128.5 ± 161.0	160.9 ± 203.9	147.6 ± 190.1	153.1 ± 195.7
Fishes with bone	13.4 ± 23.8	8.2 ± 17.8	13.8 ± 25.5	12.1 ± 21.5	12.8 ± 23.2
Legumes	26.2 ± 45.4	15.6 ± 40.8	22.7 ± 39.5	26.7 ± 48.5	25.0 ± 45.0
Green vegetables	19.5 ± 38.3	22.7 ± 42.6	19.0 ± 37.7	20.5 ± 39.6	19.9 ± 38.8
White vegetables	162.1 ± 78.8	137.8 ± 85.1	157.9 ± 80.8	160.4 ± 79.2	159.4 ± 79.8
Yellow vegetables	37.2 ± 68.8	28.9 ± 60.7	35.3 ± 75.4	37.0 ± 62.4	36.3 ± 67.9
Seaweeds	8.7 ± 27.9	6.9 ± 19.0	5.8 ± 16.3	10.5 ± 32.4	8.5 ± 18.8
Mushrooms	2.8 ± 19.9	–	1.9 ± 14.7	3.0 ± 21.2	2.5 ± 18.8
Fruits	68.5 ± 151.3	63.6 ± 165.3	67.2 ± 153.1	68.5 ± 152.7	68.0 ± 152.7
Cereals & grain	755.4 ± 305.5	665.1 ± 243.5	748.0 ± 394.3	743.5 ± 211.6	745.3 ± 300.2
Potatoes	22.6 ± 65.7	17.2 ± 47.6	20.8 ± 49.4	22.8 ± 72.4	22.0 ± 63.9
Sugar & sweets	4.6 ± 17.9	4.0 ± 16.2	2.6 ± 9.2	5.9 ± 21.7	4.6 ± 17.7
Oils	6.1 ± 18.9	6.5 ± 16.0	8.7 ± 28.1	4.2 ± 5.0*	6.1 ± 18.5
Alcohols	0.3 ± 5.7	10.5 ± 65.7**	–	2.5 ± 29.4	1.5 ± 22.6
Beverages	49.5 ± 133.7	269 ± 82.6	60.1 ± 147.4	37.8 ± 114.0	47.0 ± 129.1
Tea	0.0 ± 0.1	–	0.0 ± 0.2	–	0.0 ± 0.1
Cooked processed foods	43.7 ± 88.3	32.1 ± 80.7	26.3 ± 61.7	53.7 ± 100.4**	42.4 ± 87.5
Seasonings	11.5 ± 14.8	11.3 ± 18.4	11.9 ± 15.6	11.2 ± 15.0	11.5 ± 15.2

1) mean ± S.D
*Significantly differs from the 'No' group at $p < 0.05$ level by the student t test.
**Significantly differs from the 'No' group at $p < 0.01$ level by the student t test.

groups had calorie slightly less than RDA, and especially drug abusers had significantly less calorie, as much as 250kcal, than non-abusers. Also, the drug abusers showed significantly less amount of protein than the non-abusers. When the smokers were compared to the non-smokers, the smokers consumed significantly higher amount of carbohydrate than the non-smokers(p<0.01) but there was no significant difference in calorie intake, which indicates that the smokers tend to consume more carbohydrate foods, not fat or protein-rich foods. In addition, it was shown that the smokers had significantly less calcium

than the non-smokers(p<0.01). Also, the drug abusers had roughly less calcium than the non-abusers though it was not statistically significant. The drug abusers or non-smokers tended to have less iron and vitamin A than the non-abusers or smokers. Noticeably, average intake of folic acid of the whole subjects was extremely low which was almost 1/3 of RDA.

Concluding the above research results, drug abuse and smoking have close relationship to the circumstances of the adolescents. In order to improve such adolescent drug abuse and smoking, more active policy

Table 10. Nutrient intake of the subjects

Variable	Drug abuse[1]		Smoking[2]		Whole subjects
	No	Yes	No	Yes	
Energy(kcal)	2483 ± 782[1]	2227 ± 807*	2378 ± 748	2508 ± 812	2454 ± 788
Protein(g)	105 ± 37	91 ± 34*	101 ± 37	105 ± 37	104 ± 37
Fat(g)	72 ± 32	67 ± 31	68 ± 30	74 ± 33	72 ± 32
Carbohydrate(g)	325 ± 103	293 ± 114	310 ± 88	329 ± 115**	321 ± 105
Dietary fiber(mg)	435 ± 277	452 ± 295	426 ± 394	444 ± 268	437 ± 279
Calcium(mg)	643 ± 388	523 ± 327	653 ± 465	613 ± 314**	629 ± 383
Iron(mg)	14.5 ± 6.5	12.9 ± 5.8	13.6 ± 5.2	14.8 ± 7.2	14.3 ± 6.5
VitaminA(μg RE)	442 ± 590	307 ± 219	401 ± 321	445 ± 683	427 ± 526
Thiamin(mg)	1.5 ± 0.7	1.4 ± 0.6	1.5 ± 0.6	1.4 ± 0.7	4.5 ± 0.7
Riboflavin(mg)	1.37 ± 8.1	1.12 ± 5.2*	1.33 ± 7.4	1.35 ± 8.2	1.34 ± 7.9
Niacin(NE)	23.5 ± 12.4	21.2 ± 12.0	23.3 ± 12.6	23.2 ± 12.3	23.3 ± 12.4
Vitamin C(mg)	95.6 ± 56.4	91.2 ± 89.6	97.1 ± 60.1	93.8 ± 61.5	95.1 ± 60.9
Vitamin E (mgα-TE)	5.2 ± 3.6	4.3 ± 3.5	5.3 ± 3.4	5.0 ± 3.8	5.1 ± 3.6
Folic acid(μg)	80.9 ± 73.3	63.3 ± 62.4	81.8 ± 72.1	76.9 ± 72.6	79.0 ± 72.3

1) mean ± S.D
*Significantly differs from the 'No' group at p<0.05 level by the student t test.
**Significantly differs from the 'No' group at p<0.01 level by the student t test.
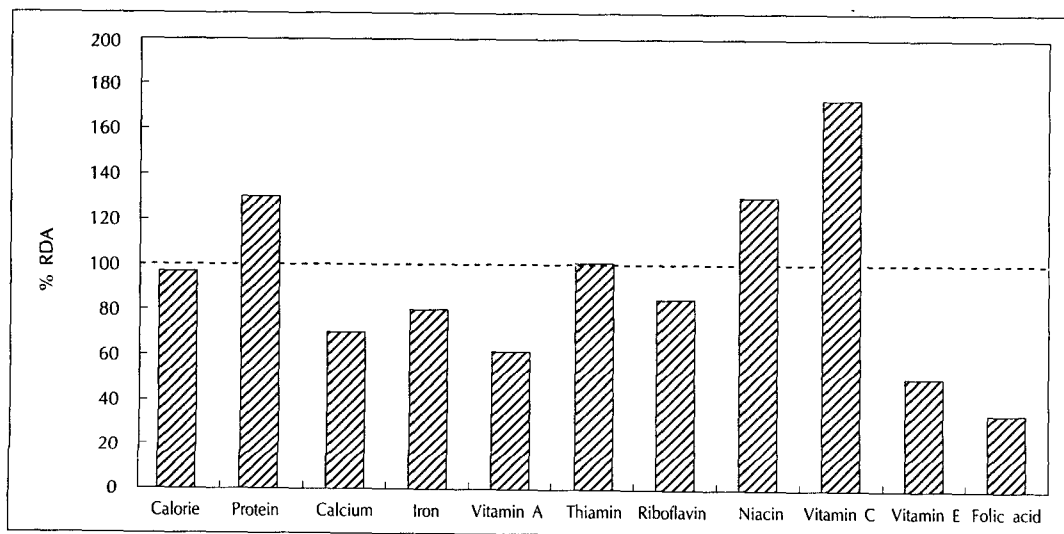
Fig. 1. The ratio of nutrients to RDA.

should be enforced, such as guidance by their parents or teachers through conversation or forming a better environment through promoting sports and leisure activities that the adolescents like. Drug abuse and smoking also have bad influence on dietary behavior, cause irregular food habit, and result in unbalanced intake of nutrient and food groups. Therefore, nutrition education about forming sound food habits and importance of nutrient intake should be done simultaneously.

Literature cited

1) Hurley LC. Developmental Nutrition. pp.304-321, Prentice-hall Inc., 1980

2) Vaughan VC, Litt IF. Child and Adolescent Develpoment : Clinical Implications. pp.229-328, W.B. Saunders Co., 1990

3) WHO, "Twentieth Report on The Expert Committee on Drug Dependence". Technical Report Series, No.155, WHO. Geneva, 1974

4) Diekelmann NL. The young adult-the choice is health or illness. Amer J Nursing 76 : 1272, 1976

5) The Korean Supreme Public Prosecutors Office. A White Book on Narcotic Crime in Korea, 1994

6) The Newspaper, Hankook-ilbo, p.37, April, 15th, 1997

7) The Newspaper, Kookmin-ilbo, p.31, May 12th, 1997

8) The Newspaper, Chosun-ilbo, p.19, June 1st, 1992

9) Ko JJ, Kim GS. The analysis on the relation between smoking behavior and delinquent of boys' high school students. J Korean Home Eco Assn 30(2) : 311-324, 1992

10) Food Research Institute, Korean Food & Technology Assn. The amount of foods and dishes by eye measure for food intake survey, 1988

11) The Korean National Education Evaluation Agency. A Handbook of Educational Statistics, 1995

12) The Korean Headquarter of Narcotic Control Movement. A Report of Survey on Drug Abuse Prevalence, 1993

13) The Korean Adolescence Society. A Study of Adolescent Drug Abuse Prevalence, 1993

14) Oh DY. Prevention and Treatment Policy of Adolescent Drug Abuse. p.31, Department of Health & Welfare, 1995

15) Wilford BB. Drug Abuse : A Guide For the primary Care Physician. American Medical Association, Chicago, 1981

16) Hammond EC, Morn D. Smoking and death rates report on forty four months of follow up of 187,783 man. JAMA 139 : 2204-2212, 1963

17) Company Letter. Dae-han-jun-sun. Cigarettes, p.24, 1996

18) Kim IS. Effects of cigarette advertisement on adolescent smoking. In : Materials for regulation of cigarette advertisement(2). Korean Anti-smoking Control Campaign Headquarter, p.23, 1992

19) Oh HC. Problem and prevention of adolescent smoking. In : A Material for School Health & Education. Seoul Education Bureau. pp.178-179, 1994

20) The Korean Nutrition Society. Recommended Dietary Allowance for Koreans. 6th revision, The Korean Nutrition Society, 1995