

Effect of the COVID-19 pandemic on smoking habits in a tertiary hospital

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Abstract. – OBJECTIVE: The aim of this study was to identify changes in smoking behaviors along with the reasons thereof, 1 year after the pandemic started. Alterations in the smoking behavior of patients were investigated in the study.

PATIENTS AND METHODS: Patients admitted to our Smoking Cessation Outpatient Clinic between March 1st, 2019, and March 1st, 2020, and registered in the Tobacco Addiction Treatment Monitoring System (TUBATIS) were evaluated. Patients were called in March 2021 by the same physician who conducted the smoking cessation outpatient clinic.

RESULTS: When the first year of the pandemic was over, the smoking behavior of 64 (63.4%) patients did not change. Of the 37 patients who changed their smoking behavior, eight (21.6%) increased the amount of tobacco they consumed, twelve (32.5%) decreased the amount of tobacco they consumed, eight (21.6%) quit smoking, and nine (24.3%) relapsed smoking. When the reasons for the changes in smoking behavior were examined 1 year after the pandemic started, it was determined that the primary reason for patients who increased the amount of tobacco they consumed and started smoking again was stress, and the primary cause in those who reduced the number of cigarettes and quit smoking was health concerns due to the pandemic.

CONCLUSIONS: This result can be a guide for estimating smoking trends in future crises or pandemics and for making necessary plans during the pandemic period to increase the rate of smoking cessation.

Key Words:

Coronavirus disease 2019, Tobacco, Smoking, Stress, Pandemic.

Introduction

Coronavirus disease 2019 (COVID-19) was first reported in December 2019 in China¹. It quickly extended around the globe, and the World

Health Organization proclaimed it a pandemic in March 2020². In addition to the increased number of deaths, the pandemic brought about social and economic impacts worldwide. Some studies³⁻⁵ at the beginning of the pandemic suggested that COVID-19-infected patients had lesser tobacco use and there was no correlation between disease severity and smoking. In contrast to these studies, studies⁶⁻¹² that were conducted subsequently showed that there was a relationship between active smoking and disease severity. Therefore, current evidence suggests that smoking increases the risk of severe COVID-19 disease and mortality. These studies once more drew attention to the importance of smoking cessation.

The common aspect of studies examining changes in tobacco use during the pandemic is that they were conducted early and online. These studies are not sufficient to reveal behavior change because they evaluated a narrow time interval.

Our study aimed to identify changes in smoking behaviors with the reasons thereof, 1 year after the pandemic started. The alterations in the smoking behavior of patients who were admitted to our Smoking Cessation Outpatient Clinic between March 1st, 2019, and March 1st, 2020, and registered in the Tobacco Addiction Treatment Monitoring System (TUBATIS) were investigated in this study.

Materials and Methods

In this observational and descriptive study, 197 patients who were admitted to our Smoking Cessation Outpatient Clinic between March 1st, 2019, and March 1st, 2020, and registered in TUBATIS were evaluated. The patients underwent the Fagerström Test at their first presentation. Patients who had psychiatric disorders were excluded from the study. The remaining patients were called in March 2021

by the same physician who conducted the smoking cessation clinic. Patients who accepted to answer the questionnaire were included in the study. The patients' demographic data, COVID-19 infection history, smoking habits before and after the pandemic, and any change in smoking behavior during the pandemic were questioned. If the patients had changed their smoking habits, probable reasons for these alterations were questioned. The effects of restrictions and lockdowns on the patients' access to tobacco products and the amount of tobacco consumption were also questioned.

Questions about their jobs and changes in their working styles were directed to the patients. The effect of the entire pandemic process on the motivation toward smoking cessation was questioned. The cluster of patients who did not stop smoking during the pandemic was questioned about the tobacco amount consumed per day and the time it took for them to smoke the first cigarette of the day. Answers to these two questions were used to calculate the Heaviness of Smoking Index (HSI), a method used to measure nicotine dependency¹³. The Local Ethics Committee approved the study protocol (Date: 10.02.2021, Approval number: 514/195/11).

Statistical Analysis

The Statistical Package for the Social Sciences 17.0 package program (SPSS Inc., Chicago, IL, USA) was used for statistical analysis. The

change in HIS index of those who continued to smoke was analyzed using the paired samples *t*-test. The Chi-square and Fisher's exact test were used for categorical data in the comparison of the group that reduced/quit smoking and those who continued to smoke. Mann-Whitney U tests were used to compare the numerical data of the group that reduced/quit smoking and those who continued to smoke. The test results were considered statistically significant when there were *p*-values below 0.05.

Results

In this study, 197 patients who were admitted to our Smoking Cessation Outpatient Clinic between March 1st, 2019, and March 1st, 2020, and registered in TUBATIS were evaluated. Sixteen patients with psychiatric disease histories were excluded from the study. The remaining 181 patients were called by phone, and 78 patients could not be reached. Two patients refused to answer the questionnaire. The remaining 101 patients who accepted to answer the questionnaire were included in the study. The design of the study is shown in Figure 1.

Fifty-seven (56.4%) of the patients were male, and 44 (43.6%) patients were female. The mean age of the participants was 41.6±11.1 (range, 20-70) years. Sixty-one (60.4%) patients were

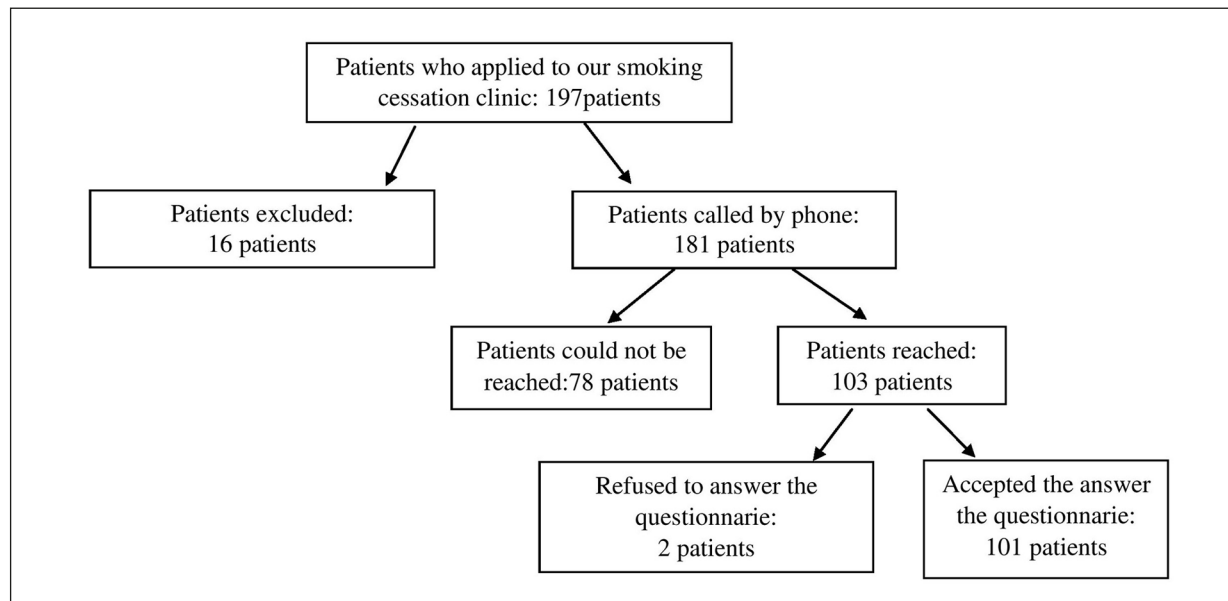


Figure 1. Patients included in the study.

Table I. Smoking behaviors 1 year after the pandemic started.

		N	%
Same compared with pre-pandemic:	Still smoking	52	51.5
	Still non-smoker	12	11.9
Changed compared with pre-pandemic:	Smoking relapse	9	8.9
	Increased	8	7.9
	Decreased	12	11.9
	Quit smoking	8	7.9
Total		101	100

employed, and 40 (39.6%) patients did not have a job. Fourteen (23%) of 61 working patients stated that the pandemic had affected their employment status. Thirteen (21.3%) participants among the employed patients expressed that they worked from home during the pandemic. A nicotine patch was started for 27 (26.7%) patients, and Varenicline was started for 74 (73.3%) patients on their first admission. Eighteen (17.8%), 15 (14.9%), 37 (36.6%), and 31 (30.7%) patients were primary school, middle school, high school, and university graduates, respectively. Seventy-eight of the 101 patients had no comorbidities. The most frequent comorbidities were hypertension (n=7) and asthma (n=7).

Fifty-two (51.5%) of the participating patients were concerned about COVID-19-related health issues; 49 (48.5%) patients stated that they did not have any concerns about their health due to COVID-19. Six (5.9%) patients had COVID-19 disease history, and 10 (9.9%) patients had had someone in their family who was infected with COVID-19.

All participating patients underwent the Fagerström Test for Nicotine Dependence at their first admission to our outpatient clinic, and their average score was found as 6.4 ±3.1. One year after the pandemic started, 81 (80.2%) patients were still active smokers, and 20 (19.8%) patients quit smoking. The distribution of the smoking statuses of the patients one year after the pandemic started is shown in Table I.

Considering the change in the HSI values of the 81 patients who continued smoking, the average value was 3.8 before the pandemic, and the mean HSI value was 3.1 one year after the pandemic started, which was a significant decrease ($p<0.0001$).

When the first year of the pandemic was over, the smoking behavior of 64 (63.4%) patients did not change, and the smoking behavior of 37 (36.6%) patients did change. Of the 37 patients who changed their smoking behavior, eight

(21.6%) increased the amount of tobacco they consumed, 12 (32.5%) decreased the amount of tobacco they consumed, eight (21.6%) quit smoking, and nine (24.3%) relapsed smoking. The distribution of the changes in smoking behavior of the patients 1 year after the pandemic started is shown in Table II.

When the first year of the pandemic was over, eight patients increased their consumption of cigarettes, and nine patients started smoking again. When the patients were questioned about the possible causes for this alteration in their smoking behavior, six patients did not describe any particular cause, but the other patients gave one or more reasons. Considering the distribution of these causes, it was determined that the primary cause was stress (58.8%).

When the first year of the pandemic was over, 20 patients who reduced the number of cigarettes (n=12) and quit smoking (n=8) were identified. When the reasons for this behavior change were examined, it was determined that the primary cause was health concerns due to the pandemic (95%).

During the pandemic period, the rate of smoking cessation in women (29.5%) was found significantly higher than in men (12.3%) ($p=0.031$). There was no significant relationship between smoking habits and occupation, education levels, smoking cessation medication types, and comorbidity.

All patients were asked whether smoking increased the risk of COVID-19 disease. Seven-

Table II. The distribution of the changes in smoking behavior of the patients 1 year after the pandemic started.

Behavior change	N	%
Increase in smoking	8	21.6
Decrease in smoking	12	32.5
Quit smoking	8	21.6
Smoking relapse	9	24.3
Total	37	100

ty-six (75.2%) patients stated that they thought smoking increased the risk of the disease, 14 (13.9%) patients said that smoking did not increase the risk of the disease, and 11 (10.9%) patients considered that they did not have any information on the subject. It was seen that those who considered smoking as a risk factor for COVID-19 significantly reduced or quit smoking ($p=0.031$).

When the 81 patients who continued to smoke when the first year of the pandemic was over were asked about the effect of the lockdowns and restrictions on their access to tobacco products and the amount of tobacco consumption, all stated that the lockdowns and restrictions did not affect their access to tobacco products. Eight (9.9%) patients stated that their amount of tobacco consumption decreased during the lockdowns and restrictions, seven (8.6%) patients said that the amount of tobacco consumption increased during the curfew, and 66 (81.5%) patients stated that the lockdowns and restrictions did not affect the amount of tobacco they smoked.

Discussion

Smoking addiction is a noteworthy public health problem because it affects both the person who smokes and the people around them. In this study, we found that by the time the first year of the pandemic ended, a change in smoking behavior occurred in 36.6% of patients who presented to our smoking cessation outpatient clinic in the year before the pandemic. We found that 54.1% of this change was reducing/quitting smoking, and 45.9% was relapsing smoking or increasing the number of cigarettes smoked. Our outcomes demonstrated that stress was still associated with increased smoking 1 year after the pandemic started, which is concordant with the studies from the first phase of the pandemic¹⁴. The primary reason for quitting and decreasing smoking was determined to be the health concern caused by the pandemic.

During the pandemic, many socioeconomic changes have been experienced. Immediately after the Ministry of Health announced the first COVID-19 case in Turkey on March 11th, 2020, social distancing regulations were enacted to minimize physical contact between individuals. As a result of these legislations, schools shut down, and remote working methods were implemented as much as possible. This new situation,

where most household members were continuously at home, with significant lifestyle changes, created an increase in health-related concerns, which made this period even harder to manage.

The functioning of smoking cessation clinics was interrupted during the pandemic period. Compared with previous years, it was observed that the number of presentations to smoking cessation outpatient clinics decreased, and there were disruptions in smoking cessation interventions in our country as in the world.

The vast majority of studies show that cigarette use has changed significantly with the pandemic. The change was in the form of an increase or decrease in the consumed amount and a switch in the tobacco product used¹⁴⁻¹⁸. In a study, 67.7% of smokers stated that the coronavirus did not affect the number of daily cigarettes smoked, 18.5% stated that they smoked less due to coronavirus, and 13.8% said they smoked more. One-third of smokers were more willing to quit smoking due to the coronavirus¹⁹. Heerfordt and Heerfordt²⁰ found no increasing trend in the number of searches related to quitting smoking on Google during the early months of the pandemic. This may designate that there was no genuine reduction in tobacco consumption during the pandemic, yet, during that time, the COVID-19 outbreak probably seemed far from over. Thus, it was thought that this situation could change in the upcoming period. The common aspect of studies examining changes in tobacco use was that they were conducted early and online. These studies are not sufficient to reveal behavior change because they evaluated a narrow time interval. By contrast, our study evaluated alterations in smoking behavior 1 year after the pandemic started.

Although research has shown that smokers respond differently to the COVID-19 outbreak, there is little explanation for why some people increase their smoking while others decrease it. Studies show that stress due to the pandemic is associated with increased and reduced smoking. The stress related to the COVID-19 outbreak seems to affect smokers in diverse ways, with some smokers increasing the number of cigarettes they smoke while others decreasing their smoking^{18-19,21-22}. In our study, we determined that the primary reason for increased smoking was stress (58.8%). Other reasons included boredom, curfew, working from home, and unemployment.

It has been stated that boredom and legislation about social distancing may have encouraged smoking for some patients, and the threat of being infect-

ed with COVID-19 and becoming seriously sick may have motivated other patients to quit smoking to protect their health^{16,18-19,23}. In the literature, perceiving the coronavirus as a serious threat and being aware of the fact that smokers are at higher risk than nonsmokers are found to be significantly associated with motivation to quit¹⁹. Similarly, in our study, it was determined that health concerns due to the COVID-19 pandemic were the primary reason for reducing or quitting smoking.

Another possible rationale is that some tobacco users may have reduced smoking because of less social activity, not because they had the drive to minimize or quit smoking. Bommele et al¹⁸ reported that curfew legislation during the coronavirus limited social smoking, such as smoking with colleagues and friends at various social events. On the contrary, in this study, curfew was determined as a reason for increased smoking.

Undoubtedly, smoking is an important risk factor for respiratory diseases. Both smoking and COVID-19 affect the respiratory system. Smoking reduces the effectiveness of the lungs' defense mechanisms against coronavirus and other agents. Tobacco use increases the risk of cardiovascular, chronic lung disease, diabetes, and infectious diseases, which are risk factors for severe COVID-19 disease.

Experts and the press should not mislead people with unproven allegations that tobacco and nicotine products reduce the risk of COVID-19 disease^{11,12}. Current evidence suggests that smoking increases the risk of COVID-19 disease severity and mortality rates. Evidence from the largest meta-analysis²⁴ of 32,849 hospitalized patients for COVID-19 reported that current tobacco users had an increased risk of severe COVID-19 (Risk Ratios: 1.80; 95% Confidence Interval: 1.14-2.85). In another study, Vardavas et al²⁵ reported that tobacco users were 1.4 times more likely to have serious COVID-19 symptoms (RR = 1.4, 95% CI: 0.98-2.00). Furthermore, smokers were reported to be nearly 2.4 times more likely to need intensive care unit admittance, require mechanical ventilation, or die (RR=2.4, 95% CI: 1.43-4.04) in comparison with nonsmokers.

It is extremely important to be careful about the messages given about smoking and COVID-19 during the pandemic. Increasing evidence that smoking is associated with the severity of COVID-19 disease may provide smokers with a source of additional motivation to quit. Avoiding tobacco use and the increase in quit rates can help to minimize severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) transmission and

disease severity associated with active smoking. These data highlight the importance of raising more resources and creating public campaigns for cessation services at this dramatic time.

The fact that patients could not be reached face-to-face and the small number of patients due to the pandemic are the limitations of this study. More reliable results will be obtained over a longer period with more participants when all the difficulties in reaching patients are over.

Conclusions

This study indicates factors that determine the alterations in smoking behavior during the pandemic are stress and illness anxiety. The results of our research can serve as a guide for identifying individuals who have increased or decreased tobacco consumption. Required planning should be achieved during the pandemic to increase smoking cessation rates. Interventions targeting reducing tobacco consumption should be prioritized. Public health messages should be simple, understandable, and supported by public policies. It should be ensured that individuals who want to quit smoking have access to an effective method of quitting in all health institutions, also during the pandemic. Stress management skills and coping strategies should be offered. It should be kept in mind that such changes during the pandemic may occur in similar events in the future.

Conflict of Interest

The Authors declare that they have no conflict of interests.

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None.

Informed Consent

Informed consent forms were signed by all participants.

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Ethics Approval

The approval for this study was obtained from the Ethics Committee of the University of Health Sciences, Kartal Dr. Lutfi Kırdar City Hospital, Istanbul, Turkey (Date: 10.02.2021, Approval number: 514/195/11).

Authors' Contribution

NK, AF, BE, SŞC, SBS: conception and planning of the study. NK, AF, BE: data collection. NK, AF, SBS: data analysis. NK, SŞC, SBS: writing the manuscript. All authors reviewed and approved the final manuscript.

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