Original Article

Anxiety, Depression, and Attention Deficit Levels and Their **Relationship with Smoking Addiction in People Applying to Smoking Cessation Outpatient Clinic**

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ABSTRACT

Objective: This study aimed to investigate the presence of depression, anxiety, and attention deficit hyperactivity disorder (ADHD) and their relationship with smoking, smoking cessation attempts, and addiction levels in people applying to a smoking cessation outpatient clinic.

Methods: A total of 158 patients, 86 men and 72 women, who applied to the smoking cessation outpatient clinic were evaluated in terms of their sociodemographic data, Fagerström Nicotine Dependence Test results, Beck Anxiety and Depression Scale results, and Adult Attention Deficit Hyperactivity Disorder Self-Report Scale results.

Results: The most common reason for beginning to smoke was peer pressure (38%) followed by stress and sadness (36.7%). The most common reasons for quitting smoking were health concerns and financial difficulties, with doctor's advice coming in the last place. Anxiety was observed in 53.2%, depression in 41.8%, and ADHD in 3.89% of the participants. There was a positive correlation between the level of anxiety and depression and the level of smoking dependence and a negative correlation between the level of anxiety and ADHD and the length of time it took to quit.

Conclusion: Since anxiety and depression are associated with smoking addiction, and anxiety and ADHD symptoms affect the duration of abstinence after quitting, psychiatric evaluation and interventions are required.

Keywords: Smoking cessation, depression, anxiety, attention deficit disorder.

INTRODUCTION

Smoking is one of the world's most serious public health threats, killing more than 8 million people each year, with secondhand smoke alone killing 1.2 million.¹ Smoking is also a known risk factor for chronic noncommunicable diseases such as lung disease, cancer, and metabolic diseases.² On the other hand, smoking is a preventable risk factor for death and disease, unlike many other risk factors.

Since smoking is very common in people with mental health problems and vice versa, less is known about the reciprocal relationship between smoking and adverse mental health conditions, which may be important for smoking initiation and post-addiction smoking cessation.³ It has recently been demonstrated that smoking may increase the risk of various neuropsychiatric disorders, particularly depression and anxiety disorders.⁴ Evidence also suggests that smoking may be involved in the pathogenesis of cognitive decline, psychosis, suicidal behavior, and attention deficit hyperactivity disorder (ADHD).4

The nicotine molecule is similar to acetylcholine, a neurotransmitter, and therefore facilitates dopamine release via nicotinic acetylcholine receptors in the central and peripheral nervous system.⁵ As a result, it has a stimulating, pleasurable, rewarding, and mood-balancing effect on negative moods. However, cigarette addiction is a

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complex behavior with both a psychological and biological component. The psychological aspect of cigarette addiction should be addressed in addition to biological and pharmacological treatments in the approach to cigarette addiction.

In recent years, Türkiye has seen the establishment of smoking cessation outpatient clinics, as well as increased social awareness of and applications to these clinics. The purpose of this study was to investigate the relationship between depression, anxiety, and ADHD symptom levels and cigarette use, smoking cessation attempts, and addiction levels of people applying to smoking cessation outpatient clinics, and to emphasize the importance of psychiatric evaluation in these people.

MATERIAL AND METHODS

The study included 158 patients, aged 18-65, who applied to the smoking cessation outpatient clinic of a state hospital for the first time between June 1, 2022, and January 1, 2023, who agreed to participate in the study and were literate. Those who were diagnosed with mental disorders before the application and those who continued to receive psychotropic drug treatment were not included in the study. This study was conducted in compliance with the 1964 Declaration of Helsinki and its subsequent amendments. Ethical approval was obtained from Kafkas University Clinical Research Ethics Committee (project number: 80576354-050-99/119; date: 27.04.2022). Written informed consent was obtained from the patients who agreed to take part in the study.

Data Collection Tools

In the study, the participants were administered a form designed by the researchers, which included information about the sociodemographic characteristics of the participants and their smoking behavior, along with four scales.

Fagerström Nicotine Dependence Test: It is a self-report scale used to measure physical dependence on nicotine and the severity of dependence. The scale consists of

MAIN POINTS

- Tobacco addicts had considerable levels of anxiety and depression symptoms.
- There was a positive correlation between the level of anxiety and depression and the level of tobacco addiction.
- Anxiety and attention deficit symptoms can affect the duration of staying clean after quitting tobacco.
- Psychiatric evaluation and intervention are required in smoking cessation clinics.

six questions responded to with a 2-point and 4-point Likert-type scoring system. The highest score that can be obtained is 10. The Turkish validity and reliability study was conducted by Uysal et al.⁶

Beck Depression Inventory: It is a self-report scale consisting of 21 items used to measure the symptoms of depressed patients. It is a 4-point Likert-type scale, and the highest score to be obtained from the scale is 63. Anxiety levels are indicated by the scores obtained: 0-12 for minimal, 13-18 for mild, 19-28 for moderate, and 29-63 for severe depression. Those with moderate to severe depression, as measured by the scale score, were statistically evaluated in our study. The Turkish validity and reliability study was conducted by Hisli.⁷

Beck Anxiety Inventory: It measures anxiety. It is a 4-point Likert-type scale with 21 items that assess anxiety and physical symptoms. The highest possible score on the scale is 63. Anxiety levels are indicated by the scores obtained: 8-15 points indicate mild anxiety, 16-25 points indicate moderate anxiety, and 26 and above indicate severe anxiety. Those with moderate to severe anxiety, as measured by the scale score, were statistically evaluated in our study. Ulusoy et al⁸ conducted a Turkish validity and reliability study on the scale.

Adult Attention Deficit Hyperactivity Disorder Self-Report Scale (ASRS): It was developed by the World Health Organization for screening purposes. It is a 5-point Likert-type scale consisting of 18 items. The highest score to be obtained from the scale is 72. A Turkish validity and reliability study was conducted by Dogan et al.⁹ The scale cut-off score is 45.

Statistical Analysis

The data obtained were analyzed with Statistical Package for Social Sciences version 26.0 (IBM SPSS Corp.; Armonk, NY, USA). The normality analysis of continuous variables was performed with the Shapiro–Wilk test. Descriptive statistics were shown as mean ± standard deviation for continuous variables, and numbers and percentages (%) for categorical variables. Spearman correlation analysis was performed for the relationship between variables.

RESULTS

A total of 158 people who applied to the smoking cessation outpatient clinic were evaluated. The participants consisted of 86 (54.4%) males and 72 (45.6%) females. The mean age of the participants was 39.32 ± 11.92 years, and the mean duration of education was $11.01 \pm$ 3.81 years. One hundred twenty (75.9%) of the participants were married, 38 (24.1%) were single, 93 (58.9%) were employed, and 65 (41.1%) were unemployed. The age of starting smoking was 18.47 ± 4.63 years, and the reasons for initiation were 38% wannabe smoking, 36.7% stress-sadness, 21.5% curiosity, 2.5% selfpromotion, and 1.3% environmental pressure. Cigarette use was 1.12 ± 0.47 packs per day and 20.24 ± 13.28 packs per year. Among the participants, 116 (73.4%) had tried to quit smoking before. One hundred forty-six (92.4%) participants applied to the smoking cessation outpatient clinic voluntarily, and 12 (7.6%) participants applied at their doctor's request. The primary reasons for quitting smoking were 45.6% fear of getting sick, 20.3% current illness, 10.1% thought that it harmed the environment, 8.9% economy, 5.1% disgust, 3.8% social pressure, 2.5% embarrassment, 2.5% belief, and 1.3% doctor's recommendation. When alcohol-substance use was guestioned in addition to smoking, only 4 patients reported alcohol use, and 2 patients reported substance use (Table 1).

When evaluated for a cut-off score of 19, the mean Beck Depression score was 17.63 ± 11.49 , and 58 (36.7%) of the participants had considerable depressive symptoms. When evaluated for a cut-off score of 16, the mean Beck Anxiety score was 17.68 ± 13.04 , and 84 (53.2%) of the participants had considerable anxiety. While the mean Adult attention deficit hyperactivity disorder self-report scale (ASRS) score was 20.66 ± 11.01 when evaluated for a cut-off score of 45, six (3.89%) people had considerable activity and attention deficit symptoms. The Fagerström Nicotine Dependence Test score was 6.48 ± 2.26 on average (Table 2).

A significant and positive (r=0.197, P=.013) relationship was determined between the anxiety level and the Fagerström addiction score, and a significant and negative (r = -0.246, P=.002) relationship between the longest period of smoking cessation. There was a significant and positive relationship (r=0.232, P=.003) between depression level and the Fagerström addiction score. Furthermore, a significant and negative correlation (r=-0.241, P=0.002) was observed between the total ASRS score and the longest period of smoking cessation (Table 3).

DISCUSSION

In this study, which included smokers who applied to a state hospital's smoking cessation outpatient clinic, the relationship between smoking and anxiety, depression, and ADHD symptom levels was investigated. It was observed that a significant proportion of the participants had high levels of anxiety and depression. There was a positive correlation between anxiety and depression levels and smoking dependence levels. In addition, there was a negative relationship between anxiety and ADHD levels and the longest period of not smoking after cessation. When patients applying to the smoking cessation outpatient clinics were evaluated by gender, in most studies, it was found that more males applied compared to females.¹⁰⁻¹² However, there are also studies showing that there were more female applicants.¹³ In a study conducted with 634 participants from Türkiye, the difference in the number of females and males was found to be 2. In our study, as in many other studies, the number of male applicants was higher.¹⁴

Table 1. General Characteristics of the Participants						
Variable	n	%	Mean ± SD			
Age			39.32 ± 11.92			
Education (year)			11.01 ± 3.81			
Gender						
Male	86	54.4				
Female	12	45.6				
Marital status Married	120	75 9				
Single	38	24.1				
Working status						
Employed	93	58.9				
Unemployed	65	41.1				
Reasons for initiation						
Wannabe smoking	60	38				
Stress-sadness	58	36.7				
Self-promotion	34 ⊿	21.5				
Environmental pressure	2	1.3				
Initiation of smoking age			18.47 ± 4.63			
Application						
Voluntarily	146	92.4				
Doctor's request	12	7.6				
Reasons for quitting smoking						
Fear of getting sick	72	45.6				
Current liness	32	20.3				
Fconomy	14	89				
Disgust	8	5.1				
Social pressure	6	3.8				
Embarrassment	4	2.5				
Belief	4	2.5				
Doctor's recommendation	2	1.3				
Quit smoking before						
Yes	116	/3.4				
	42	20.0				
Packs per day			1.12 ± 0.47			
Pack-years			20.24 ± 13.28			
Substance-alcohol use	150	00.0				
	152	96.2				
Substance	4 2	2.5				
Gubstanoo	2	1.0				

SD, standard deviation.

Table 2. Evaluation of Scale Scores						
Varibale	n	%	Mean ± SD			
Beck depression score			17.63 ± 11.49			
Depression (cut-off score of 19) Yes No	58 100	36.7 63.3				
Beck anxiety score			17.68 ± 13.04			
Anxiety (cut-off score of 16)						
Yes	84	53.2				
No	74	46.8				
Fagerström score			6.48 ± 2.26			
ASRS score			20.66 ± 11.01			
ADHD (cut-off score of 45)						
Yes	6	3.8				
No	152	96.2				
ASRS adult attention deficit hyperactivity disorder self-report scale:						

eficit hyperactivity diso ADHD, attention deficit hyperactivity disorder; SD, standard deviation.

It is known that the age of starting smoking is mostly in the 15-25 age range.¹⁵ Furthermore, studies on smoking in Türkiye have revealed that the average age of first smoking is around 17 years old, and the average number of cigarettes smoked daily is 23.57 (1.17 packs).^{16,17} In line with the literature, the mean age of the participants in our study was 18.47 years, and the mean number of packs smoked per day was 1.12.

Previous studies have shown that the most common reason for starting smoking is wannabe smoking.18-20 Similarly, in our study, it was observed that the most common reason was wannabe smoking. However, "stresssadness," which was detected at a frequency similar to wannabe smoking, is a reason that should be highlighted. Smoking may mask negative stress responses by inducing a brief feeling of relaxation. Through reinforcement, this may result in the development of addiction. Smoking can be avoided before it becomes an addiction by increasing awareness and facilitating access to mental health services in times of stress and sadness. Health concerns and economic problems have been identified as the leading reasons for smoking cessation in the literature.^{17,21} In our study, the most common reasons were health concerns and financial difficulties. In our study, the rate of "doctor's recommendation" as the primary reason for quitting was 1.3%. Motivational interviews with patients about smoking cessation can raise this rate.

Many studies investigating the relationship between smoking addiction and depression have shown that depression increases smoking rates.²²⁻²⁴ On the contrary, there are several studies showing that depression decreases it,^{25,26} while others find no relationship.²⁷ Table 3. Relationship of Scale Scores with Cigarette Addiction Level, Amount of Cigarette Smoking, and Attempt to Quit

	Beck Anxiety Score		
	r	Р	
Fagerström score	0.197	.013	
Packs per day	0.048	.553	
Pack-years	0.033	.681	
Number of quit attempts	-0.098	.219	
Longest period of smoking cessation	-0.246	.002	
	Beck Depression Score		
Fagerström score	0.232	.003	
Packs per day	0.110	.170	
Pack-years	-0.004	.962	
Number of quit attempts	-0.080	.317	
Longest period of smoking cessation	-0.073	.365	
	ASRS Score		
Fagerström score	0.082	.305	
Packs per day	0.028	.728	
Pack-years	-0.010	.901	
Number of quit attempts	-0.026	.741	
Longest period of smoking cessation	-0.241	.002	

Longest period of smoking cessation

Values in bold indicate statistical significance.

ASRS, adult attention deficit hyperactivity disorder self-report scale.

In our study, as in many others, there was a positive relationship between addiction level and depression level. Furthermore, previous research has discovered a positive relationship between anxiety level, smoking addiction, and smoking rate.28,29 Similar to the previous results, the results of our study support the positive relationship between anxiety and smoking dependence levels.

Some studies investigated the comorbidity of depression and anxiety with tobacco addiction, and the findings have been encouraging.^{30,31} In our study, anxiety and depression were noted in 53.2% and 36.7% of the participants, respectively, using scale cut-off scores. These high rates could be attributed to the fact that smoking reduces negative symptoms of mental health problems and alters mood. Furthermore, a negative relationship was observed between anxiety levels and the number of days of non-use after smoking cessation. Taking all of this into account, as well as studies showing an increase in the frequency of depression following smoking cessation,³² it is clear how important psychological assessment and intervention are in smoking cessation outpatient clinics.

It has been argued that nicotine may be a positive reinforcer in individuals with attention deficit due to its stimulating and partially attention-enhancing properties.^{33,34} Although previous research has highlighted the relationship between attention and smoking, no connection was found between the level of addiction and ADHD score in our study. However, a negative correlation was found between ADHD score and the number of non-use days after quitting smoking. A recent comprehensive review and metaanalysis study found that the prevalence of adult ADHD in the general population was 2.58%.³⁵ In our study, the rate of ADHD according to the scale cut-off score was 3.8%, which was higher than the rate in the general population.

Our research has some limitations. The scales used were self-report scales with cut-off scores, and no psychiatric interviews were held with the participants. Since the study is cross-sectional, we cannot comment on the presence of anxiety, depression, or ADHD before or after smoking addiction.

In our study, we observed that a significant proportion of smokers suffered from anxiety and depression. There was a positive relationship between anxiety and depression and smoking addiction and a negative relationship between anxiety and ADHD and the longest period of abstinence. All of these findings, including the fact that stress and sadness are among the reasons why individuals start smoking, that anxiety and depression accompany smoking addiction, and that anxiety and ADHD symptoms affect the duration of staying clean after guitting, highlight the importance of psychiatric evaluation and interventions. We believe that our study will contribute to the literature because it evaluates the reasons for starting smoking, reasons for guitting smoking, factors related to the smokefree period after guitting, and many variables related to the level of cigarette addiction in the same sample group.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: Ethics committee approval was received for this study from the Ethics Committee of Kafkas University (date: 27.04.2022; number: 80576354-050-99/119).

Informed Consent: Written informed consent was obtained from patients who participated in this study.

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