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＜Educational Report＞

GORIN Team No.2
Post Graduate of Public Health in International Health
National Institute of Public Health, Japan

Youth smoking prevention program: Influence on smoking prevention program among secondary school students in Paranaque city, Philippines

青少年禁煙プログラム：フィリピン共和国パラナケ市の公立中学・高等学校における生徒の喫煙率への影響について

Soulivanh PHOLSENA, Asaad Mahdi ASAAD, Zhan Qiu MAO, Alison Ripiapu SIO, Oliver SOKANA, Yoko KISHI, Keiko KITAJIMA

Keywords: smoking, tobacco, youth, prevention program, Paranaque city, Philippines

Supervisors: Nobuyoshi WATAHIKI, Nobuyuki HYOI, Michiko BANDO, Takuya MATSUSHIGE

Ⅰ. Introduction

1. Background

Smoking, which is one of the major risk-taking behaviors, is responsible for the health burden on the society more than any other drug. According to the World Health Organization (WHO), tobacco use is the leading cause of preventable death and is estimated to kill more than 5 million individuals each year worldwide[1]. In addition, Philippines has been reported to be one of the countries in the world that still has a very high prevalence of smoking. It was found that 21.7% of adolescents aged 13–15 years and 28.3% of the population aged 15 years and older in the Philippines were actively smoking[2,3]. Therefore, the government of the Philippines has introduced a series of stricter legislations and policies on tobacco control, including a ban on smoking in all indoor and outdoor public spaces and workplaces; a ban on all pro-tobacco advertising; mandatory printed warnings on all cigarette packages; increased taxes on tobacco products; implementation of comprehensive cessation programs, etc.

Due to the high prevalence of smoking among school-aged adolescents, the government has initiated the youth smoking prevention program targeting students at the school level in 2003. This program is implemented by the Department of Education in collaboration with the Department of Health. Lessons related to tobacco effects are integrated into the school curriculum, such as physical education, science, and other school activities.

2. Objectives of the study

The main objective of this study was to investigate the effect of the youth smoking prevention program among public secondary school students through knowledge and attitude modifications in Paranaque City. To achieve the proposed main objective, specific objectives were set as follows: (i) to identify the prevalence of smoking among students in Paranaque City, (ii) to measure their level of knowledge and attitude toward tobacco use, (iii) to assess the implementation of the school smoking prevention program and its effects on the level of the students' knowledge on health risks of smoking and their attitude toward tobacco use, and (iv) to examine the relationship between the prevalence of smoking and economic factors (depressed and non-depressed areas) among students.

Ⅱ. Methods

This was a cross-sectional study, and the data collection was divided into 2 parts. First, the questionnaire, which was modified from the Global Youth Tobacco Survey (GYTS) of the WHO and the United States Communicable Disease Control (CDC), was administered to students to assess their smoking status and the level of knowledge and attitude

toward tobacco use[4]. Second, the school principals were then interviewed using the systemic interview form, which was adapted from the school assessment tool of the US Department of Education in Rhode Island[5]. The interview was conducted to assess the implementation of the school smoking prevention program by assessing 6 areas: (i) school curriculum, (ii) instructions, (iii) school policy, (iv) staff involvement, (v) student involvement, and (vi) parent involvement. In addition, on-site observations were conducted at the schools.

Four out of a total of 9 public secondary schools were intentionally selected in order to equally represent economically depressed and non-depressed areas. Secondary schools in the Philippines have 4 levels. We applied the randomized sampling technique for selecting 1 section (class) per level. All students from 16 selected sections were eligible for our study. A total of 823 respondents provided their consent and answered the questionnaire. Of those, only 9 (1%) were excluded from the analysis because they did not answer more than 8 out of 37 questions. Therefore, 814 respondents (99%) were included in the data analysis.

Data collected from the interviews and questionnaires were entered and analyzed by using SPSS-PASW Statistics version 18. Simple calculation, descriptive analysis, cross-tabulation (Chi-square test), mean comparison (*t* test and analysis of variance (ANOVA)), and curve estimation (power regression model) were used to describe the distribution and to verify the association and correlation among the school smoking prevention program, the students' prevalence of smoking, and their level of knowledge and attitude toward tobacco use.

The conceptual framework is shown in Figure 1, and it was drawn from the 6 components of the school assessment tool developed by the US Department of Education in Rhode Island. The study question was to assess whether the school smoking prevention program would reduce the prevalence of smoking among students by increasing their knowledge and changing their attitude toward tobacco use. However, there were a number of factors outside the schools, such as influence of media, peer, and family, that were excluded from the study.

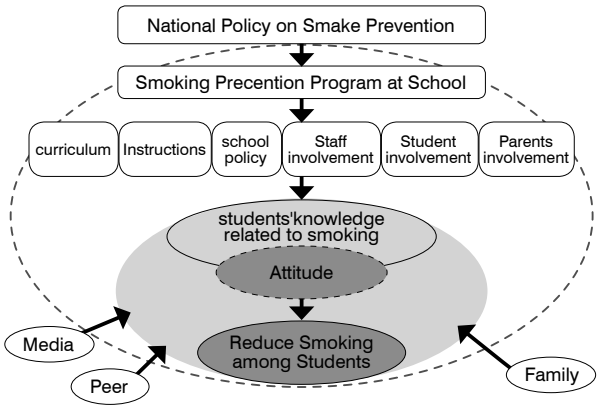

Figure 1 Conceptual Framework on School smoking prevention program reducing prevalence of smoking among students

Our study received approval from the National Institute of Public Health ethical review board (IBRA #10057). In addition, the permission was also provided by the Paranaque City education office as well as the principals of the 4 selected schools. The respondents were asked to participate voluntarily using a consent form that was clearly explained in English and Filipino both in writing and orally. Considering confidentiality, the consent form was written with the students' sign without name and collected separately from the questionnaires. Therefore, the respondents could not be traced and their identity remained anonymous.

On the basis of a literature review, in order to avoid confusion, we classified the smoking status into 3 main categories: (i) active smokers included those who currently smoked, (ii) non-active smokers included those who have tried to smoke before but were not currently smoking, and (iii) non-smokers included those who have never smoked in their life.

Ⅲ. Results

The mean age of the respondents was 14 years (Table 1). There were 447 female respondents and 364 male respondents. Among the schools, school C had the lowest number of respondents (169) and school A had the highest (230) due to differences in the class size

1. Prevalence of smoking in public secondary schools in Paranaque City

We found that 7.4% of students were active smokers, 10.8% of students were non-active smokers, while 81.8% had never smoked (Figure 2). The prevalence of smoking was higher among male students (11.9%) than in female students (3.6%) ($p < 0.01$). The number of active male smokers was 3-times

higher than that of active female smokers (Figure 3). In addition, smoking started as early as 8 years of age among male students and at 12 years among female students. School lessons were effective to persuade students to try to quit smoking; 43.3% of active smokers and 40% of non-active smokers admitted that they had tried to quit smoking because of the school lessons.

Table 1 Characteristics of Respondents

Secondary School		A	B	C	D	Total
Location		Depressed	Non-Depressed	Non-Depressed	Depressed	
Total Student		N = 1833	N = 1734	N = 3276	N = 1962	8805
Sample size		n=230 12.50%	n=220 12.60%	n=169 5%	n=195 10%	814
Mean Age		m=14.34	m=14.26	m=14.13	m=14.16	m=14.23
Gender	*Male	109	103	69	83	364
	Female	120	116	100	111	447
Age	<12	1	3	1	0	5
	12	19	25	23	31	98
	13	48	50	36	40	174
	14	55	57	39	42	193
	15	55	43	47	42	187
	16	35	27	16	27	105
	>16	14	15	7	13	49

*) 3 respondents were not applicable

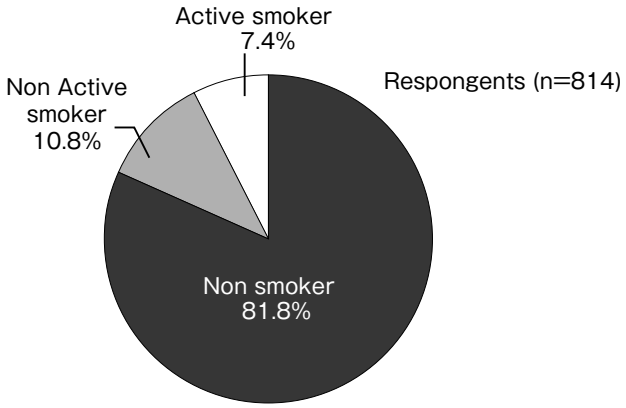

Figure 2 Smoking Status of respondents

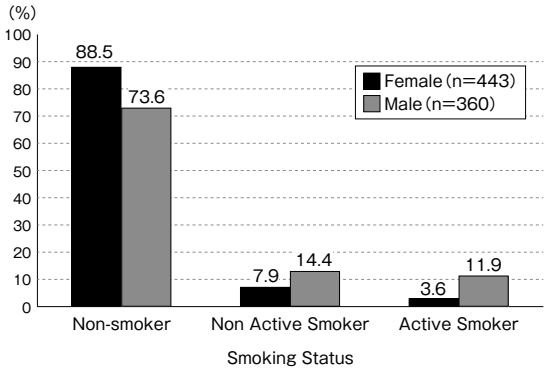

Figure 3 Smoking status among male and female students

2. Students' knowledge and attitude toward tobacco use

On the basis of each individual response, the knowledge and attitude toward tobacco were measured by numerical scoring. There were 10 questions on the knowledge of health risks associated with smoking. Each correct answer was scored one point. Thus, the respondent's knowledge score ranged from 0 to 10 points. Similarly, the respondent's attitude toward tobacco use was measured by 4 questions. Each answer that favored smoking was scored one point. Therefore, the respondent's attitude score ranged from 0 to 4 points.

The knowledge of active smokers on health risks associated with smoking is likely to be lower than that of non-active and non-smokers (Figure 4). When comparing the mean score of knowledge with smoking status, active smokers scored only 6.80, while non-active and non-smokers scored 7.18 and 7.11, respectively. In contrast, the attitude of active smokers toward tobacco use was the highest when compared with non-active and non-smokers (Figure 5). The attitude score among active smokers was 1.32, while it was only 1.13 for non-active smokers and 0.96 for non-smokers.

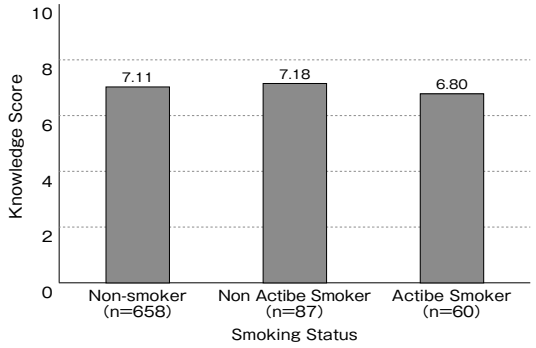

Figure 4 Respondents' level of knowledge related on smoking

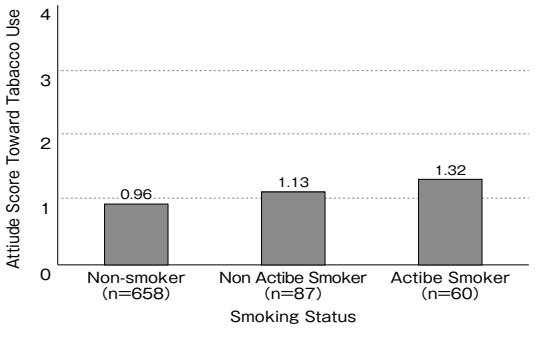

Figure 5 Respondents' level of attitude toward smoking

3. Relation between prevalence of active smoking and the school smoking prevention program

On the basis of the interviews with the school principals and on-site observations, the schools' tobacco prevention program was assessed using a pre-determined checklist. In this checklist, each school was evaluated by 6 criteria related to their smoking prevention program, including its policy; curriculum; staff-, student-, and parent-involvement; and instructions. Furthermore, each criterion was evaluated by the score system and ranged from 0 to 6. The school performance was then converted into percentage points as follows: school A with 89%, school B with 81%, school C with 96%, and school D with 74% (Figure 6). The performance points could be used for comparison among the schools.

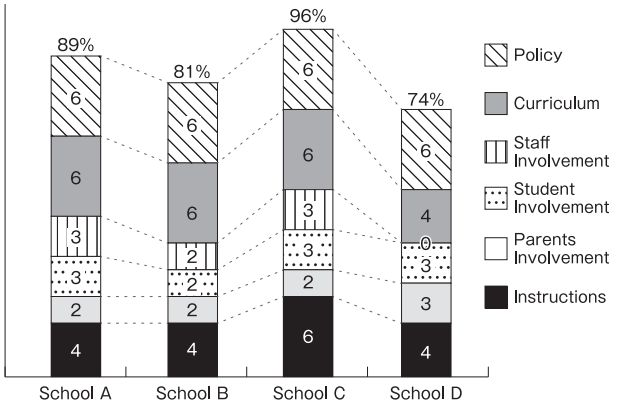

Figure 6 School performance on their smoking prevention

By applying the power model of the regression analysis, the students' knowledge related to smoking was significantly increased with the increase in the school performance on smoking prevention at the 5% significance level (R^2 = 0.826; p = 0.032) (Figure 7). For example, school C had the best implementation because of the strong leadership of the principal together with active involvement of teachers, students, and their parents. Therefore, it had the highest level of knowledge among students with the lowest prevalence of smoking compared with other schools. However, the regression analysis revealed that the students' attitude toward smoking was reduced with the increase in the school's performance on smoking prevention; however, the difference did not reach significance (p = 0.079) (Figure 8). In summary, the school smoking prevention program was effective in increasing the students' knowledge on tobacco-related health risks but resulted in limited changes in the students' attitude toward smoking.

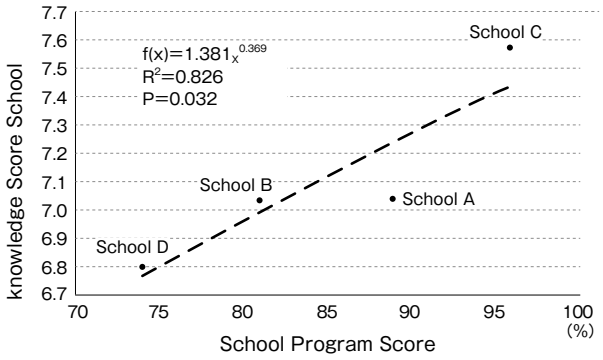

Figure 7 Relation between school program and knowledge

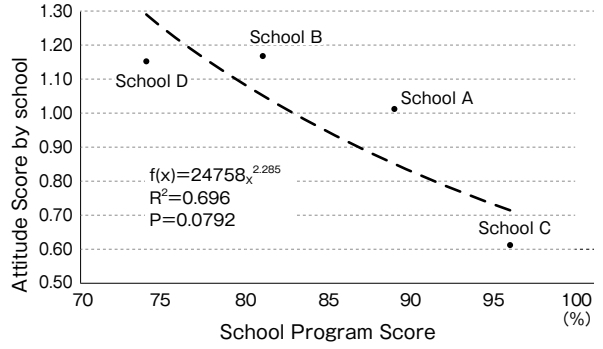

Figure 8 Relation between school program and attitude toward preferring smoking

The study examined the relation between the school performance and the prevalence of smoking. The results of the bivariate correlation test indicated that the prevalence of active smoking was significantly reduced with the increase in the school's performance (one-tailed correlation test; Pearson correlation = -0.854 and p = 0.033) (Figure 9).

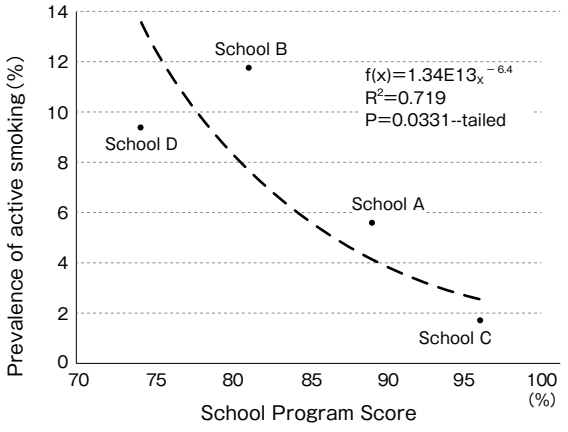

Figure 9 Relation between school program and prevalence of active smoking

4. Influence of the economic location

No significant differences were found in the prevalence of active smoking in economically depressed and non-depressed areas (p = 0.624).

Ⅳ. Discussion

1. Relation between the school prevention program and students' knowledge and attitude change

According to literature reviews, information-based education has predominated in school-based smoking prevention programs[6] for a long time. However, such approach could not provide evidence of effectiveness on behavior. A research study in which a short-term cigarette smoking prevention intervention was conducted in a middle school revealed that there was a significant increase in knowledge on tobacco but no change in the attitude regarding the use of tobacco[7]. These studies support our findings that school smoking prevention is associated with the students' level of knowledge on smoking but results in limited changes in their attitude toward tobacco use. In addition, a number of studies recommended that school smoking prevention programs should include more activities related to attitude modification, peer education, and communication skills together with an active family and community involvement[8,9,10,11,12].

Based on the GYTS conducted in 2007, the prevalence of active smoking in Paranaque City was lower than the national average (21.7%). In addition, we also found that 43.3% of active smokers and 40.0% of non-active smokers chose to quit smoking on the basis of what they learned in the school lessons.

The knowledge on the effects of smoking varied among schools and smoking status. At the same time, non-smokers had better knowledge on the effects of smoking tobacco compared to active smokers. A similar trend was noted in the attitude and behavior of students.

There was a stronger relationship between the school program and students' knowledge which resulted in a lower smoking prevalence. However, the implementation of the program varied dramatically among the schools as there were no standardized procedures for it.

2. Influence of environmental factors on the students' smoking behavior

Education on tobacco-related health risks had been integrated into the school curriculum. However, an unfavorable environment might interact with the students' attitude and behavior toward smoking. For example, the majority of students are currently living with smokers at home and tobacco is very accessible, even within less than 100 meters from the school compound, which is currently prohibited by law.

While role models, e.g., parents and guardians, remained a key factor to attitude modification, the role of media, especially internet, mobile phones, and television, as major sources of information should not be underestimated. While our study was focused on smoking, other health-related issues such as illicit drug abuse, unsafe sex, alcohol use, violence, and malnutrition should be integrated comprehensively into the school programs.

Ⅴ. Conclusion

The prevalence of tobacco smoking was 7.4% (boys: 11.9% and girls: 3.6%). The prevalence of smoking was associated with individual knowledge and attitude toward tobacco use. Our results suggest that there is an association between the school smoking prevention program and the students' knowledge but not between the program and the students' attitude. The school program was very effective in improving the students' knowledge on health risks associated with smoking, but resulted in limited changes in the attitude.

Ⅵ. Limitations of the study

At least 4 limitations were considered in our study. First, the school tobacco prevention program was not assessed in detail with regard to specific activities, for example, curriculum contents, teaching methods, etc. Thus, it might be difficult to completely determine how the program is actually implemented in schools. Second, time constraints limited the opportunity to observe and obtain information based on the local context. Third, marginalized students, who drop-out of school and are more likely to smoke, were not included in the study. Finally, because private schools were excluded from the sample selection, we could not evaluate the situation in private schools.

Ⅶ. Recommendations

On the basis of our findings, we would like to make 3 suggestions. First, the program should strengthen the peer education to change the student's behavior beyond knowledge. Second, the program needs to include additional activities, especially attitude modification and teaching of skills such as cigarette refusal and coping with peer pressure to smoke, etc. Third, the program needs to provide a counseling service for students who want to quit smoking, because we found that 75% of active smokers wanted to quit smoking.

Ⅷ. Acknowledgments

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