



## Short Communication

## Stop smoking clinics in Malaysia: characteristics of attendees and predictors of success

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## ABSTRACT

**Introduction:** As Stop Smoking Clinics (SSCs) become more common across the globe, it is important to know how far one can make broad generalisations concerning characteristics of smokers who attend these clinics and factors that predict their success. This involves accumulation of data from different countries.

**Objective:** The aim of this study was to identify characteristics of smokers and factors leading up to quitting with clinics in Malaysia.

**Method:** Records from 629 smokers who had sought help from five selected SSCs in Malaysia from January 2006 to June 2007 were analysed.

**Results:** The characteristics of smokers attending Malaysian smoking clinics were broadly similar to those in Western countries. Consistent with the findings from other countries, older age and longest duration of previous quit attempts were associated with successful smoking cessation. Greater baseline carbon-monoxide readings (OR 0.96, 95% CI 0.93–0.99;  $p = 0.013$ ), but not Fagerstrom Test for Nicotine Dependence (FTND), predicted failure to quit at six-month in multivariate analysis. Success rates varied greatly between clinics even after adjusting for all other predictors.

**Conclusion:** In these rare data from a non-Western culture some predictors of successful smoking cessation appeared to generalise from Western smokers but the universal validity of the FTND in particular needs to be examined further.

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### 1. Introduction

As Article 14 of the Framework Convention of Tobacco Control is implemented worldwide, it will be helpful to those designing stop smoking services to plan for the kinds of clients they can expect and this depends on how far findings in one country can generalise to other countries. At present very little data of this kind exist. Adding data from a country such as Malaysia with a very different culture from the UK and the US is a useful step forward.

Of the world's 1.25 billion adult smokers, 10% (about 125.8 million) reside within South East Asian countries. Smoking prevalence in these countries varies from 12.6% in Singapore to 40% in Laos with Malaysia recording 21% adult current smokers (Southeast Asia Tobacco Control Alliance (SEATCA), 2007).

The smokers' average consumption in Malaysia is 12 cigarettes daily (Ministry of Health Malaysia, 2006). There are no data to show

how many quit attempts in Malaysia are carried out unaided or with the help of specialised clinics and how many of these attempts are successful (Ministry of Health Malaysia, 2006). Most of the dedicated quit smoking services are available in the public health care services. In the UK, the only country to date that has published characteristics of smokers attending a national network of stop smoking clinics, clients are more likely to be female than male, and there is a high representation of less affluent smokers (Ferguson, Bauld, Chesterman & Judge, 2005; Kotz & West, 2009). The average age is in the 40s and the average Fagerstrom Test for Nicotine Dependence (FTND) score is 3.9 (West, 2010). Predictors of success in UK clinics are older age, lower levels of nicotine dependence, and higher social grade (Ferguson et al., 2005).

South East Asian countries are unique in their ethnic and religious composition and common predictors of successful smoking cessation in Western countries may therefore not apply straightforwardly. For instance, given the high proportion of the population who practice the Islamic faith (Hourri, Atcha & Sheikh, 2005), religious approaches are used as one of the control measures for reducing smoking prevalence, particularly during the fasting month. An unpublished study carried out among Malaysian smokers who sought clinical help to quit

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smoking found that the majority considered smoking as 'makruh' (optional) but not forbidden in Islam (Selahuddeen, 2006). Similar findings were reported in a qualitative study among Bangladeshi and Pakistani adult smokers in the UK (Bush, White, Kai, Rankin & Bhopal, 2003). However, given a recent increase in Muslim scholars who believe that Islam prohibits smoking, debate continues (Nawi, Weinehall & Ohman, 2007). It is therefore possible that in this country stopping smoking for religious reasons may be prevalent and influence outcomes.

Given the paucity of research into smoking cessation in non-Western countries, the current study attempted to explore common characteristics of smokers attending quit smoking clinics in Malaysia as well as predictors of successful quit attempts.

## 2. Methods

### 2.1. Study design

This is a retrospective study examining records of all smokers who attended established quit smoking clinics in the Federal Territory, Malaysia from January 2006 to June 2007. Data was obtained by trained quit smoking personnel who interviewed smokers face-to-face at baseline and follow-up visits. The study received ethical approval from the Medical Ethics Committee, University Malaya Medical Centre.

### 2.2. Sample and procedure

Smokers who attended clinics were either self-referred, referred by friends or family members or by their doctors. In most cases, smokers sought access to clinics by themselves. These clinics had designated and trained quit-smoking personnel with competence in research provided free nicotine replacement therapy (NRT) to smokers and had scheduled quit smoking sessions. Smokers were assessed individually, provided with an advice and NRT and a quit date was fixed. Smokers were encouraged to quit either after the first or second visit. The standard practice for treatment requires smokers to come for follow-up sessions at their respective clinics once a week for the first month, every two weeks for the subsequent month, and once a month for follow-up from the third to sixth month. However, this schedule was flexible depending on the quit smoking status of the respondents. The treatments at the clinics followed the evidence-based recommendations set forth in the Malaysian Clinical Practice Guidelines (CPGs), Treatment of Tobacco Smoking and Dependence, 2003 adapted from the US and New Zealand CPGs' (Clinical Practice Guidelines, 2003).

### 2.3. Measures

Records were available in either Malay or English and included:

- (a) Socio-demographic characteristics – Age, gender, race, religion, educational level, types of occupation and marital status.
- (b) Smoking history – Age started smoking, ways of obtaining first cigarettes, duration of previous abstinence, previous quit attempts made and reasons for relapse.
- (c) Current smoking habits and nicotine dependence – Number of cigarettes smoked in a day, daily average spent, time to first cigarette of the day, nicotine dependence – FTND (Heatherton, Kozlowski, Frecker & Fagerstrom, 1991) and expired-air carbon monoxide measurement (CO).
- (d) Health status – Health problem, types of health problem.
- (e) Reasons for quitting (list of reasons, participants could tick as many as applied).

The primary outcome for analysis was self-reported smoking status at six months follow-up through face-to-face interview.

Consistent with standard 'intent to treat' analysis, smokers who did not attend follow-up were assumed to be smoking. Only participants who had attended the stop smoking clinics at least 6 months prior to the data collection point were included resulting in a total sample of 629 clinic attendees.

### 2.4. Statistical analyses

Data were analysed using SPSS 15.0. Descriptive statistics were used to analyse the socio-demographic characteristics of smokers. In addition, univariate logistic regression analyses were undertaken to assess the relationship between independent variables and abstinence at six months follow-up, providing odds ratios (with 95% confidence interval) for each independent variable. All significant independent variables (statistical significance was set at a level of  $p < 0.05$ ) were then entered together into a multiple logistic regression model to determine their independent contribution.

## 3. Results

### 3.1. Socio-demographic characteristics

Socio-demographic characteristics information included age, gender, marital status, education level, occupation and ethnicity. Out of the 629 respondents, nearly two thirds attended the Tanglin clinic and Putrajaya clinic. Almost all smokers (92.1%) had at least secondary or tertiary education (Table 1). Most of the smokers were male, and there were fewer Chinese smokers compared to other major races.

### 3.2. Smoking characteristics

Most smokers started smoking in their teens. Average nicotine dependence score was relatively high; FTND score was 4.7 (SD = 2.4) however average CO concentrations were relatively low (mean = 12.0, SD = 7.3). At the six-month follow up, more than two thirds of the respondents either relapsed or were lost to follow up (Table 1).

### 3.3. Univariate analysis

There were differences in the success rate between clinics. Smokers who were older, who had made previous quit attempts, had a longer period of previous abstinence, had health problems and were motivated to quit because of health concerns or religious beliefs were more likely to be abstinent at the six-month. A higher FTND score and CO reading were associated with lower abstinence rates. (Table 2).

### 3.4. Multivariate analysis

In the multivariate analysis, the abstinence rate at the six-month showed no significant association with previous quit attempts, health concern as a reason to quit or smokers' health status at baseline (Table 2). The quit smoking clinic attended was still associated with successful quitting. In addition, older smokers and those with a longer previous quit duration were also more likely to have stopped smoking when controlling for all other variables. Smokers who had high baseline CO readings were less likely to be abstinent at the follow-up. Interestingly, nicotine dependence as measured by the FTND was not related to smoking cessation in the multivariate analysis but there remained a marginal effect of religious beliefs as a motivator to quit (Table 2).

**Table 1**  
Socio-demographic characteristics and smoking history of participants.

Characteristics	N	%
<i>Clinic (N = 629)</i>		
Tanglin	232	36.9
Putrajaya	178	28.3
Jinjang	82	13.0
Pantai	74	11.8
Kg Pandan	63	10.0
<i>Age, years (N = 629)</i>		
15–24	92	14.6
25–34	199	31.6
35–44	150	23.8
45–54	115	18.3
≥ 55	73	11.6
<i>Gender (N = 626)</i>		
Male	595	95.0
<i>Ethnicity (N = 629)</i>		
Malay	460	73.1
Chinese	71	11.3
Indian	91	14.6
Other	6	1.0
<i>Education<sup>a</sup> (N = 620)</i>		
Primary school	31	5.0
Secondary school	351	56.6
Tertiary education	220	35.5
Other/none	18	2.9
<i>Occupation (N = 627)</i>		
Professional, technical and business	254	40.5
Clerical, service and arm forces	162	25.8
Manual	78	12.4
Retired, unemployed, housewife or student	133	21.1
<i>Health problems (N = 627)</i>		
Yes	173	27.6
<i>Ways obtained first cigarette (N = 503)</i>		
From friends/family	405	80.5
Own purchased	98	19.5
<i>Number of cigarettes smoked per day (N = 627)</i>		
< 10	85	13.6
10–15	228	36.4
16–20	185	29.5
≥ 21	129	20.6
<i>Fagerstrom Test of Nicotine Dependence (N = 614)</i>		
Low (0–3)	209	34.0
Moderate (4–5)	157	25.6
High (6–10)	248	40.4
<i>CO reading, ppm (N = 629)</i>		
Very light smoker (1–6)	181	28.8
Light smoker (7–10)	138	21.9
Moderate smoker (11–20)	242	38.5
Heavy smoker (>20)	68	10.8
<i>Previous quit attempt (N = 602)</i>		
Yes	505	83.9
<i>Reasons for previous relapse (N = 216)</i>		
Missing cigarettes/habitual/addicted	85	39.4
Stressed	50	23.1
Friends' influenced	45	20.8
Withdrawal symptoms	36	16.7
<i>Smoking status at 6 months follow-up (N = 629)</i>		
Abstainers	200	31.8
Relapsers	103	16.4
Defaulters	326	51.8

<sup>a</sup> Tertiary education – pre-university (A-level/diploma) or university education; ppm – parts per million.

#### 4. Discussion

Smokers attending Malaysian clinics were similar in many respects to those attending UK clinics. They tended to be middle-aged, nicotine dependent and stopped primarily for health reasons. However, they tended to have a higher educational level and there was a predominance of males which reflects the fact that few women smoke in Malaysia (Ministry of Health Malaysia, 2006). Quitting for religious reasons was rare. Predictors of success that generalised from Western samples to Malaysian clinic attendees were older age, heavier smoking as indexed by high CO readings, and longest duration of prior quit attempts. A major point of divergence was that FTND score was not found to be an independent predictor. The finding of a near significant association between quitting for religious reasons and success after adjusting for other predictors, is also worthy of comment. It is also noteworthy that, even after having adjusted for other predictors of success, different clinics had markedly different success rates.

Where commonalities with Western samples are found, this suggests that it may be possible to generalise across cultures, although more evidence from a variety of different countries are required. Where differences were found, it suggests a need to revise models of the quitting process to account for cultural differences. Thus the duration of success of previous quit attempts as a predictor of success may be a broadly applicable aggregate marker of a range of factors that result in a positive prognosis. On the other hand, FTND may be a culturally limited index of nicotine dependence. If this is the case, there is a need to identify indices of dependence that can be generalised.

The finding of marked differences between clinics after adjusting for client characteristics suggests that there may be important differences in the way that the treatment is delivered which affect success rates. It will be important to follow this up with further research to assess where the source of this difference lies and to implement appropriate changes to training and operating procedures to ensure that all clinics are brought up to the standard of the best.

One limitation of this study is that the smoking status at six-month was based on self-report without biochemical verification. Studies that depend on self-reports have suggested that smoking behaviour is often under-reported (Benowitz, Jacob & Ahijevych, 2002; Jarvis, Tunstall-Pedoe, Feyerabend, Vesey & Saloojee, 1987; Velicer, Prochaska, Rossi & Snow, 1992) as smokers may not admit that they smoke or underestimate the amount they smoke (Patrick et al., 1994). In the present study this may have led to an overestimation of success rates but it is unclear to what extent it could account for the associations that were found between the baseline characteristics and success rates and the success rate was comparable to those in other clinic studies (Ferguson et al., 2003; Nerin et al., 2004; Oleans, Rotberg, Quade & Lees, 1990; Raupach et al., 2008). A second limitation is that the clinics were drawn from urban settings. It is not clear how far the findings would generalise to rural clinics as no such comparison can be made.

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#### Contributors

Awang Bulgiba proposed for the study to be carried out. Ms Wee Lei Hum wrote the protocol, managed the literature searches and undertook the statistical analysis with Robert West and Awang Bulgiba. Ms Wee wrote the first draft of the manuscript and edited by Lion Shahab. All contributed to and have approved the final manuscript.

#### Conflict of Interest

Lion Shahab has received an honorarium for a talk and travel expenses from Pfizer. Robert West undertakes research and consultancy for the following developers and manufacturers of smoking cessation treatments: Pfizer, J7J, McNeil, GSK, Nabi, Novartis

**Table 2**  
Univariate and multivariate logistic regression analysis for smoking abstinence at 6-month follow up (N = 589)<sup>a</sup>.

Characteristics	Univariate		Multivariate	
	OR (95% CI)	P	OR (95% CI)	P
Clinic				
Tanglin	1	–	1	–
Putrajaya	0.50 (0.32–0.77)	<0.001	0.68 (0.38–1.23)	0.206
Jinjang	0.80 (0.47–1.37)	0.420	0.76 (0.43–1.34)	0.339
Pantai	0.09 (0.03–0.23)	<0.001	0.11 (0.04–0.28)	<0.001
Kg Pandan	0.16 (0.07–0.36)	<0.001	0.14 (0.06–0.34)	<0.001
Duration of previous abstinence in weeks <sup>b</sup>	1.00 (1.00–1.01)	0.010	1.01 (1.00–1.01)	0.023
Age in years <sup>b</sup>	1.02 (1.01–1.04)	0.002	1.02 (1.00–1.04)	0.033
Previous attempts made				
Yes	1.80 (1.07–3.02)	0.027	1.31 (0.74–2.31)	0.353
CO reading in ppm <sup>b</sup>	0.95 (0.92–0.97)	<0.001	0.96 (0.93–0.99)	0.013
Fagerstrom Nicotine Dependence score <sup>b</sup>	0.92 (0.85–0.99)	0.022	0.95 (0.87–1.04)	0.255
Having any health problem	1.46 (1.00–2.13)	0.049	1.15 (0.73–1.81)	0.534
Health concern as motivation to quit	1.41 (1.00–2.00)	0.050	1.24 (0.75–2.07)	0.407
Religion as motivation to quit	10.93 (1.27–94.21)	0.030	8.42 (0.85–83.7)	0.069

ppm – parts per million; OR – odds ratio; CI – confidence interval; P – probability; abstinence was defined as follows: 1 = abstainers; 0 = relapsers/non-attenders.

<sup>a</sup> Excluding those with some missing data (N = 40).

<sup>b</sup> Per unit increment.

and Sanofi-Aventis. Robert West also has a share in the patent of a novel nicotine delivery device.

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