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**INDO AMERICAN JOURNAL OF  
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.3551873>Available online at: <http://www.iajps.com>**Research Article****SMOKING CESSATION OUTCOMES AND PREDICTORS  
AMONG INDIVIDUALS ENROLLED IN THE ANTI-  
TOBACCO PROGRAM IN JEDDAH 2018**Anwar Ajlan Alqurashi<sup>1</sup> Hanin Fayeز Alluhaybi<sup>2</sup> Rajaa Al-raddadi<sup>3</sup><sup>1,2</sup> Family Medicine Residents, Ministry of Health, Saudi Arabia<sup>3</sup> Preventive Medicine Consultant, Ministry of Health, Saudi Arabia**Abstract:****Background and Objective:**

Smoking is one of the major risk factors linked to several health problems. Due to the age-standardized prevalence of smoking among adults, the researchers intended to assess the effectiveness of the anti-tobacco program aiming for improving the quitting outcomes in Jeddah, to identify the prevalence of quitting rate, the predictors of quitting status, and the prevalence of quitting attempts among individuals enrolled in the anti-tobacco program in 2017.

**Methods:** The study took place in three randomly selected anti-smoking clinics at the primary health care in Jeddah during a four-week duration in November 2018. All available records were reviewed then, the questionnaire was filled through the telephone interviews.

**Results:** A total of 333 smokers participated in this study, the age range was 30 to 50 years old. The majority of the participants started smoking at ages 16 to 20 years old and 66.5% of the participants reported that they were smoking for more than 15 years. In terms of addiction level, 37.1% of the participants have very high dependence, and 32.4% have high dependence. The majority of the smokers reported health and living a better life as the most common reason for quitting, however, a high percentage of the participants were non-quitter. There was no significant association between the characteristics of the participants and smoking cessation among the participants, except patients who start smoking at a younger age (<16 years old) tend not to quit smoking ( $p=0.018$ ).

**Conclusion:** A need to educate teenagers or even children was made clear according to the young age when smokers tend to start this habit. This government program has a lot of potential in total the eradication of smoking among the general population.

**Keywords:** anti-tobacco program, outcomes, smoking cessation, predictors

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**INTRODUCTION:**

Smoking is one of the major risk factors linked to several health problems. Harmful substances found in smoke affect every organ of the body which could lead to serious diseases or even death (1). According to the Center for Disease Control and Prevention (CDC), smoking causes approximately 6 million deaths per year, and recent studies show that by 2030, smoking will cause more than 8 million deaths every year (1). In order to prevent these grave consequences, health organizations have been promoting smoking cessation worldwide. Quitting smoking lowers the risk of smoking-related diseases and can extend the lifespan of an individual. Studies have shown that even only 20 minutes of quitting smoking has a short-term benefit of decreasing the heart rate and blood pressure, and can decrease the rate of mortality due to various types of cancers such as lung cancer in the long run (2). Based on a recent study, a high percentage of 68% among adult cigarette smokers wanted to stop smoking and 55.4% adult smokers had attempted to quit smoking in the past year (1).

In 1987, the World Health Organization (WHO) established “World No Tobacco Day” which is an annual day-long celebration to increase awareness on the health risks associated with tobacco use and motivate government units to spearhead effective policies that will promote quitting rate and alleviate smoking (2). In accordance with this, the Kingdom of Saudi Arabia established the royal law on anti-smoking on May 17, 2015. This law seeks to fight smoking by explaining all tobacco derivatives, controlling the sales to limit the tobacco and its derivatives, prohibiting the cultivation or manufacturing, prohibiting the smoking in certain places, increasing the tax, limiting the advertising through Saudi media, recording violations and imposing fines and displaying warning labels. The Ministry of Health developed 6 main smoking cessation clinics in Jeddah in order to support the implementation of this law (3). Furthermore, the USPSTF recommended that physicians should ask all adults about tobacco use, advise them to stop using tobacco, and provide behavioral interventions and U.S. Food and Drug Administration (FDA)–approved pharmacotherapy, in order to promote smoking cessation among the adult population (4).

The age-standardized prevalence of use of any tobacco form in Saudi Arabia (2016) was 12.2%, 23.7%, and 1.5% among adults of combined sexes, males, and females, respectively (5). Several determinants were identified to affect the status of quitting smoking such as age, gender, marital status, socioeconomic status, duration of smoking, age at the start of smoking, quitting trials, reasons of quitting, reason for relapse (6). Globally, the

prevalence rate of smoking cessation was 37.6%, while a national study in Saudi Arabia reported 22% (7, 8). The predictors of quitting vary from one study to another however, the most significant factors in national studies were the religion, social reasons and smokers who had previous attempts to quit (7). On the other hand, international studies have determined factors including health status, previous quit attempts of 21-month duration or more, and follow-up of more than 3 visits (8).

Smoking is a preventable cause of death. Several smoking cases among males and females of different age groups were encountered in the anti-smoking clinics in Jeddah, Saudi Arabia. Due to the age-standardized prevalence of smoking among adults which was 12.2%, the researchers intended to assess the effectiveness of the anti-tobacco program aiming for improving the quitting outcomes in Jeddah. Since there are only few studies about the predictors and outcomes of smoking cessation in anti-smoking program in Jeddah, we sought to identify the prevalence of quitting rate within 4 months, the predictors of quitting status, and the prevalence of quitting attempts among individuals enrolled in the anti-tobacco program in 2017.

**METHODS:****Study design and setting**

The study took place in three randomly selected anti-smoking clinics at the primary health care in Jeddah during a four-week duration in November 2018. All available records were reviewed then, questionnaires were filled through telephone interviews.

Jeddah is a Saudi Arabian city on the coast of the red sea. Its population is approximately about 3.4 million and it's a gateway for pilgrimages to the holy cities Makkah and Medina (9). The Ministry of Health, represented by the Tobacco Control Program, has issued the comprehensive Saudi guide to help citizens give up smoking. This guide serves as a scientific and standardized reference for all providers of this service with a view to ensuring a provision of treatment services based on evidence-based medicine (3). We identified 6 main smoking cessation clinics distributed in Jeddah, 3 centers were randomly selected and included in the study. These clinics provide treatment by counseling or pharmacotherapy and follow-up visits. During the first visit, the physicians fill smoking cessation forms which is then pooled into the system of the anti-tobacco program at the administration of public health (3). Patients in Saudi Arabia can also book an appointment at the anti-smoking clinics by calling the hotline (937) for free (3). <sup>[1]</sup><sub>SEP</sub>

### Study population and sample size

All smoking individuals enrolled and newly registered (N=333) at the anti-smoking clinics in Jeddah in 2017 were included in the study. Participating clinics consisted of Al-Naeem Healthcare Center, Northern Obhur Healthcare Center, and Al-Salama Healthcare Center.

### Data collection

All available records of 2017 in 3 randomly selected PHCC were reviewed and included in this study. Data collection sheet was used in this study based on the smoking cessation forms that has been filled in the smoking cessation clinics at the primary health care centers in Jeddah. A data collection sheet was formulated from the smoking cessation forms by the researchers.

Questionnaires were filled through telephone interviews. The researchers introduced themselves to the participants and explained briefly the research and the questionnaire. After receiving verbal consent, the interview regarding the contents of the questionnaire proceeded. A follow-up interview after a year was done in order to assess their quitting status and predictors.

### Study variables

The dependent variables of this study included the status of quitting. On the other hand, the independent variables included socio-demographic information (age, gender, marital status, education, occupation, income), duration of smoking, age at starting of smoking, any smoker at home, addiction level using the Fagerstrom test (very low, low, medium, high and very high), quitting trials (previous quit attempts, how many quit attempts, reasons for relapse), method used to quit (counseling, NRT patch, NRT lozenge, varencline, bupropion), reasons of quitting (health, cost, family, to live a better life, religion, others).

### Data entry and statistical analysis

A pilot study was conducted on 10% of the sample size from the population. The study was carried out in the anti-smoking clinic at Al-salamah PHC in October 2018 in order to assess the completeness of the data in the antismoking collection forms. The deficit was identified and modified. The data collected in the pilot study was not included in the final analysis of the study.

This study was analyzed using IBM SPSS version 23 (IBM Corp., Armonk, New York). A simple descriptive statistic was used to define the characteristics of the study variables through a form of counts and percentages for the categorical and nominal variables while continuous variables are presented using their mean and standard deviations. Dependent variables were defined as a

binary outcome. A Binary Logistic Regression Model (BLRM), with Backward Conditional Elimination with Enter Criteria=0.05 and Elimination=0.10 was used to determine the significant predictors of any given dependent study variables with 95% confidence intervals. Lastly, a conventional p-value of <0.05 was the criteria to reject the null hypothesis.

### Ethical considerations

Research committee approval and permission from the Jeddah Joint Program of Family Medicine were obtained. Approval from the ethical committee was obtained. Approval from the director of the health affairs postgraduate and research center was also obtained.

Permission from the directorate of public health administration in Jeddah was obtained. Verbal consents from all participants were obtained. All information gathered from the participants remained confidential throughout the conduct of the study and results were used solely for the purpose of this research.

### RESULTS:

#### Demographic profile of the study participants

A total of 333 smokers participated in this study. As shown in Table 1, the majority of the participants were adults within the age range of 30 to 50 years old (57.7%). Out of the 333 smokers, 91.6% were males. The majority of the smokers were married (68.5%), university graduates (51.1%), and employed (62.8%). In terms of monthly income, more than half (51.1%) of them did not fill this data, and the majority (25.2%) of the remaining reported a monthly income within the range of 6000 to 12000 SAR.

#### Smoking patterns of the participants

Out of the 333 smokers who participated in this study, 63.7% smoked at home. The majority (49.4%) of the participants started smoking at ages 16 to 20 years old. 66.5% of the participants reported that they were smoking for more than 15 years. Most of the smokers included in this study smoked cigarette (90.0%), while 9.4% smoked shisha/maasel (hookah), 0.6% used smokeless tobacco/shama. The majority (59.0%) of the cigarette smokers smoked 15-30 cigarettes per day, and 39.4% of the shisha /maasel smokers smoked 1-2 times per day. According to the gathered data on addiction level, 37.1% have very high dependence, and 32.4% have high dependence. Out of the total number of respondents, 72.1% has previous quit attempts while 18.9% has no previous quit attempts. Most of them (46.7%) attempted to quit smoking once, while 34.0% had 2-3 attempts. In terms of method of quitting, 45.8% had determination to quit, while 11.7% had counseling.

The majority of the smokers (83.8%) reported health and living a better life as the most common reason for quitting, followed by family reasons (15.0%), then religion (5.4%), and cost (4.6%). A high percentage of the participants (86.5%) were non-quitter.

#### **Association between characteristics of the participants and smoking cessation**

The relationship between the characteristics of the participants and smoking cessation was determined. Based on the corresponding *p*-values, there was the significant difference found between in non-quitters and quitters who started smoking earlier than 16 years of age, 16 to 20 years old, and older than 20 years of age ( $p=0.029$ ). Moreover, patients who started smoking at an earlier age than 16 years old were most likely to negatively influence smoking cessation ( $p=0.018$ ).

#### **DISCUSSION:**

Several studies around the globe have shown that even though smoking has many health problems, many individuals are still having difficulty in quitting. The involvement of government institutions had been promoted in order to reduce the prevalence of smoking among the general population.

This study assessed the effectiveness of the anti-tobacco program aiming for improving the quitting outcomes in Jeddah by identifying the prevalence of quitting rate, the predictors of quitting status, and the prevalence of quitting attempts among individuals enrolled in the anti-tobacco program in 2017.

Our findings have shown that a total of 333 smokers participated in the study and majority of the participants were adults within the age range of 30 to 50 years old (57.7%), male (91.6%), married (68.5%), university graduates (51.1%), and employed (62.8%). These results were comparable with studies conducted by Davila *et al.*, (10), Mostafa *et al.*, (6), and Zhu *et al.*, (11). The low prevalence of smoking in females could be caused by their reluctance to seek help, or they were less educated and did not perceive smoking as a significant health issue, or they were embarrassed to seek help because of the social stigma linked to smoking (12). Our findings indicate that recruitment among female smokers must be promoted for them to be made more aware of the health risk coined to smoking.

The results of our study also presented that 49.4% of the participants started smoking at ages 16 to 20 years old. Another study in Saudi Arabia by Siddiqui *et al.*, (13) reported that smoking among

their participants began at around the age of 20 years old. More and more younger individuals are resorting to smoking as a stress reliever, however, further investigation is still needed regarding this trend over the past decades. Moreover, the majority of the smokers included in our study were long-term smokers (>15 years). Although most of the smokers are aware of the adverse effects of smoking, this seemed not to aid in quitting smoking. Mony *et al.*, (14) explained this as a result of a behaviorally induced conflict, a psychologically unacceptable inconsistency between belief and behavior.

Smokers in this study perceived high dependence on their smoking habit (66.3%), and less and less smokers attempted to quit more than once. Failure to quit smoking has been explained by several studies (15-17). They stated that quitting is difficult because most quit attempts end in relapse. These studies explained that during the first 2-3 weeks of quitting, smokers commonly experience nicotine withdrawal symptoms, which tend to lessen over time and are normally resolved by the fourth week of quitting. Past this early stage wherein cravings and temptations to smoke are tough to fight, the endeavor changes from having to battle to stay quitting to an emphasis on becoming comfortable being a non-smoker. Segan *et al.*, (18) added that this is prone to encompass the demand to improve other ways of acquiring pleasures concomitant to smoking and obtaining means of managing with life's stressors and unpleasant feelings that do not depend on cigarettes.

The study showed a high rate of 45.8% for determination as a method of quitting, while only 11.7% had counseling and 15.0% had medications such as Varencline, NRT patch and lozenge, which may imply the need to improve the recommended methods of quitting for smokers in the center. The majority of the smokers (83.8%) reported health and living a better life as the most common reason for quitting, followed by family reasons (15.0%), then religion (5.4%), and cost (4.6%). However, a high percentage of the participants (86.5%) were non-quitter. A similar study exhibited that while several smokers wish to stop smoking due to its health implications, there remained a significant minority who have no desire to quit, which may be caused by the addictive nature of smoking (19).

Although we attempted to determine significant predictors of smoking cessation in our study, we found no significant association between the characteristics of the participants and smoking cessation, except patients who start smoking at a younger age (<16 years old) tend not to quit smoking ( $p=0.018$ ).



**CONCLUSION:**

Due to the addictive nature of smoking, more and more smokers are having difficulty in quitting this habit. Our results showed alarmingly high dependence on smoking among our sample population and participants tend to start smoking at a very early age. Even though a large proportion of our participants were well-educated and well-informed on the health consequences of smoking, a significantly big proportion still has no desire to quit. Furthermore, those who tried to quit tend not to last longer than 4 months.

Based on our findings, there is still a need to improve the implementation of the anti-smoking program in primary healthcare centers in Jeddah. A need to educate teenagers or even children was made clear according to the young age when smokers tend to start this habit. Psychological, emotional, and medical support can be helpful especially to those who think that determination alone can help them in quitting smoking. This government program has a lot of potential in total eradication of smoking among the general population, it just needs to continually monitor and improve its policies in order to cover more individuals and needs to find ways to improve the follow up in the clinics to reduce the relapse rate among those who are already involved in the program.

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### TABLES

**Table 1. Personal characteristics of 333 study sample**

	No.	%
<b>Age</b>		
<30 years	79	23.7
30-50 years	192	57.7
>50 years	58	17.4
Not Filled	4	1.2
<b>Gender</b>		
Male	305	91.6
Female	28	8.4
<b>Relationship status</b>		
Unmarried	58	17.4
Married	228	68.5
Divorce	5	1.5
Not filled	42	12.6
<b>Level of education</b>		
Primary	3	.9
Secondary	81	24.3
Intermediate	17	5.1
University	170	51.1
Not filled	62	18.6
<b>Employment status</b>		
Unemployed	40	12.0
Employed	209	62.8
Not filled	84	25.2
<b>Income /month</b>		
<6000 SAR	34	10.2
6000-12000 SAR	84	25.2
>12000 SAR	45	13.5
Not filled	170	51.1

**Table 2. Smoking status of the study participants**

	No.	%
<b>Any smoker at home before starting N=287</b>		
No	104	36.3
Yes	183	63.7
<b>At what age did you start smoking N=318</b>		
<16 years	96	30.2
16-20 years	157	49.4
>20 years	65	20.4
<b>Smoking period &gt; 15 yrs N=200</b>		
No	67	33.5
Yes	133	66.5
<b>Type of smoking:</b>		
Cigarettes	317	90.0
Shisha/maasel	33	9.4
Smokeless tobacco/Shama	2	.6
<b>How many cigarettes per day N=316</b>		
<15 cigarettes a day	41	12.9
15-30 cigarettes a day	187	59.2
>30 cigarettes a day	88	27.8
<b>Addiction level N=318</b>		
Very low dependence	16	5.0
Low dependence	41	12.9
Medium dependence	40	12.6
High dependence	103	32.4
Very high dependence	118	37.1
<b>Previous quit attempts N=303</b>		
No	63	18.9
Yes	240	72.1
<b>How many quit attempts N=229</b>		
1 times	107	46.7
2-3 times	78	34.0
>3 times	44	19.3
<b>Methods used for quitting attempts N=240</b>		
Determination	110	45.8
Varencline	23	9.6
NRT patch & lozenge	13	5.4
Counseling	28	11.7
<b>Reasons of quitting N=240</b>		
Family	36	15.0
Health/To live better life	201	83.8
Religion	13	5.4
Cost	11	4.6
<b>Quitter/Non-quitter N=333</b>		
Quitter	45	13.5
Non-quitter	288	86.5