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Research Article

Success Rate of Smoking Quitting in those who Attends Smoking Cessation Clinic: A Cross Sectional Study

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Abstract

Background: Different cessation rates have been reported from various smoking cessation clinics. There is limited and contradicting available data about smoking cessation rate in Saudi Arabia.

Objectives: To objectively and accurately measure the cessation rate, and subsequently the effectiveness, of smoking cessation clinics.

Subjects and Methods: Cross-sectional observational study was carried out at the smoking cessation clinic, Ministry of Health, Makkah city. It included a sample of smokers enrolled in the national Saudi tobacco control program and followed regularly with an anti-smoking clinic at least for 3 months despite the form of treatment (either cognitive behavioral therapy or pharmaceutical). A self-administered Arabic validated questionnaire was used in this study. It includes two main sections: the demographic data of the participants, and the factors and the determinants that faced the participants in the smoking cessation process.

Results: A total of 340 smokers were included in this study. Most of them (77.4%) were males. Their age ranged between 18 and 66 years with an arithmetic mean of 37.9 and standard deviation of 12.1 years. Almost one-quarter of the participants (27.4%) had succeeded to quit smoking. Determination and purposefulness was the main reason for successful smoking cessation (53.8%), followed by following anti-smoking program (21.5%) and using anti-smoking therapy (10.8%). Starting smoking after age of 20 years ($p = 0.001$), smoking 10 cigarettes or less per day ($p<0.001$) and frequent trying to quit smoking ($p<0.001$) were significant determinants for successful smoking cessation.

Conclusion: The smoking cessation success rate among smokers attending the smoking cessation clinic, Ministry of Health in Makkah is quite acceptable; however can be improved.

Keywords: Smoking Cessation; Success; Anti-smoking Clinics

Introduction

Background/Literature Review

Smoking is the leading cause of preventable deaths world widely with expected 8.3 million deaths in 2030 [1]. Smoking has a well-established relationship with many serious diseases such as lung cancer, cardiovascular diseases and chronic obstructive pulmonary diseases [2]. In 2015, the global age-adjusted prevalence of smoking was 25% in men and 5.4% in women which accounted for 28.4% and 34.4% decline in smoking prevalence from 2005, in men and women respectively [2].

In the past 50 years, governments showed an increasing commitment to reduce smoking prevalence by banning advertisements, increase taxation on tobacco products, prohibiting smoking in public places, and conduction of educational campaigns [3]. Smoking cessation is one of the main goals of public health efforts with proven health benefits including a significant reduction

in the risk of cardiovascular diseases and cancer [4]. The conceptual framework of smoking cessation showed that smoker firstly think to quit, plan to quit, try to quit and finally sustain quitting or relapse. Clinics of smoking cessation aim to help smokers to plan, quit and sustain the healthy life style.

The findings of a large-scale study, conducted in the United States, revealed that referral rate from primary health centers to smoking cessation clinics was significantly improved. However, this increase was not translated into improvement in smoking quitting rate. Lack of effectiveness was attributed to the service pitfalls including delay in referral, shortage of experts, and low awareness among smokers [5]. Another study conducted in the United States and used a new approach for smoking counseling by trained community pharmacists. A quarter of included smokers reported continuous quitting for more than 12 months, while 31.3% and 43.8% sustain quitting smoking for 3 and 1 month, respectively. There were no association between quitting rate and age, level of nicotine dependence, and method of cessation [6].

In Denmark, about 423 clinics of smoking cessation, with a total of 82,515 registered patients, are evaluated. After 6 months of follow-up, 24% of the monitored smokers were considered as a successful quitter. The comprehensive smoking cessation approaches was found significantly better than face-to- face interventions. Moreover, short interventions were more effective in smoking cessation among men than women [7].

A hospital-based approach for smoking cessation was evaluated in 243 smokers and 187 controls in a tertiary hospital in Australia. Smokers were subjected to intensive counselling on behavioural changes and abstinence was assessed by level of exhaled Carbon monoxide (CO). The prevalence of smoking quitters after 12 months was 32%, which was influenced by self-confidence, having a cardiovascular condition, and elevated number of pack-years [8]. The outcomes of this study are more reliable because it depends on objective assessment, namely level of exhaled CO.

A sample of 254 smokers, from smoking cessation clinics in Malaysia were followed for 6 months after quitting smoking. About 17% of the study participants can sustain smoking cessation for the end of follow-up period (more than 6 months). Although a self-reported prevalence was assessed in this study, the abstinence rate was lower compared to other rates reported from cohort studies. Moreover, when the smoking status was confirmed by CO level, the abstinence rate was decreased to 15.3% [9].

In china, a total of 220 young smokers underwent counselling sessions in the outpatient departments. A quitting rate of 24% was reported after 6 months of follow up but it was a self-reported rate. That means, no confirmation with CO level was obtained in this study [10]. A slightly higher prevalence (27%) of smoking quitters was reported in Hong Kong, where a mixed intervention was used (counselling + nicotine replacement therapy). The mean cost per each smoking quitter was 339$, which make it a cost- effective intervention [11].

In Arabic countries, limited data are available about smoking cessation rate with a few studies aimed to evaluate the effectiveness of smoking cessation clinics. In Jordon, a cross-sectional study found only a half of the participants have heard about smoking clinics and hotlines with 2.4% had ever used these services [12].

Saudi Arabia was ranked 8th in the world regarding cigarettes smoking [13]. Based on World Health Organization estimates, the prevalence of smoking in Saudi Arabia is not more than 20% [14]. In Saudi Arabi, working within the faith-based paradigm, a National Tobacco Control Program that focuses on primary prevention and supporting tobacco cessation has been adopted [15]. Till 2009, more than 30 smoking clinics were established in Saudi Arabia [16].

Different cessation rates have been reported from various smoking cessation clinics. An interesting initiative was established by Qassim university in 2012 with fully-equipped smoking cessation clinics containing videos and models demonstrating health hazards of smoking, in addition to tools assessing lung capacity, CO and oxygen levels. Moreover, nicotine replacement therapy was available and administered by pharmacists who provided individual consultation. A self-reported 6-month cessation rate, in Buraidah, was as high as 38.3% [17], while it was 13% in different clinics, in Saudi Arabia, as reported by Bassiony [16].

The limited and contradicting available data about smoking cessation rate in Saudi Arabia highlight the importance of the current study to objectively and accurately measure the cessation rate, and subsequently the effectiveness, of smoking cessation clinics.

Aim of the Study

To assess the effectiveness of the national tobacco control program.

Specific objectives

- To estimate the rate of smoking cessation success among smokers attending the smoking cessation clinic, Ministry of Health (MOH), Makkah, 2021 and compare it with those who triedsmoking cessation by themselves.
- To determine the determinants of successful smoking cessation in smokersattending smoking cessation clinic, MOH, Makkah, 2021.

Methodology

Research design

Cross-sectional observational study.

Study setting

The study was carried out at the smoking cessation clinic, Ministry of Health, Makkah city.

Target population

Patients enrolled in the national Saudi tobacco control program.

Inclusion/exclusion criteria

Patient followed regularly with an anti-smoking clinic at least for 3 months despite the form of treatment (either cognitive behavioral therapy or pharmaceutical).

Case definition

A smoker was labeled as a quitter after achieving 3 months of complete abstinence of any kind of tobacco forms (cigarettes, cigars, vape, tobacco pipe, waterpipes such as shisha, smokeless tobacco).

Sample size

The minimum sample size was determined using the following sample size equation:

Where:-

Z is the value from the standard normal distribution reflecting the confidence level that was used (eZ = 1.96 for 95%)

E is the desired margin of error (0.05).

P is the proportion of success in smoking cessation among smokers following a smoking cessation program. (p = 0.30 i.e. 30%) (17).

Accordingly, the estimated sample size was 323 smokers. The non-responses or incomplete response rate was considered 10%, so the total sample size was increased to ~355 smokers.

A convenience non-probability sample was adopted in this study to recruit the participants.

Data collection tool

A self-administered Arabic validated questionnaire, adopted from a previous Saudi study was used in this study [18]. It includes two main sections:

- Section one: The demographic data of the participants, e.g. age, sex, marital status …etc.
- Section two: Includes the factors and the determinants that faced the participants in the smoking cessation process.

Measurement of quitting rate

In the present study, a smoker was labeled as a quitter after achieving 3 continuous months of complete abstinence of any kind of tobacco forms (cigarettes, cigars, vape, tobacco pipe, waterpipes such as shisha, smokeless tobacco) and the quitting rate was measured by dividing the number of quitter by the total number of those trying to quit smoking either through the clinic or by themselves.

Statistical plan

Descriptive statistics in the form of frequency and percentage for categorical variables as well as mean and standard deviation for continuous variables were adopted. Inferential statistics were done using chi-square test to investigate the association between two categorical variables and student`s t-test to compare the arithmetic means of a continuous variable between two different groups. Statistical significance was determined at $p<0.05$. Data entry and statistical analysis were performed utilizing the Statistical Package for Social Sciences software (SPSS), version 26.

Results

Personal characteristics

A total of 340 smokers were included in this study. Table 1 presents their personal characteristics. Most of them (77.4%) were males. Their age ranged between 18 and 66 years with an arithmetic mean of 37.9 and standard deviation of 12.1 years. Majority of the participants (91.2%) were married, 73.8% were university graduated and 75.6% were employees. Regarding their income, 44.4% had an income ranged between 3001 and 6000 Saudi Riyals (SR) per month whereas 37.9% had an income ranged between 6001 and 10000 SR/month.

	Frequency	Percent
Gender		
Male	263	77.4
Female	77	22.6
Age (years)		
Range	18-66	
Mean ± SD	37.9 ± 12.1	
Marital status		
Single	27	7.9
Married	310	91.2
Divorced	3	0.9
Educational level		
Elementary school	6	1.8
Intermediate school	16	4.7
Secondary school	53	15.6
University	251	73.8
Postgraduate	14	4.1
Job status		
Not working	28	8.2
Employee	257	75.6
Student	24	7.1
Retired	31	9.1
Income (Saudi Royals per month)		
<3000	55	16.2
3001-6000	151	44.4
6001-1000	129	37.9
>10000	5	1.5

Table 1: Personal characteristics of the participants (n = 340).

Medical history

More than half of the participants (58.2%) had a history of chronic diseases; particularly both hypertension and diabetes together (19.1%). History of attending hospital for cardiac problems was mentioned by 8.5% whereas history of difficulty in breathing was mentioned by 10.9% of them. More than half of them described their health as either excellent (26.5%) or very good (35.9%) (Table 2).

	Frequency	Percentage
History of chronic diseases		
No	142	41.8
Yes	198	58.2
Diabetes mellitus	50	14.7
Hypertension	28	8.2
Both	65	19.1
Cardiac diseases	32	9.4
All	23	6.8
History of attending hospital for cardiac problems		
No	311	91.5
Yes	29	8.5
History of difficulty in breathing		
No	303	89.1
Yes	37	10.9
Self-description of health status		
Excellent	90	26.5
Very good	122	35.9
Fair	91	26.8
Bad	26	7.6
Very bad	11	3.2

Table 2: Medical history of the participants (n = 340).

Smoking behavioural history

Figure 1 shows that majority of the participants (92.4%) were current smokers and the remaining 7.6% were quitter. Details of smoking history of all participants are summarized in table 2. The age at starting smoking was below 18 years among 43.8% of the participants. Most of them currently/previously used cigarettes (76.5%) as a type of smoking. More than half of them (53.5%) smoked between 11 and 20 cigarettes/day as an average. Regarding usual place for smoking, all of public places, homes and work places were mentioned most of the participants (72.1%). Living with smokers and smoking while sick were reported by 84.1% and 83.5% of the participants, respectively.

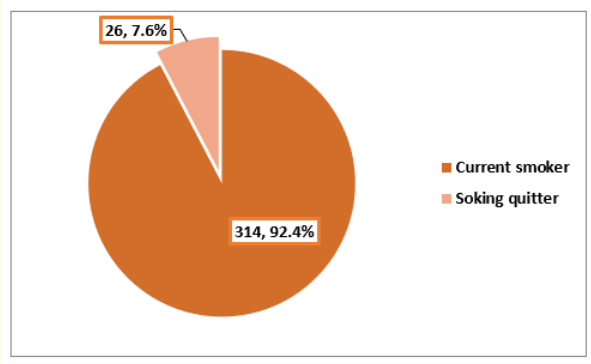

Figure 1: Current smoking status of the participants.

	Frequency	Percentage
Age at first smoking (years)		
Less than 18	149	43.8
18-20	116	34.1
More than 20	75	22.1
Type of smoking currently previously used*		
Cigarettes	260	76.5
Moassel	60	17.6
Water pipes	20	5.9
Number of cigarettes smoked/day		
≤10	42	12.4
11-20	182	53.5
>20	116	34.1
Usual place of smoking		
Home	62	18.2
Work	18	5.3
Public places	15	4.4
All	245	72.1
Living with another smoker		
No	54	15.9
Yes	286	84.1
Smoking while you are sick		
No	56	16.5
Yes	284	83.5

Table 3: Details of smoking history of the participants (n = 340).

Smoking cessation

Almost one-quarter of the participants (27.4%) had succeeded to quit smoking (i.e. 3 months of complete abstinence of any kind of tobacco forms).

Determination and purposefulness was the main reason for successful smoking cessation (53.8%), followed by following anti-smoking program (21.5%) and using anti-smoking therapy (10.8%) (Figure 3).

Almost half of those succeeded to quit smoking (48.4%) reported three smoking cessation trials. Majority of them (92.7%) had an average of 6 months of the attempt. Almost half of them (50.5%) had first trial of smoking cessation at age between 26-35 years. Regarding reasons for smoking cessation trials, majority of them (79.5%) reported financial concern while only 18.3% reported health concern. Regards reasons of re-smoking after cessation, majority of smokers reported social reasons (84.2%). The most frequently reported feeling accompanied re-smoking was guilt sensation (57.2%).

Figure 2: History of successful smoking cessation among the participants.

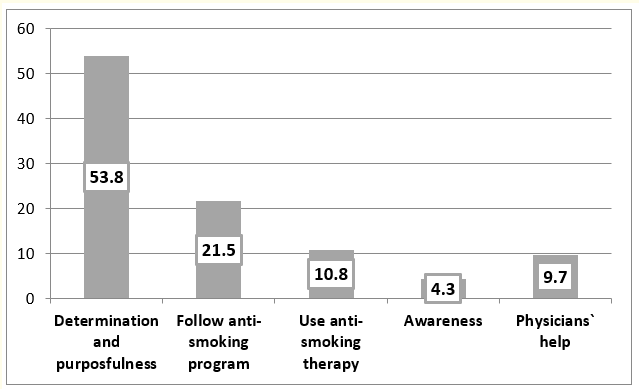

Figure 3: Main reason for successful smoking cessation among the participants (n = 93).

	Frequency	Percentage
Frequency of smoking cessation attempts		
One	11	11.8
Two	29	31.2
Three	45	48.4
>three	8	8.6
Average duration of the attempt		
6 months	86	92.5
>6 months	7	7.5
Age at first smoking cessation trial		
≥25	29	31.2
26-35	47	50.5
>35	17	18.3
Main reason/s for smoking cessation trials		
Health concern	17	18.3
Society	2	2.2
Financial	74	79.5
Reason/s for re-smoking after cessation (n = 63)		
Social	53	84.2
Work	4	6.3
Being alone for long time	6	9.5
Feeling accompanied retaining smoking (n = 63)		
Guilt	36	57.2
Sadness	7	11.1
Relief	10	15.9
Anxious	4	6.3
Non-specific	6	9.5

Table 4: Description of smoking cessation trials among the participants (n = 93).

Experience with smoking cessation clinic

About two-thirds of the participants (67.7) visited smoking cessation clinic three times whereas 12.9% of them visited it more than three times. Varenicline was the most frequent reported therapy taken at smoking cessation clinic (92.6%), followed by nicotine replacement therapy (6.8%) whereas cognitive behavioral therapy was given to minority of them (0.6%) as seen in figure 4. Duration of prescribed medication by anti-smoking clinic was three months among majority of the participants (95.2%) (Figure 5).

Frequency of visiting anti-smoking clinic	Frequency	Percentage
Once	14	4.1
Twice	52	15.3
Three times	230	67.7
More than three times	44	12.9

Table 5: Frequency of visiting anti-smoking clinic among the participants.

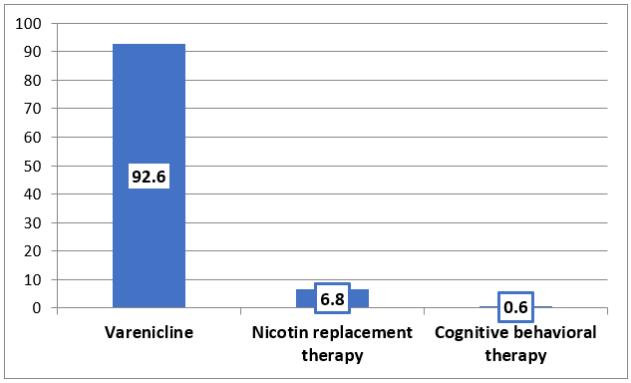

Figure 4: Prescribed medications by the smoking cessation clinic among the participants.

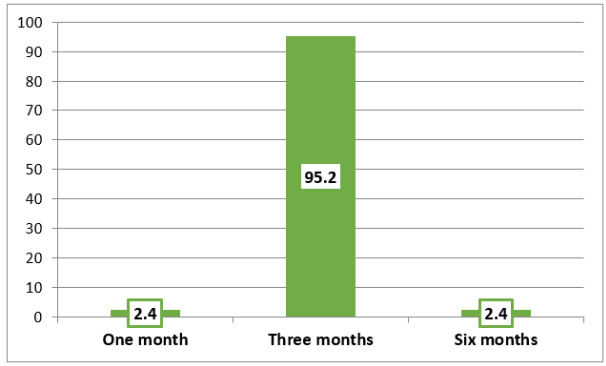

Figure 5: Duration of prescribed medications given by smoking cessation clinic among the participants.

Factors associated with successful smoking cessation

Personal factors

None of the studied personal factors (gender, age, marital status, educational level, job status, and income) was significantly associated with successful smoking cessation (Table 6).

Medical characteristics

None of the studied medical characteristics (history of chronic diseases, history of attending hospital for cardiac problem, history of difficulty in breathing and self-description of health status) was significantly associated with successful smoking cessation (Table 7).

Smoking characteristics

Smokers who started smoking after age of 20 years were more likely to success in its cessation compared to those started smoking at age less than 18 years (42.7% vs. 19.5%), p = 0.001. Two-thirds (66.7%) of smokers who smoked 10 cigarettes or less/day compared to only 19% of those who smoked >20 cigarettes/day, p < 0.001. More than half (56.8%) of those tried more than three times to quit smoking compared to only 21.4% of those who tried once succeeded to quit smoking, p < 0.001 (Table 8).

	Successful smoking cessation		p-value
	No N = 247 N (%)	Yes N = 93 N (%)	
Gender Male (n = 263) Female (n = 77)	 191 (72.6) 56 (72.7)	 72 (27.4) 21 (27.3)	 0.986*
Age (years) Mean ± SD	 37.6±11.8	 38.7±12.8	 0.475**
Marital status Single (n = 27) Married (310) Divorced (n = 3)	 20 (74.1) 224 (72.3) 3 (100)	 86 (27.7) 7 (25.9) 0 (0.0)	 0.554*
Educational level Elementary school (n = 6) Intermediate school (n = 16) Secondary school (n = 53) University (n = 251) Postgraduate (n = 14)	 6 (100) 10 (62.5) 42 (79.2) 176 (70.1) 13 (92.9)	 0 (0.0) 6 (37.5) 11 (20.8) 75 (29.9) 1 (7.1)	 0.094*
Job status Not working (n = 28) Employee (n = 257) Student (n = 24) Retired (n = 31)	 15 (62.5) 194 (75.5) 21 (67.7) 17 (60.7)	 9 (37.5) 63 (24.5) 10 (32.3) 11 (39.3)	 0.198*
Income (Saudi Royals per month) <3000 (n = 55) 3001-6000 (n = 150) 6001-1000 (n = 129) >10000 (n = 5)	 38 (69.1) 109 (72.2) 97 (75.2) 3 (60.0)	 17 (30.9) 42 (27.8) 32 (24.8) 2 (40.0)	 0.755*

Table 6: Association between personal characteristics of smokers and successful smoking cessation.

*Chi-square test; **Student` t-test.

	Successful smoking cessation		p-value*
	No N = 247 N (%)	Yes N = 93 N (%)	
History of chronic diseases			
No (n = 142)	105 (73.9)	37 (26.1)	
Yes (n = 198)	142 (71.7)	56 (28.3)	0.650
History of attending hospital for cardiac problems			
No (n = 311)	226 (72.7)	85 (27.3)	
Yes (n = 29)	21 (72.4)	8 (27.6)	0.976
History of difficulty in breathing			
No (n = 303)	217 (71.6)	86 (28.4)	
Yes (n = 37)	30 (81.1)	7 (18.9)	0.223
Self-description of health status			
Excellent (n = 90)	68 (75.6)	22 (24.4)	
Very good (n = 122)	92 (75.4)	30 (24.6)	
Fair (n = 91)	65 (71.4)	26 (28.6)	
Bad (n = 26)	16 (61.5)	10 (38.5)	
Very bad (n = 11)	6 (54.5)	5 (45.5)	0.361

Table 7: Association between medical characteristics of smokers and successful smoking cessation.

*Chi-square test.

	Successful smoking cessation		p-value*
	No N = 247 N (%)	Yes N = 93 N (%)	
Age at first smoking (years)			
Less than 18 (n = 149)	120 (80.5)	29 (19.5)	
18-20 (n = 116)	84 (72.4)	32 (27.6)	
More than 20 (n = 75)	43 (57.3)	32 (42.7)	0.001
Type of smoking currently/previously used*			
Cigarettes (n = 260)	188 (72.3)	72 (27.7)	
Moassel (n = 60)	42 (70.0)	18 (30.0)	
Water pipes (n = 20)	17 (85.0)	3 (15.0)	0.414
Number of cigarettes smoked/day			
≤10 (n = 42)	14 (33.3)	28 (66.7)	
11-20 (n = 182)	139 (76.4)	43 (23.6)	
>20 (n = 116)	94 (81.0)	22 (19.0)	<0.001
Living with another smoker			
No (n = 54)	41 (75.9)	13 (24.1)	
Yes (n = 286)	206 (72.0)	80 (28.0)	0.556
Smoking while you are sick			
No (n = 56)	43 (76.8)	13 (23.2)	
Yes (n = 284)	204 (71.8)	80 (28.2)	0.447

Frequency of smoking cessation attempts			
One (n = 14)	11 (78.6)	3 (21.4)	
Two (n = 52)	37 (71.2)	15 (28.8)	
Three (n = 230)	180 (78.3)	50 (21.7)	
>three (n = 44)	19 (43.2)	25 (56.8)	<0.001
Type of anti-smoking therapy			
Varenicline (n = 315)	226 (71.7)	89 (28.3)	
Nicotine replacement therapy (n = 23)	19 (82.6)	4 (17.4)	
Cognitive behavioral therapy (n = 2)	2 (100)	0 (0.0)	0.362
Duration of anti-smoking therapy			
One month (n = 8)	5 (62.5)	3 (37.5)	
Three months (n = 324)	237 (73.1)	87 (26.9)	
6 months (n = 8)	5 (62.5)	3 (37.5)	0.647

Table 8: Association between smoking history of smokers and successful smoking cessation.

*Chi-square test.

Discussion

The World Health Organization (WHO) recommended decrease the smoking prevalence to 30% by 2030, to reduce the rate of premature death among smokers [19]. In this context, practices to help tobacco cessation are directed to all smokers through specialized clinics existed in many countries, including the Kingdom of Saudi Arabia. Despite the fact that these smoking cessation clinics remarkedly increased success rates [20], it was noted that theses success rates were somewhat less than would be expected [21]. The present study aimed to evaluate the effectiveness of the national tobacco control program through estimating the rate of smoking cessation success and identifying its determinants among smokers attending the smoking cessation clinic, Ministry of Health (MOH), Makkah.

In the current study, almost one-quarter of the participants (27.4%) had succeeded to quit smoking (i.e. 3 months of complete abstinence of any kind of tobacco forms). The smoking cessation rate was 13% in different clinics, in Saudi Arabia, as reported by Bassiony [16]. However, figure close to ours has been reported in a similar study carried out in Jeddah (30.8%) [18]. Also, in Denmark, after 6 months of follow-up, 24% of the monitored smokers were considered as successful quitters [7]. In Australia, the prevalence of smoking quitting after 12 months to intensive counselling on behavioural changes and abstinence of smokers was 32% [8]. In china, a rate of 24% has been observed among young smokers underwent counselling sessions in the outpatient departments after 6 months of follow up [10]. A prevalence (27%) of smoking quitting was reported in Hong Kong, where a mixed intervention was used (counselling + nicotine replacement therapy) [11]. In the United States using a new approach for smoking counseling by trained community pharmacists, a quarter of smokers reported continuous quitting for more than 12 months, while 31.3% and 43.8% sustained smoking quitting for 3 and 1 month, respectively [6]. In Malaysia, only 17% of smokers sustained smoking cessation for more than 6 months of follow-up [9]. However, higher rates were observed in Lebanon (37%) [22]. In Buraidah, Saudi Arabia, a self-reported 6-month cessation rate was 38.3% [17], Higher rates were observed in France (53.7%) [23] and in the United states (61.7%) [24]. Comparing between the aforementioned rates, including the present one is not practical as a result of using different meanings of smoking cessation in these studies as well as applying different strategies to quit smoking.

The main reason for re-smoking after cessation in the present study was social reasons in the form of friends` pressure. Therefore, preparation of the smokers from this point before beginning the cessation is very important [23].

It has been documented that smoking at the earlier age decreases the possibility of success in smoking cessation in future trials [25]. In accordance with that, a considerable proportion (43.8%) of smokers in this study started smoking at age of <18 years and this was associated with less successful rate of smoking cessation if compared with those started smoking after age of 20 years.

In the current study, average number of cigarettes smoked per day was significantly associated with success in smoking cessation as those smoked on the average 20 cigarettes per day were less likely to achieve successful smoking cessation compared to those smoked on the average 10 cigarettes or less per day. The same has been observed in another study carried out in Lebanon where those who smoked < 15 cigarettes per day on average were more likely to success in quitting smoking than heavy smokers who smoked 15 or more cigarette on the average per day [22].

Also, in accordance with our findings, numerous international studies confirmed the relationship between earlier age of smoking and high number of cigarettes smoked per day from one side and the failure of smoking cessation from the other side [23,26-30]. In Australia, the determinants for successful smoking cessation were self-confidence, having a cardiovascular condition, and higher number of pack-years [8]. In accordance with others [18,22,31], no difference between male and female smokers regarding rate of smoking cessation. Also, in accordance with another Saudi study carried out in Jeddah [18], smoker`s age was not a significant determinant for successful smoking cessation. However, others observed that older smokers were more likely to success in cessation of smoking due to their more experience with bad smoking outcomes [22,32,33].

In the present study, neither type of anti-smoking therapy nor its duration was associated with successful smoking cessation. Also, this is confirmed by finding that the main reason mentioned by smokers who succeeded in smoking cessation was determination and purposefulness (53.8%), followed by following anti-smoking program (21.5%) and finally using anti-smoking therapy (10.8%). Other studies reported that compliance with anti-smoking therapy was the main factor for successful smoking cessation [22].

In the present study, we did not investigate the impact of compliance with anti-smoking therapy on successful trials of quitting. It has been documented that, the type of pharmacological therapy is not of the importance as compliance with it in terms of dosage and duration [34,35].

The present study revealed that medical factors such as history of chronic diseases, history of attending hospital for cardiac problems, or history of difficulty in breathing as well as self-description of the overall health were not associated with the success of smoking cessation. This is in line with others [36,37]. More strangely, some others reported a relation between smoking-related health problems and failure in smoking cessation [22,28]. However, some others observed an association between cancer and successful cessation of smoking [39-42].

This study has important limitations. A cross-sectional design adopted possesses inability to draw causal associations. The study was a single-facility one, which could influence the generalizability of the results over other facilities. Using of a self-administered questionnaire for data collection is considered a limitation as it is subjected to bias as a result of possible under or over evaluation. Despite those limitations, the study highlighted a vital public health problem in our Region and the results could be of benefit for higher authorities to improve the efficiency of smoking cessation clinics.

Conclusion

The smoking cessation success rate among smokers attending the smoking cessation clinic, Ministry of Health in Makkah is quite acceptable; however can be improved. Role of smoking cessation clinic was not evident ans determination and purposelessness of smokers in the present study was the main reason for success. Starting smoking at earlier age, heavier smoking and less frequent trials to quit smoking were determinants of failure to quit smoking. History of re-smoking after successful smoking cessation was mentioned by a considerable proportion of those who successes to stop smoking with a common feeling of guilt among them. The main reason of re-smoking after cessation was friend`s pressure.

Recommendations

According to the findings of this study, we recommended the following to improve the current situation:

- Improving compliance of healthcare workers with the Saudi national guideline to enhance smoking cessation rate.
- Educating smoking hazards to people at very young age (elementary school) as earlier smoking was associated with lower success rate for smoking cessation.
- Attention should be paid to fiends` pressure, through education, as it was the main reason for re-smoking after cessation
- Physicians should play more impressive role in encouraging smokers to attend smoking cessation clinics and compliant with therapy.

- Further larger study is recommended including other healthcare facilities in Makkah to identify barriers associated with smoking cessation.

Bibliography

1. Mathers CD and Loncar D. "Projections of global mortality and burden of disease from 2002 to 2030". *PLoS Medicine* 3.11 (2006): e442.

2. GBD 2015 Tobacco Collaborators. "Smoking prevalence and attributable disease burden in 195 countries and territories, 1990-2015: a systematic analysis from the Global Burden of Disease Study 2015". *Lancet* 389.10082 (2017): 1885-1906.

3. Bonita R., *et al.* "Country actions to meet UN commitments on non-communicable diseases: a stepwise approach". *Lancet* 381.9866 (2013): 575-584.

4. Abuse S., *et al.* "The Health Benefits of Smoking Cessation. Smoking Cessation: A Report of the Surgeon General". US Department of Health and Human Services (2020).

5. Yano EM., *et al.* "Targeting Primary Care Referrals to Smoking Cessation Clinics Does Not Improve Quit Rates: Implementing Evidence-Based Interventions into Practice". *Health services research* 43.5 (2008): 1637-1661.

6. Kennedy DT., *et al.* "Results of a smoking cessation clinic in community pharmacy practice". *Journal of the American Pharmaceutical Association* (1996) 42.1 (2002): 51-56.

7. Rasmussen M., *et al.* "Effectiveness of the Gold Standard Programme compared with other smoking cessation interventions in Denmark: a cohort study". *BMJ open* 7.2 (2017): e013553.

8. Fung PR., *et al.* "Effectiveness of hospital-based smoking cessation". *Chest* 128.1 (2005): 216-223.

9. Ezat W., *et al.* "Pattern and predictors of smoking cessation among smokers attending smoking cessation clinics in Peninsular Malaysia". *Journal of Community Health* 14.1 (2008): 17-23.

10. Zhu WH., *et al.* "Characteristics of smokers and predictors of quitting in a smoking cessation clinic in Guangzhou, China". *Journal of Public Health* 32.2 (2010): 267-276.

11. Abdullah ASM., *et al.* "Establishment and evaluation of a smoking cessation clinic in Hong Kong: a model for the future service provider". *Journal of Public Health* 26.3 (2004): 239-244.

12. Jaghbir M., *et al.* "Quitting smoking and utilization of smoking cessation services in Jordan: a population-based survey". *EMHJ-Eastern Mediterranean Health Journal* 20.9 (2014): 538-546.

13. Al-Doghether MH. "Do we need national guidelines for smoking cessation?" King Faisal Specialist Hospital and Research Centre (2001).

14. Mackay J., *et al.* "The tobacco atlas: World Health Organization" (2002).

15. Moradi-Lakeh MTobacco consumption in the Kingdom of Saudi Arabia, 2013: findings from a national survey". *BMC Public Health* 15.1 (2015): 611.

16. Bassiony MM. "Smoking in Saudi Arabia". *Saudi Medical Journal* 30.7 (2009): 876-881.

17. Salih MA and Farghaly AAB. "Determinants of outcome among smoker in a smoking cessation program". *Journal of Family and Community Medicine* 3.2 (1996): 22.

18. Juma MA., *et al*. "Success rate and determinants of smoking cessation among patients attending Ministry of Health smoking cessation clinics program in Jeddah, Saudi Arabia 2018". *Indo American Journal of Pharmaceutical Sciences* 06.12 (2019): 17680-17694.

19. World Health Organization. "WHO Global Report On Trends in Prevalence of Tobacco Smoking 2015". (2015).

20. West R., *et al*. "Performance of English stop smoking services in first 10 years: analysis of service monitoring data". *BMJ* 347 (2013): f4921.

21. West R., *et al*. "Can we trust national smoking prevalence figures? Discrepancies between biochemically assessed and self-reported smoking rates in three countries". *Cancer Epidemiology, Biomarkers and Prevention* 16.4 (2007): 820-822.

22. Bacha ZA., *et al*. "Factors associated with smoking cessation success in Lebanon". *Pharmacy Practice* 16.1 (2018): 1111.

23. Joly B., *et al*. "Success rates in smoking cessation: Psychological preparation plays a critical role and interacts with other factors such as psychoactive substances". Pershouse MA, editor. *PLoS One* 12.10 (2020): e0184800.

24. Creamer MR., *et al*. "Tobacco Product Use and Cessation Indicators Among Adults — United States, 2018". *Morbidity and Mortality Weekly Report* 68 (2019): 1013-1019.

25. Hughes JR., *et al*. "Shape of the relapse curve and long-term abstinence among untreated smokers". *Addiction* 99 (2004): 29-38.

26. Abdelwahab SI., *et al*. "Patterns of Use, Cessation Behavior and Socio-Demographic Factors Associated with Smoking in Saudi Arabia: a Cross- Sectional Multi-Step Study". *Asian Pacific Journal of Cancer Prevention* 17.2 (2016): 655-660.

27. Nicotine et troubles neuropsychiatriquesÐHenri-Jean Aubin, Collectif (2016).

28. "Arrêt du tabac chez les patients atteints d'affections psychiatriques". ConfeÂrence d'experts. Paris: OFT (2009).

29. Gillet C. "Quelle deÂmarche de soins et d'accompagnement?" Tabac, alcool et cannabis. Alcoologie Addictologie. DeÂcembre (2007): 390-7.

30. TraiteÂ d'addictologie (2ÊEÂ d.) REYNAUD Michel, KARILA Laurent, AUBIN Henri-Jean, BENYAMINA Amine. Librairie Lavoisier (2016).

31. Hall SM., *et al*. "Smoking cessation abstinence goal in treatment-seeking smokers". *Addict Behaviour* 42 (2015): 148-153.

32. Abdullah AS., *et al*. "Predictors of smoking cessation behavior among Bangladeshi adults: findings from ITC Bangladesh survey". *Tobacco Induced Diseases* 13.1 (2015): 23.

33. Stolz D., *et al*. "Predictors of success for smoking cessation at the workplace: a longitudinal study". *Respiration* 87.1 (2014): 18-25.

34. World Health Organization. "Adherence to long-term therapies" (2017).

35. Catz SL., *et al*. "Adherence to varenicline in the COMPASS smoking cessation intervention trial". *Nicotine and Tobacco Research* 13.5 (2011): 361-368.

36. Nayan S., *et al*. "Smoking cessation interventions and cessation rates in the oncology population: an updated systematic review and meta-analysis". *Otolaryngology–Head and Neck Surgery* 149.2 (2013): 200-211.

37. Karam-Hage M., *et al*. "Tobacco use and cessation for cancer survivors: an overview for clinicians". *CA Cancer Journal of Clinics* 64.4 (2014): 272-290.

38. Azevedo RCS de and Fernandes RF. "Factors relating to failure to quit smoking: a prospective cohort study". *São Paulo Medical Journal/. Revista Paulista de Medicina* 129.6 (2011): 380-386.

39. Gritz ER., *et al*. "Smoking behavior following diagnosis in patients with stage I non-small cell lung cancer". *Cancer Causes Control CCC* 2.2 (1991): 105-112.

40. Ostroff JS., *et al*. "Prevalence and predictors of continued tobacco use after treatment of patients with head and neck cancer". *Cancer* 75.2 (1995): 569-576.

41. Ostroff J., *et al*. "Cigarette smoking patterns in patients after treatment of bladder cancer". *Journal of Cancer Education* 15.2 (2000): 86-90.

42. Sanderson Cox L., *et al*. "Tobacco use outcomes among patients with lung cancer treated for nicotine dependence". *Journal of Clinical Oncology* 20.16 (2002): 3461-3469.