ORIGINAL ARTICLE

FACTORS DETERMINING ATTEMPT-TO-QUIT SMOKING AMONG ADULT CURRENT SMOKERS IN SARIKEI, SARAWAK, MALAYSIA

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ABSTRACT

Achieving smoking cessation is an arduous process, where smokers try different methods or approaches to achieve cessation. Quit smoking attempts play an important role in smoking cessation.Thus, this study was conducted to determine the factors associated with attempt-to-quit smoking among the currentsmokers in Sarawak.This cross-sectional study was conducted among adult smokers in Sarikei, Sarawak by face-to-face interview using an adapted and validated questionnaire. Non-probability sampling method was used to select the study place. An adult smoker was selected systematically from each selected household. A total of 482 smoker households were identified with a response rate of 92.3%. Data was analysed using IBM SPSS Version 22.0. A p-value of <0.05 was considered statistically significant. The mean (SD) age of the smokers was 36.3(13.3) years. However, the mean (SD) age of smoking initiation was 18.5(4.8) years. Majority of the smokers were male (91.5%), with the male to female ratio being 1:0.1. Mean (SD) score on The Fagerström Test for Nicotine Dependence was 4.75(2.4), while motivation to quit smoking score was 3.04(1.0). Majority of the smokers (83.1%) hadever seen pictorial health warnings on cigarette packs. More than half of the smokers (54.8%) had ever tried to quit smoking. Binary logistic regression analysis revealed that marital status, religion, ethnicity, pictorial health warnings on cigarette packs and motivation to quit smoking appeared to be the significant predictors of attempt-to-quit smoking (p<0.05). Understanding the attempts to quit smoking will assist inclinical expectations. Thus, a smoking cessation programme should be designed in line with these factors, to aid quit smoking attempts.

***Keywords**: Smoking, Attempt-to-quit, Addiction, Motivation, Pictorial Health Warning, Sarawak*

INTRODUCTION

Issues pertaining to tobacco have been present among the community for a long time. Cigarette smoking is associated with both communicable and non-communicable disease. Smoking remains the world's leading preventable cause of death and is estimated to be responsible for about six million deaths yearly, with many of the deaths occurring prematurely[1,2]. There were over 1.1 billion smokers in 2015, with the numbers continuing to increase[2]. In Malaysia, prevalence of smoking among Malaysian adults varies from 23.3% to 43.9%, with about 20% of total mortalities associated with smoking[3-6].

Acknowledging smoking as an issue in Malaysia, the government have taken many measures to tackle the rising number of smokers, such as raising cigarettes prices, enforcing public health policies, setting up of Quit Smoking Clinics (QSCs), and enforcing pictorial health warnings on cigarette packaging[7]. Withthe many measures taken, a large percentage of smokers have attempted to quit smoking, however, only a small percentage of the smokers have successfully quit smoking[8]. One of the attributing factors is the lack of motivation to quit smoking, where motivation is one of the key elements in the sustainability of the quit smoking attempt[9].Understanding the factors that motivate smokers to attempt-to-quit smoking can determine the success and long-term maintenance of the quit smoking attempt[10].

A global voluntary tobacco target was established by the World Health Assembly in 2013 to help reduce and prevent premature avoidable mortality from non-communicable diseases. To achieve the targets, evidence-based, concrete analysis of the smoking situation in the country is required[6]. Thus, to combat the rising number of smokers, it is crucial to know the factors determining attempt to quit smoking among smokers, to enable more effective measures to be taken, for the community's health.

METHODOLOGY

Study design and sampling procedure

This was a cross-sectional community-based study conducted among the smokers in Sarikei town, Sarawak, Malaysia. All Malaysian adult smokers aged more than 18 years, irrespective of gender, who were current smokers living in Sarikei town, were included as the study population. Using 48.6% prevalence of smokers who had tried to quit smoking[6], with 95% confidence interval, a total of 384 sample smokers were calculated to get a plausible estimate of an "attempt to quit smoking". However, considering the possibility of

incomplete questionnaires, an attrition rate of fifteen percent was included.

Upon approaching the house occupant, the screening question of whether there were any current smokers in the household was asked. If there was only one current smoker in the household, that current smoker would be asked regarding the willingness to participate in the study.However, if there was more than one current smoker in the household, a respondent would be randomly selected bylottery method and the selected smoker would be asked regarding the willingness to participate in the study. The study was explained to the smokers who were willing to participate in the study.If the current smoker was not at home at that time, the researcher would return another time to collect the data. However, if there were no current smokers in the household, or the smokers declined to participate in the study, the house occupant or smoker was thanked and the researcher proceeded on to the next house.

A total of 712 households were visited, where there were 482 households with smokers (67.7%) and 230 households with no smokers (32.3%). Among the households with smokers, 445 agreed to participate in the study (92.3%), while 37 refused to participate in the study (7.7%). However, among the collected data, 20 of the data (4.5%) had to be discarded due to incomplete data. The incomplete data was due to certain respondents expressing their unwillingness to continue with the interview in view of personal matters. Finally, a total of 425 data (95.5%) was included for analysis.

Data collection instruments and data collection procedure

Data was collected from house to house visit by face-to-face interview using a structured interviewer-administered questionnaire. The original questionnaire was in English, and using back-to-back translation method, the questionnaire was then translated into Bahasa Malaysia and Mandarinby the researcher, which was then translated back to English by an expert. This was to ensure that a scripted questionnaire in the respondent's preferred language was available, to reduce the risk of inconsistency in the meaning of the questions when the questions were asked. A pre-test of the questionnaires was then conducted in a non-sample area.

Thequestionswereadapted from previous studies[10-13]. The questionnaire was divided into six parts for the respondents to answer, to ensure that the questionnaire was more systematic. Part A was about socio-demographic characteristics such as age, gender, marital status, ethnicity, religion, occupation, monthly income, and education level, apart from the number of family members in the respondent's household and the number of family members in the respondent's household who smoke. Part B was about smoking initiation, which included the age when the respondent first started smoking, the age when the respondent first started smoking on a regular basis, and the reason for the respondent to start smoking. Part C was about the level of smoking addiction, which consisted of six questions adopted from Fagerström Test for Nicotine Dependence[12].

The level of motivation to quit smoking in Part D was adopted from Celik (2014)[11] and had ten sub-answers. Each item of the question was based on Likert's scale, ranging from 1 to 5, with '1' being Strongly Disagree, '2' Disagree, '3' Neutral, '4' Agree, and '5' Strongly Agree. Part E was about the perception of pictorial health warnings on cigarette packs, which consisted of five questions adapted from Sychareun*et al*. (2015)[13]. The questions were whether the respondent had seen pictorial health warnings on cigarette packs, which if answered yes, which of the pictorial health warnings was seen and the pictorial health warning that most influenced the respondent to quit smoking.

The respondent was also asked regarding his or her opinion on whether he or she thought that pictorial health warnings on cigarette packs were effective in helping smokers to try to quit smoking.If the answer wasyes, the respondent was asked regarding the pictorial health warning that they thought was most effective in helping smokers to try to quit smoking. The final part had a series of questions that assessed the smoker's attempt to quit smoking.

The attempt to quit smoking was operationalized as any effort of trying to achieve or complete a difficult task, which in this study referred to smoking cessation, especially where success is uncertain[14].Here, we defined attempt as smokers who have tried to quit smoking. A current smoker was defined as people who reported smoking at least 100 cigarettes in their lifetime, and who, at the time of the survey, smoked either every day or some days, or continuously smoked in the last month[1]. Smoking was considered as an action of inhaling and exhaling tobacco smoke from conventional manufactured cigarettes and self-hand-rolled cigarettes[1].

Data entry and analysis

The collected data was checked and verified manually. Any inconsistencies and inaccuracies were corrected the following day. A complete data was then coded and entered in the computer using Statistical Package for Social Science (SPSS) version 22.0 platform[15]. Before data analysis, the data was cross-checked for any unusualfindings, outliers and missing values. Missing values were imputed using multiple imputation techniques[16].Descriptive statistics was presented

with frequency, percentage, mean, standard deviation and bootstrap bias corrected confidence interval.For inferential statistics, Chi-square test of independence was done to find the significant association between the qualitative variables. Finally, a binary logistic regression analysis was done to determine the factors associated with the attempt to quit smoking. Statistical analysis was done using Statistical Package SPSS, version 22.0[15]. A p-value of less than 0.05 was considered as statistically significant.

Ethical considerations

Ethical approval for this study was obtained from the Ethics Committee of Universiti Malaysia Sarawak [UNIMAS/NC-21.02/03-02(94)], and also from Medical Research and Ethics Committee (MREC), Ministry of Health (MOH), Malaysia [(05) KKM/NIHSEC/p16-33]. At the same time, as the study was conducted among the community in Sarikei town, a letter of intent to conduct the survey in Sarikei town was sent to Sarikei District Council, seeking permission from the Chairman of the council. All respondents were briefed about the objectives of the study and a written informed consent was obtained prior to data collection.

RESULTS

Sociodemographic characteristics

Socio-demographic characteristics of the respondents are shown in Table 1, in the forms of frequency, mean and standard deviation with the corresponding 95% confidence interval. The mean(SD) age of the respondents was 36.28(13.3) years, with a minimum age of 19 years and maximum age of 79 years. Majority of the respondents (91.5%) were male, while the rest (8.5%) were female. More than half (54.1%) were married, while the rest (45.9%) were either single or divorced. Nearly two-thirds (65.6%) of the respondents were Chinese, followed by Iban (17.2%) and Malay (11.5%). About three-fourths (76.5%) of the respondents were Non-Muslim, while the rest (23.5%) were Muslim. More than two-thirds (69.6%) of the respondents were engaged in a gainful job, while the rest (30.4%) were self-employed. About three-fifths (59.5%) of the respondents had completed secondary level of education, followed by 26.8% who had a diploma and above. Few (5.2%) had no formal education. The mean(SD) family size was 5.4(2.4), with size ranges from living alone up till 25 members. The median monthly income was MYR 2300, with ranges from MYR 288.63 to MYR 30000.

Table 1 Socio-demographic characteristics of the smokers

Variables	n	%/Mean(SD)	95% CI	
			Lower Limit	Upper Limit
Age in years	425	36.28 (13.3)	34.97	37.61
Gender				
Male	389	91.5	88.7	94.1
Female	36	8.5	5.9	11.3
Marital status				
Single	195	45.9	41.2	50.6
Married	230	54.1	49.4	58.8
Race				
Malay	49	11.5	8.7	14.6
Chinese	279	65.6	60.9	69.9
Iban and Others	97	22.8	19.1	26.8
Religion				
Muslim	100	23.5	19.8	27.8
Non-Muslim	325	76.5	72.2	80.2
Occupation				
Self employed	129	30.4	25.9	34.6
Private employee	109	25.6	21.7	30.1
Government employee	61	14.4	11.3	17.9
Others(Unemployed, Retired, etc.)	126	29.6	25.6	34.3
Level of education				
No formal education	22	5.2	3.1	7.5
Primary	36	8.5	5.7	10.8
Secondary	253	59.5	54.8	64.5
Diploma and above	114	26.8	22.8	30.8
Median Monthly income (MYR)	425	2300	2628.8	3083.6
Family size (SD)	425	5.4(2.4)	5.19	5.64

**CI= Confidence interval*

Smoking related characteristics

Smoking-related characteristics of the respondents can be seen from Table 2. The mean(SD) number of family members who smoked was 1.72(1.1). The mean(SD) age of starting smoking was 18.51(4.8) years, with an age range

from 7 years to 50 years. The mean(SD) Fagerström Test for Nicotine Dependence or Nicotine Addiction score was 4.75(2.4), with a minimum score of one and the maximum score of 10. The mean(SD) score for motivation to quit smoking was 3.04(1.0), with a score range of 1 to 5. It was revealed that four-fifths (83.1%) of the respondents had ever seen pictorial health warnings on cigarette packs.

Table 2 Smoking related characteristics

Variables	n	Mean(SD)	95% CI	
			Lower Limit	Upper Limit
No. of family members who smoke	425	1.72(1.1)	1.61	1.83
Age at starting smoking	425	18.51(4.8)	18.04	19.01
Total Addiction score	425	4.75(2.4)	4.52	4.99
Motivation to quit score	425	3.04(1.0)	2.94	3.14
Ever seen PHWs (%)				
Yes	353	83.1	79.1	86.4
No	72	16.9	13.6	20.9

Factors influencing the attempt to quit smoking: Binary logistic regression analysis

More than half (54.8%) of the respondents have ever attempted to quit smoking.To determine the factors influencing attempt to quit smoking, a binary logistic regression analysis was done. The independent variables that were statistically significant in bi-variate chi-square test were included into the binary logistic regression model with forward likelihood ratio method. Those independent variables were age in years, gender, ethnicity, marital status, religion, level of education, pictorial health warnings on cigarette packs and motivation score to attempt to quit smoking. The dependent variable 'attempts to quit smoking' was dichotomized into dummy variable coded as Yes (1) and No (0).

The full model containing all the predictors was statistically significant with model x2 (df, N= 425) = 134.412(6); p<0.001, indicating that the model could distinguish between respondents who attempted to quit smoking and those that did not. The model explained between 27.1% (Cox and Snell R square) and 36.3% (Nagelkerke R squared) of the variance of an attempt to quit smoking and was correctly classified in 75.5% of the cases. The goodness of fit indices was not statistically significant (p>0.05), which indicated a well fitted model and did not violate the assumption. During the analysis, five of the independent variables made a unique contribution to the model (p<0.05), namely ethnicity, marital status, religion, pictorial health warnings on cigarette packs and motivation towards attempt to quit smoking. However, age, gender and level of education were found to be not statistically significant for attempt to quit smoking (p>0.05).

Smokers of Chinese ethnicity were 2.413 (95% CI: 1.103, 5.299) times more likely to attempt to quit smoking compared to smokers of other ethnicities. Respondents who were married had an odds ratio of 1.689 (95% CI: 1.071, 2.664), indicating that they were 1.689 times more likely to have attempted to quit smoking compared to those who were single. Muslims were 2.282 (95% CI: 1.332, 3.909) times more likely to have attempted to quit smoking compared to those of other religions. Besides that, those who had ever seen Pictorial Health Warnings (PHWs) on cigarette packs were 6.600 (95% CI: 3.168, 13.751) times more likely to have attempted to quit smoking compared to those who have never seen pictorial health warnings on cigarette packs. Also, attempt to quit smoking was likely to be high among the respondents who were motivated to quit smoking. Analysis revealed that with every one unit increase of motivation score, the attempt to quit smoking increased by 2.423 times (95% CI: 1.873, 3.34).

DISCUSSION

The aim of the study was to determine the number of smokers who have attempted to quit smoking, as well as to assess the factors determining attempt-to-quit smoking among smokers. Only 54.8% of the smokers had ever tried to quit smoking. This was slightly higher than the national finding of 48.6% of smokers who had ever tried to quit smoking[6].However, the smoking-related policies applied in Sarikei town was the same asthat applied at national level.

Among the socio-demographic characteristics, marital status, religion, ethnicity, ever seen pictorial health warnings on cigarette packs and level of motivation towards attempt to quit smoking were found to be significantly associated with quit smoking attempt. Married smokers were more likely to attempt to quit smoking compared to smokers who were still single. The higher attempt to quit smoking among married people might be due to the presence of another person in their life, of which there was not only more support,but also more to care about. If the smoker was still single, the smoker would only need to care for himself or herself. This was supported by evidence that those with partner influence were

more likely to attempt to quit smoking[17-20]. As for religion, Christianity and Buddhism encourage their followers to abstain fromsmoking[21]. However, Islam discourages and ban smoking[22]. Thus, this may lead to more quitting attempts for religious purposes among Muslims[23], which may be the reason that Muslims were more likely to attempt to quit smoking compared to those of other religions. The study showed that comparatively, smokers of Chinese ethnicity were more likely to attempt to quit smoking compared to smokers of other ethnicities. This might be attributed to the Chinese population being more aware and knowledgeable about the ill-effects of smoking on their health, thus leading to them being more motivated to attempt to quit smoking[24].

Table 3 Factors affecting the attempt to quit smoking: Binary logistic regression analysis

Variables	*B*	Adj.OR	95% CI	
			Lower Limit	Upper Limit
Marital status				
Single (RC)	1			
Married	0.524*	1.689	1.071	2.664
Religion				
Non-Muslim (RC)	1			
Muslim	0.825**	2.282	1.332	3.909
Ethnicity				
Malay (RC)	1			
Chinese	0.883*	2.417	1.103	5.299
Iban and others	0.032	1.033	0.443	2.405
Ever seen PHWs				
Yes	1.887***	6.600	3.168	13.751
No (RC)				
Motivation score to quit smoking	0.885***	2.423	1.873	3.134
Constant	-5.589***	0.001		
Model Chi-square (df)	134.472(6)****			
Cox & Snell R Square	0.271			
Nagelkerke R Square	0.363			
Hosmer and Lemeshow (GOF)	10.387(8); p>0.05			
n	425			

**p<0.05; **p<0.01; ***p<0.001; Adj. OR = Adjusted Odds ratio*

The study found that motivation was significantly associated with quit smoking attempts. The more motivated the smoker is to attempt to quit smoking, the higher chance the smoker will attempt to quit smoking. However, if there is no motivation, the smoker will not attempt to quit smoking. Motivation to attempt to quit is an important aspect in quit smoking process[25-27]. Thus, smoking cessation programs that target smokers' motivation may have a higher rate of success.

As for pictorial health warnings, in the study, most of the smokers who had ever seen pictorial health warnings mentioned that they did not find pictorial health warnings effective. Similar findings were reported in previous studies[28]. However, the study found the likelihood of quit smoking attempts among the smokers who had seen the pictorial health warnings was still higher than among the smokers who had never seen the pictorial health warnings. Pictorial health warnings evoke fear, where they increase the intention to attempt to quit smoking[28-29]. This was supported by the fact that the percentage of those intending to attempt to quit smoking was higher if they had ever seen pictorial health warnings, compared to if they had never seen a pictorial health warning.

From the study, level of motivation and pictorial health warnings on cigarette packs positively influenced attempt-to-quit smoking, which supported two of the hypotheses made. However, the level of addiction did not influence attempt-to-quit smoking as the quit smoking attempt was similar for smokers with low dependence on nicotine and high dependence on nicotine, which did not support the hypothesis. This showed that no matter the level of addiction, it did not influence smokers in their quit smoking attempts. However, despite their attempts to quit smoking, none of the smokers managed to achieve complete smoking cessation, since they were all current smokers.

LIMITATIONS

One of the limitations of this study was that data was collected via face-to-face interview by a medical doctor, which may lead to response bias because some respondents may not be truthful when facing health authorities, as smoking is a health-related issue. Moreover, data collected

were self-reports from the respondents, where their values depended on the memory of the respondents, which may lead to recall bias. Another limitation was the study only involved current smokers, which may not portray actual quit smoking attempts as past smokers should be included as well. Also, the study was only carried out among the community in Sarikei town. Thus, the results are not representative of the general population and cannot be extrapolated to the rest of Sarawak.

CONCLUSION

Our study found that 54.8% of the smokers had ever tried to quit smoking. Factors such as ethnicity, marital status, religion, level of motivation and pictorial health warnings on cigarette packs were associated with higher quit smoking attempts. There is a need to conduct suitable smoking-related programs based on the community needs, targeting the prominent factors and the smokers' motivation to quit smoking, which may lead to a reduction in the number of smokers. Also, as only certain pictorial health warnings were found to be associated with quit smoking attempts, suitable pictorial health warnings should be used on cigarette packs for them to have an impact on smokers to quit smoking.

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