



Research Article

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THE EFFECT OF TREATMENT METHODS AND CONTINUITY OF FOLLOW-UP ON SUCCESS RATES IN PATIENTS FOLLOWED IN THE SMOKING CESSATION POLYCLINIC

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Abstract

Objectives: Smoking causes addiction with physical and psychosocial factors. This study aimed to reveal factors that affected the success rate and continuity of follow-up in people who presented to the smoking cessation polyclinic

Materials and Methods: The study included 154 patients who presented to the smoking cessation polyclinic (SCP) of a training and research hospital between September 1st, 2018, and February 28th, 2019. Varenicline or nicotine replacement therapy (NRT) was given to eligible patients, along with cognitive behavioral therapy (CBT). The demographic characteristics, number of cigarettes smoked daily, number of outpatient visits, treatment received, Fagerström Test for Nicotine Dependence (FTND) results, and treatment success at the end of the third month and first year were examined retrospectively in all patients.

Results: Among those who received pharmacotherapy, 33 (21.43%) received varenicline and 37 (24.02%) had NRT. As a result of the analysis, the smoking cessation rate in the entire group was 33.11% at the end of 3 months and 20.78% at the end of 1 year. Three-quarters (75.76%) of patients using varenicline and 54.05% of patients using NRT quit smoking. Although the rate of quitting in patients using varenicline was higher than in those using NRT, it was not statistically significant ($p=0.059$).

Conclusion: According to the results of this study, there was no significant difference between varenicline + CBT and NRT + CBT in smoking cessation. Male sex, receiving treatment, and regular follow-up visits are factors that increase the chances of success.

Keywords: Cessation of treatment, smoking cessation, clinic visits, pharmacotherapy, addiction.

Introduction

Tobacco use is one of the greatest public health threats to which humanity is exposed. Tobacco is implicated in chest diseases, cardiovascular diseases, more than 20 different types of cancer, and many other health problems, which cause the death of more than 8 million people in the world annually. The nicotine found in tobacco is highly addictive and there is no safe level of exposure. Smoking is the most common form of tobacco use worldwide.¹ According to the Global Adult Tobacco Survey 2016 data, 19.2 million adults (31.6%) use tobacco products in Turkey and the frequency of use is 44.1% in men and 19.2% in women.²

The Framework Convention on Tobacco Control, which is the first international agreement, was adopted and implemented by our country. The World Health Organization (WHO) has published a series of measures under the name of the 'MPOWER policy package' to control the spread of tobacco use. According to this series of measures, there are two main interventions for users to quit their tobacco habit. The first of these is a consultancy service that includes face-to-face meetings with physicians and other healthcare professionals, integrated into primary healthcare services, as well as easily accessible free telephone helplines. The second is access to low-cost drug therapy.² Quitting smoking ensures a longer, healthier, and more productive life. Health costs will decrease due to chronic disease, and socially productive years and quality of life will increase.³ Most smokers want to quit and providing effective means of quitting increases the likelihood of a successful quit attempt. There is strong evidence that behavioral education and pharmacotherapy are effective in smoking cessation, and the combination of the two modalities produces better results.^{4,5}

In the SCP, a detailed anamnesis is taken, and physical examinations and necessary medical examinations are performed. Afterward, behavioral training is given to each patient, and pharmacologic treatment, which will continue for at least three months, is started for eligible patients. Patient follow-ups are conducted face-to-face, at least once in the first 15 days, monthly for up to 3 months, and once every three months until the end of 1 year. This study aimed to contribute to reducing the rates of tobacco addiction, which is an important public health problem, by evaluating the reasons that affect treatment attendance and success rates in people who present to quit smoking.

Materials and Methods

Participants and Procedures

Our study was approved by the scientific research ethics committee of a university (Approval No: 20/75). The study was conducted among people who presented to the SCP and were included in the treatment program from September 1st, 2018, when our SCP started, until February 28th, 2019. In our study, whether the subjects

quit smoking at the end of the 3rd and 12th months was evaluated both by scanning the file data and by contacting them by phone.

Patients whose smoking cessation was not recorded and could not be reached by phone were excluded from the study and 154 were included in the study. In the period when the patients used both pharmacotherapy methods (varenicline and NRT) in a similar way along with behavioral education, the demographic characteristics of the individuals, the number of cigarettes smoked daily, the number of applications to the polyclinic, the treatment they received, their nicotine addiction status, and their effects on the success of the treatment were retrospectively examined.

The nicotine addiction status of individuals is measured using the Fagerström Test for Nicotine Dependence (FTND), which is widely used in the SCP, and the results are routinely available in patient files. The Turkish validity and reliability study of the FTND was performed by Uysal et al. and it was concluded that it could be used as a measurement method in the evaluation of nicotine addiction in smoking cessation.⁶

Smoking cessation rates were determined from the files in the third month when the pharmacologic treatments of the individuals ended and after the 1st year when the routine follow-up period ended. The patients who stopped the follow-up were contacted by phone and asked about their smoking cessation status and the reasons for quitting the follow-up.

Statistical Analysis

In the study, descriptive data are shown as number (n), percent (%) values for categorical data, and mean \pm standard deviation and median minimum-maximum values in continuous data. The Chi-square test was used to compare categorical data. Cross-tables were created to show the smoking cessation status of individuals according to their treatment method. Because the percentage of expected values less than 5 was higher than 20%, except those who only received cognitive behavioral therapy from the treatment methods were cross-tabulated with a 2x2 regular basis and the p-value was given.

Measurement data were tested using the Kolmogorov-Smirnov test for the assumption of normal distribution. The Mann-Whitney U test and Kruskal-Wallis tests were used as appropriate for the comparison of measurement data that did not show normal distribution. For data showing normal distribution, the t-test and one-way analysis of variance (ANOVA) were used in independent groups, where appropriate. $P < 0.05$ was accepted as statistical significance in all analyzes. Analyses were performed using the IBM © SPSS program version 20.

Results

Of the 154 people included in the study, 69 (44.80%) were female and 85 (55.19%) were male. The mean age was 40.1 ± 12.1 years. When the number of cigarettes smoked per day was grouped, the majority was between 11 and 20. Treatment was started in 75 (48.70%) patients, 79 (51.30) individuals left the follow-up before deciding on the treatment method or did not use the recommended treatment at all. Of the 75 people who were given treatment, 33 (21.43%) received varenicline, 37 (24.02%) had NRT, and five (3.25%) received CBT only. When the FTND score was classified as low, moderate, or high, those with a medium score (4-6) were in the majority (Table 1) (Figure 1).

The participants were divided into two groups according to their smoking cessation status and compared again (Table 2). No significant difference was found between the mean age and education level in both groups, but a significant difference was found in terms of smoking cessation rate by sex, which was higher in males ($p=0.271$, $p=0.065$, and $p=0.044$, respectively). When the number of cigarettes smoked per day was grouped as ≤ 10 , 11-20, and >20 , the distribution was similar between the two groups ($p=0.828$). When we divided the FTND scores into three groups, low, moderate, and high, and took the average, there was no significant difference in the quitter and non-quitter groups ($p=0.687$).

The quit rate of participants who used any method to quit smoking was significantly higher than those who did not receive treatment ($p<0.001$). Three-quarters (75.76%) of our patients using varenicline and 54.05% of patients using NRT quit smoking. Although the rate of quitting in patients using varenicline was higher than in those using NRT, it was not found to be statistically significant ($p=0.059$). The mean number of physician follow-up visits was significantly higher in the group who quit smoking ($p<0.001$). The rate of smoking cessation in the entire group was 33.11% at the end of 3 months. The quit rate of these patients at the end of 1 year was 20.78%; the relapse rate was 12.33%.

Seventeen (11.04%) of the participants regularly came for follow-up visits. When the reasons for the patients who discontinued SCP follow-up were questioned, 29 (21.17%) were due to personal reasons (inability to get leave from work, stress, loss of motivation), 27 (19.71%) quit smoking, 18 (13.14%) could not find medicine, 17 (12.41%) were related to problems with the recommended method (drug adverse effects and ineffectiveness), 11 (8.03%) were reported as bureaucratic reasons (unable getting an appointment or not reaching health institutions) (Figure 2).

Table 1. Sociodemographic data and smoking factors of the patients

Group	n	%
Age (mean ± standard deviation)	40.11±12.13	
Sex		
Female	69	44.80
Male	85	55.19
Educational status		
Under primary education	37	24.02
Primary education	31	20.13
High school	40	25.97
University	46	29.87
Number of cigarettes per day		
≤10	19	12.34
11-20	85	55.19
>20	50	32.47
Status of receiving treatment		
Received	75	48.70
Not received	79	51.30
Treatment Method		
Varenicline	33	21.43
NRT	37	24.02
Only CBT	5	3.25
FTND score		
Low (0-3)	19	12.34
Moderate (4-6)	64	41.56
High (≥7)	71	46.10

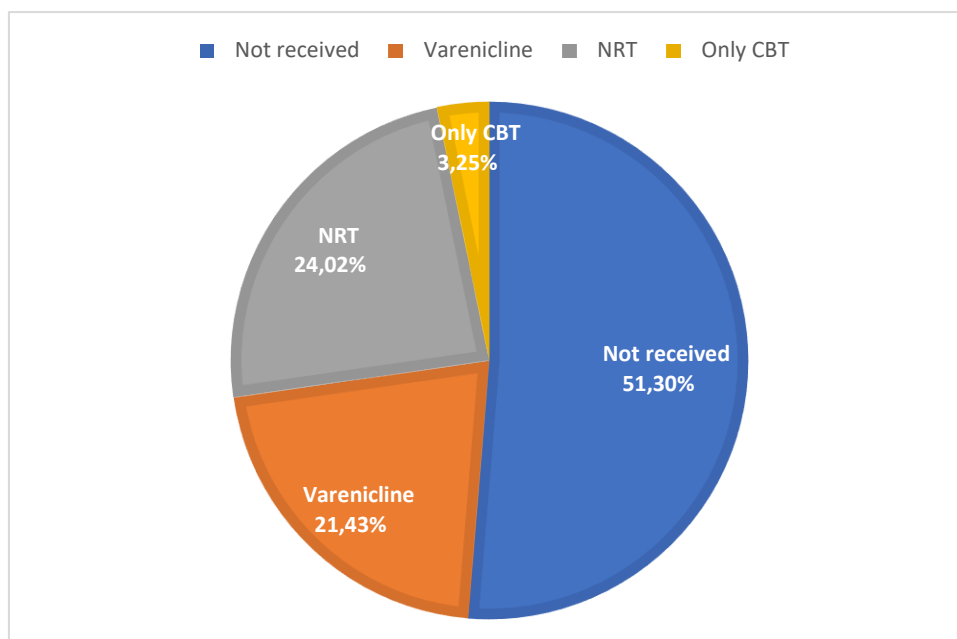


Figure 1. Status of Receiving Treatment and Method

Table 2. Characteristics of the Participants According to Whether They Quit

Group	Smoking Status		p
	Quit n (%)	Did not Quit n (%)	
Age [median (min-max)]	38.0 (18.00-65.00)	40.0 (20.00-67.00)	0.271
Sex			
Male	34 (40.00)	51 (60.00)	0.044
Female	17 (24.64)	52 (75.36)	
Status of receiving treatment			
Received	49 (65.33)	26 (34.67)	<0.001
Not Received	2 (2.53)	77 (97.47)	
Treatment method			
Varenicline	25 (75.76)	8 (24.24)	0.059
NRT	20 (54.05)	17 (45.94)	
FTND			
Low	7 (36.84)	12 (63.16)	0.687
Moderate	23 (35.94)	41 (64.06)	
High	21 (29.58)	50 (70.42)	
FTND [median (min-max)]	6.0 (1.00-10.00)	6.0 (0.00-10.00)	0.559
Educational status			
Under primary education	9 (24.32)	28 (75.67)	0.065
Primary education	6 (19.35)	25 (80.64)	
High school	18 (45.00)	22 (55.00)	
University	18 (39.13)	28 (60.87)	
Number of cigarettes per day			
≤10	7 (36.84)	12 (63.16)	0.828
11-20	29 (34.12)	56 (65.88)	
>20	15 (30.00)	35 (70.00)	
Follow-up visits [median (min-max)]	3.00 (1.00-6.00)	1.00 (1.00-6.00)	<0.001

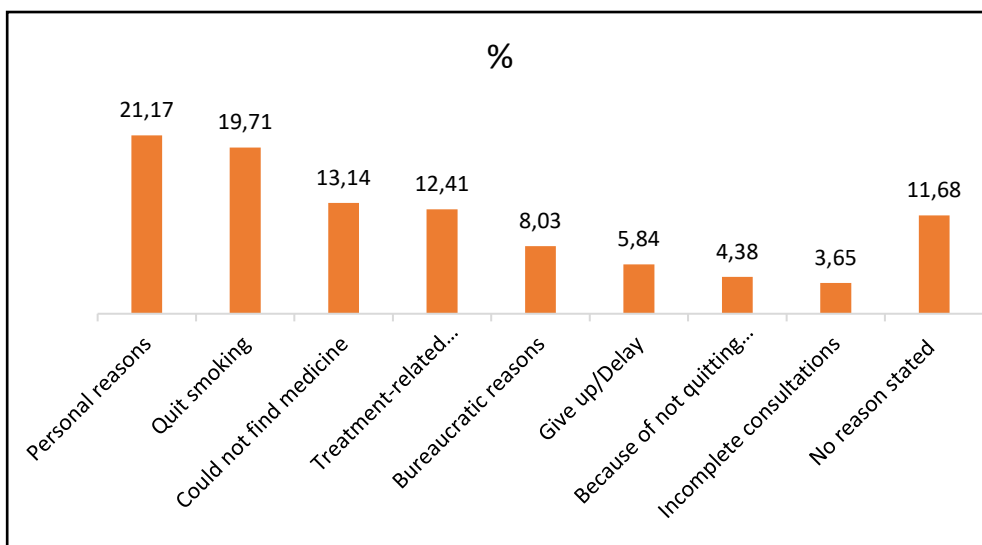


Figure 2. Distributions of reasons for not coming to follow-up visits (%)

Discussion

The number of smoking cessation clinics in our country is increasing and this systematic program increases the chance of success in eliminating tobacco addiction.

Behavioral education is as important as pharmacologic treatment in this smoking cessation process, which can be perceived as chronic and repetitive by patients. In our study, the smoking cessation rate was 33.11% at the end of the third month and 20.78% at the end of the 1st year. Different rates have been reported in studies evaluating the success of smoking cessation in our country. In the third month, the quit rates were found to be between 34% and 54%.⁷⁻⁹ In studies conducted in our country that evaluated smoking cessation success at the end of the 1st year, rates between 19.3% and 45.3% were reported.^{8,10-14} The 3-month success rates in our study were similar to Yılmaz et al., and 1st-year quit success rates were similar to those of Kanatsız et al. In both studies, success was associated with continued treatment and follow-up.^{9,11} In our study, it was observed that the number of physician follow-up visits and the rate of continuation of treatment were low in the group that failed to quit smoking.

Different results have been obtained regarding the effects of age and sex on smoking cessation success. Monso et al. stated that advanced age and male sex increased the success of quitting.¹⁵ Although sex was not significant in some studies and the success of quitting at an advanced age was high^{8,9}, age and sex were not found to be significant in other studies.^{7,10,14} In our study, just as in Sağlam's study, age was not found to be a significant factor, but the male sex was found to have a positive effect on quitting success.¹³

In some studies, it has been shown that higher education level increases the success of quitting.^{16,17} In the study of Monso et al., it was found that education level was ineffective in quitting success, but it was thought that this might be due to the high level of education of the participants included in the study.¹⁵ Consistent with some studies conducted in our country, our study also found that education level had no significant effect on quitting success.^{7,10,14,18}

In the study of Niu et al., the number of cigarettes smoked daily and the increase in the risk of nicotine addiction were highly correlated.¹⁹ On the other hand, some studies show that the number of cigarettes smoked daily has a significant effect on the success of quitting⁷, whereas others claim it has no effect.¹² Studies state that only the FTND score affects quitting success,^{9,10,13,14} as it has been shown that patients who smoke a high number of cigarettes daily with high FTND scores have low quitting success.¹⁵ In our study, the number of cigarettes smoked daily and FTND score levels were not found to be effective in the success of smoking cessation, similar to the findings of Salepçi et al.⁸

In some studies in the literature, it has been reported that the success of smoking cessation is higher in patients using varenicline than with NRT.²⁰⁻²³ In multicenter studies, the variability of subjects, such as completed treatment, behavioral support, how drug efficacy is perceived, and adverse effect management, appear as confounding factors.²¹ In our study, the rate of smoking cessation in patients using varenicline was found to be higher than in those using NRT, but this difference was not statistically significant ($p=0.059$). In some studies, although the success of varenicline users in the fourth week of treatment was higher than with NRT, there was no significant difference between the two methods in the follow-ups after treatment.^{24,25}

Another point that draws attention is that only 11,04% of our patients attended their follow-ups regularly. The most frequently reported reasons for discontinuation were not being able to take time off from work, loss of motivation, quitting smoking, and not being able to find drugs. In a similar study, the most common reasons for discontinuing follow-up were the thought that the treatment did not work, the occurrence of adverse effects, and smoking cessation, and 54% of those using NRT reported that they terminated the treatment in less than four weeks. Smokers are typically resistant to receiving treatment for the recommended amount of time. However, stopping treatment early in the belief that they have been successful in quitting smoking seems to be a mistake many can make. Encouraging smokers to participate more actively in their treatment can increase their success in quitting.²⁶

In smoking cessation clinics, giving free drugs increases participation in programs. However, difficulties experienced from time to time in finding drugs may cause patients to quit their follow-up. Some studies argue that telemedicine or online interview-based counseling is similar to the standard face-to-face smoking cessation interview in the clinic.²⁷ In addition to face-to-face meetings, alternative methods can be applied to manage smoking cessation programs. Situations that make it difficult to meet face-to-face with a physician, such as the pandemic, may also create additional reasons for the necessity of using these methods.

It is thought that increasing the number and duration of face-to-face meetings with physicians, as well as making physicians' work schedules suitable for telephone and/or online visits, and facilitating access to drugs will increase the success rates of smoking cessation clinics.

Limitations

The smoking cessation status of the individuals was not evaluated using a breath carbon monoxide monitor, and only their verbal statements were recorded. This may have resulted in the patients having difficulty declaring that they are still smoking and misdirecting the physician. The single-center nature of the study is also among the limitations. Multicenter studies with a higher number of participants and continuous communication with the consent of the participants will reveal valuable results on smoking cessation and treatment.

Ethical considerations: Our study was approved by the scientific research ethics committee of Health Sciences University (Date: 28.02.2020, Approval No: 20/75).

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References

1. World Health Organization, Tobacco [Internet]. 2021; <https://www.who.int/news-room/fact-sheets/detail/tobacco> (Accessed: 31.01.2021).
2. GATS (Global Adult Tobacco Survey) Fact Sheet, Turkey [Internet]. 2016; https://www.tobaccofreekids.org/assets/global/pdfs/en/GATS_Turkey_2016_FactSheet.pdf (Accessed: 31.01.2021)
3. World Health Organization, *WHO Global Report on Trends in Prevalence of Tobacco Use 2000–2025*. 4th ed., [Internet]. 2021; <https://apps.who.int/iris/handle/10665/348537> (Accessed: 20.12.2021).
4. Fanshawe TR, Halliwell W, Lindson N, et al. Tobacco cessation interventions for young people. *Cochrane Database Syst Rev*. 2017;11:CD003289.
5. Hartmann-Boyce J, Hong B, Livingstone-Banks J, et al. Additional behavioural support as an adjunct to pharmacotherapy for smoking cessation. *Cochrane Database Syst Rev*. 2019;6:CD009670.
6. Uysal M, Kadakal F, Karşıdağ C, et al. Fagerstrom test for nicotine dependence: reliability in a Turkish sample and factor analysis. *Tüberküloz ve toraks*. 2004;52:115-21.
7. Argüder E, Karalezli A, Hezer H, et al. Sigara bırakma başarısını etkileyen faktörler. *Türk Toraks Dergisi*. 2013;14(3):81-87.
8. Salepçi B, Fidan A, Oruç Ö, et al. Sigara bırakma polikliniğimizde başarı oranları ve başarıda etkili faktörler. *Toraks Dergisi*. 2005;6(2):151-8
9. Yılmaz A, Turan A. Sigara Bırakma Tedavisindeki Hastalarımızın Genel Özellikleri Ve Tedavi Başarısını Etkileyen Faktörler. *İzmir Göğüs Hastanesi Dergisi*. 2015;29(3):145-9
10. Esen AD, Soylem Y, Arica S, et al. Factors affecting success and abstinence within a smoking cessation clinic: A one-year follow-up study in Turkey. *Tob Prev Cessat*. 2020;6:71.
11. Kanatsız B, Başlılar Ş, Şaylan B, et al. Sigara Bırakma Başarısını Etkileyen Faktörler ve Medikal Tedavilerin Değerlendirilmesi. *Eurasian Journal of Family Medicine*. 2017;6(2):65-71.
12. Pekel Ö, Ergör G, Günay T, et al. Smoking cessation and the effect of nicotine dependence on relapse rate in İzmir, Turkey. *Turk J Med Sci*. 2015;45(4):895-901.
13. Sağlam L. Investigation of the results of a smoking cessation clinic and the factors associated with success. *Turkish Journal of Medical Sciences*. 2012;42(3):515-22.
14. Yaşar Z, Kurt ÖK, Talay F, et al. One-Year Follow-up Results of Smoking Cessation Outpatient Clinic: Factors Affecting the Cessation of Smoking. *Solunum*. 2014;16(2):99-104.
15. Monso E, Campbell J, Tonnesen P, et al. Sociodemographic predictors of success in smoking intervention. *Tob Control*. 2001;10(2):165-9.
1. 16. Janson C, Künzli N, de Marco R, et al. Changes in active and passive smoking in the European Community Respiratory Health Survey. *Eur Respir J*. 2006;27(3):517-24.

16. Osler M, Prescott E. Psychosocial, behavioural, and health determinants of successful smoking cessation: a longitudinal study of Danish adults. *Tob Control*. 1998;7(3):262-7.
17. Şahbaz S, Kiliç O, Günay T, et al. Sigara içme ve demografik özelliklerin sigara bırakma tedavilerinin sonuçlarına etkileri. *Toraks Dergisi*. 2007;8(2):110-14.
18. Niu T, Chen C, Ni J, et al. Nicotine dependence and its familial aggregation in Chinese. *International Journal of Epidemiology*. 2000;29(2):248-52.
19. Arslan Y, Ocal N, Cagin A, et al. The Success of Smoking Cessation Treatments: The Gulhane Experience. *ADDICTA: The Turkish Journal on Addictions*. 2021;8(1):8-15.
20. Brose LS, West R, Stapleton JA. Comparison of the effectiveness of varenicline and combination nicotine replacement therapy for smoking cessation in clinical practice. *Mayo Clin Proc*. 2013;88(3):226-33.
21. Kralikova E, Kmetova A, Stepankova L, et al. Fifty-two-week continuous abstinence rates of smokers being treated with varenicline versus nicotine replacement therapy. *Addiction*. 2013;108(8):1497-1502.
22. West R, Evins AE, Benowitz NL, et al. Factors associated with the efficacy of smoking cessation treatments and predictors of smoking abstinence in EAGLES. *Addiction*. 2018;113(8):1507-16.
23. Aubin HJ, Bobak A, Britton JR, et al. varenicline versus transdermal nicotine patch for smoking cessation: results from a randomised open-label trial. *Thorax*. 2008;63(8):717-24.
24. Gray KM, McClure EA, Baker NL, et al. An exploratory short-term double-blind randomized trial of varenicline versus nicotine patch for smoking cessation in women. *Addiction*. 2015;110(6):1027-1034.
25. Balmford J, Borland R, Hammond D, et al. Adherence to and reasons for premature discontinuation from stop-smoking medications: data from the ITC Four-Country Survey. *Nicotine & tobacco research : official journal of the Society for Research on Nicotine and Tobacco*. 2011;13(2):94-102.
26. Nomura A, Tanigawa T, Muto T, et al. Clinical Efficacy of Telemedicine Compared to Face-to-Face Clinic Visits for Smoking Cessation: Multicenter Open-Label Randomized Controlled Noninferiority Trial. *J Med Internet Res*. 2019;21(4):e13520.