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The Frequency of Mental Health according to Smoking Status: A Cross-sectional Study

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ABSTRACT

Objectives: The goal of this study is to compare the frequency of psychiatric symptoms according to smoking status.

Methods: Participants were divided into three groups: 120 active smokers who wanted to quit were assigned to the case group, 120 active smokers who did not want to quit were assigned to control group 1, and 120 non-smokers were assigned to control group 2. The sociodemographic questionnaire and Brief Symptom Inventory were administered by the researcher using a face-to-face interview technique for all participants.

Results: A total of 360 participants were included in the study, and the participants' mean age was 39.7 ± 12.5 years. Somatization was detected in 35 (29.4%) of the case group, 13 (10.8%) of control group 1, and 3 (2.5%) of control group 2 ($p=0.001$). Obsessive-compulsive disorder was present in 36 (30.0%) of the case group, 15 (12.5%) of control group 1, and 17 (14.2%) of the control group 2 ($p=0.001$). In addition, depression was found 29 (24.2%) in the case group, 15 (12.5%) in the control group 1, 14 (11.7%) in the control group 2 ($p=0.013$). Anxiety was observed 21 (17.5%) in the case group, 13 (10.8%) in the control group 1, 8 (6.7%) in the control group 2 ($p=0.031$). General Severity Index positivity was found 24 (20.0%) in the case group, 11 (9.2%) in control group 1, and 7 (5.8%) in control group 2.

Conclusion: A comprehensive approach should be taken with individuals who want to quit smoking, considering that tobacco addiction is a substance use disorder.

Keywords: Mental disorders, mental health, smoking cessation, tobacco use



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INTRODUCTION

The medical and economic consequences of the worldwide tobacco epidemic demonstrate that tobacco control is a vital public health priority.^[1] According to the World Health Organization, nicotine is a psychoactive substance that may not always result in addiction, but it impacts mental processes, such as perception, consciousness, mood, and emotions upon entering the system.^[2] In the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, tobacco use is categorized as “tobacco use disorder” within the group of substance-related and addictive disorders. This inclusive category covers all forms of tobacco use. Recent studies suggest a relationship between smoking and mental disorders, as individuals with mental disorders have been found to have increased smoking rates and lower smoking cessation success when compared to those without a history of psychiatric illness.^[3,4] This highlights the potential impact of smoking on mental health. This study aims to compare the frequency of psychiatric symptoms according to smoking status.

METHOD

This case-control study was conducted from November 01, 2022, to March 01, 2023, and included individuals aged 18 years and above who applied to the smoking cessation outpatient clinic (SCOC) and family medicine outpatient clinics (FMOC). The study's sample size was determined by incorporating a 50% frequency, 95% confidence interval and 5% type 1 error margin in an unknown population. The participants were divided into 3 groups. 120 (33.3%) participants who were smokers and applied to the SCOC at the family medicine center were included as the case group, 120 (33.3%) participants who were smokers but did not want to quit and applied to the FMOC were included as the control group 1 and 120 (33.3%) participants who were non-smokers were included as the control group 2.

Patients who refused to participate, had communication disabilities, cognitive impairments, or intellectual disabilities were excluded.

In this study, regular smokers were defined as individuals who, according to the National Health Survey criteria, had smoked at least 100 cigarettes in their lifetime and used at least one tobacco product per day.^[5] Individuals who consume alcohol at least once a month, regardless of the amount consumed, were classified as alcohol users.

All participants completed a sociodemographic and medical history questionnaire with 16 questions, prepared by the researchers. Subsequently, the researcher administered a 53-question survey, including the brief symptom inventory (BSI), using a face-to-face interview technique.^[6,7] This questionnaire covered topics, such as somatization disorder, obsessive-compulsive disorder (OCD), interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, psychoticism, and additional items. Additional items included sleep disturbances, appetite problems, thoughts of death, and feelings of guilt. The sociodemographic survey consisted of multiple-choice questions about participants' age, gender, marital status, education level, employment status, income level, chronic illnesses, use of medication, history of psychiatric conditions, smoking habits, history of smoking cessation, alcohol consumption, and substance use status.

BSI is a self-assessment scale used for evaluating psychopathology, which was developed by Derogatis in 1992 based on the symptom checklist-90 (SCL-90).^[6] The scale's reliability and validity study was carried out by Sahin and Durak in 2002.^[7] The BSI, like the SCL-90, comprises 9 subscales and 3 scales that assess global discomfort. The scale includes three global indices: The general severity index (GSI), the positive symptom

distress index and the positive symptom total. When calculating the GSI, the cutoff value was taken as 1.51 point.

The study data were analyzed using the IBM Statistical Package for the Social Sciences Statistics 28.0. Descriptive values are presented as number, percentages, mean, standard deviation, median, interquartile range. Categorical variables were compared using the Chi-square test. Statistical significance was defined as $p < 0.05$.

RESULTS

A total of 360 participants, 231 (64.2%) males and 129 (35.8%) females, were included in the study. The participants' mean age was 39.7 ± 12.5 years. The socio-demographic characteristics of the participants according to groups are summarized in Table 1.

The mean duration of smoking among participants was 19.8 ± 11.2 years in the case group and 19.6 ± 12.4 years in the control group 1 ($p = 0.896$). The mean number of cigarettes smoked daily in the case group was 24.0 ± 10.7 , meanwhile it was 18.9 ± 11.2 in the control group 1 ($p < 0.001$). The mean smoking cessation time for the case group was 25.5 (118.0) days, while that for the control group 1 was 290.0 (260.0) days ($p = 0.077$). Alcohol use was 29 (24.2%) for the case group and 43 (35.3%) for the control groups ($p = 0.005$). Substance use did not differ significantly between groups (1 [0.8%] vs. 0 [0.0%], $p = 0.558$).

In the case group, 24 (20.0%) of individuals tested positive for GSI, compared to 11 (9.2%) and 7 (5.8%) in the control groups ($p = 0.013$). The frequency of psychiatric symptoms according to groups is summarized in Table 2.

DISCUSSION

Although it is reported previously that smoking behavior is higher in patients with mental disorders, the number of studies on the underlying mechanisms is insufficient.^[3,4] In this study, the frequency of prior psychiatric disease diagnosis was higher in the case group. A case-control study by Rosenblum et al., divided participants into three groups similar to this study, indicated that higher levels of cigarette craving and consumption were observed in the first two groups compared to the control group without a psychiatric diagnosis.^[8] It is hypothesized that patients in these groups differed from the control group due to the motivation that smoking provides a sense of comfort. Nobile et al., also suggest that people with bipolar disorder have a lifetime prevalence of smoking that is 2–5 times higher than the general population.^[9] Second, this study found a statistically significant difference in daily cigarette consumption between the case group and the control group 1.

Table 1. Socio-demographic characteristics of the participants according to groups

	Case Group (n=120)	Control Group 1 (n=120)	Control Group 2 (n=120)	p
Age groups				
≤35 years	59 (49.2)	47 (39.2)	60 (50.0)	0.173
>35 years	61 (50.8)	73 (60.8)	60 (50.0)	
Gender				
Male	77(64.2)	77 (64.2)	77 (64.2)	1.000
Female	43 (35.8)	43 (35.8)	43 (35.8)	
Marital status				
Married	72 (60.0)	73 (60.8)	70 (58.3)	0.111
Single	34 (28.3)	38 (31.7)	46 (38.3)	
Widow/divorced	14 (11.7)	9 (7.5)	4 (3.4)	
Education level				
Less than high school	75 (62.5)	52 (43.3)	36 (30.0)	<0.001
More than high school	45 (37.5)	68 (56.7)	84 (70.0)	
Employment status				
Employed	72 (60.0)	91 (75.8)	87 (72.5)	0.019
Unemployed	48 (40.0)	29 (24.2)	33 (27.5)	
Monthly income				
≤450 \$	58 (48.3)	41 (34.2)	31 (25.8)	0.001
>450 \$	62 (51.7)	79 (65.8)	89 (74.2)	
Chronic illnesses				
Yes	38 (31.7)	30 (25.0)	27 (22.5)	0.250
No	82 (68.3)	90 (75.0)	93 (77.5)	

Data are presented as n (%).

Chi-Square test.

Table 2. The frequency of psychiatric symptoms according to groups

	Case Group (n=120)	Control Group 1 (n=120)	Control Group 2 (n=120)	p
Somatization disorder	35 (29.4)	13 (10.8)	3 (2.5)	<0.001
Obsessive-compulsive disorder	36 (30.0)	15 (12.5)	172(14.2)	0.001
Interpersonal sensitivity	24 (20.0)	12 (10.0)	11 (9.2)	0.021
Depression	29 (24.2)	15 (12.5)	14 (11.7)	0.013
Anxiety disorder	21 (17.5)	13 (10.8)	8 (6.7)	0.031
Hostility	29 (24.4)	23 (19.2)	10 (8.3)	0.004
Phobic anxiety	14 (11.7)	1 (0.8)	6 (5.0)	0.001
Paranoid ideation	37 (30.8)	11 (25.0)	11 (12.5)	0.003
Psychoticism	13 (10.8)	6 (5.0)	4 (3.3)	0.045
Additional Items	35 (29.2)	16 (13.3)	8 (6.7)	<0.001

Data are presented as n (%).

Chi-square test.

On the other hand, studies suggest that nicotine addicted smokers are three times more likely to develop alcohol dependence than those who do not smoke.^[10] However, one of the limitations of this study is that nico-

tine dependence was not measured in the groups; a significant difference was found between the case group and the control group 1 in the frequency of alcohol use in this study.

A significant difference was detected between the case and control groups in terms of somatization disorder. According to a case-control study carried out by Gulsen and Uygur in individuals who applied to SCOC, somatic symptoms in the case group were found to be significantly different when compared with the control group, who had never smoked.^[3] The findings of high somatization scores in people with high levels of nicotine dependence indicate that nicotine or nicotine dependence may be involved in the etiology.^[3] Examining somatic symptoms in both those who applied to the SCOC and FMOC is what differentiates our approach from previous studies.

In a study conducted in Turkey among clinically followed adolescents with various mental disorder diagnoses, those diagnosed with OCD demonstrated a significantly lower smoking rate compared to those with other psychiatric disorders.^[11] A review of the literature reveals that individuals diagnosed with OCD tend to have low rates of smoking.^[12] The elevated frequency detected in this study's case group is probably a result of the limited sample size. However, no studies have investigated the incidence of OCD among smokers. This study differs from previous research in its examination of the presence of OCD in smokers reversely. A cohort study conducted by Virtanen et al., in a larger sample revealed that OCD elevates the risk of substance use disorder.^[13] Considering that cigarette addiction is also a type of substance abuse, there is a need for studies to clarify its relationship to OCD. In addition, it was found that OCD patients exhibit higher severity of nicotine dependence. In the study, a significant relationship between impulsivity and nicotine dependence was found in the OCD group.

When the participants were analyzed regarding interpersonal sensitivity, a significant difference was observed between the groups. However, according to the case-control study conducted by Gulsen and Uygur, there was no significant difference between the groups.^[3]

In this study, there was a significant difference between all three groups in the analysis of depression. Based on the literature, numerous studies have screened depression among individuals who have applied to SCOC and among those who have quit smoking.^[14,15] However, the inclusion of control groups 1 and 2 distinguishes this study from the existing literature. In a study reported by Velioğlu et al., on patients who applied to SCOC, the relationship between nicotine dependence level and depression was found to be significant.^[16] In a study conducted by Hahad et al., analysis was performed on a 5-year follow-up of smokers and individuals who applied to SCOC.^[17] It has been found that present smokers exhibit a higher prevalence of depressive

symptoms, and there exists a correlation between cigarette pack years and depressive symptoms.^[16] However, the absence of measurement of nicotine dependence is a limitation of this study; the comparison of cigarette pack-years and potential depression frequencies between the case and control groups supports these findings. A retrospective analysis by Wooton et al., examined individuals with a history of lifelong smoking and depression and concluded that smoking is a risk factor for the development of depression.^[18] Similarly, Gulsen and Uygur found a significant difference between smokers and non-smokers with respect to depression.^[3] It is unexpected that the frequencies of potential depression were similar between control group 1 and control group 2 in this study, when evaluated objectively. This is likely due to the fact that depression was the most frequently diagnosed psychiatric disorder in all three groups.

An evaluation of the participants in terms of possible anxiety revealed a significant difference between the groups. A review of the literature reveals a higher prevalence of smoking among individuals with anxiety disorders.^[19] It is reasonable to expect that these people would have a higher nicotine dependence than people without anxiety and would seek help from the SCOC; this is thought to be the reason for the difference between the case and control groups in this study.

A significant difference was identified between the groups in terms of their level of hostility. The correlation between nicotine consumption and heightened aggression has been established in previous research.^[20] The findings of this study suggest that the elevated nicotine consumption in the case group might have contributed to these outcomes.

A significant difference was noted between the groups with regard to the presence of possible phobic anxiety. Dahne et al reported that individuals with social phobia had higher smoking frequencies compared to those without psychological comorbidity, with 54.0% being lifelong smokers.^[21] There are few studies on the relationship between phobic anxiety and smoking in the literature and this study has enriched the literature in this regard. The cause of the high frequency in the case group compared to the control group 1 can be clarified by examining the object or event considered as phobic in detail with different methods and measurements.

A significant difference between the groups was found when analyzing the participants in terms of paranoid disorder. The study by Gulsen and Uygur found that an increase

in nicotine dependence level corresponded with higher levels of paranoid symptoms, while no significant difference was observed between smokers and non-smokers in the same study.^[3] In a study by Zvolensky et al., a significant proportion of people with personality disorders were found to be nicotine dependent.^[22] However, in cases of paranoid personality disorders, this correlation has been partially attributed to co-occurring anxiety/mood disorders. As the level of nicotine dependence was not assessed in the study, it is not possible to conclude that the high frequency of possible paranoid disorder in the case group is attributable to the relationship between personality disorders and nicotine dependence.

A significant difference was identified between the groups when the participants were analyzed in terms of possible psychoticism. Similarly, Gulsen and Uygur found a significant difference in psychoticism frequencies between smokers and non-smokers in their study.^[3] In a study conducted by Lally et al., the positive symptom score was found to be higher among those with high nicotine dependence, regardless of whether they had first-episode psychosis or established psychosis.^[4] Mustonen et al., reported that smoking could be a potential risk factor for the development of psychosis.^[23] The results of this study indicate a potential correlation between tobacco use and the emergence of psychosis. While acknowledging the limitation of not measuring nicotine addiction in this study, it is crucial to note that the case group had higher levels of cigarette consumption for more years and shorter quit times, resulting in a greater amount of nicotine exposure compared to the control group. Further research is needed to support this hypothesis.

Significant differences were found among the three groups regarding additional items. Since the scale was introduced in 1994 and the use of these additional items has decreased terminologically, present literature lacks studies on the topic.^[24] In addition to its psychostimulant effect, smoking is known to cause insomnia and anorexia by disrupting the hypothalamic-pituitary-adrenocortical axis. The research conducted by Gulsen and Uygur revealed a statistically significant difference between smokers and non-smokers in terms of additional items.^[3]

The case group had a much higher GSI and this indicates more psychological distress in people seeking smoking cessation treatment. GSI is the most reliable indicator of overall symptom severity. This suggests that these patients have more complex mental health needs. They may need more support than smokers and non-smokers. Prior studies found similar results. They also found higher psychiat-

ric comorbidity and distress in smokers trying to quit. This highlights the role of psychological factors in smoking and relapse.^[14,17] Therefore, smoking cessation programs should include mental health screening and support. This may improve treatment success and patient well-being.

This study has several limitations. First, the study design is cross-sectional. This prevents conclusions about cause and effect. Second, nicotine dependence was not measured. This limits the evaluation of symptom severity and addiction intensity. Third, differences in socioeconomic status were not fully controlled for. This includes education and income, which may be confounding factors. Finally, self-reported data were used. This may have introduced reporting bias.

CONCLUSION

These findings indicate that patients presenting to smoking cessation clinics frequently experience a higher burden of psychiatric symptoms. This underlines the importance of conducting routine mental health screening during smoking cessation consultations for family physicians. A holistic and multidisciplinary approach that addresses both nicotine dependence and coexisting psychiatric symptoms may improve cessation success and overall patient well-being.

Disclosures

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Editorial Expression of Concern

Following a post-publication review, it was identified that the Editor-in-Chief was involved in the editorial decision-making process of this article. The scientific content of the manuscript is not under question. This notice is issued solely to ensure transparency regarding the editorial process. This notice does not relate to the authors' conduct or the scientific integrity of the article.