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The effects of being infected with COVID-19 in smokers on their smoking habits

Sigara içenlerde COVID-19 hastalığı geçirmenin sigara içme alışkanlığına etkisi

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Abstract

Aim: It is aimed to investigate the attitude and behaviour changes in the smoking habit of those who had COVID-19 while smoking.

Materials and Methods: This descriptive cross-sectional study was conducted with 312 active smokers with Coranavirus disease (COVID-19) between October and November 2021.

Results: It was determined that 38.6% (n=81) of those who had COVID-19 while smoking reduced smoking, 2.4% (n=5) quit smoking, and 9.5% (n=20) quit for a while and then restarted. It was determined that individuals over the age of 45 who had COVID-19 while smoking (p=0.011) and those who received 1-5 years of education compared to those with education of 6-12 years and 13 years or more (p:0.012; p:0.010 respectively) developed more desire to quit smoking.

Conclusion: Public service ads on the health hazards of smoking and the need to quit smoking could have been shared more actively during the pandemic. Also, smoking cessation treatments such as counselling, nicotine patches and medication could have been offered more widely. This COVID-19 Pandemic period, which is an opportunity to quit smoking, unfortunately could not be fully utilized and positive results could not be obtained in this habit.

Keywords: Smoking cessation; Smoking; Pandemics; COVID-19.

Öz

Amaç: COVİD-19 hastalığına yakalanmış sigara içicilerinde, bu enfeksiyona bağlı sigara içme alışkanlığında meydana gelen değişikliklerin değerlendirilmesi amaçlanmıştır.

Gereç ve Yöntem: Tanımlayıcı kesitsel türdeki bu çalışma, Ekim ve Kasım 2021 tarihleri arasında COVID-19'lu 312 aktif sigara içicisi ile yürütülmüştür.

Bulgular: Sigara içerken COVID-19 geçirenlerin %38,6'sının (n=81) sigarayı azalttığı, %2,4'ünün (n=5) sigarayı bıraktığı, %9,5'inin (n=20) ise bir süre bırakıp sonra yeniden başladığı belirlendi. 45 yaş üstü bireylerin sigara içerken COVID-19 kaptığı (p=0,011) ve 1-5 yıl eğitim alanların 6-12 yıl ve 13 yıl ve üzeri eğitim alanlara göre (p:0,012; p:0,010) sigarayı bırakma isteğini artırdı.

Sonuç: Pandemi sürecinde sigaranın sağlığa zararları ve sigarayı bırakmanın gerekliliği konulu kamu spotları daha aktif bir şekilde paylaşılabilirdi. Ayrıca danışmanlık, nikotin bantları ve ilaç tedavisi gibi sigarayı bırakma tedavileri daha yaygın olarak sunulabilirdi. Sigarayı bırakmak için bir fırsat olan bu COVID-19 pandemisi ne yazık ki tam olarak değerlendirilememiştir ve bu alışkanlığı bırakma konusunda olumlu sonuçlar alınamamıştır.

Anahtar Kelimeler: Sigara bırakma; Sigara içmek; Pandemiler; COVID-19.

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Introduction

The world is experiencing the latest pandemic caused by Coronaviruses, known as a zoonotic infection causing three major epidemics in history.[1] It started in Wuhan, China in 2019 and spread rapidly and still affects the whole world.[2] This epidemic, which continued its effect by spreading in waves, affected 260 million people and caused the death of more than 5 million people according to the reports of the World Health Organization (WHO).[3]

Although there is confusing information about smoking and severe COVID-19 disease in some studies conducted around the world[4], it is now indisputably acknowledged that smoking significantly increases mortality and morbidity in COVID-19. In a meta-analysis, it was reported that the COVID-19 infection was severe at a rate of 38% in smokers, and the mortality rate increased by 1.45[5,6]. The causative agent of COVID-19 is Severe Acute Respiratory Syndrome Coronavirus 2 (SarsCov-2). Combination of the virus's S (Spike) protein and ACE receptors in the host cell and a series of furin proteases, transmembrane proteases, serine 2 (TMPRSS2) and cathepsin L play a role in its entry into the human body and pathogenicity occurs.[7] Nicotine increases the level of angiotensin-converting enzyme (ACE)/angiotensin (ANG)-II/ANG II type 1 receptor and is even reported to activate "cytokine storm" and its related genes. Thus, the pathogenicity of the virus increases, which explains the negative effects of smoking on the COVID-19 infection.[5,8-10]

According to WHO data, 22.3% of the world population, that is, approximately 36.7% of men and 7.8% of women, smoked in 2020. The highest rates of tobacco use were in the Western Pacific region (49.0%) for men and Europe (19.0%) for women.[11] The COVID-19 pandemic has affected many social and economic areas, and new habits have emerged. While people's closeness, physical contact and touch were indications of affection prior to the pandemic, they are now perceived as misdeed or even hostility. In terms of the changes that have occurred in the habit of smoking, one of the oldest habits of mankind, review of the studies shows that most of those investigating the relationship between COVID-19 and smoking habits were conducted on people who applied to smoking cessation outpatient clinics with this desire to quit smoking.[12,13] Instead, studying the relationship between smoking habit and COVID-19 in society may give more accurate results. Therefore, this study was conducted on all smokers in the community who had COVID-19 disease, regardless of whether they had the desire to quit smoking or not. It was aimed in this study to investigate what kind of changes occurred in smoking habits both during and after the disease in COVID-19 patients with smoking habit. Not only an opportunity to quit smoking, but this pandemic was also an important opportunity to evaluate whether this chance was utilized and how to act more effectively in future pandemics.

Materials and Methods

Type of the study

The study was done as a descriptive cross-sectional study

The sample size of the study

According to the data of Ministry of Health, as of November 2021, 84 thousand of people have been diagnosed with COVID-19 disease in the city of Kütahya.[14] The population of our study consists of patients with COVID-19 who also have smoking habits. The smallest sample size was found as 309 individuals with 95% confidence level, 5% margin of error, and 28% prevalence according to Turkish Statistical Institute (TUIK) data.[15] Simple random sampling method was used in sample selection. Sampling selected individuals were determined with a random numbers table. Our study was completed on 312 COVID-19 patients with smoking habits. This study was conducted on volunteer patients followed in the Kütahya Evliya Çelebi Training and Research Hospital COVID-19 follow-up outpatient clinic.

Data collection tools

A questionnaire including demographic characteristics and Fagerstrom Test for Nicotine Dependence (FTND) were administered to the individuals included in the

study, after obtaining patient consent, by telephone or by using face-to-face interview technique. FTND was adapted into Turkish by Uysal et al. and consists of 6 questions that are scored separately with the following interpretation: 0-3 little, 4-6 moderately, and 7 and above highly dependent.[16-17]

Data analysis

Data were recorded in the SPSS (Statistical Package for the Social Science, Inc.; Chicago, IL, USA) 20.0 package program and statistical analysis was performed. Numeric variables were represented as mean ± standard deviation, while categorical variables as numbers (n) and percentage (%). Since the number of samples was large, the normality assumption was accepted according to the central limit theorem. According to the central limit theorem (since n>30), the data are assumed to be in normal distribution.[18-19] Chi-square significance test was used to compare the categorical variables of the patient and control groups, and independent groups t-test was used to compare the numerical variables. A $p<0.05$ for statistical differences was considered statistically significant.

Ethics committee approval

Ethics committee approval was obtained from the Ethics Committee of the Faculty of Medicine of the Kütahya Health Sciences University (Date: 11.11.2021; Number: 2021/15-24). The study was conducted under the principles of the Declaration of Helsinki.

Results

Of the participants in our study, 36.5% (n:114) were women, 63.5% (n:198) were men, and the mean age was 36.59±12.40 years. The mean education year was 12.63±3.76 years, and 46.8% (n:146) were university graduates. Occupation of 34.9% of the participants (n:109) was being a worker, and 61.2% (n:191) were married. No chronic disease was present in 89.4% (n:279) of the participants did not have any chronic disease, and 92.9% (n:290) did not have any medication use continuously. The most common chronic diseases were found to be hypertension and diabetes. The number of children was found to be mean 1.98±0.82. It was found that the participants had been smoking for a mean 12.51±9.52 years and smoked a mean of 14.74±5.01 cigarettes per day. FTND was applied to our study group and the mean score of the test was found to be 5.01±1.20; that is, our study group turned out to be moderately dependent.

While 66.7% (n:208) of COVID-19 patients with smoking habit stated that they had not wanted to quit smoking before this disease, 33.3% (n:104) stated that they wanted to quit smoking. In addition, 43.9% (n:137) of the study group attempted to quit smoking and became successful. However, 78.1% (n:107) of these people started smoking again within one year, and 21.9% (n:30) after one year. All of these 137 patients who had attempted to quit smoking were still smokers. When the participants were asked whether having a COVID-19 disease affected their smoking habit, 32.7% (n:102) of these people stated that it had no effect, while 67.3% (n:210) reported that COVID-19 had an effect. With this effect, 26.7% (n:56) thought of quitting smoking, 38.6% (n:81) reduced the number of cigarettes they smoked, 12.4% (n:26) had never smoked while they were sick but started smoking again after they recovered or the quarantine period ended, 9.5% (n:20) did not smoke for a while but started at a later time, and 2.4% (n:5) quitted smoking completely. With the effect of the COVID-19 pandemic, it was found that 81 people reduced smoking by an average of 7.26±4.10 cigarettes and 2.4% (n:5) quitted smoking, 10.4% (n:22) of the patients did not state in which direction they were affected (Table 1).

In our study, no statistically significant relationship was found between the desire to quit smoking in individuals who contracted the COVID-19 disease while smoking to quit smoking and gender, having a chronic disease, using medications regularly, and being married or single. It was observed that the desire to quit smoking was significantly higher in individuals who had COVID-19 disease while being active smokers, and and those who received 1-5 years of education compared to those with education of 6-12 years and 13 years or more (p:0.012; p:0.010 respectively)

and those aged 45 years and over (p=0.011) (Table 2).

Table 1. Changes in smoking habits during and after COVID-19 infection.

	Number (n)	**Percentage (%)**
Whether there was a desire to quit smoking before the COVID-19 Pandemic (n:312)		
Yes	104	33.3
No	208	66.7
Whether there was an attempt to quit smoking before Corona (n:312)		
Yes	137	43.9
No	175	56.1
If successful, the duration of not smoking (n:312)		
Less than 1 year	107	78.1
1-5 years	27	19.7
6 years and above	3	2.2
Did the pandemic have an effect on smoking habits? (n:312)		
No	102	32.7
Yes	210	67.3
Any thought of quitting smoking due to the effect of the pandemic? (n:210)		
Yes	56	26.7
No	154	83.3
Any reduction in the amount of smoking while suffering from COVID-19? (n:210)		
Yes	81	38.6
No	231	61.4
Restarting smoking after quitting while suffering from COVID-19? (n:210)		
Yes	26	12.4
No	184	87.6
Quitting due to COVID effect, starting again after a while (n:210)		
Yes	20	9.5
No	190	90.5
Quitting due to COVID 19 effect? (n:210)		
Yes	5	2.4
No	205	97.6

Table 2. Analysis of the factors affecting the desire to quit smoking due to the disease in COVID-19 patients who smoke.

The factors affecting the desire to quit smoking	**Yes (n:104)**		**No (n:208)**		x^2	p
	%	**n**	**%**	**n**		
Gender						
Female	34.8	69	65.2	129	0.560	0.533
Male	30.7	35	69.3	79		
Age						
18-44 years	29.1	66	70.9	161	6.799	0.011
45 years and above	44.7	38	55.3	47		
Education						
1-5 years	54.8	17	45.2	14		
6-12 years	31.1	42	68.9	93	7.166	0.028
13 years and above	30.8	45	69.2	101		
Marital Status						
Single	28.1	34	71.9	87	2.437	0.139
Married	36.6	70	63.4	121		
Chronic Disease						
Yes	31.5	88	68.5	191	3.812	0.051
No	48.5	16	51.5	17		
Continuous Medication						
Yes	32.4	94	67.6	196	1.565	0.211
No	45.5	10	68.5	12		
Fagerstrom Test for Nicotine Dependence						
Very little dependent	40.0	4	60.0	6		
Little dependent	39.0	32	61.0	50		
Moderately dependent	34.1	28	65.9	54	2.974	0.562
Highly dependent	29.2	40	70.8	97		
Very highly dependent	0	0	100.0	1		

The participants' attempts to quit smoking were found to be higher in those aged 45 years and older (p<0.001), married (p=0.036), and those without chronic disease (p=0.005) (Tablo 3).

Table 3. Analysis of the factors affecting the smoking cessation attempt due to the disease in COVID-19 patients who smoke.

The factors affecting smoking cessation	Yes (n:137)		No (n:175)		x^2	p
	%	n	%	n		
Gender						
Female	43.4	86	56.6	112	0.050	0.906
Male	44.7	51	55.3	63		
Age						
18-44 years	37.4	85	62.6	142	14.141	<0.001
45 years and above	61.2	52	38.8	33		
Education						
1-5 years	61.3	19	38.7	12	4.856	0.088
6-12 years	44.4	60	55.6	75		
13 years and above	39.7	58	60.3	88		
Marital Status						
Single	36.4	44	63.6	77	4.570	0.036
Married	48.7	93	51.3	98		
Chronic Disease						
Yes	41.2	115	58.8	164	7.759	0.005
No	66.7	22	33.3	11		
Continuous Medication						
Yes	42.8	124	57.2	166	2.215	0.137
No	59.1	13	40.9	9		
Fagerstrom Test for Nicotine Dependence						
Very little dependent	80.0	8	20.0	2		
Little dependent	47.6	39	52.4	43		
Moderately dependent	43.9	36	56.1	46	7.638	0.084
Highly dependent	39.4	54	60.6	83		
Very highly dependent	0.0	0	100.0	1		

It was determined that the thoughts, attitudes and behavioural changes of the participants about quitting smoking due to COVID-19 differ according to the degree of dependence (p=0.003). It was determined that especially little and moderately dependent people reduced smoking more than other groups during COVID-19. According to the FTND, the study group whose dependence levels were determined reduced the amount of smoking (7.26±4.10) when the participants were sick, regardless of the degree of dependence (p<0.001). In all degrees of dependence, no statistically significant relationship was found between having COVID-19 disease and quitting smoking for a while (p=0.927), thinking to quit smoking (p=0.612), not smoking during COVID-19 disease (p=0.663) and quitting smoking (p=0.324).

When analysed proportionally, it was observed that the group with high dependence was the most unaffected group in those who smoked in this COVID-19 Pandemic and had COVID-19 (77.4%, n:106) (p=0.003). Those with little dependence were the group that thought to quit smoking the most (39.1%, n:36) (p=0.272). The group that reduced the amount of cigarette due to Coronavirus disease the most was the group with little (39.0%, n:32) and moderate dependence (34.1%, n:28) (p<0.001). The majority of those who never smoked during the Coronavirus disease period and restarted later were those very little (10%, n:1) and little dependent (12.2%, n:10) (p=0.322). In addition, those who were not affected in terms of the amount of smoking in this period and used as before were those with high dependence (77.4%, n:106) (p=0.006). It was determined that those with little dependence quitted smoking at a higher rate (10.0%, n:1) during COVID-19 infection, while those with high dependence (100%, n:1) (p=0.240) did not quit smoking. Those with high dependence (7.3%, n:6) (p=0.904) constituted the majority of those who quitted for a while and then started smoking again.

Discussion

Many studies have been conducted to address the change in smoking habits during the COVID-19 pandemic. However, some of these studies were conducted on people who applied to smoking cessation outpatient clinics because of their desire to quit smoking. In other words, the research subject has been evaluated on the groups formed by those whose desire turns into an action. Some of the studies, on the other hand, were carried out on all individuals, regardless of whether they had COVID-19. Conducting a study on a population-based sample that can represent the community can explain the research topic more accurately. The most important feature of our study is that it is a generalizable study to smokers who have had COVID-19, by investigating COVID-related attitude and behaviour changes on this habit in people who had COVID-19 while actively smoking. Smoking habit is observed at a rate of 28% in Turkey with three males and one female out of every four smokers.[15]

Sim et al. defined male gender as a risk factor for smoking.[20] In a study conducted by Gallus et al. in twelve European countries, the overall usage rate was found to be 25.9%. While 31.0% of smokers in the study group were men, 21.2% were women.[21] Smoking rates in Turkey were similar to those in Latvia (28.1%) from European countries. In the same study, it was found that smoking habits decreased with increasing age. In our study, while the rate of smoking was 72.8% in the 18-44 age group, this rate decreased to 27.2% over the age of 45, which was in line with the findings of Gallus et al. In the literature, there were some studies suggesting that smoking habits were more common in young people.[22] It was also found that as the level of education increased, the rate of smoking decreased[20-21]; on the contrary, the opposite was found in our study with 46.8% of the participants with 13 years of education, which may be attributed to such factors as being away from home, social setting and school stress in university education. Although it was stated in the same study by Sim et al. that smoking habits were observed more frequently in single people[20], Klemper et al. found smoking habit more frequently in married people and men (69.0%).[23]

In our study, we also found that COVID-19 was more common in married people with smoking habits (61.2%), which can be explained by the fact that the increase in the number of individuals living at home my cause an increase in the probability of being infected with the virus.

In previous studies, it was determined that smoking habits were observed more in people with low socioeconomic status[21,24-25], and in our study, we observed that smoking habits were more common in workers living on minimum wage. It has been observed in other studies that especially psychological disorders encourage smoking habits in nicotine tests performed on diabetic rodents[20,26]. In our study, we found that 10.6% of the smokers with COVID-19 were those with chronic diseases and 7.1% were chronic medication users.

In the study by Klemper et al., about half of the individuals who participated in the study (regardless of whether they had COVID-19) stated no change in smoking habit due to concerns about Coronavirus disease, while one-fourth reported that they reduced smoking and electronic cigarettes, and more than one-third of them wanted to quit.[23] In addition, 20.0% of the participants attempted to quit while some smokers increased the amount due to the stress of the pandemic. In our study, we found that more than half of the study group was affected of being infected with Coronavirus and one-fourth of the patients reduced smoking (both in line with Klemper's study), while 16.3% (n:51) of the patients quit smoking. In fact, 2.4% (n:5) of this group quit smoking permanently, which may be due to their underestimation of the relationship between COVID-19 and smoking.

Arpacıoğlu et al. conducted research on a group of healthy individuals who had not had COVID-19 about behavioural changes in adults due to COVID-19 pandemics. They found that there was no change in smoking habits at a rate of 14.6% with the effect of the COVID-19 Pandemic and its spread, an increase in smoking by 4.6%, and a decrease in

or quitting smoking in 11.3%. In our study, we found that having COVID-19 did not have an inhibitory effect on smoking habits as much as suggested in the study by Arpacıoğlu et al.[12]

In our study, we observed that 67.3% (n:210) of smokers who had COVID-19 were affected by this pandemic, 26.7% (n:56) were considering quitting smoking, and only 2.4% (n:5) of them were able to quit smoking, which showed that although the desire to quit smoking was high due to the COVID-19 Pandemic, there was not enough action of this desire. In the study performed by Tetik et al. on patients who applied to the smoking cessation outpatient clinic, the rate of smoking in men was 66.9%, and the mean age was 36.59 years, which almost coincided with the results of our study. While the rate of quitting smoking after applying to the smoking cessation outpatient clinic in the last two years was 23.0%, it increased to 31.2% after the COVID-19 Pandemic, which could be attributed to a fear that COVID-19 complications and its course could be more severe in smokers. However, in our study, the rate of quitting smoking habit was 16.3% (n:51) despite the fact that they had COVID-19 actively and went into quarantine.[27] Their rates may have been higher because both Arpacıoğlu et al. and Tetik et al. conducted their studies on groups that wanted to quit smoking.

In the study of Li et al.[28] on smokers, it was determined that 26.7% of smokers attempted to quit smoking due to the high perceived sensitivity and prevalence of violence due to Coronavirus effect. In addition, they found that 27.9% of individuals reduced their cigarette consumption with the effect of Coronavirus, and 14.3% aimed to quit smoking within 30 days[28], which was in line with the results of our study. In our study, it was observed that 26.7% of smokers who had COVID-19 thought about quitting, 26% reduced smoking, and 16.3% quit smoking. [The rate of 16.3% was obtained by adding up those who never smoked during the disease and quit during this period (12.4%), those who quit smoking for good (2.4%), and those who quit for a while due to the coronavirus effect and started again (9.5%).]

It was found in our study that individuals over the age of 45 who had COVID-19 while smoking and those who received education between 1-5 years had a greater desire to quit smoking. It was also found that smoker over the age of 45, married and with chronic diseases turned this desire into action and they attempted to quit smoking. However, when considered in general, it was observed that having COVID-19 had an effect on quitting smoking in 67.3% of individuals with smoking habits, and that most of the smokers (61.4%) reduced smoking. The participants may have had stopped smoking at first due to anxiety disorders at the time of their Coronavirus disease, but as time passed, they started smoking again. In this study, we found that having COVID-19 did not affect smoking cessation rates (2.4%, n:5) significantly, which may be due to the fact that those who wanted to quit smoking during the COVID-19 process could not receive support due to the closures.

Limitations

Since our study is a cross-sectional study, it does not show temporality. The findings of the study are objective, as a self-assessment questionnaire is used. The results of the research can be generalized to Kütahya, not to Turkey.

Longitudinal studies can be planned in a larger universe on this subject.

Conclusion

It was found in this study that although having COVID-19 disease had a partial effect on the thought of quitting smoking, decreasing the amount of daily smoking and quitting for a temporary period, it did not affect the rates of quitting smoking completely. This COVID-19 Pandemic period, which has been affecting the whole world for about two years, has been perceived as an opportunity to quit smoking, and health-related organizations, especially the T.R. Ministry of Health, have tried to effectively draw attention to the harms of smoking and the serious course of COVID-19 disease in these people, using the media. However, this study showed that this effort was insufficient in this regard and that it did not have enough effect on the individuals in the society where the study was conducted. Due to

the limited impact of the education given to the society, it may be more effective to provide individual training on quitting smoking habit by healthcare professionals at the time of diagnosis and during the isolation period. It would be appropriate to start these trainings routinely and to investigate their effects.

Ethics Committee Approval

Ethics committee approval was obtained from the Ethics Committee of the Faculty of Medicine of the Kütahya Health Sciences University (Date: 11.11.2021; Number: 2021/15-24). The study was conducted under the principles of the Declaration of Helsinki.

Informed Consent

The purpose of the study was explained to the participants who volunteered to participate in the study and their consents were obtained.

Author Contributions

Study concept/design, data collecting, data analysis and interpretation, literature review, writers: AD., MY. The final version of this article was read and approved by all authors.

Conflict of Interest

The authors have no conflicts of interest to declare.

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