The Impact of Covid-19 on Smoking among University Students in Turkey:
Evidence from a Longitudinal Survey

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Purpose

The COVID-19 pandemic offers a quasi-experimental setting to study smoking and quitting behaviors and attitudes.

What is the effect of the pandemic on smoking behavior?

➤ Lockdowns, reduced mobility, reduced exposure to peer smoking, heightened concerns about health, financial constraints **may have reduced tobacco consumption**

➤ Adverse mental health conditions (stress, anxiety, depression, sleep disorders) **may have led to increased tobacco consumption**

Both in the intensive and extensive margin.

Purpose

Conceptually, the link between COVID-19 and smoking behavior is not clear.

So, this is an empirical question.

Evidence is conflicting, **with some studies showing declines in smoking prevalence and increases in quit behavior** (Denlinger-Apte, R.,et al. (2022); Gaffney, A., et al. (2022); Yang, H., et al. (2021); Bella, A., et al. (2022); Kreslake, J. M., et al. (2021); Siddiqi, K., et al.(2021); Ho, L. L. K., et al.(2020); Jackson, S. E., et al.(2021)

while others providing evidence to support the opposite (Gonzalez, M.,et al. (2021); Koopmann, A., et al. (2021); Gendall, P., et al. (2021); Vanderbruggen, N., et al. (2020); Munarini, E., et al. (2022); Carreras, G., et al. (2022); Kalkhoran, S. M., et al. (2022); Kalkhoran, S. M., et al. (2021); Sokolovsky, A. W.,et al. (2021).

Methods

❖ Data: Collected by two online surveys on SurveyMonkey, in 2018 and in 2021, in several large-enrollment universities in Turkey.

Two waves of cross-sectional data collected from two universities in Ankara that participated in both surveys (hence chosen for this study to make pre- and post-COVID comparison possible).

❖ Questionnaires were developed by adopting the questions in internationally validated questionnaires (mainly the GATS).

❖ Pilot tests performed to ensure that the questions were clear.

❖ Participants remained anonymous.

Methods

Students were sent the link to the online survey (university e-mail addresses).

In the two universities, 2525 students responded to the pre-Covid survey and 1324 responded to the post-Covid survey.

Sample: 2331 students in the pre-Covid survey and 1095 students in the post-Covid survey (***a total of 3426 responses***), after accounting for attrition and dropping a few students in older ages.

Methods

➤ Outcome variables:

- **Daily Use** and **Regular Use** (daily or occasional) of cigarettes. Binary.

- Number of cigarettes consumed on an average day (**Cigs Consumed**),

- Used to be a daily smoker but quit (**Quit Daily**),

- Used to be a daily or occasional smoker but quit (**Quit Regular**).

➤ Confounding variables:

- **Gender; Age** at the survey year; **Living arrangement** (In dormitory, Alone (outside of dormitory), With family, or With roommate(s)).

➤ **Post-Covid** dummy variable: 1 if observed in the post-Covid survey.

Methods

❖ Binary logistic regression:

Outcome variables: **Daily Use** and **Regular Use, Quit Daily**, **Quit Regular**. Adjusted odds ratios estimated.

❖ Ordered logistic regression:

Outcome variable: **Cigs Consumed** (Daily cigarette consumption, 0: none, 1: 1-10 cigarettes, 2: 11-20 cigarettes, 3: 21-30 cigarettes, 4: 31 or more).

Regressions estimated for men and women separately.

Results: The effect of COVID-19 on smoking behavior (odds ratios)

	Daily Use		Regular Use		Cigs Consumed	
	Men	**Women**	**Men**	**Women**	**Men**	**Women**
Post-COVID dummy	0.691***	0.636***	0.711***	0.785**	0.649***	0.743**
	(0.081)	(0.083)	(0.080)	(0.090)	(0.072)	(0.087)
Age (years)	1.093***	1.089***	1.064***	1.109***	1.103***	1.126***
	(0.025)	(0.029)	(0.025)	(0.031)	(0.025)	(0.030)
Living arrangement						
With family	1	1	1	1	1	1
With roommate(s)	1.810***	2.242***	2.274***	2.513***	1.975***	2.087***
	(0.358)	(0.559)	(0.487)	(0.642)	(0.341)	(0.457)
Alone	1.857***	2.669***	2.451***	2.780***	2.235***	3.312***
	(0.356)	(0.648)	(0.507)	(0.681)	(0.379)	(0.873)
In dormitory	0.768**	0.830	0.835	0.854	0.781**	0.941
	(0.0927)	(0.113)	(0.0966)	(0.104)	(0.0861)	(0.116)
N	1,753	1,673	1,753	1,673	1,753	1,673

Results

Older students

➢ were significantly more likely to be daily or occasional smokers (ORs ranging from 1.064 (CI: 1.017 - 1.114) to 1.109 (CI: 1.050 - 1.171))

➢ were significantly more likely to smoke a higher number of cigarettes (ORs 1.103 (CI: 1.055 - 1.154) and 1.126 (CI: 1.069 - 1.186) for men and women).

Compared to those living with family, students who lived

➢ Alone or with roommate(s) were significantly more likely to be daily or occasional smokers (ORs ranging from 1.810 (CI: 1.229 - 2.666) to 2.780 (CI: 1.720 - 4.492));

➢ To smoke a higher number of cigarettes (ORs ranging from 1.975 (CI: 1.408 - 2.771) to 3.312 (CI: 1.976 - 5.551)).

Results: The effect of COVID-19 on quit behavior (odds ratios)

	Quit Daily		Quit Regular	
	Men	**Women**	**Men**	**Women**
Post-COVID dummy	1.401	2.279***	1.048	1.124
	(0.367)	(0.693)	(0.160)	(0.167)
Age (years)	1.129***	1.063	0.985	0.939*
	(0.053)	(0.053)	(0.032)	(0.034)
Living arrangement:				
With family	1	1	1	1
With roommate(s)	0.352*	0.182*	0.371***	0.372***
	(0.217)	(0.185)	(0.119)	(0.134)
Alone	0.567	0.642	0.586**	0.398***
	(0.241)	(0.378)	(0.149)	(0.137)
In dormitory	1.401	1.486	1.175	1.252
	(0.378)	(0.482)	(0.178)	(0.190)
N	776	518	1,232	1,067

Results

Compared to the pre-COVID survey,

➢ Women who used to be daily smokers were more likely to have quit smoking in the post-COVID survey (OR: 2.279 (CI: 1.255 - 4.137)). Among smokers, those who lived alone or with roommate(s) were less likely to quit smoking in general (ORs ranging from 0.182 (CI: 0.0247 - 1.334) to 0.586 (CI: 0.356 - 0.965)).

➢ The pandemic did not have any statistically significant effect on quit incidence for those who smoked regularly.

Results: The effect of risk perceptions of the Covid-19 virus on smoking

	Daily Use		Regular Use		Cigs Consumed	
	Men	**Women**	**Men**	**Women**	**Men**	**Women**
Had COVID-19 disease	0.750	1.072	0.748	0.974	0.774	0.831
	(0.192)	(0.311)	(0.176)	(0.243)	(0.181)	(0.208)
How does smoking effect the likelihood of catching COVID-19?						
No effect	1	1	1	1	1	1
Reduces likelihood	2.983***	0.799	2.481**	1.313	2.122**	1.072
	(1.127)	(0.407)	(0.969)	(0.597)	(0.688)	(0.482)
Increases likelihood	0.632*	0.313***	0.760	0.459***	0.645**	0.387***
	(0.149)	(0.0900)	(0.164)	(0.105)	(0.135)	(0.0895)
How does smoking effect the severity of COVID-19 when you catch it?						
No effect	1	1	1	1	1	1
Lessens severity	3.713	2.026	3.745	3.298	2.042	1.950
	(3.033)	(1.422)	(3.527)	(3.092)	(1.241)	(0.995)
Worsens severity	1.115	0.474*	0.845	0.317***	0.850	0.409***
	(0.459)	(0.182)	(0.332)	(0.127)	(0.334)	(0.135)
N	435	442	435	442	435	442

Results

Having had COVID-19 has no stat. significant effect on either the intensive or extensive margin of smoking.

Women who think COVID-19 worsens severity of COVID-19 are;

➤ Less likely to smoke (OR:474 (CI: 0.223 - 1.007) for daily use and 0.317 (CI: 0.145 - 0.693) for regular use)

➤ Smoke fewer number of cigarettes (OR: 0.409 (CI: 0.214 - 0.782))

➤ This effect is not statistically significant for men

Men who think smoking reduces the likelihood of catching COVID are significantly;

➤ More likely to smoke (OR: 2.983 (CI: 1.423 - 6.254) for daily use and 2.481 (CI: 1.154 - 5.333) for regular use),

➤ Smoke a higher number of cigarettes.

Discussion

We examine the effects of COVID-19 on smoking prevalence, smoking intensity, quitting, and the effect of risk perception of the COVID-19 virus on smoking behavior among young people.

- Breakdown by gender: Some studies in the literature considered the entire sample and did not analyze the effect by gender. However, behavioral responses of men and women may differ.

Results indicate that COVID-19 increased the prob. of quitting smoking among women, but not among men, indicating a distinguishing feature of our work from the others.

Discussion

Literature: Perceptions of risk are connected to their health behaviors, including smoking (Amy L. Nyman, et al. (2021); Brewer, N.T., et al. (2004); C.L. Jones, et. Al. (2015)). People who perceive a greater threat from COVID-19 are more likely to engage in preventive behaviors such as frequent handwashing and avoiding large gatherings (C.L. Jones, et. Al. (2015)).

➢ Similarly, the risk of getting the disease may have affected smokers. Those who felt greater risk may have tried to quit or to smoke less.

➢ As expected, we find that women who think smoking increases chances of getting Covid are less likely to smoke. And men who think smoking reduces chances of getting Covid are more likely to smoke.

➢ Women more risk averse and men more risk taker?

Discussion

➢ Women who think smoking increases the likelihood of catching COVID and worsens severity of COVID-19 are less likely to smoke and smoke fewer number of cigarettes.

➢ For men, the latter effect is not statistically significant.

In line with the earlier literature: Our results support the literature that documents perceiving a higher risk of COVID-19 infection is associated with reduction in smoking (A.K. Gold, et al. (2021)) and increased interest in quitting smoking (A.K. Gold, et al. (2021); I.R.A. Chertok (2020); Elling, J. M., et al. (2020); E.M. Klemperer, et al. (2020)), <u>and contributes to these studies by revealing the gender difference in the behavior change.</u>

Contribution

- First: Evidence from a developing country with an alarmingly high rate of smoking prevalence. Unlike many countries, smoking rate in Turkey has remained high—second highest smoking prevalence rate among OECD countries—despite tobacco control policies.

- Second: Turkey was one of the countries that was hit the hardest by the pandemic and was among the first to impose measures and strict restrictions. (As of December 2022, Turkey had the 11th highest case number with over 17 million cases and 101,000 deaths).

A unique opportunity to study the impact of the COVID-19 pandemic on smoking behavior.

Conclusions

By thoroughly investigating the impact of the pandemic on smoking habits, experts can gain valuable insights to develop specific outreach and educational initiatives for the youth.

This is especially important since young individuals are more prone to engaging in harmful behaviors and could greatly benefit from targeted interventions.

Implementing such programs can help reduce the prevalence of smoking among young people, leading to improved public health outcomes.