Turk J Pharm Sci 2022;19(4):416-421
DOI: 10.4274/tjps.galenos.2021.26985

ORIGINAL ARTICLE

Impact of a Coronavirus Pandemic on Smoking Behavior in University Students: An Online Survey in Türkiye

Fatma Gül Nur ÇELİK, Göksun DEMİREL*

Çukurova University, Faculty of Pharmacy, Department of Pharmaceutical Toxicology, Adana, Türkiye

ABSTRACT

Objectives: Coronavirus Disease-2019 (COVID-19) pandemic has a massive impact on human health, causing sudden lifestyle changes. As it affects health, determining the lifestyles of university students related to smoking has gained importance. This study provides evidence of change in smoking behavior among university students in Türkiye during the ongoing COVID-19 pandemic.

Materials and Methods: This cross-sectional survey study was conducted *via* an electronic questionnaire approximately 2020-2021 among university students in Türkiye. The study comprised a structured questionnaire that inquired about demographic information; and the Fagerström Test for Nicotine Dependence. The questionnaire was distributed randomly to university students; it required 6 min to complete.

Results: A total of 749 respondents were included in the study, aged between 19 and 35 years (54.8% females). Of 749 participants, 571 health science students (medicine, pharmacy, dentistry, *etc.*) completed the survey. The pre-pandemic and COVID-19 pandemic mean nicotine dependence scores were 3.03 and 2.97, respectively. A difference was seen pre-pandemic (p= 0.002) and during pandemic (p= 0.005) for those studying in health and other departments. Students who had middle socio-economical status had significantly higher nicotine dependence scores pre-COVID-19, compared to during the pandemic (p= 0.027). Compared to pre and during the pandemic, the mean score of dependence was significantly lower in students, whose parents were non-smokers during the pandemic.

Conclusion: In this study, we have provided the first data on the Turkish university student's nicotine dependence changes during the COVID-19 lockdown. The nicotine dependence level may change based on various factors including behavioral changes. Crucial times such as pandemics can affect individuals, thus, smoking addiction can increase. Behavioral support for quitting smoking such as digital platforms, internet, and television programs should also assist to support smokers quitting successfully during this supreme time.

Key words: Smoking behaviors, COVID-19, university students, Türkiye

INTRODUCTION

Smoking tobacco has been accepted to be related to many disease diagnoses, as wide evidence has highlighted the negative effect of nicotine consumption on the respiratory system.[1] Smoking tobacco is an evident risk of immune system diseases and smokers more undefended from many respiratory infections that occur in the respiratory system.[2,3]

Recent studies have shown that smoking is related to the increase in the severity of symptoms and fatality-level hospitalize of the patients with Coronavirus Disease-2019 (COVID-19).[4]

The global COVID-19 pandemic started in the first quarter of 2020 and caused many people to die from lung problems. Because of such drastic outcomes, addiction levels are expected to change because of the changes in social behavior.[5]

Due to COVID-19 pandemic, an unexpected and major change in the lifestyle of the community has appeared with an extreme decline of any form of socialization.[6] Especially, young university

*Correspondence: gdemirel@cu.edu.tr, Phone: +90 555 854 34 30, ORCID-ID: orcid.org/0000-0002-2994-5505
Received: 05.07.2021, Accepted: 20.09.2021

students were going through an overwhelming process, as they had to continue their life in isolation. Self-isolation and social distancing affected university students' rhythm of life especially lifestyle with smoking behavior.

Caused by the pandemic quarantine, with leaving confined indoor to digital education and the limitations of social life could result in boredom, which in turn, is associated with changes in smoking behavior.[7]

Our study must target evaluating the evidence of the changes in smoking behavior among smoker Turkish university students in the process of COVID-19 pandemic and, more importantly, to understand how demographic factors influence these behaviors.

MATERIALS AND METHODS

Survey instrument and dissemination

A web-based, cross-sectional study was conducted using a survey instrument to obtain responses from university students in Turkey between 2020-2021 after obtaining their written informed consent. Approval for the study was obtained from the Republic of Türkiye Ministry of Health-Scientific Research Platform (form number: 2020-11-01T15_03_42) and Çukurova University Non-Interventional Clinical Studies Ethics Committee (project number: GO-105 dated 22.11.2020 and decision number: 55).

A 30-item survey instrument was developed using the Fagerström Nicotine Dependence Test (FTND) and demographic data including COVID-19. The survey was administered to university students and demographic data, nicotine dependency, and knowledge and perceptions related to COVID-19 were obtained. In this survey, both pre and during the COVID-19 dependency levels were questioned.

The developed draft survey instrument was made accessible through a link and was distributed to 10 randomly selected faculty members from different regions to comprehensively assess the content domains of the questionnaire. Regarding their answers, the final version of the survey was reached.

The final version of the survey was administered using the e-mail databases of the universities in Türkiye.

Statistical analysis

The research data were evaluated using SPSS 20.0. The normal distribution assumption was confirmed with the Kolmogorov-Smirnov test and it was seen that the data showed a normal distribution. The descriptive data of the research were evaluated with numbers and percentages. Independent samples *t*-test, paired-samples *t*-test, and one-way ANOVA were used for continuous data. Chi-square test and crosstabs were used for categorical data. A *p* value of 0.05 or less in all tests was considered significant.

RESULTS

Descriptive statistics

The sample for this study consisted of 749 university students in total. The study data from students from 57 universities in 66 provinces in Türkiye are gathered online. The participant students' socio-demographic characteristics are shown in Table 1.

Table 2 includes the descriptive statistics for university students. The average age of the students is 22.1. Pre-COVID-19 pandemic nicotine dependence mean score averaged 3.03; the

Table 1. Frequency distributions

	Frequency (n)	Percentage (%)
Gender		
Female	412	55.0
Male	337	45.0
Living place		
Village	18	2.4
Town	6	0.8
County	237	31.6
City center	488	65.2
Department		
Health departments	571	76.2
Other departments	178	23.8
Economical status		
Very low	10	1.3
Low	63	8.4
Middle	435	58.1
High	215	28.7
Very high	26	3.5
Smoking habits in the family members		
No	193	25.8
Yes	556	74.2
Mandatory quarantine condition due to contact with someone diagnosed with COVID-19		
No	618	82.5
Yes	131	17.5
Having/passing the coronavirus infection		
Yes, I passed it and got through. My last test result was negative	50	6.7
No, I did not experience any symptoms	522	69.7
No, I had a test and my result was negative	128	17.1
Yes, I doubt it, but it was not confirmed by a test	41	5.5
Yes, I had the test and my result was positive	8	1.1

COVID-19: Coronavirus Disease-2019

nicotine dependence mean score during COVID-19 pandemic process was determined as 2.97.

A comparison of nicotine dependence score pre-pandemic and during the pandemic is shown in Table 3. According to the Table, the nicotine dependence scores of female (p<0.001) and male (p<0.001) students, pre and during the pandemic differ statistically significant.

According to the place where students live, nicotine dependence scores pre-COVID-19 (p= 0.014) and during the pandemic (p= 0.003) differ significantly. The nicotine dependence of the students living in the country pre-pandemic differed significantly from that during the pandemic (p= 0.003). A difference was seen pre-pandemic (p= 0.002) and during pandemic (p= 0.005) for those studying in health and other departments.

Students who had middle socio-economical status had significantly higher nicotine dependence scores pre-COVID-19, compared to during the pandemic (p= 0.027). Compared to pre and during the pandemic, the mean score of dependence was significantly lower in students, whose parents were non-smokers during the pandemic (p= 0.017).

For students who had to be in quarantine due to their relatives or family members, their dependency level was significantly higher compared to pre-pandemic (p= 0.011).

Students, who were diagnosed with COVID-19 and had negative results after recovery, had significantly lower levels of dependency compared to pre-COVID-19 (p= 0.40).

The nicotine dependence-level results are summarized in Table 4. Dependence levels pre and during the pandemic showed significant differences (p<0.001). Three hundred thirty two of the students, who self-evaluated at the very low dependence levels on FTND pre-pandemic continued at the same level during the pandemic. However, 10 students' dependence levels have increased to low dependence levels. One hundred thirty two of the individuals, who proclaimed low addiction levels on the FTND pre-pandemic, continued at the same level during the pandemic. Ten students moved to a very low addiction level and 15 students moved to moderate dependence. Six of those proclaiming a high level of addiction in the pre-pandemic moved down to moderate levels during the pandemic.

DISCUSSION

This study was conducted with 749 university students, 571 of whom were health department students. The addiction score averages of the students studying in health departments and studying in other departments before COVID-19 (p= 0.002) and during COVID-19 process (p= 0.005) differ statistically significant.

More than 80% of dependency on tobacco begins between the ages of 10 and 18 with an average age of onset of 14-15. Youth tobacco dependency was similar to that among adults. The signs of addiction are generally correlated with the number of cigarettes smoked *per* day and generally with the smoking was beginning.[8] In 2015, it was found that approximately 20% of youth in the world between the ages of 15 and 24 smoke. An individual who begins using cigarettes before his/her early 20s is more likely to develop an addiction. In this respect, it can have a negative influence on the students educated in the disciplines of healthcare concerning the capacity to refrain from smoking throughout their lives, even more among male students (p= 0.007).[9,10]

The psychological mood caused by COVID-19 pandemics seems to have various sorts of influences on the usage of cigarettes. That is to say, while some users have consumed more than usual, others seem to decrease the density of consumption. The reason behind the increase in consumption level during the quarantine would be social isolation, while the reason behind the decrease in consumption level would be the fear of falling ill.[11]

Because of our study, the addiction score averages of female and male students before (p<0.001) and during the COVID-19 pandemic (p<0.001) differ significantly. Also, the male students had higher nicotine dependence scores compared with female students, both pre and during the pandemic.

Although there were healthcare professionals in the largest risk group during the pandemic period, it was observed that the cigarette addiction levels of the students of the health departments, where most students studying in departments such as medicine, dentistry, pharmacy, and emergency medical technicians were higher than others and remained unchanged during the pandemic period.

Students who had middle socio-economic status had significantly higher nicotine dependence scores pre-COVID-19, compared to during the pandemic (p= 0.027). However, no statistically significant difference was found in students who had high and low socio-economic status in addiction scores or during the pandemic.

Since the occurrence of the COVID-19 pandemic, supreme evidence has shown that smoking tobacco was a risk factor for pandemic.[12] Recent studies have demonstrated that smoking impacts the increase in the risk in terms of the infection of COVID-19[12] and that cigarette users are more prone to the adverse effects after being contaminated.[13] However, the psychosocial effect of the pandemic with related anxiety and stress raised by limitations and fear of illness could lead smokers to continue to use tobacco.[14]

Table 2. Descriptive statistics

	Mean	Standard deviation	Minimum	Maximum
Age	22.12	3.41	19	35
Smoking addiction scores before the pandemic	3.03	2.47	0	9
Smoking addiction scores during the pandemic	2.97	2.59	0	10

Table 3. Pre-pandemic and during the pandemic comparison of smoking addiction scores

	Pre-COVID-19	During COVID-19	Test statistic	*p*
Sex				
Female	2.69 ± 2.42	2.63 ± 2.52	t^a= 1.769	0.073
Male	3.40 ± 2.47	3.35 ± 2.62	t^a= 1.604	0.0110
Test statistic	t^b= -3.789	t^b= -3.632		
p	***p*<0.001**	***p*<0.001**		
Living place				
Village	3.58 ± 2.85	4.14 ± 3.30	t^a= -1.075	0.302
Town	1.66 ± 2.65	1.33 ± 1.36	t^a= 0.598	0.576
Country	2.65 ± 3.38	2.51 ± 2.44	t^a= 2.973	**0.003**
City center	3.20 ± 2.47	3.16 ± 2.61	t^a= 1.161	0.246
Test statistic	*F*= 3.538	*F*= 4.817		
p	**0.014**	**0.003**		
Department				
Other departments	2.87 ± 2.47	2.82 ± 2.58	t^a= 1.820	0.071
Health science department	3.60 ± 2.38	3.50 ± 2.58	t^a= 1.757	0.079
Test statistic	t^b= 3.187	t^b= 2.822		
p	**0.002**	**0.005**		
Economic situation				
Atrocious	3.88 ± 3.44	4.00 ± 4.09	t^a= 0.263	0.799
Bad	3.28 ± 2.34	3.23 ± 2.55	t^a= 0.490	0.626
Middle	2.94 ± 2.40	2.87 ± 2.51	t^a= 2.225	**0.027**
Good	3.00 ± 2.58	2.98 ± 2.69	t^a= 0.464	0.643
Very good	3.77 ± 2.50	3.49 ± 2.53	t^a= 1.781	0.088
Test statistic	*F*= 1.115	*F*= 0.848		
p	**0.348**	**0.495**		
Smoking in the family				
No	2.76 ± 2.44	3.07 ± 2.63	t^a= 2.407	**0.017**
Yes	3.11±2.47	2.62 ± 2.44	t^a= 1.349	0.178
Test statistic	t^b= 1.577	t^b= 1.920		
p	**0.115**	**0.055**		
Mandatory quarantine condition due to contact with someone diagnosed with COVID-19				
No	2.98 ± 2.47	3.24 ± 2.57	t^a= 2.563	**0.011**
Yes	3.16 ± 2.45	2.91 ± 2.59	t^a= 0.257	0.797
Test statistic	t^b= 1.108	t^b= 1.265		
p	**0.268**	**0.206**		
Having/passing the coronavirus infection				
Yes, I passed it and got through. My last test result was negative	3.11 ± 2.53	2.88 ± 2.58	t^a= 2.121	**0.040**
No, I did not experience any symptoms	2.98 ± 2.42	2.93 ± 2.55	t^a= 1.395	0.164
No, I had a test and my result was negative	3.32 ± 2.67	3.24 ± 2.70	t^a= 1.516	0.132
Yes, I doubt it. But it was not confirmed by a test	2.56 ± 2.33	2.46 ± 2.50	t^a= 1.000	0.324
Yes, I had the test and my result was positive	3.50 ± 2.50	3.75 ± 3.57	t^a= 475	0.649
Test statistic	*F*= 0.908	*F*= 0.915		
p	**0.459**	**0.455**		

t^a:Dependent sample *t*-test, t^b: Independent sample *t*-test and *F* test statistic of the analysis of variance. Bold values were statistically significant. COVID-19: Coronavirus Disease-2019

Table 4. Comparison of nicotine dependence levels pre and during the pandemic

Nicotine dependence levels during COVID-19 pandemic n (%)								
		Very low dependence	Low dependence	Moderate dependence	High dependence	Total	Test statistic	*p*
Nicotine dependence levels before the pandemic	Very low dependence	332 (44.3)	10 (1.3)	0	0	342	1356.47	*p*<0.001
	Low dependence	29 (3.9)	136 (18.1)	15 (2)	0	180		
	Moderate dependence	0	15 (2)	143 (19.1)	12 (1.6)	170		
	High dependence	0	0	6 (0.8)	51 (6.8)	57		
Total		361	161	164	63			

COVID-19: Coronavirus Disease-2019

In a large survey of 53,002 individuals in the UK, current smoking was associated with a 1.8 times higher chance of confirmed COVID-19. The same study showed that smokers reported lower respect to guidelines than non-smokers despite the fear of falling into illness seriously. Many users reported that they smoke more than they did previously and that stress is the prominent factor in the increase in smoking.[15]

CONCLUSION

This study has indicated that the smoking behavior of the students receiving education in the various departments of healthcare increased during the pandemic process considering their behavior on the same issue during the pre-pandemics process. Consequently, an increase or decrease in addiction levels can be seen because of isolation from society and anxiety caused by a pandemic. During the COVID-19 pandemic, addictions like smoking need exhaustive management, especially among vulnerable young populations such as quarantined people and individuals, who are at higher risk of smoking and other addictions. Therefore, the relevant healthcare institutions should develop the necessary projections to fight smoking addiction as well as with other substance addictions by taking advantage of the pandemic process.

Ethics

Ethics Committee Approval: Çukurova University Non-Interventional Clinical Studies Ethics Committee (project number: GO-105 dated 22.11.2020 and decision number: 55).

Informed Consent: Informed consent forms have been obtained from all volunteers.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Concept: G.D., Design: G.D., Data Collection or Processing: F.G.N.Ç., G.D., Analysis, or Interpretation: G.D., Literature Search: F.G.N.Ç., Writing: F.G.N.Ç., G.D.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

REFERENCES

1. Strzelak A, Ratajczak A, Adamiec A, Feleszko W. Tobacco smoke induces and alters immune responses in the lung triggering inflammation, allergy, asthma and other lung diseases: a mechanistic review. Int J Environ Res Public Health. 2018;15:1033.
2. World Health Organization (WHO). Smoking and COVID-19: Scientific brief. Available from: https://apps.who.int/iris/handle/10665/332895 Accessed date: June 30, 2020.
3. Han L, Ran J, Mak YW, Suen LK, Lee PH, Peiris JSM, Yang L. Smoking and influenza-associated morbidity and mortality: a systematic review and meta-analysis. Epidemiology. 2019;30:405-417.
4. Umnuaypornlert A, Kanchanasurakit S, Lucero-Prisno DEI, Saokaew S. Smoking and risk of negative outcomes among COVID-19 patients: a systematic review and meta-analysis. Tob Induc Dis. 2021;19:09.
5. Fidancı İ, Aksoy H, Yengil Taci D, Ayhan Başer D, Cankurtaran M. Evaluation of the effect of the COVID-19 pandemic on smoking addiction levels. Int J Clin Pract. 2021;75:e14012.
6. Wang C, Pan R, Wan X, Tan Y, Xu L, Ho CS, Ho RC. Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. Int J Environ Res Public Health. 2020;17:1729.
7. Di Renzo L, Gualtieri P, Pivari F, Soldati L, Attinà A, Cinelli G, Leggeri C, Caparello G, Barrea L, Scerbo F, Esposito E, De Lorenzo A. Eating habits and lifestyle changes during COVID-19 lockdown: an Italian survey. J Transl Med. 2020;18:229.
8. Henningfield JE, Jude NR. Prevention of nicotine addiction: neuropsychopharmacological issues. Nicotine Tob Res. 1999;1(Suppl 1):S41-S48.
9. World No Tobacco Day 2020: protecting youth. Available from: http://www.euro.who.int/en/mediacentre/events/events/2020/05/world-notobacco-day-2020-protecting-youth Accessed date: 15.1.2021.
10. Granja L, Lacerda-Santos T, de Moura Brilhante D, de Sousa Nóbrega Í, Granville-Garcia AF, de França Caldas A Jr, dos Santos JA. Smoking and alcohol consumption among university students of the healthcare area. J Public Health (Berl). 2020;28:45-52.
11. Bommele J, Hopman P, Walters BH, Geboers C, Croes E, Fong GT, Quah ACK, Willemsen M. The double-edged relationship between COVID-19 stress and smoking: implications for smoking cessation. Tob Induc Dis. 2020;18:63.

12. Russo P, Bonassi S, Giacconi R, Malavolta M, Tomino C, Maggi F. COVID-19 and smoking: is nicotine the hidden link? Eur Respir J. 2020;55:2001116.

13. Vardavas CI, Nikitara K. COVID-19 and smoking: a systematic review of the evidence. Tob Induc Dis. 2020:18:20.

14. Stubbs B, Veronese N, Vancampfort D, Prina AM, Lin PY, Tseng PT, Evangelou E, Solmi M, Kohler C, Carvalho AF, Koyanagi A. Perceived stress and smoking across 41 countries: a global perspective across Europe, Africa, Asia and the Americas. Sci Rep. 2017;7:7597.

15. Jackson SE, Brown J, Shahab L, Steptoe A, Fancourt D. COVID-19, smoking and inequalities: a study of 53 002 adults in the UK. Tob Control. 2021;30:e111-e121.