

# The effects of the pandemic on smoking behaviors in a border region of Turkey where access to low-price tobacco products is easier

Dilek Karadoğan<sup>1</sup>, Tahsin G. Telatar<sup>2</sup>

## AFFILIATION

**1** Department of Chest Diseases, Faculty of Medicine, Recep Tayyip Erdogan University, Rize, Turkey

**2** Department of Public Health, Faculty of Medicine, Recep Tayyip Erdogan University, Rize, Turkey

## CORRESPONDENCE TO

Dilek Karadoğan. Department of Chest Diseases, Faculty of Medicine, Recep Tayyip Erdogan University, Rize, 53020, Turkey.

Email: cakmakcidilek@yahoo.com

ORCID ID: <https://orcid.org/0000-0001-5321-3964>

## KEYWORDS

pandemic, tobacco use, change, fine-cut tobacco

**Received:** 21 January 2022, **Revised:** 26 April 2022,

**Accepted:** 23 September 2022

Popul. Med. 2022;4(October):28

<https://doi.org/10.18332/popmed/154878>

## ABSTRACT

**INTRODUCTION** The aim of this study is to assess the effect of the pandemic on smoking patterns in the border regions of Turkey, where access to cheaper tobacco products is easier.

**METHODS** Data from a cross-sectional convenience sample of adults (n=204) were collected between 1 July and 1 August 2021, via face-to-face interviews, immediately after the opening of the borders. Approval to perform the study was provided by the Hopa District Governorship and the University Ethics committee. Data were collected using a single-page data collection form containing 26 questions.

**RESULTS** Of the 204 participants, 75% were male, and the mean age was 38.6 ± 11.6 years. The ratio of smokers using non-cigarette tobacco products increased from 3.9% to 6.4%. While the percentage of smokers using roll-your-own tobacco was 2.5%, this increased to 6.8%. In contrast, tobacco product purchases from duty-free shops decreased

from 10.2% to 2.5%, while those using non-taxed foreign cigarettes decreased from 3% to 0% (p<0.05). Regarding the amount of tobacco consumed, 65% of the participants reported no change, 21% reported increased use, and 14% reported a decrease in tobacco use. No significant difference was found between tobacco consumption during the pandemic and the economic conditions of the participants (p=0.72). However, the participants who opted for cheaper tobacco products reported experiencing financial difficulties during the pandemic (p<0.05).

**CONCLUSIONS** There was no change in smoking behaviors in most participants during the pandemic period. Despite the changes in the economic conditions, no significant relationship was found between the amounts of tobacco consumed; however, product switching did take place to alternative cheaper products.

## INTRODUCTION

Studies on how the COVID-19 pandemic has affected the smoking behaviors of tobacco users yield varying results based on the sociocultural background of the sample populations. Some studies found an increase in smoking habits<sup>1</sup>, while others found an increased willingness to stop smoking among the public<sup>2</sup>. In addition, there have been changes to the access and purchase of tobacco products due to lockdown measures, travel restrictions and border closures. Moreover, studies on the effects of the pandemic period on tobacco in Turkey do not exist. In a survey study from China that evaluated the tobacco use behavior

of smokers conducted on 1595 adults between February and April 2020, it was noted that 65.3% of the sample reported no change in overall tobacco use, 23.1% used less, and 11.6% used more tobacco. Additionally, the decrease was prevalent for cigarettes compared to heated tobacco products and e-cigarettes<sup>3</sup>. Another study determined that smokers increasingly want to quit smoking as COVID-19 is associated with an increased risk of adverse outcomes<sup>4</sup>. A study examining the quitting rates of smokers who applied to the smoking cessation outpatient clinic in Turkey before and during the pandemic found that the smoking cessation rate was 23.7% before and 31.1% during the pandemic<sup>5</sup>.

Furthermore, it is known in Turkey that lower priced tobacco products can be obtained in border regions. One of these regions is the Hopa district of Artvin, which is known for its access to low-priced cigarettes from duty-free shops and for cross-border purchases, as Georgia, the neighboring country, had cheaper cigarettes before the pandemic period.

With borders closed during the pandemic, access to this low-priced cigarette source was also closed. Hence, we aimed to investigate how both the effect of the pandemic and the closure of access to low-priced cigarettes may have affected the smoking behavior of individuals. In this study, we aim to assess the smoking behaviors of smokers living in the border region of Turkey, where access to low-priced tobacco products is easy, and to compare their smoking patterns and behaviors during the pandemic period in the pre-pandemic period.

## METHODS

### Study design, setting and participants

This cross-sectional study was performed between 1 July and 1 August 2021, via face-to-face interviews with individuals who are active smokers aged  $\geq 18$  years, using a single-page data collection form containing 26 questions. Borders were closed during the pandemic between 15 March 2020 and 1 June 2021; hence this timeframe represented the immediate time after the opening of the borders. Ethical approval was obtained from the Hopa District Governorship and the Recep Tayyip Erdoğan University ethics committee. The Hopa District was divided into two parts; half of the individuals were collected from the eastern part of the district and half from the west. A convenience sample selection process was used with data collected through face-to-face interviews at places and times with high population density. The study's sample size was calculated using Gpower software; the calculation yielded a minimum of 172 participants, with a  $p=0.05$ , degrees of freedom of 2, and 95% power.

The inclusion criteria in the study were: aged  $\geq 18$  years, being a smoker for  $\geq 3$  years and smoking at least one cigarette per day, and being available for contact. Exclusion criteria were: aged  $< 18$  years, not being an active smoker, not being available for communication, and self-reported severe psychiatric illness.

### Measures

In the data collection form (Supplementary file), it was asked whether there was a difference in the participant's sociodemographic characteristics, smoking patterns and behaviors, and use and purchase of tobacco products, especially cigarettes, before and after the lockdown period.

### Statistical analysis

The categorical variables from the demographic characteristics of the participants were determined as frequency and percentage, and the continuous variables were determined as mean and standard deviation. Chi-

squared test and Fisher's exact test were used for categorical variables in comparing smoking status before and during the pandemic, and the repeated-measures ANOVA test was used to compare continuous variables.

## RESULTS

A total of 204 responses were collected. The average age was  $38.6 \pm 11.6$  years, 75% were male, 61.3% were married, 37.7% were high school graduates, and 45.6% were university graduates. The monthly income of the household was three times the minimum wage in 63.2%

**Table 1. Demographic characteristics of the study population, Turkey 2021 (N=204)**

Characteristics	n	%
<b>Age (years), mean <math>\pm</math> SD</b>	38.66 $\pm$ 11.60	
<b>Gender</b>		
Female	51	25.0
Male	153	75.0
<b>Marital status</b>		
Married	125	61.3
Single	72	35.3
Widow/divorced	7	3.4
<b>Education level</b>		
5 year primary school or less	15	7.4
Secondary school	19	9.3
High school	77	37.7
University graduate or higher	93	45.6
<b>Income level perception</b>		
Good	39	19.1
Medium	141	69.1
Low	24	11.8
<b>Smoking initiation age (years), mean <math>\pm</math> SD</b>	19.72 $\pm$ 5.21	
<b>Smoking duration (years), mean <math>\pm</math> SD</b>	18.83 $\pm$ 11.62	
<b>Smoker household member</b>		
Present	116	56.9
Absent	88	43.1
<b>Monthly income</b>		
Lower than the minimum wage	2	1.0
Equal to minimum wage	37	18.1
Up to 3 times the minimum wage	129	63.2
More than 3 times the minimum wage	36	17.6
<b>Chronic disease</b>		
Present	27	13.2
Absent	177	86.8
<b>COVID-19 diagnosis ever</b>		
Present	32	15.7
Absent	172	84.3

of the participants. The average age of starting smoking was  $19.7 \pm 5.2$  years, and the average duration of being a smoker was  $18.8 \pm 11.6$  years (Table 1). A comparison of the characteristics of smokers according to their tobacco product use is presented in Table 2.

The number of cigarettes smoked per day was  $18.9 \pm 9.7$  before the pandemic; this figure increased to  $19.2 \pm 9.6$ , but the difference was not statistically significant ( $p=0.407$ ). The percentage of smokers using non-cigarette tobacco products

increased from 3.9% to 6.4% during the pandemic. The pre-pandemic rates of roll-your-own tobacco use, duty-free tobacco, and the use of cross-country domestic cigarettes were 2.5%, 10.2%, and 3.0%, respectively, while these rates were determined to be 6.8%, 2.5%, and 0%, respectively, during the pandemic ( $p<0.05$ ) (Table 3).

Regarding the amount of tobacco used, 65.2% of the participants reported no change, 21.1% reported increased use, and 13.7% reported a decrease in tobacco

**Table 2. Comparison of other tobacco product users with taxed cigarettes users, Turkey 2021**

	Taxed cigarettes (n=185)	Roll-your-own tobacco and cheaper cigarettes (n=19)	p
	n (%)	n (%)	
<b>Age (years), mean ± SD</b>	37.8 ± 11.5	46.4 ± 9.7	0.002
<b>Smoking initiation age (years), mean ± SD</b>	19.6 ± 4.9	20.7 ± 7.6	0.35
<b>Gender</b>			0.03
Female	50 (27.0)	1 (5.1)	
Male	135 (72.9)	18 (94.7)	
<b>Education level</b>			0.04
Lower than high school	34 (18.3)	0	
High school and over	151 (81.6)	19 (100)	
<b>Marital status</b>			0.053
Married	111 (60.0)	14 (73.6)	
Single	69 (37.2)	3 (15.7)	
Widowed/divorced	5 (2.7)	2 (10.5)	
<b>Financial status</b>			0.65
Good	35 (18.9)	4 (21.0)	
Medium	127 (68.6)	14 (73.6)	
Low	23 (12.4)	1 (5.2)	
<b>Smoker household member</b>			0.38
Present	107 (57.8)	9 (47.3)	
Absent	78 (42.1)	10 (52.6)	
<b>Chronic comorbid disease</b>			0.07
Present	22 (11.8)	5 (26.3)	
Absent	163 (88.1)	14 (73.6)	
<b>COVID-19 diagnosis ever</b>			0.18
Yes	27 (14.5)	5 (26.3)	
No	158 (85.4)	14 (73.6)	
<b>Income level</b>			
Minimum wage and lower	37 (20.0)	2 (10.5)	
Higher than the minimum wage	148 (80.0)	17 (89.4)	
<b>Financial status change in pandemic</b>			0.15
No change	56 (30.2)	2 (10.5)	
Negatively affected	124 (67.0)	16 (84.2)	
Positively affected	4 (2.1)	1 (5.2)	

**Table 3. Differences in tobacco use characteristics of the participants for the pre-pandemic (before 15 March 2020) and during the pandemic period**

Characteristics	Pre-pandemic period n (%)	Pandemic period n (%)	p
Cigarettes smoked per day (sticks), mean ± SD	18.92 ± 9.67	19.2 ± 9.56	0.407
First cigarette smoking (minutes after waking up), mean ± SD	49.12 ± 59.05	49.17 ± 64.59	0.941
Other tobacco products used other than cigarettes	8 (3.9)	13 (6.4)	0.263
<b>Tobacco product provision</b>			
Roll-your-own tobacco	5 (2.5)	14 (6.8)	0.034
Duty-free shop	21 (10.2)	5 (2.5)	0.001
Imported cigarettes without taxation	6 (3.0)	-	
Cigarettes with taxation from TEKEL stores	172 (84.3)	185 (90.7)	0.052
<b>Change in cigarette smoking behavior</b>			
No change		133 (65.2)	
Increased		43 (21.1)	
Decreased		28 (13.7)	
<b>Change in financial status/income level</b>			
No change		58 (28.4)	
Negatively affected		141 (69.1)	
Positively affected		5 (2.5)	
<b>Budget for cigarettes</b>			
No change		126 (61.8)	
Increased		46 (22.6)	
Decreased		32 (15.7)	
<b>Change in tobacco consumption</b>			
Preferred cheaper alternatives		14 (24.6)	
Decreased daily smoked amount		23 (40.4)	
Attempted to quit		20 (35.0)	

For comparing the pandemic period with the pre-pandemic period for continuous variables repeated-measures ANOVA was used and categorical variables were tested by the chi-squared test.

**Table 4. Relationship between the tobacco consumption and changes in financial status during the pandemic, Turkey 2021**

Tobacco use during the pandemic	Financial status during the pandemic				p
	No change or positively affected		Negatively affected		
	n	%	n	%	
No change	41	65.1	92	65.7	0.721
Increased	12	19.0	31	22.1	
Decreased	10	15.9	17	12.1	

use. The financial status of 69.1% of the participants was adversely affected due to the pandemic; among all participants, the budget allocated for cigarettes during the pandemic remained unchanged at 61.8%, while it increased by 22.6% and decreased by 15.7% for the participants. Of the participants with a change in their

smoking behaviors, 24.6% switched to cheaper tobacco products, 35.0% tried to quit smoking, and 40.4% reduced the number of cigarettes smoked daily (Table 3). No significant difference was found between the amount of tobacco use during the pandemic and changes in financial status during the pandemic (Table 4); however, as noted

**Table 5. Comparison of the change in the income level and the change in smoking behavior of those responders who had a change in smoking behavior during the pandemic (57 responders out of 71), Turkey 2021**

Financial status and income level	Change in smoking behavior				p
	Decreased or attempted to quit		Turned to cheaper alternative tobacco products		
	n	%	n	%	
No change or positively affected	16	100	0	0	0.006
Negatively affected	27	65.9	14	34.1	

Fisher’s exact test was used.

in Table 5, those who stated that their financial status had changed adversely during the pandemic preferred cheaper cigarettes ( $p < 0.05$ ).

### DISCUSSION

During the pandemic period, for nearly two-thirds of the participants the smoking stayed the same, and those that changed more their behavior increased rather than reduced smoking, in this region of Turkey. Of the participants with a change in their smoking behaviors, one in four switched to cheaper tobacco products, one in three tried to give up smoking, and 40.4% reduced the number of cigarettes smoked daily. During the pandemic, access to cheaper tobacco products via border checkpoints decreased due to the pandemic restrictions, and the rate of roll-your-own cigarettes increased, according to our findings. Despite the changes in the economic conditions, no significant relationship was found between the amount of tobacco consumption before and after such changes.

Other studies have also indicated changes in tobacco product use during the pandemic. Gold et al.<sup>6</sup>, in their study dated May 2020 in the US, found that the majority (68.9%) of smokers consumed fewer cigarettes than their normal amounts in the last one month and that the increasing fear of COVID-19 motivated people to quit or reduce smoking. A study conducted in Turkey found that short-term smoking cessation of patients with COVID-19 diagnosis who were active smokers was 78.9%. This rate was maintained at 57.8% in the long-term, a teachable moment for smoking cessation<sup>7</sup>. A study by Yingst et al.<sup>8</sup> in the US, assessed the changes in tobacco use of active smokers during the COVID-19 pandemic, and found that 28% increased their tobacco use, 15% reduced their tobacco use, while 24.5% tried to quit smoking. In a study in Korea, the rates of those who increased their tobacco use and those who decreased their tobacco use were found to be comparable, 20.2% and 19.5%, respectively<sup>9</sup>. While research in England revealed that the first COVID-19 lockdown was associated with increased smoking prevalence among younger adults. More smokers made quit attempts during the lockdown and more smokers quit successfully<sup>10</sup>.

In our study, while 21.1% of the smokers increased their tobacco use, 13.7% reduced their tobacco use. While the rate of those who increased tobacco use is close to the literature data, this rate is low for those who reduce it. This may be potentially due to the smokers’ tendency to purchase cheaper tobacco products. Another important finding of our study is that the places where smokers obtain tobacco products have changed significantly during the pandemic. While 84% of the participants bought cigarettes from TEKEL dealers (cigarettes with taxation) before the pandemic, this rate increased to 90.7% during the pandemic period. The rate of untaxed foreign cigarette smokers decreased from 3% to 0% during the pandemic. While the rate of purchase from duty-free shops was 10.2%, it decreased to 2.5% during the pandemic; in contrast, the rate of roll-your-own cigarettes increased to 6.8% during the pandemic period from the pre-pandemic rate of 2.5% ( $p < 0.05$ ). The cigarettes bought from TEKEL stores are more expensive compared to the other sources due to the taxes imposed. While the alternative purchase options to the TEKEL dealers were, in descending order, duty-free shops, untaxed foreign cigarettes, and roll-your-own cigarettes, this situation changed to roll-your-own cigarettes and purchases from duty-free shops because borders were closed during the pandemic period due to COVID-19 restrictive measures. During the pandemic period, the majority of our study population faced economic difficulties; however, the budget allocated for smoking did not change in 61% of the participants. Therefore, there was no clear difference in terms of worsening economic conditions and smoking, which is another finding of our study; smokers who purchased cigarettes from duty-free shops or untaxed foreign cigarettes opted for cheaper tobacco products (such as roll-your-own cigarettes). Of the participants with a change in their smoking behaviors due to increased prices, 24.6% switched to cheaper tobacco products, 35.0% tried to give up smoking, and 40.4% reduced the number of cigarettes smoked per day. During the pandemic, smoking cessation assistance services remained in the background, and smokers who wished to quit smoking could not access evidence-based smoking cessation methods. Smoking cessation support should be enhanced during the

pandemic as a high COVID-19 risk perception has been found to be correlated with the desire to stop smoking<sup>11</sup> and smoking cessation attempts in the pandemic lockdown period<sup>10</sup>.

We found out that the people who stated their economic conditions worsened opted more for cheaper cigarettes, and those who were adversely affected by the pandemic in terms of financial condition constituted the entire population of those who opted for more affordable tobacco products. It has been reported that price hikes, increase in taxes on cigarettes, and minimum tax limit regulations, are significantly effective policies for smoking cessation and preventing smoking. However, the effect of these measures was limited in cases where access to cheaper tobacco products was available<sup>12</sup>, while it has been reported that the practice of minimum base price law on tobacco control would be a practice that would reduce socio-economic inequalities in smoking prevalence<sup>13</sup>. In the Philippines, smoking prevalence decreased from 28.3% to 23.8% after a price increase in 2012<sup>14</sup>. In a study conducted to evaluate the effects of the tobacco prices on starting smoking and smoking cessation in China, the rates for initiating smoking decreased with higher prices; however, smoking cessation behavior patterns showed a lower result stemming from price increases, as access to cheaper tobacco products is relatively high<sup>15</sup>. South Korea increased the taxes on cigarettes in 2015 and after the tax hike in tobacco prices, 60.9% of smokers tried to quit smoking and 34.7% managed to achieve smoking cessation. Those who continued smoking showed a decrease in smoking frequency; however, no such effect was observed among light smokers, young smokers, and those in the higher income brackets<sup>16</sup>. Tobacco prices are related to smoking cessation and lead to a reduction in the number of cigarettes smoked. Research has indicated that in low-income smokers, the price correlation is stronger; however, in high-income smokers, the relation between smoking cessation and price was stronger. In light of these findings, it was reported that higher cigarette prices may trigger smoking cessation in the short-term among smokers of all income levels; however, low-income smokers might require additional factors to continue their smoking cessation<sup>17</sup>. In systematic reviews that evaluate the effectiveness of price/tax policies, low socioeconomical smokers are noted to be more responsive to price/tax increases compared to high socioeconomical smokers. However, some underestimated effects that can be considered as 'bias' are: only capturing short-term effects which do not translate into sustained quitting, and not accounting cross-border sales or smuggling<sup>18</sup>. In line with the above literature, we note that smokers' access to untaxed tobacco products (smuggled cigarettes, roll-your-own tobacco, duty-free tobacco, etc.) should be prevented to achieve the goals envisaged by taxation policies. Our findings are parallel with these results.

### Strengths and limitations

Our study covers only active smokers and, therefore, is limited in terms of determining the ex-smokers who quit smoking during the pandemic period. Also, the data were only collected at one time point and relied on respondents' self-report. On the other hand, data collection by face-to-face interviews, and the fact that the study was conducted in an area where access to cheap tobacco products is easy, constitute strong aspects of the study. In addition, the study offers a rare viewpoint as it provides an assessment of the impact of access to cheap cigarettes during the pandemic.

### CONCLUSIONS

There was no change in smoking status in the majority of smokers during the pandemic period, with an increase observed in 21.1% and a decrease in 13.7% of the participants. During the pandemic period, changes were observed in tobacco product supply points and tobacco product preferences for reasons such as closed border gates and being affected by the economic conditions. People who turned to lower priced tobacco products such as roll-your-own tobacco comprised those who experienced a negative effect in their economic situation due to the pandemic. These findings are in line with studies examining the effectiveness of tobacco taxation policies. Our findings support the view that societies where tobacco users with low socioeconomic status prefer cheap tobacco products when prices increase and have access to low-priced tobacco products, taxation policies may not be effective in supporting quitting smoking.

### REFERENCES

1. Sun Y, Li Y, Bao Y, et al. Brief Report: Increased Addictive Internet and Substance Use Behavior During the COVID-19 Pandemic in China. *Am J Addict.* 2020;29(4):268-270. doi:10.1111/ajad.13066
2. Di Renzo L, Gualtieri P, Pivari F, et al. Eating habits and lifestyle changes during COVID-19 lockdown: an Italian survey. *J Transl Med.* 2020;18(1):229. doi:10.1186/s12967-020-02399-5
3. Sun Y, Wang MP, Cheung YTD, et al. Changes in tobacco use at the early stage of the COVID-19 pandemic: Results of four cross-sectional surveys in Hong Kong. *Tob Induc Dis.* 2022;20(March):1-9. doi:10.18332/tid/145935
4. Chertok IRA. Perceived risk of infection and smoking behavior change during COVID-19 in Ohio. *Public Health Nurs.* 2020;37(6):854-862. doi:10.1111/phn.12814
5. Kayhan Tetik B, Gedik Tekinemre I, Taş S. The Effect of the COVID-19 Pandemic on Smoking Cessation Success. *J Community Health.* 2021;46(3):471-475. doi:10.1007/s10900-020-00880-2
6. Gold AK, Hoyt DL, Milligan M, et al. The role of fear of COVID-19 in motivation to quit smoking and reductions in cigarette smoking: a preliminary investigation of at-risk cigarette smokers. *Cogn Behav Ther.* 2021;50(4):295-304. doi:10.1080/16506073.2021.1877340
7. Telatar TG, Karadoğan D, Baykal MH, Yurtsever BA. Role of

- tobacco exposure in the course of COVID-19 disease and the impact of the disease on smoking behavior. *Clin Respir J*. 2022;16(1):57-62. doi:10.1111/crj.13452
8. Yingst JM, Krebs NM, Bordner CR, Hobkirk AL, Allen SI, Foulds J. Tobacco Use Changes and Perceived Health Risks among Current Tobacco Users during the COVID-19 Pandemic. *Int J Environ Res Public Health*. 2021;18(4):1795. doi:10.3390/ijerph18041795
  9. Kang E, Lee H, Sohn JH, Yun J, Lee JY, Hong YC. Impact of the COVID-19 Pandemic on the Health Status and Behaviors of Adults in Korea: National Cross-sectional Web-Based Self-report Survey. *JMIR Public Health Surveill*. 2021;7(11):e31635. doi:10.2196/31635
  10. Jackson SE, Garnett C, Shahab L, Oldham M, Brown J. Association of the COVID-19 lockdown with smoking, drinking and attempts to quit in England: an analysis of 2019–20 data. *Addiction*. 2021;116(5):1233-1244. doi:10.1111/add.15295
  11. Rigotti NA, Chang Y, Regan S, et al. Cigarette Smoking and Risk Perceptions During the COVID-19 Pandemic Reported by Recently Hospitalized Participants in a Smoking Cessation Trial. *J Gen Intern Med*. 2021;36(12):3786-3793. doi:10.1007/s11606-021-06913-3
  12. Branston JR, McNeill A, Gilmore AB, Hiscock R, Partos TR. Keeping smoking affordable in higher tax environments via smoking thinner roll-your-own cigarettes: Findings from the International Tobacco Control Four Country Survey 2006–15. *Drug Alcohol Depend*. 2018;193:110-116. doi:10.1016/j.drugalcdep.2018.07.047
  13. Golden SD, Kim K, Kong AY, Tao VQ, Carr D, Musburger P. Simulating the Impact of a Cigarette Minimum Floor Price Law on Adult Smoking Prevalence in California. *Nicotine Tob Res*. 2020;22(10):1842-1850. doi:10.1093/ntr/ntaa046
  14. Cheng KJG, Estrada MAG. Price Elasticity of cigarette smoking demand in the Philippines after the 2012 Sin Tax Reform Act. *Prev Med*. 2020;134:106042. doi:10.1016/j.ypmed.2020.106042
  15. Kostova D, Husain MJ, Chaloupka FJ. Effect of cigarette prices on smoking initiation and cessation in China: a duration analysis. *Tob Control*. 2016;26(5):569-574. doi:10.1136/tobaccocontrol-2016-053338
  16. Lee B, Seo DC. Effects of an 80% cigarette price increase on quit attempts, successful quitting and smoking intensity among Korean adult smokers: results from nationally representative longitudinal panel data. *Tob Control*. 2021;30(3):336-343. doi:10.1136/tobaccocontrol-2019-055518
  17. Mayne SL, Gordon-Larsen P, Schreiner PJ, Widome R, Jacobs DR, Kershaw KN. Longitudinal Associations of Cigarette Prices With Smoking Cessation: The Coronary Artery Risk Development in Young Adults Study. *Nicotine Tob Res*. 2019;21(5):678-685. doi:10.1093/ntr/nty109
  18. Brown T, Platt S, Amos A. Equity impact of population-level interventions and policies to reduce smoking in adults: A systematic review. *Drug Alcohol Depend*. 2014;138:7-16. doi:10.1016/j.drugalcdep.2014.03.001

#### CONFLICTS OF INTEREST

The authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest and none was reported.

#### FUNDING

There was no source of funding for this research.

#### ETHICAL APPROVAL AND INFORMED CONSENT

Approval to perform the study was provided by the Hopa District Governorship and the Recep Tayyip Erdogan University Ethics Committee

(Approval number: 2021/130; Date: 8 July 2021). Participation in the interviews was deemed informed consent.

#### DATA AVAILABILITY

The data supporting this research are available from the authors on reasonable request.

#### PROVENANCE AND PEER REVIEW

Not commissioned; externally peer reviewed.