

The impact of coronavirus pandemic on smoking behaviors in university students: an online survey in Turkey

Koronavirüs Pandemisinin (Covid-19) Üniversite Öğrencilerinde Sigara İçme Davranışları Üzerine Etkisi: Türkiye'de Çevrimiçi Bir Araştırma

Kısa başlık: Covid 19 Pandemisinde Sigara İçme Davranışları
Short title: Smoking behaviors in Covid 19

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ABSTRACT

Introduction: The 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 aims to provide evidence of change in smoking behavior among university students in Turkey during the ongoing Covid-19 pandemic.

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

Results: A total of 749 respondents have been included in the study, aged between 19 and 35 years (54,8% females). Of 749 participants, a total of 571 health science students (medicine, pharmacy dentist, 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 departments and other departments. Students who have 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.

Discussion and 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 like pandemics can affect individuals, thus smoking addiction can increase. Behavioral support for quitting smoking such as digital platforms, the internet, and television programs should also assist to support smokers quitting successfully during this supreme time.

ÖZET

Giriş ve Amaç: COVID-19 salgınının insan sağlığı üzerinde büyük bir etki bıraktığı görülmektedir. Bu durum en çok pandemiye bağlı ani yaşam tarzı değişiklikleri sebebiyle ortaya çıkmaktadır. Üniversitelerin eğitime çevrimiçi yöntemle devam etmesi ve öğrencilerin alınan tedbirler kapsamında sokağa çıkma kısıtlamalarıyla karşılaşmaları sebebiyle üniversite öğrencilerinin sigara ile ilgili yaşam tarzlarının belirlenmesi önem kazanmıştır.

Yöntem ve Gereçler: Bu kesitsel anket çalışması, 2020-2021 yılları arasında Türkiye'deki üniversite öğrencileri arasında elektronik anket yoluyla gerçekleştirilmiştir. Çalışmamız katılımcıların demografik bilgileri ile ilgili sorular ve sigara bağımlılık düzeyi belirlemede kullanılan Fagerström Bağımlılık Testi sorularıyla yapılandırılmış bir anketten oluşmaktadır. Tamamlanması 6 dakika süren anket üniversite öğrencilerine rastgele dağıtılarak gerçekleştirilmiştir.

Bulgular: Çalışmaya 19 ile 35 yaşları arasında %55'i kadın, %45'i erkek olmak üzere toplam 749 katılımcı dahil edildi. Bu katılımcılardan toplam 571 tanesi sağlık bilimi öğrencisinden (tıp, eczacılık, diş hekimi vb.) oluşmaktadır. Pandemi öncesi ve Covid-19 pandemisi esnasında ortalama nikotin bağımlılığı skorları sırasıyla 3,03 ve 2,97 olarak ölçülmüştür. Sağlık bölümleri ve diğer bölümlerde okuyanlarda pandemi öncesi ($p = 0,002$) ve pandemi sırasında ($p = 0,005$) farklılık görülmüştür. Orta sosyo-ekonomik statüye sahip öğrencilerin, pandemi dönemine kıyasla covid-19 öncesinde önemli ölçüde daha yüksek nikotin bağımlılık puanlarına sahip olduğu belirlenmiştir ($p = 0,027$). Pandemi öncesi ve sırasında karşılaştırıldığında, pandemi sırasında ebeveynleri sigara içmeyen öğrencilerin ortalama bağımlılık puanının anlamlı olarak daha düşük olduğu saptanmıştır.

Tartışma ve Sonuç: Çalışmamız Türkiye'de yaşayan üniversite öğrencilerinin COVID 19 karantinası sırasında nikotin bağımlılığındaki değişimlere ilişkin ilk verileri göstermektedir. Nikotin bağımlılık düzeyi, davranış değişiklikleri de dahil olmak üzere çeşitli faktörlere bağlı olarak farklılık göstermektedir. Pandemi gibi kritik zamanlar bireyleri etkileyebilir, dolayısıyla sigara bağımlılığı artabilir. Dijital platformlar, internet ve televizyon programları gibi sigarayı bırakmak için davranışsal destek de bu kritik zamanda sigara içenlerin başarılı bir şekilde bırakılmasını desteklemeye yardımcı olmalıdır.

INTRODUCTION

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

Recent studies showed that smoking is related to the increase in the severity of symptoms and fatality level hospitalize of the patients with COVID-19 (4).

The global Covid-19 pandemic started in the first quarter of 2020 and caused many people to die due to lung problems. As a result of such drastic outcomes, addiction levels are expected to change because of the change in social behaviors (5).

Due to the 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 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 behaviors.

Caused by the pandemic quarantine, with leaving confined indoor the digital education and the limitation of social life could result in boredom, which in turn is associated with changing smoking behavior (7).

Our study has to 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, of understanding how demographic factors influenced these behaviors.

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 from 2020-2021 after obtaining their written informed consent. Approval for the study was obtained from the Republic of Turkey Ministry of Health- Scientific Research Platform (form number 2020-11-01T15_03_42) and xx 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 Fagstöröm Nicotine Dependence Test (FTND) and demographic data including COVID-19 [17]. The survey was administered to university students and demographic data, nicotine dependences, and knowledge and perceptions related to COVID-19 were obtained. In this survey, both pre and during the Covid-19 dependency level was 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 Turkey.

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 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 used for categorical data. A p-value of 0.05 or less in all tests was considered significant.

RESULTS

Descriptive Statistics

The sample of the study consists of 749 university students. The study data from students from 57 universities in 66 provinces in Turkey are gathered online. The participant students' socio-demographic characteristics are shown in Table 1.

Table 1. Frequency Distributions

	Frequency(n)	Percentage(%)
<i>Gender</i>		
Female	412	55,0
Male	337	45,0
<i>Living place</i>		
Village	18	2,4
Town	6	,8
County	237	31,6
City center	488	65,2
<i>Department</i>		
Health Departments	571	76,2
Other Departments	178	23,8
<i>Economical status</i>		
Very low	10	1,3
low	63	8,4
Middle	435	58,1
High	215	28,7
Very high	26	3,5
<i>Smoking habits in the Family members</i>		
No	193	25,8
Yes	556	74,2
<i>Mandatory Quarantine Condition Due to Contact with Someone Diagnosed with Covid-19</i>		
No	618	82,5
Yes	131	17,5
<i>Having / Passing the Coronavirus Infection</i>		
Yes, I passed it and got through. My last test result is 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

Table 2 includes descriptive statistics of university students. The average age of the students is 22.1. Pre-Covid-19 pandemic nicotine dependence mean score averages 3.03; The nicotine dependence mean score during the Covid-19 pandemic process was determined as 2.97.

Table 2. Descriptive Statistics

	Mean	Standard Deviation	Minimum	Maximum
Age	22,12	3,41	19	

Smoking addiction scores before the pandemic	3 03	2,47	0	9
Smoking addiction scores during the pandemic	2,97	2,59	0	10

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 females ($p < 0.001$) and male ($p < 0.001$) students, pre and during the pandemic differ statistically significantly.

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

	Pre Covid-19	During Covid-19	Test statistic	p
<i>Sex</i>				
Female	2,69±2,42	2,63±2,52	$t^a = 1,769$	.073
Male	3,40±2,47	3,35±2,62	$t^a = 1,604$	.110
Test statistic	$t^b = -3,789$	$t^b = -3,632$		
p	p<0.001	p<0.001		
<i>Living place</i>				
Village	3,58±2,85	4,14±3,30	$t^a = -1,075$	.302
Town	1,66±2,65	1,33±1,36	$t^a = 0,598$	.576
Country	2,65±3,38	2,51±2,44	$t^a = 2,973$	.003
City Center	3,20±2,47	3,16±2,61	$t^a = 1,161$	.246
Test statistic	F=3,538	F=4,817		
p	.014	.003		
<i>Department</i>				
Other departments	2,87±2,47	2,82±2,58	$t^a = 1,820$	.071
Health Science department	3,60±2,38	3,50±2,58	$t^a = 1,757$	.079
Test statistic	$t^b = -3,187$	$t^b = -2,822$		
p	.002	.005		
<i>Economical situation</i>				
Very bad	3,88±3,44	4,00±4,09	$t^a = 0,263$	.799
Bad	3,28±2,34	3,23±2,55	$t^a = 0,490$	.626
Middle	2,94±2,40	2,87±2,51	$t^a = 2,225$	.027
Good	3,00±2,58	2,98±2,69	$t^a = 0,464$	.643
Very good	3,77±2,50	3,49±2,53	$t^a = 1,781$	.088
Test statistic	F=1,115	F=0,848		
p	.348	.495		
<i>Smoking in the Family</i>				
No	2,76±2,44	3,07±2,63	$t^a = 2,407$	.017
Yes	3,11±2,47	2,62±2,44	$t^a = 1,349$	.178
Test statistic	$t^b = 1,577$	$t^b = 1,920$		
p	.115	.055		
<i>Mandatory Quarantine Condition Due to Contact with Someone Diagnosed with Covid-19</i>				
No	2,98±2,47	3,24±2,57	$t^a = 2,563$	.011

Yes	3,16±2,45	2,91±2,59	$t^a = 0,257$	.797
Test statistic	$t^b = 1,108$	$t^b = 1,265$		
p	.268	.206		
<hr/>				
<i>Having / Passing the Coronavirus Infection</i>				
Yes, I passed it and got through. My last test result is negative.	3,11±2,53	2,88±2,58	$t^a = 2,121$	.040
No, I did not experience any symptoms.	2,98±2,42	2,93±2,55	$t^a = 1,395$	.164
No, I had a test and my result was negative.	3,32±2,67	3,24±2,70	$t^a = 1,516$	.132
Yes, I doubt it but it was not confirmed by a test.	2,56±2,33	2,46±2,50	$t^a = 1,000$	.324
Yes, I had the test and my result was positive.	3,50±2,50	3,75±3,57	$t^a = -,475$	.649
Test statistic	F=.908	F=0.915		
p	.459	.455		

^a Dependent sample t-test.

^b Independent samples *t*-test and *F* test statistic of the analysis of variance.

Bold values are 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 the 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 departments and other departments. Students who have 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 ($P < .001$). 332 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. 132 Of the individuals who proclaimed low addiction levels on the FTND pre-pandemic, continued at the same level during the pandemic. 10 students moved to a very low addiction level, and 15 students moved to moderate dependence. 6 of those proclaiming a high level of addiction in the pre-pandemic moved down to moderate levels during the pandemic.

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

Nicotine dependence levels during the Covid 19 pandemic n (%)

Nicotine dependence levels before the pandemic		Very low dependence	Low dependence	Moderate dependence	High dependence	Total	Test statistic*	p
	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			

UNCORRECTED PROOF

DISCUSSION

This study was conducted with a total of 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 the Covid-19 process ($p = 0.005$) differ statistically significantly.

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 is similar to 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 to use 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 counted as the fear to fall ill. (11) As a result 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 to 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 the majority of students studying in departments such as medicine, dental and pharmacy, emergency medical technicians were higher than others and remained unchanged during the pandemic period.

Students who have middle socioeconomic 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 have high and low socioeconomic status in addiction scores before 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 demonstrated that smoking has an impact on the increase in the risk in terms of the infection of covid 19 (13) and cigarette users are more prone to the adverse effects after being contaminated (14). However, the psychosocial effect of the pandemic with related anxiety and stress raised by limitation and fear of illness could lead smokers to keep going the use of tobacco (15).

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 (16).

CONCLUSIONS

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 for smoking and other addictions. Therefore, the relevant healthcare institutions shall develop necessary projections to fight smoking addiction as well as with other substance addictions by taking the advantage of the pandemic process.

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