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Effects of Depression and Anxiety Scores on Smoking Cessation Treatment

ABSTRACT

Objective: Smoking prevalence is high in many psychiatric diseases. The aim of this study is to evaluate depression and anxiety effect among smoking cessation treatment.

Methods: Records of patients who admitted to the smoking cessation clinic in Health Sciences University, Konya Education and Research Hospital, in 2016 were retrospectively evaluated. A total of 560 patients' records were investigated. Records consisted of Beck Depression Scale (BDS), Beck Anxiety Scale (BAS), Fagerström Nicotine Dependence Test (FNDT), carbon-monoxide (CO) measurement, and sociodemographic questionnaire form. Patients were called by phone at the 3rd month following initiation of cessation treatment, and asked whether they quit smoking or not. Although this study was started with total 560 patients, the study was completed with 517 patients who could be reached by telephone 3 months later.

Results: The mean age of quitters was higher than the ones who could not ($p=0.002$). Contrary, the mean CO levels ($p<0.001$), and the mean BDS ($p<0.001$) and BAS ($p<0.001$) scores were significantly higher in patients who failed to quit. Remaining characteristics of the patients were not statistically different between groups.

Conclusions: High depression and anxiety scores decreases the success rates of smoking cessation treatments. Assessment of these patients regarding anxiety and depression, providing psychosocial counselling by health professionals together with the medical treatment, and consulting with a psychiatrist when needed are important steps for achieving high quit success in these patients.

Keywords: Depression, Anxiety, Smoking Cessation Treatments

Depresyon ve Anksiyete Skorlarının Sigara Bırakma Tedavisi Üzerine Etkisi

ÖZET

Amaç: Birçok psikiyatrik hastalıkta sigara içme prevalansı yüksektir. Bu çalışmanın amacı depresyon ve anksiyete skorlarının sigara bırakma tedavisi üzerine etkisini değerlendirmektir.

Gereç ve Yöntem: 2016 yılında Sağlık Bilimleri Üniversitesi Konya Eğitim ve Araştırma Hastanesi Sigara Bırakma Polikliniğine başvuran hastaların kayıtları retrospektif olarak değerlendirildi. Toplam 560 hasta kaydı araştırıldı. Kayıtlar Beck Depresyon Ölçeği (BDS), Beck Anksiyete Ölçeği (BAS), Fagerström Nikotin Bağımlılık Testi (FNDT), karbonmonoksit (CO) ölçümü ve sosyodemografik anket formundan oluşmaktadır. Hastalar, bırakma tedavisinin başlamasının ardından 3. ayda telefonla aranmış ve sigarayı bırakıp bırakmadıkları sorulmuştur. Bu çalışmaya toplam 560 hasta ile başlanmasına rağmen, 3 ay sonra telefonla ulaşılabilen 517 hasta ile çalışma tamamlandı.

Bulgular: Sigarayı bırakanların yaş ortalaması, bırakamayanlara göre daha yüksekti ($p = 0.002$). Aksine, sigarayı bırakamayan hastalarda ortalama CO düzeyleri ($p <0.001$) ve ortalama BDS ($p <0.001$) ve BAS ($p <0.001$) skorları anlamlı olarak yüksek bulundu. Hastaların diğer temel özellikleri gruplar arasında istatistiksel olarak farklı değildi.

Sonuç: Yüksek depresyon ve anksiyete skorları sigara bırakma tedavisinin başarı oranını azaltır. Bu hastaların anksiyete ve depresyon açısından değerlendirilmeleri, sağlık profesyonellerinin tıbbi tedavi ile birlikte psikososyal danışmanlık sağlaması ve gerektiğinde psikiyatristle konsülte edilmesi, bu hastalarda yüksek başarı elde etmek için önemli basamaklardır.

Anahtar Kelimeler: Depresyon, Anksiyete, Sigara Bırakma Tedavisi

INTRODUCTION

Tobacco use disorder is still one of the leading causes of preventable deaths worldwide. Cigarette smoking is globally considered as a chronic disease due to nicotine addiction. Tobacco use disorder is a risk factor for various diseases that affect mortality and morbidity. It is estimated that tobacco use disorder causes approximately 6 million deaths annually in the world. In 2030, the number of deaths is estimated to increase to 8 million annually if solid action plans are not applied by the countries (1). As a consequence, smoking is considered as an epidemic disease, which is a significant health problem for all of the world.

Many countries conduct smoking control and cessation programs. By applying these programs, decreases in giving up smoking levels have been reported. Nevertheless, the low success rates in smoking cessation treatments are disquieting (2).

Studies report that presence of depression and anxiety symptoms , stress, treatment modality, duration of motivational interviews, number of visits, and calling patients by phone are the factors that affect smoking cessation treatment (3).

Smoking prevalence is high in many psychiatric diseases (4). Patients with findings of depression prior to smoking cessation treatments are reported to have more depressive symptoms after quitting, and risk of recurrent depression is increased in these patients (5, 6). Some previous studies reported that smoking quit rates are lower in patients with mood disorders like unipolar and bipolar depression when compared to general population (7, 8). K. McClave et al. (9) reported that levels of depression were lower in individuals who achieved to quit smoking than the individuals who could not.

The aim of this study is to evaluate the effect of depression and anxiety score among smoking cessation treatment. We anticipate that the outcomes of this study may provide novel insights in smoking cessation treatments, and may increase the success rates of giving up smoking.

MATERIAL AND METHODS

Participants and study protocol: Records of patients who admitted to Health Sciences University, Konya Education and Research Hospital, Smoking Cessation Outpatient Clinic in 2016 were retrospectively evaluated. A total of 560 patients who had completed the form including Beck Depression Scale (BDS), Beck Anxiety Scale (BAS), Fagerström Nicotine Dependence Test (FNDT), carbon-monoxide (CO) measurement, and sociodemographic questionnaire form were included in the study. Inclusion criteria consisted of also included being over 18 years of age, not having any cognitive-debilitating disease, not been diagnosed with anxiety and depression in the past and having a history of cigarette use over 10 pack-years. Patients with high score (>17) on the BDS were included after approval of the psychiatrist. In the smoking cessation clinic, we arrange phone calls by the 3rd month of following cessation treatment for every patient and control whether they quitted smoking or not. Although this study was started with total 560 patients, the study was completed with 517 patients who could be reached by telephone 3 months later. Selçuk University Ethical Committee approved this study (2016-179). CO levels at admission, and sociodemographic and clinical characteristics of patients were obtained from the records of the hospital and analyzed with SPSS 22.0 software.

CO levels were measured from expiratory flow by piCOSmokerlyzer Breath CO Monitor Bedfront Scientific equipment. This device measures CO levels in expiratory air over a scale of 0-100 ppm.

All patients completed the Beck Depression Scale (BDS) that included 21 questions for the assessment of depressive symptoms. Depression levels were graded according to BDS scores as 0-13 point: no depression; 14-19 points: low depression; 20-18 points: moderate depression; 29-63 points: high depression. Patients with a score over 14 points and patients who had a diagnosis of depression took smoking cessation treatment after obtaining an approval from the psychiatry department.

Beck Anxiety Scale assessment: Beck Anxiety Scale (BAS) is a self-evaluation scale including 21 items in a 0-to-3 points score range. These questions evaluate the level of disturbance that the patient felt because of anxiety. The BAS scores were categorized as low (0-17 points), moderate (18-24 points), and high (≥25 points).

Fagerström Nicotine Dependence Test assessments were performed to determine the nicotine addiction levels of patients. Maximum score in this six-questions test is 10. Scores were graded as very low dependence (0-2 points), low dependence (3-4 points), moderate dependence (5 points), high dependence (6-7 points), and very high dependence (≥8 points) (10).

Statistical Analyses: Descriptive statistics of the study were presented with frequency and percent for categorical data, and with mean and standard deviation for numerical data. Independent group comparisons were performed with Student-t and chi-square tests for numerical and categorical data, respectively. Logistic regression analysis was performed for identifying the independent determinants of success of smoking cessation, and model fit was evaluated with Hosmer-Lemeshow test. All statistical analyses of the study were calculated as two-sided at a significance level of 5% and confidence interval of 95%. SPSS® 21 (IBM Inc., USA) software was used for the analyses.

RESULTS

Basic characteristics of the participants are presented in Table 1. Accordingly, 21.3% were female (n=110), and 78.7% were male (n=407), mean age was 38.1±11.9 years, and mean age of smoking initiation was 15.9±5.1 years. 48.5% of the participants were laborers, and 39.3% were graduated from primary school. 22.2% of the target population of the study have never attempted to quit smoking. The presence of smokers at the participants home and the work was respectively 41.2% and 76.8%. The rate of participants who have an alcohol abuse problem was 3.9%.

Mean FNDT score of the patients was 6.2±2.4, mean CO level was 6.5±3.8 ppm, and mean cigarette consumption was 24.8±17.2 pack-years. Mean BDS and BAS scores were 15.7±10.5 and 15.4±11.6, respectively.

Proportions of bupropion, varenicline, and nicotine replacement therapies were 72.7%, 25.5%, and 1.7%, respectively. 46.2% of patients have quitted smoking, and 53.8% of them have failed to quit smoking.

The mean age of quitters of smoking was higher than the ones who could not (p=0.002). Contrary, the mean CO levels (p<0.001), and the mean BDS (p<0.001) and BAS (p<0.001) scores were significantly higher in patients who failed to quit smoking. Remaining characteristics of the patients were not statistically different between groups (Table 2).

The logistic regression analysis for determining the quit smoking status of the patients revealed that increased CO levels in expiratory air (OR=0.932;95% CI: 0.886-0.980; p=0.006), high BDS score (OR=0.967; 95% CI: 0.944-0.992; p=0.009), high BAS score (OR=0.967; 95% CI: 0.946-0.989; p=0.004), and being younger than 37 years of age (OR=0.675; 95% CI: 0.467-0.976; p=0.037) were negatively affected the success in smoking cessation treatment (Table 3).

DISCUSSION

Recently, smoking is a preventable risk factor for mortality and morbidity. Smoking is one of the most important health problems in the world, especially in developing countries like our country (11). Smoking addiction is a chronic and recurrent "disease" due to withdrawal symptoms, and most of the smokers struggle to quit for long periods. In this study, we have evaluated the effects of depression and anxiety scores among smoking cessation treatment.

Literature data suggest that male patients are more successful on smoking cessation treatment compared to women but some studies have showed that gender had no effect on smoking cessation treatment (12-14). Contrary, Monso et al. (15) reported vice versa. In our study, we found that smoking cessation treatment success was not associated with gender.

Table 1. Basic characteristics of the study participants

Age (year)	38.1±11.9
Age of smoking initiation (year)	15.9±5.1
Fagerström Nicotine Dependence Test score	6.2±2.4
Carbon-monoxide measurement (ppm)	6.5±3.8
Pack-year	24.8±17.2
Beck depression score	15.7±10.5
Beck anxiety score	15.4±11.6
	n (%)
Gender	
Women	110 (21.3)
Men	407 (78.7)
Occupation	
Worker	241 (48.5)
Craftsmen	98 (19.7)
Officer	87 (17.5)
Housewife	71 (14.3)
Craftsmen	98 (19.7)
Officer	87 (17.5)
Housewife	71 (14.3)
Education level	
Illiterate	10 (1.9)
Literate	3 (0.6)
Primary school	203 (39.3)
Secondary school	96 (18.6)
High school	109 (21.1)
University and above	96 (18.6)
Previous quit attempts	
None	115 (22.2)
1 time	184 (35.6)
2-3 times	133 (25.7)
4 and more times	85 (16.4)
Another smoker at the home	
None	304 (58.8)
Present	213 (41.2)
Another smoker at the workplace	
None	120 (23.2)
Present	397 (76.8)
Alcohol consumption	
No	497 (96.1)
Yes	20 (3.9)
Cessation medication	
Nicotine replacement	9 (1.7)
Bupropion	376 (72.7)
Varenicline	132 (25.5)
Quit status	
Failed	278 (53.8)
Quit	239 (46.2)

Table 2. Comparisons of basic characteristics according to quit status

	Quit Status		
	Failed to quit (n=278)	**Quit (n=239)**	**p**
	Mean±SD	**Mean±SD**	
Age (year)	36.5±11.8	39.9±11.8	0.002
Age of smoking initiation (year)	15.7±5	16.2±5.2	0.267
Fagerström Nicotine Dependence Test score	6.4±2.4	6±2.5	0.093
Carbon-monoxide measurement (ppm)	7±3.9	5.9±3.6	<0.001
Pack-year	24.3±18.2	25.3±16	0.271
Beck depression score	18.3±11.4	12.6±8.4	<0.001
Beck anxiety score	18.3±12.3	11.9±9.6	<0.001
	n (%)	**n (%)**	
Gender			0.974
Women	59 (21.2)	51 (21.3)	
Men	219 (78.8)	188 (78.7)	
Occupation			0.256
Worker	53 (19.9)	34 (14.8)	
Craftsmen	121 (45.3)	120 (52.2)	
Officer	57 (21.3)	41 (17.8)	
Housewife	36 (13.5)	35 (15.2)	
Education level			0.328
Illiterate	7 (2.5)	3 (1.3)	
Literate	2 (0.7)	1 (0.4)	
Primary school	100 (36)	103 (43.1)	
Secondary school	48 (17.3)	48 (20.1)	
High school	65 (23.4)	44 (18.4)	
University and above	56 (20.1)	40 (16.7)	
Previous quit attempts			0.622
None	57 (20.5)	58 (24.3)	
1 time	105 (37.8)	79 (33.1)	
2-3 times	72 (25.9)	61 (25.5)	
4 and more times	44 (15.8)	41 (17.2)	
Another smoker at the home			0.09
None	154 (55.4)	150 (62.8)	
Present	124 (44.6)	89 (37.2)	
Another smoker at the workplace			0.116
None	57 (20.5)	63 (26.4)	
Present	221 (79.5)	176 (73.6)	
Alcohol consumption			0.208
No	270 (97.1)	227 (95)	
Yes	8 (2.9)	12 (5)	
Cessation medication			0.971
Nicotine replacement	5 (1.8)	4 (1.7)	
Bupropion	201 (72.3)	175 (73.2)	
Varenicline	72 (25.9)	60 (25.1)	

Table 3. Factors determining the smoking cessation

	OR	**95% Confidence Interval**	**p**
CO (ppm)	0.932	0.886-0.98	0.006
Beck Depression score	0.967	0.944-0.992	0.009
Beck Anxiety score	0.967	0.946-0.989	0.004
Age group (reference: <37 years)	0.675	0.467-0.976	0.037

OR= Odd's ratio

Raherison et al. (16) showed that successful cessation was positively correlated with age. Previous studies showed that mean age of the patients who successfully quitted smoking were significantly higher than the ones who failed (17, 18). Similarly, in our study elder people were more successful than youngers among smoking cessation. Some previous studies reported that successful smoking cessation was associated with age, gender, socioeconomic status, and nicotine dependence (15, 19-21).

When the association between success in smoking cessation and education level is considered, some previous studies showed that quit smoking success increases with the increased education level (22, 23), but some other studies reported that education level had no contribution on smoking cessation (15, 24). Our study also revealed that there was no significant association between quit success and education level.

A study by Prochaska et al. (25) reported that smoking cessation success of the individuals increases as the number of their quit attempts increases. On the other hand, Raherison et al. (16) reported that smoking cessation success is higher in individuals who have less number of quit attempts. In our study, we didn't find any relation between previous quit attempts and quit success.

Fidan et al. (17) reported that smoking cessation success is negatively associated with alcohol abuse, and recurrence of smoking is high in individuals who have higher levels of alcohol addiction. In our study, there was no relation between smoking cessation success and alcohol abuse. So, this may be related with the low prevalence of alcohol abusers in this study.

Previous studies showed that number of cigarettes smoked per day, FNDT score, and pack-year amount are the determinants of smoking cessation success. Also, some studies reported that high nicotine addiction and increased smoking patterns decreases the success rates of quitting (21, 23). According to our study, age of smoking initiation and pack-year levels of quitters were similar with non-quitters.

Another study compared the CO levels in expiratory air of 31 smokers and 30 non-smokers; found that CO levels were positively correlated with the number of cigarettes smoked (26). According to our study, there was a statistically significant association between number of cigarettes smoked and CO levels, besides patients who failed to stop smoking had significantly higher CO levels.

Gorecka et al. (20) reported that lower FNDT scores positively affected smoking cessation success. On the other hand, our study found that FNDT scores were not statistically significantly different between quitters and non-quitters.

Yasar et al. (27) found in their study that presence of other smokers at home had no effect on quit success. Similarly, we found that presence of other smokers at home or work had no statistically significant effect on quitting. These results are also compatible with the other studies in our country.

Jorenby et al. (25) recruited 893 patients into 4 groups, and gave placebo, NRT, bupropion, and NRT+bupropion to the patients for 9 weeks. At the end of the first year, the quit rates were found to be significantly higher in 3rd and 4th groups. Patients who took NRT+bupropion had significantly higher smoking cessation rates when compared to only NRT users. In our study, we found that smoking cessation success was not associated with the medical treatment options.

Many studies have reported that prevalence of smoking is high in patients with psychiatric diseases (28). Glassman et al. (29) emphasized the importance of assessment of anxiety and depression, due to high prevalence of depression at treatment initiation and following cessation. Patients with a history of depression have low cessation success, higher rates of depressive symptoms and recurrent depression when compared to patients without depression history (30). The review by Van der Meer et al. (31) reported that addition of psychosocial support on standard interventions during smoking cessation attempts increases the long term success rates in patients with both previous and also current depression history. Weinberger A.H. et al. (32) reported that patients with depression had lower smoking cessation rates when compared to the ones without. Fidan et al. (17) found in their study that anxiety and depression scores were significantly higher in patients who quit smoking. In accordance with these literature data, we found in our study that high scores in BDS and BAS negatively affects smoking cessation success.

As a conclusion, high depression and anxiety scores decreases the success rates of smoking cessation treatments. Assessment of these patients regarding anxiety and depression, providing psychosocial counseling by health professionals together with the medical treatment, and consulting with a psychiatrist when needed are important steps for achieving high quit success in these patients.

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