

ORIGINAL ARTICLE

---

**PATTERNS AND PREDICTORS OF SMOKING CESSATION AMONG SMOKERS ATTENDING SMOKING CESSATION CLINICS IN PENINSULAR MALAYSIA**

W.P Sh. Ezat<sup>1</sup>, A.A Selahuddeen<sup>2</sup>, S.M Aljunid<sup>1</sup>, Z Zariah<sup>2</sup>

<sup>1</sup> Department of Community Health, UKMMC, <sup>2</sup> Ministry of Health Malaysia

**ABSTRACT**

**Introduction:** This study seeks to identify the socio-demographic and behavioral characteristics of smokers (aged 18 and above), thus develop a predicting model for tobacco abstinence receiving cessation services for tobacco dependence at the Smoking Cessation Clinics (SCC) in government Primary Health Centers in Malaysia. These predictors would improve the effectiveness and efficiency of these clinics.

**Methods :** Smokers who sought smoking cessation therapy at the SCCs from 1<sup>st</sup> January 2004 to 31<sup>st</sup> December 2004 were chosen randomly from clinic's registries, and 254 smokers were recruited from 8 clinics chosen through stratified random sampling. Data analyses were performed with SPSS 12.0. 17.3% of smokers attending SCCs were able to quit smoking for at least six months.

**Results :** Factors significantly contributing to quitting success were elderly smokers (above 40 years old), smoked for more than 15 years, smoked less than ten sticks per day, had a previous history of quitting attempt, self referral to the clinic, high confidence level, attended SCC at least four times, each counseling session lasted for at least 30 minutes and were satisfied with the clinic service. In logistic regression model, smokers aged 40 years and above were 6.7 times more successful to quit, high level of confidence were nine times more successful, smoked more than ten sticks per day were ten times less successful, self referred smokers were ten times more successful and attending for at least 30 minutes counseling session were 12 times more successful.

**Conclusion :** This study concludes that more concerted effort is needed to approach various groups of target population and SCCs clinic services need to be improved.

**Keywords :** Smoking cessation, Smokers, Smoking Cessation Clinics.

---

**Correspondence to:** Sharifa Ezat Wan Puteh, Community Health Department, UKM, Medical Centre.  
Tel: 03-91455901, Fax: 03-91737825  
(e-mail:sh\_ezat@yahoo.com)

## **INTRODUCTION**

The problems of tobacco consumption have been devastating. If effective and efficient strategies are not implemented towards curtailing these problems, they would further lead to escalating public health disasters. Smoking cessation has significant health benefits but effective strategies are lacking cessation support<sup>1</sup>. Among the services to support cessation, Smoking Cessation Clinics were reported to be effective<sup>2,3</sup>. Support and treatment to help smokers stop is one of a range of approaches to tobacco control. Tobacco consumption is a chronic condition that for the majority of smokers requires repeated and persistent effort to overcome this condition. Theoretical analysis of smoking cessation suggests that it is a process, not a single event<sup>4</sup>. Stage of change theory suggests that smokers move from being content to smoke, thinking about quitting, planning to quit, attempting to quit, maintaining cessation or relapsing to smoking. Smokers may cycle through some or all of the stages many times before they achieve long-term cessation. Therefore quitting remains a daunting task for smokers.

Guidelines have been issued for health care providers to actively encourage patients to stop consuming tobacco<sup>5,6</sup>. There are almost five million smokers in Malaysia and most would want to quit if help is rendered to them. Studies have shown that almost 40% of smokers want to stop smoking at one time or another and many have tried to do so but have difficulty succeeding because of its powerful addiction<sup>7,8,9</sup>. Clinics and predictors of smoking cessation among clinic attendants in Malaysia are lacking. More information on this would help in improving the effectiveness and efficiency of the Smoking Cessation Clinic (SCC). This paper describes the characteristics of the smokers who used the SCC. The purpose of this study was to identify the socio-demographic and behavioral characteristics of smokers and to develop a model to predict tobacco abstinence among smokers receiving cessation services for tobacco dependence at the Smoking Cessation Clinics in government Primary Health Centers in Peninsular Malaysia.

## **METHODOLOGY**

This was a descriptive study, involving smokers aged 18 years and above who sought smoking cessation therapy at the SCCs in government primary health centers from 1<sup>st</sup> January to 31<sup>st</sup>

December 2004. Smokers were recruited from eight clinics throughout Peninsular Malaysia. The states in Peninsular Malaysia were stratified into four zones and one state was randomly selected from each zone. The states were Kedah (northern zone), Perak (central zone), Johor (southern zone) and Kelantan (eastern zone). Each zone would contribute randomly two clinics and each clinic contributes 35 smokers from the Smoking Cessation Clinic registry. There were a total of 280 smokers selected from the eight clinics in these states but the minimum sample size was 252.

Face to face interview was attempted for all smokers recruited, failing which the smokers were interviewed by telephone. The interview was either conducted in the clinic or at home. Standardized questionnaires were used to gather the information. Inclusion criteria were smokers from clinics having at least 40 patients throughout year 2004, smokers with minimal information available in the clinic registry, smokers agreeable to be interviewed and for verification test. Smokers from outside the study area and smokers with acute psychiatric illness or active drug addiction were excluded from the study. Smokers reported as quitters had a breath CO level analyzed.

Smokers were defined as those having smoked more than 100 sticks of cigarette in their lifetime. The dependent variable was status of the smoker, either able to quit or unable to quit after attending the SCC. Able to quit is defined as having stopped smoking and sustained abstinence at least more than six months after the quit date. The independent variables were; sex, age, referral source, marital status, education level, occupation, presence of household smokers, history of parents smoking, reason for attending SCC, age at which smoking began, level of nicotine dependence<sup>9</sup> (Fagerstrom Test), number of cigarettes per day, number of years of smoking, presence of concomitant illness, previous attempts to quit smoking, reasons for difficulty in quitting, confidence of quitting, religious perspective on smoking and satisfaction on SCC services.

## **RESULTS**

The response rate for this study was 92%. There were 26 smokers who were not contactable via the address or the telephone number provided. A sample comprised of 254 smokers interviewed was analyzed. 201 smokers (80%) were interviewed in person and the others were

interviewed by telephone. Of the 254 smokers, 98% (n=251) were male and 2% (n=3) female, with a mean age of 43.9 (SD of 12.1) years old. In terms of education level, 36.6% (n=93) had primary or no formal education and 63.4% (n=161) had completed secondary or university studies. The occupational class of the smokers in the study were, 24% (n=61) were manual workers, 23.6% (n=60) were non manual workers, 24% (n=61) were self employed and the rest were from other occupational classes. The study revealed 71% (n=180) of smokers were earning RM 1,500 and below a month. 87.8% (n=223) of the smokers reported that their father were smokers and 13.4% (n=34) had household

who are smokers. With regards to age of starting smoking, the mean age were 17 years old (SD of 2.5). The mean score on the Fagerstrom test was 5.8 (SD of 1.5) points. The reasons for the smokers to attend the clinic 18.5% (n=47) were self referral, 41.3% (n=105) were referred for chronic illnesses, 34% (n=87) referred following screening in the outpatient and 6% (n=15) following no smoking campaigns. With regards to the Islamic religion's perspective on smoking, 89% (n=193) stated smoking as 'makruh', 7% (n=15) stated as 'haram' and 4% (n=9) did not know. Table 1 shows the result of the other variables studied.

**Table 1 Association between Smokers Characteristics with Smoking Status**

Characteristic features	Frequency Smokers	Frequency Quitters	% of Quitters	Statistical Test
Smokers' Age (years old)				
Less than 40	87	7	7.4%	Chi square test X <sup>2</sup> =10.16 p=0.001
40 and above	113	37	17.3%	
Duration of Smoking				
15 years and <	35	2	5.4%	Chi square test X <sup>2</sup> =4.295 p=0.038
> than 15 years	175	42	19.4%	
Number of Cigarette/day				
10 sticks and less	8	6	42.9%	Fischer exact test p = 0.02
> than 10 sticks	202	38	15.8%	
History of Previous Quit Attempt				
Yes	128	34	21%	Chi square test X <sup>2</sup> =4.194 p=0.041
No	82	10	10.9%	
Using Nicotine Replacement Therapy (NRT)				
Used	119	25	17.4%	Chi square test X <sup>2</sup> =0.000 p=0.985
Did not use	101	19	17.3%	
Number of clinic sessions				
Less than 4	146	4	2.7%	Chi square test X <sup>2</sup> =54.95 p=0.0001
4 and more	64	40	38.5%	
Confidence Level				
Having Confidence	115	41	26.3%	Chi square test X <sup>2</sup> =22.660 p=0.001
No Confidence	95	3	3.1%	
Satisfaction with clinic services				
Satisfied	182	44	19.5%	Fischer exact test p=0.01
Not satisfied	28	0	0%	
TOTAL	210	44	17.3%	

Of the patients included in the study, 17.3% (n=44) were abstinence for more than six months. The rest were unable to quit smoking. Of the smokers who were unable to quit, 50% (n=105) cited withdrawal symptoms, 18% (n=38) on socializing, 12.4% (n=24) on craving, 12.4% (n=24) on work stress and the others on various other reasons for them not able to quit smoking.

The significant variables influencing the smokers to quit were smokers age 40 years old and above, smoked for more than 15 years, smoked more than ten sticks per day, had a previous history of quitting attempt, self referral to the clinic, high confidence level, attended QSC at least four times, each counseling session lasted for at least 30 minutes and were satisfied with the clinic service (Table 1).

These variables were entered into the logistic regression model, five variables were found to be significant. The model revealed that smokers aged 40 years and above were 6.7 times more successful, smokers with high level of confidence were nine times more successful, smokers who smoked more than ten sticks per day were ten times less successful, smokers who self referred to the clinic were ten times more successful and smokers attending at least 30 minutes counseling session were 12 times more successful. Table 2 and 3 shows the logistic regression modeling used for predicting the status of smokers attending the Smoking Cessation Clinic.

**Table 2: Coding of variables used in Logistic Regression Modelling**

VARIABLES	CODE	FREQUENCY
Occupation	0 Manual	81
	1 Non Manual	173
Duration of smoking	0 15 years and less	37
	1 more than 15 years	217
Confidence level	0 not confident	98
	1 confident	156
Previous quitting attempts	0 no	92
	1 yes	162
Using NRT	0 no	144
	1 yes	110
Satisfaction	0 not satisfied	28
	1 satisfied	226
Age	0 less than 40 years old	94
	1 40 years old and above	160
Cigarette stick per day	0 10 and less	92
	1 more than 10	162
Referral	0 other methods	207
	1 self referral	47
Duration of each counselling session	0 30 minutes and less	241
	1 more than 30 minutes	13
Smoking status (Dependent Variable)	0 still smoking	210
	1 able to quit	44

**Table 3: Logistic Regression Model to Predict the Status of Smokers Attending SCC**

Variables	Coefficient Regression $\beta$	p	Odds Ratio	Confidence Interval 95%	
Occupation	0.350	0.479	1.419	0.538	3.743
Age	1.901	0.004*	6.696	1.866	24.028
Confidence level	2.185	0.002*	8.888	2.219	35.595
Previous quitting attempts	0.001	0.998	1.001	0.336	2.987
Using NRT	-0.832	0.068	0.435	0.178	1.062
Duration of smoking	0.892	0.396	2.439	0.311	19.146
Cigarette stick per day	-2.239	0.009*	0.107	0.020	0.571
Referral	2.309	0.0001*	10.068	3.640	27.846
Duration of each counselling session	2.452	0.011*	11.606	1.741	77.387
Satisfaction	21.292	0.997	17660	00.00	
Constant	-3.098	0.003	0.045		

\* Significant level of  $p < 0.05$

## DISCUSSION

The smoking cessation rate in this study was 17.3%. This rate is lower than most of the studies conducted in the SCCs in developed countries<sup>5,10,11</sup>. Their studies quoted a quit rate of 25% - 35% but methods used to measure abstinence vary from study to study. Several authors have evaluated the potential disparity between self reported results and those obtained using objective measures of the CO level<sup>12</sup>. The results however, differ according to the study population. For smokers who have undergone smoking cessation treatment the difference was small<sup>13</sup>. In our study, the criteria used to determine success was self reporting, but CO level of less or equal to 6 ppm using a breath analyzer was used to verify the smokers' status. When we compared the self reported quit rate to the quit rate verified by CO analyzer, the rates changed from 17.3% to 15.3% but the findings using self reporting and validation did not differ significantly. A meta-analysis of the validity of self-reporting recommends the use of biochemical validation in interventional studies<sup>12</sup>. However, self reporting has been described

as a useful tool that is less expensive and more accessible than biochemical validation.

The characteristic features of smokers attending the SCCs in the primary health care facilities were studied. The features positively associated with smokers quitting smoking were age 40 years and above, having smoked for more than 15 years, having smoked more than ten cigarettes per day, having previous attempts to stop smoking, confidence on ability to stop, having attended the clinic for at least four times, undergoing at least 30 minutes of counselling in each session and satisfied with the services in the QSC. There were a few factors which were not shown to be significantly associated with quitting although other studies have shown a positive association. The usage of NRT has been proven to be effective in treating tobacco dependence<sup>3</sup>. This was not shown in our study. This could be due to the selection problem, as five of the clinics in our study did not prescribe NRT and neither was it bought by the smokers. A better design to check this would be to compare smokers from clinics using NRT and smokers from clinics not using NRT.

Our study showed that smokers aged 40 years and above were six to seven times more likely to stop smoking. This was consistent with the report<sup>10</sup> that 74% of smokers attending the SCCs in England were aged 35 years and above. The rate of quitters increased significantly as the age increase with 61% of smokers quitting at age 60 years and above. The other factor seen in our study was the mean age of smokers attending the SCCs were aged 44 years old. There were not many smokers in the 20 – 30 years old age group. More concerted effort is required to attract this age group. Involvement and assistance of non governmental organizations and the community at large is required to attract this group.

Our finding that smokers with 15 years of smoking history was significantly associated with quitting is consistent with some studies where the duration of smoking were associated with abstinence<sup>14</sup> although other reports did not showed similar association<sup>11</sup>. However, this association was not predictive of quitting. The number of cigarettes smoked per day was showed to be significantly associated with quitting. This was the only features of nicotine dependence which were significant. Smokers who smoked more than ten sticks per day were ten times less successful to quit. The study showed that majority of smokers attending SCCs in Malaysia were heavy smokers and they were unsuccessful in quitting. The effectiveness of the program needs to be looked into especially providing NRT to this group of smokers.

Those with previous history of quitting attempt seems to have better outcome than those who had no previous quitting attempt. However, it was found to be not predictive of quitting although the difference was significant. This was inconsistent with result obtained in research based samples where previous quitting attempt was associated with predictive quitting outcome<sup>15</sup>. Those who had previous quitting attempt might have gain confidence on their ability to quit the next time. This was seen in this study which showed that those with confidence on their success on quitting were nine times more successful than those with no confidence. It might be likely that multiple attempts to quit smoking improves the confidence level in the smokers.

Our results showed that those smokers who self referred to the SCCs were more successful in quitting than those who were referred for other causes. This might be due to the difference of motivation and confidence in these two groups. Those who were screened in

the outpatient and referred to the SCC were not ready to quit. It was found that smokers who self referred to the clinic were ten times more successful to quit than those who were referred for some other reasons<sup>16, 17</sup>. The reason for the referral was not important but the readiness of the smokers to quit which would be more predictive of quitting. Therefore, it is important to motivate smokers to quit and when they are ready, to refer them to the SCC.

Our study showed that it is pertinent for smokers to attend the SCC at least four times and for 30 minutes each session. This would enable them to be adequately counseled and prepare them with all the required skills to help them quit. Our result showed that those who attended the 30 minutes counseling were twelve times more successful to quit. Other studies have shown that the duration of counseling session would influence the outcome in a smoker<sup>3</sup>.

## **CONCLUSION**

The study revealed the characteristic features of the smokers attending the SCCs in the primary health care facilities. The variables positively associated with smokers quitting smoking were age 40 years and above, having smoked for more than 15 years, having smoked more than ten cigarettes per day, having previous attempts to stop smoking, confidence on ability to stop, having attended the clinic for at least four times, undergoing at least 30 minutes of counseling in each session and satisfied with the services in the SCC. There were a few factors which were not shown to be significantly associated with quitting. These factors were shown to be positively associated in other studies. With verification of smoking status, a difference of 2.0% in the quit rate was obtained which was in accordance to other studies. This study concludes that more concerted effort is needed to approach various groups of target population pro actively rather than awaiting passively for smokers to attend the clinic. The characteristic features demonstrated positively to predict quitting outcome should be used to improve the services in the clinic.

## REFERENCES

1. Koop CE, Kessler DA. 1997. Final report of the advisory committee on tobacco policy and public health. *Tobacco Control*. **6**:254-261
2. West R, McNeil A, Raw M. 2000. Smoking cessation guidelines for health professionals: an update. *Thorax*. **55**: 987-999.
3. Fiore MC, Bailey WC, Cohen SJ, 2000. Treating Tobacco Use and Dependence. Clinical Practice Guideline. Rockville, MD: US Department of Health and Human Services. Public Health Service.
4. Prochaska and C.C. DiClemente. 1983. Stages and processes of self-change of smoking: Toward an integrative model of change. *Journal of Consulting and Clinical Psychology*. **51**:390-395
5. Adelman, Anne K. D, Patricia H., Alain Joffe. 2001, Effectiveness of a High School Smoking Cessation Program. *Pediatrics* **107**(4).
6. Chandola T; Head J; Bartley M 2004. Socio-demographic predictors of quitting smoking: How important are household factors? *Addiction*. **99** (6): 770-776.
7. Tobacco Advisory Group. 2000. Royal College of Physicians. Nicotine addiction in Britain. London.
8. CGP Malaysia. 2003. Clinical Practice Guidelines on treatment of tobacco use and dependency. Ministry of Health Malaysia.
8. Fagerstrom KO, 1991. The Fagerstrom test for nicotine dependence. *British Journal Addict*. **86**:1119-1127.
10. Kennedy DT, Giles JT, Ziba Gorji Chang, Ralph E. Small, Jennifer , 2002 Results of a Smoking Cessation Clinic in Community Pharmacy Practice . *J Am Pharm Assoc*. **42**(1):51-56.
11. Richards D, Les Toop, Keith Brockway, Sue Graham, Bill McSweeney, Donna MacLean, Margaret Sutherland and Alison Parsons 2003. Improving the effectiveness of smoking cessation in primary care: lessons learned. *New Zealand Medical Journal*. **116** (1173).
12. Patrick DL, Cheadle A, Thompson DC, Diehr P, Koepsell T, Kinne S.1994. The validity of self-reported smoking: a review and meta-analysis. *Am J Public Health*. **84**:1086-93
13. Gariti P, Alterman AI, Ehrman R, Mulvaney FD, O'Brien CP. 2002. Detecting smoking following smoking cessation treatment. *Drug Alcohol Dependency*. **65**:191-196.
14. Zhu SH; Sun JC; Billings SC; Choi WS; Malarcher A 1999. Predictors of smoking cessation in US adolescents. *American Journal of Preventive Medicine* **16** (3): 202-207.
15. Stapleton JA, M.A. Russell, C. Feyerabend, S.M. Wiseman, G. Gustavsson, U. Sawe and D. Wiseman. 1995. Dose effects and predictors of outcome in a randomized trial of transdermal nicotine patches in general practice. *Addiction*. **90** 31-42.
16. Lichtenstein E, Jack Hollis 1992. Patient referral to a smoking cessation program: who follows through? *J Fam Practice*. **34**:739-744.
17. Van Der Rijt GAJ; Westerik H 2004. Social and cognitive factors contributing to the intention to undergo a smoking cessation treatment. *Addictive Behaviors* **29**(1): 191-198.