A 3-Year Review of Smoking Cessation Programme in Luyang Health Clinic, Kota Kinabalu, Sabah

Dyllan Jordan Ho[1], Khamisah Binti Itim[2], Nor Sulaiha Binti Zulkaflee[2]

[1] Pharmacy Unit, Jalan Kebajikan Health Clinic, Sabah, Ministry of Health Malaysia
[2] Pharmacy Unit, Luyang Health Clinic, Sabah, Ministry of Health Malaysia

Abstract

Introduction: Quit smoking services were provided in the Ministry of Health Malaysia, health clinics and government hospitals since 2004, but the success rates have varied widely.
Objective: This study aimed to evaluate the success rate of quit smoking clinic and the association between the characteristics of patients and the success rate of the quit smoking clinic in Luyang Health Clinic, Sabah.
Methods: Participants enrolled in the smoking cessation programme between January 2017 and December 2019 at Luyang Health Clinic in Sabah, Malaysia were included in this study. Information on BMI, smoking history, quit smoking history, Fagerström Test for Nicotine Dependence, and Depression Anxiety Stress Scales (DASS) scores were collected. A patient was considered successfully quit if they remained smoke-free for six months without relapse from the agreed quit date. The characteristics of the patients, success rate and comparison between the success and the failed groups were analysed using chi square tests and independent t tests.
Results: A total of 286 patients were recruited in this study. An 8.4% success rate was achieved in the smoking cessation programme. Pregnant women had a significantly higher success rate (27.3%) compared to nonpregnant women (0%) ($p<0.001$). Additionally, the mean number of follow-up visits of 7.18 (standard deviation, SD 4.94) ($p<0.001$) among the success group were significantly higher as compared to the failed group (mean 2.95, SD 3.45).
Conclusion: Despite implementing a comprehensive smoking cessation module, there was still a high rate of unsuccessful quitters. Pregnancy status and the number of follow-up visits were associated with the success rate of smoking cessation programmes. An effective smoking cessation module that focuses on specific groups is needed to achieve a higher success rate.
Keywords: Smoking cessation, success rate, association

NMRR ID: NMRR-22-00360-Z31
Corresponding Author: Dyllan Jordan Ho
Pharmacy Unit, Jalan Kebajikan Health Clinic, Queen Elizabeth Quarters, Kota Kinabalu, 88300 Sabah.
Email: dyllanjordanho@yahoo.com

Introduction

A survey conducted in 2016 in Malaysia revealed that 78.7% of adolescent smokers had started smoking before the age of fourteen. The survey also showed that 28.5% of current cigarette smokers had already developed a low dependence on nicotine (1). Smoking is the leading cause of preventable deaths in Malaysia, accounting for over 20,000 deaths each year. The economic burden of smoking in Malaysia is estimated to be over RM10 billion annually (1). Smoking damages almost all organs in the body that leads to various ailments and disabilities (2). The most efficient strategy to lower the risk of smoking-related diseases is to stop smoking. Smoking cessation programmes were provided to the public at 731 Ministry of Health Malaysia (MOH) health clinics and 46 MOH hospitals (3) throughout Malaysia. These programmes are a national programme that provides free smoking cessation services to the public.

Despite the continuation of the national programmes during the past ten years, the success rates of smoking cessation programmes have varied widely across the healthcare facilities in Malaysia. This indicated the need for a closer examination of the programme implementation and effectiveness. A study done at the Seremban district involving public healthcare clinics showed that 30.2% of patients recruited were able to quit within six months of follow up (4). Another study by Ezat et al. reported that 17.3% of patients recruited were able to quit for at least six months. This study involved patients from eight randomly chosen government primary healthcare clinics including from the states of Kedah (northern zone), Perak

(central zone), Johor (southern zone) and Kelantan (eastern zone) (5). Elderly smokers (above 40 years old), having smoked for more than 15 years, smoked less than ten cigarettes per day, had a previous history of quitting attempt, self-referral to the clinic, high confidence level, attended smoking cessation clinic at least four times, having counselling session lasted at least 30 minutes and being satisfied with the clinic service were the factors that significantly affects the success rate in this study. A similar study conducted in Taiwan found that 37.7% of patients achieved the six-month point abstinence (6). This study reported that higher success rates were associated with smoking less than twenty cigarettes per day, having a lower Fagerström Test for Nicotine Dependence (FTND) score, having lower exhaled carbon monoxide (CO) concentration value at first visit, and attending more than one smoking cessation session. Different clinic approach and measures could contribute to different success rates despite being in the same national programme.

Luyang Health Clinic is one of the primary care clinics that offer smoking cessation programmes in Sabah, Malaysia. Based on Figure 1, the standard care pathway for smoking cessation programme at Luyang Health Clinic involves a physician first referring a patient to the quit-smoking clinic. The patients will then need to make an appointment with the nurse in charge of the quit-smoking clinic. During first visit, a physician will assess the patient and set a quit date. This assessment includes evaluating the patient's body mass index (BMI), smoking history, quit smoking history, FTND score, and completing the Depression Anxiety Stress Scales (DASS) questionnaire. The FTND is used to assess a patient's nicotine dependence and can be used to guide the dosage of nicotine replacement therapy. Meanwhile, the DASS questionnaire assesses the patient's level of stress, anxiety, and depression. The smoking cessation programme consists of pharmacological and nonpharmacological methods of reducing smoking. The pharmacological method involves nicotine replacement therapy (NRTs) to control nicotine cravings, while the nonpharmacological process involves behavioural therapy counselling without using NRTs.

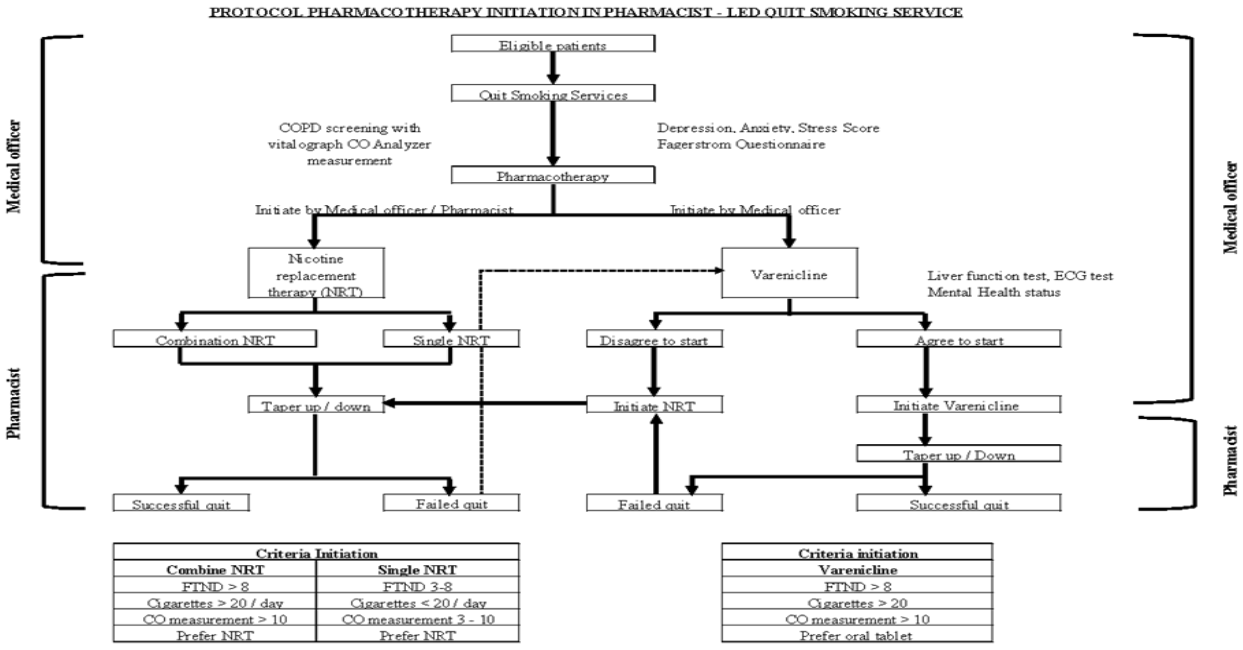

Figure 1: Protocol pharmacotherapy initiation in pharmacist-led quit smoking service

Most smokers have the perception that they can easily quit smoking (7). Some will ask whether they can quit smoking within the six months period. This study will provide detailed data on the previous success rate of this quit smoking clinic which can be used to change the patient's perceptions and educate them on the factors that influence the success rate. By gaining a better understanding of patient characteristics and programme structure such as number of follow ups needed, will help the healthcare professionals to individualise the approach and structure more successful programmes. This will increase the success rate and encourage more patients to confidently enrol in the smoking cessation programme. Therefore, we aimed to evaluate the success rate of the smoking cessation clinic at Luyang Health Clinic and investigate the association between patient characteristics and the success rate of the smoking cessation clinic.

Methods

This retrospective observational study was conducted at a primary care centre (Luyang Health Clinic) in Kota Kinabalu, Sabah using secondary data. This study was registered with the National Medical Research Registry (NMRR ID-22-00360-Z31) and was approved by the Medical Research Ethics Committee, Ministry of Health, Malaysia.

All patients who enrolled in the smoking cessation programme at Luyang Health Clinic between January 2017 and December 2019 were included in this study through universal sampling. Patients with acute psychiatric illness were excluded from this study. The sample size was calculated using Raosoft® (Sample Size Calculator; Raosoft inc) (8). Based on 95% of confidence level, 5% margin of error and total population estimation of smokers in Kota Kinabalu district, a sample size of 384 was required to obtain statistically valid results.

Patient information and smoking history details were recorded and kept in a record file. These records provided information about patient demographics, medication regimes, and laboratory parameters. A patient is considered a successful quitter if they remain smoke-free for six months without relapse from the agreed quit date (4). A Google form was created to extract the data of interest from patients' medical records including patient characteristics, smoking history, FTND score, DASS score, number and duration of follow-up visit, and pharmacological interventions.

The data were analysed using IBM Statistical Package for Social Sciences (SPSS) version 29. Demographic data were presented as frequencies (n) and percentages (%) for categorical variables. Numerical variables, for example, age, were presented as mean and standard deviation (SD). The association between the characteristics of smokers and outcome analysis were analysed using Chi Square test for categorical data and independent t-test for continuous data. A confidence interval of 95% was utilized in this study and the results were considered statistically significant when the P-value was less than 0.05.

Results

The number of patients enrolled in the smoking cessation clinic at Luyang Health Clinic during the study period was 289. Of these, 286 patients were recruited in this study with three patients excluded due to acute psychiatric illness. Among the 286 patients, the majority were male (88.1%) and the highest proportion of patients was in the age group of 31-40 years old (26.6%). Concurrent illnesses were reported by 54.8% of the participants. Most patients (40.9%) had a normal BMI, and the mean age at which participants began smoking was 18 years old, which is the legal age to purchase cigarettes in Malaysia. Almost 73% of the patients had attempted to quit smoking at least once before joining the programme. The FTND scores indicated that most patients had a medium level of nicotine dependent (49.7%). As for mental health, the patients had varying levels of anxiety, stress, and depression, with the majority falling within the normal range for each category. The mean smoking duration was 25.75 years. The outcome of the smoking cessation programme showed that 91.6% of the patients failed to quit smoking, while only 8.4% succeeded (Table 1).

Table 1: Sociodemographic characteristics of study participants (*n* = 286)

Characteristic	n (%)	Mean (SD)
Gender		
Female	34 (11.9)	-
Male	252 (88.1)	
Age (years)		44.07 (13.61)
17-30	47 (16.4)	
31-40	76 (26.6)	
41-50	75 (26.2)	
51-60	47 (16.4)	
>60	41 (14.3)	
Concurrent illness		
No	129 (45.1)	-
Yes	157 (54.9)	
BMI (kg/m^2)		
< 18.5 (Underweight)	16 (5.6)	
18.5 - 25 (Normal)	117 (40.9)	
25 - 30 (Overweight)	109 (38.1)	
≥ 30 (Obese)	44 (15.4)	
Age when started smoking (years)	-	18.26 (5.31)
Previous quit attempt		
None	78 (27.3)	
1 - 2 times	156 (54.5)	
3 - 4 times	22 (7.7)	
> 4 times	29 (10.1)	
FTND score		
High dependent level	51 (17.8)	
Medium dependent level	142 (49.7)	
Low dependent level	88 (30.8)	
Smoking duration (years)		25.75 (13.13)
Pregnant (n=34)		
No	23 (67.6)	
Yes	11 (32.4)	
Frequency of follow-up		3.05 (3.53)
Outcome		
Failed in quit smoking	262 (91.6)	
Success in quit smoking	24 (8.4)	
DASS Score (Anxiety)		
Mild	45 (15.7)	
Moderate	13 (4.5)	
Normal	184 (64.3)	
Severe	39 (13.6)	
DASS Score (Stress)		
Mild	37 (12.9)	
Moderate	24 (8.4)	
Normal	209 (73.1)	
Severe	11 (3.8)	
DASS Score (Depression)		
Mild	26 (9.1)	
Moderate	18 (6.3)	
Normal	225 (78.7)	
Severe	13 (4.5)	

Abbreviation: FTND = Fagerström Test for Nicotine Dependence, DASS = Depression Anxiety Stress Scales, SD = Standard deviation

Most of the patients' characteristics showed no statistically significant difference between the successful and failed group except for pregnancy status (Table 2). All the women that manage to quit are pregnant women (p<0.001). The success group has a significantly higher average number of visits (7.18, SD 4.94) as compared to the failed group (2.95, SD 3.45; p<0.001) (Table 3).

Table 2: Association between characteristics of smokers and outcome analysis

Variable	Failed group, *n* (%) (n=262)	Success group, *n* (%) (n=24)	p-value [a]
Gender			
Female	31 (11.8)	3 (12.5)	0.923
Male	231 (88.2)	21 (87.5)	
Age (years)			
17-30	41 (15.6)	6 (25.0)	0.683
31-40	72 (27.5)	4 (16.7)	
41-50	68 (26.0)	7 (29.2)	
51-60	43 (16.4)	4 (16.7)	
>60	38 (14.5)	3 (12.5)	
Concurrent illness			
Without concurrent illness	118 (45.0)	11 (45.8)	0.940
With concurrent illness	144 (55.0)	13 (54.2)	
Pregnant			
No	23 (74.2)	0 (0)	**<0.001**
Yes	8 (25.8)	3 (100)	
BMI (kg/m^2)			
< 18.5 (Underweight)	15 (5.7)	1 (4.2)	0.941
18.5 - 25 (Normal)	106 (40.5)	11 (45.8)	
25 - 30 (Overweight)	100 (38.2)	9 (37.5)	
30 or > (Obese)	41 (15.6)	3 (12.5)	
Previous quit attempts			
None	73 (27.9)	6 (25.0)	0.816
1 - 2 times	143 (54.6)	13 (54.2)	
3 - 4 times	19 (7.3)	3 (12.5)	
> 4 times	27 (10.3)	2 (8.3)	
FTND score			
High dependent level (7-10)	49 (18.7)	2 (8.3)	0.439
Medium dependent level (4-6)	130 (49.6)	13 (54.2)	
Low dependent level (0-3)	83 (31.7)	9 (37.5)	
DASS Score (Anxiety)			
Mild	41 (15.6)	4 (16.7)	0.107
Moderate	13 (5.0)	0 (0.0)	
Normal	168 (64.1)	20 (83.3)	
Severe	40 (15.3)	0 (0.0)	
DASS Score (Stress)			
Mild	36 (13.7)	1 (4.2)	0.091
Moderate	25 (9.5)	0 (0.0)	
Normal	190 (72.5)	23 (95.8)	
Severe	11 (4.2)	0 (0.0)	
DASS Score (Depression)			
Mild	24 (9.2)	2 (8.3)	0.332
Moderate	19 (7.3)	0 (0.0)	
Normal	206 (78.6)	22 (91.7)	
Severe	13 (5.0)	0 (0.0)	

[a] Chi Square test

Abbreviation: FTND = Fagerström Test for Nicotine Dependence, DASS = Depression Anxiety Stress Scales, SD = standard deviation

Table 3: Comparison of age when started smoking, smoking duration, and number of follow-up visits between the success and fail groups (n)

Group (n)	Mean (SD)	p-value [a]
Age when started smoking (years)		
Success (22)	16.73 (2.60)	0.079
Fail (252)	18.39 (5.46)	
Smoking duration (years)		
Success (22)	25.09 (15.68)	0.403
Fail (250)	25.81 (12.92)	
Frequency of follow-up		
Success (22)	7.18 (4.94)	**<0.001**
Fail (258)	2.95 (3.45)	

[a] Independent t-tests

Abbreviation: SD = standard deviation

Discussion

Our study demonstrated that the success rate of smoking cessation programme in Luyang Health Clinic was considerably low. Our study showed a lower success rate compared to previous studies done by Fai et al. (42.6%) (9) and Zamzuri et al. (30.2%) (10), despite using the same module of smoking cessation programmes. The study by Fai et al. found that lower cigarette intake and lower FTND scores were associated with the success in smoking cessation. Whereas in our study, we found that FTND score was not associated with the success rate. This could be due to the incomplete data on cigarette intake for some patients in our study. Additionally, the success of smoking cessation was self-reported and not confirmed by biochemical measures. Also, our study did not control for other influencing factors, such as patient's age, gender, or smoking history. The variance might result from the practice's heterogeneity or the knowledge and expertise of the smoking cessation counsellors (11). Moreover, Wee et al. observed that some smoking cessation clinics faced challenges in securing committed staff to run the programme (12). They continued by saying that all healthcare professionals must take on extra work to manage this scenario. The Australian Cancer Society, stated in their research that patients often make twelve to fourteen attempts to quit before finally giving up (13). Furthermore, according to Chaiton and colleagues, many patients may take up to 30 tries to quit smoking successfully (14).

Pregnant women were generally willing to quit smoking for the health of their baby (15). In our study, one third of the women attending the smoking cessation clinic were pregnant, and almost 30% of them were able to quit smoking. The awareness of harmful effects of smoking during pregnancy on the baby were reported to be a significant predictor of willingness to quit smoking among pregnant women (15). Psychosocial intervention was given to the pregnant mothers during the smoking cessation programme (4). Such intervention is a way to support the pregnant women to stop smoking and eventually increases the proportion of women who manage to stop (16). Thus, reinforcing the risks of smoking on both the mother and baby such as miscarriage, preterm birth, and low birth weight can motivate the women to quit smoking during pregnancy (17, 18). Although our study found that pregnancy was significantly associated with successful smoking cessation among women, the success rate was considerably low. A study in the United Kingdom demonstrated that the intention to quit smoking decreased over time as pregnancy progressed (19). Nevertheless, information on pregnancy stages were not collected in our study. National level studies can be carried out in Malaysia to understand the quitting behaviours and intentions among smoking pregnant women so that more targeted interventions can be formulated.

Our study showed that participants with more follow-up visits had significantly higher success rate of smoking cessation. This was probably because patients who received proper advice on managing withdrawal symptoms from the trained healthcare professionals were more motivated to quit smoking. The healthcare professionals in quit-smoking clinics were trained using proper modules. This was also proved by Huang et al., where patients who attended multiple smoking cessation consultations or were treated by experienced physicians in quit-smoking clinics had higher success rates (6). A study by Xie et al. also found that smoking cessation clinics and frequent telephone follow-ups improved the success rates of quitting smoking in China (20). Thus, all healthcare professionals should be educated and updated on the harmful effects of tobacco and motivational counselling, and their roles in ensuring patient success in quitting smoking and being free from nicotine addiction (21).

Quitting smoking may be more challenging nowadays than in previous years due to the growing availability of e-cigarettes on the market. E-cigarettes are often marketed as a safer alternative to smoking, and were perceived as a tool to "quit smoking" without actually quitting nicotine. However, e-cigarettes can be just as addictive as cigarettes, and can make it harder to quit smoking as they deliver nicotine similarly to traditional cigarettes and can trigger cravings. Additionally, e-cigarettes can make it harder to resist the urge to smoke because they are more convenient and discreet than cigarettes. A study published in Tobacco Control found that quit attempters who used e-cigarette as an aid had a lower 12+ month cigarette abstinence rate than those who did not (22). Another study, published in "Pediatrics", found that teens who used e-cigarettes were more likely to start smoking cigarettes and become regular smokers than teens who did not use e-cigarettes (23). These studies suggested that e-cigarettes were not effective smoking cessation tool and could make quitting more difficult.

Our study had several limitations that should be considered. Firstly, the sample size was small, with only 24 participants who successfully quitted smoking and 262 participants who did not. It was difficult to make judgments about the effectiveness of the smoking cessation programme given the small sample size. Next, the relatively short follow-up period of six months may not be sufficient to capture potential relapses or sustained abstinence beyond this time frame. A more extended follow-up period would provide a more comprehensive understanding of the programme's effectiveness. We also encountered recording bias, as some case records were incomplete or difficult to read. Additionally, as reported in a previous study by Ismail et al., the possibility of Hawthorne effect existed, as the quit smoking status in the patients' records were collected through direct interviewed by the healthcare professional (11).

Conclusion

Our study demonstrated a high rate of unsuccessful smoking quitters among patients who attended the smoking cessation clinic at Luyang Health Clinic. Pregnancy status was significantly associated with the success rate of smoking cessation in women, highlighting the need for comprehensive measure to increase the success rate among pregnant women. The number of follow-up visits was also associated with the success of smoking cessation. Healthcare professionals should try to optimise the number of follow-up visits to improve the outcomes of the smoking cessation programme. Further research involving larger sample sizes, the use of biochemical measures, and extended follow-up periods are necessary to validate these findings.

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Conflict of interest statement

No funding was received for this study. The authors have no conflict of interest to disclose.

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