Effects of a Cigarette Smoking Prevention Program among Junior High School Students in North-East Thailand: A Pilot Survey

Anun Chaikoolvatana BSc, PharmD, PhD, GTC (Cert.)*, Mereerat Manwong MPH**, Niyom Junnual MPH**, Cholada Chaikoolvatana MPH, PhD***, Wantanee Thongnun RN****, Jamsai Apirakmontree BE*****, Areepan Wanchai BE******, Maleewan Pongpaew BE******

** Department of Pharmaceutical Science, Ubon Ratchathani University, Ubon Ratchathani, Thailand*
*** College of Medicine and Public Health, Ubon Ratchathani University, Ubon Ratchathani, Thailand*
**** Faculty of Nursing, University of Phayao, Phayao, Thailand*
***** Sapasithiprasong Hospital, Ubon Ratchathani, Thailand*
****** Pratumpithayakom School, Ubon Ratchathani, Thailand*
******* Sripratumpithayakarn School, Ubon Ratchathani, Thailand*

Objective: *Evaluate the implementation of a smoking prevention program via a questionnaire. Both knowledge and attitudes toward smoking behavior and smoking cessation were also investigated.*
Material and Method: *An experimental study was conducted between October 2011 and July 2012. Two hundred twenty six school students from Mathayom 1 to 6 participated into the present study. They were divided into either a study group (n = 99) or a control group (n = 127). Participants in the study group underwent two days of a smoking prevention program and the control group was not subjected to this program. Both groups completed a questionnaire containing questions related to the knowledge of the dangers of cigarette, attitudes toward smoking behavior, and smoking cessation at three different stages, pre-program, immediate post-program, and one month post-program. All data was analyzed via statistical methods.*
Results: *Participants in the study group were smokers and non-smokers, aged between 13 and 15, studied in Mathayom 1 to 6. It was reported that 75% of smokers had tried to quit smoking at least once. For those who quit smoking successfully, 83.6% sought advice from their families. Regarding knowledge related to the dangers of cigarettes, the study group had significantly higher scores than the control group at the three different stages (pre-program, immediate post-program, and one month post-program p = 0.001, 0.001, and 0.024 respectively). The attitudes toward smoking cessation behavior between the groups were significantly different at the three different stages (p = 0.03, 0.01, and 0.001 respectively). The influential factor significantly related to decision-making related to quitting cigarettes was advice, especially from friends and families (p<0.05).*
Conclusion: *School students aged between 13 to 15 years of age studying in Mathayom 3 (grade 9) represented the majority of smokers. The study found the smoking cessation prevention program was able to improve knowledge of the dangers of cigarettes. After the completion of the program, the effect of factors on their lives such as medical conditions, social norms, and friends and families made smokers realize the importance of quitting smoking.*

Keywords: *Cigarette smoking prevention program, Smoking cessation behavior, Smoking cessation*

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Smoking is the leading cause of preventable morbidity and mortality in the world[1]. The number of smokers worldwide is up to 1 billion, accounting for 18% of the world's population[2]. Cigarette smoking is a risk factor for a broad range of conditions such as lung cancers, emphysema, aged appearance, throat cancer, stroke, ischemic heart disease, gastric ulcer, diabetes mellitus, and cataract[3]. Although the prevalence of smoking among Western countries has been in steady decline for more than a decade, smoking rates continue to rise in many developing countries[4]. Over 500 million smokers are in Asia. Approximately 50% of males smoke.

In Asia, Thailand is one of the critical regions for tobacco consumption. The Thai National Statistics

Correspondence to:
Chaikoolvatana A, Department of Pharmaceutical Science, Ubon Ratchathani University, Ubon Ratchathani 34190, Thailand.
Phone: 045-353-630, Fax: 045-353-626
E-mail: kkjc5476@yahoo.com

Office reported that the prevalence of smoking among adolescents aged 15 to 18 had increased from 4.29% in 2004 to 4.45% in 2006[5]. This evidence has been confirmed by the Global Adult Tobacco Survey (GATS) finding that showed that 25.4% of all daily smokers or occasional smokers were in the 15 to 24 age group, indicating that young adults are the largest at-risk group. In this group, 39% of males smoked, whereas the female smoking rate in this age group was 11.7%[6,7]. Between 2000 and 2001, the incidence of smoking for both boys and girls increased, 24 to 26% for boys and 0.3 to 0.6% for girls. Those adolescents have easily approached through a variety of available sources to the cigarettes through the public media including, advertising network, imported tobacco products, alternative cigarettes. Common sources of cigarettes include friends, older siblings, parents, and over-the-counter purchases in shops. Research indicated that the high school period was a critical time for the onset of smoking behavior[8] and literature provided consistent support for friends' social norms as a predictor of adolescent smoking, making it difficult for young people to avoid cigarettes.

Noticeably, cigarettes have affected both physical and mental well-being of adolescents. The effects of cigarette smoking on mental health are cognitive impairment and negative moods[9]. The problem-solving skills of smokers may also be deteriorated by cigarettes. Thus, adolescent smoking is of particular concern because it poses long-term and short-term hazards to smokers' health[10]. Smoking is also known as a "gateway drug" that often leads to other, more serious substance abuses, such as marijuana, cocaine, heroin, and alcohol[11-13].

Ubon Ratchathani is a province located in the Northeastern part of Thailand and has continually had high numbers of smokers between 2007 and 2011[14]. Most are ages between 14 and 20 years old and are studying. Despite rules prohibiting smoking in schools, a survey conducted prior to the program revealed that students smoke at schools, some being regular smokers and others being at-risk of starting smoking due to social and environmental factors such as friends, curiosity, and imitation.

The researchers aimed to evaluate the implementation of the smoking prevention program that contained various activities to encourage young smokers and non-smokers to avoid smoking behavior. Comparisons were made between the study and control groups regarding knowledge of the dangers of cigarettes, attitudes toward smoking behavior, and smoking cessation related to the prevention program.

Material and Method

Study design

The present study was of an experimental design and was conducted between October 2011 and July 2012. Pratumpithayakom School, a medium-sized school with 1400 students, was selected for the site of the program, and the school principal intended to collaborate with the research as part of a smoking ban in the school. A school report indicated most current smokers were in Mathayom 1 to 3 (grade 9).

Population and samples

The volunteers are school students studying between Mathayom 1 and 6 (grade 7-12) from a local school in Ubon Ratchathani province, were calculated for the sample size via the equation[15]:

$$n/group = \frac{2(Z_\alpha+Z_\beta)^2\, p(1-p)}{\Delta^2}$$

$$n = \frac{2(1.64+0.84)^2 x 0.1 x 0.9^{(39)}}{0.1^{2(39)}}$$

= 111 participants per group

Note: The number of participants in each group has been increased approximately 15% for missing data, study group (127), control group (127).

Thus, there are totally 260 students were randomly the target population of the study. Ninety-nine volunteers were independently sampled into a study group and 127 in a control group. All volunteers had to satisfy certain criteria, including being a student in Mathayom 1 to 6 (grades 7-12), identified as either a non-smoker or smoker, and having signed the consent form prior to the study. The participants were able to withdraw themselves from the study at any time they wished. The study was approved via ethical committees.

Process

The school was informed by the researchers of the objectives and steps of the study. All details of the smoking cessation prevention program were explained to representatives of the students and teachers, and they underwent tutoring hours as well as smoking cessation skills (5A) training. Ten representatives of the school helped the researchers regarding the distribution and collection of the survey forms, following the smoker groups, and reporting any limitations that occurred during the program.

A 2-day cessation program for the study group was held at the investigating school from

08.00 am-04.00 pm. Day 1 included a lecture on the dangers of cigarettes, demonstration of a smoking cessation campaign in school, and participating in recreational activities. Day 2 involved all participants joining the "smart camp" activities, including painting, singing, dancing contests, and poster presentations regarding quitting smoking campaigns. A smoking cessation counseling service was provided for those seeking to quit cigarettes. 5A (ask, advise, assess, assist, arrange) cessation skills were given depending upon the severity of smoking addiction and the willingness of the smokers. Health care providers from Central Sapasithiprasong Hospital kindly prepared to counsel smokers. At the same time, the control group was not involved in any activities related to the smoking cessation prevention program.

The study of the program was divided into three different periods. First, when the participants enrolled into the program, they were required to fill out the survey forms modified from previous works[16]. The pre-test included 1) demographic data, 2) basic knowledge related to the dangers of cigarettes, 3) smoking behaviors, 4) attitudes toward smoking cessation, and 5) smoking cessation behaviors. After the completion of the program, participants were again asked to fill out those forms as part of the immediate post-test. This process was repeated one-month later for the one-month post-test. Student representatives collected the forms and sent them back to the researchers for further evaluation. The control group also completed the survey forms at the same times as the study group. All results were further investigated.

Tools

The questionnaire paper was a self-administered instrument containing six different sections as mentioned earlier. The severity of cigarette addiction was assessed via Fagerstrom Test prior to further investigation. The addiction levels were from mild (0-1) to severe (>6). The results of section 2 were reported as means and standard deviations, whereas those of sections 4 and 5 were reported via Likert's scales. Other sections were multiple-choice questions. Scores of each section were calculated and interpreted into different ranks depended upon students' scores.

The questionnaire paper was tested for content validity by three clinical experts involved in smoking cessation services. Reliability was assessed with 35 students to measure the Cronbach's alpha coefficient of the questionnaire items (α). The mean value of "α" was 0.789 (standard alpha ≥0.7).

Analyses

Utilization of statistics was divided into two parts. Descriptive analysis included mean scores, SD, and percentages were used to evaluate questionnaire sections 1 to 5, numbers of quit smokers, ready to quit smokers, and not ready to quit smokers. Comparisons of pre-test, immediate post-test and one-month post-test scores within each group and between groups involved analytical statistics such as independent t-test, paired t-test, multiple logistic regression, and repeated measurement and ANOVA.

Results

Two hundred and twenty-six students were enrolled into the program with the consents from their parents and guardians. Ninety-nine participants were in the study group and 127 were in the control group. In the study group, 90% were males, 59.6% were in Mathayom 3, 66.7% were aged between 13 and 15, 38.4% studied in Mathematics and Science subjects, and 86.5% earned 50 to 100 baht per day. The majority (87.9%) spent less than 50 baht per month on cigarettes. In the control group, 70.9% were females, 97.6% were in Mathayom 3, and 72.4% were aged similarly to the study group. Most participants studied in Computer and Occupation subjects (39.4%), 66.9% received between 50 and 100 baht per day, and all were non-smokers (Table 1).

Smoking behaviors

The findings showed the earliest age of commencing cigarette smoking was 13.4 years of age. Most participants smoked cigarettes approximately 1-10 cigarettes per day (67.7%). Cigarettes were normally received from either close friends or personal purchases (36.4% and 34.3% respectively). These purchases were made at convenience stores (70.2%). Most cigarettes smoked were from the major tobacco companies (73.9%) compared to paper-rolled cigarettes (26.1%). LM was the most common cigarette brand found in this study (40%). Smokers stated they had tried to quit cigarettes at least once (48.9%). For those who were still smoking, they reported that started to think about smoking at least 60 minutes after waking up (67.2%).

Smoking cessation behaviors and attitudes toward smoking cessation

About seventy-five out of 99 school students were reported to have attempted to quit smoking (75.3%). However, 64% were unsuccessful. Those

who had tried to quit smoking had given it up for between one and two months (64%). Interestingly, 62.5% of smokers had sought help and advice had mainly come from family members (83.6%) (Table 2).

When the 75 participants who had attempted to quit smoking were asked their reasons for quitting cigarettes, most revealed that cigarette smoking could affect their health, neighboring non-smokers' health, Thai culture, and social norms, and also

Table 1. Frequencies and percentages of participants (n = 226)

Item(s)	Study (n = 99)		Control (n = 127)	
	Frequency	Percentage	Frequency	Percentage
Gender(s)				
Male	90	90.9	37	29.1
Female	9	9.1	90	70.9
Age (s)				
13-15 years	66	66.7	92	72.4
15-17 years	26	26.3	35	27.6
Above 17	7	7.0	-	-
School level(s)[a]				
M.1	2	2.0	-	-
M.2	26	26.3	3	2.4
M.3	59	59.6	124	97.6
M.5	6	6.1	-	-
M.6	6	6.1	-	-
Subject(s)				
Science and math	38	38.4	45	35.4
Science and social	22	22.2	23	18.1
Computer and occupation	30	30.3	50	39.4
Language	9	9.1	8	7.1
Accommodation(s)				
Dormitory	1	1.0	2	1.6
Rent house	3	3.1	5	3.9
Parent house	93	95.9	120	94.5
Income (baht per day)				
Less than 50	10	10.4	26	20.5
50-100	83	86.5	99	78.0
More than 100	3	3.1	2	1.6
Expense (baht per day)				
Less than 50	50	50.5	42	33.1
50-100	49	49.5	85	66.9
Smoking behavior				
Non-smoker	-	-	127	100.0
Smokers	99	100.0	-	-
Cigarette expense (baht per month)				
Less than 50	87	87.9	-	-
50-100	10	10.1	-	-
More than 100	2	2.0	-	-
Past medical history				
No	90	90.9	112	88.2
Yes (identify)	9	9.1	15	11.8
Respiratory disorders	2	22.2	4	26.7
Diabetes Mellitus	-	-	1	6.7
Allergy	4	44.4	5	33.3
Gastrointestinal disorders	2	22.2	5	33.3
Anemia	1	11.1	-	-

[a] M4 students were missing due to public activities.

mentioned high cigarette prices and public smoking bans (Table 3).

Comparison of knowledge related to dangers of cigarette smoking

Comparisons of pre-test, immediate post-test, and one-month post-test scores of the study group participants showed there was no statistical significance of the scores of the three different periods (p = 0.076) (Table 4). Noticeably, mean knowledge scores were average (between 8 and 14).

However, the evaluation of knowledge scores between the study and control groups at the same stages of investigation revealed there were

Table 2. Frequencies and percentages of attitudes towards smoking cessation (n = 99)

Question item(s)	Frequency	Percentage
1. Have you ever quited smoking cigarette?		
Yes	75	75.6
No (if "No" you can return the paper)	24	24.4
2. Have you quited smoking successfully?		
Successful	19	25.3
Failed	48	64.0
Just think about quitting	8	10.7
3. When was the last time you tried to quit smoking?		
Last month	58	77.3
Last 6 months	6	8.0
Last year	4	5.3
More than a year	5	6.7
Never	2	2.7
4. How long did you hold not to smoke cigarette?		
1-2 months	48	64.0
3-6 months	10	13.3
6 months-1 year	7	9.4
More than a year	10	13.3
5. Have you ever received any helps and or advices to quit smoking?		
Yes	55	62.5
Not sure	12	16.0
No	8	10.7
6. Who gave you help or advice to quit smoking? (can choose more than 1 answer)		
Friends	28	50.9
Family members (e.g., dad, mom, brother, sister, relatives)	46	83.6
Health providers (e.g., doctor, pharmacist, nurse)	9	16.4
Teachers/school staff	5	9.1

Table 3. Percentages of reasons to quit smoking (n = 75)

Reason(s) to quit smoking	Agreed	Not sure	Disagreed
Health concern	81.3	17.3	1.3
Effect on neighboring non-smokers	72.0	26.7	1.3
Thai culture	70.7	25.3	4.0
Cigarette price	64.0	33.3	2.7
Insufficient income	56.0	41.3	2.7
Public smoking ban	62.7	36.0	1.3
Warning labels on a cigarette case	54.7	41.3	4.0
Unacceptable social norm	60.0	32.0	8.0
Decreased stress	48.0	42.7	9.3
Request from family members	62.7	34.7	2.6

statistically significant differences of scores within all three periods ($p<0.05$) with the mean scores of study group were less than the control group (Table 5).

Comparison of smoking cessation behaviors between study and control groups

The findings revealed mean scores of the study group were statistically significantly higher than those of the control group within all three stages ($p = 0.03, 0.011, 0.001$ respectively) (Table 6). Overall, both groups had mean scores within "good" levels (mean score >31) (Table 6).

Comparison of attitudes towards smoking cessation within the study group

Perception scores of the study group revealed mean scores of pre-test, immediate post-test, and one month post-test were not statistically significantly different ($p = 0.76$) (Table 7).

Factors related to decisions to quit smoking

All factors related to smoking cessation behavior and attitudes toward smoking cessation were assessed via "Multivariate Analysis" with Multiple Logistic Regression. The results indicated there were three factors that statistically significantly influenced the decision-making to quit smoking. These included receiving some advice, advice from friends, and advice from family. First, most smokers were in M1 to M3 levels. Only smokers given medical advice, advice from friends, and parents tended to make their decision to quit smoking more than the other smokers who were not given any advice (95% CI: 1.87-3.14, $p = 0.007$; 95% CI: 2.51-8.51, $p = 0.006$; 95% CI: 1.66-12.85, $p = 0.021$) (Table 8).

Table 4. Mean knowledge scores of the study group at pre-test, immediate post-test, and one month post-test stages (n = 57)

Period(s) of investigation	Mean[a]	SD	95%CI	F	df	p-value[b]
Pre-test	9.91	5.74	8.39, 11.44	2.64	2	0.076
Immediate post-test	11.65	5.44	10.21, 13.10			
One month post-test	10.96	5.35	9.55, 12.39			

[a] Mean score: ≤7 low knowledge level, 8-14 average knowledge level, ≥15 good knowledge level
[b] Repeated measurement ANOVA

Table 5. Mean knowledge scores between study and control groups at pre-test, immediate post-test, and one month post-test

Period(s) of investigation	Study mean[a] (SD)	Control mean[a] (SD)	$Mean_{diff}$ (SD)	95% CI: $mean_{diff}$	t	df	p-value[b]
Pre-test	11.11 (6.26)	15.48 (5.92)	-4.36 (0.78)	-5.89, -2.84	5.62	224.00	<0.001
Immediate post-test	11.54 (6.02)	14.46 (5.14)	-2.93 (0.76)	-4.42, -1.43	-0.87	192.60	<0.001
One month post-test	12.27 (5.66)	13.88 (5.69)	-1.61 (0.71)	-3.02, -0.21	-2.26	224.00	0.024

[a] Mean score: ≤7 low knowledge level, 8-14 average knowledge level, ≥15 good knowledge level
[b] Independent t-test

Table 6. Mean scores of smoking cessation behaviors between study and control groups (n = 214)

Period(s) of investigation	Study mean[a] (SD)	Control mean[a] (SD)	$Mean_{diff}$ (SD)	95% CI: $mean_{diff}$	t	df	p-value[b]
Pre-test	35.92 (5.14)	34.62 (4.36)	1.30 (0.60)	0.12, 2.47	2.17	212.00	0.030
Immediate post-test	35.21 (6.71)	33.14 (4.83)	2.08 (0.81)	0.49, 3.67	2.58	170.37	0.011
One month post-test	35.89 (6.52)	33.31 (4.92)	2.58 (0.75)	1.10, 4.05	3.45	197.29	0.001

[a] Mean score: ≤15 negative behaviors, 16-30 normal behaviors, ≥31 positive behaviors
[b] Independent t-test

Table 7. Mean attitude scores related to smoking cessation of study group at pre-test, Immediate post-test, and one month post-test (n = 57)

Period(s) of investigation	Mean[a]	SD	95% CI	F	df	p-value[b]
Pre-test	35.7	5.6	34.2, 37.2	0.325	2	0.723
Immediate post-test	35.1	5.2	33.8, 36.5			
One month post-test	35.1	5.6	33.7, 36.6			

[a] Mean score: ≤10 negative attitudes, 11-20 neutral attitudes, ≥21 positive attitudes
[b] Repeated measurement ANOVA

Table 8. Factors related to decisions made to quit smoking

Factors	Crude OR	Adjusted OR	95% CI	p-value
School level(s)				
M1	1.00	1.00		
M2	0.28	0.44	0.04-5.58	0.53
M3	1.02	0.10	0.003-3.04	0.18
Knowledge level(s)				
Low	1.00	1.00		
Average	3.53	7.20	0.78-66.40	0.08
High	0.44	2.03	0.24-17.63	0.52
Attitudes toward smoking cessation				
Negative	1.00			
Neutral	0.75	1.11	0.16-7.63	0.91
Positive	1.11	-	-	-
Advice to quit smoking				
Not received	1.00	1.00		
Received	4.19	10.33	1.87-57.08	0.007*
Not sure	0.03	2.10	0.10-43.70	0.63
Advice from friends				
Not received	1.00			
Received	13.79	26.96	2.51-289.08	0.006*
Advice from family members				
Not received	1.00			
Received	37.24	27.70	1.66-461.73	0.021*

* p-value significant ($p<0.05$)

Discussion

The results showed that most young smokers were males, average age of 13, and currently studying between Mathayom 2 and 3 (grade 8-9), which is similar to a previous study which indicated young school students were likely to experience cigarette smoking[17-19]. Additionally, cigarettes were obtained from close friends and personal purchases. A previous finding revealed that smokers who have smoking friends tend to smoke cigarettes 3.74 times more compared to those who have non-smoking friends[20]. Moreover, early exposure to smoking makes young smokers 69.3 times more likely to light a cigarette than people who did not experience early exposure[20]. Therefore, smokers wanting to quit cigarettes should avoid being involved with smoking friends. In addition, seeking particular help for smoking cessation should be required to quit cigarettes properly and permanently.

The study found it was easy for school students to access cigarettes as they were sold in convenience stores, despite Thailand's laws prohibiting people below 18 buying cigarettes. Law enforcement is a problem with most stores being operated by local people familiar with school staff as well as students. Schools need to explain laws to storeowners, the local community, students, and parents/guardians. More importantly, teachers and parents need to be role models for the students because adolescents imitate behavior of respected ones. Students should also be

given essential information related to the dangers of cigarettes and the avoidance of smoking behaviors via the school curriculum[21]. Recently, most schools and universities in Thailand have provided tobacco control topics in the curriculum, allowing students to have opportunities to learn about cigarette smoking, tobacco law enforcement, and smoking cessation. Studying in medical, dental, nursing, pharmacy, and public health schools have a better chance to train for smoking cessation counseling.

In the community, the involvement of the tobacco control campaigns is strongly recommended. Village headmen, sub-district administration organizations (SAO), provincial administration organizations (PAO), primary care providers, and villagers should participate in tobacco control campaigns. Up-to-date information related to tobacco control should be provided to the communities and surveillance of tobacco industry targets regarding young smokers needs to be done.

When asked about the reasons for quitting smoking, participants indicated they were firstly concerned about their health (81.3%), effects on neighboring non-smokers (72%), Thai culture (70.7%), and cigarette prices (64%). These findings were similar to previous studies that revealed that people gave up when they realized the dangers to themselves and quit when they faced some serious health problems[22-27]. The Thai government needs to adequately provide crucial information related to smoking behavior and control to the public via mass media in the forms of television, radio, newspaper, and social networks. This will help people to recognize the dangers of cigarettes. That only 43% of participants indicated uncertainty of stress relief through smoking was at odds with the findings of another study[28] and suggested that information should be given to the smokers about the causes and management of stress.

In Thailand, a 1997 report surveyed the attitudes toward smoking behaviors. It was found that 42% of non-smokers felt all right with smoking behaviors. In addition, the survey questioned smokers regarding their attitudes toward smoker behavior and they felt the smoking habit was normal and non-disturbing (97.6%)[29]. This finding reflected misunderstanding and ignorance of the dangers of cigarettes. Similarly to the previous findings, they revealed that families, friends, schools, public policies, and organizations have the positive effects on tobacco prevention and control. Thus, the long-run tobacco control strategies through those resources should be continually conducted. In addition, public tobacco prevention advertising should be addressed. More campaign activities should be implemented into high-risk groups including young school students. Finally, the law enforcement of public smoking bans and cigarette trading should be lawful.

A previous study found that warning labels influenced smokers to quit cigarettes[30]. However, this finding was not evident in the present study. This may be explained by the limited number of participants and further investigation with a larger number of participants and multi-centered evaluation should be completed.

Regarding knowledge of the dangers of cigarettes, mean scores of the study group compared within pre-test, immediate post-test, and one month post-test were not statistically different and were at average levels (Table 4). This meant that smoking students were generally well-educated. During data collection, the researchers found students were taught about cigarette smoking in class for approximately three hours per semester, indicating at least a basic knowledge of cigarettes. Nevertheless, the number of teaching hours related to tobacco control was limited. The study recommends an expansion of tobacco control courses and their implementation at earlier school levels such as primary school.

Comparisons of mean scores between the study and control groups revealed statistically significant differences. The control group had significantly higher mean scores than the study group at all three stages (Table 5). Smokers tended to overlook the dangers of smoking and continued to smoke. As a result, questions involving knowledge of the dangers of cigarettes may result in young smokers not paying attention to understand it. In addition, cigarette smoking may affect memory and work concentration, resulting in cognitive dysfunction related to knowledge gaining. The control group not currently smoking responded actively to the information related to cigarette smoking behaviors and health dangers and they tended to answer questions related to cigarette smoking better than the study group (smokers). Results of previous studies supported these findings[31,32].

Regarding smoking cessation behavior, young smokers who considered quitting cigarettes (the study group) had significantly higher scores of smoking cessation behavior than non-smokers (the control group) at all three stages (Table 2, 6). Smokers seeking to quit smoking were more likely to expand their options for help. While they revealed the methods of quitting smoking themselves, the success was

questionable. There was no significant difference in the attitudes toward smoking cessation within the study group (Table 7). Nevertheless, smokers still had positive attitudes toward smoking cessation at all three stages. The findings also revealed advice from family and friends significantly affected the decision to quit smoking[33-35]. Overall, it showed smoking participants in the study group were more likely to perceive disadvantages of cigarette smoking and seek moral support from family and friends. Consequently, they were able to stop smoking successfully. Similar findings were found in previous studies[36,37].

Other factors were involved in the decisions of quitting cigarette smoking, including marital status and having non-smoking friends. It was reported that these two factors helped to predict the success of smoking cessation. It was found that if spouses and friends were non-smokers, it was easier and more successful to quit smoking[38].

Limitations

The authors note a number of limitations in the present study. The program was implemented once, meaning that some students may miss the activities and were not able to join the study. This limitation could be avoided by the program being held on a regular basis with financial support from the Thai government.

Student representatives need to be developed to maintain the program and follow-up the outcomes of the program. All representatives require training in both knowledge and skills in the smoking cessation program.

A lack of follow-up for smoking abstinence limited the efficacy of the prevention program. A further investigation is required to follow-up young smokers to observe changes in their smoking behaviors, measure lengths of quitting, and provide support. Such features would lead to a more reliable confirmation of the effectiveness of the program. A further investigation should look at the participants' money spending (e.g., cigarettes, food) and money left each day to compare with their monthly incomes. Thus, the balance of budget spending in each student will be revealed.

Multi-centered studies should also be completed to view the whole picture of the current situation regarding cigarette smoking in schools. Results from different areas would create a variety of information essential for effective assessment and planning for the future.

Conclusion

The findings indicated smoking was a common practice in schools, especially for Mathayom 2 and 3 students aged between 13 and 15 who bought cigarettes from convenience stores near the schools. Smokers stated that they had tried at least once to quit smoking. After the completion of the smoking prevention program, it was found that knowledge related to the dangers of cigarettes in the non-smoking group was higher than that in the smoking group at all three-study stages. Attitudes toward smoking cessation were favorably positive among smokers. Finally, factors including advice from family and friends can predict the decision making of smoking cessation. The Thai government should concentrate on the methods of tobacco control among school students, including national campaigns, content of tobacco control in school curriculum, development of student representatives, availability of smoking cessation counseling in schools, and collaboration between different schools in tobacco prevention programs.

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Potential conflicts of interest

None.

References

1. World Health Organization. The facts about smoking and health. Geneva: WHO; 2009.
2. Public Relations Department of Thailand. Tighter tobacco control regulations [Internet]. 2007 [cited 2012 Sep 2]. Available from:

www.ashthailand.or.th/th/content_image/informationcenter/126.pdf
3. The ASPECT Consortium. Tobacco or health in the European Union: Past present and future [Internet]. 2004 [cited 2012 Aug 28]. Available from: http://ec.europa.eu/health/ph_determinants/life_style/Tobacco/Documents/tobacco_exs_en.pdf
4. Mackay J, Erikson M. The tobacco atlas [Internet]. Geneva: World Health Organization; 2002 [cited 2012 Jul 10]. Available from: http://www.who.int/tobacco/statistics/tobacco_atlas/en/
5. Tobacco Control Research and Knowledge Management (TRC). Thailand's tobacco use surveillance: smoking prevalence 1991-2006 [Internet]. 2009 [cited 2012 Sept 10]. Available from: http://www.trc.or.th/upload/publicaitons/thailand's%20tobacco%20Use%20Surveillance%20%20Smoking%20Prevalence,%201991%20~%202006.pdf.
6. Turkish Statistical Institute. Global adult tobacco survey (Kiiresel Yetskin, Tutiun Arasturmasu]. No 3324 [Internet]. 2009 [cited 2012 Jul 20]. Available from: http://www.tuik.gov.tr/PreHaber Bultenleri.do?id=4044
7. Vathesatogkit P. Important information on youth smoking. 2009 [cited 2010 May 23]. Available from: http://www.ashthailand.or.th/th/content_image/informationcenter/237.pdf
8. National Health Statistical Office. Tobacco information among Thai people. Bangkok: Action on Smoking and Health Foundation (ASH Thailand); 1999.
9. Anderson CB, Pollak KI, Wetter DW. Relations between self-generated positive and negative expected smoking outcomes and smoking behavior: an exploratory study among adolescents. Psychol Addict Behav 2002; 16: 96-204.
10. Kegler MC, Cleaver VL, Yazzie-Valencia M. An exploration of the influence of family on cigarette smoking among American Indian adolescents. Health Educ Res 2000; 15: 547-57.
11. Boonyarattavet C. Nearly half of Bangkok metropolitan students smoke. The Local Doctor Journal 1988; 10: 74.
12. Griesbach D, Inchley J, Currie C. More than works? The status and impact of smoking policies in Scottish school. Health Promot Int 2002; 17: 31-40.
13. Wada K, Price RK, Fuikui S. Cigarette smoking and solvent use among Japanese adolescents. Drug Alcohol Depend 1997; 46: 137-45.
14. Department of Disease Control, National Statistic Office, Thailand. The annual report of cigarette smoking per province 2010. Bangkok: Charoendeemankong Press; 2010: 107-19.
15. Jirawathakul A. Statistics of health science research. Bangkok: Withayapat Press; 2009.
16. Pongpit K, Chankamkum S, Kraiwisej R, Chaikoolvatana A. A survey of general knowledge, attitude and belief related to cigarette smoking of Ubon Ratchathani University students. IJPS 2011; 7: 36-46.
17. Witoelar F, Rukumnuaykit P, Strauss J. Smoking behavior among youth in a developing country: case of Indonesia [Internet]. Princeton, NJ: Princeton University; 2005 [cited 2012 Jun 14]. Available from: http://paa2006.princeton.edu/download.aspx?submissionld=60756.processed
18. Centers for Disease Control and Prevention. Global youth tobacco survey: search request for GYTS data 9 ages 13 to 15) [Internet]. 2007 [cited 2012 Jun 14]. Available from: http://apps.nccd.cdc.gov/OSH_GTSS/default/SearchResults.aspx
19. Choe MK, Thapa S, Podhisita C, Raymudo C, Lin HS, Achmad S. The teen tobacco epidemic in Asia: Idonesia, Nepal, Philippines, Taiwan and Thailand. J Youth Stud 2004; 7: 73-87.
20. Lanz PM. Smoking on the rise among young adults: implications for research and policy. Tob Control 2003; 12 (Suppl 1): i60-70.
21. Bauer UE, Johnson TM, Hopkins RS, Brooks RG. Changes in youth cigarette use and intentions following implementation of a tobacco control program: findings from the Florida Youth Tobacco Survey, 1998-2000. JAMA 2000; 284: 723-28.
22. Antoñanzas WF, Viscusi K, Rovira j, Braña FJ, Portillo F, Carvalho I. Smoking Risks in Spain: Part I—Perception of risks to the smoker. J Risk Uncertain 2000; 21: 161-86.
23. Viscusi WK. Do smokers underestimate risk? J Polit Econ 1990; 98: 1253-69.
24. Viscusi WK. Smoking: making the risky decision. New York: Oxford University Press; 1992.
25. Viscusi WK, Hakes J. Risk beliefs and smoking behavior. Paper presented at 2006 Western Economic Association Conference, NBER Working paper 4thcoming; 2006.
26. Celemajer DS, Sorensen KE, Georgakpoulos D, Bull C, Thomas O, Robinson J, et al. Cigarette smoking is associated with dose related and potentially reversible impairment of endothelium-

dependent dilation in healthy young adults. Circulation 1993; 88 (5 Pt 1): 2149-55.
27. Turner J, Page-Shafer K, Chin DP, Osmond D, Mossar M, Markstein L, et al. Adverse impact of cigarette smoking on dimensions of health-related quality of life in persons with HIV infection. AIDS Patient Care and STDs 2001; 15: 615-24.
28. Penny GN, Robinson JO. Psychological resources and cigarette smoking in adolescents. Br J Psychol 1986; 77(Pt 3): 351-7.
29. Supawong C, Baolai S, Tantiket N. Smoking behavior among Thai adolescents [Internet]. Nonthaburi: Department of Medical Service, Ministry of Public Health; 1997 [cited 2012 Jun 10]. Available from: http://advisor.anamai.moph.go.th
30. Fathelrahman AI, Omar M, Awang R, Borland R, Fong GT, Hammond D, et al. Smokers' responses toward cigarette pack warning labels in predicting quit intention, stage of change, and self-efficacy. Nicotine Tob Res 2009; 11: 248-53.
31. Cherek DR. Effects of smoking different doses of nicotine on human aggressive behavior. Psychopharmacology 1998; 75: 339-45.
32. Clark E, McCann TV, Rowe K, Lazenbatt A. Cognitive dissonance and undergraduate nursing students' knowledge of, and attitudes about, smoking. J Adv Nurs 2004; 46: 586-94.
33. Key JD, Marsh LD, Carter CL, Malcolm RJ, Sinha D. Family-focused smoking cessation: enhanced efficacy by the addition of partner support and group therapy. Subst Abus 2004; 25: 37-41.
34. Thompson KA, Parahoo KP, McCurry N, O'Doherty E, Doherty AM. Women's perceptions of support from partners, family members and close friends for smoking cessation during pregnancy-combining quantitative and qualitative findings. Health Educ Res 2004; 19: 29-39.
35. Farkas AJ, Distefan JM, Choi WS, Gilpin EA, Pierce JP. Does parental smoking cessation discourage adolescent smoking. Prev Med 1999; 28: 213-8.
36. Phanucharas D, Chalongsuk R. Smoking behavior and smoking-related knowledge of students at Silpakorn University, Thailand. Silpakorn Univ Sci Technol J 2009; 3: 34-43.
37. Awotedu AA, Jordan ER, Ndukwana OZB, Fipaza NO, Awotedu KO, Awotedu KO, et al. The smoking habits, attitudes towards smoking and knowledge regarding anti-smoking legislation of students in institutions of higher learning in the Eastern Cape Province of South Africa. South Afr Fam Pract 2006; 48: 14-14d.
38. Chen PH, White HR, Pandina RJ. Predictors of smoking cessation from adolescence into young adulthood. Addict Behav 2001; 26: 517-29.
39. Manwong M, Chaikoolvatana A, Sriphumwong W, Konsai T, Praisuen P, Chaikoolvatana C. The comparison of knowledge related to dangers of Roll-Your-Own (RYO) cigarette at Sriki and Tat Sub-Distracts, Ubon Ratchathani. IJPS 2013. (In press).

การศึกษาประสิทธิผลของโปรแกรมการป้องกันการสูบบุหรี่ของนักเรียนระดับมัธยมศึกษา เขตพื้นที่ภาคตะวันออกเฉียงเหนือ: การศึกษานำร่อง

อนันต์ ไชยกุลวัฒนา, เมรีรัตน์ มั่นวงศ์, นิยม จันทร์นวล, ชลลดา ไชยกุลวัฒนา, วันทนีย์ ทองหนุน, แจ่มใส อภิรักษ์มนตรี, อารีพันธ์ วันชัย, มะลิวัลย์ ผ่องแผ้ว

วัตถุประสงค์: *เพื่อประเมินการนำโปรแกรมการป้องกันการสูบบุหรี่โดยอาศัยแบบสอบถาม โดยประเมินทั้งองค์ความรู้และทัศนคติต่อพฤติกรรมการสูบบุหรี่และการเลิกบุหรี่*

วัสดุและวิธีการ: *เป็นการศึกษาแบบทดลองเริ่มตั้งแต่เดือนตุลาคม พ.ศ. 2554 ถึง เดือนกรกฎาคม พ.ศ. 2555 นักเรียนจำนวนทั้งสิ้น 226 ราย ที่กำลังศึกษาชั้นมัธยมศึกษาปีที่ 1-6 เข้าร่วมโครงการ โดยถูกแบ่งเป็นกลุ่มศึกษา 99 ราย และกลุ่มควบคุม 127 ราย นักเรียนกลุ่มศึกษาต้องเข้าร่วมทำกิจกรรมที่จัดขึ้น 2 วัน ซึ่งประกอบด้วยโปรแกรมป้องกันการสูบบุหรี่ ส่วนกลุ่มควบคุมไม่ต้องเข้าร่วมกิจกรรมดังกล่าว นักเรียนทั้ง 2 กลุ่ม จะกรอกแบบสอบถามที่เกี่ยวข้องกับความรู้พิษภัยของบุหรี่ ทัศนคติต่อพฤติกรรมการสูบบุหรี่และการเลิกบุหรี่ โดยต้องกรอก 3 ระยะดังนี้ ก่อนเริ่มโปรแกรม หลังโปรแกรมเสร็จสิ้นทันที และหลังโปรแกรมเสร็จสิ้น 1 เดือน ข้อมูลที่ได้จะถูกนำไปวิเคราะห์ทางสถิติต่อไป*

ผลการศึกษา: *กลุ่มตัวอย่างประกอบด้วยผู้ที่สูบและไม่สูบบุหรี่ อายุเฉลี่ย 13-15 ปี และกำลังศึกษาอยู่ชั้นมัธยมศึกษาปีที่ 1-6 ผลการศึกษาพบว่า 75 เปอร์เซ็นต์ของนักเรียนที่สูบบุหรี่คิดหรือพยายามที่จะเลิกสูบบุหรี่อย่างน้อย 1 ครั้ง อย่างไรก็ตาม ส่วนใหญ่ไม่ประสบผลสำเร็จ แต่สำหรับผู้ที่เลิกสูบบุหรี่ได้สำเร็จนั้น 83.6 เปอร์เซ็นต์ ได้รับคำแนะนำจากคนในครอบครัว นอกจากนั้นในด้านความรู้เกี่ยวกับพิษภัยบุหรี่ พบว่ากลุ่มศึกษามีค่าคะแนนต่ำกว่ากลุ่มควบคุมอย่างมีนัยสำคัญทางสถิติทั้ง 3 ระยะ ($p = 0.001$, 0.001, 0.024 ตามลำดับ) นอกจากนี้ ทัศนคติต่อพฤติกรรมการเลิกบุหรี่ระหว่าง 2 กลุ่ม ก็มีความแตกต่างกันทางสถิติ ทั้ง 3 ระยะเช่นกัน ($p = 0.03$, 0.01, 0.001 ตามลำดับ) ปัจจัยที่มีผลต่อการตัดสินใจเลิกบุหรี่อย่างมีนัยสำคัญทางสถิติคือ คำแนะนำที่ดี โดยเฉพาะคำแนะนำที่ได้จากเพื่อนและคนในครอบครัว ($p<0.05$)*

สรุป: *กลุ่มตัวอย่างที่สูบบุหรี่ ส่วนใหญ่มีอายุในช่วง 13-15 ปี กำลังศึกษาอยู่ชั้นมัธยมศึกษาปีที่ 3 (เกรด 9) ผลการศึกษาพบว่าโปรแกรมป้องกันการสูบบุหรี่ไม่มีผลต่อองค์ความรู้เกี่ยวกับพิษภัยบุหรี่ให้กับกลุ่มตัวอย่างที่สูบบุหรี่ นอกจากนั้น หลังเข้าร่วมกิจกรรมของโปรแกรมดังกล่าว ทำให้กลุ่มนักเรียนที่สูบบุหรี่ได้ตระหนักถึงความสำคัญของการเลิกสูบบุหรี่ อาทิเช่น ผลกระทบต่อสุขภาพ การยอมรับทางสังคม เพื่อน และคนในครอบครัว*