

PERCEPTIONS OF THE PREVALENCE OF CIGARETTE SMOKING BY PEERS: A STUDY OF TAIWANESE, FILIPINO, AND THAI HIGH SCHOOL STUDENTS

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Abstract. Youth cigarette smoking is a major public health concern in Southeast Asia. A suspected determinant of youth smoking is perceived peer behavior. Previous research has suggested that the probability that a teenager will use substances increases when there is the perception that most peers engage in the substance use behavior. This study aimed to assess the perceptions of the prevalence of peer cigarette smoking in samples of high school students from three Southeast Asian countries and to examine the association of these perceptions to self-reported personal use of cigarettes. Perceptions of the prevalence of peer smoking were generally characterized by the perception that most students do not smoke. However, a significant percentage of students held the perception that most students were current smokers. Students who held this perception were at increased risk of being current smokers relative to those who believed most students were not current smokers. The results of this study imply that public health programs may benefit from health promotion interventions which focus on dispelling misconceptions that most youth smoke cigarettes.

INTRODUCTION

Tobacco smoking is clearly one of the chief preventable causes of death in the world. The World Health Organization cites that cigarettes are responsible for about five million deaths every year and that if current smoking patterns continue, that number could double by 2020 (WHO, 2004). Half the people who smoke today, about 650 million people, will eventually be killed by tobacco. According to Murray and Lopez (1996), the Asian region is expected to experience a fourfold increase in tobacco mortality between 1998 and 2030.

Smoking prevalence in Southeast Asia is likely to increase (Choe *et al*, 2001). Multinational tobacco companies are marketing their products

with increasing intensity in Asia, particularly targeting young people (Bettcher *et al*, 2000). Asia is often viewed by transnational tobacco companies as an "emerging market" for cigarettes and as a result is often targeted for expansion. For example, 8,000 executives in the international tobacco industry are expected to attend the upcoming Emerging Tobacco Markets 2005 Convention in Kuala Lumpur, Malaysia in November 2005 which aims to provide "a fast-track gateway to all vigorous markets in the Asia region to promote tobacco products" (Anonymous, 2005). The web site advertising this event touts that the convention is the "perfect opportunity for all players in the tobacco industry, from inside of Asia or outside of Asia, to strengthen their position in the Asian region".

Continuing economic development in Southeast Asia will also result in more youth having disposable income for purchasing cigarettes. Economic development and modernization will probably also result in increases in the

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prevalence of smoking in young females, which presently is at lower rates than for young males (Bettcher *et al*, 2000; Global Youth Tobacco Survey Collaborating Group, 2003).

Because the use of substances, such as cigarettes, is considered to be a highly social behavior, peer factors have been identified as a critical determinant for use by teenagers (Gavira and Raphael, 2001). One of these suspected determinants is perceived peer behavior. Research by Kawaguchi (2004) found that when the perceived peer substance use increases by ten percentage points, the probability that a teenager will use substances increases by two to three percentage points. Unfortunately, there is little research examining perceptions of cigarette smoking in youth and the relationship of these perceptions to actual or reported use (Page *et al*, 2002). In particular, this research is lacking among many populations of youth including Southeast Asian youth. Therefore, the purpose of this study was to assess Southeast Asian high school students' perceptions of the prevalence of cigarette smoking by their peers and to examine the association of these perceptions and reported smoking behavior.

MATERIALS AND METHODS

Subjects

Subjects for this study included 3,307 students from eight Philippine high schools, 2,665 students from twenty-one high schools in Taiwan, and 2,519 students from ten high schools in Thailand. The eight Philippine schools represent a mix of schools representing urban and rural areas and the three major regions of the country (Luzon, Visayas, and Mindanao). Of the twenty-one Taiwanese schools, fourteen were located in Taipei City and seven were in Taipei County. The ten schools in the Thai sample were located in Chiang Mai Province and represented a mix of rural and urban and public and private schools. All these schools included in the samples were co-educational. Characteristics of the subjects are presented in Table 1.

Questionnaire design

The questionnaire items for this study included questions designed to assess the stu-

dents' perception of the prevalence of peer cigarette smoking and self-reported personal use of cigarettes. These items were part of questionnaires that elicited information about a wide range of health behaviors and characteristics.

Perception of the prevalence of peer cigarette smoking was measured in the Philippine and Taiwan samples by asking respondents, "Which best describes the use of cigarettes by most students at your high school?" Response options included: have never smoked, have smoked cigarettes in their life but not within the last 30 days, have smoked cigarettes within the last 30 days but not during the last week, have smoked cigarettes within the last week but not daily, and smoke cigarettes daily. Perception of the prevalence of peer cigarette smoking was measured in the Thai sample by asking "How many of your friends smoke?" The response options for this question were: none of them, some of them, half of them, most of them, and all of them. Thai subjects also responded to the question "How many of your friends pressure you to smoke?" The same response options were used.

Self-reported personal use of cigarettes was also measured in all three samples. Students were asked to select the response that best describes their personal use of cigarettes: never smoked, smoked cigarettes but not within the last 30 days, smoked cigarettes within the last 30 days but not during the last week, smoked within the last week but not daily, and smoke cigarettes daily.

Data collection

Faculty members from three Southeast Asian universities (University of the Philippines, National Taiwan Normal University, and Chiang Mai University) coordinated data collection in each respective sample in each Southeast Asian country. Questionnaires in each school in each of the samples were administered in regularly scheduled classes. Students were instructed not to place their names on questionnaires and to answer all questions honestly. Students were also informed that their participation was voluntary and that the decision to participate would not affect their grade in the class. Teachers ad-

ministering the questionnaire were on hand to provide assistance to students requiring help or having questions.

Data analysis

Descriptive statistics were computed for the variables assessed in this study. The difference between male and female students on these variables was determined by chi-square tests. Chi-square tests were also used to determine if there was a significant association between perceptions of prevalence of peer smoking and reported smoking behavior (current smoking). Current smoking was defined as having smoked cigarettes in the last 30 days. These tests were calculated separately for boys and girls. SAS version 8.2 was used for statistical analysis.

RESULTS

Results for self-reported personal use of cigarettes are presented in Table 2. In each sample, girls were significantly more likely than boys to have never smoked while boys were more likely to have smoked cigarettes. Perception of the prevalence of use of cigarettes by most students in one's school is shown in Table 3 for the Taiwan and Philippines sample. Boys and girls did not differ in perceptions within these two samples. Table 4 displays the perceptions of Thai sample students' perceptions of how many friends smoke cigarettes and how many friends pressure them to smoke. Boys were significantly more likely than girls to report that their friends smoked and pressure them to smoke.

Table 1
Subject characteristics for the three samples.

	Philippines	Taiwan	Thailand
No. of subjects	3,307	2,665	2,519
No. of schools	8	21	10
Location	3 major regions of the country	Taipei City and Taipei County	Chiang Mai Province
Mean age	15.5 (SD=1.23)	16.7 (SD=1.06)	16.2 (SD=1.33)
Gender			
No. of males	1,267	1,564	830
No. of females	1,819	1,026	1,662
No. not reporting	221	25	27

Table 2
Self-reported personal use of cigarettes.

	Taiwan ¹		Thailand ²		Philippines ³	
	Boys % (n)	Girls % (n)	Boys % (n)	Girls % (n)	Boys % (n)	Girls % (n)
Never smoked	66.5 (1,038)	79.1 (810)	84.6 (706)	96.3 (1,580)	83.8 (1,054)	90.2 (1,634)
Smoked, but not within last 30 days	17.9 (280)	13.3 (136)	8.1 (66)	1.8 (30)	10.9 (137)	6.6 (119)
Smoked within the last 30 days but not during the last week	2.3 (36)	1.1 (11)	1.2 (10)	0.7 (11)	1.1 (14)	0.8 (15)
Smoked within the last week but not daily	5.8 (91)	2.5 (26)	1 (8)	0.4 (7)	3.7 (47)	2.4 (44)
Smoke cigarettes daily	7.4 (115)	4 (41)	3.3 (27)	0.7 (12)	0.5 (6)	0 (0)

¹Boys and girls differed significantly on self-reported personal use of cigarettes, $\chi^2 = 53.6$, $p < .0001$, $df = 4$

²Boys and girls differed significantly on self-reported personal use of cigarettes, $\chi^2 = 87.7$, $p < .0001$, $df = 4$

³Boys and girls differed significantly on self-reported personal use of cigarettes, $\chi^2 = 37.7$, $p < .0001$, $df = 4$

Table 3
 Perception of use of cigarettes by most students at your high school, Taiwan and Philippine sample.

	Taiwan ¹		Philippines ²	
	Boys % (n)	Girls % (n)	Boys % (n)	Girls % (n)
Never smoked	40.1 (628)	37.9 (389)	37.1 (458)	38.4 (684)
Smoked, but not within last 30 days	19 (298)	18.7 (192)	15.8 (195)	13.5 (241)
Smoked within the last 30 days but not during the last week	7.4 (115)	5.6 (57)	3.6 (45)	3.1 (55)
Smoked within the last week but not daily	18.7 (292)	22.6 (232)	25 (309)	26.4 (470)
Smoke cigarettes daily	14.8 (231)	15.2 (156)	18.5 (229)	18.5 (330)

¹ Boys and girls did not differ on perception of use, $\chi^2 = 8.6$, $p = 0.07$, $df = 4$

² Boys and girls did not differ on perception of use, $\chi^2 = 4.1$, $p = 0.39$, $df = 4$

Table 4
 Perceptions of how many friends smoke cigarettes and pressure you to smoke cigarettes, Thai sample only.

	Smoke cigarettes ¹		Pressure you to smoke ²	
	Boys % (n)	Girls % (n)	Boys % (n)	Girls % (n)
None of them	38.5 (317)	55.1 (909)	88.5 (726)	96.7 (1,595)
Some of them	51.7 (426)	42.2 (697)	9.3 (76)	2.9 (48)
Half of them	3.3 (27)	1.6 (26)	1.3 (11)	0.4 (6)
Most of them	6.2 (51)	1.1 (19)	0.6 (5)	0 (0)
All of them	0.4 (3)	0 (0)	0.2 (2)	0 (0)

¹Boys and girls differed significantly on perception of smoking, $\chi^2 = 104.2$, $p < .0001$, $df = 4$

²Boys and girls differed significantly on perception of smoking, $\chi^2 = 69.6$, $p < .0001$, $df = 4$

The prevalence of current smoking according to perception of peer use results are shown in Table 5. Results showed that students in all three samples who held the perception that most stu-

dents in their school never smoked or that none of their friends smoke were significantly less likely to be current smokers. Boys and girls in the Taiwan sample and boys in the Thailand sample who held the perception that most students in their school are current smokers, or that half or more friends smoke, were significantly more likely to be current smokers than in any of the classification groups on this variable (perception of peer smoking).

DISCUSSION

As expected, girls were more likely to report having never smoked cigarettes than boys across all three samples. The percent of girls reporting having never smoked was much higher in the Thai (96.3%) and Filipino (90.2%) samples than in the Taiwan (79.1%) sample. This trend showing higher rates of never smoking was also true for boys in the Thai (84.6%), Filipino (84.6%), and Taiwanese (66.5%) samples. Conversely, boys in each sample were more likely to have smoked cigarettes than girls and to report smoking more frequently. Boys and girls in Taiwan reported higher involvement in personal use of cigarettes than students in Thailand and the Philippines. This finding, showing a higher smoking prevalence of Taiwanese youth compared to

Table 5
Prevalence (%) of current smoking according to perception of peer use.

Perception	Taiwan ^a		Thailand ^b		Philippines ^a	
	Boys % ¹ (n)	Girls % ² (n)	Boys % ³ (n)	Girls % ⁴ (n)	Boys % ⁵ (n)	Girls % ⁶ (n)
Most never smoked ^a or none of friends smoke ^b	5.4 (34)	1.3 (5)	3.3 (14)	1.3 (9)	3.5 (16)	2.3 (16)
Most smoke, but not within last 30 days ^a or some friends smoke ^b	12.4 (37)	2.1 (4)	11.1 (3)	7.7 (2)	8.7 (17)	5.8 (14)
Most are current smokers ^a or half or more friends smoke ^b	26.8 (171)	15.5 (69)	16.7 (9)	5.3 (1)	5.5 (32)	3.4 (29)

Note. The chi-square results listed below indicate that the perception groups differed significantly on prevalence (%) of current smoking for each respective country and gender specific sample.

¹Taiwan boys $\chi^2 = 113.3$, $p < 0.0001$, $df = 2$; ²Taiwan girls $\chi^2 = 69.9$, $p < .0001$, $df = 2$; ³Thailand boys $\chi^2 = 19.7$, $p < 0.0001$, $df = 2$; ⁴Thailand girls $\chi^2 = 8.1$, $p = .0176$, $df = 2$; ⁵Philippine boys $\chi^2 = 7.6$, $p = 0.0223$, $df = 2$; ⁶Philippine girls $\chi^2 = 6.7$, $p = 0.0346$, $df = 2$

Thai and Filipino youth, is consistent with a report investigating smoking rates in Asia by Choe *et al* (2001).

Smoking in many Asian nations has traditionally been viewed as a male activity (Knight and Chapman, 2004). The higher prevalence of smoking among boys than girls observed in this study is consistent with other research that has looked at this health behavior among Southeast Asian youth. Choe *et al* (2001) also found a higher smoking prevalence among teenage boys and girls in Thailand, the Philippines, and Taiwan as well as in Indonesia and Nepal. The ratio of boys to girls for current smoking (smoked cigarettes in the past 30 days) in our samples was 2.0 in Taiwan (15.7%/7.6%), 3.0 in Thailand (5.5%/1.8%), and 1.6 in the Philippines (5.3%/3.2%).

Despite the low prevalence of smoking among Southeast Asian girls, there is concern that the prevalence in young girls will rise steeply in the future (Morrow and Barraclough, 2003). This trend of an increasing number of young women taking up smoking has occurred in many areas of the world. Results from the Global Youth Tobacco Survey show that teenage girls now smoke cigarettes at about the same rate as teenage boys in half of the sites (61 of 120) throughout the world surveyed for cigarette smoking (Global Youth Tobacco Survey Collaborating Group, 2003). A rising prevalence of smoking

among girls in Southeast Asia poses many problems for rising generations in addition to the health problems common to both genders. Women face additional hazards in pregnancy, female-specific cancers such as cancer of the cervix, and exposure to passive smoking. The health problems are likely to increase in response to the following conditions: the spending power of girls and women is increasing so that cigarettes are becoming more affordable, the social and cultural constraints that previously prevented many girls and women from smoking are weakening, and female-specific health education and smoking cessation programs are rare. Furthermore, evidence suggests that females find it harder to quit smoking. Tobacco companies are clearly targeting females by marketing cigarettes specifically designed to appeal to women and by advertising directed toward females. This advertising associates smoking with feminism, sophistication, weight control, and Western-style independence. Thus, a major challenge and opportunity in primary preventive health in Southeast Asia is to avert the predicted rise in smoking among girls and young women (Mackay and Amos, 2003).

A major focus of the current study was perceptions of smoking among peers. When Taiwanese and Filipino students were asked to indicate the frequency of cigarette smoking that characterized most students at their high school,

the most common response was "never smoked" (Thai students were not asked this question.) In the Taiwan sample, 40.1% of boys and 37.9% of girls said that most students at their high school have never smoked. Similar percentages of Filipino students (37.1% of boys, 38.4% of girls) said that most students at their high school never smoked. These perceptions were supported by the fact that high percentages of Taiwanese (66.5% of boys, 79.1% of girls) and Filipino (83.8% of boys, 90.2% of girls) students reported that they have personally never smoked. Nevertheless, 40.9% of Taiwanese boys, 23.4% of Taiwanese girls, 47.1% of Filipino boys and 98.0% of Filipino girl characterized most students at their schools as current smokers (smoking in the past 30 days). An interesting finding regarding these perceptions is the association between perception of peer use and the personal prevalence of current smoking (Table 5). Boys and girls in the Taiwan sample as well as boys in the Thailand sample who held the perception that most students at their high school were current smokers (smoked in the past 30 days) were significantly more likely to be current smokers themselves, compared to students holding perceptions that most students never smoked or have smoked, but not in the last 30 days. This finding supports the findings from Kawaguchi (2004) that perceptions of peer behavior may be an important determinant of youth substance use and may influence smoking behavior.

Students in the Thai sample were asked their perception of how many of their friends smoke and how many of their friends pressure them to smoke (Table 4). A very small percentage of boys (9.9%) and girls (2.7%) said that half, most, or all of their friends smoked cigarettes. Thus, it is not surprising that only 2.1% of boys and 0.4% of girls said that half, most, or all of their friends pressure them to smoke. A high percentage of the boys (88.5%) and girls (96.7%) said that none of their friends pressure them to smoke.

An important limitation concerning this study needs mentioning. Because this study relied on self-report measures, it may have suffered from reluctance on the part of students that

were surveyed to honestly and accurately report their smoking behavior (Brener *et al*, 2003). Despite the fact that students were told not to place their names on questionnaires and that their answers would remain anonymous, some students may not have wanted to divulge the fact that they smoke cigarettes. Certain unaccounted for factors inherent in the administration of the questionnaire in these three samples may have reduced students' desires to divulge this information. This may have been a factor in explaining why smoking prevalence in the current study was lower than in other studies reporting the smoking prevalence of Southeast Asian youth (Choe *et al*, 2001; Choe and Raymundo, 2001; Miguel-Baquilod, 2001; Podhista *et al*, 2001; Global Youth Tobacco Survey Collaborating Group, 2003). Differences in items used to assess smoking behavior between these studies and the current study may also be factors.

Another important limitation of this study is that it did not consider forms of tobacco other than cigarettes. Future studies of Southeast Asian youth may benefit from considering other forms of tobacco such as chewing tobacco, cigars, bidis, and kreteks.

In conclusion, youth cigarette smoking is a major public health concern in Southeast Asia. Of particular concern, is the prospect that smoking prevalence among the young will rise steeply in the near future in response to modernization, Westernization, economic development, and expansion of transnational tobacco companies into the region. There is also concern that the levels of smoking among young females in Southeast Asia will approach that of males, similar to what has occurred in much of the world.

In the three samples that we studied, self-reports of smoking were relatively low. This was especially true in the Philippine and Thailand samples. Perceptions of the prevalence of peer smoking were generally characterized by the perception that most students do not smoke. However, a significant percentage of students held the perception that most students were current smokers. Students who held this perception were at increased of being current smokers relative to those who believed most students were not current smokers. As a result, public

health programs may benefit from health promotion interventions which focus on dispelling misconceptions that most youth smoke cigarettes.

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