

Factors affecting dropout in the smoking cessation outpatient clinic

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Abstract

The objective of this study was to investigate the prevalence of discontinuation in the smoking cessation outpatient clinic (SCC) and to examine the features of noncompliance. We retrospectively included 1324 smokers into the study. Patients were divided into two groups, as those who discontinued (dropped out) follow-up (group 1) and those who stayed in follow-up (group 2). Of the total 1324 smokers, 540 (40.8%) patients were in group 1. The mean age, smoking pack-years, and Fagerstrom scores of group 1 were lower than group 2 ($p = 0.001$, $p = 0.008$, and $p = 0.007$, respectively). In addition, the choice of treatment was also different between groups ($p < 0.001$). Motivational/behavioral therapy and nicotine replacement therapy (NRT) were more common in group 1 compared with group 2. There was no difference among groups in gender, having household smokers, history of antidepressant treatment, previous quit attempts, and educational status ($p > 0.05$). Almost 40% of our patients did not come to their follow-up SCC visit. Younger age, lower Fagerstrom score, low amount of daily cigarette consumption, and being treated only with behavioral therapy or NRT were detected as the characteristics of the dropout group. Awareness of the characteristics of smokers who drop out of SCC programs may provide for the implementation of personalized treatment at the first appointment.

Keywords

Smoker, cessation, dropout, control, characteristics, follow-up

Introduction

Cigarette smoking is a most important factor associated with serious pulmonary and cardiovascular diseases. Cessation of smoking is a low-cost treatment modality. Six million people die worldwide each year due to smoking-related diseases. Unless we take urgent measures, this number is expected to be more than eight million by 2030.¹ In Turkey, 16 million adults aged ≥ 15 years smoke daily, which is nearly 31.2% of the total population. Of those, approximately 100,000 people die per year due to diseases related with smoking, and that number is expected to reach 240,000 in 2030.^{2–4}

Although Turkey approved a comprehensive law restricting smoking in 1996, the implementation of that law in the real sense started after January 2008. In the first phase, implementation began primarily at bars, restaurants, and cafes. A “smoke-free air space” has been in place in Turkey since June 2009 and has

been widely supported by society. With this law, Turkey has become one of the six countries with the strongest antismoking laws in the world (United Kingdom, Ireland, New Zealand, Uruguay, Bermuda, and Turkey).³

Among smokers, 70% want to quit smoking, half of them attempt to quit, yet only 4–7% succeed.⁴ These results indicate a need for more effective

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interventions. For this reason, large numbers of smoking cessation programs (SCPs) have been developed. Despite the inconsistency in the literature, several factors have been identified that influence the success of smoking cessation outpatient clinics (SCCs). Personal factors are also important in the success of the SCP. Similarly, most recent studies focus on individualized treatment.⁵

One factor that determines the success of a SCP is patient compliance, which affects the treatment success, treatment cost, and health economics.⁶ Studies indicate that patient dropout from SCPs is not random. Dropout was found to be more common in patients with low socioeconomic status, those without sufficient knowledge about their health, and those of black race.⁷ However, nonattender patients of SCC follow-up visits and those who failed to regularly use medication as prescribed were excluded from most studies. Consequently, the features of this nonattending and noncompliant group of patients are not known. Adherence and awareness of the target population are essential for the structuring of SCP design to meet the specific needs of these patients. Due to the antismoking law, we have had increased numbers of applicants to SCCs in Turkey since 2010. On the other hand, we have also experienced that many smokers did not attend the follow-up visits after their first visit. One of the goals of this study was to analyze the information gathered from our SCC and provide a general image of its population. The main aim of this study was (a) to investigate the prevalence of discontinuation in SCC visits and (b) to examine the features of noncompliant patients.

Material and methods

Our hospital is a tertiary care center that serves patients with pulmonary diseases. In our smoking cessation unit, smokers are evaluated by a pulmonologist who specializes in SCP.⁸ After the first SCC interview of 30 min, we advise a pharmacologic/non-pharmacological treatment support that is appropriate for the smoker's needs. Herein, "non-pharmacologic treatment" refers to therapy consisting of motivational therapy or behavioral therapy. The motivational/behavioral therapy is provided by our pulmonologists who are trained in smoking cessation counseling via our national programs and international guidelines.⁸ Each SCC session includes motivational therapy for 5–20 min depending on the needs of the patients. For example, patients are advised to be

with their family and friends more frequently and have their support during the smoking cessation period. Our SCC also gives advice and information on how to handle strong desires to smoke. Furthermore, our nurse educates patients in smoking cessation and the use of drugs prescribed before and after each visit. The pharmacologic treatment options present in Turkey are nicotine patches and gum, varenicline, and bupropion. Smoking cessation pharmacotherapy is not covered by health insurance payments of the government.

The inclusion criteria of the study were as follows: aged ≥ 20 years, being current or regular smoker (>5 cigarettes per day), and willingness to set a quit date. The exclusion criteria were having unstable cardiovascular disease (uncontrolled blood pressure, unstable angina pectoris, or myocardial infarction in the past 4 weeks); current homicidal or suicidal ideation; history of suicidal ideation; history of psychosis; having a serious or untreated psychiatric illness (major depression, bipolar disorder, or schizophrenia); severe renal or hepatic impairment; and defined alcohol or substance dependence.

We included 1330 smokers into the study. Six were excluded because they were aged under 20 years. Clinical forms of the patients were analyzed, and the following information was collected retrospectively: age, gender, level of education, history of smoking, antidepressant treatment, degree of nicotine dependence based on the Fagerström Test for Nicotine Dependence (FTND), the duration and number of previous quit attempts, and the choice of treatment at current quit attempt. Patients were divided into two groups: (a) discontinued (dropout) group, those who did not attend follow-up visits or did not use their medication (group 1) and (b) follow-up group, patients who attended cessation program at least twice (group 2).

The Statistical Package for Social Sciences version 16.0 for Windows software was used for statistical analysis of the data. Descriptive data were given as the number of participants and frequency. Categorical variables were expressed as the number of smokers and the percentage value. Comparison of categorical variables were performed using χ^2 and Fisher's exact tests. Continuous variables were given as mean and standard deviation. The Shapiro–Wilk test was used to determine whether continuous variables were normally distributed. For continuous variables, Student's *t*-test and Mann–Whitney *U*-test were used according to the situation of variables (normally distributed or

Table 1. The demographic data of the patients (N = 1324).

| | |
|---|-------------------------|
| Mean age (years) (mean \pm SD (min-max)) | 45 \pm 11 (20-70) |
| Gender, n (%) | |
| Male | 727 (54.9%) |
| Educational status, n (%) | |
| Elementary school | 536 (40.5%) |
| Secondary school | 212 (16%) |
| High school | 322 (24.3%) |
| University | 243 (18.4%) |
| Married, n (%) | 478 (36.1%) |
| Smoking pack-years (mean \pm SD (min-max)) | 35.9 \pm 22.2 (1-160) |
| FTND (mean \pm SD (min-max)) | 6.5 \pm 2.5 (0-10) |
| Prior quit attempts, n (%) | 937 (70.8%) |
| Number of quit attempts (mean \pm SD (min-max)) | 1.9 \pm 1.5 (1-7) |
| At least 6 months of successful quit, n (%) | 149 (11.3%) |

SD: standard deviation; min-max: minimum-maximum value; FTND: Fagerström Test for Nicotine Dependence.

not). A p value of <0.05 was considered statistically significant. The study was approved by the research ethics committee of the institution.

Results

The mean age of the 1324 patients was 45 ± 11 years. Male patients constituted 54.9% (727) of the patients. The mean pack-years of smoking was 35.9 ± 22.2 , and the mean FTND score was 6.5 ± 2.5 . Seventy percent of the smokers had previously tried to quit smoking at least once. Among these previous attempts, only 11.3% had succeeded to quit for at least 6 months. This successful 6 months of abstinence was achieved with an average of four to six attempts. In the evaluation of educational status of smokers, primary level of education (first 8 years) constituted the vast majority. Information on marital status was not complete, but the majority of the applicants were married (Table 1).

About 540 of the 1324 smokers (40.8%) did not attend the program after the first visit (group 1). The mean age, pack-years smoking, and FTND scores of group 1 were lower than in group 2 ($p = 0.001$, $p = 0.008$, and $p = 0.007$, respectively). In addition, the choice of treatment was also different between the groups ($p < 0.001$). Motivational/behavioral therapy and nicotine replacement therapy (NRT) were more common in group 1 than in group 2. There was no

Table 2. Characteristics of the patients according to their compliance for SCC.

| Features | Group 1 n = 540 (40.8%) | Group 2 n = 784 (59.1%) | p Value |
|---------------------------------------|-------------------------------|-------------------------------|-----------------------|
| Mean age, years (mean \pm SD) | 43 \pm 11 | 45 \pm 11 | 0.001 ^a |
| Age-groups, n (%) | | | 0.005 ^a |
| 20-24 years | 21 (3.9%) | 12 (1.5%) | |
| 25-44 years | 267 (49.4%) | 345 (44.1%) | |
| 45-64 years | 236 (43.7%) | 401 (51.1%) | |
| ≥ 65 years | 16 (3%) | 26 (3.3%) | |
| Gender, n (%) | | | 0.53 |
| Male | 303 (56.1%) | 424 (54.1%) | |
| Educational status, n (%) | | | 0.11 |
| Elementary school | 228 (42.2%) | 308 (39.2%) | |
| Secondary school | 81 (15%) | 131 (16.8%) | |
| High school | 116 (21.5%) | 206 (26.3%) | |
| University | 112 (20.7%) | 131 (16.8%) | |
| Having smoking household, n (%) | 294 (54.4%) | 409 (52.2%) | 0.41 |
| Prior antidepressant treatment, n (%) | 74 (13.7%) | 130 (16.6%) | 0.63 |
| Pack-years smoking (mean \pm SD) | 34.1 \pm 22.1 | 37.3 \pm 22.1 | 0.008 ^a |
| Prior quit attempts, n (%) | 368 (68.1%) | 549 (70%) | 0.47 |
| Number quit attempts (mean \pm SD) | 1.9 \pm 1.5 | 1.9 \pm 1.6 | 0.60 |
| FTND (mean \pm SD) | 6.2 \pm 2.6 | 6.6 \pm 2.4 | 0.007 ^a |
| Treatment modality, n (%) | | | <0.001 ^a |
| No pharmacotherapy ^b | 160 (29.6%) | 64 (8.2%) | |
| NRT | 134 (24.8%) | 112 (14.3%) | |
| Varenicline | 197 (36.5%) | 440 (56.1%) | |
| Bupropion | 49 (9.1%) | 168 (21.4%) | |

SCC: smoking cessation outpatient clinic; SD: Standard deviation; FTND: Fagerström Test for Nicotine Dependence; NRT: nicotine replacement therapy.

^aSignificant p values.

^bBehavioral therapy without pharmacologic therapy.

difference between the groups in gender, having household smokers, history of antidepressant treatment, previous quit attempts, and educational status ($p > 0.05$; Table 2).

When we evaluated group 1, both genders were similar in terms of age, educational status, and FTND scores. However, household smokers and previous antidepressant treatment were more common among female smokers, and pack-years smoking was lower

Table 3. Characteristics of the discontinued group (group I) according to gender.

| Features | Male (n: 303) | Female (n: 237) | p Value |
|---|------------------|--------------------|---------------------|
| Mean age, years (mean \pm SD) | 44 \pm 12 | 43 \pm 10 | 0.15 |
| Age-groups, n (%) | | | |
| 20–24 years | 12 (4.1%) | 9 (3.8%) | |
| 25–44 years | 142 (46.9%) | 125 (52.7%) | |
| 45–64 years | 136 (44.9%) | 100 (42.2%) | |
| \geq 65 years | 13 (4.1%) | 3 (1.3%) | |
| Having smoking household, n (%) | 143 (47.2%) | 151 (63.7%) | <0.001 ^a |
| Educational status, n (%) | | | 0.24 |
| Elementary school | 120 (39.6%) | 108 (45.6%) | |
| Secondary school | 53 (17.5%) | 28 (11.8%) | |
| High school | 67 (22.1%) | 49 (20.7%) | |
| University | 62 (20.5%) | 50 (21.1%) | |
| Prior antidepressant treatment, n (%) | 21 (6.9%) | 53 (22.4%) | <0.001 ^a |
| Pack-years smoking (mean \pm SD) | 38.5 \pm 24.6 | 28.3 \pm 16.5 | 0.03 ^a |
| Prior quit attempts, n (%) | 219 (72.3%) | 149 (62.9%) | 0.02 ^a |
| Number of quit attempts (mean \pm SD) | 1.24 \pm 0.4 | 1.32 \pm 0.4 | 0.03 ^a |
| At least 6 months of successful quit, n (%) | 42 (13.9%) | 26 (11%) | 0.34 |
| FTND (mean \pm SD) | 6.2 \pm 2.6 | 6.3 \pm 2.6 | 0.65 |

SCC: smoking cessation clinic; SD: standard deviation; FTND: Fagerström Test for Nicotine Dependence; NRT: nicotine replacement therapy.

^aSignificant *p* values.

compared with men ($p < 0.001$, $p < 0.001$, and $p = 0.03$, respectively). Although previous quit attempts were statistically more common among men, the average number of attempts was lower than in the women ($p = 0.02$ and $p = 0.03$, respectively). There was no statistically significant difference between genders for having achieved a successful smoking cessation period of at least 6 months ($p = 0.84$; Table 3).

Discussion

Our study was designed to investigate the prevalence of discontinuation of SCC visits and the features of noncompliant patients. In our study, there was no

difference in the distribution of gender in the smokers who presented to the SCC. The applicants were mostly middle aged, and the vast majority had primary level education. Seventy percent of the smokers had previously attempted to quit, and almost 10% had succeeded smoking cessation for at least 6 months.

In high-income countries, the distribution of smoking in terms of gender is similar. However, in middle-income countries such as Turkey, smoking rates are lower among women.^{4,9} A part of the study of “Global burden of tobacco” was performed in Turkey. The data related to Turkey in this study revealed that smoking rate among women was 15% and was 45% in men.⁴ In our study, men and women had similar rates on presentation to the SCC for smoking cessation. Given that there are fewer female smokers in the population than male, we may say that women present to SCCs more commonly than men. These results suggest that women are more willing to quit smoking. In the literature, it was shown that low education and low socioeconomic levels were more common among applicants to SCCs.^{10,11} Consistent with the literature, about half of the smokers in our study had primary level of education.

Smokers' compliance with SCCs affects treatment success, the cost of treatment, and health economics.^{6,12} In our study, the ratio of smokers who presented to the SCC but did not attend for the next follow-up visits was 40.8%, which is very high. There was no statistically significant difference between the dropout group and the remainder in terms of gender, education level, living in smoking household, and prior antidepressant treatment history. Studies on smoking prevention and cessation revealed that dropout was not random. According to these studies, in contrast with impulsivity and temperament, gender did not make a significant difference for dropout. Smokers who dropped out more frequently were those with insufficient knowledge about their health, black people, and smokers with low socioeconomic status.^{7,13,14} In another study, attrition was associated with female gender, history of depression, high number of cigarettes smoked per day, the length of previous successful quitting periods, low educational level, and feelings of guilt due to continued smoking; however, being elderly has been determined to be protective against attrition.^{12,15–17} In the present study, similar to the literature, when we evaluated age-groups, we found that participants of older age had lower dropout rate compared with younger smokers. This may be related to the absence of comorbid

diseases associated with smoking in younger age-groups. There is a need for new investigations to study whether the presence of comorbid diseases or respiratory symptoms determines dropout.

Despite the widespread use of FTND, it is not identified as a marker for the success of smoking cessation, rather it is used to guide to treatment.^{18,19} However, in our study, FTND scores were lower in the dropout group than in group 2. This may suggest that the low level of dependence measured with FTND may be associated with low willingness to quit smoking. Smokers with low levels of addiction or low daily cigarette consumption may think that they can stop smoking whenever they want. Therefore, this may be a cause to delay the decision to quit smoking.

When we evaluated the dropout group, age and education status were found to be similar in terms of gender. Prior use of antidepressant treatment was significantly higher among women smokers in group 1. Similarly, some studies reported that depression was a factor that caused people to start and continue smoking, and was an obstacle to quit smoking in women smokers.^{18,20} Also we found that women had more household smokers than men. Household smoking may be a strong negative factor to quit smoking in female smokers. In most studies, women smokers were affected indirectly during smoking cessation in the presence of household smokers compared with men. Also, another factor that affects cessation success in women is weight gain problems after quitting.²¹⁻²³ We did not record body mass index in our study. Therefore, we could not investigate the link between weight gain and willingness to quit.

NRT and behavioral therapy/motivational support (without pharmacotherapy) were the most common treatment chosen for the dropout group in our study. In the literature, the most common causes of discontinuation with use of NRT were adverse effects (17%), and thoughts of it not helping and not being needed (15%). The rate of discontinuation rises up to 60% depending on the type of pharmacotherapy. Our SCC physicians prefer non-pharmacologic therapy for the patients with FTND score <5 or low daily consumption of cigarettes. However, some patients in this group insist on getting medication and believe that any therapy other than pills would be ineffective. In addition, patients' preferences also affect the choice of treatment. For example, some patients have heard about the adverse effects of a particular drug and do not want to use it. Also, some patients insist on a specific drug with which a friend quit smoking. There

is a common perception among smokers that NRT has many negative effects, it is not an efficient treatment modality, and that there is no need to use it to quit smoking.²⁴⁻²⁶ Some patients believe that oral/injectable drugs are more effective than transdermal patches. This may be the cause for having more dropout in the group treated with NRT compared with the oral pharmacotherapy group.

Our study aimed to determine the profile of dropout smokers. Therefore, we believe that it may assist in predicting dropout smokers from SCCs. Setting frequent SCC appointments may be a solution for smokers with possible high risk of dropout. We may organize frequent motivational phone calls with these smokers, and appointment reminder service may be considered. Phone call-based counseling might help smokers to access effective behavioral therapies more easily. This method might overcome some barriers in smoking cessation counseling such as distant location, financial limitations, problems with schedule, and transportation. There are studies reporting advantages of phone call-based counseling and behavioral therapies. Furthermore, these studies showed that phone calls maintained reasonable participant engagement and intervention efficacy.²⁷⁻²⁹ The optimal number or frequency of phone calls to be made is unknown. These promising strategies should be evaluated further, and if needed, might be added into daily practice of SCCs.

A number of studies have examined patient characteristics related with treatment responses. For instance, male smokers were found to be better responders to NRT.³⁰ In addition, it was reported that high-dose NRT might be more effective for heavy smokers.³¹ Another study reported that transdermal NRT was less effective for faster nicotine metabolizers and this group experienced more frequent anxiety symptoms associated with smoking cessation.³² Therefore, personalized smoking cessation treatment might be more effective; however, this needs to be studied more precisely. Besides, missing information related to the real causes of dropout is a limitation of our study, because we did not retrospectively call the dropout group and to obtain this information.

In conclusion, smokers were admitted to SCCs, informed about smoking cessation, and given treatment to quit. Afterwards, 40.8% of the smokers in our study did not come to their follow-up SCC visit. Younger age, lower FTND score, low daily cigarette consumption, and being treated only with behavioral therapy or NRT were detected as the characteristics of the dropout

group. Awareness of the characteristics of dropout smokers may provide for the implementation of personalized treatment at the first SCC appointment. This may lead to an increase in smoking cessation. There is a need for more extensive studies in this area.

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Author's Note

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