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ORIGINAL ARTICLE

**Impact of Tobacco Consumption During COVID-19 Lockdown: Insights from Employees at a Government Medical College in Gujarat**

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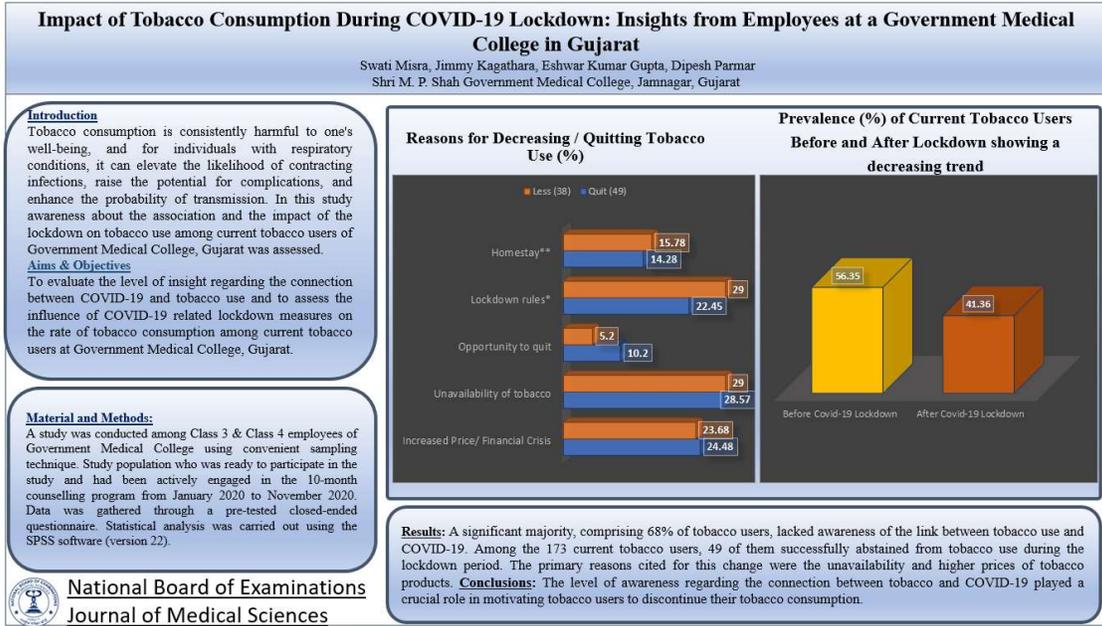
**Abstract**

**Background:** Tobacco consumption is consistently harmful to one's well-being, and for individuals with respiratory conditions, it can elevate the likelihood of contracting infections, raise the potential for complications, and enhance the probability of transmission. In this study awareness about the association and the impact of the lockdown on tobacco use among current tobacco users of Government Medical College, Gujarat was assessed. **Objectives:** To evaluate the level of insight regarding the connection between COVID-19 and tobacco use and to assess the influence of COVID-19 related lockdown measures on the rate of tobacco consumption among current tobacco users at Government Medical College, Gujarat. **Methods:** A study was conducted among Class 3 & Class 4 employees of Government Medical College using convenient sampling technique. Study population who was ready to participate in the study and had been actively engaged in the 10-month counselling program from January 2020 to November 2020. Data was gathered through a pre-tested closed-ended questionnaire. Statistical analysis was carried out using the SPSS software (version 22). Ethical approval was obtained from the Institute Ethical Committee, and written informed consent was acquired from all the participants. **Results:** A significant majority, comprising 68% of tobacco users, lacked awareness of the link between tobacco use and COVID-19. Among the 173 current tobacco users, 49 of them successfully abstained from tobacco use during the lockdown period. The primary reasons cited for this change were the unavailability and higher prices of tobacco products. **Conclusions:** The level of awareness regarding the connection between tobacco and COVID-19 played a crucial role in motivating tobacco users to discontinue their tobacco consumption.

**Keywords:** COVID-19, Lockdown, Counselling, Tobacco Cessation, Employees

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### Graphical Abstract



### Introduction

The outbreak of Coronavirus Disease 2019 (COVID-19), caused by the SARS-CoV-2 virus, was initially identified at the close of 2019 in Wuhan, China [1] COVID-19 is an infectious illness caused by the highly contagious SARS-CoV-2 virus. It can lead to severe pneumonia, acute respiratory distress syndrome, and, in many cases, fatal outcomes, particularly among vulnerable populations. These at-risk groups include older adults and individuals with chronic medical conditions like cardiovascular disease, diabetes, respiratory issues, hypertension, and malignancies [2]. The importance of maintaining optimal respiratory health has been underscored by the COVID-19 pandemic. One noteworthy aspect that has received significant focus in the context of COVID-19 is the link between tobacco use, which includes both smoking cigarettes and using other tobacco products, and the heightened risk of contracting the virus and experiencing severe consequences.

Understanding that COVID-19 primarily spreads through respiratory droplets released when an infected person coughs, sneezes, or talks is crucial. These droplets can be inhaled by individuals in close proximity, potentially leading to infection. Given that COVID-19 primarily targets the respiratory system, any factor that compromises lung health and the immune response can potentially increase the risk of severe illness. Tobacco use is recognized for its harmful impact on the respiratory system, with smoking being a significant contributor to respiratory conditions like chronic obstructive pulmonary disease (COPD) and lung cancer. Smoking causes damage to the lungs, diminishing their ability to function optimally. It also impairs the cilia, tiny hair-like structures in the airways that help remove mucus and particles, making it harder for the body to clear infections. In the context of COVID-19, this is concerning because individuals with compromised lung health may be less equipped to combat the virus. This had

affected severely the whole world resulting into implementation of 'lockdown' interventions at different degrees and at different times [3]. The Prime Minister of India initiated a nationwide lockdown as a measure to combat the COVID-19 pandemic on 24<sup>th</sup> march, 2020 [4]. While the COVID-19 pandemic and lockdown measures were linked to increased levels of anxiety, fear, sadness, adjustment problems, post-traumatic stress disorder, and suicidal tendencies, these psychological issues may raise the risk of engagement in and exacerbation of substance misuse as an unhealthy coping mechanism in various populations [5]. Columbia University [6] also conducted the study to know initial COVID-19 lockdown period witnessed a potential surge in tobacco use. However, quitting tobacco consumption has the potential to alleviate the burden of non-communicable diseases [7] and also respiratory diseases.

According to few studies [8-10], COVID-19 prevalence and its association with tobacco use have been extensively studied. According to those studies, the global prevalence of COVID-19 continues to fluctuate, with periodic surges in cases driven by variants, vaccination rates, and public health measures. However, ongoing research consistently highlights the association between tobacco use and adverse COVID-19 outcomes. Studies have shown that smokers are at a higher risk of severe illness, hospitalization, and death from COVID-19 compared to non-smokers. Additionally, tobacco use may exacerbate respiratory symptoms and impair the body's immune response, making individuals more vulnerable to respiratory infections like COVID-19. These findings underscore the urgent need for targeted interventions to address

tobacco use, particularly in populations vulnerable to COVID-19 complications. By understanding the socio-demographic factors influencing tobacco consumption patterns, the study can provide valuable insights for public health initiatives aimed at reducing both tobacco use and the burden of COVID-19. According to Almu'atasim, Khamees et al. [8], the study found that the lockdown had a notable effect on individuals' lifestyles, particularly their smoking behaviors. The majority of smokers in our sample reported a shift in their smoking habits, with a predominant increase observed. Conversely, those who reported a decrease in smoking levels generally exhibited a healthier lifestyle in terms of nutrition and other facets.

Quitting tobacco is a critical step in reducing the risk of severe COVID-19 outcomes. It not only helps improve lung function and the immune system but also reduces the overall risk of respiratory infections. For individuals who are concerned about their susceptibility to COVID-19 and its potential consequences, quitting tobacco should be a priority. Keeping in mind the above facts regarding lockdown and tobacco consumption, the aim of present study to assess the effect of covid-19 related lockdown over quit rate of tobacco consumption. Whereas, objectives of the current study to assess the understanding about the association with covid-19 and tobacco consumption and to analyze the effect of covid-19 related lockdown on tobacco consumption rate of current tobacco users of Government Medical College, Gujarat.

### **Methodology**

The current study was the longitudinal follow-up study type which was carried out in medical college of

Gujarat on Class 3 and Class 4 (total 307) employees working there. Using the universal sampling technique and after taking their interview it was found that out of all the employees, 178 were consuming tobacco in one or the other form. 5 employees were not willing to participate in the study. Hence, 173 was the final sample size, considered for the study. Study duration was January 2020 to November 2020 with 5 follow-ups. Each time questions related with their current status of tobacco consumption, their perception for covid and tobacco, their reason for decreasing/ quitting were asked. Participants in the study provided verbal informed consent, and they were assured of the confidentiality of their data. The study commenced after receiving Institutional Ethical Clearance from the Ethics Committee, with the Ethical Clearance Certificate Reference Number IEC/CERTI/66/02/2020. The current article is a component of a comprehensive study conducted on tobacco users in the designated area. The study employed a pre-tested, semi-structured questionnaire for data collection. Initial data was gathered through individual interviews, and subsequently, five focused group discussions were conducted, involving a total of 15 groups with seven members in each group. During the Focused Group Discussions (FGD), we evaluated information pertaining to the reduction or cessation of tobacco consumption, along with the associated reasons. Additionally, we assessed the quitting rate among current tobacco users and its correlation with awareness of COVID-19 and tobacco.

**Definition/Criteria used in the study [11]**

1) Current tobacco user – An employee who was using tobacco in any form

like bidi, cigarette, pan masala or any other chewable form in last 12 months.

- 2) Former tobacco user – An employee who used to have tobacco in any form in any time during his life but stopped from the past 12 months.
- 3) Non-user – An employee who had never used tobacco in any form during his life.

**Results**

Among 307 employees of the institute who were interviewed, 56.35% participants were current tobacco user, 7.81% were former tobacco user while 35.83% were not using tobacco. Out of those current tobacco user Class 3 employees were 24.43% while 75.57% belonged to the Class 4. According to Table 1, the socio-demographic distribution of current tobacco users in the study sample reveals several key insights. Firstly, in terms of age, the majority of participants fall within the age brackets of 28-37 and 38-47, comprising 31.79% and 28.32% of the sample, respectively. This suggests that tobacco use is more prevalent among individuals in their late twenties to mid-forties. Interestingly, participants aged 18-27 and those aged 48-57 also constitute significant proportions, though slightly lower. However, individuals over 58 represent a minimal portion of the sample, indicating a decline in tobacco use among older age groups. Secondly, regarding gender, males significantly outnumber females, with 75.14% of participants being male. This gender disproportionality aligns with broader trends indicating higher tobacco consumption rates among men. Thirdly, marital status analysis reveals that the vast majority of participants are married (87.28%), potentially implying that marital

status might be associated with tobacco use behavior. Lastly, in terms of family type, nuclear families constitute the majority, followed by joint and third-generation families, suggesting that family structure may play a role in influencing tobacco use habits. Overall, this data underscores the importance of considering socio-demographic factors when studying tobacco use patterns and designing targeted interventions for prevention and cessation.

According to Table 2, the association between socio-demographic details and tobacco consumption patterns among study participants reveals several significant findings. Firstly, the prevalence of family history of tobacco consumption and friends/ colleagues' history of tobacco consumption is high, with 80.92% and 85.55% respectively. This suggests a strong influence of social networks and familial factors on tobacco use behavior among individuals. Secondly, smokeless tobacco

consumption (chewing) is notably more prevalent (90.75%) compared to smoking, indicating a preference for this form of tobacco among the study participants. Additionally, the majority of participants report daily tobacco use (92.48%), with a significant proportion using tobacco 3-5 times per day (48.55%). This suggests a pattern of regular and frequent tobacco consumption among the sample. Furthermore, a relatively small percentage of participants report using other substances (12.13%), implying that tobacco is the primary substance of choice for the majority of individuals in this study. Overall, these findings highlight the interconnectedness of socio-demographic factors and tobacco consumption behaviors, emphasizing the need for targeted interventions that address social influences and patterns of tobacco use among specific demographic groups.

Table 1. Socio-demographic Distribution of study participants (Current Tobacco Users)

Variable	No. of Participants (%)
<b>A] Age</b>	
18-27	29 (16.76%)
28-37	55 (31.79%)
38-47	49 (28.32%)
48-57	36 (20.81%)
>58	4 (2.31%)
<b>B] Gender</b>	
Male	130 (75.14%)
Female	43 (24.85%)
<b>C] Marital Status</b>	
Married	151 (87.28%)
Unmarried	22 (12.72%)
<b>D] Family Type</b>	
Nuclear	112 (64.73%)
Joint	41 (23.69%)
3 <sup>rd</sup> Generation	20 (11.56%)

Table 2. Association between socio-demographic details and tobacco consumption pattern in study participants

<b>A] Family History of Tobacco Consumption</b>	
Yes	140 (80.92%)
No	33 (19.08%)
<b>B] Friends/ Colleagues History of Tobacco Consumption</b>	
Yes	148 (85.55%)
No	25 (14.45%)
<b>C] Tobacco Form</b>	
Smokeless (chewing)	157 (90.75%)
Smoke	16 (9.25%)
<b>D] Tobacco Use</b>	
Daily	160 (92.48%)
Occasional	13 (7.52%)
<b>E] Frequency of Tobacco Use (per day)</b>	
0-2	25 (14.45%)
3-5	84 (48.55%)
6-8	57 (32.94%)
>9	7 (4.04%)
<b>F] Use of other substances</b>	
Yes	21 (12.13%)
No	152 (87.87%)

After Covid-19 lockdown on follow up after 10 months it was found that 49 participants had quit tobacco consumption completely. For the sake of convenience abstinence of tobacco intake for at least 1 month was considered as quit. As per Figure 1, people who quit tobacco, majority of them gave reason for quitting and decreasing use was increased price or financial crisis and unavailability of tobacco. Least common reason given by users was that of opportunity to quit. (Figure 2). As per Figure 3, nearly two-thirds of the participants were unaware of the link between tobacco consumption and COVID-19. Out of the total 173 participants, only 118 (68.2%) were uninformed about the connection between

harmful tobacco use and COVID-19 outcomes, while 55 (31.79%) were aware of the association [ $\chi^2=11.53$ , p-value=0.00069]. Among participants with awareness of the association between tobacco consumption and COVID-19 outcomes, 43.64% quit tobacco during the study period. The quit rate among those aware of the COVID-19 and tobacco connection was twice that of those who were unaware, indicating a significant difference and a higher likelihood of quitting tobacco when individuals were informed about the association [ $\chi^2=12.057$ , p-value=0.00051]. The prevalence of current tobacco users exhibited a decreasing trend before and after the lockdown, as illustrated in Figure 4.

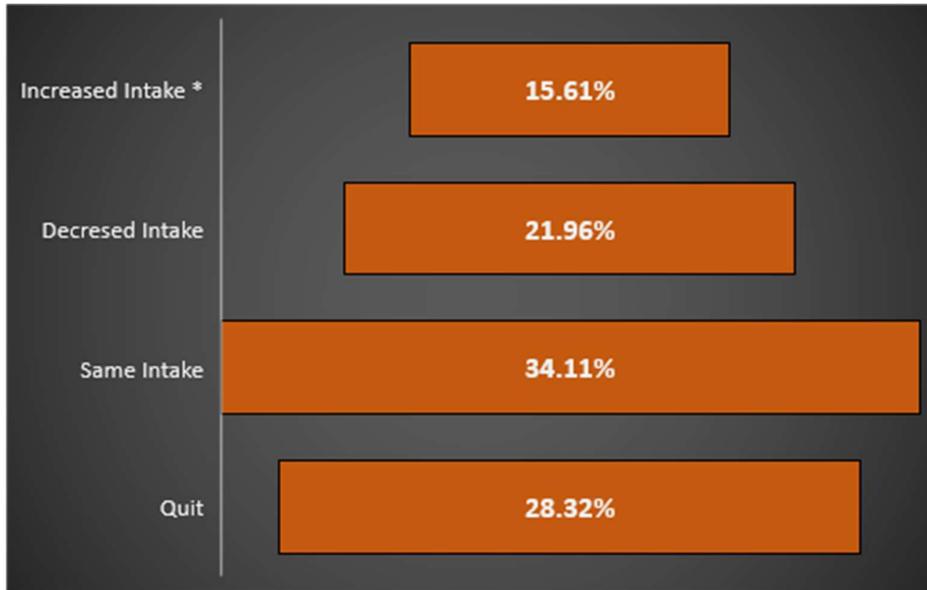


Figure 1. Outcome of COVID-19 Lockdown among Current Tobacco Users (%)

\*Increased use due to increased stress

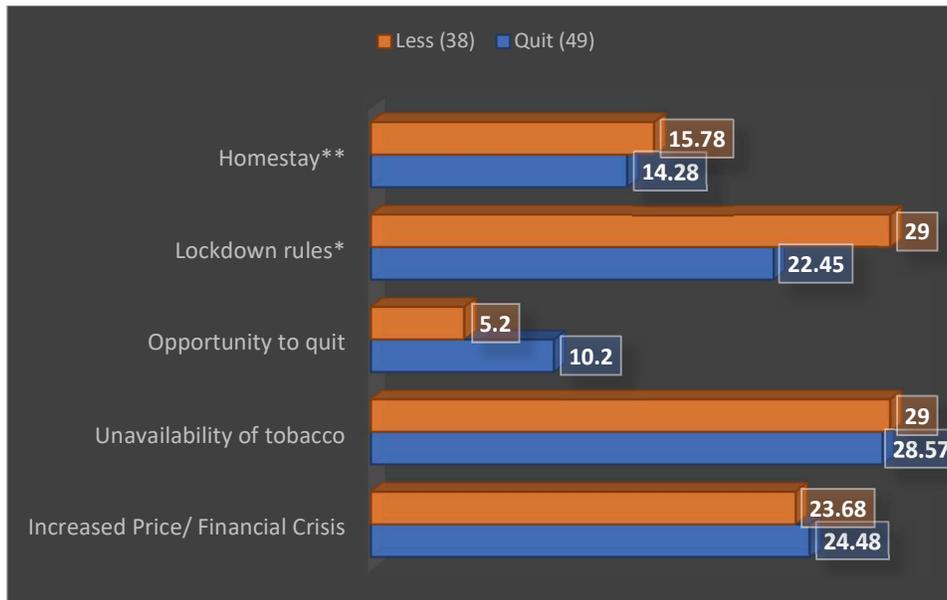


Figure 2. Reasons for Decreasing / Quitting Tobacco Use (%)

\*\*Decreased due to family

\*Can't go outside

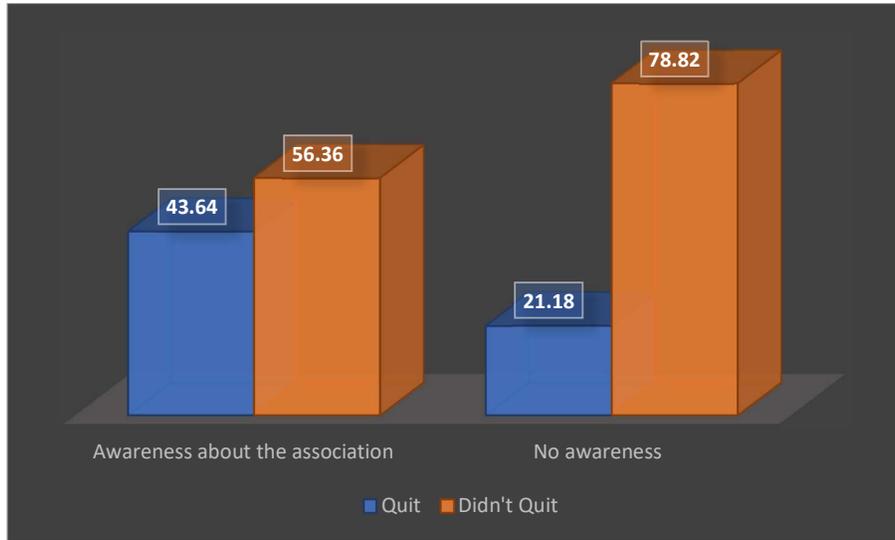


Figure 3. Association between Awareness and Quit Rate (%)

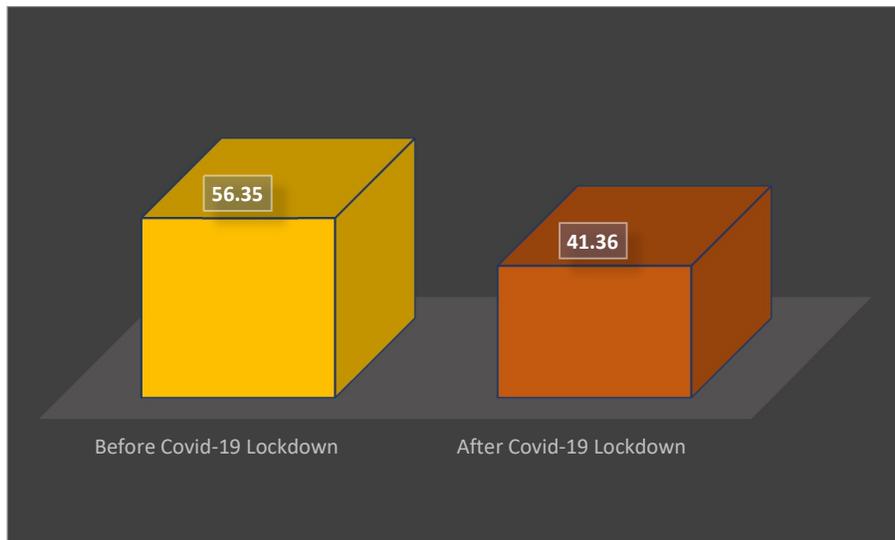


Figure 4. Prevalence (%) of Current Tobacco Users Before and After Lockdown showing a decreasing trend

### Discussion

Using a series of monthly follow up, we observed changes in tobacco intake, reduction, attempts to quit from January 2020 till November 2020 when covid-19 lockdown was implemented by government. In the current study, 56.35% were current tobacco user, almost 90.75% participants were using smokeless form like

chewing pan masala, gutkha and mawa masala also tobacco consumption was highly common in males (75.14%) as compared to females (24.85%); while as per Himanshu A. Gupte et al. [12] 46% were smokers, 45% smokeless tobacco users. The majority of participants, comprising 96%, were males, with an average age of 40 years. In alignment with S. Veeraiah et al.

[13], the mean age was 42.5 years (SD=14; range: 15–76), and the majority were males (n = 243, 97%). Out of the total participants, 101 (40%) were current tobacco users, with 61% being smokers, 35% using smokeless tobacco, and 4% employing both forms. Notably, almost two-thirds of the participants in the current study were unaware of the association between tobacco consumption and COVID-19. The quitting rate among individuals aware of the association between COVID-19 and tobacco was twice that of those who were unaware. This significant difference suggests a higher likelihood of quitting tobacco when a person is informed about the connection between tobacco consumption and COVID outcomes [p-value<0.05]. The reasons for quitting or reducing tobacco use in our study included the heightened prices or financial constraints and the unavailability of tobacco. This aligns with findings by Himanshu A. Gupte et al. [12], where 67% were unaware of the tobacco and COVID-19 association. The most common impacts reported were non-availability of tobacco products (45%) and increased prices (27%). Some users saw this as an opportunity to quit (24%), while a small proportion (4%) reported an increase in tobacco use due to heightened stress in the current context.

In the current study during follow up of 10 months, 49 participants had quit tobacco consumption completely but 3 participants started tobacco consumption for the first time; while as per Himanshu A. Gupte et al. [12] out of the contacted tobacco users, a total of 219 individuals (38%) claimed to have refrained from tobacco use since the onset of the lockdown. Notably, among those aware of the association between COVID-19 and tobacco use, the proportion of users who

abstained was twice as high (51%) compared to those who were unaware (25%). According to Romain Guignard et al. [14], among current smokers, 26.7% reported an increase in tobacco consumption since the beginning of the lockdown (i.e., during the 2 weeks before the survey), 18.6% reported a decrease, while it remained stable for 54.7%. According to S. Veeraiah et al. [13], 64% of tobacco users reported a reduction in tobacco use during the lockdown, while usage remained unchanged for 20%, and it increased for 16%. A significant portion, nearly two-thirds (63%), expressed an intention to quit during the lockdown. Out of those with intentions to quit, 6% sought help or consultation, and 38% made an actual quit attempt during the lockdown. Interestingly, only 15% had the urge to increase tobacco use during this period. In our study, reduced tobacco use during the lockdown was associated with both the intention to quit (P = 0.02) and actual quit attempts (P = 0.01). Notably, over 50% of participants cited increased tobacco prices or financial constraints and unavailability of tobacco as reasons, with the least common reason being the 'opportunity to quit.' In contrast, Himanshu A. Gupte et al. [12] found that the main reason for stopping tobacco use was related to lockdown or concerns about the coronavirus, accounting for 51%. Additionally, as per S. Veeraiah et al. [13], more than half (56%) reported easy availability of tobacco products. During the lockdown, almost two-thirds (66%) of tobacco users bought tobacco products daily from shops, 27% had existing stocks, and the remaining 6% obtained tobacco from peers. The majority of tobacco users reported easy access to tobacco products, with a significant proportion being able to purchase them daily from shops during the

lockdown. The data indicates blatant breaches of lockdown regulations, particularly in the context of a strict ban on tobacco product sales in the city. Encouragingly, nearly two-thirds of tobacco users reported a reduction in tobacco use, with an equal number expressing an intention to quit during the lockdown. A recent study by Elling et al. [15,16] highlighted that smokers were more motivated to quit due to the heightened risk of contracting COVID-19 as a smoker and increased social support for tobacco cessation.

### **Conclusion**

The COVID-19 pandemic and the ensuing lockdown have acted as substantial catalysts for various mental health challenges, such as anxiety and depression. Additionally, there has been a notable increase in unhealthy behaviors, including heightened tobacco consumption, as individuals seek coping mechanisms for negative emotions. However, within our study, a subgroup of participants saw the lockdown as a chance to decrease or quit tobacco use, and notably, some of them successfully initiated quit attempts. In our research, approximately 28.32% of participants managed to quit tobacco entirely, while 21.96% reduced their tobacco intake. To further increase the rate of successful quitting, it is imperative to implement effective measures aimed at motivating and supporting tobacco users in their cessation efforts. Another critical aspect of tobacco use that demands attention within the context of COVID-19 is the behavioral component. Smoking often involves repeated hand-to-mouth contact, which could elevate the risk of virus transmission from contaminated surfaces to the mouth. This behavior might

inadvertently expose smokers to the virus, particularly in public settings or shared smoking areas. Addressing this concern necessitates comprehensive education and awareness initiatives regarding COVID-19 and tobacco. Remarkably, individuals who were aware of the link between COVID-19 and tobacco were more inclined to quit compared to those without awareness. Consequently, increasing awareness about the harmful effects of tobacco and fostering an environment with restricted access to tobacco products can play a role in partially reducing tobacco consumption. To sum up, the relationship between COVID-19 and tobacco usage is complex and worrisome. Tobacco use can undermine lung health, suppress the immune system, and instigate inflammation, collectively heightening the risk of severe outcomes in the context of COVID-19. Ceasing tobacco use not only contributes to long-term health but also plays a crucial role in alleviating immediate risks linked to the pandemic. It's vital for tobacco users to seek support and resources for quitting, alongside adhering to public health guidelines to minimize the risk of COVID-19 transmission. Combining these efforts can yield improved individual and public health outcomes in the fight against COVID-19.

### **Recommendation**

Based on the research findings concerning COVID-19 and tobacco use, several recommendations can be put forth to mitigate the potential risks linked to tobacco consumption during the pandemic. It's important to recognize that tobacco is detrimental in any circumstance. Therefore, based on multiple follow-up assessments, in-depth interviews, and focus group discussions, a strong emphasis should be placed on deaddiction as the preferred

approach to address this issue. Primary care physicians and mental health specialists should take special care to consider this possibility. Healthcare professionals should conduct thorough assessments of their patients, ensuring a comprehensive examination that includes evaluating for signs of substance abuse. Additionally, sustaining ongoing research efforts to delve into the complex interplay between tobacco use and COVID-19 outcomes is crucial. This involves studying the impact of various tobacco products and shifts in smoking behavior during the pandemic. Such research forms the foundation for evidence-based policies and interventions aimed at diminishing the health risks linked to tobacco use, both in the context of COVID-19 and beyond.

#### **Limitations of the study**

This study has its share of limitations that merit acknowledgment. Firstly, the reliance on self-reported data introduces the possibility of recall bias, potentially leading to less than completely accurate information about participants' tobacco habits. Second, establishing causation is intricate due to confounding factors such as age, comorbidities, and socioeconomic status, which are interconnected with both tobacco use and COVID-19 outcomes. Furthermore, the dynamic nature of the COVID-19 pandemic and the emergence of new variants pose challenges in generalizing our findings across diverse time periods and regions. While our study provides valuable insights into potential associations, these limitations emphasize the need for cautious interpretation. It is advisable to consider multiple sources of evidence for a more comprehensive understanding of the impact of tobacco use on COVID-19.

#### **Author Contributions**

The manuscript has been read and approved by us and we believe that the manuscript represents honest work.

#### **Conflict of Interest**

The authors declares that they do not have conflict of interest.

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No funding was received for conducting this study.

#### **Ethical Approval**

Ethical Reference	Clearance	Certificate Number
IEC/CERTI/66/02/2020)		

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