Covid-19 and Tobacco Cessation

Lessons from India

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COVID-19 and tobacco cessation: lessons from India

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ABSTRACT

Objectives: The Government of India prohibited the sale of tobacco products during the COVID-19 lockdown to prevent the spread of the SARS-CoV-2 virus. This study assessed the tobacco cessation behaviour and its predictors among adult tobacco users during the initial COVID-19 lockdown period in India.

Methods: A cross-sectional study was conducted with 801 adult tobacco users (both smoking and smokeless tobacco) in two urban metropolitan cities of India over a 2-month period (July to August 2020). The study assessed complete tobacco cessation and quit attempts during the lockdown period. Logistic and negative binomial regression models were used to study the correlates of tobacco cessation and quit attempts, respectively.

Results: In total, 90 (11.3%) tobacco users reported that they had quit using tobacco after the COVID-19 lockdown period. Overall, a median of two quit attempts (interquartile range 0–6) was made by tobacco users. Participants with good knowledge on the harmful effects of tobacco use and COVID-19 were significantly more likely to quit tobacco use (odds ratio [OR] 2.2; 95% confidence interval [CI] 1.2–4.0) and reported more quit attempts (incidence risk ratio 5.7; 95% CI 2.8–11.8) compared to those with poor knowledge. Participants who had access to tobacco products were less likely to quit tobacco use compared to those who had no access (OR 0.3; 95% CI 0.2–0.5].

Conclusions: Access restrictions and correct knowledge on the harmful effects of tobacco use and COVID-19 can play an important role in creating a conducive environment for tobacco cessation among users.

Introduction

The COVID-19 pandemic has presented the world with unprecedented challenges for the 21st century, in addition to excess mortalities.[1] Although there remains a lack of evidence to define the risk of COVID-19 infection among tobacco users,[2] these individuals are at an increased risk of adverse outcomes (i.e. death and severity of COVID-19).[3] Recent evidence suggests that smokers have a higher likelihood of COVID-19 complications, including mortality (odds ratio [OR] 1.91; 95% confidence interval [CI] 1.4–2.6).[4] The act of tobacco smoking involves frequent contact between the fingers and mouth and hence can potentially increase the risk of COVID-19 infection.[5] The use of smokeless tobacco (SLT) products, such as gutkha, khaini, zarda, and paan (betel quid with tobacco), induces salivation and hence increased spitting, which may also increase the spread of the SARS-CoV-2 virus.[6]

Stringent tobacco control measures have been enforced by some countries to help prevent the spread of COVID-19. Several countries from the Eastern Mediterranean Region banned the use of waterpipe in indoor and outdoor public places.[7] Bangladesh suspended the production, supply, marketing and sale of all kinds of tobacco

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products;[8] Botswana banned the import and sale of cigarettes and other related products;[9] South Africa restricted the sale of cigarettes, snuff, hookah pipes and e-cigarettes to combat the risks posed by the use of tobacco products during the pandemic.[10] The COVID-19 pandemic has provided an opportunity to study the impact of policy environment on tobacco consumption habits of users. A web-based survey in the United States, conducted during the pandemic, showed that 22.9% of respondents attempted to quit smoking cigarettes to reduce their risk of harm from COVID-19 and one-third of respondents reported an increase in motivation to quit tobacco during the pandemic period.[11]

India enforced a nationwide lockdown on 24 March 2020 to prevent the spread of COVID-19.[12] At the beginning of the lockdown, different state governments issued warnings and advisories against tobacco use and about its interwoven relationship with COVID-19. Subsequently, the Indian Council of Medical Research[13] and the Ministry of Health and Family Welfare, Government of India, each issued advisories to prohibit the use and spitting of tobacco.[14,15] Many states in India also announced bans on tobacco use under the troupe of the Indian Penal Code 1890, Cigarettes and Other Tobacco Products Act 2003 and the Epidemic Diseases Act 1897.[16] In addition, the Ministry of Home Affairs, Government of India, prohibited the sale and use of gutkha and other tobacco products in the country,[17] which created a nationwide conducive environment for tobacco control.

Previous evidence suggests that tobacco control policies, such as restricting the availability or access to tobacco products, limit tobacco use.[18,19] A study by Narotam et al.,[20] with 650 participants enrolled in a tobacco cessation counselling programme before the lockdown, reported the positive impact of public health measures on tobacco use behaviour. However, the study only included participants who were already motivated and enrolled in a cessation programme and did not assess the predictors of cessation and quit attempts among other tobacco users. In this study, we aimed to assess tobacco cessation behaviours and identify predictors of tobacco cessation and quit attempts among adult tobacco users during the late COVID-19 lockdown period in India.

Methods

Study design, setting and participants

A cross-sectional study was conducted in two urban metropolitan cities of India (Delhi and Chennai) over a 2-month study period (July–August 2020). Assuming a large (>1 million) target population, a 50% outcome factor in the population, a 5% margin of error and 95% CI, the minimum required sample size was estimated to be 384–400 in the general population. Therefore, a total sample size of 800 participants (approximately 400 from each city) was estimated using open-source epidemiological statistics (OpenEpi).[21] A list of participants from an existing cohort (**C**entre for c**A**rdiometabolic **R**isk **R**eduction in **S**outh Asia),[22] with a history of any form of tobacco use was prepared and individuals were invited to participate in the present study. Participants aged 25 years or more (irrespective of their sex), using any form of tobacco, who spoke English, Hindi or Tamil, and those who provided consent were enrolled in the study. Tobacco users who had recently quit using tobacco (i.e. in the previous 3 months from the date of survey [i.e. after the initial lockdown]) or who had used tobacco in any form during the previous month were also included in the study. Participants who were suffering from any severe illness, institutionalised, unable to respond to the survey or not willing to provide or record verbal consent were excluded from the study.

The objectives of the study were explained to the study participants, and after obtaining informed consent, a telephone questionnaire was administered. Prior ethical approval for research involving human subjects for this study was obtained from the Centre for Chronic Disease Control's Institutional Ethics Committee (Reference #CCDC_IEC_04_2018).

Study tool

The questionnaire was translated, adapted and modified from the STOP survey[23] for the context of smoking and SLT use in India. The survey tool has previously been used in a longitudinal study in Pakistan to capture and compare tobacco use behaviour among users before and during COVID-19.[23] The survey was translated into regional languages (i.e. Hindi [for participants in Delhi] and Tamil [for participants in Chennai]). The survey included questions on sociodemographic variables, knowledge of the adverse effects of tobacco use during COVID-19, intentions to quit tobacco, number of quit attempts and knowledge of tobacco control policies implemented in India during the lockdown period. The questionnaire was piloted on a subgroup of 20 respondents (from each city) and was subsequently adapted before administering it to the study population. A brief description of the study variables is provided in the supplementary file (Table S1).

Data collection and management

Following the rules of social distancing, the questionnaire was administered by telephone, and a standardised protocol was used for data collection. Informed consent was sought from eligible participants. Verbal consent was audio recorded following the recent Indian Council of Medical Research's revised guidelines for obtaining consent for biomedical and health research during the COVID-19 pandemic.[24] The questionnaire was then administered in the language preferred by the participant (i.e. English, Hindi or Tamil).

Data analyses

Descriptive statistics are presented as frequencies and percentages. The primary outcomes of the study were 'cessation' and 'quit attempts'. Participants were asked the question, '*What best describes you?*' and those selecting the option – '*I have stopped using tobacco*' were categorised as 1 for cessation (otherwise, 0). Participants were then asked the question, '*How many attempts to stop tobacco use have you made in the last 6 months?*', and the answers were recorded as an integer. The 'Quit attempts' was treated as discrete (count) data.

Univariate associations were analysed using Fisher's exact/Chi-squared test as appropriate for categorical variables, whereas the count variables were analysed using Mann–Whitney/Wilcoxon test and Kruskal–Wallis test as appropriate. A P value of <0.05 was considered significant. Cross-tabulations between various sociodemographic characteristics (e.g. gender, city, age, education, employment status), knowledge on the harmful effects of tobacco use and COVID-19, knowledge on legislative decisions (taken by government on tobacco sales and consumption during the national lockdown) and access to tobacco products during the lockdown were studied. Responses to all questions assessing the knowledge of participants were aggregated and thereafter scored anonymously. The correct responses were marked as 1 and incorrect as 0. The maximum score for knowledge on the harmful effects and knowledge on legislative decisions was 5, and the minimum score was 0. The aggregate scores were further categorised as poor (mean − 1 standard deviation [SD]), average (mean −1 SD to mean +1 SD) and good (mean +1 SD).[25]

Because of the overdispersion in the number of quit attempts, its associations with various independent variables were studied using the negative binomial regression model,[26] whereas the logistic regression model was used to study the association of independent variables with cessation. The results of the negative binomial regression models and the logistic regression models are given in incidence risk ratio (IRR) and OR with 95% CI, respectively. Variables with a P value <0.15 in the univariate analysis were retained in the multivariate models.[27] Data were analysed using STATA v.13.1 (StataCorp, LP, TX).

Results

Study participant characteristics

A total of 801 tobacco users participated in the survey, including 444 (55.4%) from Delhi and 357 (44.6%) from Chennai (Table 1). As the survey was conducted via telephone, a disposition table[28] is used to explain the response rates. The gross response rate for the study was 48.4%, the basic response rate was 85.3% and the response rate calculated using the CASRO estimator was 60.9%. The detailed disposition table and response rate calculations are provided in supplementary file (Tables S2 and S3). In total, 305 (38.1%) participants were current cigarette smokers, 195 (24.3%) were bidi smokers and 324 (40.4%) were SLT users. There were 90 (11.3%) tobacco users who reported that they had stopped using tobacco at the time of the survey after the lockdown measures were introduced. Overall, a median of two quit attempts (interquartile range [IQR] 0–6) was made by the tobacco users over the past 6 months. The mean scores for knowledge on the harmful effects and knowledge about legislative decisions in the study population were 2.1 (SD 1.9) and 2.7 (SD 2.1), respectively.

Most participants (90.1%) were men. In total, 56.3% of participants were in the 45–64 years age group, followed by 31.6% in the 25–44 years age group and 12.1% in the ≥65 years age group. More than half of the participants were educated either up to high school (39.4%) and intermediary school (31.1%). Most participants were employed (81.1%), whereas the remaining were students (10.9%), housewives (3.6%), retired (2.0%) or unemployed (2.2%; Table 1).

Table 1
Sociodemographic characteristics of the study population (N = 801).

Sociodemographic characteristics	n (%)
City (n = 801)	
Delhi	444 (55.4)
Chennai	357 (44.6)
Sex (n = 801)	
Male	722 (90.1)
Female	79 (9.9)
Age group (n = 801)	
25–44 years	253 (31.6)
45–64 years	451 (56.3)
≥65 years	97 (12.1)
Education (n = 801)	
Illiterate	80 (9.9)
Professional degree/postgraduate	17 (2.1)
Graduate (BA/BSc/BCom/Diploma)	75 (9.4)
Secondary school intermediary	249 (31.1)
High school (class V to IX)	316 (39.4)
Primary school (up to Class IV)	64 (7.9)
Employment status (n = 801)	
Employed	650 (81.1)
Student	88 (10.9)
Housewife	29 (3.6)
Retired	16 (2.0)
Unemployed	18 (2.2)
Current cigarette smokers (n = 801)	305 (38.1)
Current bidi smokers (n = 798)[a]	195 (24.3)
Current SLT users (n = 800)[b]	324 (40.4)

SLT, smokeless tobacco.
[a] Three missing responses for current bidi smokers.
[b] One missing response for current SLT users.

Univariate association of cessation and quit attempts with sociodemographic variables

Cessation and quit attempts were significantly higher in females (cessation 21.5%; number of quit attempts 6.5 [IQR 2–20]) than males (cessation 10.2%; number of quit attempts 2 [IQR 0–5]). The percentage of participants who quit was higher in Chennai (15.4%) than Delhi (7.9%); however, the median number of quit attempts in the past 6 months was higher in Delhi (2 [IQR 0–7]) than in Chennai (1 [IQR 0–4]). Cessation and quit attempts were predominantly higher in housewives (cessation 27.6%; number of quit attempts 12.5 [IQR 7.5–30]) compared with students, employed or retired participants (Table 2).

Univariate association of cessation and quit attempts with knowledge and access

In the univariate analysis, cessation was greater in participants who had no access to tobacco products during the COVID-19 lockdown (19.0%) compared with those who had access (7.8%). Quit attempts were higher in daily bidi smokers (2 [IQR 0–7]) compared with occasional smokers (0 [IQR 0–3]). Whereas in the case of SLT users, quit attempts were higher in occasional SLT users (2 [IQR 0–10]) than in daily users (1 [IQR 0–4]). Quit attempts were predominantly higher in people with good knowledge of the harmful effects of tobacco use during COVID-19 (4 [IQR 0–16]) than participants with average (1 [IQR 0–4]) or poor knowledge (0 [IQR 0–3]). Similarly, quit attempts were also higher in participants with good knowledge on legislative decisions (2 [IQR 0–7]) compared with participants with either average (1 [IQR 0–5]) or poor knowledge (0 [IQR 0–3]; Table 3).

Correlates of cessation and quit attempts

To further determine the correlates that are significantly associated with cessation and quit attempts, logistic regression and negative binomial regression models were used, respectively. Table 4 shows the adjusted OR, IRR and 95% CI for cessation and quit attempts. The final regression models included 797 and 328 participants for cessation and quit attempts, respectively, with complete cases across all variables.

Participants with good knowledge on the harmful effects of tobacco use and COVID-19 were significantly more likely to cease tobacco use than participants with poor knowledge (OR 2.2; 95% CI 1.2–4.0), whereas participants with average knowledge were 50% less likely to cease tobacco use (OR 0.5; 95% CI 0.3–0.9).

Participants with good (OR 0.4; 95% CI 0.2–0.9) and average (OR 0.5; 95% CI 0.3–0.9) knowledge on legislative decisions were 60% and 50%, respectively, more likely to cease tobacco use than those with poor knowledge on legislative decisions.

Participants who had access to tobacco products were 70% less likely to cease tobacco use (OR 0.3; 95% CI 0.2–0.5) compared with those who had access to tobacco.

Quit attempts were significantly more likely to occur in participants with average (IRR 1.9; 95% CI 1.0–3.4) and good (IRR 5.7; 95% CI 2.8–11.8) knowledge on the harmful effects of tobacco use and COVID-19 compared with participants with poor knowledge. However, no significant associations for quit attempts were observed among participants with average or good knowledge on legislative decisions.

Table 2
Univariate association of cessation and quit attempts with sociodemographic characteristics.

Variables	Cessation[a]		Quit attempts[b]	
	n (%)	*P* value	Median (IQR)	*P* value
Overall	90 (11.3)		2 (0–6)	
Gender		**0.002***		**0.001$**
Male (*n* = 718)	73 (10.2)		2 (0–5)	
Female (*n* = 79)	17 (21.5)		6.5 (2–20)	
City		**0.001***		**0.024$**
Chennai (*n* = 357)	55 (15.4)		1 (0–4)	
Delhi (*n* = 440)	35 (7.9)		2 (0–7)	
Age group		0.818		0.107
25–44 years (*n* = 253)	26 (10.3)		2 (0–7)	
45–64 years (*n* = 447)	53 (11.9)		1 (0–5)	
≥65 years (*n* = 97)	11 (11.3)		5 (0–4)	
Education		0.162		0.531
Illiterate (*n* = 80)	7 (8.7)		1 (0–10)	
Professional degree/postgraduate (*n* = 16)	5 (31.2)		4 (2–10)	
Graduate (*n* = 74)	7 (9.5)		2 (0–7)	
Secondary/intermediary schools (*n* = 248)	26 (10.5)			
High school (*n* = 315)	39 (12.4)		2 (0–5)	
Primary schools (*n* = 64)	6 (9.4)		0 (0–2)	
Employment status		0.102		**0.020&**
Employed (*n* = 648)	68 (10.5)		2 (0–5.5)	
Student (*n* = 86)	10 (11.6)		2 (0–6.5)	
Housewife (*n* = 29)	8 (27.6)		12.5 (7.5–30)	
Retired (*n* = 16)	2 (12.5)		1 (0–2)	
Unemployed (*n* = 18)	2 (11.3)		1 (0–3)	

Bold *P*-values indicate significant association.
IQR, interquartile range.
*P value <0.05 using Chi-squared test.
$$P$ value <0.05 using Mann–Whitney Wilcoxon test.
&P value <0.05 using Kruskal–Wallis H test.
[a] 4 missing responses for cessation.
[b] Total 329 responses for quit attempts.

Discussion

The COVID-19 pandemic provided a unique opportunity for the promotion of tobacco control strategies, nationally as well as globally.[29,30] The tobacco control policies implemented to address the spread of COVID-19, including restricting access to tobacco products, led to favourable circumstances for tobacco cessation among users.[31] In the present study, 11.3% of tobacco users stopped using tobacco during the lockdown. On average, two quit attempts were made by tobacco users during the past six months. The percentage of people who ceased tobacco use was much lower than reported in a previous study (51%) by Gupte et al.[20] However, this may be attributed to the fact that the population in the study by Gupte et al. comprised of individuals who were already enrolled in a tobacco cessation programme, thus were already motivated to quit tobacco use. On the contrary, some studies from other countries have reported an increase in smoking during the pandemic because of high levels of stress and boredom.[32,33]

Existing evidence suggests that there are low levels of knowledge on the harmful effects of tobacco use and COVID-19.[34,35] The results of the present study also show low levels of knowledge on the harmful effects of tobacco use and COVID-19 among study participants during the lockdown period. Despite this, the results suggest that participants with good knowledge on the harmful effects of tobacco use and COVID-19 were more likely to cease tobacco use and make attempts to quit compared with those with poor knowledge. These findings are consistent with those of a previous study conducted in India[20] and indicate that good knowledge on the harmful effects of tobacco use and COVID-19 could discourage tobacco use among existing users. Moreover, good knowledge on the legislative decisions also seemed to motivate tobacco cessation among users.

Technology has played a vital role in enabling routine and professional activities to continue during the pandemic.[36] Hence, cessation efforts (e.g. creating awareness of tobacco use during COVID-19 and cessation services) via digital media (e.g. television, internet and social media) can be useful.[37,38] Information Communication and Technology can help in propelling and strengthening tobacco control policies.[39] Informative advertising (e.g. harmful effects of tobacco use during COVID-19, knowledge about the National Quitline and m-cessation services) in local languages and dialects can further motivate the cessation of tobacco use.[29] These advertisements should be comprehensively integrated with other commonly used digital applications or social media websites to create awareness among tobacco users.[29]

In the present study, cessation was more prevalent in tobacco users who had no access to tobacco products (19.0%). In fact, cessation was 70% less likely among participants reporting access to tobacco products. The national lockdown during the early months of the COVID-19 pandemic curbed access to tobacco products and may have encouraged abstinence from tobacco among existing users. However, quitting tobacco is often associated with a high relapse rate,[40,41] and there is a high likelihood that users who reported having ceased tobacco use during this period might subsequently relapse after the end of lockdown restrictions. Implementing non-price-based tobacco control policies (e.g. tobacco use restrictions in working places, restriction on access to tobacco products) is considered to be a highly cost-effective measure.[42] Therefore, the ban on the sale of tobacco products and spitting in public places, in addition to designating these acts as an

Table 3
Univariate association of cessation and quit attempts with knowledge and accessibility of tobacco products.

Variables	Cessation[a]		Quit attempts[b]	
	n (%)	*P* value	Median (IQR)	*P* value
Overall	90 (11.3)		2 (0–6)	
Cigarette smoking				
Current daily cigarette smokers ($n = 220$)	NA		1 (0–5)	0.107
Current occasional smokers ($n = 85$)	NA		1 (0–5)	
Non-smokers ($n = 496$)	NA		2 (0–7)	
Bidi smokers				**0.002****
Current daily bidi smokers ($n = 167$)	NA		2 (0–7)	
Current occasional bidi smokers ($n = 28$)	NA		0 (0–3)	
Non-smokers ($n = 603$)			0 (0–10)	
SLT users				**0.000****
Current daily SLT users ($n = 266$)	NA		1 (0–4)	
Current occasional SLT users ($n = 58$)	NA		2 (0–10)	
Non-users ($n = 476$)			5 (1–60)	
Knowledge on the harmful effects				
Poor ($n = 267$)	41 (15.4)	**0.000***	0 (0–3)	**0.000****
Average ($n = 298$)	16 (5.4)		1 (0–4)	
Good ($n = 232$)	33 (14.2)		4 (0–16)	
Knowledge on legislative decisions				
Poor ($n = 231$)	45 (19.5)	**0.000***	0 (0–3)	**0.018****
Average ($n = 280$)	25 (8.9)		1 (0–5)	
Good ($n = 286$)	20 (6.9)		2 (0–7)	
Accessibility of tobacco products				
Yes ($n = 550$)	43 (7.8)	**0.000***	2 (0–6)	0.649
No ($n = 47$)	47 (19.0)		1 (0–4)	

Bold *P*-values indicate significant association.
IQR, interquartile range; SLT, smokeless tobacco.
*P value <0.05 using Fisher's chi exact test.
**P value <0.05 using Kruskal–Wallis H test.
[a] Four missing responses for cessation.
[b] Total 329 responses for quit attempts.

offence with huge penalties for violations, should be considered a public health strategy, both to overcome the COVID-19 pandemic and for tobacco control in India.[43,44] Continuation of the tobacco ban can be justified, as the COVID-19 pandemic is far from over; however, the restrictions laid down by the government (i.e. limiting access to tobacco products) should be monitored closely. Restricting access to tobacco products requires multisectoral regulatory policies and a whole-society approach so that users can be supported to quit and initial uptake can be prevented.

The COVID-19 pandemic provides a conducive policy environment to implement tobacco control strategies to reduce the production as well as consumption of tobacco products. Implementing demand-reduction strategies,[45] such as the ban on tobacco use and spitting in public places, and raising awareness of the harmful effects of tobacco use during COVID-19 can further strengthen tobacco control policies. Similarly, curtailing tobacco supply,[45] by limiting the access to products, can further help address both the COVID-19 pandemic and tobacco epidemic. The results from this study can be used to align population- and individual-level interventions, including drawing on national-level change to encourage greater participation in tobacco cessation programmes. Sustained efforts may help substantially reduce tobacco use, with the possibility of eliminating tobacco use in the future.

Strengths and limitations

The present study enrolled participants from an existing cohort.[22] Respondents were followed up during the COVID-19 pandemic to assess the impact of COVID-19 restrictions on tobacco use cessation and quit attempts. A previous study investigated tobacco cessation behaviour during COVID-19 lockdown in participants enrolled in a tobacco-cessation programme; thus, this study population was already motivated to cease tobacco use.[20] Participants in the present study were not premotivated to cease tobacco use, and hence, their behaviour can be attributed to the pandemic alone.

This study attempted to investigate cessation and quit attempts among tobacco users during the COVID-19 crisis, but there are limitations to this study. Cessation is generally defined as the abstinence from tobacco use for a minimum period of 6–12 months. However, as this was a rapid study conducted over a 2-month period (during the COVID lockdown period in India), patients who reported that they had stopped using tobacco completely since the start of the lockdown were considered to have ceased tobacco use. The number of quit attempts was reported over 6 months; the survey was conducted in the months of July and August, but the number of quit attempts could also include attempts made before the study period. This study presents estimates based on a single study conducted in two large Indian cities (Delhi and Chennai). Furthermore, the cohort was limited to urban areas of the country and does not include tobacco users aged <25 years. Therefore, the findings of the study cannot be generalised to all tobacco users in India. Thus, we recommend that large population-based interstate studies are used to further evaluate the effects of restrictions in access to tobacco products on tobacco use cessation.

Conclusion

Measures enforced by the Government of India to reduce access to tobacco products during the nationwide COVID-19 lockdown led to a favourable environment for existing tobacco users to quit. This highlights an opportunity to align communicable and non-communicable disease responses during a public health crisis and could provide lessons for future tobacco control efforts. The m-

Table 4
Correlates of cessation and quit attempts.

Variables	Cessation [OR (95% CI)][a] $n = 797$	Quit attempts [IRR (95% CI)][b] $n = 328$
Gender		
Male	Ref	Ref
Female	1.3 (0.5–3.1)	1.9 (0.5–6.7)
City		
Chennai	Ref	Ref
Delhi	0.6 (0.3–1.1)	0.6 (0.3–1.1)
Age group		
25–44 years	NA	Ref
45–64 years	NA	0.9 (0.6–1.5)
≥65 years	NA	0.7 (0.2–2.1)
Employment status		
Employed	Ref	Ref
Student	1.0 (0.4–2.4)	1.1 (0.3–3.5)
Housewife	1.9 (0.6–6.1)	0.9 (0.2–5.4)
Retired	1.5 (0.3–7.0)	0.2 (0.0–1.0)
Unemployed	0.8 (0.1–3.9)	0.3 (0.1–2.0)
Cigarette smokers		
Non-users	NA	Ref
Current daily cigarette smokers	NA	0.7 (0.3–1.8)
Current occasional smokers	NA	0.7 (0.3–1.6)
Bidi smokers		
Non-users	NA	Ref
Current daily bidi smokers	NA	**0.2 (0.1–0.6)**
Current occasional bidi smokers	NA	0.7 (0.2–2.2)
SLT users		
Non-users	NA	Ref
Current daily SLT users	NA	0.7 (0.2–1.7)
Current occasional SLT users	NA	1.4 (0.4–4.5)
Knowledge on the harmful effects of tobacco use and COVID-19		
Poor	Ref	Ref
Average	**0.5 (0.3–1.0)**	**1.9 (1.0–3.4)**
Good	**2.2 (1.2–4.0)**	**5.7 (2.8–11.8)**
Knowledge on legislative decisions		
Poor	Ref	Ref
Average	**0.5 (0.3–0.9)**	1.5 (0.8–2.9)
Good	**0.4 (0.2–0.9)**	1.6 (0.7–3.6)
Overall access		
No	Ref	NA
Yes	**0.3 (0.2–0.5)**	NA

CI, confidence interval; IRR, incidence risk ratio; OR, odds ratio; Ref, reference; SLT, smokeless tobacco.
Bold values indicate significant association.
[a] Estimates derived using logistic regression. Variables with P values <0.15 in univariate analysis were included in the regression models.
[b] Estimates derived using negative binomial regression model. Variables with P values <0.15 in univariate analysis were included in the regression models.

cessation, Quitline and in-person cessation services should be provided proactively during this opportune time to encompass more tobacco users and help encourage cessation and quit attempts.

Author statements

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Ethical approval

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Competing interests

None declared.

Authors' contributions

M.A. and G.P.N. conceptualised the study. L.B. and M.A. secured funding for the study. M.A., G.P.N. and N.J. adapted the study tool. G.P.N., N.S. and N.J. facilitated the data collection and implementation of the study. N.S. and G.P.N. analysed the results, and all the authors contributed to the interpretation of the findings. M.A., G.P.N., N.S. and N.J. drafted the article. S.M., D.P., D.M., L.B., K.S.R., M.K.A., V.M., N.T., K.M.V.N. and F.D. revised the article. All authors approved the final article.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.puhe.2021.11.010.

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