



Original Article

Attitude of Smoking Students toward Graphic and Text Warnings on Cigarette Packages

D. Phanucharas, R. Chalongsuk,* K. Chaweekanlayakun, K. Sriphirom,
W. Sanguanpong and S. Niyomsucharit

*Faculty of Pharmacy, Silpakorn University, Sanamchan Palace Campus,
Nakhon Pathom, Thailand*

Abstract Objective: To obtain information about attitude of smoking students at Silpakorn University toward the six existing graphic and text warnings on cigarette packages. **Design:** A cross-sectional study. **Setting:** A university in Thailand. **Participants:** 137 smoking university students from 9 faculties at the Silpakorn University, Sanamchan Palace Campus, located in Nakhon Pathom Province, Thailand. **Methods:** Data of attitude toward warnings on cigarette packages and attitude toward quit were collected between 8 July to 4 August 2006 using self-administered questionnaires. **Results:** Students felt that the image of "Cigarettes cause fatal lung cancer" was most terrible and caused loss of craving and this image made most students did not want to handle the cigarette packages. Students felt that the image of "Cigarettes can kill smokers" was ordinary. The images of "Cigarettes make smokers look older" and "Cigarettes cause persistent bad breath" made them thought that they were over claimed. The text warning on cigarette package said "Cigarettes hurt babies" made students feel that it was most interesting and most attractive. **Conclusion:** Of the university students, 58.8% expressed a desire to quit and/or reduce smoking as a result of the graphic warning on cigarette packages. The warning on cigarette packages which made most students wish to quit smoking was "Tobacco smoke causes lung cancer". ©All right reserved.

Keywords: attitude of smoking students, warnings on cigarette packages

INTRODUCTION

Over 50 years after the first link between smoking and lung cancer was established, more diseases are being found to be caused by smoking.¹ Cigarette smoking caused a broad range of diseases such as lung cancer, emphysema, ischaemic heart disease, looking older, throat cancer, mouth cancer, stroke, tuberculosis, gastric ulcer, diabetes mellitus, arthritis and cataract. In population with prolonged cigarette use, the proportion of lung cancer cases attributable to cigarette smoking has reached 90%. However, it is known that about half of all continuing regular smokers will be killed by their smoking and those that

die in middle age (defined as aged 35-69 years) as a result of their smoking lose on average 22 years of life, with a larger proportion of that shortened life span being spent in ill health.² Men born in 1900-1930 who smoked only cigarettes and continued smoking died on average about 10 years younger than lifelong non-smokers. Cessation at age 60, 50, 40, or 30 years gained, respectively, about 3, 6, 9, or 10 years of life expectancy. Probabilities of dying in middle age (35-69 years) among the cigarette smokers versus non-smokers were 42% versus 24%. Smoking was recognized as the largest single preventable cause of disease and premature death.³

* **Corresponding author:** Faculty of Pharmacy, Silpakorn University, Sanamchan Palace Campus, Nakhon Pathom, Thailand.
Email: Rapeepun@email.pharm.su.ac.th

Health warning labels in Thailand started to be used in 1974, when the law required for the first time printing the warning “*Cigarette smoking may be harmful to health*” on the side of cigarette packages; however, the law provided no indication of letter size and colour.³ Afterwards, there were efforts to improve such warning labels. It was during the period 1997-2004 when a measure was adopted to enhance legibility. The warning label was required to be printed on the top front and back of packages, covering no less than 33.3% of the display area, using white characters on a black background in 20-point “see-praya” Thai letter type. In 2002, the enforcement of the non-smokers’ health protection law was expanded and led to a total ban on smoking in all air-conditioned restaurants. The law also coded that the health warning label on cigarette packages be made larger (increasing from 33.3% to no less

than 50% of the total space) with six versions of four-colour graphic labels (Figure 1), with white letters against a black background for eligibility. The graphic health warning label was applicable under the law requirement on 2003. Eventually, the Minister of Health, issued a ministerial order on 19 January 2004, referring to the power under Article 12 of the Tobacco Products Control Act B.E. 2535 (1992), to require a new graphic health warning label on cigarette packages as follows:

- Six versions of four-colour graphic labels inscribed with written information as the followings: *Cigarettes make smokers look older*; *Cigarettes hurt babies*; *Cigarettes can kill smokers*; *Cigarettes cause fatal emphysema*; *Cigarettes cause persistent bad breath*; and *Cigarettes cause fatal lung cancer*.
- The label must occupy at least 50% of the total surface area of the package.



No.1 warning = Cigarettes can kill smokers

No.2 warning = Cigarettes hurt babies

No.3 warning = Cigarettes cause fatal emphysema

No.4 warning = Cigarettes cause fatal lung cancer

No.5 warning = Cigarettes make smokers look older

No.6 warning = Cigarettes cause persistent bad breath

Figure 1. The six health warnings on Thailand cigarette packages.

- The label must be displayed on the top front and back of the package. The Control Act to have a graphic health warning was effective in 2005, which is 30 years after a health warning label was first used. It made Thailand the fourth country to introduce such a measure aimed at controlling tobacco consumption.

These warnings were similar to current practice in Canada which introduced graphic warnings that covered half of the front and back of cigarette packs in January 2001.⁴ Brazil introduced large graphic warnings on tobacco products in February 2002. And after 1 July 2004, cigarettes sold in Singapore must display one of six health warning messages. The messages must cover at least 50% of the cigarette package front and back and on 1 October 2006, new health warnings come into effect. Cross-sectional evaluation studies of previous Canadian research suggested that warning labels were an effective means of communicating the health effects of smoking.⁵ Most of smokers read, thought about and discussed, the warning labels and 41% had intention to quit within 6 months. However, field research on the impact of cigarette warning has been limited. The National Statistic Office of Thailand found that in 2004, an average age of smokers was 18.4 years old that majority of which were students at university.⁶

This research evaluated effect of the six existing graphic and text warnings on cigarette package on attitude of smoking students at Silpakorn University. Data from

this research might advocate health warnings on the label of tobacco products to raise adolescences' concerns about their smoking, and provide impetus for behaviour change such as giving up smoking or less smoking.

METHODS

Study Population

Populations of this study were all smoking students from 9 faculties of the Sanamchan Palace Campus, Silpakorn University. Pilot study in the second semester of academic year 2005 found that 0.1 percent of all 9,307 students had smoked cigarettes. Formula for calculating sample size from proportions was⁷

$$n_0 = \frac{Z^2 pq}{e^2}$$

$$n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

Where, n_0 = the sample size,

Z^2 = the desired confidence level = 95%,

E = the desired level of precision = $\pm 5\%$,

p = the estimated proportion of smoking students in the population = 0.1,

q = 1- p ,

N = the population size, and

N = the adjusted sample size.

Of smoking students, 137 (with 95% of confidence level and $\pm 5\%$ of precision level) were chosen from population on basis of quota random sampling (Table 1). Preliminary study to clarify construct validity of the questionnaires was conducted on 40 smoking

Table 1. Numbers of questionnaires in each faculty

Faculty	No. of smoking students*	No. of questionnaires, N (%)
Faculty of Engineering and Industrial Technology	396	57 (41.6)
Faculty of Arts	139	20 (15.0)
Faculty of Decorative Arts	138	20 (15.0)
Faculty of Science	123	18 (13.1)
Faculty of Architecture	65	9 (6.6)
Faculty of Education	52	8 (5.8)
Faculty of Pharmacy	17	2 (1.5)
Faculty of Animal Science and Agricultural Technology	11	2 (1.5)
Faculty of Painting, Sculpture and Graphic Arts	6	1 (0.7)
Total	947	137 (100.0)

* Number of smoking students from pilot study

students from other universities; Chulalongkorn University, Thammasat University, Prince of Songkla University, Khon Kaen University and Nakhon Pathom Civil University.

Data Collection

Between 8 July to 4 August 2006, data was collected in the form of self-administered questionnaires at cafeterias and water pool and park in the university which were area that had many smoking students during lunch and in the evening. The following variables were studied: sex, age, faculty, number of cigarettes smoked per day, age at which smoking began, previous attempts to quit smoking, Students' attitude toward warnings on cigarette packages, attitude toward quit smoking, and other related data.

Statistical Analysis

Students' attitudes toward graphic warnings were recorded into 10 categories: ugly, do not want to handle, terrible, ordinary, depress, over claim, suffering, interesting, loss of craving and others. Students' attitudes toward text warnings were recorded into 9 categories: interesting, attractive, reliable, comprehensible, lack of interest, over claim, unbelievable, complicate and others. Data were presented in percentages, ranges, modes, medians and means with standard deviations and analyzed by SPSS/PC program (statistical package for Social Sciences) version 11.0.

RESULTS

Characteristics of Samples

There were 137 students who completed questionnaires. Table 2 showed the baseline characteristics of students. Smoking students were 21 years of mode of age, had 1.80-4.00 range of averaged cumulative GPA and had mode and range of income per month of 6,000 and 2,000-18,000 bahts. Mean initiation of smoking was 17.1 years (SD: 2.3, range: 7-21, mode 18, median: 18) and 47.4 percents of students started smoking before 18 years. The high percentage (51.8%) of university students started smoking after they had entered university (since 18 years of age). Average consumption was 8.6 cigarettes per day (SD: 7.3, range: 1-40, mode: 10, median: 7).

Table 2. The baseline characteristics of students

Characteristics	N =137
Gender	
Male, n (%)	123 (89.8)
Age, years (range)	20.5 (18-25)
Cumulative Grade Point Average, mean \pm S.D.	2.55 \pm 0.48
Level of education	
First-year, n (%)	17 (12.4)
Second-year, n (%)	31 (22.6)
Third-year, n (%)	51 (37.2)
Fourth-year and higher, n (%)	38 (27.7)
Income per month in bahts, mean \pm S.D.	5,537.40 \pm 2,276.82
Age at which smoking began, years, n (%)	
> 10	1 (0.7)
11-14	15 (11.0)
15	13 (9.5)
16	18 (13.1)
17	18 (13.1)
18	35 (25.5)
19	18 (13.1)
20	16 (11.7)
21	2 (1.5)
Number of cigarettes per day, n (%)	
1-10	103 (76.9)
11-20	26 (19.4)
> 20	5 (3.7)
Previous attempt to quit smoking, n (%)	
Never,	40 (29.2)
Ever	97 (70.8)
1 time	14 (14.4)
2 times	21 (21.6)
3 times	10 (10.3)
4 times	4 (4.1)
5 times	6 (6.2)
> 5 times	9 (9.3)
na*	33 (34.0)

na* = not assessed

Students' Attitudes toward Graphic Warnings

Some students had never seen some warnings and the warning that most familiar to students was "Cigarettes make smokers look older" (Table 3). Students felt that the image of "Cigarettes cause persistent bad breath" was

Table 3. Student had ever seen the graphic warnings on cigarette box before the study

Graphic warning	%
Cigarettes can kill smokers	94.2
Cigarettes hurt babies	92.0
Cigarettes cause fatal emphysema	93.4
Cigarettes cause fatal lung cancer	94.2
Cigarettes make smokers look older	97.8
Cigarettes cause persistent bad breath	97.1

most ugly (61.3%), but least depress (16.1%) (Table 4). “Cigarettes make smokers look older” image warning was the one that students liked to handle among the others. The image of “Cigarettes cause fatal lung cancer” made 13.9% of students deny handling the cigarette packages and made them thought that it was most terrible (57.7%) and caused loss of craving (9.5%). Of students, 56.2% felt that the image of “Cigarettes can kill smokers” was most ordinary. The majority of students felt that the image of “Cigarettes cause fatal emphysema” made them most depress (36.5%) and most suffering (26.3%). The image of “Cigarettes make smokers look older” and “Cigarettes cause persistent bad breath” made them feel of over-claiming (17.5%). Students thought that the most interesting images were 2 pictures, i.e. “Cigarettes hurt babies” and “Cigarettes make smokers look older” (9.5% each).

Students' Attitudes toward Text Warnings

The text warning on cigarette packages that made students thought that it was most interesting (32.1%) and most attractive (17.5%) (Table 5) was “Cigarettes hurt babies”, most reliable (44.1%) was “Cigarettes cause fatal lung cancer”, most comprehensible (47.4%) was “Cigarettes cause persistent bad breath”, lack of interest (11.8%) was “Cigarettes can kill smokers”, most over-claimed (14.6%) was “Cigarettes make smokers look older”, most unbelievable labels (8.8% each) were “Cigarettes make smokers look older” and “Cigarettes cause persistent bad breath”. Of these students, 4.4% thought that these 4 labels were complicate and hard to understand, i.e. “Cigarettes can kill smokers”, “Cigarettes hurt babies”, “Cigarettes cause fatal emphysema” and “Cigarettes make smokers look older”. “Cigarettes can kill smokers”, most over-claimed (14.6%) was “Cigarettes make smokers look older”, most unbelievable labels (8.8% each) were “Cigarettes make smokers look older” and “Cigarettes cause persistent bad breath”. Of these students, 4.4% thought that these 4 labels were complicate and hard to understand, i.e. “Cigarettes can kill smokers”, “Cigarettes hurt babies”, “Cigarettes cause fatal emphysema” and “Cigarettes make smokers look older”.

Table 4. Percentage of students' attitudes toward graphic warnings (one student could have more than 1 answer, N = 137)

Attitude toward graphic warnings	No.1 warning	No.2 warning	No.3 warning	No.4 warning	No.5 warning	No.6 warning
Ugly	15.3	13.9	24.8	43.8	16.8	61.3
Do not want to handle	10.9	11.7	10.9	13.9	5.8	8.8
Terrible	19.0	14.6	43.8	57.7	16.1	25.5
Ordinary	56.2	39.4	24.8	21.9	49.6	20.4
Depress	21.9	35	36.5	31.4	22.6	16.1
Over claim	10.9	10.9	8.8	5.8	17.5	17.5
Suffering	5.8	10.2	26.3	24.1	10.2	8
Interesting	7.3	9.5	2.9	6.6	9.5	8
Loss of craving	2.2	8	8	9.5	3.6	8.8
Others ^a	7.3	8	1.5	1.5	7.3	3.6
Total	156.9	161.3	188.3	216.1	159.1	178.1

^a e.g., pitiful, crazy, dirty, no any feeling

No.1 warning = Cigarettes can kill smokers

No.2 warning = Cigarettes hurt babies

No.3 warning = Cigarettes cause fatal emphysema

No.4 warning = Cigarettes cause fatal lung cancer

No.5 warning = Cigarettes make smokers look older

No.6 warning = Cigarettes cause persistent bad breath

Table 5. Percentage of students' attitudes toward text warnings (one student could have more than 1 answer)

Attitude toward text warnings	No.1 warning (N = 136)	No.2 warning (N = 137)	No.3 warning (N = 135)	No.4 warning (N = 136)	No.5 warning (N = 137)	No.6 warning (N = 137)
Interesting	27.9	32.1	29.6	27.2	25.5	27.0
Attractive	10.3	17.5	9.6	11.8	8	10.2
Reliable	22.1	28.5	35.6	44.1	31.4	32.8
Comprehensible	40.4	43.1	39.3	43.4	40.1	47.4
Lack of interest	11.8	5.1	7.4	4.4	10.2	10.2
Over claim	9.6	6.6	5.9	8.1	14.6	9.5
Unbelievable	6.6	2.9	3	3.7	8.8	8.8
Complicate	4.4	4.4	4.4	3.7	4.4	0.7
Others ^a	14.7	15.3	14.8	12.5	11.7	13.1
Total	147.8	155.5	149.6	158.8	154.7	159.9

^a e.g., pitiful, no any feeling, friends reminding, quit smoking desire, distinct imagination

No.1 warning = Cigarettes can kill smokers

No.2 warning = Cigarettes hurt babies

No.3 warning = Cigarettes cause fatal emphysema

No.4 warning = Cigarettes cause fatal lung cancer

No.5 warning = Cigarettes make smokers look older

No.6 warning = Cigarettes cause persistent bad breath

Other comments from smoking students about graphic warning were that they should be more terrible, more variety of graphic pictures, cheerfulness to quit smoking, VIP's graphic pictures, also English, only text warning, in other media and some students wanted no any warning because warning had no any effects.

Students' Attitudes toward Quit Smoking

Only 60 smoking students (58.8%) expressed a desire to quit and/or reduce smoking (Table 6). Of this group, 54 students (90.0%) would reduce number of cigarettes consumption per day to 2.7 (SD: 2.3, range: 1-10, mode: 1, median: 2) and 46 students (76.6%) designed to quit smoking at 24.7 years (SD: 8.1, range: 13-60, mode: 22, median: 22). 41.2% of students had never considered quitting. Warning on cigarette packages which made 48.9% of students would like to quit smoking was "*Tobacco smoke causes lung cancer*" (Table 7). Some of students made any efforts to avoid the warnings such as 36.5% of students used a cigarette case of their own and 7.3% tried other ways (Table 8).

Table 6. Students' attitudes toward quit and/or reduce smoking after seeing the graphic warning on cigarette packages

Attitude toward quitting smoking	N = 102
Do not quit, n (%)	42 (41.2%)
Quit and/or reduce smoking, n (%)	60 (58.8%)
Expectation on consumption of cigarettes per day, n (%)	54 (52.9%)
Average age expected to quit smoking (years), n (%)	46 (45.1%)

Table 7. Warnings on cigarette packages which made students expressed a desire to quit smoking (one student could have more than 1 answer)

Warnings	n (%)
Cigarettes cause fatal lung cancer	67 (48.9)
Cigarettes cause persistent bad breath	23 (16.8)
Cigarettes hurt babies	14 (10.2)
Cigarettes cause fatal emphysema	10 (7.3)
Cigarettes make smokers look older	5 (3.6)
Total	119 (86.9)

Table 8. How students did with cigarette package containing warnings

Method	N = 137
Do nothing	100 (73.0%)
Using a cigarette case of their own	50 (36.5%)
Others ^a	10 (7.3%)
Total	160 (116.8%)

^a e.g., requesting a specific package to avoid a particular warning, cut the warning out, buy cigarettes that do not have picture, do not look at the packages

DISCUSSION

Mean age of smoking initiation of students was 17.1 ± 2.3 years closely that of 17.2 ± 2.6 years of sixth-year medical students in Spain.⁸ In this study, 47.4% of students started smoking before 18 years that was against the Tobacco Products Control Act B.E. 2535 (1992) of cigarette sold to persons under 18 years of age banning.³ Students should be asked to show proof of age when buying cigarettes in order to restrict students who want to start smoking under 18 years of age.⁹ Stricter enforcement of tobacco buying and smoking laws were needed to support the reduction of tobacco use among youth. An important finding was the high percentage (51.8%) of university students started smoking after they had entered university (since 18 years old). This result was higher than 32.54% that found in sixth-year medical student group⁸ probably due to, in general, medical students had better health habits than general university students. Whatever a smoking-related education for students should be imperative to increase concern about smoking as a health problem, and the best possible time for this activity was before they had entered university. Average income per month of smoking students was 5,537 bahts while average national income per capita was 6,669 bahts per month.¹⁰ So tobacco tax increasing should be effective to make students quit smoking.¹¹

The image that was most ugly such as "*Cigarettes cause persistent bad breath*" picture had less effect on quitting the cigarettes. And from the idea of students, the text warning of "*Cigarettes cause fatal lung cancer*" had most reliability. The image of "*Cigarettes cause fatal lung cancer*" made students feel that it was most terrible and caused loss of craving. This image also made them did not want to handle and might be the image that they used cigarette cases of their own. Besides that, some of them requested a specific package to avoid a particular warning, and "*Cigarettes make smokers look older*" image warning was familiar to students who liked to handle. Some students reported trying to avoid the warnings. Those who avoided the warnings were no less likely

to read and think about the warnings, and no less likely to engage in cessation behavior.¹²

Graphic warning which made 48.9% of students would like to quit smoking was "*Cigarettes cause fatal lung cancer*". For about 50 years, researchers and practitioners had conducted research demonstrating the effectiveness of fear appeals in influencing health relevant attitudes and behaviour. Several conclusions were made, including two that were relevant here: (1) fear appeals can be effective in increasing healthy behaviour and decreasing unhealthy behaviour; and (2) fear appeals are effective to the extent that they are accompanied by efficacy messages—that was, messages that provided information about how to avoid the threat that was highlighted by the fear appeal.¹³ The terrible images and reliable messages of the warning might be used as a basis for promoting smoking cessation. When smoking students were motivated by interesting feeling on cigarette packages warning such as the "*Cigarettes hurt babies*" image, they might assess what they already knew and they perhaps wanted additional information and a narrative of baby might be a new thing for them. The image of "*Cigarettes make smokers look older*" and "*Cigarettes cause persistent bad breath*" made students thought that it was most over-claimed and both of these text warnings were most unbelievable because these images might be suitable to serve for the older.

This study appeared that smoking rates among general university students and female students were 10% and 1.0%, respectively. Report in 2005 on Thai people aged 15 years and older found that prevalence of general smokers and female smokers were 19.5% and 2.1%³ that were higher than prevalence of university student smokers. In that matter, effective tobacco warning label should be continuously developed, tested and revised over time for many targeted groups such as students, males and females.

There were 4 labels that the smoking students thought they were complicate and hard to understand, e.g. "*Cigarettes can kill smokers*", "*Cigarettes hurt babies*", "*Cigarettes cause fatal emphysema*" and "*Cigarettes make*

smokers look older". This might be used as crucible to increase knowledge about these topics and used varieties of media to increase reliability that cigarette smoking caused a broad range of diseases.

From this study, 70.8% of the students had ever made at least one quit attempt while high percentages, 58.8%, of the university students expressed a desire to quit and/or reduce smoking as a result of the graphic warning on cigarette packages. In Canada where the graphic health warning label on cigarette packages was first used, the Canadian Cancer Society conducted a survey one year after the measure was adopted and found that 44% of smokers thought about smoking cessation.³ So effective tobacco warnings and campaigns should be developed, tested and revised over time for each targeted groups such as male and female students to increase reliability of conceivable information among students and finally improve their smoking behavior.

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