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## RESEARCH COMMUNICATION

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# The Experiences of Smoking in School Children up to and Including High School Ages and the Current Status of Smoking Habits; a Survey of Male High School Students in Japan

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### Abstract

**Objective:** The burden of tobacco-induced cancer is so heavy that every country should give the highest priority to tobacco control in its fight against cancer. The purpose of the present study was to investigate the actual conditions of tobacco smoking among boys in Japan.

**Methods:** A self-administered questionnaire survey. Two thousand and fourteen high school boys in Fukuoka City, Japan, answered unsigned self-administered anonymous questionnaires about tobacco smoking.

**Result:** Among 2014 students, 10.9% were current smokers. The rates of current smokers increased with the school age: 6.3% in the first grade; 11.3% in the second grade; and 15.5% in the third grade ( $p_{\text{trend}} < 0.01$ ). A total of 35.1% of students had the experience of smoking and 30% experienced smoking before entering high school. Of the students with smoking experience, 28.6% answered that they started smoking because their friends had offered them cigarettes and 52.5% of current smokers bought cigarettes from vending machines.

**Conclusion:** Health education for anti-smoking in all primary and secondary schools as well as restriction of cigarette vending machines should be strongly recommended.

**Key Words:** Tobacco - Cigarette vending machines - education - primary and secondary schools - lung cancer

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### Introduction

Prevention of cancer means eliminating or reducing exposure to the causes. There are many reports that showed tobacco smoking was harmful for the health (Japanese Ministry of Health and Welfare, 1993), (Sobue, 1996), (Sibuya, 2001), (Ozasa et al., 1994), (Walley et al., 2001), (Baron et al., 1996), (Farmer and Gotto, 1997). Chronic inhalation of tobacco smoke is a major risk factor in the development of lung cancer (Japanese Ministry of Health and Welfare, 1993), (Sobue, 1996), (Walley et al., 2001), (Baron et al., 1996). (World Health Organization, 2002) and many other cancers (e.g., esophagus cancer, stomach cancer, colon cancer, rectum cancer, pancreas cancer, kidney cancer, bladder cancer) (Japanese Ministry of Health and Welfare, 1993), (Baron et al., 1996), (World Health Organization, 2002), (Gajalakshmi et al., 2000). Tobacco smoking is

associated with an increased risk of malignancies of both organs in direct contact with smoke such as the esophagus and lung, and organs not in direct contact with smoke, such as the pancreas and kidney (Gajalakshmi et al., 2000). In industrialized countries, tobacco smoking is responsible for 80-90% of lung cancer deaths and some of the deaths from other cancers (World Health Organization., 2002). According to the World Health Organization (WHO), 4 million people die annually as a result of tobacco smoking (Walley et al., 2001). Forward projections suggested that tobacco smoking will kill 10 million people a year in 2030 (Walley et al., 2001). The burden of tobacco-induced cancer is so heavy that every country should give the highest priority to tobacco control in its fight against cancer (WHO, 2002). Tobacco elimination would reduce the great number of cancer deaths, especially lung cancer (WHO, 2002).

In Japan, publicity regarding the dangers of tobacco

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smoking, warning signs on tobacco packing, the introduction of anti-smoking devices, a ban on TV and radio commercials for tobacco-related products, and litigation against the tobacco industries have been introduced (Tokunaga, 2001). By those efforts, the rates of smoking for adult males have tended to somewhat decline in Japan (Statistics and Information Department, Minister's Secretariat, Japanese Ministry of Health, Labour and Welfare, 2003). However, the rates of current smokers for adult Japanese males (52.0%) is much higher than the rates in other developed countries (Statistics and Information Department, Minister's Secretariat, Japanese Ministry of Health, Labour and Welfare, 2003).

As adolescent smoking had increased worldwide (Gilpin et al., 1999), health education programme has focused on prevention. Young people usually encounter the practice among their friends, and then take up the habit themselves (World Health Organization, 2002). Although smoking by young people under 20 years has been prohibited by law in Japan, 36.9% of male high school students at the third grade have ever smoked and 25.9% of them smoke every day (Statistics and Information Department, Minister's Secretariat, Japanese Ministry of Health, Labour and Welfare, 2003). Smoking among the young population is a serious problem because the longer duration of smoking causes the greater risk of cancer (World Health Organization, 2002) and smoking has more harmful effects on the health of adolescent students than adults (Japanese Ministry of Health and Welfare, 1993). In addition, smoking habit is difficult for habitual smokers to quit (Japanese Ministry of Health and Welfare, 1993), (Chaloupka et al., 2000) because tobacco dependence is one of the mental and behavioral disorders (World Health Organization, 2002). As reducing tobacco smoking among adolescents is a public health priority, anti-smoking education programs should urgently be developed and introduced at an early age.

To investigate the actual conditions of tobacco smoking among boys in Japan, we designed a self-administered questionnaire for high school students.

## Subjects and Methods

### Participants

High school boys aged 15-18 years in a private high

school in Fukuoka City, Japan, took part in this study. In July 2001, their class teachers distributed unsigned self-administered anonymous questionnaires to the students during the homeroom as a health education. Having announced to the students that any information obtained by the questionnaire was to be confidential, they were asked to fill out the forms which were then collected by teachers. Sixty-six students were absent on the day when the questionnaires were distributed, but the remaining 2014 students responded to the questionnaire, all of them were included in the analysis. The present study was approved by the Ethics Committee of Sapporo Medical University.

### Questionnaire

All students were questioned about the experiences of smoking and drinking, the current status of smoking and drinking habits. Current smokers and ex-smokers were also asked about the reason why they started to smoke. Current smokers were also asked about 1) the occasion when they smoked, 2) the persons whom they smoked with, 3) the way how they got cigarettes, and 4) the smokers in their family members who lived with them. The details of other questions in the questionnaires have been reported elsewhere (Kiyohara and Washio, 2001).

### Statistical Analysis

Statistical analysis was performed with the SAS statistical package (SAS Institute Inc., Cary, NC) (SAS Institute Inc., 1998). Students were classified into three categories according to their school age: the first grade, the second grade, and the third grade. They were also divided by their smoking habits: never-smokers; those who had never smoked, ex-smokers; those who had smoked at some time but stopped; and current smokers. The trend of rates was determined by a trend test using a logistic regression model.

## Results

Among 2014 students, 219 (10.9%) were current smokers and 487 (24.2%) were ex-smokers. Thus 706 students (35.1%) had experience of smoking while 1308 (64.6%) were never smokers (Table 1). The rates for current smokers increased with the school age ( $p_{\text{trend}} < 0.01$ ). In contrast, the rates of never-smokers decreased with the school age ( $p_{\text{trend}}$

**Table 1. Smoking Status among Male High School Students in Japan**

	Grade of high school students			
	1 st n= 684 No (%)	2 nd n=709 No (%)	3 rd n=621 No (%)	all n=2,014 No (%)
Never-smokers* <sup>1</sup>	483 (70.6%)	451 (63.6%)	374 (60.2%)	1,308 (64.9%)
Ex-smokers	158 (23.1%)	178 (25.1%)	151 (24.3%)	487 (24.2%)
Current smokers * <sup>2</sup>	43 (6.3%)	80 (11.3%)	96 (15.5%)	219 (10.9%)

\*<sup>1</sup>: The rate decreased with the grade, P trend <0.01

\*<sup>2</sup>: The rate increased with the grade, P trend <0.01

**Table 2. First Smoking Experience among Male High School Students Who had ever Smoked**

	Grade of high school students			
	1 st n= 201 No (%)	2 nd n=258 No (%)	3 rd n=247 No (%)	all n=706 No (%)
The first time of smoking				
Primary school 1-3	26 (12.9%)	34 (13.2%)	29 (11.7%)	89 (12.6 %)
Primary school 4-6	45 (22.4%)	51 (19.8%)	47 (19.0%)	143 (20.3 %)
Secondary school 1	40 (20.0%)	47 (18.2%)	34 (13.8%)	121 (17.3%)
Secondary school 2	46 (22.9%)	43 (17.8%)	35 (14.2%)	124 (17.6%)
Secondary school 3	39 (19.4%)	46 (17.8%)	45 (18.2%)	130 (18.4%)
High school 1	4 (2.0%)	29 (11.2%)	30 (12.1%)	68 (8.9%)
High school 2	NA	7 (2.7%)	19 (7.7%)	26 (3.7%)
High school 3	NA	NA	5 (2.0%)	5 (0.7%)
Unknown	1 (0.5%)	2 (0.8%)	3 (1.2%)	6 (0.8%)

<0.01). The rates for ex-smokers were similar in the three grades ( $p_{\text{trend}}=0.59$ ).

Among 706 students with smoking experience, over 10% had their first experience from the first to the third grade in the primary school and about 20 % did from the fourth to the sixth grade in the primary school (Table 2). Thus over 30 % of students with smoking experience had the first experience in the primary school. In their secondary school hood, 17-18% of students with smoking experience had the first experience in each grade. The rate of students who had the first experience of smoking was follows: in the first grade of secondary school, 17.3% of all high school students had the first experience; in the second grade of secondary school, 17.6% of all high school students had the first experience; in the third grade of secondary school, 18.4% of all high school students had the first experience. Table 2 also showed us that most of the 247 students with smoking experience in the third grade high school students had the first experience before entering high school while only 54 students (21.9%) did so after becoming high school students.

Table 3 summarises the reasons why they started to smoke. The dominant three reasons are follows. Among 706 students with smoking experience, 202 students (28.6%)

answered that their friends offered them smoking, 202 (28.6%) could not find any reasons, and 194(27.5%) started smoking because of the curiosity to smoke.

Table 4 illustrates the frequency of smoking among current smokers. Among 219 current smokers, 114 (52.1%) answered that they smoked every day. The rate of those who smoked every day increased with the grade: 37.2% in the first grade; 46.3% in the second grade; and 63.5% in the third grade ( $p_{\text{trend}}<0.01$ ).

Table 5 shows the doses of cigarettes among current smokers. Among 219 smokers, 22 smokers (10.5%) answered that they smoked more than 20 cigarettes, and 32(10.5%) smoked 11-20 cigarettes every day. Thus 54 (24.7%) of 219 smokers smoked more than 10 cigarettes every day. The rate of heavy smokers who smoked more than 10 cigarettes a day increased with the school age but did not reach the significance ( $p_{\text{trend}}=0.15$ ).

Table 6 summarises the occasion when they smoked. Among 219 smokers, 141 (64.4%) answered that smoked in their own rooms, while 133(60.7%) in their friends' rooms, 89(40.6%) in tea rooms or public houses, 50(22.8%) on the way to or back from school, 25 (11.4%) with family members and 13(5.9%) at the parties with the members of school

**Table 3. The Reason Why They Smoked (ever-smokers)**

	Grade of high school students			
	1st n= 201 No (%)	2nd n=258 No (%)	3rd n=247 No (%)	All n=706 No (%)
Offered by friends	62 (30.8%)	76 (29.5%)	64 (25.9%)	202 (28.6 %)
Could not find any reason	54 (26.9%)	77 (29.8%)	71 (28.7%)	202 (28.6 %)
Smoking guys look nice	6 (3.0%)	7 (2.7%)	9 (3.6%)	22 (3.1%)
With curiosity	57 (28.4%)	75 (29.1%)	62 (25.1%)	194 (27.5%)
Offered by Family members	10 (5.0%)	11(4.3%)	8 (3.2%)	29 (4.1%)
Want to be adult	4 (2.0%)	4 (1.6%)	4 (1.6%)	12 (1.7%)
Look TV commercial	3 (1.5%)	2 (0.8%)	1 (0.4%)	6 (0.8%)
Other reasons	11 (5.5%)	20 (7.8%)	18 (7.3%)	49 (6.9%)

Students could give two or more answers

**Table 4. The Frequency of Smoking How often They Smoked (current smokers only)**

	Grade of high school students			
	1 st n= 43 No (%)	2 nd n=80 No (%)	3 rd n=96 No (%)	all n=219 No (%)
Once a month or less	12 (35.8%)	16 (20.0%)	9 (9.4%)	37 (16.9 %)
Twice or three times a month	4 (9.3%)	11 (13.8%)	5 (5.2%)	20 (9.1%)
Once a week or less	3 (7.0%)	6 (7.5%)	2 (2.1%)	11 (5.0%)
Twice or three times a week	7 (16.3%)	5 (6.3%)	7 (7.3%)	19 (8.7%)
Four or five times a week	1 (2.3%)	4 (5.0%)	6 (6.3%)	11 (5.0%)
Every day* <sup>1</sup>	16 (37.2%)	37 (46.3%)	61 (63.5%)	114 (52.1%)
Unknown	0 (0.0%)	1 (1.3%)	6 (6.3%)	7 (3.2%)

\*<sup>1</sup>: The rate increased with the grade, P trend <0.01

**Table 5. The Dose of Cigarettes How many They Smoked (current smokers only)**

	Grade of high school students			
	1 st n= 43 No (%)	2 nd n=80 No (%)	3 rd n=96 No (%)	all n=219 No (%)
Several cigarettes a year	8 (18.6%)	12 (15.0%)	8 (8.3%)	28 (12.8 %)
Several cigarettes a month	9 (20.9%)	18 (22.5%)	7 (7.3%)	34 (15.5%)
Several cigarettes a week	9 (20.9%)	8 (10.0%)	16 (10.4%)	33 (15.1%)
1-10 cigarettes a day	10 (23.3%)	22 (27.5%)	38 (39.6%)	70 (32.0%)
11-20 cigarettes a day	5 (11.6%)	12 (15.0%)	15 (15.6%)	32 (14.6%)
More than 20 cigarettes a day	2 (4.7%)	8 (10.0%)	12 (12.5%)	22 (10.5%)

circles. The rate of those who smoked in tea rooms or public houses increased with the grade ( $p_{\text{trend}} < 0.01$ ). In contrast, the rate of those who smoke in their friends' room decreased with the school age ( $p_{\text{trend}} < 0.01$ ).

Table 7 shows the persons whom they smoked with: 141 (64.4%) smoked with students of other high schools; 108(49.3%) smoked alone; 95(43.3%) smoked with students of their high school; and 16(7.3%) smoked with family members or relatives.

Table 8 illustrates the way how they got cigarettes. The

dominant three ways are follows. Among 219 smokers, 115 (52.5%) bought cigarettes from vender machines, 98(44.7%) got cigarettes from friends or seniors, and 82(37.4%) bought cigarettes at tobacco-stores or supermarkets.

Table 9 summarises the time of their first experiences of drinking. Less than 20% of students answered that they had never drunk while about 30% had the first experiences of drinking between the first and the third grade in primary school and about 25% did between the fourth grade and the sixth grade in primary school, which shows that more than

**Table 6. The Occasion when They Smoked (current smokers only)**

	Grade of high school students			
	1 st n= 43 No (%)	2 nd n=80 No (%)	3 rd n=96 No (%)	all n=219 No (%)
With family members	2 (4.7%)	11 (13.8%)	12 (12.5%)	25 (11.4 %)
Party of club	3 (7.0%)	6 (7.5%)	4 (4.2%)	13 (5.9%)
Tea-room /public house* <sup>1</sup>	11 (25.6%)	26 (32.5%)	52 (54.2%)	89 (40.6%)
In their own rooms	37 (86.0%)	41 (51.3%)	63 (65.6%)	141 (64.4%)
In friend's rooms* <sup>2</sup>	32 (74.4%)	49 (61.3%)	52 (54.2%)	133 (60.7%)
On the way to or from school	10 (23.3%)	13 (16.3%)	27 (28.1%)	50 (22.8%)

Students could answer two or more answers if they had two or more answers.

\*<sup>1</sup>: The rate increased with the grade, P trend <0.01

\*<sup>2</sup>: The rate decreased with the grade, P trend <0.01

**Table 7 The Persons Who They Smoked with (current smokers only)**

	Grade of high school students			
	1 st n= 43 No (%)	2 nd n=80 No (%)	3 rd n=96 No (%)	all n=219 No (%)
Without any person	30 (69.8%)	56 (70.0%)	72 (75.0%)	108 (49.3%)
Students in the same school	17 (39.5%)	30 (37.5%)	48 (50.0%)	95 (43.3%)
Students in other school	39 (90.7%)	47 (58.8%)	55 (57.3%)	141 (64.4%)
With family and relatives	2 (4.7%)	7 (8.8%)	7 (7.7%)	16 (7.3%)
Others	12 (27.9%)	18 (22.5%)	31 (32.3%)	61 (27.9%)

Students could answer two or more answers if they had two or more answers.

**Table 8 The Way How They Got Cigarettes (current smokers only)**

	Grade of high school students			
	1 st n= 43 No (%)	2 nd n=80 No (%)	3 rd n=96 No (%)	all n=219 No (%)
Steal from family members	3 (7.0%)	4 (5.0%)	4 (4.2%)	11 (5.0%)
Receive from friends or seniors	29 (67.4%)	35 (43.8%)	34 (35.4%)	98 (44.7%)
Receive from parents or siblings	6 (14.0%)	4 (5.0%)	7 (7.3%)	17 (7.8%)
Vender machines	43 (100.0%)	35 (43.8%)	37 (38.5%)	115 (52.5%)
Tobacco store/supermarkets	10 (23.3%)	35 (43.8%)	37 (38.5%)	82 (37.4%)
Others	3 (7.0%)	5 (6.3%)	10 (10.4%)	18 (8.2%)

Students could answer two or more answers if they had two or more answers.

half had the experiences of drinking before entering secondary school.

As shown in Fig.1, 30.1% of students experienced smoking and 77.2% experienced drinking before entering high school. The experience rate of smoking as well as of drinking increased with school age but the experience rate of drinking was greater than that of smoking all through the period of primary and secondary school.

## Discussion

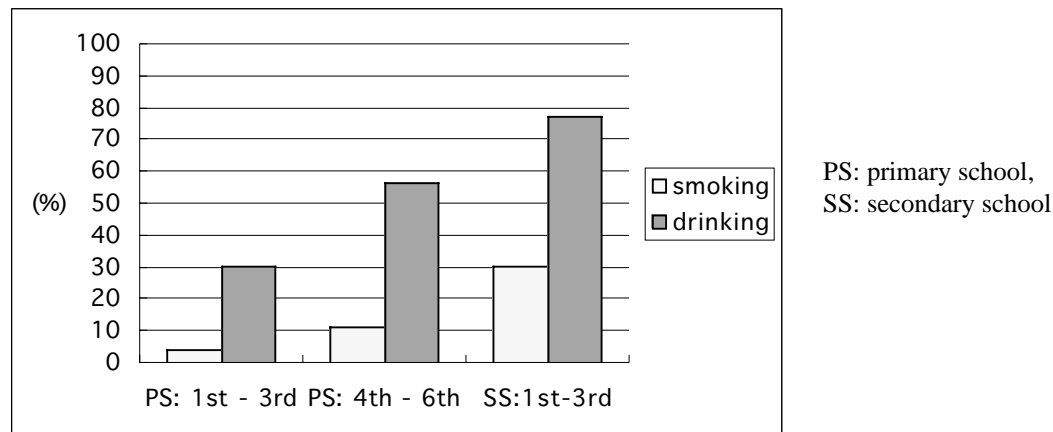
A nationwide survey of smoking habits showed that 36.9% of Japanese male high school students at the third grade had ever smoked and 25.9% of them smoked every day (Statistics and Information Department, Minister's

Secretariat, Japanese Ministry of Health, Labour and Welfare, 2003). The rates of current smokers in other studies were as follows: 25.5% in Japan (Osaki and Minowa, 1993), 21% in China (Zhu et al., 1992), and 28% in USA (Wakefield et al., 2000). In the present study, the rate of current smokers was 10.9%, which is smaller than the rates that we expected. In spite of the unsigned self-administered anonymous questionnaires, some of smokers may have answered that they did not smoke because their teachers collected questionnaires. In contrast, the rate of those who had ever smoked was 35.1%. This rate is almost the same rate as we expected.

The present study showed that the rates of current smokers increased from 6.3% in the first grade to 15.5% in the third grade. More effective anti-smoking education

**Table 9. First Drinking Experience among Male High School Students in Japan**

	Grade of high school students			
	1 st n= 684 No (%)	2 nd n=709 No (%)	3 rd n=621 No (%)	all n=2,014 No (%)
The first time of drinking				
Never drinkers	132 (19.3%)	117 (16.5%)	101 (16.3%)	346 (17.2%)
Primary school 1-3	206 (30.1%)	231 (32.6%)	178 (28.7%)	615 (30.5%)
Primary school 4-6	199 (29.1%)	180 (25.4%)	147 (23.7%)	526 (26.1%)
Secondary school	133 (19.4%)	150 (21.2%)	131 (21.1%)	414 (20.5%)
High school	12 (1.8%)	28 (3.9%)	56 (9.0%)	96 (4.8%)
Unknown	2 (0.3%)	3 (0.4%)	8 (1.3%)	13 (0.7%)



**Figure 1. Smoking Experience Rates and Drinking Experience Rates among Male High School Students in Their Primary and Secondary School Hood.**

should be recommended in high school. Oriol et al. (1998) reported that interventions to decrease smoking among the young, should take into account not just individuals but the young as a group. In the present study, 44.7% of current smokers got cigarettes from peers or seniors, and 60.7% of ever-smokers answered that they smoked in their friends' rooms. In addition, 64.4% of ever-smokers smoked with high school students of other schools (64.4%) and 43.3% smoked with their schoolmates. Furthermore, 28.6% answered that they started smoking because their friends offered them smoking, and 27.5% answered that they started smoking because of the curiosity to smoke. Since personal life-style is socially conditioned (Rose, 1995), high school students may not hesitate to smoke if their peers are smoking. Ozaki et al. (1993) reported that smoking by a friend had the strong relationship to smoking status of secondary school and high school students, and Watanabe et al (1995) reported that the number of friends who smoked was strongly associated with adolescent smoking behaviors. It makes little sense to expect individuals to behave differently from their peers (Rose, 1995). Crone et al. (2003) reported that school programs aimed at increasing the peer group pressure not to smoke could reduce the rate of adolescents who start smoking. Anti-smoking education not only for smokers but also for all students should be recommended. Moriwaki et al.(2003) reported that combination of anti-smoking education and total ban on smoking including school teachers increased the rates of secondary school students who could refuse offers of smoking from their friends.

Our previous study (Kiyohara and Washio, 2001) showed that the smoking rate increased with the grade although over 90% of high school students thought that smoking was harmful for health and knew that smoking was a risk factor for lung cancer. In the present study, the rate of daily smokers who smoked every day as well as the rate of heavy smokers who smoked more than 10 cigarettes a day increased with the grade. These findings may be partly explained by the addictives of tobacco smoking (Chaloulpca

et al., 2000), (Japanese Ministry of Health and Welfare, 1993). Since support for smoking cessation is an important component tobacco-control programs (Novotny et al., 2000), for those students who are smoking, smoking cessation programs should be considered including such as prescription of nicotine patch by school doctors.

The present study also revealed that 11.5% of boys experienced smoking up to the 6th grade of primary school and 30.1% did up to the 3rd grade of secondary school. These rates are smaller than the rates reported by Kawabata et al. (1998). They reported that the smoking experience rates of boys were 24% at the 6th grade of primary school and 49% at the 3rd of secondary school. Smaller rates may be partly explained by the possibility that some students pretended to be never-smokers because their teachers collected questionnaires.

Terao (1999) reported that the first experience of smoking was most common between 4th and 6th grade of primary school, which were 65.0% of ex-smokers among secondary school boys. This is consisted with the result of the present study. In the present study, the first experience of smoking was most common (20.3%) between 4th and 6th grade of primary school. Smoking among adolescents is a serious problems because the longer duration of smoking causes the greater risk of cancer (World Health Organization, 2002) and smoking is more harmful for adolescents than adults (Japanese Ministry of Health and Welfare, 1993). In addition, smoking habit is difficult for habitual smokers to break (Japanese Ministry of Health and Welfare, 1993), (Chaloulpca et al., 2000) because the tobacco addiction is one of the mental and behavioral disorders (World Health Organization, 2002). Hasuo et al. (1998) reported that 36% of Japanese men continued smoking even after diagnosis of cancer. Since young people have a poor understanding of the addictives of smoking (Chaloulpca et al., 2000), health education for anti-smoking should be strongly recommended to start in all primary and secondary schools. Kawabata et al. (1998) reported that ever-smokers had lower self-efficacy to refuse

peer pressure to smoke than never-smokers. It may be too late to start anti-smoking education in high school.

In the present study, 40.6% of smokers smoked in tea rooms or public houses. The rate of those who smoked in tea rooms or public houses increased with the grade ( $p_{\text{trend}} < 0.01$ ). Ikegami et al. [1983] reported that frequent drinkers tended to be frequent smokers for male high school students. In the present study, 30.1% of students experienced smoking and 77.2% experienced drinking before entering high school. In addition, the experience rate of drinking was greater than that of smoking all through the period of primary and secondary school. These findings suggest the possibility that boys may be offered smoking when they are drinking with peers and seniors. It seems to be practical to give them anti-smoking education with anti-drinking education.

Twenty four hours available venter machines may be convenient for adult smokers because they can get cigarettes at any time. However, the present study revealed that 52.5% of current smokers bought cigarettes from venter machines. It is a serious problem in Japan. Venter machines are easy way to get cigarettes not only for adults but also adolescents. Although smoking under 20 years is banned in Japan, youth can easily get cigarettes from venter machines. Ozaki and Minowa (1998) reported that in Japan, 50-80% of current smokers among secondary and high school students got cigarettes from venter machines and recommended the restriction of cigarette vending machines.

WHO has been promoting the Framework Convention on Tobacco Control (FCTC) which includes restriction on selling to persons aged under 18 (Usuda et al., 2002). Tobacco control tends to be less restricting in Japan than in other developed countries (Usuda et al., 2002). In Japan, adult smokers should accept the inconvenience with total ban of cigarette vending machine to protect their children from the harm of smoking.

We must confess that we investigated only male students. Smoking rates have been reported higher among boys than girls in Japan (Osaki and Minowa, 1993), (Ikegami et al., 1983), (Kawabata et al., 1998), (Terao, 1999). However, some epidemiological studies showed that smoking increased the greater risk of lung cancer in females than males (Lubin and Blot, 1984), (McDuffie et al., 1987), (Brownson et al., 1992). Further studies are recommended based on large samples of female students.

Tobacco smoking is one of the greatest health problems because it will become the biggest single risk factor for ill-health (Walley et al., 2001), (Sibuya, 2001). Tobacco accounted for 12% of total mortality, and the burden of disease attributable to tobacco amounted to 10% of the total years of life lost and 7% of disability-adjusted life years in Japan (Sibuya, 2001). Tobacco smoking is the greatest risk factor of lung cancer (Japanese Ministry of Health and Welfare, 1993), (Sobue, 1996), (Walley et al., 2001), (Baron et al., 1996), (World Health Organization, 2002); over 90% of cases of squamous cell carcinoma and small cell carcinoma and about 40% of adenocarcinoma can be explained by direct smoking (Sobue, 1996). In addition, it is

also a major risk factor of other chronic lung diseases (Japanese Ministry of Health and Welfare, 1993), (Walley et al., 2001), (Gajalakshmi et al., 2000), and heart disease (Japanese Ministry of Health and Welfare, 1993), (Walley et al., 2001), (Gajalakshmi et al., 2000), (Farmer and Gotto, 1997). Prevention through health education should put a high priority among all school and communities. We hope that social changes brought about by education will make youth to dislike smoking. To reduce smoking among the youth, we may need further anti-smoking actions (e.g., control on smoking in public places, ban on smoking in school, total ban on tobacco advertising, tough advertising to discourage smoking, increasing tobacco tax).

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