

# Quit Smoking Clinic: Factors Associated with Successful Quit Smoking in Besut District, Terengganu State of Malaysia

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## ABSTRACT

**Background:** The Malaysian National Health and Morbidity Survey 2019 illustrated the prevalence of current smoker was 21.3%. Out of current smokers, only about half of them made an attempt to quit smoking in the past 12 months and only 7.4% of the smokers had visited a healthcare provider for quit smoking advice. The “Quit Smoking Clinic” was established in Malaysia since 2000 to make smoking cessation service accessible for everyone. This study aims to determine the factors associated with successful quit smoking among smokers attending “Quit Smoking Clinic” in Besut District, Malaysia.

**Materials and Methods:** A district-wide record review study using “Quit Smoking Clinic” record [BPKK/KBM(PKD)/3/2012 Amendment 2018] from seven health clinics was conducted. A logistic regression (LR) model was performed to assess the factors influencing successful quit smoking status. A success quit smoking status was defined as remaining abstinent from smoking behavior at six months of clinic follow-up.

**Result:** A total of 414 clients from seven health clinics in Besut were included, 14.3% of them had success quit smoking status. In the final MLR model, factors influencing successful quit smoking were older age group 45 years old and above (Adj. OR 2.27; 95% CI: 1.22, 4.22, p-value=0.010), voluntary participation in the clinic (Adj. OR 1.86; 95% CI: 1.00, 3.45, p-value=0.049) and frequent visits to the clinic (Adj. OR 5.33; 95% CI: 2.88, 9.86, p-value<0.001).

**Conclusion:** Emphasis on these factors associated with the success of quit smoking status is beneficial to improve the service of “Quit Smoking Clinic” as well as to promote an accessible smoking cessation support for smokers in the district. Reinforcement of tobacco control policies in Malaysia is imperative to encourage more smokers to quit smoking in the country.

**Keywords:** Associated factors, cessation, Malaysia, smoking, quit.

**Submitted :** August 10, 2022

**Published :** November 9, 2022

**ISSN:** 2593-8339

**DOI:** 10.24018/ejmed.2022.4.6.1476

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## I. INTRODUCTION

In Malaysia, tobacco is the leading cause of premature and preventable death and currently 4.8 million Malaysians are smokers. The National Health and Morbidity Survey 2019 illustrated the prevalence of current smoker in Malaysia was 21.3%. It has been reported that 27.1% of the smokers were in group of age 30 to 34 years old and majority of them live in rural areas [1]. Out of current smokers, only about half of them made an attempt to quit smoking in the past 12 months and only 7.4% of them had visited a healthcare provider for quit smoking advice [1]. Terengganu is the third state with the highest smokers (23.9%) in Malaysia [1]. MPOWER policies was introduced by World Health Organization (WHO) in 2008 aim to help countries to tackle smoking issue, to reduce the tobacco demand and to achieve the implementation of The End Game [2]. One of the six MPOWER strategies is to offer help to quit smoking.

The “Quit Smoking Clinic” was established in Malaysia since 2000 in line with this strategy to make smoking cessation services accessible for everyone. It has been well established in 729 primary health clinics nationwide. Currently the “Quit Smoking Clinic” is provided by an integrated primary health care (PHC) team consisting of family medicine specialist, medical officer, assistant medical officer, nurses, pharmacist and dietitian [3]. This “Quit Smoking Clinic” highlights the concept of transtheoretical model (TTM) of behaviour change theory. The goal of this theory is to move a person to the next stage. This model postulates that smoking behaviour change involves progress through six stages of change; precontemplation, contemplation, preparation, action, maintenance, and termination [4]. The 3As strategies; Ask, Advice, and Action are also employed to guide the team through the right process to talk to the smokers to quit on the tobacco use and to deliver advice [5]. The Fagerström test for nicotine dependence is

used as a screening tool for nicotine dependence and also as a severity rating which can guide healthcare provider to arrange the treatment planning for smoking cessation. This tool consists of six items to assess the amount of cigarette consumption, the desire to consume, and level of dependence [6]. The clinic offers various type of choice of treatment to assist smokers in the cessation of smoking behavior. The treatment is divided into pharmacology and non-pharmacology treatment [3]. The pharmacological are the nicotine replacement therapy (NRT) for example the gum and nicotine patch and the common use of non-NRT is the varenicline. Counselling is offered as a non-pharmacological treatment in the “Quit Smoking Clinic”.

Over recent years, successful quit smoking rates were reported as ranging from 30.2% to 45.5% [7]-[11]. A study in South Korea reported almost 40.0% of smokers accomplished smoking cessation following a 12-week quit smoking intervention [8]. In Karachi, Pakistan, a study among 330 former adult smokers, 50.3% quit successfully on their first attempt [12]. A recent study by Ahmad Zamzuri, Kamarudin [7] among smokers attending “Quit Smoking Clinic” in Seremban district, Malaysia discovered 30.2% had effectively stop smoking after six month of clinic follow-up. Among the ever smokers in Malaysia, at least one third of them have ceased smoking behaviour [11]. Previous study performed in pharmacist-led Integrated Quit Smoking Service (IQSS) in Sabah, Malaysia showed a 42.6% had successfully ceased smoking after completed the six-month program in the state [9].

Several studies worldwide have looked into the significance of demographic and behavioural factors in association with successful quit smoking behaviour [12]-[14]. A few studies reported older smokers had greater smoking cessation [10], [15], [16]. Male smokers were more likely to quit smoking than females [17]. However, some suggest females had higher chance to succeed in quitting because they were more likely to have concerns regarding health [18] and due to stereotypical societal values and cultural disapproval of smoking among females [19]. A study in Seremban district, Malaysia demonstrated Malay smokers had a higher likelihood of quitting smoking [7]. Another study among Malaysian illustrated smokers of Malay ethnicity was significantly successful in quitting behaviour [11]. Smokers who live in urban areas have a higher chance in smoking cessation because of better access to medical facilities and more media resources for tobacco control educational campaigns, as well as higher educational attainment [20], [21]. Smokers with chronic medical illness such as hypertension, diabetes, tuberculosis, ischemic heart disease and asthma were associated with successful quit smoking and they often used more assertive choice of tobacco-cessation treatment compared to those without comorbidities [7], [8], [10], [22]-[24]. Other associated factor influencing successful quit smoking was voluntary participation in the smoking cessation service. Having higher self-efficacy and motivation to quit smoking as assessed before the clinic participation was significantly associated with the success of quitting smoking at the end of the service [12], [25], [26]. A few studies showed frequent visit to quit smoking clinic had resulted in a higher success rate of smoking cessation [7], [9], [27]. Choice of tobacco-cessation

treatment is essential to assist the quit smoking behaviour. First-line pharmacotherapies for smoking cessation include nicotine replacement therapy (NRT) and varenicline [28]. Studies by Ahmad Zamzuri, Kamarudin [7] and Moore, Aveyard [29] showed NRT had a significant effect on the success rate of smoking cessation. A randomized-controlled study conducted in 10 countries demonstrated varenicline to be very effective in helping smokers to quit smoking at the end of treatment [30]. In addition, there was also evidence on effectiveness of individual counselling when pharmacotherapy was not offered to the smokers [31].

Smoking cessation is the most critical challenge as it is a modifiable risk factor for morbidity and premature mortality in the world [32]. Ministry of Health Malaysia took initiative introducing “Quit Smoking Clinic” as a form of smoking cessation service to assist smokers to quit smoking behavior. However, the outcome of the service in Besut district never been evaluated. The knowledge about quit smoking in Besut district is limited and the associated factors are not widely explored. Yet, there is no available study describes the associated factors of successful quit smoking in Besut district. This study aims to determine the proportion and factors associated with successful quit smoking among smokers attending “Quit Smoking Clinic” in Besut District, Malaysia. This is the first study in the district to investigate the implementation of the service in public health clinics. The researchers hope that this study findings will assist to provide detailed evidence on the factors associated with successful quit smoking, which can be used by the healthcare provider and other agencies in the planning for effective quit smoking services in the future.

## II. MATERIALS AND METHODS

This was a cross-sectional study conducted in the Besut district which is situated at the north of Terengganu State, Malaysia. Health facilities were built to serve the people in this district, including one hospital and eight primary health clinics. There were seven health clinics equipped with a “Quit Smoking Clinic” in the district, chosen to be involved in this study. The health clinics were Klinik Kesihatan Kampung Raja, Klinik Kesihatan Kuala Besut, Klinik Kesihatan Jerteh, Klinik Kesihatan Padang Luas, Klinik Kesihatan Jabi, Klinik Kesihatan Sri Medang and Klinik Kesihatan Pasir Akar. Each “Quit Smoking Clinic” has a complete multi-disciplinary team with the necessary services as provisioned by the Ministry of Health document on stop smoking service in health clinics [3].

A district-wide record review was conducted using “Quit Smoking Clinic” records from seven health clinics. The study used secondary data from “Quit Smoking Clinic” record [BPKK/KBM(PKD)/3/2012 Amendment 2018]. Data between January 2018 and December 2021 were collected. All data of smokers who were aged 18 years old and above, registered in “Quit Smoking Clinic” and had been followed up for six months in the clinic were included in the study. The information obtained includes demographic factors such as age, sex, ethnicity, residence locality and comorbidities. The behavior at “Quit Smoking Clinic” are mode of participation, frequency of clinic visits and the choice of treatment. A success quit smoking status was defined as remaining

abstinent from smoking behaviour at six months of clinic follow-up [3], [9]. The data samples were later stratified into two groups: those who were success or failed in quitting. The mode of participation in the clinic was based on how the client was registered with the service, either 'Voluntary' or 'Referral' from the healthcare provider [7]. The choices of treatment were divided into three groups; the smokers who received a nicotine replacement therapy (NRT), a non-NRT or counselling only [10]. An appropriate sample size calculation was conducted with a sample size of 414 data of smokers was estimated to be sufficient to address the objective.

### III. STATISTICAL ANALYSIS

Data entry and analysis was carried out using the SPSS version 22.0 software. The demographic characteristics and behavior at "Quit Smoking Clinic" were tabulated for descriptive characteristics where numerical data was presented as mean (SD) and categorical data was presented as frequency (%). Logistic regression models were used to analyse the association between the factors with the quit smoking status. Preliminary main effect model was obtained after using auto forward selection. The single dichotomous outcome of quit smoking status was coded as 0 for fail and 1 for success. The variables explored were age, sex, ethnicity, residence locality, comorbidities, mode of participation, frequency of clinic visits and the choice of treatment. All the variables were analyzed as categorical variables. Age was categorized as "18-44" and " $\geq 45$ " years, sex was characterized as "female" and "male" and ethnicity was categorized as "others" and "Malay". The residence locality was classified into "urban" and "rural". There were five comorbidities analyzed in this study which were diabetes, hypertension, ischemic heart disease, tuberculosis and asthma. Each comorbidity variables were categorized as "no" and "yes". The mode of participation in the clinic was characterized into "referral" and "voluntary". The frequency of clinic visits was divided into " $\leq 2$ " and " $> 2$ ". Choice of treatment was categorized as "counselling", "Non-NRT" and "NRT" based on the record of treatment given in the clinic. From univariate analysis, variables with p-value of less than 0.25 or of clinical importance were selected for multiple logistic regression. The final model was established where the adjusted odds ratio (Adj. OR) was estimated with 95% confidence interval. Statistical significance was set at p-value  $< 0.05$  (two-tailed).

### IV. ETHICAL APPROVAL

The participants were not required to provide informed consent as this involved a record-review study of secondary data. Ethics approval was obtained from Medical Research and Ethics Committee (MREC), Ministry of Health Malaysia (NMRR ID-22-01389-KJ).

### V. RESULTS

A total of 598 smokers were registered in the selected seven health clinics with comprehensive "Quit Smoking Clinic" between January 2018 and December 2021. Out of these, only  $n=414$  (69.2%) individuals fulfilled the study criteria while  $n=184$  (30.8%) were the missing data or smokers who were lost to follow up, hence were excluded from the study. Of the 414 records reviewed, 59 (14.3%) had a success quit smoking status while 355 (85.7%) had failed in quitting.

Table I shows the sociodemographic characteristics and behaviour of smokers attending "Quit Smoking Clinic" in Besut, by quit smoking status. The mean age was 45.40 ( $\pm$ SD 13.07) years. There were 28.6% females and 14.0% males in the success quit smoking group. Majority of the smokers were Malay ethnicity (99.0%) and 13.7% of smokers from urban locality had success in quitting. Approximately 27.6% of those with diabetes and 16.7% with hypertension were in the group that successfully quit smoking. About 32.3% smokers with ischemic heart disease have successfully quit smoking after six months in the clinic. Around 33.3% of smokers with a history of tuberculosis and 27.3% of those with asthma have achieved smoking cessation status. Smokers who voluntarily registered in the "Quit Smoking Clinic", 25.2% of them had success in quitting. The minimum frequency of clinic visits was 1 and the maximum was 10. The mean frequency of clinic visits was 2.10 ( $\pm$ SD 1.17). One-third of smokers (34.0%) with more than two clinic visits attained a success quit status. The smokers with successful quit smoking status who received counselling, non-NRT and NRT were 9.0%, 21.4% and 10.5%, respectively.

Simple logistic regression showed age, comorbidities of diabetes, ischemic heart disease, tuberculosis and asthma, mode of participation, frequency of clinic visits and choice of treatment as significant factors with all the p-values less than 0.25. Variable sex, ethnicity, residence locality and hypertension were not significant in the simple logistic regression, therefore were not included in the multiple logistic regression analysis.

In the final multiple logistic regression model, only age, mode of participation and frequency of clinic visits remained statistically significant; after adjusting for comorbidities and choice of treatment. Table II shows the univariate and multivariate logistic regression analysis of the study. Those aged 45 years old and above showed better odds of having a success quit smoking status compared to a person 18 to 44 years old (Adj. OR 2.27; 95% CI: 1.22, 4.22,  $p=0.010$ ). Smokers who were voluntarily participated in the clinic showed greater chance of smoking cessation compared to those who were referred to the clinic by healthcare provider (Adj. OR 1.86; 95% CI: 1.00, 3.45,  $p=0.049$ ). Smokers who attended more than two clinic visits had five times odd of having a success quit smoking status compared to smokers with two and less clinic visits (Adj. OR 5.33; 95% CI: 2.88, 9.86,  $p$ -value = 0.099).

TABLE I: SOCIODEMOGRAPHIC CHARACTERISTICS AND BEHAVIOR OF SMOKERS ATTENDING “QUIT SMOKING CLINIC” IN BESUT, BY QUIT SMOKING STATUS (N = 414)

Variables	Total, n (%)	Mean ( $\pm$ SD)	Quit Smoking Status, n (%)	
			Success	Fail
<b>SOCIODEMOGRAPHIC CHARACTERISTICS</b>				
Age				
		45.40 ( $\pm$ 13.07)		
18-44	201 (48.6)		19 (9.5)	182 (90.5)
$\geq$ 45	213 (51.4)		40 (18.8)	173 (81.2)
Sex				
Female	7 (1.7)		2 (28.6)	5 (71.4)
Male	407 (98.3)		57 (14.0)	350 (86.0)
Ethnicity				
Others	4 (1.0)		1 (25.0)	3 (75.0)
Malay	410 (99.0)		58 (14.1)	352 (85.9)
Residence Locality				
Rural	312 (75.4)		45 (14.4)	267 (85.6)
Urban	102 (24.6)		14 (13.7)	88 (86.3)
Diabetes				
No	385 (93.0)		51 (13.2)	334 (86.8)
Yes	29 (7.0)		8 (27.6)	21 (72.4)
Hypertension				
No	342 (82.6)		47 (13.7)	295 (86.3)
Yes	72 (17.4)		12 (16.7)	60 (83.3)
Ischemic Heart Disease				
No	383 (92.5)		49 (12.8)	334 (87.2)
Yes	31 (7.5)		10 (32.3)	21 (67.7)
Tuberculosis				
No	405 (97.8)		56 (13.8)	349 (86.2)
Yes	9 (2.2)		3 (33.3)	6 (66.7)
Asthma				
No	403 (97.3)		56 (13.9)	347 (86.1)
Yes	11 (2.7)		3 (27.3)	8 (72.7)
<b>BEHAVIOUR AT QUIT SMOKING CLINIC</b>				
Mode of Participation				
Referral	299 (72.2)		30 (10.0)	269 (90.0)
Voluntary	115 (27.8)		29 (25.2)	86 (74.8)
Frequency of Clinic Visits				
$\leq$ 2	311 (75.1)	2.10 ( $\pm$ 1.17)	24 (7.7)	287 (92.3)
$>$ 2	103 (24.9)		35 (34.0)	68 (66.0)
Choice of Treatment				
Counselling	222 (53.6)		20 (9.0)	202 (91.0)
Non-NRT	173 (41.8)		37 (21.4)	136 (78.6)
NRT	19 (4.6)		2 (10.5)	17 (89.5)

## VI. DISCUSSION

Our study showed only 14.3% of smokers attending “Quit Smoking Clinic” attained a success quit smoking status. This study result was consistent with a study conducted in England, Nottingham and North Cumbria which reported similar rate of smoking cessation at 14.6% [33]. In Northern Taiwan, a study among smokers attending outpatient smoking cessation service showed that 37.7% had successfully quit smoking after six-month in the service which was higher compared to this study [27]. In Malaysia, [7] demonstrated 30.2% of the smokers from Seremban district had achieved smoking cessation after attending “Quit Smoking Clinic” provided by the primary health clinics. Another study in Sabah reported 42.6% of our smokers who registered in the pharmacist-led Integrated Quit Smoking Service (IQSS) had obtained a success quit smoking status, much higher than what was found in this study [9]. However, the measurement outcome timeline for these studies were all different, therefore making comparisons difficult. It is expected that the longer the duration of the cessation service, the higher the chances of smoking cessation could be observed [34].

Three factors were associated with the success quit smoking status; these were the age, mode of participation and frequency of clinic visits. This study aimed to determine factors associated with successful quit smoking among smokers attending “Quit Smoking Clinic” in Besut District. There was significant association between older age group of the smokers and their smoking cessation status. Ageing is a natural process whereby individuals are exposed to various ill-health issues [35]. Older smokers were more likely to stop smoking because of their health issues. Abdullah, Ho [36] reported increasing age was positively related to the success in quit smoking behavior. The older smokers in the study were successfully quit smoking behavior due to poor health and presence of comorbidities. Smoking cessation in older age also can be related to the inverse U-shaped relationship of nicotine dependence with the age. Nicotine dependence is markedly reduced when the individual is over 50 years of age [37]. In contrast to a study by Messer, Trinidad [38] in United States of America, reported young smokers might also be able to quit smoking due to higher prevalence of smoke-free homes in the country and their own strong desire to quit smoking.

TABLE II: UNIVARIATE AND MULTIVARIATE LOGISTIC REGRESSION ANALYSIS OF FACTORS ASSOCIATED WITH SUCCESSFUL QUIT SMOKING STATUS AMONG SMOKER ATTENDING “QUIT SMOKING CLINIC” IN BESUT (N = 414)

Variables	n (%)	Crude OR* (95% CI)	p-value	Adjusted OR† (95% CI)	p-value
Age					
18-44	201 (48.6)	1		1	
≥ 45	213 (51.4)	2.22 (1.24, 3.97)	0.008	2.27 (1.22, 4.22)	0.010
Sex					
Female	7 (1.7)	1			
Male	407 (98.3)	0.41 (0.08, 2.15)	0.290	-	-
Ethnicity					
Others	4 (1.0)	1			
Malay	410 (99.0)	0.49 (0.05, 4.83)	0.545	-	-
Residence Locality					
Urban	102 (24.6)	1			
Rural	312 (75.4)	1.06 (0.56, 2.02)	0.861	-	-
Diabetes					
No	385 (93.0)	1			
Yes	29 (7.0)	2.49 (1.05, 5.93)	0.039	-	-
Hypertension					
No	342 (82.6)	1			
Yes	72 (17.4)	1.26 (0.63, 2.51)	0.520	-	-
Ischemic Heart Disease					
No	383 (92.5)	1			
Yes	31 (7.5)	3.25 (1.44, 7.30)	0.004	-	-
Tuberculosis					
No	405 (97.8)	1			
Yes	9 (2.2)	3.12 (0.76, 12.82)	0.115	-	-
Asthma					
No	403 (97.3)	1			
Yes	11 (2.7)	2.32 (0.59, 9.02)	0.223	-	-
Mode of Participation					
Referral	299 (72.2)	1		1	
Voluntary	115 (27.8)	3.02 (1.72, 5.32)	<0.001	1.86 (1.00, 3.45)	0.049
Frequency of Clinic Visits					
≤ 2	311 (75.1)	1		1	
> 2	103 (24.9)	6.16 (3.44, 11.02)	<0.001	5.33 (2.88, 9.86)	<0.001
Choice of Treatment					
Counselling	222 (53.6)	1			
Non-NRT	173 (41.8)	2.75 (1.53, 4.94)	0.001	-	-
NRT	19 (4.6)	1.19 (0.26, 5.52)	0.826	-	-

\*Crude OR using Univariate Logistic Regression analysis. †Adjusted OR using Multivariate Logistic Regression analysis. Constant = -3.130  
Forward LR method. No interaction and multicollinearity. Hosmer-Lemeshow Test is not significant, p-value = 0.558. Classification table 85.7%  
Area Receiver Operating Characteristics (ROC) 76.6%

Mode of participation was found to influence the success in smoking cessation. A quarter of smokers who voluntarily attending “Quit Smoking Clinic” in Besut had ceased smoking. The results also showed that smokers who willingly participated in the service had almost two times odd of having success quit smoking status compared to those presented because of physician referral. A study conducted in Japan reported smoking cessation status was significantly associated with voluntary participation in the clinics [25]. A strong desire and higher self-efficacy to quit smoking contributed to smoking cessation at the end of the intervention [26]. In addition to effective psychological and emotional support conveyed by well-trained staff in cessation program, good attitude and insight would be beneficial for smokers to be more prepared in practicing lifestyle modification [39].

The frequency of clinic visits was found to influence the success of smoking cessation among smokers attending “Quit Smoking Clinic”. Smokers who had more than two clinic visits were 5.33 times more likely to have a success quit smoking status compared to those who attend two or less visits. Similar to a study in Taiwan, reporting frequent clinic visits contributed to higher abstinence rates. An increase in the frequency of visits to the clinic can lead to better adherence to management and increase motivation to quit smoking in the smokers [27]. One of the reasons of loss of

follow-up was starting the cessation treatment in the first appointment. One of the reasons for the loss of clinic follow-up was initiating cessation treatment early during the first appointment. Study by [40] showed that increase in frequency of follow up in quit smoking clinic is superior than starting medication treatment early without frequent follow up. Our study result was similar to few other studies which reported the evidence of dose-response relationship between frequency of clinic visits and quit smoking status [14], [41]. An increase in the number of clinic visits led to successful smoking cessation.

In this study, comorbidities such as hypertension, diabetes mellitus, tuberculosis, ischemic heart disease and asthma were found to be insignificant for successful smoking cessation. Smoking behavior could adversely affect treatment efficacy and cause deterioration of comorbidities [24]. Smokers with various comorbidities were usually more motivated to quit smoking and ready for cessation treatment [23]. Somehow, our study did not show any significant relationship between the presence of any comorbidities and the success of smoking cessation. Choices of treatment was not a significant factor influencing success quit smoking status in this study. Many other studies reported various findings on the evidence-based smoking cessation treatment [31]. Among the three treatment options provided in the “Quit Smoking Clinic” in Besut, the majority of smokers who

underwent non-NRT intervention had successfully quit smoking compared to those who had NRT and counselling alone. A randomized clinical trial demonstrated varenicline is a powerful drug to assist smokers on their journey to quit smoking [30]. Meanwhile, study also reported NRT could help to reduce withdrawal symptoms associated with stopping smoking by replacing the nicotine from cigarettes. The chances of stopping smoking were increased by 50 to 70% [42]. However, multivariate analysis did not find any significant relationship between any of the treatment options and the success of smoking cessation in this study.

## VII. STRENGTHS AND LIMITATIONS

This study is the first that explored factors influencing success quit smoking status among smokers attending “Quit Smoking Clinic” in Terengganu state of Malaysia. The findings represent the overall status of smoking cessation after six months follow-up in the clinic and the information can be used to improve the quality of service. Nonetheless, this study also has several shortcomings. It carries the risk of recording bias because this study uses secondary data. The data integrity was reliant on the quality of documentation in the quit smoking records. The limited variables in this study were inadequate to address a larger scope of demographic and clinical factors. Additional information on educational level, occupation and smoking-related history such as number of quit attempts, duration of smoking and daily cigarettes consumption were not available. The definition of the quit smoking status varies in many different studies. Some studies used the duration of eight weeks service follow-up and some used up to one year follow-up, but this study defined smoking cessation as remained abstinence after six months clinic follow-up [7], [9].

## VIII. CONCLUSION

The “Quit Smoking Clinic” plays an essential role in advising and supporting smokers throughout the smoking cessation journey and concomitantly providing appropriate smoking cessation treatment. The goals are to empower the smokers to quit smoking and to practise a healthy lifestyle free from nicotine addiction. We identified that nearly one-sixth of smokers had successfully quit smoking after clinic follow-up. Those aged 45 years old and above, voluntarily participated in the clinic and had frequent clinic visits (> two visits) were found to show successful smoking cessation. Recognition of these factors associated with the success of quit smoking status is beneficial to improve the service of “Quit Smoking Clinic” as well as to promote an accessible smoking cessation support for smokers in the district. This smoking cessation service should be extensively and sustainably operated in Malaysia and efforts can be periodically made to improve its quality. Reinforcement of tobacco control policies in Malaysia is imperative to encourage more smokers to quit smoking in the country.

## ACKNOWLEDGMENT

We would like to acknowledge the Ministry of Health Malaysia for giving us an opportunity to conduct this research in their health clinics. Our gratitude to all the staff from the health clinics and Besut District Health Office involved in this study.

## CONFLICT OF INTEREST

Authors declare that they do not have any conflict of interest.

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