Factors associated with unsuccessful quitters in stop smoking services in Perlis, Malaysia

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ABSTRACT

Introduction: Tobacco smoking is one of major risk factor of non-communicable disease worldwide. As a prevention strategy, stop smoking services has been advocated at primary care. However, evidence suggests that worldwide there is high rate of unsuccessful quitters. In Malaysia, such evidence has come from small studies or single site study, and evidence on factors associated with failure to quit is scarce. This study aimed to identify the factors associated with unsuccessful quitters among smokers in Stop Smoking Services provided by government health clinics at North Peninsular of Malaysia.

Materials and Methods: This was a retrospective study record review using data from the Stop Smoking Services registry and patient file card between January 2017 and Jun 2019. Independent variables included in this analysis are sociodemographic data, comorbidity, number appointments attended, duration of smoking, age of starting smoking, previous attempt to quit, fagerstrom score and type of treatment. The outcome of interest, is unsuccessful quitters defined as those who continued to smoke at 6 months after attending the service. A total of 427 sample randomly cases selected from 490 eligible sample was analysed. Logistic regression was used to model factors associated with unsuccessful quitters.

Results: The study suggested that clients who attended 0-3 clinic sessions (AdjOR 6.57; 95% CI: 4.14, 10.43) and being single, unmarried (AdjOR: 2.78; 95%CI: 1.07, 7.18) was associated with increased risk of being unsuccessful quitters among smokers in Northern state of Malaysia

Conclusion: The number of clinic sessions attended and marital status were factors associated with unsuccessful quitters among smokers in the State of Perlis, of Malaysia.

KEYWORDS:
Stop Smoking Services, Factor Associated, Unsuccessful Quitters

INTRODUCTION

Tobacco Smoking is one of the risk factors for many chronic diseases such as diabetes mellitus, hypertension, cancer and cardiovascular disease. It is estimated that there are around 1.1 billion people who smoke tobacco cigarettes worldwide. Nicotine, the pharmacological active drug inside the tobacco is highly addictive that may cause quitting a challenge.[1] Results from the National Health Morbidity Survey (NHMS) 2015, showed approximately 22.8% of Malaysian aged 15 years and above were smokers which relatively increased in trend from 21.5% in 2006.[2] Furthermore, smoking causes 15% hospitalization and 35% inpatient death in Malaysia. In fact, smoking also caused 20000 deaths per year in Malaysia.[3] To minimise the impact of tobacco use, the World Health Organisation (WHO) had promoted the Framework Convention on Tobacco Control (FCTC) worldwide which is the only public health treaty under the auspices of WHO since 2003.[4] The framework including the MPOWER package as a technical measure and resources that will assist in reducing the demand for tobacco products at country-level. Despite recommendation from WHO FCTC, the rate of unsuccessful quitters still varies across state and even countries ranging from 44.3-82.7%. [5-9]

There are many factors known from previous studies that may contribute to unsuccessful quitters, for example amount of cigarette smoked per day, previous attempts to quit, motivation, level of stress, number of clinic sessions, living alone or sharing living place with other smoker and many others.[7,9-14] Several studies in Malaysia showed that the prevalence of unsuccessful quitters in stop smoking services ranged between 40% and 82.7%.[7,15,16] Even though the Stop Smoking Services had started since 2004, there was no evaluation done in the state of Perlis as yet. The northern peninsular states have the highest prevalence of tobacco smokers among adolescents as compare to other states in Malaysia, thus strengthening the purpose of this study.[17] It has also been demonstrated that those who started smoking before the age of 16 years old had a two-fold increase risk of being as unsuccessful quitter.[18] This is a worrying trend as it may impact on the rise of chronic diseases burden in the future, therefore it is necessary to know how the service needs to be improved by targeting key smokers at risk in the population.

This study aimed to identify the factors associated with unsuccessful quitters among smokers in Stop Smoking Services provided by the Malaysian government health clinics in North Peninsular State of Malaysia. Data are selected from the Stop Smoking Services registry available. This may optimise the service as there is limited state wide

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evidence regarding factor associated with unsuccessful quitters among smoker who registered in stop smoking services in primary health care.

MATERIALS AND METHODS

Perlis is a state located at North Peninsular end of Malaysia with a population estimated of 254,000 people mainly Malays, followed by Chinese, Indians and others including Siamese.19 This was a retrospective record review study where the data were collected from the Stop Smoking Services (SSS) registry from 10 government health clinics. SSS are provided by medical officer, trained paramedics and pharmacists who always contribute to trustworthiness of the registry data. Smokers more than 18 years old that registered with SSS between January 2017 and June 2019 were included for this study. This duration has been selected in view of the format of SSS registry has been updated to latest version among all government health clinics in Malaysia since January 2017. From total 691 sample available, 490 met the inclusion and exclusion criteria. A pre-calculated sample size of 427 was selected by random sampling using a random number of samples generated from Microsoft excel. From the random sample generated number, the data filtered according to rank of the random generated number and first 427 sample listed were selected. Data were extracted from the Stop Smoking Clinics registry and patient file card from the clinics involved. The variable collected included sociodemographic data, age started smoking, comorbidity, Fagerstrom score, previous attempt to quit, type of treatment given, and outcome either successfully quit form smoking or not. Comorbidity was defined as either client having hypertension, diabetes mellitus, asthma or pulmonary tuberculosis at time of the stop smoking treatment given. The primary outcome (unsuccessful quitters) defines as those who continued to smoke at 6 months after attending the service. The Fagerstrom score was categorise as 0-3(Low),4-5(Moderate) and 6-10(High).[20] Counselling only and Combine Counselling and Pharmacotherapy treatment (combine) are provided in this service. Counselling, also known as Behaviour Therapy can be delivered individually or as a group.[21]

Statistical analysis

Data was entered and analysed using SPSS version 24. Multiple logistic regressions were performed with the aim to find the predictive factor of unsuccessful quitters among smokers. The dependent variable was outcome of the stop smoking services at 6 months either successful quitters or unsuccessful quitters with the successful quitters as the reference category. Clients lost to follow up were excluded from this study. There were missing data for variable occupation, education level, marital status, Fagerstrom score and age started smoking. Missing data from Fagerstrom score and age started smoking were replaced by mean value before proceed to simple logistic regression. After replacing the missing data, the variables were reassessed and there was no extreme deviation of the mean from original data for both variables. The variable 'Occupation' was not included in simple logistic regression since the missing data was not at random and contained more 25% of the data. The preliminary main effect template was obtained base on factor with p-value <0.25 at univariate level. Factor included in Multiple logistic regression were age, gender, ethnicity, marital status, education level, hypertension disease, number of clinic session, previous attempt to quit, duration of smoking and type of treatment.

This study was approved by Jawatankuasa Etika Penyelidikan (Manusia) JEPeM of Universiti Sains Malaysia (JEPeM Code: KKM/NIHSEC/P19-2534(6)) and Malaysia Research and Ethics Committee (MREC) (NMRR-19-3235-51279).

RESULTS

From 427 cases selected by simple random sampling, the successful quitters were 158 (37%) and the unsuccessful quitters were 269 (63%). Overall mean (SD) for age client registered in stop smoking services was 51.8 (16.2) years with 74.9% of client aged 40 and above. Mean (SD) for age start smoking was 19.5 (6.45) with age '19 years old or less' comprised 42.9% of clients and mean (SD) for Fagerstrom score was 2.6 (2.5) with score of 0-3 (Low) comprised 72.6% of clients. Mean (SD) for numbers of clinic sessions follow up was 3.2 (2.2) with number of clinic session 0-3 times comprise 64.2% of clients. Table I shows the population characteristics of this study.

From the simple logistic regression, 10 factors were significant at p<0.25 these included age, gender, ethnicity, marital status, education level, hypertension disease, number of clinic session, previous attempt to quit, duration of smoking and type of treatment. These were selected for multiple logistic regressions. Only 3 factors remained significant to be included in the final model which are Number of Clinic session, marital status and age.

In the final model (Table III) showed that the number of clinic sessions attended and marital status were significant factors associated with unsuccessful quitters of smoking. The number of clinic sessions attended, those who attended 0-3 sessions was six times more likely to be as an unsuccessful quitter as compared to those who attended 4 or more sessions. For marital status, being single or unmarried had double the risk of being an unsuccessful quitter when the frequency of clinic session attended and age was adjusted.

DISCUSSION

Tobacco smoking remains the main factor that may contribute to the Non-communicable disease globally. As the SSS implemented worldwide, the rate of unsuccessful quitters remained as a public health concern. Many studies had been done globally to understand the risk factor that associate with the unsuccessful quitters. Results from many studies are varied. The marked difference in unsuccessful quitter's rate between each study may depend of different sociodemographic factors, religious sensitivity and availability of trained staff that might influence the unsuccessful rates.[16] Current study had been proposed to study the associated factors with unsuccessful quitters among smoker who registered in stop smoking services in Perlis.

Table I: Sociodemographic, Clinical Characteristic and Outcome of Client in Stop Smoking Services Attending Health Clinic in Perlis January 2017-Jun 2019 (N=427)

Variable	Number (%)
Age group	
18-24	25 (5.9%)
25-39	82 (19.2%)
40-54	111 (26.0%)
≥ 55	209 (48.9%)
Gender	
Female	14 (3.3%)
Male	413 (96.7%)
Ethnicity	
Malay	380 (89.0%)
Chinese	32 (7.5%)
Others	15 (3.5%)
Marital status	
Single, unmarried	58 (13.6%)
Married	354 (82.9%)
Missing	15 (3.5%)
Education level	
No education/ Primary	67 (15.7%)
Secondary	223 (52.2%)
Diploma or Higher	40 (9.4%)
Missing	97 (22.7%)
Occupation	
Professional or manager	32 (7.5%)
Clerical, service, arm forces or technician	53 (12.4%)
Manual	137 (32.1%)
Retiree, housewife, student or unemployed	80 (18.7%)
Missing	125 (29.3%)
Hypertension	
No	253 (59.3%)
Yes	174 (40.7%)
Diabetes mellitus	
No	328 (76.8%)
Yes	99 (23.2%)
Ischemic heart disease	
No	413 (96.7%)
Yes	14 (3.3%)
Pulmonary tuberculosis	
No	423 (99.1%)
Yes	4 (0.9%)
Asthma	
No	416 (97.4%)
Yes	11 (2.6%)
Number of clinic session attended	
0-3	274 (64.2%)
4 or more	153 (35.8%)
Previous attempt to quit	
No	82 (19.2%)
Yes	273 (63.9%)
Missing	72 (16.9%)
Age started smoking	
<20	183 (42.9%)
≥20	133 (31.1%)
Missing	111 (26.0%)
Duration of smoking	
≤ 15 years	79 (18.5%)
>15 years	348 (81.5%)
Level of Fagerstrom score	
Low	310 (72.6%)
Moderate	53 (12.4%)
High	64 (15.0%)
Type of treatment	
Counselling	339 (79.4%)
Combine therapy	88 (20.6%)

Table II: Simple Logistic Regression of Factors Associated with Unsuccessful Quitters among Smokers who attended Stop Smoking Services in Perlis between January 2017-Jun 2019, N=427

Factors	Crude OR , B (95% CI)	*p*- value
Age		
18-24	1	
25-39	0.26(0.07,0.96)	0.042
40-54	0.32(0.09,1.15)	0.081
55 or more	0.17(0.05,0.58)	0.005
Gender		
Female	1	
Male	3.19(1.05,9.69)	0.041
Ethnicity		
Malay	1	
Chinese	0.69(0.33,1.44)	0.323
Others	0.20(0.06,0.63)	0.006
Marital status		
Married	1	
Single, unmarried/widow	3.73(1.78,7.84)	<0.001
Education level		
No education/Primary		
Secondary	1.61(0.93,2.78)	0.091
Diploma or higher	1.31(0.60,2.89)	0.499
Hypertension		
No	1	
Yes	0.59(0.40,0.88)	0.010
Diabetes Mellitus		
No	1	
Yes	0.78(0.50,1.24)	0.300
Ischaemic Heart Disease		
No	1	
Yes	0.58(0.20,1.68)	0.311
Asthma		
No	1	
Yes	1.03(0.30,3.57)	0.965
Number of clinic sessions		
4 or more	1	
0-3	6.68(4.31,10.37)	<0.001
Previous quit attempt		
No	1	
Yes	0.60(0.33,0.95)	0.031
Age Start Smoking		
<20	1	
≥20	0.96(0.63,1.47)	0.865
Duration of Smoking		
≤ 15 years	1	
>15 years	0.37(0.20,0.66)	0.001
Fagerstrom Score		
0-3 (Low)	1	
4-5 (Mod)	1.13(0.61,2.09)	0.694
6-10 (High)	0.85(0.49,1.47)	0.562
Type Of Treatment		
Counselling		
Combine Therapy	0.64(0.40,1.03)	0.066

Number of clinic sessions attended is a strong predictor of being unsuccessful quitter.[22] The recommended schedule of appointments were to come for follow-up sessions at their respective clinics once a week for the first month, every two weekly for the second and third month, once a month for the fourth to sixth month and three monthly appointment for one year period thus making it a maximum of 15 visits for the total appointment.[20] However the schedule was practised flexibly.[16] For example, clients who are also attending other chronic disease clinic appointment, the Stop Smoking Clinic appointment will be scheduled on the same day in order to ease the attendance and avoid default.

In this study those who attended their appointments 3 times or less showed higher risk of being an unsuccessful quitters as compared to those with who attended four times or above. This finding was consistent with others studies where the risk of unsuccessful quitters increased if the clinic sessions were less than four times. The dose-response relationship for SSS has proven that the minimum of four to five appointments for at least 15 minutes each session was needed to ensure the optimum service can be delivered to client.[7,23] Another study also found that the main factor that contribute to successful quitters are treatment adherence.[12] Appointment may not be necessary for the client to attend to the clinic in person,

Table III: Multiple Logistic Regression of Factors Associates with Unsuccessful Quitters among Smokers Attending Health Clinic in Perlis January 2017-Jun 2019, N=412

Variable	Adjust OR , B (CI)	P- value
Number of Clinic Session		
≥ 4	1	
0-3	6.57(4.14,10.43)	<0.001
Marital status		
Married	1	
Single, unmarried	2.78(1.07,7.18)	0.035
Age		
18-24	1	
25-39	0.46(0.08,2.48)	0.364
40-54	0.77(0.13,4.48)	0.774
≥55	0.38(0.07,2.14)	0.272

Model Nigelkerke's R2= 0.28

instead these can be done via phone call as alternative as long as individual motivational support was delivered to educate the client.[12] Fagerstrom score of 0-2 (very low) and 6-10 (high) are prone to default scheduled treatment.[24] This may contribute to increase risk of unsuccessful quitters. In the current study, the Fagerstrom level was not a predictive factor in the final model possibly due to the different classification used. This study use the Fagerstrom group 0-3 (low), 4-5 (moderate) and 6-10 (high) as compared to other study available where they categorised the groups according to 0-2 (very low), 3-4 (low), 5 (medium), and 6-10 (high).[24] Different Fagerstrom score classification group may give a different result.

Being single or unmarried status was a risk for unsuccessful quitters as compared to being married. Persons who are married will normally undergo separation from their families and such separation may increase their interdependence of each other between the married couple and may influence each other in daily life activity.[25] For example, if the smoker had a spouse or partner who is also a smoker, the risk of unsuccessful quitters may increase; however this might not applicable in Malaysia since only 1.4% of women smoked.[26,27] On other hand, married smokers may also receive more support from their spouses who are not smokers thus increasing their motivation to quit while being single or unmarried may lack such support.[9] Other similar approach for an optimum achievement to quit smoking can be seen by targeting family members or community peers may increase the successful quitters even when motivation to quit is low.[28] According to the theory of reason action and planned behaviour, behaviour may be influenced by consequences of the behaviour (behavioural belief), belief about normative expectation from other (normative belief) and belief about factor that may impact performance of the behaviour (control belief). When a client who doesn't receive support from the spouse (normative belief) it may influence the outcome which mean the risk of unsuccessful quitter increases.[29]

This study has several limitations. This study was a retrospective record review study that used secondary data. It depended on the quality of data recorded in SSS registry and patient file card. There was no verification method can be done for secondary data. Different health staff may have different definition and understanding on what should be recorded. Besides, certain variables may be poorly recorded or neglected such as occupational status and education level in this study since clients might refuse this personal information to be known. Other important variables were not recorded namely status of house living partner, motivational status and income. The unavailable variables may contribute and improve the final model. Despite these limitations, this study was able to explore the factors associated with unsuccessful quitters among smokers in a state-wide sample using the available data from stop smoking clinic registry. The finding from this study is consistent with other studies.

CONCLUSIONS

Although SSS clinics has been implemented worldwide after FCTC ratification in 2003, the unsuccessful quitters' rate among smokers still high. This study concludes that frequency of attending the SSS and being single/unmarried status does contribute to the risk of unsuccessful quitters. Hence, primary health care should re-strategize to improve the clients' adherence to clinic attendance and involvements of family members in stop smoking services should also be considered. The result from this study can be adopted in the healthcare system to improve the outcome of stop smoking services.

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CONFLICT OF INTEREST

Izwana Binti Hamzah is the SSS data manager who contributed to idea of the study and assisted with data collection but did not involve in data analysis or interpretation of this study.

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