COMPARATIVE SOCIO-CULTURAL ANALYSIS OF SMOKING BEHAVIOR AND DIFFICULTY OF QUITTING SMOKING IN JAPAN AND THAILAND

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Objective Although education for smoking cessation is being conducted in Asian countries, the prevalence of smoking is still high. The present study was designed to clarify differences in the socio-cultural background in Japan and Thailand.

Methods Cross-sectional study. The Japan survey was conducted in Kanagawa and the Thailand survey in Suphanburi. Questionnaires written in English were translated into each language. The subjects were out-patients of community hospitals (331 males and 353 females in Japan and 293 males and 288 females in Thailand).

Results The prevalence of smoking was found to be higher in Thailand than in Japan for males but almost the same for females. A higher percentage of the subjects quit smoking in Japan than in Thailand. The motive for quitting smoking was "awareness of the harmful effects of smoking" in both countries, but "told by others to quit smoking" was also often encountered in Thailand. The method of quitting was most frequently "suppress the urge to smoke by will power" in both countries. Nicotine replacement therapy is not well known yet in either country.

Conclusion Smoking behavior was different although the difficulty of quitting smoking was common to both countries. The prevalence of smoking in younger males and females was established to be higher in Japan, and social and environmental regulations for quitting smoking were effective in Thailand. It suggests that such regulations should be made stricter in Japan. Enlightenment by providing knowledge may be particularly useful in Thailand.

Key words: smoking behavior, quitting smoking, international comparative study, socio-cultural analysis, education of smoking cessation, difficulty of quitting smoking

I. Introduction

Various types of large-scale clinical studies have shown effective prevention of lifestyle-related diseases and various types of cancer by smoking cessation[1~10]. WHO also proposed health education in smoking cessation as a first strategy[11]. Education of smoking cessation has diversified, and outpatient clinics for smoking cessation have been established in Asian countries[12~14] as well as in Western countries[14~18]. The prevalence of smoking among males in both Japan and Thailand, however, is approximately double that in Western countries[19]. In contrast, smoking among females in both Japan and Thailand is markedly less than in the West co, but has gradually been increasing in recent years[19].

It has been noted that the behavior and conduct of smoking and its cessation are influenced by social, ethical, cultural, religious, economic, educational, and other life-style factors[20~22]. In order to promote an effective education program for smoking cessation, relevant characteristic socio-cultural factors in Japan and Thailand must be clarified. For this purpose, we conducted the present comparative international socio-cultural study to examine the reason why it is difficult to quit smoking.

Five papers from international socio-cultural comparison studies for smoking have been published in the past five years. King et al.[23] researched differences in the smoking behavior of French and American women, while Bosanquet[24] investigated the

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smoking behavior of adolescents and young people in France and Spain. Cavelaars et al.[22] investigated international variations in smoking associated with educational levels in 12 European countries, and Baris et al.[25] surveyed priorities for tobacco control in developing countries through three meetings convened by Research for International Tobacco Control (RITC). Lastly, Steptoe et al.[26] reported an international comparison of tobacco smoking, beliefs and risk awareness in university students from 23 countries. However, none of these compared the socio-cultural factors in different countries using the same questionnaires for similar subjects on smoking habits and efforts made by individuals to quit smoking.

The present study is thus the first of its kind designed to clarify specific socio-cultural factors influencing the difficulties of smoking cessation conducted in both Japan and Thailand.

II. Methods

This international research project was designed by IO and SW in December 1999. The subjects and methods for both Japan and Thailand surveys were planned to be the same to make the comparison of results for the two countries epidemiologically valid.

Preparing the questionnaires

The questionnaires were prepared carefully and agreed upon by ethics committees at both universities. The original questionnaire was written in English and translated into Japanese and Thai. It consisted of 17 questions covering: sex, age group, smoking history group, efforts made in order to lead a healthy life, source of information on health, family members who smoke, age when started smoking, reasons for smoking and/or quitting smoking, number of cigarettes smoked per day, reason for still smoking, knowledge about terms "primary smoke" or "secondary smoke", number of trials for smoking cessation, method used to give up smoking, symptoms during smoking cessation, issues which make one feel stress, method to relieve stress.

The questionnaire was anonymous and self-administered. Sixteen of 17 questions were of the multiple choice type. The question about family members who smoke was the multiple-response type which means the respondent could choose more than one answer if necessary.

Study Participants

The Japan survey was conducted in the Kenou district of Kanagawa Prefecture, about 100 km from Tokyo, and the Thailand survey in Suphanburi province, about 100 km from Bangkok. These two areas were selected as being similar because middle class inhabitants live near metropolitan areas. Kenou district includes 5 cities and 3 large villages, with a total population of 848,937 (437,279 males and 411,658 females). There are two university hospitals, one government hospital, three Kanagawa Prefecture hospitals and nine community hospitals. The survey was conducted at Atsugi Prefecture Hospital and Ebina General Hospital, the largest representative community hospitals in the cities of Atsugi and Ebina.

Suphanburi province has a total population of 853,313 (417,093 males and 436,220 females) and comprises 10 districts. There are a total of 9 government-owned hospitals in the province, including one provincial hospital and 8 community hospitals. The survey was conducted in 7 community hospitals.

In both countries the survey was conducted as follows. Survey specialists interviewed out-patients in the hospitals. These out-patients were there to see physicians in a variety of departments in each hospital surveyed. The subjects were sampled according to eight groups by sex and age (i.e., in their 20s, 30s, 40s, and 50s). Interviews were continued till the number of subjects in each age-sex-group reached approximately 100.

The subjects numbered 684 (331 males and 353 females) in Japan and 581 (293 males and 288 females) in Thailand.

Informed consent

Interviewers explained the purpose of the study and the questionnaires to the subjects in such a way so the subjects understood that they would receive unbiased treatment even if they decided not to respond to the questionnaire, and gained informed consent.

Statistical analysis

Based on the questionnaires, the subjects were divided into four groups: the never-smoking group (Group 1), the ex-smoking group (Group 2), the failed-to-quit group (Group 3) and the smoking group (Group 4). Therefore, the subjects of Group 3 and Group 4 were defined as current smokers. The answers to the questionnaire were analyzed at the Department of Community Health, Tokai University School of Medicine and the Asian Institute for Health Development, Mahidol University, independently, and the data were then combined.

Statistical analysis, comparing both Japanese and Thai data, was mainly conducted by the χ^2 test using Stat View 5.0 J and SPSS ver. 11.0 J at both universities. If a multiple-response was allowed in the questionnaire, we applied the χ^2 test for each response. When the result of the χ^2 test was significant for a single-response question, we calculated the adjusted residual to make a cell-by-cell compari-

son of observed and expected frequencies. The residual was given by the formula

$$R = \frac{O - E}{\sqrt{E}}$$

where "O" is observed frequency and "E" is expected frequency of the cell. The adjusted residual was defined by the formula

$$\frac{R}{\sqrt{Var(R)}}$$

where "Var(R)" is the variance of residual R. With a value for the adjusted residual is higher than 3, the difference in frequency between the two groups was considered significant for each response[27].

III. Results

Comparison of the 4 groups in Japan and Thailand

In Japan, there were 292 subjects (62 males and 230 females) in Group 1, 121 (76 males and 45 females) in Group 2, 105 (68 males and 37 females) in Group 3, and 166 (125 males and 41 females) in Group 4 (Table 1). In Thailand there were 246 subjects (37 males and 209 females) in Group 1, 66 (49 males and 17 females) in Group 2, 98 (77 males and 21 females) in Group 3, and 171 (130 males and 41 females) in Group 4.

For males, the percentage for the whole age Group 1 was higher in Japan than in Thailand (18.7% vs. 12.6%; $P<0.05$) as shown in Table 1. The age group values for Group 1 subjects ranged from 11.5% to 25.8%, and the younger generation showed a higher percentage compared that for those in aged 40 and more in Japan. In Thailand this tendency was more remarkable, that is, the 26.1% for those in their 20s was the highest in Group 1.

The age group values for Group 2 subjects in Japanese males ranged from 12.3% to 38.1%, the highest being 38.1% in the people in their 50s. In Thailand the values ranged from 13.0% to 20.0%, and, and the percentage in their 50s (20.0%) was lower than in Japan.

Regarding values for Group 3 males, Thai were higher than Japanese in the 20s and particularly 30s (33.3% vs. 15.1%). The subjects of Group 4 in male Japanese ranged from 28.3% to 46.6%, the highest 46.6% were in their 20s. In contrast, the age groups of Group 4 in Thailand were 37.7% to 48.0%, and the lowest 37.7% in their 20s.

The prevalence of current smokers (Groups 3 and 4) in males overall was higher in Thailand than in Japan with statistical significance (70.3% vs. 58.3%, $P<0.05$). There was also the case for those in their 30s and 50s in Thailand (81.3%, 68.0%) as compared to Japan (60.3%, 50.4%) with statistical significance ($P<0.05$, $P<0.01$), respectively.

For females, Thailand showed a higher percentage in Group 1 compared with Japan with statistical significance overall as well as for those in their 20s (72.6% vs. 65.2%, 75.0% vs. 49.4%). The age group values for Group 2 female subjects ranged from 6.4% to 17.9% in Japan and from 2.8% to 9.9% in Thailand, being higher for younger generation in Japan. The age group values for Group 3 female subjects ranged from 7.6% to 14.5% in Japan and from 6.8% to 8.5% in Thailand. As to Group 4 females, those in their 40s in Japan showed the lowest percentage (4.5%), much lower than that for Thailand (23.0%).

Although the female prevalence of current smokers overall was almost the same in the two countries, the highest prevalence was seen in those in their 20s in Japan (35%) but in their 40s in Thailand (29.8%).

Socio-cultural analysis of smoking habit formation (Tables 2 and 3 for male, the tables for females not shown)

Of the subjects (Groups 2, 3, and 4) 41.2% for males and 42.3% for females in Japan and 69.1% for males and 58.2% for females in Thailand started smoking at the age of 10–19 years. For males, Group 2 and Group 4 in Thailand started smoking at the age of 10–19 years more frequently while those in Japan started at the age of 20–29 years more frequently. For female, there was no significant difference between the country.

Smokers started most frequently "out of curiosity" in both Japan and Thailand. In Thailand, "on someone's recommendation" was also often observed for both males and females. The reason they still smoked was most frequently "out of habit" in both countries. For males "need to have something in the mouth" was also a frequent reply in Group 4 while for females "relaxation" and "need to have something in the mouth" were also frequent replies in Group 4 in Thailand (Table 2).

The number of cigarettes smoked by current smokers per day was 12.5 ± 8.7 for males and 7.5 ± 4.2 for females in Thailand but 20.9 ± 10.0 for males and 15.2 ± 7.9 for females in Japan (Table 2).

In Groups 2, 3, and 4 overall, 55.0% of males and 58.5% of females had at least one family member who smoked in Japan and 40.3% of males and 54.9% of females in Thailand. Especially in Japan, Group 1 and Group 4 males and Group 3 females had a family member who smoked more frequently with statistical significance. The family member who smoked was most frequently the "father" in both countries (Table 3). For males, "brother" was also frequent, especially in Group 3 and Group 4 with statistical significance in Thailand. For females, "husband" was more frequent in Japan than in

Table 1. Numbers of subjects enrolled in the present study

		Male			Female		
		Japan	Thailand	Absolute value for adjusted residual	Japan	Thailand	Absolute value for adjusted residual
Whole age		*			**		
	Group 1 (Never-smoking)	62(18.7)	37(12.6)	2.1	230(65.2)	209(72.6)	2.0
	Group 2 (Ex-smoking)	76(23.0)	49(16.7)	1.9	45(12.7)	17(5.9)	2.9
	Group 3 (Failed-to-quit)	68(20.5)	77(26.3)	1.7	37(10.5)	21(7.3)	1.4
	Group 4 (Smoking)	125(37.8)	130(44.0)	1.7	41(11.6)	41(14.2)	1.0
	Total	331(100)	293(100)		353(100)	288(100)	
	Group 3+Group 4 (Current Smoker)	*			N.S.		
		193(58.3)	207(70.3)		78(22.1)	62(21.5)	
20–29 years		N.S.			**		
	Group 1 (Never-smoking)	16(21.9)	18(26.1)	—	41(49.4)	54(75.0)	3.3
	Group 2 (Ex-smoking)	9(12.3)	9(13.0)	—	13(15.7)	2(2.8)	2.7
	Group 3 (Failed-to-quit)	14(19.2)	16(23.2)	—	12(14.5)	5(6.9)	1.5
	Group 4 (Smoking)	34(46.6)	26(37.7)	—	17(20.5)	11(15.3)	0.8
	Sub-total	73(100)	69(100)		83(100)	72(100)	
	Group 3+Group 4 (Current Smoker)	N.S.			*		
		48(65.8)	42(60.9)		29(35.0)	16(22.2)	
30–39 years		***			N.S.		
	Group 1 (Never-smoking)	24(25.8)	3(4.0)	3.8	54(56.8)	50(70.4)	—
	Group 2 (Ex-smoking)	13(14.0)	11(14.7)	0.1	17(17.9)	5(7.0)	—
	Group 3 (Failed-to-quit)	14(15.1)	25(33.3)	2.8	10(10.5)	6(8.5)	—
	Group 4 (Smoking)	42(45.2)	36(48.0)	0.4	14(14.7)	10(14.1)	—
	Sub-total	93(100)	75(100)		95(100)	71(100)	
	Group 3+Group 4 (Current Smoker)	*			N.S.		
		56(60.3)	61(81.3)		24(25.2)	16(22.6)	
40–49 years		N.S.			**		
	Group 1 (Never-smoking)	9(17.3)	7(9.5)	—	50(75.8)	49(66.2)	1.2
	Group 2 (Ex-smoking)	11(21.2)	14(18.9)	—	8(12.1)	3(4.1)	1.8
	Group 3 (Failed-to-quit)	15(28.8)	18(24.3)	—	5(7.6)	5(6.8)	0.2
	Group 4 (Smoking)	17(32.7)	35(47.3)	—	3(4.5)	17(23.0)	3.1
	Sub-total	52(100)	74(100)		66(100)	74(100)	
	Group 3+Group 4 (Current Smoker)	N.S.			*		
		32(61.5)	53(71.6)		8(12.1)	22(29.8)	
50–59 years		*			N.S.		
	Group 1 (Never-smoking)	13(11.5)	9(12.0)	0.1	85(78.0)	56(78.9)	—
	Group 2 (Ex-smoking)	43(38.1)	15(20.0)	2.6	7(6.4)	7(9.9)	—
	Group 3 (Failed-to-quit)	25(22.1)	18(24.0)	0.3	10(9.2)	5(7.0)	—
	Group 4 (Smoking)	32(28.3)	33(44.0)	2.2	7(6.4)	3(4.2)	—
	Sub-total	113(100)	75(100)		109(100)	71(100)	
	Group 3+Group 4 (Current Smoker)	**			N.S.		
		57(50.4)	51(68.0)		17(15.6)	8(11.2)	

( ): Percentage data. *: $P<0.05$, **: $P<0.01$, ***: <0.001 significant by the chi-square test. N.S.: not significant.

Table 2. Socio-cultural analysis of the smoking habit (males in Groups 2, 3 and 4)

	Japan				Thailand			
	Group 2 (N=76) Ex-smoking	Group 3 (N=68) Failed-to-quit	Group 4 (N=125) Smoking	Total (N=269)	Group 2 (N=49) Ex-smoking	Group 3 (N=77) Failed-to-quit	Group 4 (N=130) Smoking	Total (N=256)
Age when started smoking (%)								
10–19 years	26.3(−5.4)	42.5	49.6(−2.8)	41.2	75.6(5.4)	68.8	66.9(2.8)	69.1
20–29 years	63.3(5.1)	54.5	46.4(2.6)	53.2	16.3(−5.1)	29.9	30.8(−2.6)	27.7
30–39 years	2.6(0.2)	1.5	2.4(1.0)	2.2	2.0(−0.2)	1.3	0.8(−1.0)	1.2
40–49 years	3.9(−0.6)	0.0	0(−1.4)	1.1	6.1(0.6)	0.0	1.5(1.4)	2.0
50– years	3.9(1.4)	1.5	1.6(2.0)	2.2	0.0(−1.4)	0.0	0.0(−2.0)	0.0
Reasons for starting smoking (%)								
Out of curiosity	38.3(−1.9)	36.8(−1.7)	46.4(−2.9)	41.7	55.1(1.9)	50.7(1.7)	63.7(2.9)	58.2
Those around you smoked	26.3(2.2)	14.7(−0.6)	20(0.8)	20.4	10.2(−2.2)	18.2(0.6)	16.1(−0.8)	15.6
No particular reason	28.9(2.8)	42.6(5.1)	29.6(3.7)	32.7	8.2(−2.8)	6.5(−5.1)	10.8(−3.7)	9.0
On someone's recommendation	3.9(−3.2)	1.5(−3.3)	0.8(−2.5)	1.9	22.4(3.2)	18.2(3.3)	6.9(2.5)	13.3
Other	2.6(−0.4)	4.4(0.5)	3.2(0.9)	3.3	4.1(0.4)	6.5(−0.5)	1.5(−0.9)	3.5
Number of cigarettes smoked on average per day								
Mean	20.5	20.0	21.5	20.9	14.4	8.4	14.2	12.5
Standard deviation	9.7	11.5	9.4	10.0	12.1	7.2	8.8	8.7
Proportion of smokers in each category (%)								
0–5 cigarettes	13.2(−2.6)	5.9(−5.0)	3.2(−2.4)	6.7	32.7(2.6)	41.6(5.0)	10.8(2.4)	24.1
6–10 cigarettes	21.1(0.4)	17.6(−3.5)	17.6(−4.3)	18.5	18.3(−0.4)	45.5(3.5)	42.3(4.3)	38.7
10–15 cigarettes	10.5(0.8)	22.1(4.0)	9.6(0.1)	13.0	6.1(−0.8)	1.3(−4.0)	9.2(−0.1)	6.3
16–20 cigarettes	28.9(−0.4)	35.3(3.8)	35.2(0.5)	33.5	32.7(0.4)	9.1(−3.8)	32.3(−0.5)	25.4
more than 20 cigarettes	26.3(2.2)	19.1(3.2)	34.4(5.8)	28.3	10.2(−2.2)	2.6(−3.2)	5.4(−5.8)	5.5
Reason why still smokes (%)				(N=193)				(N=207)
Relaxation	—	35.3	36.0	35.8	—	28.6	28.5	28.5
Out of habit	—	48.5	50.4	49.7	—	41.6	44.6	43.5
Need to have something in the mouth	—	14.7	12.0	13	—	18.2	24.6	22.2
Other	—	1.5	1.6	1.6	—	11.6	2.3	5.8
Terms "primary smoke" or "secondary smoke" (%)								
Have heard and understand both terms	39.5(1.5)	36.8	34.4(1.9)	36.4	26.5(−1.5)	33.8	23.8(−1.9)	27.3
Have heard both terms but don't know meaning	22.2(2.1)	22.1	12.8(2.1)	17.8	8.2(−2.1)	9.1	5.4(−2.1)	7.0
Have heard only one term	0.0(−3.1)	4.3	4.8(0.4)	3.3	12.2(3.1)	2.6	3.8(−0.4)	5.1
Have heard of neither term	38.3(−1.6)	36.8	48.0(−3.1)	42.4	53.1(1.6)	54.5	66.8(3.1)	60.6
Reason for thinking about smoking cessation			(N=93)	(N=237)			(N=91)	(N=217)
Awareness of the harmful effects of smoking	40.8	41.2	51.6(3.8)	39.8	49.0	32.5	24.2(−3.8)	32.7
Feeling ill	38.3	41.2	24.7(0.4)	29.7	24.5	36.3	22.0(−0.4)	27.6
Money was tight	3.9	7.3	3.2(−1.6)	4.1	0.0	6.5	8.8(1.6)	6.0
Being told by those around	7.8	3.0	10.8(−1.7)	6.7	12.2	13.0	19.8(1.7)	15.7
Those around gave up smoking	0.0	0.0	1.1(−0.6)	0.4	2.1	5.2	2.2(0.6)	3.2
Other reasons	9.2	7.3	8.6(−2.7)	7.4	12.2	6.5	23.0(2.7)	14.7

All data are percentages. ( ): adjusted residual.

Variables for each question were compared between the smoking groups in both countries by the chi-square test

*: $P<0.05$, **: $P<0.01$, ***: $P<0.001$ significant by the chi-square test.

†: subjects who have tried to quit smoking or who have considered it.

Table 3. Efforts to improve health and environmental conditions in the four groups (males)

	Japan					Thailand				
	Group 1 (N=62) Never-smoking	Group 2 (N=76) Ex-smoking	Group 3 (N=68) Failed-to-quit	Group 4 (N=125) Smoking	Total (N=331)	Group 1 (N=37) Never-smoking	Group 2 (N=49) Ex-smoking	Group 3 (N=77) Failed-to-quit	Group 4 (N=130) Smoking	Total (N=293)
Efforts made in order to lead a healthy life										
Living environment	9.7	9.2(1.6)	1.5	4.8(−2.1)	6.0	5.4	2.0(−1.6)	7.8	12.3(2.1)	9.6
Daily diet	24.2	26.4(−1.9)	19.2	26.4(−1.8)	24.5	16.2	43.0(1.9)	29.8	36.9(1.8)	33.4
No smoking	9.7	17.1(2.6)	2.9	3.2(2.1)	7.6	16.2	2.0(−2.6)	2.6	0.0(−2.1)	3.4
Avoiding alcoholic beverages	3.2	2.6(−0.4)	4.4	2.4(−1.2)	3.0	2.7	4.1(0.4)	6.5	5.4(1.2)	5.7
Exercise	24.2	18.4(0.9)	23.5	16.0(1.4)	19.6	29.8	12.2(−0.9)	13.0	10.0(−1.4)	15.3
Stress avoidance	9.7	9.2(0.6)	11.8	16.0(2.1)	12.4	5.4	6.1(−0.6)	3.9	7.7(−2.1)	6.9
Rest	9.7	5.3(−2.0)	8.8	11.2(0.1)	9.1	5.4	16.3(2.0)	15.6	10.8(−0.1)	13.8
Sleep	6.4	11.8(0.7)	23.5	16.0(2.5)	14.8	2.7	8.0(−0.7)	11.7	6.2(−2.5)	7.5
Other	0.0	0.0(−1.8)	0.0	0.0(−1.4)	0.0	8.1	4.1(1.8)	2.6	1.5(1.4)	3.1
None of the above	3.2	0.0(−1.3)	4.4	4.0(−1.7)	3.0	8.1	2.0(1.3)	6.5	9.2(1.7)	7.2
Source of information on health										
Media	80.6	80.3	76.5	83.2	80.7	91.9	71.5	76.6	82.3	80.2
Government administrative bodies	0.0	0.0	2.9	0.0	0.6	0.0	4.1	2.6	3.1	2.7
School/Workplace	12.9	2.6	5.9	5.6	6.3	2.7	2.0	0.0	3.1	2.0
Medical organizations	6.5	17.1	14.7	11.2	12.4	5.4	22.4	18.2	9.2	13.4
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
None of the above	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.6	2.3	1.7
Family smoking										
No	24.2	57.9	48.5	45.6	45.0	59.5	73.5	51.9	59.2	59.7
Yes	75.8	42.1	51.5	54.4	55.0	40.5	26.5	48.1	40.8	40.3
Family member who smokes† (multiple-responses allowed)										
Father	31.9	37.5	45.7(−0.5)	42.6(0.9)	39.6	86.7	53.8	62.2(0.5)	62.3(−0.9)	64.4
Mother	6.4	9.4	11.4(1.1)	13.2(3.2)	10.4	6.7	7.7	5.4(−1.1)	1.9(−3.2)	4.2
Brother and sister	19.1	28.1	28.6(−2.2)	30.9(−4.0)	26.9	20.0	38.5	64.9(2.2)	45.3(4.0)	47.5
Grandfather	0.0	0.0	2.9(−0.8)	2.9(−0.8)	1.6	0.0	7.7	8.1(0.8)	9.4(0.8)	7.6
Grandmother	0.0	0.0	0.0(−0.9)	0.0(−1.2)	0.0	0.0	7.7	2.7(0.1)	3.8(1.2)	3.4
Husband/Wife	19.1	12.5	28.6(3.8)	11.8(2.1)	17.0	0.0	0.0	0.0(−3.8)	5.7(−2.1)	2.5
Children	14.9	9.4	2.9(1.1)	10.3(0.6)	9.9	6.7	15.4	0.0(−1.1)	13.2(−0.6)	8.5
Other	0.0	0.0	0.0(0.0)	0.0(−1.2)	0.0	0.0	0.0	0.0(0.0)	3.8(1.2)	1.7

All data are percentages. ( ): adjusted residual.

Variables for each question were compared between the smoking groups in both countries by the chi-square test

*: $P<0.05$, **: $P<0.01$, ***: $P<0.001$ significant by the chi-square test. †: N=182 in Japan, 118 in Thailand.

Table 4. Socio-cultural analysis of failure to quit smoking (males)

	Japan			Thailand		
	Group 2 (N=76) Ex-smoking	Group 3 (N=68) Failed-to-quit	Total (N=144)	Group 2 (N=49) Ex-smoking	Group 3 (N=77) Failed-to-quit	Total (N=126)
Number of attempts for smoking cessation		***				
1 time	22.4(−5.4)	30.9	26.4	71.5(5.4)	26.0	43.6
2 times	35.5(2.9)	25.0	30.6	12.2(−2.9)	31.2	23.8
3 times	18.4(0.9)	25.0	21.5	12.2(−0.9)	18.2	15.9
more than 3 times	23.7(2.9)	19.1	21.5	4.1(−2.9)	24.6	16.7
Method to give up smoking				**		
Sheer will power	65.9	29.4(−1.5)	48.6	63.2	41.5(1.5)	50.0
Chewing gum or sweets	19.7	41.2(1.3)	29.8	18.4	31.2(−1.3)	26.2
Exercise	2.6	1.5(−3.1)	2.1	4.1	16.9(3.1)	11.9
Drinking water	3.9	7.3(1.3)	5.6	8.2	2.6(−1.3)	4.8
Breathing deeply	1.3	1.5(0.1)	1.4	0.0	1.3(−0.1)	0.8
Other methods	6.6	9.1(2.3)	12.5	6.1	6.5(−2.3)	6.3
Symptoms during smoking cessation				**		
No particular symptoms	34.3	16.2(−0.5)	25.7	24.5	19.5(0.5)	21.4
Easily irritated	22.4	54.3(3.2)	37.4	38.8	28.5(−3.2)	32.6
Easily lose temper	7.9	4.4(−1.8)	6.3	18.4	13.0(1.8)	15.1
Loss of concentration	3.9	11.8(1.1)	7.6	4.1	6.5(−1.1)	5.6
Increased appetite	19.7	8.8(0.5)	14.6	6.1	6.5(−0.5)	6.3
Physically and mentally drained	2.6	1.5(0.1)	2.1	2.0	1.3(−0.1)	1.6
Increased anxiety	3.9	1.5(−2.4)	2.8	0.0	11.7(2.4)	7.1
Other symptoms	5.3	1.5(−2.6)	3.5	6.1	13.0(2.6)	10.3

All data are percentages. ( ): adjusted residual.
Variables for each question were compared between the smoking groups in both countries by the chi-square test
**: $P<0.01$, ***: $P<0.001$ significant by the chi-square test

Thailand.

Socio-cultural analysis of failure to quit smoking (Tables 2, 3 and 4 for males, tables for females not shown)

Among various efforts made in order to lead a healthy life, "daily diet" ranked first in all age groups for both genders in both countries, and more significantly in Thailand. In Japan, "sleep" was higher in Group 4 for males and in Group 1 for females, while "stress avoidance" and "sleep" were higher in Group 3 for females (Table 3).

In both countries, an overwhelming number of subjects obtained health information from the "media" (Table 3). More than 50% of the subjects in Japan knew or understood the terms "primary smoke" and "secondary smoke," but 60.6% of males and 70.9% of females in Thailand had never heard either term (Table 2). Especially males in Groups 1 and 4 had heard neither more frequently in Thailand than in Japan, with statistical significance.

The number of attempts at smoking cessation tended to be higher in Japan for both genders (Table 4), particularly in Group 2 for males and in Group 3 for females, with statistical significance.

The reason for thinking about quitting was often "awareness of the harmful effects of smoking" for males in both countries, especially in Group 4 in Japan with statistical significance ($P<0.001$) (Table 2). In contrast, "feeling ill" was often for females in both countries, especially in Group 4 in Japan. In Thailand, "being told by those around" was also often observed for both genders.

The method of quitting smoking was most frequently "sheer will power (suppress the urge to smoke)" in Group 2 for both genders in both countries (Table 4). In Group 3, "chewing gum or sweets" was selected frequently for both genders in Japan, and for female Thailand subjects who needed to have something in the mouth. Only few subjects used nicotine replacement therapy in both countries.

Concerning symptoms during smoking cessation, in Group 3, "easily irritated" was frequently noted for both genders in both countries. On the

Table 5. Participant's stress and means of stress relief in the four groups (males)

	Japan					Thailand				
	Group 1 (N=62) Never-smoking	Group 2 (N=76) Ex-smoking	Group 3 (N=68) Failed-to-quit	Group 4 (N=125) Smoking	Total (N=331)	Group 1 (N=37) Never-smoking	Group 2 (N=49) Ex-smoking	Group 3 (N=77) Failed-to-quit	Group 4 (N=130) Smoking	Total (N=293)
Issues which make one feel stress										
Social issues	72.5(2.9)	69.7(5.4)	70.6(5.2)	80.0(10.6)	74.3	43.2(−2.9)	20.4(−5.4)	27.3(−5.2)	13.8(−10.6)	22.2
Financial matters	9.7(−3.6)	7.9(−4.6)	7.4(−3.7)	8.0(−6.2)	8.2	40.5(3.6)	42.9(4.6)	32.4(3.7)	41.5(6.2)	39.3
Study	3.2(1.1)	1.3(0.8)	4.4(1.1)	0.8(0.0)	2.1	0.0(−1.1)	0.0(−0.8)	1.3(−1.1)	0.8(0.0)	0.7
Romantic issues	0.0(0.0)	3.9(1.4)	0.0(−0.9)	0.8(−1.0)	1.2	0.0(0.0)	0.0(−1.4)	1.3(0.9)	2.3(1.0)	1.4
Domestic issues	8.1(0.0)	13.2(−2.1)	17.6(−1.4)	9.6(−5.4)	11.8	8.1(0.0)	28.6(2.1)	27.3(1.4)	38.5(5.4)	30.0
Health problems	0.0(−1.8)	0.0(−1.3)	0.0(−0.9)	0.0(−1.0)	0.0	5.4(1.8)	2.0(1.3)	1.3(0.9)	0.8(1.0)	1.7
Other situations	6.5(1.6)	3.9(0.6)	0.0(0.0)	0.8(1.0)	2.4	0.0(−1.6)	2.0(−0.6)	0.0(0.0)	0.0(−2.3)	0.3
Never feel stress	0.0(−1.3)	0.0(−1.8)	0.0(−2.5)	0.0(−1.7)	0.0	2.7(1.3)	4.1(1.8)	9.1(2.5)	2.3(2.1)	4.4
Means of stress relief										
Work	4.8(−2.2)	3.9(−4.4)	8.8(−4.2)	1.6(−6.2)	4.0	18.9(2.2)	32.7(4.4)	39.0(4.4)	30.0(6.2)	31.3
Hobbies	46.8(2.8)	36.8(2.2)	39.7(3.1)	46.4(3.9)	42.9	18.9(−2.8)	18.3(−2.2)	16.8(−3.9)	23.0(−3.9)	20.2
Sports	27.4(0.0)	23.7(1.0)	20.6(2.5)	14.4(1.5)	20.3	27.0(0.0)	16.3(−1.0)	6.5(−1.5)	8.5(−1.5)	11.6
Alcohol	9.7(0.8)	11.8(1.5)	22.1(2.2)	20.8(0.8)	16.9	5.4(−0.8)	4.1(−1.5)	9.1(−0.8)	16.9(−0.8)	11.3
Smoking	0.0(0.0)	0.0(0.0)	0.0(0.0)	0.8(−1.6)	0.3	0.0(0.0)	0.0(0.0)	0.0(1.6)	3.9(1.6)	1.7
Karaoke or listening to music	6.5(1.6)	3.9(0.0)	5.9(2.2)	8.8(2.3)	6.6	0.0(−1.6)	4.1(0.0)	0.0(−2.3)	2.3(−2.3)	1.7
Other methods	4.8(−3.4)	19.7(−0.6)	2.9(−4.1)	7.2(−2.1)	8.8	29.7(3.4)	24.5(0.6)	28.6(2.1)	15.4(2.1)	22.2

All data are percentages. ( ): adjusted residual.

Variables for each question were compared between the smoking groups in both countries by the chi-square test

**: $P<0.01$, ***: $P<0.001$ significant by the chi-square test.

other hand, the answer "no particular symptoms" was frequent in Group 2 for both genders in Japan and for females in Thailand (Table 4).

Regarding smoking and stress as well as the relation of success or failure of quitting smoking and stress, "social issues" caused stress significantly more often in Japan, and "financial matters" caused stress significantly more often for both genders, but especially for males, in Thailand (Table 5).

The means for relieving stress was most frequently "hobbies," followed in order by "sports," "alcohol" for both genders in Japan, while in Thailand "work," and "hobbies" were answered. In Thailand, "sports" and "alcohol" were also seen for males and "karaoke" for females. No special means of stress relief, however, were observed in relation to the success or failure of quitting smoking.

IV. Discussion

There are many barriers to be overcome in international comparative studies. The authors designed this project in detail to make a valid comparison possible. The first requirement is appropriate selection of the subjects of the survey in both countries. We could not confirm the validity of the comparison between two countries directly from this survey, but by using the same questionnaires and setting a similar situation for the subjects, most obvious criteria were met.

The present study showed that (1) current smokers were numerous overall, and in the population in their 30s and 50s in Thai male subjects, (2) the proportion of ex-smokers was higher overall and Japanese male subjects in their 50s, and (3) the proportion of unsuccessful subjects (Group 3) was higher overall, and in Thai males in their 30s and 50s as shown in Table 1. For females, the proportions of current smokers were almost the same between the two countries, and Group 1 was higher in whole age, 20s, and 40s of Thailand subjects.

Based on data reported by Japan Tobacco Inc. (JT), the prevalence of smoking in Japan in 2000 was 53.5% for males and 13.7% for females[19]. In Thailand, data in 1999 showed a prevalence of smoking of 38.9% for males and 2.4% for females (total, 20.5%)[28]. In the present study, the prevalence of smoking for both males and females in the present study was higher than the reported data described above in both countries and this may reflect the fact that the subjects were outpatients in hospitals.

In Thailand, the subjects often had a male family member who smoked, which is consistent with the higher prevalence of current smoker in the males and the low prevalence of current smoker in the females in this country. In Japan, evaluation according to the four smoking history groups showed a high percentage of subjects with a family member who smoked in Group 3. In Group 3, family members had smoked, providing an environment that readily allows smoking on the part of the subject. The number of cigarettes smoked per day based on the JT data is 8.9, which markedly different from the number observed in this study. This may also be due to the selection bias of the survey, having been conducted at hospitals.

Smoking starts often at a low age in Thailand. Supawomgse and Buasai[29] reported that 35.7% of 15-year-old males and 9.3% of 15-year-old females have smoking experience. As the motive for smoking or quitting in Thailand, "recommended by others around" was observed relatively often. The reason for the more marked influence of the actions and words by persons close to the subject on behavior in Thailand than in Japan is unclear, but it is possible that the effects of education on smoking cessation spread more easily in Thailand.

The present survey also showed that 87% of smokers considered quitting smoking. Many understood the harmful effects of smoking but did not attempt to quit smoking unless actual effects on health were observed. Concerning methods of quitting smoking, the subjects tended to only suppress the urge to smoke by will power without employing special measures. Kawakami et al.[30] surveyed the characteristics of ex-smokers and found these to include a low number of cigarettes smoked per day, short smoking years, low frequency of smoking, slight psychological withdrawal symptoms, knowledge of the adverse effects on fetuses, positive attitude to smoking restrictions in the workplace, history of many disorders, clerical work, presence of time to spare in private life, consumption of a lot of vegetables, and frequent exercise. In the present study, subjects of Group 2 generally could give up smoking with sheer will power. Group 3 who could not succeed to quit smoking not frequently tried with sheer will power or chewing gum or sweets. From these results, it is recommended that nicotine replace therapy be a candidate for the method of smoking cessation for Group 3.

The causes of stress and means for its relief were have found to differ between the two countries. The results suggested a harder life and an environment in which leisure time is difficult to obtain in Thailand. In Japan, the recent economic recession is not so serious as to make living hard, and many still have time to enjoy leisure.

These results should be re-confirmed in further studies, because the proportion of subjects was strati-

fied with gender and smoking history, but not with age-group in this study.

In Thailand, there are many health warnings on cigarette packages such as "tobacco may cause lung cancer," "tobacco may cause heart disease," "tobacco may cause weakening of sexual prowess," etc. Advertising of tobacco products in TV commercials is also banned and on TV programs and in movie theaters in Thailand, the images of people smoking are blurred over. Many restaurants separate smoking seats and no-smoking seats in Japan as well as in Thailand, but in Thailand there are more no-smoking seats than smoking seats. Japan requires more strategies to quit smoking in daily life, for example, eliminating TV commercials, providing stronger warnings of the harmful effects of tobacco on health on cigarette packages, and blurring images of smoking on TV programs because the smoking rate among the younger generation is on the rise and is more serious in Japan than in Thailand.

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