



## Predicting the outcome of smoking cessation based on Fagerstrom test in people referring to smoking cessation centers in Isfahan during the years 2015- 2018

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### A B S T R A C T

Cigarettes are the first preventable cause of death in the world. The factors affecting its abandonment consist of a wide range of social, family, and individual issues. Severe nicotine dependence is also one of the prominent factors that make smoking difficult for a person. There are some tools for measuring nicotine dependence for clinical use. The aim of this study was to predict the outcome of smoking cessation based on Fagerstrom test in patients referring to Isfahan Smoking Cessation Centers during the years 2015- 2018. This is a descriptive cross-sectional study. Data were collected through questionnaires of all smokers who participated in Isfahan smoking cessation clinics during the years 2015- 2018, using the designed questionnaire of the World Health Organization and IUATLD. Dependence was assessed by Fagerstrom test and quit based on the individual's non-smoking status after the third session of treatment and confirmation by expiratory carbon monoxide measurement. The data were then analyzed using t-test, chi-square and logistic regression in SPSS software. In this study 988 samples were studied that 78% (79.6%) were male. Evaluation of nicotine dependence revealed that more than half (25.6% - 35.6%) of the clients had high dependence (37.5%) and moderate dependence (84.5%). The success rate of quitting at the end of the period was 98.6% (642) of the eliminated group. The relationship between nicotine dependence and nicotine dependence at the end of the course in participants with three successful, defeat and elimination groups showed that the highest success rate in quitting (79- 94%) had the lowest success rate in people with high dependency (216 people - 84%). ( $P = 0.00$ ). This study showed that those who are highly addicted to nicotine were less likely to quit. Therefore, it is recommended that special arrangements be made for specific periods of longer duration using multiphase compounds to relieve high dependency.

**Keywords:** Smoking, Quit, Nicotine Dependence, Fagerstrom Test.

## INTRODUCTION

Cigarettes are the first preventable cause of death in the world (Borland et al., 2010; Hymowitz, Sexton, Ockene, Grandits, & Group, 1991). Factors affecting abandonment consist of a wide range of social, environmental, familial, and individual issues (Banzer et al., 2017; Barker et al., 2003). Statistics show that 70% of smokers tend to quit smoking and 46.4% have quit smoking over the past year, but only 4 to 6% of those who quit smoking (Babb, 2017; CDC, 1993). Severe nicotine dependence is one of the prominent factors that make smoking very

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difficult for a person (Balfour, Benowitz, Fagerström, Kunze, & Keil, 2000; Haxby, 1995). Numerous invasive and noninvasive tools for measuring nicotine dependence. Available for clinical use. The Fagerstherm Test (FT) is one of the most applicable noninvasive methods to determine nicotine dependence. The test raises questions about the pattern of smoking that include the first smoking cessation after waking up, the number of cigarettes smoked and the frequency of daily use, the best daily cigarettes, the tendency to smoke in the disease, and the problem of banning smoking (Criner et al., 2019; Matthey & Berger, 1981). Subjects are then classified into three categories of low, medium, and high dependency, based on the scores obtained from the set of questions. One study found that nicotine dependence had a significant effect on quitting, so that nicotine dependence may be more important than some of the psychological, personal, and social determinants, as well as daily and time cigarette smoking. Early morning cigarette smoking was used as predictors of successful quitting (Holm et al., 2017; Hymowitz et al., 1997; Salman & Doherty, 2020). In another study based on stepwise linear regression analysis on factors affecting cessation, it was found that smoking dependency accounts for approximately 35% of all variables related to withdrawal syndrome symptoms and the rate of cessation. Nicotine dependence plays a decisive role in the choice of treatment options and planning for quitting (Bahelah, DiFranza, Fouad, et al., 2016; Bahelah, DiFranza, Ward, et al., 2016; Rojas, Killen, Haydel, & Robinson, 1998) in Iran, a study that can independently evaluate the value of nicotine dependence and success in smoking cessation. To determine its application to other factors, no studies have been conducted from Iranian sources. The aim of this study was to predict the outcome of smoking cessation based on Fagerstrem test in patients referred to Isfahan Cigarette Smoking Clinic affiliated to Isfahan University of Medical Sciences during 2015 to 2018 years.

## **METHODOLOGY**

This is a descriptive cross-sectional study. Data were collected through a questionnaire survey of all smokers who referred to Isfahan Cigarette Smoking Clinic during the years of 2015-2018. In this study, all smokers who participated in smoking cessation training courses in Isfahan from April 2015 to March 2018 were studied. These clinics provide separate monthly treatment sessions for both men and women. Deprivation training courses consist of 7 2-hour sessions that the therapist can help individuals present in a course, typically 15 to 20, using educational methods, counseling, psychotherapy, and drug therapy, from the third treatment session. , Quit smoking. In these courses, nicotine replacement drug is offered as free nicotine gum made in Iran.

Those who missed more than half of the sessions were excluded and those who completed the course (3 sessions or less) were classified as completers. Required information was collected from a questionnaire consisting of demographic and demographic information, cigarette information and treatment factors. Demographic section of the questionnaire including age, sex, marital status.

It was the educational and occupational status. Cigarette smoking information was collected using Fagerström's Nicotine Dependence Scale, which included 6 questions.

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Questions included morning smoking, number of yarns, best cigarettes, how often to smoke, tendency to smoke, and difficulty in smoking bans, which were rated from zero to ten. The validity and reliability of this test were compared in a preliminary and limited pilot study in the same population. Other questions in this section include the reasons for smoking and envelopes / year ( $P / Y = \text{smoking envelope per day in number of years of smoking}$ ) and in the factors of treatment type and method of drug use as well as the number of absenteeism sessions. The outcome of the course was questioned. The outcome of treatment and quitting was determined on the basis of self-report of smoking cessation from the third session of the training course and also confirmation by measuring the amount of caudal carbon monoxide.

Nicotine dependence index was evaluated by chi-squared test in three groups of successful, unsuccessful and delinquent. Then, by subtracting the elimination group, chi-square test was used to evaluate the index of dependence on the outcome of pain withdrawal and the successful and unsuccessful group. Nicotine dependency index was calculated by Chi square test with the mean number of daily consumed yarns, mean envelopes / year, and age and sex of the two successful and unsuccessful groups. Also, the degree of dependency, age and sex status in the elimination group were compared with the degree of dependency and age and sex status in the complementary group using chi-square.

## RESULTS

In this study, 98 individuals were studied, and 718 persons completed smoking cessation training and their characteristics are shown in Table 1. Evaluation of nicotine dependence showed that high dependence (scores 8-10) in 25% (35.6%), moderate dependence (scores 4 to 7) in 37% (52.5%) and low dependence (scores 1-3). There were 84 (11.7%) patients. Success rate at the end of the period (not smoking even one pack of cigarettes after the third session) was equivalent to 1 person (65%), failure to 7% (7.4%) and elimination to 272 (27.6%). Obtained. After excluding the excluded group, the success rate of abandonment was 89.6%.

**Table 1.** Frequency Distribution of Participants in Isfahan Tobacco Prevention and Control Training Courses by Gender, Age, Education and Occupation

	contributors	Number	Percentage
Sex	male	575	80.1
	Female	143	19.9
Age	Less than 20	16	2.2
	21 to 40	404	56.6
	41 to 60	265	37.1
	61 years and over	29	4.1
education	illiterate	31	4.3
	Less than a diploma	279	39.2
	Diploma	227	31.9
	Higher than diploma	175	24.6
Job		44	6.2
		164	23
		316	44.3
		136	19
		54	7.5

Table 2. Frequency Distribution of End-of-Term Results by Nicotine Dependence in Cigarette Smoking Clinic Participants

Cigarette dependence	Successful Number(%)	Failure Number(%)	Total Number(%)
Low	(94) 79	(6) 5	100 (84)
medium	(3.92) 348	(7.7) 29	100 (261)
Much	84(216)	(16) 41	100 (373)
Total	(6.89) 643	(4.10) 70	100 (718)

Chi-square test was used to examine the effect of demographic variables on quitting by sex (P = 0.13), age (P = 0.1), education (P = 0.2), occupation. (P = 0.09), envelope / year (P = 0.1<sup>9</sup>) were among the factors that had no significant relationship with the outcome. However, the result of Fagerstrom test (P = 0.001) strongly influences the outcome of quitting. Job occupation was only significant at 0.1 level. Therefore, logistic regression analysis, as shown in Table 3, was performed, and the effect of job with Fagerstrom score on logistic regression was adjusted for gender. It was observed that Fagerström remained the strongest predictor of crack outcome in the model. Also, the results of logistic regression analysis showed that the odds of quitting with moderate FGR were significantly lower than those with low FGR but those with high FGR 0.67 (0.13 to 0.87) had less chance of quitting. They have a lower score than people.

Table 3. Results of Logistic Regression Analysis of Variables Following the Negative Outcome of Quit in Individuals Participating in Smoking Cessation Training Courses

Fagerström	OR( SE)	CI	P- value
Moderate to low Fagerstrom	0.75(0.38)	-2.02(0.29)	0.58
High to low Fagerstrom	0.33(0.16)	-0.87(0.13)	0.03

## CONCLUSION

Most smokers tend to quit smoking and 4.46% of them quit each year. However, due to problems in quitting smoking, only 5.7% of those who quit can quit smoking for a month and 2.5% of the population can quit smoking permanently. Smoking cessation depends on a wide range of factors that can be identified by focusing on important factors and focusing on increasing the likelihood of success in quitting and preventing the costs of medical treatment imposed by these individuals on the health system in the years to come. And increased the level of community health. Nowadays, one of the factors that have been studied on its effect on smoking cessation is the level of nicotine dependence of the smoker.

One of the most important findings in this study is the significant relationship between course outcomes and the level of nicotine dependence that had not been studied in previous Iranian studies. In this study we found the inverse relationship between success in quitting and nicotine dependence (based on Fagotrom test). Since more than half of the individuals with high dependence were studied in this study, it was observed that as the dependence on smoking increased, the percentage of successful individuals in quitting decreased. This problem has also been confirmed in the study of Sargent et al. In their study, the rate of quitting also decreased with increasing dependency, so that the rate of successful quitting among those who occasionally smoked was 46.3%, compared to 1.3% in those who consumed 1 to 9 cigarettes daily. The percentage was 0.8% in those who smoked 10 or more cigarettes daily. The inverse relationship between quit success and nicotine dependence was also confirmed in another

study (Hymowitz et al., 1997), with high dependency (spending more than 25 cigarettes a day) on quitting and two important factors. Dependence on the number of yorns consumed daily and the time of first smoking in the morning are among the determining factors in quitting. Also, according to the study by Gad et al., Those with higher dependency were less likely to quit smoking ( $P < 0.001$ ). Nicotine dependence can be an important factor in diagnosing and predicting the outcome and prognosis of individuals and can be achieved by planning and performing specific measures based on the level of dependence (such as developing different training patterns, designing special classes for people with high dependency). Increasing the duration of treatment for these patients, adding other scientific areas, such as psychiatric counseling to the course of treatment and the use of multi-drug compounds in the treatment of people with high dependency, increased their presence in the classroom and their likelihood of quitting. The study of Rojas et al. (1998), also emphasized the need for special planning to leave people with high dependency. According to Gad et al., A combination of psychotherapy and pharmacotherapy has been shown to stimulate both nicotine-dependent and high-nicotine withdrawal groups and increase their withdrawal rate and success in quitting. . Compared to the results of the Heydari (2017), which was the influencing factor on the number of sessions attended per session and the number of yorns consumed, in the Gorini et al. (1998), study on 693 high dependency smokers 8 or 9 Session participated in quitting programs were performed. Two important predictive factors for quitting were attendance of at least 7 sessions in quitting programs (OR = 4.26) and smoking less than 30 threads per day at time of consumption. (OR = 1.5) determined. The study also found that there was a significant relationship between the number of sessions attended and the outcome of quitting, but contrary to previous studies and the general belief that the higher the number of cigarettes consumed, the higher the so-called nicotine dependence. Person is smoker. Our results showed that 91.8% of those who smoked less than 10 yarn daily and 71.4% of those who smoked more than 30 yarn per day based on Fagerstrom test of dependency score they had high nicotine. This may indicate that the number of cigarettes consumed alone does not indicate nicotine dependence. After adjusting for age and sex in both elimination and non-elimination groups (completing the course), it was found that not only age and sex had no significant relationship with absenteeism and deletion but also nicotine dependence with age and sex factors. Gender is not correlated, as confirmed in the study by Lessov et al. (2004), However, in the Rojas study, nicotine dependence was higher in men than in women. There was also no significant relationship between gender and treatment outcome, which is to be expected with respect to other studies.

Based on the experiences gained, it can be identified from the beginning of the treatment using the Fagerstrom test for high dependency and more precise treatment can be performed. Based on this study, it is suggested that more detailed studies be conducted on different educational patterns and special courses for people with high dependency and further studies will be undertaken to investigate other factors influencing withdrawal.

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