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Hulya Ertekin¹
Yusuf Haydar Ertekin²

¹Canakkale Onsekiz Mart
University, Department of
Psychiatry, Canakkale, Turkey

²Canakkale Onsekiz Mart
University, Department of
Family Medicine, Canakkale,
Turkey

Corresponding Author:
Yusuf Haydar Ertekin
Canakkale Onsekiz Mart University,
Department of Family Medicine,
Canakkale, Turkey
E-mail: dr.ertekin@gmail.com

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konuralptipdergi@duzce.edu.tr
konuralptipdergisi@gmail.com
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The Evaluation of the Nicotine Dependence in Psychiatric Disorders

ABSTRACT

Objective: It has been known that there is a relationship between high nicotine dependence and recurrent major depression. A similar relevance may establish a reference for further investigations evaluating the role of nicotine dependence on various psychiatric disorders. For this purpose, we assessed the frequency of smoking and nicotine dependence, according to psychiatric diagnosis in psychiatric outpatients.

Methods: A total of 1036 psychiatric patients were included in this descriptive study. The participants were evaluated according to DSM IV (Diagnostic and Statistical Manual of Mental Disorders, 4th. Edition) for psychiatric disorders and Fagerström Test for Nicotine Dependence (FTND) that was applied to define smoking habits.

Results: The overall smoking rate was 40.2% (n=416), while the smoking rate of females and males was 32.6% (n=229) and 56.0% (n=187), respectively (p<0.001). The mean age of onset of smoking, and the mean FTND score were significantly higher in men than women [The mean age of onset of smoking was 19.4 ± 6.7 years in women, and 16.9 ± 6.0 years in men (p<0.001). The mean FTND score in women and men were 3.9 ± 2.7 and 5.1 ± 2.6 (p<0.001) respectively]. The number of smoking cessation trials, the prevalence of lower FTND scores (≤ 7 points), and the smoking cessation request of patients with psychotic disorders were significantly lower than patients with affective disorders and anxiety disorders (respectively p=0.022, p<0,001, p=0,015). The mean FNBT score was higher in psychotic disorder (p<0.001).

Conclusion: The higher mean FTND score and the higher prevalence of higher FTND score (> 7 points) in psychotic disorder in comparison to affective and anxiety disorders may give insight to the role of nicotine in the pathogenesis of the psychiatric diseases.

Keywords: Smoking, Nicotine, Outpatients, Tobacco Use Disorder, Smoking Cessation, Diagnostic and Statistical Manual of Mental Disorders, Prevalence, Major Depressive Disorder, Psychotic Disorders, Mood Disorders, Anxiety Disorders.

Psikiyatrik Hastalıklarda Nikotin Bağımlılığının Değerlendirilmesi

ÖZET

Amaç: Yüksek nikotin bağımlılığıyla tekrarlayan major depresyon arasında ilişki olduğu bilinmektedir. Benzer bir ilişkinin diğer psikiyatrik hastalıklarda saptanmasında nikotin bağımlılık düzeylerinin araştırılması ileriki çalışmalara yön verecektir. Bu amaçla ayaktan psikiyatrik hastalarda, psikiyatrik tanılara göre sigara içme sıklığını ve nikotin bağımlılık düzeyini diğer ilişkili faktörler ekseninde inceledik.

Gereç ve Yöntem: Bu tanımlayıcı çalışmaya toplam 1036 ayaktan psikiyatri hastası dâhil edildi. Hastaların psikiyatrik tanıları DSM-IV'e göre ve nikotin bağımlılıkları Fagerström Nikotin Bağımlılık Testi (FNBT) ile ele alındı.

Bulgular: Genel sigara içme oranı %40,2 (n = 416); sırasıyla kadınların sigara içme oranı %32,6 (n = 229) ve erkeklerin %56,0 (n = 187) idi (p<0,001). Erkek hastaların sigaraya başlama yaşı ve FNBT puanları kadınlardan istatistiksel olarak daha yüksekti (p<0,001). [Kadınların sigaraya başlama yaşı 19,4 ± 6,7 ve erkeklerin sigara başlama yaşı 16,9 ± 6,0 (p<0,001). Ortalama FNBT puanları ise kadın ve erkeklerin sırasıyla 3,9 ± 2,7 ve 5,1 ± 2,6 idi (p<0,001)]. Psikotik bozukluğu olan hastalarda sigarayı bırakma deneme sayısı, düşük FNBT skor (≤ 7 puan) sıklığı ve sigarayı bırakma isteği, duygudurum bozukluğu ve anksiyete bozukluğu olan hastalardan istatistiksel olarak daha düşüktü (sırasıyla p=0,022, p<0,001, p=0,015). Ortalama FNBT skoru psikotik bozuklukta daha yüksekti (p<0,001).

Sonuç: Psikotik bozuklukta, duygudurum ve anksiyete bozukluklarına kıyasla ortalama FNBT skorunun ve yüksek FNBT skor (> 7 puan) sıklığının daha yüksek olması, nikotinin psikiyatrik hastalıkların patogenezindeki rolü hakkında fikir verebilir.

Anahtar Kelimeler: Sigara, Nikotin, Ayaktan Hastalar, Tütün Kullanım Bozukluğu, Tütün Bırakma, Ruhsal Bozuklukların Tanısal ve Sayımsal El Kitabı, Prevalans, Major Depresif Bozukluk, Psikotik Bozukluklar, Duygudurum Bozuklukları, Kaygı Bozuklukları.

INTRODUCTION

Smoking is the most significant preventable cause of death currently, killing around 6 million people a year. The prevalence of smoking in worldwide population is 21% aged 15 and above (1). The latest data in Turkey, reported that 31.2% of adults over 15 years of age were current smokers (2, 3).

Tobacco dependency is more common in mental disorders than in physical illnesses and/or the general population (3, 4). There is evidence that individuals with mental disorders have higher mortality and morbidity rates from cardiovascular diseases, respiratory disorders and cancer than the general population. Nicotine dependence causes smokers with psychiatric disorders to increased risks of smoking-related morbidity, and mortality (5, 6).

Patients with schizophrenia have higher rates of smoking than other psychiatric patients and the general population. Smoking prevalence is 45-82% in patients with schizophrenia (7-12). A meta-analysis exposed an association between smoking and schizophrenia (13). Heavy smoking is defined as smoking ≥ 30 cigarettes (or 1.5 packs) per day, according to self-report in most epidemiological studies (14). Wehring et al suggests that heavy smoking may be a particular health risk for schizophrenia (15). Schizophrenic patients are heavier smokers, have highly nicotine dependence, and extract more nicotine from each cigarette than smokers in the general population (14, 15). Additionally, these patients had lower success rates of motivation to stop smoking and quitting smoking than in controls (16).

There are a limited number of studies evaluate the prevalence of smoking in bipolar disorder. Smoking prevalence of bipolar disorder patients is 43% up to 82% (8). Some studies suggest that an association between smoking and manic and depressive symptoms and between smoking and suicide among patients with bipolar disorder (17-19).

Current studies have also indicated a high prevalence of smoking among patients with depression, anxiety, or comorbid depression and anxiety than the general population (20). Nicotine dependence of patients with recurrent episodes of major depression were higher than non-recurrent depression. Depressed smokers smoke more cigarettes, and their attempts of quit smoking were less than never-depressed smokers (21). A longitudinal study has demonstrated an association between nicotine dependence with severe depressive and anxiety symptoms (22). Patients with depression have severe affective symptoms, and have more and heavy risks to re-start smoking (23).

The aims of this study was to evaluate the rate of smoking in a sample of psychiatric outpatients and to examine the level of dependence and

to determine the differences of smoking rates and related factors among psychotic disorders, affective disorders and anxiety disorders.

MATERIAL AND METHODS

The Study Procedure and Participants:

This study is a prospective cross-sectional study performed at the Canakkale State Hospital between September 2013 and February 2014 in Turkey. The local ethics committee of Canakkale Onsekiz Mart University gave the approval of the study.

A total of 1036 patients were recruited from psychiatry outpatient unit to study. Eight patients younger than 18 years were not included in the study and one of the referral patients did not agree to participate in the study. The axis I psychiatric disorders were evaluated according to DSM IV. A demographic form was administered to all individuals. All smokers were determined by Fagerström test for nicotine dependence (FTND) and a questionnaire to define conditions about smoking. FTND was applied to define smoking habits. The FTND has 6 items with an overall score ranging between 0-10. FTND score ≥ 7 was defined high dependence. FTND is validated by Uysal et al. for Turkish use (24).

Exclusion criteria were identified as mental retardation, age under 18, and not to give consent to participate in the study.

Statistical Analysis: The PASW Statistics 19 (SPSS Inc., Chicago, Illinois) statistical program was used for data analysis. The chi-square and Fisher's exact tests were used for the comparison of categorical data, and the Student's t-test was used for the analysis of the non-categorical data. A P value of <0.05 was considered statistically significant.

RESULTS

Out of 1036 patients 67.8% (n=702) were females and 32.2% (n=334) were males. The overall smoking rate was 40.2% (n=416), while the smoking rate of females was 32.6% (n=229) and males were 56.0% (n=187) ($p < 0.001$). The mean age of the smokers was 40.6 ± 13.1 years (18 – 84), while it was 48.3 ± 17.9 years (18 – 98) in non-smokers, and the difference is statistically significant ($p < 0.001$, $t = -7.60$). The mean education years of smokers was 8.7 ± 4.2 years, while it was 7.8 ± 4.4 years in non-smokers ($p = 0.001$, $t = 3.327$).

The 27.4% (n=114) of smokers were single, 60.1% (n=250) of smokers were married, and 12.5% (n=52) of smokers were widowed, when the 20.3 % (n=126) of non-smokers were single, 67.9 % (n=421) of smokers were married and 11.8 % (n=73) of smokers were widowed ($p = 0.02$, $\chi^2 = 7.840$).

The smoking rate of the overall patients with psychotic disorders was 43% (n=43), while it was 51% (n=26) in patients with schizophrenia. The

smoking rate of the overall patients with affective disorders was 40.4% (n=181), while it was 51.4% (n=26) in patients with bipolar disorder and 35.4% (n=119) in patients with major depression. The smoking rate of the overall patients with anxiety

disorders was 35% (n=86), while it was 31.3% (n=36) in patients with generalized anxiety disorder (GAD) and 44.4% (n=20) in patients with panic disorder (Table 1).

Table 1. The diagnosis of the patients according to smoking status

Diagnosis		Smokers (n, %) (416, 40.2)	Non-smokers (n, %) (620, 59.8)
Psychotic disorders	Schizophrenia	26 (51.0)	25 (49.0)
	Atypical psychotic disorder	13 (29.5)	31 (70.5)
	Delusional disorder	4 (80.0)	1 (20.0)
	Total	43 (43)	57 (57)
Affective disorders	Major Depression	119 (35.4)	217 (64.6)
	Dysthymia	10 (52.6)	9 (47.4)
	Bipolar disorder	36 (50.7)	35 (49.3)
	Mood disorder not otherwise specified	12 (66.7)	6 (33.3)
	Schizoaffective disorder	4 (100)	0 (0,0)
Total	181(40.4)	267(59.6)	
Anxiety disorder	Generalized anxiety disorder	36 (31.3)	79 (68.7)
	Panic disorder	20 (44.4)	25 (55.6)
	Social anxiety disorder	8 (33.3)	16 (66.7)
	Obsessive compulsive disorder	11 (44.0)	14 (56.0)
	Agoraphobia	3 (60.0)	2 (40.0)
	Posttraumatic stress disorder	1 (25.0)	3 (75.0)
	Anxiety disorder not otherwise specified	7 (31.8)	15 (68.2)
	Total	86(35)	154(65)
Adjustment disorder	63 (36.4)	110 (63.6)	
Somatoform disorders	9 (29.0)	22 (71.0)	
Conversion disorder	9 (39.1)	14 (60.9)	
Eating disorder	0 (0,0)	1 (100.0)	
Conduct disorder	5 (38.5)	8 (61.5)	
Impulse control disorder	1 (33.3)	2 (66.7)	
Adult ADHD	1 (33.3)	2(66.7)	
Alcohol addiction	11 (84.6)	2 (15.4)	
Substance dependence	8 (100.0)	0 (0,0)	

The mean age of onset of smoking of men 16.9 ± 6.0 years old was statistically higher than women 19.4 ± 6.7 years old (p<0.001). The smoking cessation request of women was

statistically higher than men (p=0.035) (Table 2). The mean FTND scores of men (5.1 ± 2.6) were statistically higher than women (3.9 ± 2.7) (p<0.001) (Table 3).

Table 2. Evaluation of smokers according to gender

		Women (n,%) (229, 32.6)	Men (n, %) (187, 56.0)	p
Age of onset of smoking(mean years of age)		19.4 ± 6.7	16.9 ± 6.0	<0.001*
Number of smoking cessation trials		1.3 ± 1.4	1.5 ± 1.8	0.170
A smoker at home				
	Yes	151(71.2)	92(53.2)	<0.001*
	No	61(28.8)	81(46.8)	
Smoking cessation request				
	Yes	166(75.5)	118(65.5)	0.035*
	No	54(24.5)	62(34.5)	
Request for psychiatric treatment in smoking cessation				
	Yes	121(57.3)	89(50.9)	0.210
	No	90(42.7)	86(49.1)	

Table 3. Evaluation of FTND according to gender

	Women (n,%)	Men (n, %)	p
1. How soon after you wake up do you smoke your first cigarette?			
0-5 minutes	70(33)	74(42.5)	<0.005*
6-30 minutes	42(19.8)	46(26.4)	
31-60 minutes	31(14.6)	24(13.8)	
≥60 minutes	69(32.5)	30(17.2)	
2. Do you find it difficult to refrain from smoking in places where it is forbidden?			
Yes	67(31.2)	80(44.2)	<0.05*
No	148(68.8)	101(55.8)	
3. Which cigarette would you hate most to give up?			
Any other	120(55.3)	83(45.5)	0.070
The first in the morning	97(44.7)	98(54.1)	
4. How many cigarettes a day do you smoke?			
0-10	84(39.4)	26(14.9)	<0.001*
11-20	81(38)	69(39.7)	
21-30	30(14.1)	48(27.6)	
30>	17(8.5)	31(18.4)	
≥ 21	48(22.1)	79(43.6)	
5. Do you smoke more frequently during the first hours after waking than during the rest of the day?			
Yes	114(52.5)	94(51.9)	0.920
No	103(47.5)	87(48.1)	
6. Do you smoke even if you are so ill that you are in bed most of the day?			
Yes	66(30.4)	60(33.1)	0.580
No	151(69.6)	121(66.9)	
FTND score			
≤7 points, as lower	190(89.2)	137(78.7)	<0.05*
> 7 points, as higher	23(10.8)	37(21.3)	
mean	3.9 ± 2.7	5.1 ± 2.6	<0.001*

**p<0.05, % values are given in parentheses

The number of smoking cessation trials, lower FTND scores (≤7 points), and the smoking cessation request of patients with psychotic disorders were statistically lower than patients with affective disorders and anxiety disorders

(respectively p=0.022, p=0.015, p=0.001) (Table 4 and 5). Also the mean FTND score of psychotic disordered patients was higher than other disordered patients (p<0.001) (Table 5).

Table 4. Comparison of smokers according to DSM IV diagnosis groups

Diagnosis	Psychotic Disorders	Affective Disorders	Anxiety Disorders	p
Age of onset of smoking (<i>mean years of age</i>)	17.2 ± 5.5	18.1 ± 6.7	19.2 ± 5.7	0.059
Number of smoking cessation trials	0.8 ± 1.1	1.4 ± 1.6	1.5 ± 1.8	0.022*
A smoker at home	20 (46.5)	105 (65.2)	46 (60.5)	0,082
Smoking cessation request	21 (50.0)	119 (72.6)	56 (71.8)	0.015*
Request for psychiatric treatment in smoking cessation	19 (45.2)	93 (57.4)	37 (48.1)	0.219

DISCUSSION

In this study, we have demonstrated that the overall smoking rate was 40% in the psychiatric out-patient group. We reported a prevalence of 51.1% smoking rate in a past study (25). Our result of smoking rate was lower than this study. It can be explained that our sample population includes mostly from women and we evaluated only outpatients in a large sample.

Gender is a substantial concern in smoking; men have more risk to smoke than women. The smoking rates of men have been demonstrated

higher than women with serious mental illnesses (3-5). Consistent with the literature smoking rates of male patients were higher than female patients and the age of onset of smoking was lower in men in this study. Men smoke more cigarettes in a day than women and the dependence of nicotine was higher in men according to Fagerström score. In addition, females have more request of smoking cessation than males in the recent study (8).

The overall smoking rate in the patients with psychotic disorders was 43% and while it was 51% in schizophrenics.

Table 5. Evaluation of FTND according to DSM IV diagnosis

Diagnosis	Psychotic Disorders	Affective Disorders	Anxiety Disorders	p
1. How soon after you wake up do you smoke your first cigarette?				
0-5 minutes	29(72.5)	63 (39.1)	17 (22.4)	<0.001*
6-30 minutes	4(10.0)	32 (19.9)	18 (23.7)	
31-60 minutes	4 (10.0)	20 (12.4)	18 (23.7)	
≥60 minutes	3 (7.5)	46 (28.6)	23 (30.3)	
2. Do you find it difficult to refrain from smoking in places where it is forbidden?				
Yes	26 (65.0)	57 (35.4)	23 (30.7)	0.001*
No	14 (35.0)	104 (64.6)	52 (69.3)	
3. Which cigarette would you hate most to give up?				
The first in the morning	26 (65.0)	73 (45.3)	35 (46.1)	0.075
Any other	14 (35.0)	88 (54.7)	41 (53.9)	
4. How many cigarettes a day do you smoke?				
0-10	3 (7.5)	51 (31.7)	28 (36.8)	0.001*
11-20	16 (40.0)	55 (34.2)	31 (40.8)	
21-30	8 (20.0)	34 (21.1)	12 (15.8)	
30>	13 (32.5)	21 (13.0)	5 (6.6)	
5. Do you smoke more frequently during the first hours after waking than during the rest of the day?				
Yes	24 (60.0)	86 (53.4)	36 (47.4)	0.416
No	16 (40.0)	75 (46.6)	40 (52.6)	
6. Do you smoke even if you are so ill that you are in bed most of the day?				
Yes	24 (60.0)	43 (26.7)	16 (21.1)	<0.001*
No	16 (40.0)	118 (73.3)	60 (78.9)	
FTND Score				
≤ 7 points	25 (62.5)	135 (83.9)	71 (93.4)	<0.001*
> 7 points	15 (37.5)	26 (16.1)	5 (6.6)	
FTND Mean Score				
	6.6 ± 2.1	4.2 ± 2.9	3.6 ± 2.6	<0.001*

**p<0.05, % values are given in parentheses

A meta-analysis of 42 studies across 20 countries demonstrated that the smoking of people with schizophrenia or schizoaffective disorder was 5.3 times higher compared to the general population (13). Consistent with this study Itkin et al reported that the prevalence of smoking in schizophrenics was 45% and Kim et al found the rate of smoking 51.9% in a sample of 576 schizophrenic patients (12, 28). In this study, we found lower rates of smoking in patients with psychotic disorder and schizophrenia. This could explain that we had a small sample of psychotic disordered patients and all of the patients were from an outpatient unit of our hospital.

In the recent study, patients with psychotic disorder started to use tobacco at a younger age compared to patients with affective disorders and anxiety disorders. Kelly et al. found that the smoking onset of individuals with schizophrenia was at least 4 years earlier before disease onset (29). Patients with psychotic disorders have fewer quit attempts and have request of smoking cessation than other psychiatric disorders in our study (8, 16). FTND scores and rate of more smoking was higher in psychotic disorders consistent with the literature. While smokers with schizophrenia would like to stop smoking, the studies suggest that smoking

cessation rates of schizophrenics are quite low. De Leon and Diaz's meta-analyses reported that 9% for schizophrenia versus 14% to 49% for the general population the rates of attendance for cessation (13). Ziedonis and George have suggested that this may be related to lower motivation to quit (30).

The heavy smoking ratio of psychotic disordered patients was higher than other disordered patients in this study. Kelly et al reported that smokers with schizophrenia are more likely to be heavy smokers compared to smokers in the general population (29).

The prevalence of smoking in our bipolar disorder sample was 51.4%, which is consistent with the prevalence rates of 33% to 60.6% reported in previous studies (32-34). Smoking level of patients with major depression was 35.4% and patients with anxiety disorders were 35% in this study. Kuloğlu et al found similar rates with our results (shown as 34.3 – 29.0%) (34). Consistent with previous studies this recent study showed once again higher smoking rates of bipolar disordered and depressive patients in Turkey.

LIMITATIONS

The first limitation was that the scales of evaluating the severity of psychiatric diagnosis were not given. The relationship between severity of illness and nicotine dependence was not

evaluated. Nicotine dependence and related factors were not evaluated after treatment in the longitudinal follow-up of the patients. There is also a need for prospective studies that is evaluating the relation of the severity of illness between smoking habits and treatment effect of treatment for nicotine dependence.

CONCLUSION

A higher level of nicotine dependence was associated with gender of male and the diagnosis of

schizophrenia in our study. The results of this study highlight the importance of considering gender differences and the differences of the diagnosis about cessation of smoking. This result suggests that smoking cessation treatments should be regulated by considering by differences of gender and diagnosis. Although, the lower rate of nicotine dependence in psychotics may be due to a sampling bias, it opens new horizons to investigate the role of nicotine in psychiatric diseases.

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