Original Investigation

Predictors of smoking cessation among adult smokers in Malaysia and Thailand: Findings from the International Tobacco Control Southeast Asia Survey

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Abstract

Introduction: Limited longitudinal studies on smoking cessation have been reported in Asia, and it remains unclear whether determinants of quitting are similar to those found in Western countries. This study examined prospective predictors of smoking cessation among adult smokers in Thailand and Malaysia.

Methods: Four thousand and four smokers were surveyed in Malaysia and Thailand in 2005. Of these, 2,426 smokers were followed up in 2006 (61% retention). Baseline measures of sociodemographics, dependence, and interest in quitting were used to predict both making quit attempts and point prevalence maintenance of cessation.

Results: More Thai than Malaysian smokers reported having made quit attempts between waves, but among those who tried, the rates of staying quit were not considerably different between Malaysians and Thais. Multivariate analyses showed that smoking fewer cigarettes per day, higher levels of self-efficacy, and more immediate quitting intentions were predictive of both making a quit attempt and staying quit in both countries. Previous shorter quit attempts and higher health concerns about smoking were only predictive of making an attempt, whereas prior abstinence for 6 months or more and older age were associated with maintenance.

Discussion: In Malaysia and Thailand, predictors of quitting activity appear to be similar. However, as in the West, predictors of making quit attempts are not all the same as those who predict maintenance. The actual predictors differ in potentially important ways from those found in the West. We need to determine the relative contributions of cultural factors and the shorter history of efforts to encourage quitting in Asia.

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Introduction

Smoking cessation reduces smokers' risk of dying prematurely and is beneficial for men and women of all ages (Centers for Disease Control and Prevention, 1990, 2001). However, quitting tobacco use is difficult for many people, and it may involve multiple attempts (U.S. Department of Health and Human Services, 2000). It is critically important to understand factors that are associated with quitting behaviors in specific cultural and socioeconomic settings in order to provide people with appropriate support in their efforts to quit.

Most research to date comes from Western developed countries. There is now substantial evidence that the predictors of making quit attempts differ from those that predict outcomes among those who try (Hyland et al., 2006). Sociodemographic predictors of making attempts include being young (Hyland et al., 2006; Vanasse, Niyonsenga, & Courteau, 2004), male gender (Nides et al., 1995), White race (e.g., White American vs. minority American; Tucker, Ellickson, Orlando, & Klein, 2005), and well educated (Hatzianandreu et al., 1990). Smoking-related predictors of making attempts include level of nicotine dependence (Clark, Kviz, Crittenden, & Warnecke, 1998; Hyland et al., 2006; Vanasse et al.), measures of intention/motivation (Burt & Peterson, 1998; Clark et al.; Hyland et al., 2006), past quit attempts (Burt & Peterson; Hyland et al., 2006), self-efficacy (Woodruff, Conway, & Edwards, 2008), and concern for health effects caused by smoking (Hyland et al., 2006; West, McEwen, Bolling, & Owen, 2001).

Predictors of successful quitting have been examined among all smokers sampled and among those who tried to quit. Overall, successful cessation in the West has been associated with sociodemographic variables: older age (Hymowitz et al.,

1997; Lee & Kahende, 2007; Osler & Prescott, 1998), male gender (Hymowitz et al.; Osler, Prescott, Godtfredsen, Hein, & Schnohr, 1999), White race/majority race (Hatziaandreu et al., 1990), higher education (Broms, Silventoinen, Lahelma, Koskenvuo, & Kaprio, 2004), and higher income (Pisinger, Vestbo, Borch-Johnsen, & Jorgensen, 2005). Among smoking-related variables, predictors of successful quitting include lower level of nicotine dependence (Godtfredsen, Prescott, Osler, & Vestbo, 2001; Hyland et al., 2006; Pisinger et al.; Siahpush, Borland, & Scollo, 2003; West et al., 2001), longer length of past quit attempt (Honda, 2005; Zhu, Sun, Billings, Choi, & Malarcher, 1999), higher levels of self-efficacy (Borland, Owen, Hill, & Schofield, 1991; Dijkstra, de Vries, & Bakker, 1996), stronger desire to quit (Hymowitz et al.; Pisinger et al.; Siahpush et al., 2003), and absence of other smokers in the household (Hymowitz et al.; Osler & Prescott).

Among those who tried to quit, demographic predictors of successful quitting are similar: being older (Hyland et al., 2004; Lee & Kahende, 2007), higher education (Lee & Kahende; Siahpush & Borland, 2001), plus new ones (married or living with a partner; Lee & Kahende) but notably not gender. In addition, lower level of dependence (Hyland et al., 2004, 2006; as for all cases), rules against smoking at homes (Lee & Kahende), having fewer smoking friends (Rose, Chassin, Presson, & Sherman, 1996), and having social supports for quitting (Borland et al., 1991) have all been shown to be predictive.

Differences in predictors between making an attempt and staying quit are age (younger age predicts trying and older age staying quit), gender, and measures of intention and/or motivation, the latter two seem more important for making attempts. In a recent study from the International Tobacco Control (ITC) Four Country Survey, Hyland et al. (2006) examined individual-level predictors of making serious quit attempts and smoking cessation among cigarette smokers in four developed countries (Australia, Canada, the United Kingdom, and the United States) and found that intention to quit, other measures of motivation to quit, and a history of past quit attempts were strongly associated with making a serious quit attempt but not independently associated with succeeding in that attempt; indeed, for the motivational measures, the association reversed. This pattern has been found elsewhere, but the reversal has not always been significant (Borland et al., 1991; West et al., 2001).

This knowledge from developed countries is not necessarily generalizable to developing countries, due to different socioeconomic conditions and cultural contexts as well as disparities in tobacco control policies and social acceptability of smoking (Abdullah & Husten, 2004; Siahpush, Borland, Yong, Kin, & Sirirassamee, 2008). Siahpush et al. (2008) examined the association of socioeconomic position with cigarette consumption, intention to quit, and self-efficacy to quit among male smokers in Thailand and Malaysia using the ITC–Southeast Asia (SEA) survey. They found that in the Malaysian sample, higher level of education was not associated with intention to quit or self-efficacy to quit or cigarette consumption; in Thailand, higher level of education was associated strongly with not having self-efficacy, and higher income was not found to be associated with an intention to quit in either country. These findings differ from related studies in Western countries where higher levels of education and socioeconomic status are predictive of making quit attempts and/or associated with staying quit (see above). This

highlights the need for an enhanced research agenda in smoking cessation in the developing countries, where the world's majority of smokers live.

Cross-sectional studies from Asian countries have focused on predictors of intention to quit (sometimes measured as stage of change). With the exception of age, these mirror predictors of quit attempts in the West: being older, male, and married (Abdullah & Yam, 2005; Yu, Wu, & Abdullah, 2004), and having higher level of education (Abdullah & Yam; Minh et al., 2006) were all positive predictors. For smoking-related variables, past experience with quitting (Haddad & Petro-Nustas, 2006; Yu et al.), having a positive attitude toward quitting (Yu et al.), higher self-efficacy (Ham & Lee, 2007; Wang, Borland, & Whelan, 2005), and high level of readiness to quit (Haddad & Petro-Nustas) were positively associated with intentions. Other factors, known to be important in the West, such as heaviness of smoking, concern for health effects of smoking, outcome expectancy of quitting, length of past quit attempts, and smoke-free environments, have been understudied. The extent to which determinants of quitting in developing countries are similar to those found in Western countries is unclear.

The present study used longitudinal data from the ITC-SEA Survey to examine and compare quit behaviors among adult smokers in Thailand and Malaysia, in light of existing knowledge from previous research in Western countries, particularly focusing on the Hyland et al. (2006) study, which used many of the same measures.

Although Malaysia and Thailand are both Southeast Asia countries, they are culturally quite different with Thailand dominated by Buddhist Thais and Malaysia more multiculturally dominated by Muslim Malays but with large minorities of Chinese and Indians. There are also differences in their history in tackling the tobacco epidemic. Thailand is a leader in fighting the tobacco epidemic in the region and has been compliant with most requirements of the World Health Organization Framework Convention on Tobacco Control for some time (see Table 1), although it only launched its first mass public education campaign in late 2005 (between the two surveys reported on here). Compared with Thailand, Malaysia has a shorter history in tobacco control and has made less progress on regulating tobacco products. By contrast, its first mass education campaign ("Tak Nak"—"Say No to Tobacco" campaign) was conducted in the second half of 2004, a year before Thailand (and before our baseline survey). Smoking prevalence, particularly among men, is higher in Malaysia than in Thailand (Table 1).

Methods

Data source and participants

The data for this paper came from the ITC-SEA Smoker Survey, a cohort survey, designed to evaluate the psychosocial and behavioral impacts of tobacco control policies. The first wave of data collection was conducted between January and March 2005 with 4,004 adult smokers (smoked at least weekly; Malaysia, $n = 2,004$ and Thailand, $n = 2,000$). Of the 2,004 Malaysian smokers, 868 (43.3%) were successfully followed up in the second wave between August 2006 and May 2007. In Thailand, the follow-up rate was much higher (77.9% or 1,558 of 2,000), giving an overall follow-up rate of 60.6% ($n = 2,426$).

Table 1. Summary of general information and tobacco control efforts in Malaysia and Thailand (up to end of study period)

	Malaysia	Thailand
Population (millions)	26	64
Smoking prevalence		
Male (%)	45	37
Female (%)	2.5	2
Date of ratification of FCTC	16 September 2005	8 November 2004
Number of full-time equivalent employees in National Tobacco Control Agency	3	18
Taxation (%) ^a	39	79
On pack warnings	Small on one side of pack	50% black on white text only, replaced by graphic warnings in mid-2005
Availability of NRT	Pharmacy	Prescription

Note. FCTC = Framework Convention on Tobacco Control; NRT = nicotine replacement therapy. Main sources: World Health Organization (2008), Rampal (2005), and National Statistical Office (2004).

^aThis means the percentage contribution of tobacco-specific taxes to the total retail price of the most widely sold local brand.

All survey questions and study procedures were standardized across the two countries. The respondents were selected based on a multistage cluster sampling procedure. Face-to-face interviews were conducted in English or Malay in Malaysia and in Thai in Thailand. The survey took about 50 min to complete. A detailed description of the sampling and study design has been reported by Yong et al. (2008).

Measures

The main outcomes assessed in this study were (a) quit attempts between Waves 1 and 2 and (b) staying quit, defined as reporting being quit (no longer smoking) at Wave 2, analyzed among those who made an attempt. Regression models were constructed using these outcomes. Respondent were defined as having made a quit attempt between waves if they answered “yes” to “Since we last talked to you in 2005 have you made any attempts to quit smoking?” or if they were currently quit.

All predictor variables were measured in the baseline wave. Sociodemographic variables were sex (male and female), age (18–24, 25–39, 40–54, and 55 years and older), race (majority group, i.e., the Malays in Malaysia and the Thais in Thailand versus minority groups), rural versus urban dwelling, education, and income (low, moderate, and high). Relative levels were used for education and income across the two countries. “Low” level of education refers to no schooling/lower elementary in Malaysia or no schooling/lower than elementary in Thailand; “moderate” was from upper elementary to upper secondary in Malaysia or elementary to upper secondary in Thailand; “high” were those who received postsecondary education (from preuniversity to postgraduate degree). For income, three levels were determined based on annual household income: low income (Malaysia, ≤10,000 ringgit and Thailand, ≤70,000 Baht), moderate (Malaysia, 10,001 through 30,000 ringgit and Thailand, 70,001 through 195,749 Baht), and high income (Malaysia >30,000 ringgit and Thailand, ≥195,750 Baht), with a fourth code for those refusing or unable to answer.

Ever having quit and length of last quit attempt: “Thinking about your last serious attempt—How long did you stay

smoke-free?”, coded “never,” “1 week or less,” “>1 week to <6 months,” and “6 months or longer.”

Cigarettes per day, based on responses to “On average, how many cigarettes do you smoke each day [for daily smokers]/each week [for those who smoked less than everyday] (including both factory-made and hand-rolled cigarettes)?”, recoded to “5 cigarettes or less,” “6–14 cigarettes,” and “15 or more cigarettes/day.”

Respondents’ were asked about their intention to quit via the following question: “Are you planning to quit smoking?” Response options were “within the next month;” “within the next 6 months;” “sometime in the future, beyond 6 months;” and “not planning to quit.” Self-efficacy of quitting was assessed by “If you decided to give up smoking completely in the next 6 months, how sure are you that you would succeed?” Response options were “not at all sure,” “somewhat sure,” “very sure,” and “extremely sure.”

Outcome expectancy for quitting was assessed by “How much do you think you would benefit from health and other gains if you were to quit smoking permanently in the next 6 months?” (not at all, somewhat, and very much). We also asked smokers about their health concerns: “How worried are you, if at all, that smoking will damage your health in the future?” (not at all, somewhat, and very much). Smokers’ attitudes about smoking were assessed by extent of agreement or disagreement with “You enjoyed smoking too much to give it up”, with the original 5-point scale recoded into “agreeing” (agree and strongly agree) versus “other.”

In addition, we asked about smoke-free environments at home: “Which of the following best describe smoking inside your home?”: “smoking is not allowed in any indoor area,” “smoking is allowed only in some indoor areas,” and “no rules or restrictions,” with the latter two combined for analysis.

Data analysis

Group differences for categorical variables were examined using chi-square tests. The association between smoking cessation outcomes and a range of potential predictor variables was

examined using logistic regression. Simple logistic regression models were used to examine the bivariate association between an outcome variable and each predictor. All variables were then entered into the multivariate logistic regression model to determine their independent effects. Country differences were examined by including country-by-predictor interaction terms into the model. Since no by-country interactions were found to be significant, the analyses reported here combine data from both countries. To check if the results would be considerably different if we only include the male sample, we conducted ancillary analyses with female smokers removed from the data (there being insufficient women to do full interactive analyses), and we also performed sensitivity analyses (using correlation) to check the consistency of quit intentions in different ITC countries across waves (Waves 1 and 2 in the ITC-SEA Survey and Waves 1–3 in the ITC four Country Survey). A α level of $p < .05$ was used for all statistical tests. All data analyses were conducted with SPSS Version 14.0 (SPSS, Chicago, IL).

Results

Demographic and smoking-related characteristics

Table 2 summarizes the demographic and smoking-related characteristics of the sample. The 2,426 followed-up smokers (Malaysia, $n = 868$ and Thailand, $n = 1,558$) were predominantly male (more than 90% in both countries, reflecting the large gender gap in smoking rates). The majority had received secondary education. In Thailand, the respondents were overwhelmingly of Thai ethnicity (98%). Among the Malaysians, 71% were Malays.

In both countries, the followed-up respondents (compared with those lost to follow up) were older, with lower income, and were more likely to smoke hand-rolled cigarettes. No differences were found in gender or the number of cigarettes smoked. In Malaysia, but not Thailand, those retained were more likely to have lower education, be from the dominant ethnic group (Malays), have stronger intentions to quit, a previous quit history, higher self-efficacy, and higher levels of health concerns about smoking. Those retained in Thailand, but not Malaysia, were more likely to have smoking restrictions at home.

Also apparent from Table 2 is that the characteristics of the retained sample differed on most variables between countries.

Making quit attempts between Waves 1 and 2 and related predictors

More Thais (71%) than Malaysians (39%) reported having made a quit attempt between waves ($p < .001$; Table 3). Table 4 presents a summary of logistic regression modeling results for making a quit attempt between waves. Because no significant country interaction differences were found in multivariate analysis, the statistics of related factors were presented together for these two countries in a combined model. We provide the outcomes separately by country in the Supplementary Table 1 for interested readers, as there were some potentially interpretable trends. As in bivariate analysis, logistic regression modeling shows that the Thai smokers were more likely to report having made a quit attempt between waves (adjusted odds ratio [AOR] = 3.90, 95%

CI: 2.96–5.14). In addition, multivariate analysis shows that for both countries, independent predictors of making a quit attempt included being a majority ethnic group member (i.e., a Malay in Malaysia and a Thai in Thailand), having previous shorter quit attempts (<6 months), smoked fewer cigarettes per day, having higher levels of quitting self-efficacy, stronger intentions to quit (intended to quit within 1 month, $p = .048$), and higher levels of health concerns about smoking. We were concerned about the long interwave interval, so reanalyzed dropping the cases who made quit attempts 6 months before the follow up, but the pattern was essentially the same.

We also analyzed the data removing all female smokers, and it made no appreciable difference to the results, so reported the results with both genders included.

Staying quit at Wave 2 among those who made quit attempts and related predictors

Overall, 19% who made quit attempts were still stopped when surveyed at Wave 2. This was lower in Thailand than in Malaysia (18% vs. 23.8%), but the difference disappeared in multivariate analysis (AOR = 0.67, 95% CI: 0.43–1.05; Table 5).

Independent predictors of staying quit in both countries included being older (55+), urban residence, abstinence for 6 months or more in the past, having smoked fewer cigarettes per day, a higher level of self-efficacy, and having had an intention to quit within 1 month (Table 5).

We found similar results when restricting the analyses to men and no clear differences in pattern when the two countries were analyzed separately (see Supplementary Table 1).

Discussion

The findings from this study show that predictors of making quit attempts and staying quit among those who tried are similar in these two Southeast Asia countries. We found no significant interactions by country for predictors of either making attempts or staying quit. That said, we did analyze the data separately and for intentions found some different trends for making attempts. Care should be taken in interpreting these trends as there was no overall significant interaction, that said, it can be useful to consider them in regard to specific hypotheses (see below).

The findings from this study have a number of similarities to a similar study in four Western countries (Hyland et al., 2006). This was more marked for staying quit among those who tried, with both self-efficacy and measures of dependence being predictors in both cases. The only notable differences here were in not replicating the negative relationship with outcome expectancies (the small trend was positive here) and the finding of a significant positive effect of having been planning to quit in the next month at baseline in this study as compared with a nonsignificant trend in the Hyland et al. data.

The results for making a quit attempt have more differences to those of Hyland et al. The main sociodemographic difference was that in SEA countries, older smokers were more likely to make attempts, the reverse of what was seen in the West.

Table 2. Demographic and smoking-related characteristics of smokers who were followed up and not followed up at Wave 2, by country

	Malaysia			Thailand			Followed up. Malaysia versus Thailand (<i>p</i> value)
	% Followed up (<i>n</i> = 868)	% Not followed up (<i>n</i> = 1,136)	<i>p</i> Value for chi-square tests (Followed vs. not followed)	% Followed up (<i>n</i> = 1,558)	% Not followed up (<i>n</i> = 442)	<i>p</i> Value for chi-square tests (followed vs. not followed)	
Gender							
Male	96.3	95.2	.21	92.2	92.8	.68	.000
Age (years)			.000			.000	.000
18–24	11.1	17.9		4.5	15.8		
25–39	28.3	36.8		21.2	35.3		
40–54	36.7	29.6		43.2	34.4		
55+	23.9	15.7		31.1	14.5		
Education ^a			.001			.20	.000
Low	13.7	9.6		8.5	7.0		
Moderate	76.3	76.0		83.9	83.0		
High	10.0	14.4		7.6	10.0		
Income ^b			.000			.000	.000
Low	45.8	32.7		53.8	41.4		
Moderate	38.3	44.0		30.4	35.5		
High	15.9	23.3		15.8	23.3		
Majority/minority			.000			.95	.000
Majority	71.4	63.5		98.0	98.0		
Minority	28.5	36.5		2.0	2.0		
Urban/rural							
Urban	49.7	70.5	.000	27.0	42.3	.000	.000
Rural	50.3	29.5		73.0	57.7		
Cigarettes per day			.20			.33	.03
≤5	19.5	14.7		21.9	25.1		
6–14	42.5	45.9		37.2	36.7		
15+	38.0	39.4		40.9	38.2		
Type of cigarettes			.000			.000	.000
Factory-made only	74.4	87.1		42.2	58.1		
Hand rolled only	12.0	7.0		34.7	20.4		
Both	13.6	5.9		23.1	21.5		
Intention to quit			.003			.97	.000
No intention	42.1	47.1		59.8	59.5		
Beyond 6 months	43.6	43.6		19.4	18.8		
Within 6 months	7.3	5.1		13.7	14.5		
Within 1 month	6.9	4.1		7.1	7.2		
Longest time quit			.002			.15	.000
Never tried	35.4	43.1		23.8	21.5		
1 week or less	32.1	28.4		28.8	33.9		
Between 1 week and 6 months	26.5	24.6		36.2	35.5		
6 months or more	6.0	3.9		11.2	9.0		
Tried to quit within last year	39.3	36.5	.21	38.1	48.1	.000	.56
Self-efficacy			.014			.53	.000
Not at all sure	22.2	26.3		37.5	33.9		
Somewhat sure	54.3	55.5		35.5	38.5		
Very sure	16.6	13.2		17.2	18.1		
Extremely sure	6.9	4.9		9.8	9.5		
Outcome expectancy			.11			.58	.000
Not at all	6.9	7.3		1.7	1.2		
Somewhat	54.4	58.7		15.2	14.0		
Very much	38.7	34.1		83.1	84.8		

Table 2. Continued

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	Malaysia			Thailand			Followed up. Malaysia versus Thailand (<i>p</i> value)
	% Followed up (<i>n</i> = 868)	% Not followed up (<i>n</i> = 1,136)	<i>p</i> Value for chi-square tests (Followed vs. not followed)	% Followed up (<i>n</i> = 1,558)	% Not followed up (<i>n</i> = 442)	<i>p</i> Value for chi-square tests (followed vs. not followed)	
Worries about health			.000			.96	.000
Not at all	23.4	20.1		9.0	8.6		
Somewhat	46.9	57.0		36.8	37.3		
Very much	29.7	23.0		54.2	54.1		
Enjoy smoking too much to quit			.09			.56	.000
Other	31.9	28.4		61.0	59.5		
Agree	68.1	71.6		39.0	40.5		
Smoking restrictions at home			.11			.03	.000
Home bans	11.9	9.6		50.2	44.1		
No home bans	88.1	90.4		49.8	55.9		

Note. ^aRelative levels were used for education and income across countries. Definitions for each category were described in the Methods section.

^bThere were 74 missing cases in Malaysia and 16 missing cases in Thailand in the income variable among the longitudinal samples.

We also found effects for majority versus minority group and urban/rural residence, but these are not directly comparable with the Western countries. Dependence-related variables were similar, with greater daily consumption being associated with lower quit attempts, but in SEA countries, short previous attempts were predictive of trying, while it was longer previous attempts that predicted in the West, and we failed to find a negative effect of recent (last year) failure (this being clearest in Malaysia). We found that self-efficacy was predictive here, while in the West, it was only a trend, and we failed to find a negative effect for enjoyment of smoking. Most surprising of all, in our multivariate analyses, there was only a weak relationship between interest in quitting (with intending to quit within 1 month) and attempts, while it was an extremely strong positive predictor in the West.

We consider the possibility that the pattern of differences between what we have found in SEA and the Hyland et al. (2006) findings that they are because SEA is at an earlier stage of tackling the tobacco epidemic than the four countries studied by Hyland et al. and/or that they are due to cultural differences between the affluent West and the emerging economies of SEA. There is some support for the differences being in part due to different stages of confronting the epidemic. The results suggest that Asian smokers still have a greater capacity to quit volitionally than do smokers in the West, as indicated by the fact that intention was related to success, and there was no negative relationship with outcome expectancies. This would be because in the West, most smokers who want to quit and have not done so continue to smoke because they find quitting too difficult to achieve by willpower alone.

The higher rate of quit attempts in Thailand may be explained by both the stronger antismoking attitudes at baseline (perhaps a result of the longer history of tobacco control efforts in Thailand) and the effects of Thailand's first large-scale mass media antismoking campaign, which occurred between our surveys. That the predictors were similar under these circumstances, as were the levels of most predictors, suggests that the predictors play a consistent role over a broad range of contexts, perhaps only gradually changing as the period of encouraging quitting extends into decades rather than into years. The trend to lower rates of staying quit in Thailand could be because Thailand now has a greater proportion of more addicted smokers. This is consistent with the prevalence of smoking now being lower in Thailand than in Malaysia, at least among men, although we did not find clear evidence of different predictors of staying quit in the two countries.

The pattern for making quit attempts is more difficult to interpret. There is evidence that past negative experiences with trying may not be inhibiting attempts as much in SEA: Short past attempts predicted new attempts, particularly in Thailand, and recent experience was less inhibitory (particularly in Malaysia). The positive relationship with self-efficacy is even consistent if it is interpreted as the smokers in SEA who try, do so with a greater expectation of success, perhaps because more smokers in the West are trying (again) because they feel they should, not out of confidence in success.

The one finding that such theorizing cannot satisfactorily explain is the weak relationship between quit intentions and

Table 3. Reported outcomes by country

	Malaysia	Thailand	Both countries
Made an attempt between Waves 1 and 2	39.3% (341/868)	71.4% (1,112/1,558)	59.9% (1,453/2,426)
Staying quit at Wave 2 among those who tried	23.8% (81/341)	18% (200/1,112)	19.3% (281/1,453)

Note. Country differences for these two outcomes are significant (at $p < .001$ for quit attempt and $p < .05$ for staying quit) based on Pearson chi-square test.

Table 4. Predictors of making a quit attempt between Waves 1 and 2 (*n* = 2,426^a)

Predictors	<i>n</i>	% Quit attempt	Crude OR	95% CI	AOR	95% CI
Country						
Malaysia	868	39.3	Ref		Ref	
Thailand	1,558	71.4	3.85	3.24–4.59***	3.90	2.96–5.14***
Age at recruitment (years)						
18–24	164	51.8	Ref		Ref	
25–39	570	55.6	1.17	0.82–1.65	0.99	0.67–1.46
40–54	983	60.7	1.44	1.03–2.00*	1.09	0.75–1.59
55+	687	65.4	1.75	1.24–2.47**	1.36	0.91–2.02
Sex						
Female	154	66.9	Ref		Ref	
Male	2,272	59.4	0.73	0.51–1.03	0.96	0.64–1.44
Education						
Low	247	57.9	Ref		Ref	
Moderate	1,946	60.6	1.12	0.86–1.46	0.96	0.69–1.33
High	203	57.6	0.99	0.68–1.44	0.99	0.63–1.57
Majority/minority						
Majority group	2,147	63.4	Ref		Ref	
Minority groups	279	32.6	0.28	0.21–0.36***	0.55	0.40–0.76***
Urban/rural						
Urban	852	52.2	Ref		Ref	
Rural	1,574	64.0	1.63	1.38–1.93***	1.10	0.90–1.34
Longest time quit						
Never tried	678	46.9	Ref		Ref	
1 week or less	728	63.6	1.98	1.59–2.45***	1.73	1.31–2.29***
1 week–6 months	794	66.9	2.29	1.85–2.82***	1.67	1.27–2.19***
6 months or more	226	62.4	1.88	1.38–2.56***	1.25	0.88–1.78
Tried to quit within last year						
Yes tried	932	65.2	Ref		Ref	
Not tried	1,489	56.6	0.69	0.59–0.82***	0.99	0.79–1.24
Cigarettes per day						
5 or less	510	67.1	Ref		Ref	
6–14	948	62.1	0.81	0.64–1.01	0.91	0.70–1.18
15 or more	968	53.9	0.58	0.46–0.72***	0.60	0.46–0.79***
Self-efficacy						
Not at all sure	777	56.6	Ref		Ref	
Somewhat sure	1,024	57.5	1.04	0.86–1.25	1.21	0.96–1.51
Very sure	412	66.5	1.52	1.19–1.95**	1.37	1.02–1.84*
Extremely sure	213	70.4	1.82	1.32–2.53***	1.28	0.86–1.88
Intention to quit						
No intention	1,290	57.5	Ref		Ref	
Beyond 6 months	674	58.3	1.03	0.86–1.25	1.23	0.97–1.57
Within 6 months	275	68.0	1.57	1.19–2.07**	1.01	0.73–1.39
Within 1 month	169	71.6	1.86	1.31–2.65**	1.51	1.01–2.29*
Outcome expectancy						
Not at all	86	39.5	Ref		Ref	
Somewhat	707	48.8	1.46	0.92–2.30	1.40	0.82–2.38
Very much	1,629	65.8	2.94	1.89–4.59***	1.17	0.69–1.99
Worries about health						
Not at all	343	46.6	Ref		Ref	
Somewhat	981	53.6	1.32	1.03–1.69	.94	0.70–1.26
Very much	1,102	69.6	2.62	2.04–3.36***	1.38	1.01–1.89*
Enjoy smoking too much						
Other	1,228	64.6	Ref		Ref	
Agree	1,198	55.1	0.67	0.57–0.79***	1.09	0.90–1.33
Smoking restrictions at home						
No home bans	1,518	57.2	Ref		Ref	
Home bans	881	65.2	1.40	1.18–1.66***	0.85	0.69–1.04

Note. AOR = adjusted odds ratio; OR = odds ratio; Ref = reference value.

^a“*n*” in multivariate analysis is slightly less due to missing cases. Income was excluded from the final analysis due to more than 90 missing cases.

p* < .05; *p* < .01; ****p* < .001.

Table 5. Predictors of staying quit among those who tried (*n* = 1,453^a)

Predictors	<i>n</i>	% Stay quit	Crude OR	95% CI	AOR	95% CI
Country						
Malaysia	341	23.8	Ref		Ref	
Thailand	1,112	18.0	0.70	0.52–0.94*	0.67	0.43–1.05
Age at recruitment (years)						
18–24	86	11.8	Ref		Ref	
25–39	317	12.9	1.11	0.53–2.33	1.16	0.54–2.51
40–54	597	18.6	1.71	0.86–3.42	1.89	0.90–3.95
55+	449	26.3	2.67	1.34–5.34**	3.02	1.43–6.38**
Sex						
Female	103	21.4	Ref		Ref	
Male	1,350	19.2	0.87	0.53–1.43	1.09	0.63–1.90
Education						
Low	143	24.5	Ref		Ref	
Moderate	1,179	18.4	0.69	0.46–1.05	1.08	0.68–1.72
High	117	21.4	0.84	0.47–1.50	1.57	0.79–3.11
Majority/minority						
Majority group	1,362	18.8	Ref		Ref	
Minority groups	91	27.5	1.64	1.01–2.65*	1.24	0.69–2.23
Urban/rural						
Urban	445	22.7	Ref		Ref	
Rural	1,008	17.9	0.74	0.56–.97*	0.63	0.47–0.86**
Longest time quit						
Never tried	318	19.8	Ref		Ref	
1 week or less	463	12.7	0.59*	0.40–.87**	0.56	0.36–0.90*
Between 1 week and 6 months	531	20.5	1.05	0.74–1.48	0.95	0.62–1.45
6 months or more	141	35.5	2.22	1.43–3.46***	2.03	1.25–3.32**
Tried to quit within last year						
Yes tried	608	20.1	Ref		Ref	
Not tried	843	18.9	0.93	0.71–1.21	0.76	0.55–1.06
Cigarettes per day						
5 or less	342	27.2	Ref		Ref	
6–14	589	17.3	0.56	0.41–0.77***	0.56	0.39–0.79**
15 or more	522	16.5	0.53	0.38–0.74***	0.62	0.43–0.89*
Self-efficacy						
Not at all sure	440	13.9	Ref		Ref	
Somewhat sure	589	17.8	1.35	0.96–1.89	1.17	0.79–1.72
Very sure	274	24.5	2.01	1.37–2.96***	1.67	1.07–2.61*
Extremely sure	150	32.0	2.92	1.89–4.53***	1.94	1.14–3.30*
Intention to quit						
No intention	742	17.3	Ref		Ref	
Beyond 6 months	393	17.3	1.01	0.73–1.39	0.91	0.63–1.32
Within 6 months	187	22.5	1.39	0.94–2.06	1.15	0.73–1.81
Within 1 month	121	33.9	2.46	1.61–3.75***	1.99	1.20–3.31**
Outcome expectancy						
Not at all	34	17.6	Ref		Ref	
Somewhat	345	21.2	1.25	0.50–3.14	1.04	0.39–2.75
Very much	1,072	18.8	1.08	0.44–2.65	1.02	0.38–2.71
Worries about health						
Not at all	160	46.6	Ref		Ref	
Somewhat	526	20.0	0.86	0.56–1.32	1.11	0.68–1.81
Very much	767	18.3	0.77	0.51–1.16	0.82	0.49–1.36
Enjoy smoking too much to quit						
Other	793	19.5	Ref		Ref	
Agree	660	19.1	0.97	0.75–1.26	1.02	0.75–1.37
Smoking restrictions at home						
No home bans	868	19.7	Ref		Ref	
Home bans	574	18.6	0.93	0.71–1.22	1.12	0.83–1.51

Note. AOR = adjusted odds ratio; OR = odds ratio; Ref = reference value.

^a“*n*” in multivariate analysis is slightly less due to missing cases. Income was excluded from the final analysis due to more than 90 missing cases.

p* < .05; *p* < .01; ****p* < .001.

making attempts that we found. It is notable that fewer smokers in our study reported intentions to quit in either the next month or 6 months than is found in the four Western countries, yet a greater percentage (especially in Thailand) actually made quit attempts. This suggests that intentions might have a somewhat different meaning. However, looking at the results, we found similar percentages of those planning to quit in the next month going ahead in our study to the Hyland et al. one, the big difference was the high rates among those reporting not planning at baseline. It may be that quitting intentions are more situationally determined (and thus variable) in our Asian countries and reflect more strongly internalized dispositions in the West (resulting from years of arguments that they should). If this were so, then the predictiveness of intentions would decline more rapidly with time. To check this, we looked at the consistency of intentions across waves and found that, while it was modest in our two Asian countries ($r = .17$, over 18-month period), they were greater in the ITC four Country data (Waves 1 and 2, $r = .53$, over 7-month period and Waves 1–3, $r = .50$, over 20-month period, the latter being more appropriate as this interval is slightly longer than our intersurvey interval, thus overcontrolling for time between measures). Although we found that the effect was essentially unchanged when excluding recent attempts, we know that there would have been considerable forgetting of early attempts, those most likely to result from baseline plans, so at least part of the smaller predictive effect on intentions could be due to memory bias as well as the lower stability of intentions. However, we cannot rule out the alternative that it is a function of smokers in more collectivist cultures being more likely to be prompted by external social stimuli to act than by internal attributions, as we know that normative factors operate differently in these countries than the West (Hosking et al., 2009), and this is unrelated to the history of encouraging cessation or to memory.

The main strength of this study is its longitudinal design. It, however, does have limitations. The high attrition rate, especially in Malaysia (more than 50%), is a cause for concern. The lack of a by-country interaction makes it unlikely that it has had a significant effect on the major findings (if it did, then we would expect a by-country interaction on outcomes). Because the retention rate for Thailand is extremely good for studies of this kind (nearly 80% over 18 months), the Thai sample is quite representative. It is hard to think of a way in which the results could have been affected by differential retention. It is logically possible that the poor retention in Malaysia made the Malaysian sample more like the Thai one, thus masking true by-country differences, but if this were so, it would suggest that the place to look for interactions is among subgroups of the populations, not between the two populations. In other analyses, we have shown that social normative influences vary by country in their impact on quit intentions (Hosking et al., 2009) and that religious factors affect quitting (Yong et al., 2009), so cultural factors are clearly playing a role. At this point, we cannot rule out cultural factors affecting the specific predictors studied here and thus being at least partly responsible for the differences in predictors found between this study and Hyland et al. Our finding that being part of a minority group (largely not a Muslim Malay in Malaysia), and urban/rural residence were predictors of outcome, demonstrates that cultural factors play some role but not necessarily the one that moderates effects.

This study also relied on respondent reports of cessation; however, this is typical for population-based studies of this sort, so cannot explain differences from other studies using the same outcomes. Further, there is no evidence to suggest that self-report is systematically inaccurate in these kinds of naturalistic studies. We do not see any plausible reason why self-report would be biased in any differential way for variables where differences were observed.

While this discussion has focused on the differences, the similarities are as important. Dependence-related variables seem to operate similarly, particularly for staying quit, so similar strategies for dealing with the dependence-related aspects, such as use of quit medications are likely to be equally effective. Further, in both countries, cognitive factors play a stronger role in initiating quit attempts than determining their success, even though this difference may be less marked at this point in SEA. Further work is needed to establish which effects are explicable by stage of tobacco control efforts and which are more persistent cultural factors.

Supplementary Material

Supplementary Table 1 can be found at Nicotine and Tobacco Research online (<http://www.ntr.oxfordjournals.org/>).

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Declaration of Interests

None declared.

Ethics approval

Ethical clearance for ITC study has been obtained for all ITC countries. In particular, there was clearance from the institutional review or research ethics boards from the University of Waterloo (Canada), Roswell Park Cancer Institute (USA), University of Strathclyde (UK), the Cancer Council Victoria (Australia), Mahidol University (Thailand), and Universiti Sains Malaysia (Malaysia).

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