Change in Patterns of Tobacco Use during Lockdown due to COVID-19

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Abstract

Introduction: Tobacco consumption is among the biggest public health concerns globally, causing disease, disability, premature deaths with additional economic, social and environmental burden. The COVID-19 pandemic led to a nationwide lockdown in India which affected tobacco consumption due to various reasons.

Objectives: This community-based-cross-sectional study aimed to assess the change in patterns of tobacco use during and after the lockdown. It also attempted to assess access to tobacco, withdrawal symptoms experienced, and perceptions about association of tobacco use with COVID-19.

Methods: The study was conducted in Aliganj, an urbanized village, in South Delhi. 140 adults(aged >15 years) who used tobacco before the lockdown, residing in Aliganj were included in the study. Data was analysed using SPSS-21.

Results: The prevalence of change in pattern of tobacco use during lockdown was 71.4% (66.7% smokers, 77.4% smokeless tobacco(SLT) users, 73.3% dual users). Quitting tobacco reported by 27.8% smokers, 30.2% SLT users, 13.3% dual users. A change in pattern after lockdown reported by 49.3% (45.8% smokers, 45.3% SLT users, 80% dual users). 46.2% reported experiencing withdrawal symptoms.

Difficult availability of tobacco during lockdown reported by 60.0% and unavailability by 15.2%. Increased risk of COVID-19 infection among smokers and higher risk of developing severe disease perceived by 51.4% and 64.3%, respectively.

Conclusion: Clear impact of lockdown on tobacco use is indicated by the difference between change in tobacco use pattern during and after lockdown. Lockdown restrictions led to decreased income, increased prices and decreased availability of tobacco, which were major reasons for changed pattern during lockdown. Lifting of restrictions (post lockdown period) resulting in return to regular pricing, availability of tobacco products and lack of support for those who experienced withdrawal symptoms, caused return to old patterns of usage after lockdown. The factors identified in this study, if translated to policy change, might be effective in reducing tobacco usage during the pandemic and beyond..

Introduction

Tobacco consumption is among the most significant public health concerns globally. Tobacco is consumed in various forms- both smoked and smokeless. Smoked forms of tobacco include cigarettes, *bidi,* hukkah (water-pipes), etc. Smokeless forms of tobacco include chewing tobacco, *gutkha, khaini*, betel quid mixed with tobacco, *zarda*, mawa, mishri, gudaku etc. Tobacco use is known to cause chronic illnesses like lung diseases, cardiovascular diseases, cancers, and stroke. Tobacco-related deaths and diseases in low- and middle-income countries contribute to 80% of the global burden [1]. According to the report by the Global Adult Tobacco Survey (GATS) in India during 2016-2017, about 28.6% adults (>15 years) used tobacco. GATS also revealed that 17.8% adults in Delhi used tobacco [2].

Tobacco use is related to poverty as it causes financial stress on low-income families with the diversion of family income used to meetessential household expenses. The COVID-19 pandemic led to a nationwide lockdown from 25th March'20 in India. The gradual relaxation of lockdown began from 1st June'20 with continued restrictions in containment zones (areas with high prevalence of COVID-19). During the lockdown, people also experienced financial hardships due to decreased income.Shops selling and providing non-essential goods or services including tobacco products were closed.

Contaminated hands and cigarettes/bidis may increase the risk of contracting COVID-19 while smoking. Hukkah is commonly used in communal settings, increasing the chances of contracting COVID-19through sharing of mouth-piece among users. During the lockdown, most of the population remained indoors, which could have increased the exposure of second-hand smoke among family members of smokers. Chewing of tobacco also leads to spitting. Spitting in public places by a SARS-CoV-2 infected person can increase the risk of spreading the virus in the community. Several studies have been conducted about the effect of smoking on covid-19. They have established an association between tobacco use and increased risk of contracting covid-19 and a severe form of the disease with poor outcomes such as the need for ICU care, mechanical ventilation, or mortality [3,6,7,8,9]. Few studies have been conducted on the change in patterns of tobacco use during lockdown [4,5].

This study was planned to assess the alteration in patterns of tobacco use during lockdown due to COVID-19 amongst adults residing in a community in New Delhi and to study the factors associated with alteration in that patterns of tobacco use.

Methods

It is a community-based-cross-sectional study conducted in Aliganj, an urbanized village in the South District of Delhi. The total adult population of the area is over 6000 residing in about 1668 households. Migrants contribute a significant percentage of the population. Lockdown in Delhi started on 25th March'20, and unlocking was done in phases from 1st June'20 with continued

restrictions in identified containment areas. The lockdown restrictions were gradually relaxed in the village from 1st July'20. Adults (>15 years) who used tobacco before the lockdown and residing in Aliganj for the past six months were included in the study.

Elias M. Klemperer et al. observed that 58.6% of study participants changed (increase or decrease) in tobacco consumption patterns during the lockdown [4].

Taking $Z_{\alpha/2}$= 1.96 (critical value of the normal distribution at 95% confidence), 15% relative error and adding 10% non-response rate the sample size was 133 persons. However, a total of 140 were included in the study.

Consecutive sampling was done in this community survey. The first house was chosen at random. Every adult fulfilling the inclusion criteria was included in the study until the sample size was completed.

A pre-tested, semi-structured, interviewer-administered questionnaire prepared using validated tools after a thorough review of the available literature was used to collect data. The questionnaire included socio-demographic details (Modified Kuppuswamy scale [16,17] for socioeconomic status), perceptions about the association of tobacco use and COVID-19, access to tobacco products during lockdown, change in patterns of tobacco use and other substances. The questionnaire was translated in Hindi with the standard method, which was the community's local language.

Data collection was completed in March'21 using the questionnaire by the first author. Data entry was done simultaneously. The study's primary outcome was the change in patterns of tobacco use during lockdown due to the COVID-19 pandemic. The study's secondary outcome was the change in patterns of tobacco use after lockdown due to COVID-19 pandemic. The factors studied included socio-demographic factors, perception about covid-19 and tobacco use, and access to tobacco products during lockdown.

Data were checked for errors and missed values and entered in Microsoft Excel. Data analysis was done using Statistical Package for the Social Sciences-Version 21(SPSS-21). Socio-demographic details and changes in the pattern of tobacco usage of the study population have been described using frequencies and percentages. The study population has been divided into sub-groups of smokers, smokeless tobacco (SLT) users, and dual users (using both smoked and SLT). Appropriate cross tables and tests of significance have been used to study associations; p-values <0.05 have been taken as significant, but an association of variables having a p-value<0.2 were entered into the model for calculating adjusted odds ratio (aOR).

Results

The age of study participants ranged from 17-86 years. The mean age of participants was 43.3 (±14.2 years), with 90.3% males. Of the 140 participants, 51.4% used smoked tobacco, 37.8% used SLT, and 10.7% were dual users. The majority of the participants were Hindus (91.4%). Most of the participants were migrants from outside Delhi (64.3%). Of the study population, 31.4% were illiterate, 16.4% were educated beyond secondary school. None of the participants were classified as upper class as per the Modified Kuppuswamy scale, revised for 2020. Half of the participants belonged to the upper lower class. A decrease in total family income during the lockdown

compared to before the lockdown was reported by 74.3%, and 52.1% reported a decreased family income after the lockdown. None of the study participants reported an increase in total family income either during or after lockdown. During lockdown, tobacco was easily available for 16.4% participants, available with difficulty for 60.0% participants, and not available to 15.7% participants; 7.8% did not know or refused to answer. Tobacco was purchased from store/street vendors by 42.1%, 21.4% bought it from someone else, and 30.7% reported not purchasing it during the lockdown. An increase in prices of tobacco during lockdown was reported by 60.0%. An increased risk of contracting COVID-19 among smokers as compared to non-smokers was perceived by 51.4%. An increased risk of contracting COVID-19 among SLT users was perceived by 54.3%. An increased chance of developing severe disease and poor outcome of COVID-19 among smokers on contracting the infection was believed by 64.3%, and 55.0% believed that there is an increased chance of developing severe disease and poor outcome of COVID-19 among SLT users on contracting the infection.

Table 1 shows, gender was significantly associated with the perception of increased risk of contracting COVID-19 infection among tobacco users. About 69% of the males perceived smoking to be associated with an increased risk of contracting COVID-19 infection, whereas 66% of the females did not have any knowledge of the same. However, lesser odds of increased risk of COVID-19 among tobacco users were observed among females (OR: 0.1; 95%CI 0.03-0.63). About half (50.8%) of the males perceived SLT use associated with an increased risk of contracting COVID-19 infection. In contrast, the majority (66.7%) of the females did not have any knowledge of the same. The majority (70.5%) of the males perceived an increased chance of developing severe disease and poor outcome of COVID-19 among smokers on contracting the infection. Among males, 60.6% perceived an increased chance of developing severe disease and poor outcome of COVID-19 among SLT users on contracting the infection. In contrast, the majority (73.3%) of the females did not have any knowledge of the same. Females had lesser odds of perceiving the use of SLT as a risk factor for developing severe COVID-19 infection (aOR 0.2; 95%CI: 0.04-0.9). Of the 72 smokers, 83.3% smoked tobacco daily before the lockdown, and 16.7% smoked tobacco products but not daily. Of the 53 SLT users, 96.2% used only SLT daily before the lockdown, and 3.8% used only SLT products but not daily. Among 15 dual users, 66.7% of participants used both smoked and SLT products daily, 13.3% of participants used smoked tobacco daily, and SLT less than daily, and 20.0% participants used both smoked as well as SLT on less than daily basis.

Among SLT users, 5.6% reported increased tobacco use, 31.9% reported no change, 33.3% reported decreased use, and 27.8% reported no use of smoked tobacco during lockdown. Of the 53 SLT users, 3.8% of users reported increased SLT use, 22.6% reported no change, 43.4% reported decreased use, and 30.2% reported no use of SLT during compared to before lockdown.

Among dual users, 4 (26.7%) reported no change in tobacco use patterns. One (6.7%) participant reported the same smoking pattern with increased SLT use. Two (13.3%) participants reported the same smoking pattern with decreased SLT use during the lockdown. Two (13.3%) participants reported an increase in both smoked and SLT use,

Table 1: Perceptions about COVID-19 infection among tobacco users

	Perceived increased risk of COVID-19 among smokers				Perceived increased risk of COVID-19 among smokeless tobacco users				Perceived increased chance of developing severe disease and poor outcome of COVID-19 among smokers				Perceived increased chance of developing severe disease and poor outcome of COVID-19 among smokeless tobacco users			
	n (%)	cOR (95% CI)	p-value	aOR (95% CI)	n (%)	cOR (95% CI)	p-value	aOR (95% CI)	n (%)	cOR (95% CI)	p-value	aOR (95% CI)	n (%)	cOR (95% CI)	p-value	aOR (95% CI)
Age group (n)																
15-24 (10)	4 (40.0)	0.6 (0.1-2.4)	0.472	-	4 (40.0)	0.8 (0.2-3.0)	0.716	-	6 (60.0)	0.8 (0.2-3.2)	0.777	-	6 (60.0)	1.4 (0.3-5.3)	0.651	-
25-44 (65)	34 (52.3)	Ref	-	-	30 (46.1)	Ref	-	-	42 (64.6)	Ref	-	-	34 (52.3)	Ref	-	-
45-64 (49)	25 (51.0)	0.9 (0.4-2.0)	0.892	-	23 (46.9)	1.0 (0.5-2.2)	0.934	-	32 (65.3)	1.0 (0.4-2.3)	0.939	-	29 (59.2)	1.3 (0.6-2.7)	0.465	-
≥65 (13)	9 (69.2)	2.1 (0.6-7.3)	0.269	-	8 (61.5)	1.9 (0.6-6.3)	0.316	-	10 (76.9)	1.8 (0.5-7.3)	0.395	-	8 (61.5)	1.4 (0.4-4.9)	0.544	-
Gender(n)																
Male (122)	69 (56.6)	Ref	-	-	62 (50.8)	Ref	-	-	86 (70.5)	Ref	-	-	74 (60.7)	Ref	-	-
Female (15)	3 (20.0)	0.2 (0.1-0.7)	0.014	0.15 (0.03-0.63)	3 (20.0)	0.2 (0.1-0.9)	0.034	0.3 (0.1-1.0)	4 (26.7)	0.15 (0.04-0.5)	0.002	0.23 (0.05-0.94)	3 (20.0)	0.1 (0.04-0.6)	0.007	0.2 (0.04-0.9)
Origin(n)																
Migrant (87)	47 (54.0)	1.2 (0.6-2.4)	0.65	-	45 (51.7)	1.6 (0.8-3.2)	0.187	1.3 (0.6-2.8)	61 (70.1)	1.7 (0.8-3.5)	0.152	1.380 (0.62-3.1)	53 (60.9)	1.6 (0.8-3.4)	0.144	1.3 (0.5-2.8)
Native (50)	25 (50.0)	Ref		-	20 (40.0)	Ref	-	-	29 (58)	Ref	-	-	24 (48.0)	Ref		-
Religion(n)																
Hindu (125)	66 (52.8)	Ref	-	-	59 (47.2)	Ref	-	-	80 (64)	Ref	-	-	68 (54.4)	Ref	-	-
Others (12)	6 (50.0)	0.9 (0.3-2.9)	0.853	-	6 (50.0)	1.1 (0.3-3.7)	0.853	-	10 (83)	2.8 (0.6-13.4)	0.194	2.06 (0.41-10.3)	9 (75.0)	2.5 (0.6-9.7)	0.182	1.6 (0.4-6.7)
Level of education(n)																
Illiterate (41)	21 (51.2)	0.9 (0.5-2.1)	0.923	-	21 (51.2)	1.2 (0.6-2.6)	0.634	-	21 (51.2)	**0.4 (0.2-0.8)**	**0.023**	0.6 (0.2-1.6)	19 (22.0)	0.4 (0.2-1.0)	0.063	0.9 (0.3-2.5)
Primary to High school (73)	38 (52.1)	Ref	-	-	34 (46.6)	Ref	-	-	53 (72.6)	Ref	-	-	47 (64.4)	Ref	-	-
Intermediate or higher (23)	13 (56.5)	1.2 (0.5-3.1)	0.708	-	10 (43.5)	0.9 (0.3-2.3)	0.795	-	16 (69.5)	0.8 (0.3-2.4)	0.778	0.8 (0.3-2.6)	11 (47.8)	0.5 (0.1-1.2)	0.160	0.3 (0.1-1.0)
Socio-economic status(n)																
Upper/ Lower middle (34)	23 (67.6)	2.1 (0.7-5.9)	0.169	1.0 (0.3-3.6)	21 (61.8)	1.6 (0.6-4.5)	0.363	-	25 (73.5)	2.7 (0.9-8.1)	0.064	1.2 (0.3-5.0)	23 (67.6)	3.3 (1.1-9.7)	0.027	3.3 (0.7-13.9)
Upper lower (77)	36 (46.7)	0.9 (0.4-2.1)	0.774	0.4 (0.1-1.4)	31 (40.2)	0.7 (0.3-1.6)	0.387	-	52 (67.5)	2.0 (0.8-5.1)	0.113	0.9 (0.2-2.9)	44 (57.1)	2.1 (0.8-5.3)	0.103	1.4 (0.5-4.3)
Lower (26)	13 (50.0)	Ref	-	-	13 (50.0)	Ref	-	-	13 (50)	Ref	-	-	10 (38.5)	Ref	-	-

Table 2: Change in tobacco use pattern during lockdown and associated factors.

	Smoking only (n=71)					Smokeless tobacco use only (n=53)				
	Same n (%)	Change in pattern n (%)	cOR (95% CI)	p-value	aOR (95% CI)	Same n (%)	Change in pattern n (%)	cOR (95% CI)	p-value	aOR (95% CI)
Age group										
15-24	0 (0)	3 (100)	N/A*	-	-	2 (50)	2 (50)	0.1 (0.0-1.4)	0.090	0.5 (0.0-13.8)
25-44	10 (30.3)	23 (69.7)	Ref	-	-	3 (12.0)	22 (88.0)	Ref	-	-
45-64	10 (40.0)	15 (60.0)	0.7 (0.2-1.9)	0.443	-	7 (31.8)	1 (68.2)	0.3 (0.1-1.3)	0.109	0.2 (0.0-1.5)
>65	3 (30.0)	7 (70.0)	1.0 (0.2-4.7)	0.985	-	0 (0)	2 (100)	N/A*	-	-
Gender										
Male	19 (31.1)	42 (68.9)	Ref	-	-	12 (24.0)	38 (76.0)	Ref	-	-
Female	4 (40.0)	6 (60.0)	0.7 (0.2-2.7)	0.581	-	0 (0)	3 (100)	N/A*	-	-
Origin										
Migrant	12 (33.3)	24 (66.7)	0.9 (0.3-2.5)	0.864	-	7 (16.7)	35 (83.3)	4.1 (1.0-17.5)	0.052	9.7 (0.9-106.0)
Native	11 (31.4)	24 (68.6)	Ref	-	-	5 (45.5)	6 (54.5)	Ref	-	-
Religion										
Hindu	23 (35.9)	41 (64.1)	Ref	-	-	12 (25)	36 (75.0)	Ref	-	-
Muslim/ Christian	0 (0)	7 (100)	N/A*	-	-	0 (0)	5 (100)	N/A*	-	-
Level of education										
Illiterate	10 (43.5)	13 (56.5)	0.4 (0.1-1.4)	0.162	-	5 (38.5)	8 (61.5)	0.4 (0.1-1.6)	0.189	0.2 (0.0-2.4)
Primary to High school certificate	9 (25.7)	26 (74.3)	Ref	-	-	6 (19.4)	25 (80.6)	Ref	-	-
Intermediate and above	4 (30.8)	9 (69.2)	0.8 (0.2-3.2)	0.727	-	1 (11.1)	8 (88.9)	1.9 (0.2-18.432)	0.572	12.7 (0.3-577.6)
Socio-economic status										
Upper/ Lower middle class	7 (31.8)	15 (68.2)	1.3 (0.3-5.0)	0.716	-	2 (20)	8 (80)	1.0 (0.3-25.9)	0.318	0.3 (0.0-13.6)
Upper lower class	10 (30.3)	23 (69.7)	1.4 (0.4-4.8)	0.615	-	7 (19.4)	29 (80.6)	3.1 (0.6-17.2)	0.194	1.4 (0.1-16.2)
Lower class	6 (37.5)	10 (62.5)	Ref	-	-	3 (42.9)	4 (57.1)	Ref	-	-
Change in family income during lockdown										
Same	7 (33.3)	14 (66.7)	Ref	-	-	7 (58.3)	5 (41.7)	Ref	-	-
Decreased	16 (32.0)	34 (68.0)	0.9 (0.3-2.8)	0.913	-	5 (12.2)	36 (87.8)	10.1 (2.2-44.3)	0.002	7.1 (1.01-49.6)
Tobacco use before lockdown										
Daily	17 (28.3)	43 (71.7)	Ref	-	-	12 (23.5)	39 (76.5)	Ref	-	-
Less than daily	6 (54.5)	5 (45.5)	0.3 (0.1-1.2)	0.097	0.3 (0.1-1.1)	0 (0)	2 (100)	N/A*	-	-
Believes smoking tobacco increases the risk of contracting COVID-19										
Yes	12 (31.6)	26 (68.4)	1.0 (0.4-2.7)	0.976	-	5 (21.7)	18 (78.3)	1.6 (0.5-4.9)	0.379	-
No/ Don't know	10 (31.3)	22 (68.8)	Ref	-	-	7 (23.3)	23 (76.7)	Ref	-	-
Believes smokers who contract COVID-19 have higher risk of developing severe form of the disease and poor outcome										
Yes	12 (26.7)	33 (73.3)	1.8 (0.6-5.2)	0.252	-	6 (22.2)	21 (77.8)	0.7 (0.2-2.0)	0.499	-
No/ Don't know	10 (40.0)	15 (60.0)	Ref	-	-	6 (23.1)	20 (76.9)	Ref	-	-
Availability of tobacco products during lockdown										
Easily available	8 (57.1)	6 (42.9)	Ref	-	-	3 (37.5)	5 (62.5)	Ref	-	-
Available with difficulty/ Not available	13 (25.5)	38 (74.5)	4.0 (1.2-13.4)	0.030	3.8 (1.1-13.6)	8 (18.2)	36 (81.8)	7.7 (0.9-67.6)	0.067	-
Place of tobacco purchase during lockdown										
Store/ Street vendor	14 (48.3)	15 (51.7)	Ref	-	-	6 (24)	19 (76)	Ref	-	-
From somewhere else	8 (42.1)	11 (57.9)	1.3 (0.4-4.1)	0.675	-	4 (40)	6 (60)	1.4 (0.3-6.4)	0.653	-
Price of tobacco during lockdown										
Same/ Decreased	4 (44.4)	5 (55.6)	Ref	-	-	3 (100.0)	0	Ref	-	-
Increased	15 (38.5)	24 (61.5)	1.280 (0.3-5.5)	0.741	-	8 (21.6)	29 (78.4)	N/A*	-	-
*There were no participants in reference category										

2 (13.3%) participants reported decreased use of both, and 2 (13.3%) participants reported cessation of tobacco during the lockdown. An increase in SLT use was also reported by 2 (13.3%) participants who stopped smoking during the lockdown.

Table 2 depicts, availability of tobacco products during the lockdown was significantly associated with a change in the smoking pattern during lockdown. Participants reporting difficult/ no availability of tobacco during lockdown had higher odds of showing a change in the pattern of tobacco usage during lockdown (aOR=3.8; 95%CI=1.1-13.6). All of the smoked tobacco users who reported tobacco to be unavailable during the lockdown reported either a decrease in usage (18.2%) or stopped using smoked tobacco (81.8%). More than half (57.1%) of those who reported tobacco to be easily available during the lockdown reported the same usage as before the lockdown. Change in family income during lockdown was significantly associated with a change in SLT use patterns. Participants who reported a decrease in family income had more odds of changing their pattern of tobacco usage during lockdown (aOR=7.1; 95%CI 1.1-49.6).

During lockdown, among ten dual users who used tobacco daily, 4 (40.0%) participants reported no change in pattern. Two (20.0%) participants reported increased use of both smoked and SLT. Two (20.0%) participants reported decreased use of both smoked and SLT. One (10.0%) participant reported the same smoking pattern, but increased use of SLT, and another (10.0%) participant reported decreased use of SLT with no change in smoking patterns. Among 2 participants who smoked tobacco daily and SLT less than daily, both reported smoking cessation during lockdown, with cessation of SLT in one participant and increased use of SLT in the other. Among 3 participants who used both smoked and SLT less than daily, 1 participant reported cessation of both, one reported cessation of smoking during lockdown and increased use of SLT, and 1 reported no change in smoking but decreased use of SLT.

The most common reasons for decreased use of tobacco were increased tobacco prices (41%), unavailability and difficult availability of tobacco products (24%), and decreased income during the lockdown (19%). In addition, a few participants reported change in the pattern due to health conditions/ illness/ advised by a healthcare provider (7%), fear of covid (4%), decreased or no cravings (4%), and boredom/staying idle (2%), etc.

Among smoked tobacco users, 5.6% of users reported increased tobacco use, 52.8% reported no change in tobacco use, 23.6% reported decreased use, and 16.7% reported no use of smoked tobacco after lockdown as compared to before the lockdown. Among SLT users, 1.9% reported increased SLT use, 54.7% reported no change, 30.2% reported decreased use, and 13.2% reported no SLT use after lockdown compared to before lockdown. Among dual users, 3 (20.0%) participants continued to use tobacco with no change in pattern as compared to before lockdown, 2 (13.3%) participants reported an increase in the use of SLT, and 1 (6.7%) participants reported a decrease in SLT use with no change in use smoked tobacco. Five (33.3%) participants reported an increase in smoked and SLT use, and 1 (6.7%) participant reported an increase in smoked tobacco use with cessation of SLT. Two (13.3%) participants reported a decrease in both smoke led and SLT, and 1 (6.7%) participant

reported decreased smoking but no change in SLT use.

Table 3 shows that participants who reported continued tobacco use during lockdown were more likely to report a change in the pattern of tobacco use after lockdown (aOR 10.7, 95%CI: 2.6-43.5). Half (50.0%) of the daily smoked tobacco users reported the same usage after the lockdown. The majority (87.0%) of the users who reported the same tobacco usage during the lockdown continued to report the same after the lockdown. After the lockdown, those who stopped using smoked tobacco during the lockdown, 40% reported returning to the same usage pattern as before the lockdown. Among those who reported decreased usage during the lockdown, half (50.0%) reported decreased usage after the lockdown as well.

In comparison, about one-third (37.5%) reported a return to similar usage as before the lockdown. The majority of the SLT users native to Delhi reported the same usage pattern after the lockdown. In contrast, more than half of the migrant users (52.4%) either decreased using or stopped using after the lockdown. Migrants had more odds of reporting a change in the pattern of SLT use (aOR: 12, 95%CI: 1.3-106). Among ten dual users who used tobacco daily, 2 (20.0%) participants continued to use tobacco with no change in pattern compared to before lockdown. For a change in the pattern of tobacco use after the lockdown, most of the participants (46.4%) reported decreased or no cravings/habits as a common reason. Few other participants reported change in the pattern due to increased cravings/habit (10.1%), advised by a healthcare provider (8.1%), decreased social gatherings (5.8%), and easy availability (5.8%).

Withdrawal symptoms during lockdown were assessed among those who decreased or stopped using tobacco (smoked and/or smokeless) during lockdown. Out of 140, 91 participants reported decreased or no use of smoked and/or SLT. Of these 91 participants, 46.2% reported experiencing one or more of the withdrawal symptoms included in the questionnaire, 53.8% experienced no withdrawal symptoms during the lockdown.

Figure 1 shows that the most common withdrawal symptoms that were observed were craving for tobacco (30.8%), irritability (28.6%), and fatigue (23.1%). Few participants reported experiencing lack of concentration (7.7%), constipation (6.6%), headaches (4.4%), hunger (4.4%), insomnia (3.3%), cough (2.2%), nasal drip (1.1%), dizziness (1.1%).

Among smokers, 12 participants had quit tobacco smoking after lockdown. Of them, nine users had no plans of resuming tobacco use, 2 participants planned to start again after lockdown, and one
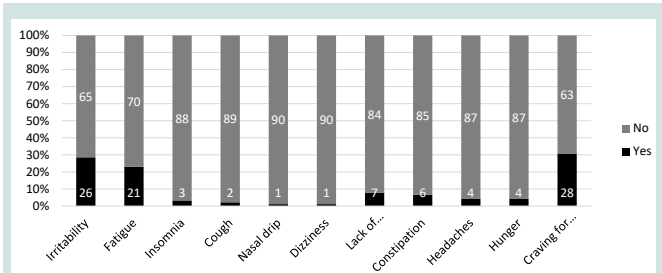

Figure 1: Experiencing of different withdrawal symptoms during lockdown on decreasing or stopping tobacco use (n=91).

Table 3: Change in tobacco use pattern after lockdown and associated factors.

	Smoking only (n=71)					Smokeless tobacco use only (n=53)				
	Same n (%)	Change in pattern n (%)	cOR (95% CI)	p-value	aOR (95% CI)	Same n (%)	Change in pattern n (%)	cOR (95% CI)	p-value	aOR (95% CI)
Age group										
15-24	2 (66.7)	1 (33.3)	0.5 (0.0-6.4)	0.619	-	2 (50)	2 (50)	1.1 (0.1-8.9)	0.941	-
25-44	17 (51.5)	16 (48.5)	Ref	-	-	13 (52)	12 (48.0)	Ref	-	-
45-64	13 (52.0)	12 (48.0)	1.0 (0.3-2.8)	0.971	-	14 (63.6)	8 (36.4)	0.6 (0.2-1.0)	0.422	-
>65	6 (60.0)	4 (40.0)	0.7 (0.2-3.0)	0.638	-	0 (0)	2 (100)	N/A*	-	-
Gender										
Male	33 (54.1)	28 (41.9)	Ref	-	-	29 (58)	21 (42)	Ref	-	-
Female	5 (50)	5 (50)	1.2 (0.3-4.5)	0.810	-	0 (0)	3 (100.0)	N/A*	-	-
Origin										
Migrant	21 (58.3)	15 (41.7)	0.7 (0.3-1.7)	0.410	-	19 (45.2)	23 (54.8)	12.1 (1.4-103.2)	0.23	12.0 (1.3-106.1)
Native	17 (48.6)	18 (51.4)	Ref	-	-	10 (90.9)	1 (9.1)	Ref	-	-
Religion										
Hindu	35 (54.7)	29 (45.4)	Ref	-	-	25 (52.1)	23 (47.9)	Ref	-	-
Muslim/ Christian	3 (42.9)	4 (57.1)	1.6 (0.3-7.8)	0.554	-	4 (80)	1 (20)	0.3 (0.0-2.6)	0.259	-
Level of education										
Illiterate	12 (52.2)	11 (47.8)	1.1 (0.4-3.1)	0.875	-	6 (46.2)	7 (53.8)	1.6 (0.4-5.9)	0.471	-
Primary to High school certificate	19 (54.3)	16 (45.8)	Ref	-	-	18 (58.1)	13 (41.9)	Ref	-	-
Intermediate and above	7 (53.8)	6 (46.2)	1.0 (0.3-3.6)	0.978	-	5 (55.6)	4 (44.4)	1.1 (0.2-4.9)	0.893	-
Socio-economic status										
Upper/ Lower middle class	10 (45.5)	12 (54.5)	1.5 (0.4-5.6)	0.512	-	5 (50)	5 (50)	0.8 (0.1-5.2)	0.772	-
Upper lower class	19 (57.6)	14 (42.4)	0.9 (0.3-3.2)	0.930	-	21 (58.3)	15 (41.7)	0.5 (0.1-2.7)	0.455	-
Lower class	9 (56.3)	7 (43.7)	Ref	-	-	3 (42.9)	4 (57.2)	Ref	-	-
Change in family income after lockdown										
Same	16 (51.6)	15 (48.4)	Ref	-	-	19 (67.9)	9 (32.1)	Ref	-	-
Decreased	22 (55.0)	18 (45.0)	0.9 (0.3-2.2)	0.777	-	10 (40)	15 (60)	3.2 (1.02-9.8)	0.045	3.1 (0.9-10.5)
Tobacco use before lockdown										
Daily	30 (50.0)	30 (50.0)	Ref	-		29 (56.9)	22 (43.2)	Ref	-	-
Less than daily	8 (72.7)	3 (27.3)	0.3 (0.1-1.6)	0.176	0.5 (0.1-2.5)	0 (0)	2 (100)	N/A*	-	-
Tobacco use during lockdown as compared to after lockdown										
Same (n=23)	20 (87.0)	3 (13.0)	Ref	-		12 (100)	0 (0)	Ref	-	-
Change in pattern (n=48)	18 (37.5)	30 (62.5)	11.1 (3.0-42.7)	<0.001	10.7 (2.6-43.5)	17 (41.5)	24 (58.5)	N/A*		
Believes smoking tobacco increases the risk of contracting COVID-19										
Yes	17 (44.7)	21 (55.3)	2.1 (0.8-5.4)	0.140	2.6 (0.9-8.0)	11 (47.8)	12 (51.2)	1.6 (0.5-4.9)	0.379	-
No/ Don't know	20 (62.5)	12 (37.5)	Ref	-		18 (60)	12 (40)	Ref	-	-
Believes smokers who contract COVID-19 have higher risk of developing severe form of the disease and poor outcome										
Yes	23 (51.1)	22 (48.9)	1.2 (0.4-3.2)	0.695	23 (51.1)	16 (59.3)	11 (40.7)	0.7 (0.2-2.0)	0.499	-
No/ Don't know	14 (56.0)	11 (44.0)	Ref	-	14 (56.0)	13 (50.0)	13 (50.0)	Ref	-	-
*There were no participants in reference category										

user did not know if they had any such plans when the interview was conducted. None of the seven SLT users, who had quit after lockdown, planned to resume tobacco use. Among dual users, only one user had quit SLT use only and did not know if they had any plans to resume SLT when the interview was conducted.

Of 140 study participants, 59 participants (42.1%) used alcohol before the lockdown. Of them, 25 (42.4%) used alcohol daily, and 34 (57.6%) used alcohol less than daily. Units per week ranged between <1- 84 units (median =10 units). During lockdown, 17 participants (28.8%;11 daily, six less than daily users) reported no change in alcohol use. Increased usage was reported by 5 participants (4 daily, one less than daily users), decreased usage by 11 participants (5 daily, six less than daily users), and 26 participants (5 daily, 21 less than daily users) reported cessation of alcohol use during lockdown. Units consumed per week ranged between <1-42 units (n=33). Of 42 (71.2%) alcohol consumers who reported change in pattern of drinking during lockdown, 35 (83.3%) also reported change in pattern of tobacco use.

After lockdown, 36 participants (61.0%;11 daily users and 25 less than daily users) reported no change in alcohol use. Eight participants (4 daily and four less than daily users) reported cessation of alcohol use during lockdown. Units consumed per week ranged between <1-63 units (n=51). Of 23 (39.0%) alcohol consumers who reported change in pattern of drinking during lockdown, 14 (60.9%) also reported change in pattern of tobacco use. During the study, seven cannabis users were identified. Of the total participants, 6 used cannabis daily, 1 used cannabis less than daily. During and after the lockdown, among the daily users, 1 reported a decrease in use, 1 reported no change, and four users reported an increase in use during the lockdown. During the study, only 1 participant reported the use of smack with no change in use during or after lockdown. In addition, study participants reported no other substance use.

Discussion

The COVID-19 pandemic and nationwide lockdown affected the stock availability and price of tobacco and the pattern of tobacco usage. It is the first such community-based study conducted in India to assess the changes in patterns of tobacco usage during the lockdown. The data was collected by the first author administered questionnaire prepared after a thorough review of available literature. In addition, change in patterns of tobacco use after the lockdown was lifted was also studied, and associated factors were identified for the same. Thus, the desired sample size was achieved despite the difficulties posed by the pandemic, which provided the necessary power for the study. The prevalence of change in the pattern of tobacco use during the lockdown among the study participants was 71.4%. This was higher as compared to the study conducted by Elias M. Klemperer et al. [4], which reported a 58.6% change in smoking patterns (28.3% decrease and 30.3% increase), and the study by SabujKanti Mistry et al. [12], which reported 15.9% increase in tobacco use. These differences could be because of differences in access to tobacco products, lockdown restrictions, and socio-demographic variations between the study populations. Difficult or no availability of smoked tobacco products during the lockdown was significantly associated with a change in the usage pattern of smoked tobacco during the lockdown (aOR=3.8; 95%CI=1.1-13.6). A decrease in family income during the lockdown was significantly associated with a change in the pattern of usage of

SLT during the lockdown (aOR=7.1; 95%CI=1.1-49.6). The difference between changes in the pattern during the lockdown (71.4%) and after the lockdown (49.3%) indicates the lockdown impacted tobacco usage. Lifting of restrictions, along with the return to regular pricing and availability of tobacco products, led to the return to old patterns of tobacco usage after the lockdown. Restriction on shops selling tobacco products in residential areas and raising prices of tobacco products to make affordability difficult might aid in reducing tobacco use. Yunfeng Shang et al. also recognised the reduced fiscal capacity during the pandemics and their long term economic impact. There effects are more pronounced in lower-middle income countries [13]. SARS outbreak in 2003 had proven to be catastrophic on economies specially in Eastern Asia and Canada [13]. Widespread loss of jobs was experienced during past epidemics and pandemics like Ebola outbreak of 2014-15 in West Africa [14] and Liberia [13,15].

Withdrawal symptoms were reported by 46.2% of participants who had decreased or stopped using tobacco during the lockdown. The main reasons cited by the study participants for the change in the pattern of tobacco use during the lockdown include increased tobacco prices, unavailability of tobacco products, and a lack of income. On the other hand, the leading reasons for the change in the usage pattern after the lockdown include a decrease or absence of craving, advice from healthcare professionals, and an increase in craving. Similar reasons were quoted by the participants in the study conducted by Himanshu A. Gupte et al. [11] in India.

These findings point to the directions in a policy change that might effectively reduce tobacco usage not just during the lockdown and pandemic but also as we slowly return to some form of normalcy in our daily lives in the post pandemic period. It is also important to note that limited support was available to the tobacco users who experienced withdrawal symptoms during the lockdown. Limitations of the study: The study design was cross-sectional; therefore, it was not possible to prove cause and effect relationships. The study was conducted six months after the gradual relaxation of lockdown restrictions from the study area. This may have introduced some recall bias regarding the availability and use of tobacco during the lockdown. Underreporting the tobacco use of the various smoking and SLT products due to social desirability bias could have affected the study's findings. The usage was self-reported and not verified biochemically. Factors associated with a change in the pattern of tobacco usage in dual users were only described but not analysed due to the small sample of dual users. Data on second-hand smoke exposure was not collected, which could be another vital avenue for study due to the increased time spent indoors during the lockdown and the pandemic as a whole. Due to small proportion of study participants reporting use of alcohol and cannabis, its association with change in pattern of tobacco could not be analysed for statistical significance which could be an avenue for study in future researches.

Conclusion

Clear impact of lockdown on tobacco use is indicated by the difference between change in tobacco use pattern during and after lockdown in the study population. Lockdown restrictions led to decreased income, increased prices and decreased availability of tobacco, which were major reasons for changed pattern during lockdown. Lifting of restrictions (post lockdown period) resulting

in return to regular pricing, availability of tobacco products and lack of support for those who experienced withdrawal symptoms, caused return to old patterns of tobacco usage. The factors identified in this study, if translated to policy changemight be effective in reducing tobacco usage during the pandemic and beyond. This recommended an effective implementation of Cigarettes and Other Tobacco Products Act, increasing the taxes on tobacco, regulating selling of tobacco by shop owners on licence basis making availability limited and restricted, setting up effective tobacco cessation clinics in community based care settings to manage withdrawal symptoms as a part of essential care and provide appropriate support.

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Conflict of Interest

The authors declare that the research was conducted without any commercial or financial relationships that could be construed as a potential conflict of interest.

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