

# SMOKING CESSATION RATES BY METHOD USED TO QUIT AT ONE YEAR AMONG PATIENTS ATTENDING A SMOKING CESSATION CLINIC IN TURKEY

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**Abstract.** Tobacco is a public health problem in Turkey. We aimed to determine the smoking cessation rates by method used to quit among patients presenting to a smoking cessation clinic in Turkey. We retrospectively reviewed the records of patients who presented to the study clinic from December 2010 to December 2011 and followed up each patient by phone call 1 year later to determine the smoking cessation rate by the method used to quit. All subjects were given behavioral modification motivation. The possible methods used to quit were: behavioral motivation, varenicline use, bupropion use and nicotine replacement therapy (NRT). A total of 857 subjects were reviewed, 49.8% female. The average age of study subjects [ $\pm$  standard deviation (SD)] was 43.7 ( $\pm$ 11.4) years. The average age of smoking initiation was 17.5 ( $\pm$ 5.1) years (range:8-60 years). The average number of previous attempts to quit smoking was 2.1 ( $\pm$ 0.9) times (range: 1-3 times). Ninety-eight point eight percent of subjects had never received treatment to help them quit smoking. The overall 1 year smoking cessation rate was 34.3%. Of the 857 subjects, 12.7% received only behavioral motivation but no medical treatment, 12.0% were ordered medication but did not receive it, 31.6% received varenicline, 36.8% received bupropion, 5.6% received NRT and 0.1% received combination medical treatment. At one year the smoking cessation success rate for those who received only behavior motivation was 21.2%, for those who received varenicline was 35.8%, for those who received bupropion was 39.0% and for those who received NRT was 41.9%. The average length of treatment at the study clinic was 45.1 ( $\pm$ 25.3) days and the average number of the times the subjects visited the clinic was 2.3 ( $\pm$  1.5) times (range:1-8 times). The best smoking cessation success rate was among those who received a combination of behavior motivation counselling and bupropion. Therefore, we recommend the combination as first line therapy for this patient population.

**Keywords:** smoking cessation, treatment compliance, varenicline, bupropion

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## INTRODUCTION

Tobacco use in Turkey is 27% (Global Adult Tobacco Survey, 2012). Nearly 100,000 people worldwide die from smoking-related diseases each year. Smoking also lowers the quality of life.

The nicotine in tobacco causes addiction. Tobacco addiction includes behavioral, psychological, and nicotine addiction, but it can be treated. Evidence-based guidelines recommend the combined use of pharmacological and cognitive-behavioral therapies (West *et al*, 2000; Abakay and Tşik, 2016; Şengezer, 2016).

Smoking cessation is important for a healthy and quality of life. The aim of this study was to determine the smoking cessation rates by method used to quit among patients presenting to a smoking cessation clinic in Turkey in order to inform the smoking cessation program at the studied clinic.

## MATERIALS AND METHODS

The study was conducted among patients who attended the study clinic from December 2010 to December 2011. All of the study subjects during the study period were reviewed to obtain demographic data, the method used to quit, their smoking habits, their level of nicotine addiction as measured by the Fagerström Test for Nicotine Dependence (FTND), their length of treatment and their carbon monoxide (CO) levels (Pico Smokerlyzer; Bedfont Scientific, Maidstone, UK). Each subject was then contacted 1 year after attending the clinic to determine their smoking status. The cessation rates by method used to quit smoking were then calculated.

### Statistical analysis

SPSS for windows version 20.0 (IBM,

Armonk, NY) was used for the statistical analyses. The Independent-Samples *t*-Test and Mann-Whitney *U* test were used to compare independent groups. Kruskal-Wallis test was used to compare multiple groups. Class variables were presented as frequencies and percentages in cross tables and their distributions were compared with the chi-square test.

### Ethical considerations

This study was approved by Adana Cukurova Dr Askim Tüfekçi Public Hospital Ethics Committee. Written informed consent was obtained from all participants.

## RESULTS

A total of 857 subjects were included in the study (49.8% females). The mean age [ $\pm$  standard deviation (SD)] of study subjects was 43.7 ( $\pm$ 11.4) years. The mean age of smoking initiation among study subjects ( $\pm$  SD) was 17.5 ( $\pm$  5.1) years. The subjects had a 30 ( $\pm$  18.2) mean ( $\pm$ SD) pack-year smoking history. The mean ( $\pm$ SD) Fagerström Test for Nicotine Dependence (FTND) score was 6.6 ( $\pm$ 2.2). The mean ( $\pm$  SD) CO levels were 11.1 ( $\pm$ 7.1). Seventy-six point five percent of subjects had previously tried to quit smoking at least once with an average ( $\pm$  SD) 2.1 ( $\pm$  0.9) (range:1-3) attempts to quit (Table 1). Ninety-eight point eight percent had never sought medical help to quit. Two point nine percent of subjects had a history of drug addiction and 46.3% had a chronic medical condition, such as diabetes or hypertension. Three point six percent of subjects were sent for psychiatric counselling at the beginning or after treatment. The average ( $\pm$ SD) duration of treatment was 45.7 ( $\pm$  25.3) days. Nineteen point nine percent of subjects received a 12 week treatment course. Subjects attended

Table 1  
Characteristics of study subjects.

	N (min.max) (857)
Age	43.7±11.4 (15-78)
Age of smoking initiation	17.5±5.1 (8-47)
Package year	30.0±18.2 (1-150)
CO level	11.1±7.1 (0-48)
FG point	6.6±2.2 (1-10)
Attempt to quit	2.1±0.9 (1-3)

CO, carbon monoxide.

Table 2  
Comparison of subjects who were unsuccessful and successful in quitting smoking.

Variable	Quit smoking (n=294)	Continued smoking (n=563)	p-value
Age in years (±SD)	45.4±11.7	42.8±11.2	0.002
Age of smoking initiation in years (±SD)	17.9±5.0	17.3±5.2	>0.05
Pack years smoking history (±SD)	31.0±19.5	29.4±17.5	>0.05
FG point	6.4±2.1	6.7±2.2	0.022
CO level	9.8±6.8	11.7±7.1	0.000

CO, carbonmonoxide; FG, Fagerström test; SD, standard deviation.

the clinic an average ( $\pm$  SD) of 2.2( $\pm$ 1.5) times (range : 1-8 times). Subjects were called once weekly for the first week, once monthly for 3 months and then once every 3 months for a year, no serious medication side-effects were reported, but 20.2% reported minor side-effects consisting of nausea, strange dreams and itching.

All subjects received cognitive-behavioral therapy, 12.8% were not prescribed any medical therapy, 12.1% did not receive the prescribed therapy, 32.1% received varenicline; 36.9% received bupropion, 5.6% received NRT (nicotine replacement therapy) and 0.5% received combination medical therapy.

The mean ( $\pm$  SD) age of those who

were not smoking at 1 year ( $45.4 \pm 11.7$  years) was significantly ( $p=0.002$ ) greater than the mean age of those who continued smoking by 1 year ( $42.8 \pm 11.2$  years). Significantly ( $p=0.037$ ) more men (37.7%) than women (30.9%) quit smoking by 1 year. The FTND score was significantly ( $p=0.022$ ) lower in those who quit smoking by 1 year than those who did not and the CO level was significantly ( $p=0.000$ ) lower in those who quit smoking by 1 year than who did not (Table 2).

The smoking cessation rates at 1 year among those who had attempted to quit smoking previously 1 time, 2 times and 3 times were 37.4%, 32.4% and 33.2%, respectively; the differences between these

were not significant ( $p=0.428$ ). The smoking cessation rates at 1 year among those who had previously quit for  $\leq 1$  year and  $\geq 1$  year were 33.8% and 47.5%, respectively; the difference was significantly different ( $p=0.036$ ). The smoking cessation rates at 1 year among those with and without chronic medical diseases were 34.8% and 33.9%, respectively; the difference was not significant ( $p=0.794$ ) (data not shown).

No significant association was found between smoking cessation rates and education level and smoking cessation rates and occupation. The overall smoking cessation rate among our subjects at 1 year was 34.4%. The smoking cessation rate of 1 year among those who had cognitive behavioral therapy was 21.5%, among those who also had varenicline was 35.6%, among those who had bupropion was 39.2% and among those who had NRT

was 47.9%; the differences between these values were significant ( $p=0.000$ ) (Table 3).

The Fagerström test for nicotine dependence scores (possible score:1-10) for the cognitive behavioral therapy group, varenicline group, bupropion group and NRT group were 6,7,4 and 4, respectively. Patients with the same FTND score who received either bupropion or varenicline were pooled; among these, the smoking cessation rates by treatment duration were: 16.7%, 22.9%, 48.8% and 70.3% among those who received treatment for 7-14, 30, 60 and 90 days, respectively; the differences in these rates were significant ( $p=0.000$ ) (Table 4, fig1), except for between the 7-14 and 30 day treatment groups. The smoking cessation rates at 60 days among those treatment with bupropion (61.0%) and varenicline (37.9%) were significantly different ( $p=0.002$ ) (Table 5). However,

Table 3  
Percent of subjects not smoking 1 year after attending smoking cessation clinic.

Method used to stop smoking	Number of patients ( <i>n</i> ) not smoking 1 year after the smoking cessation clinic	Percent of patients not smoking after attending the smoking cessation treatment (%)
Behavioral therapy	46/214	21.5
Varenicline	98/275	35.6
Bupropion	124/316	39.2
Nicotine replacement therapy	23/48	47.9

Table 4  
patients who quit smoking by duration of smoking cessation treatment

Duration of treatment in days	Number of patients( <i>n</i> )	Percent of patients who quit smoking (%)
7-14	18	16.7
30	327	22.9
60	125	48.8
90	118	70.3

## SMOKING CESSATION

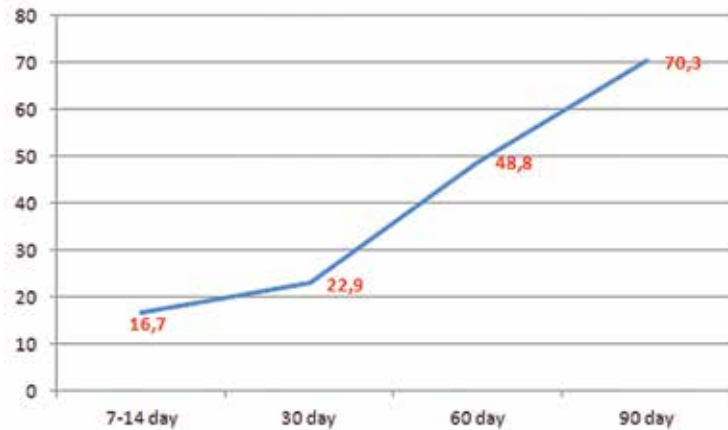


Fig 1-Percentages of smoking cessation by duration of treatment.

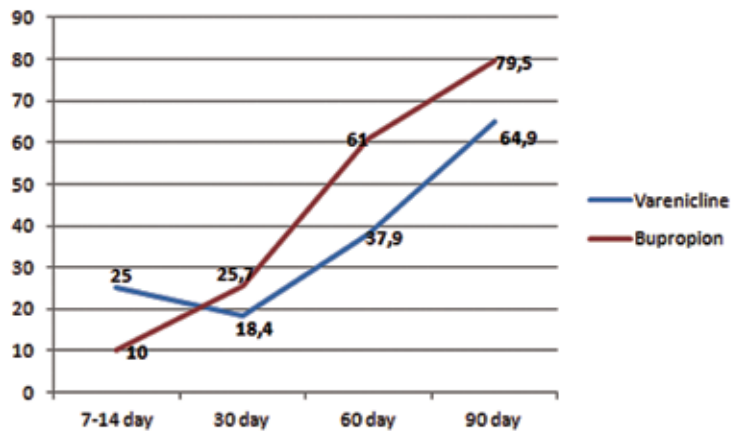


Fig 2-Varenicline and bupropion quit rate by duration of treatment.

overall there was no significant difference between smoking cessation rates with the bupropion and varenicline treatment groups ( $p=0.387$ ).

## DISCUSSION

More than 1.2 billion people worldwide are estimated to smoke tobacco and the worldwide deaths due to tobacco smoking per year are estimated to reach 10 million per year by 2020 (Şahbaz *et al*,

2007; WHO,2008). The prevalence of tobacco smoking was estimated by the Turkey Global Adult Tobacco Survey in 2012 to be 27% and by 2014 to be 32.5% (Elbek, 2010; TCSB, 2017).

Turkey adapted to tobacco control law in 1996. The Framework Convention on Tobacco Control adopted by the World Health Organisation (WHO) in 2003 was adopted by the Grand National Assembly of Turkey in 2004. In 2008, the MPOWER (Monitor tobacco use and prevention

Table 5  
Smoking cessation rates by type and duration of treatment.

Duration of treatment in days	Varenicline (%)	Bupropion (%)	p-value
7-14	25	10	>0.05
30	18.4	25.7	>0.05
60	37.9	61.0	0.002
90	64.9	79.5	—
Overall	35.6	39.2	>0.05

policies, Protect people from tobacco smoke, Offer help to quit tobacco use, Warn about the dangers of tobacco, Enforce bans on tobacco advertising, promotion and sponsorship, Raise taxes on tobacco) package was published by the WHO as a guide on tobacco control (WHO, 2008). Physicians have the duty to inform their patients about the health problem caused by smoking and help their patients to quit smoking; this is a compound of MPOWER (WHO, 2008; Bilir, 2009; Elbek, 2010; Ergüder, 2010; Turkey's Tobacco Control Adventure, 2017).

Smoking cessation rates with physician encouragement has been reported to be 2-5% (Salepçi *et al*, 2005). Smoking cessation rates have been reported to be as high as 40% with intensive motivational support, cognitive-behavioral therapy and pharmacological treatment in smoking cessation clinics (Uzaslan *et al*, 2000). In our smoking cessation clinic, each patient receives cognitive behavioral therapy; pharmacological treatment is provided based on the patient's nicotine addiction level, chronic health programs, and chronic medications. In our study, the overall 1 year smoking cessation rate was 34.4% among patients who received pharmacological treatment. One-year smoking cessation rates in the literature are reported to vary from 16% to

41% (Uzaslan *et al*, 2000; West *et al*, 2000; Salepçi *et al*, 2005; Şahbaz *et al*, 2007; Çelik *et al*, 2015; Anthenelli *et al*, 2016; Salepçi *et al*, 2016; Benli *et al*, 2017). The association between smoking cessation rates and many factors have been investigated and reported in the literature, such as age, gender, education, sociocultural status, nicotine dependency level, the number of cigarettes smoked per day, treatments received for smoking cessation (Uzaslan *et al*, 2000; West *et al*, 2000; Salepçi *et al*, 2005; Şahbaz *et al*, 2007; Çelik *et al*, 2015; Anthenelli *et al*, 2016; Salepçi *et al*, 2016; Benli *et al*, 2017). In our study, no significant difference were noted in age of smoking initiation, smoking history (pack-years), education, occupation, concomitant diseases and side effect between those who quit smoking and those did not quit smoking. Some studies in the literature reported gender was not associated with smoking cessation, while some studies reported smoking cessation rates were higher in men (Gourley *et al*, 1994; Salepçi *et al*, 2005; Şahbaz *et al*, 2007; Çelik *et al*, 2015) as seen in our study. In our study, patients with a higher FTND score had lower smoking cessation rates, similar to a previous study (Çelik *et al*, 2015).

Seventy percent of smokers consider quitting smoking every year (Salepçi *et al*, 2005). Seventy-six point five percent

of our subjects had previously tried to quit smoking at least once with an average ( $\pm$ SD) of 2.12 ( $\pm$  0.86) (range:1-3) quit attempts.

Smoking results in nicotine dependence. Pharmacological treatment improves smoking cessation success rates. The success of pharmacological treatment in smoking cessation in patients with nicotine dependence is superior to placebo. The best duration to treat the addicted subjects has been reported to be 12 weeks (Abakay *et al*, 2016; Hezer *et al*, 2016; Uzaslan *et al*, 2016) as seen in our study. A 24-week treatment course has been recommended for relapses (Gonzales *et al*, 2014; Annemans *et al*, 2015). In our study, pharmacological treatment was used in 87.2% of subjects but the mean ( $\pm$ SD) treatment duration was 45.7 ( $\pm$  25.3) days. In our study, the 12-week treatment course was associated with a higher success rate, but a lower completion rate (Benli *et al*, 2017). The prevalence of side effect is 20.2%, which is similar to that reported in the literature (Anthenelli *et al*, 2016). During the study, varenicline and bupropion were prescribed free due to funding from the Ministry of Health, but subjects were charged for NRT, so it was used in only 5.6% of subjects.

Successful tobacco cessation treatment requires cognitive behavioral therapy, pharmacologic therapy and close follow-up. Our overall quit rate at 1 year was 34.3%; however, we think this can be better, since cessation rates were better when subjects received a 12 week course of treatment but only 19.9% of subjects received 12 weeks of treatment. We recommend combined cognitive behavioral therapy and pharmacological treatment for at least 12 weeks to give the best outcome for smoking cessation by 1 year in this patient population. Further

studies are needed to determine how best to achieve these goals.

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