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Original article

Chalo Smile: Oral Health and Substance Use among Public Transport Drivers in the Mumbai Metropolitan Region during Swachhata Pakhwada 2024

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ABSTRACT

Background: Public transport drivers constitute a high-risk occupational group due to prolonged working hours, occupational stress, irregular schedules, and limited access to preventive healthcare. These factors contribute to poor oral hygiene practices and a high prevalence of substance use, particularly tobacco, placing this group at increased risk for oral diseases. **Objective:** This study aimed to describe oral hygiene practices, tobacco and alcohol use, and the prevalence of oral lesions among public transport drivers in the Mumbai Metropolitan Region, and to document the preventive oral health services delivered through the "Chalo Smile" outreach initiative during Swachhata Pakhwada 2024. **Methods:** A cross-sectional observational field study with a descriptive epidemiological focus was conducted from July 1 to July 15, 2024, as part of a community oral health outreach program. Using convenience sampling, 2,445 taxi, auto-rickshaw, and bus drivers were screened across 27 high-footfall transport locations in Mumbai, Thane, Navi Mumbai, Panvel, and Pen. Data were collected using standardized structured interviews and oral visual examinations conducted by trained dental teams. Descriptive statistics were used for analysis. **Results:** Of the 2,445 drivers screened, 80.1% were male. Tobacco use was reported by 32.1% of participants (n = 785), with smokeless tobacco—predominantly gutka—being the most common form. Oral lesions were identified in 98 individuals (4.0% of the total sample), including 83 cases of white/red patches, 14 ulcers, and one case of oral submucous fibrosis; all lesion cases occurred among tobacco users. Brushing once daily was reported by 89.3% of drivers, while only 7.1% brushed twice daily or more. Alcohol use was reported by 10% of participants. Referrals were made for tobacco cessation counselling (n = 601) and biopsy (n = 184). **Conclusion:** The "Chalo Smile" project identified significant oral health issues and tobacco-related lesions among public transport drivers. The findings reinforce the need for regular screening, targeted tobacco cessation interventions, and sustained oral health education in high-risk occupational groups.

1. INTRODUCTION

Oral health is integral to overall well-being, as a healthy mouth enables individuals to eat, speak, and interact socially without discomfort, disease, or embarrassment. With an estimated 3.5 billion people affected globally, the prevalence of oral diseases continues to impose a substantial burden, particularly

among socioeconomically disadvantaged groups (Osuh et al., 2022). Beyond causing pain and functional limitations, this condition also results in aesthetic concerns and economic burdens, such as reduced productivity and increased healthcare expenditures (Petersen, 2003).

Maintaining good oral hygiene, primarily through regular brushing and flossing, is essential for preventing dental caries and periodontal diseases (Nazir, 2017). These oral diseases are strongly influenced by modifiable behaviours such as tobacco and alcohol use, inadequate oral hygiene, and poor dietary habits (Petersen, 2005, Petersen et al., 2005). Furthermore, increasing evidence highlights a strong association between oral health and various systemic conditions, including diabetes, cardiovascular diseases, pancreatic cancer, and adverse pregnancy outcomes (Tonetti & Van Dyke, 2013). These links underscore the importance of promoting oral hygiene and encouraging regular dental check-ups. While these preventive strategies are well-recognized, there remains a challenge in the implementation, and their impact is often limited among socioeconomically disadvantaged and occupationally marginalized populations.

Public transport drivers in India represent a neglected occupational group with disproportionately high exposure to behavioural risk factors such as tobacco use, irregular meals, and limited access to preventive healthcare. Despite their elevated risk for oral diseases and oral cancer, systematic screening data among urban transport drivers remain limited, particularly in western India. Many drivers adopt coping strategies such as tobacco use, both smoked and smokeless, which elevates their risk for oral diseases, including oral cancer (Zaitsu et al., 2017, Shetty et al., 2017, Patanapu et al., 2022, Mohan et al., 2022, Chandra & Govindraju, 2012). Existing literature consistently indicates that oral mucosal lesions such as leukoplakia, erythroplakia, and oral submucous fibrosis arise predominantly within populations exposed to tobacco products, with prevalence estimated at over 30% in many developing regions (Sridharan, 2014, Verma & Sharma, 2019, Koothati et al., 2020, Sung et al., 2021).

According to GLOBOCAN 2020, India reported approximately 135,929 new cases and 75,290 deaths due to lip and oral cancers, representing more than one-third of the global burden (16). Despite this alarming statistic, awareness regarding oral cancer remains low among high-risk groups such as public transport drivers. To address this gap, the Indian Dental Association (IDA), in collaboration with Hindustan Petroleum Corporation Limited (HPCL), launched the "Chalo Smile" campaign during Swachhata Pakhwada 2024.

As part of this initiative, an epidemiological study was conducted to assess the oral health status of public transport drivers in the Mumbai Metropolitan Region. The study examined oral hygiene behaviours, consumption of tobacco and alcohol, and the prevalence of oral mucosal lesions. The objectives were to enhance oral health awareness, implement on-site oral health screenings, and encourage the adoption of preventive oral care practices among public transport drivers.

2. MATERIALS AND METHODS

This study was conducted as a cross-sectional observational field study with a descriptive epidemiological focus, embedded within the "Chalo Smile" community outreach program. The study took place over a two-week period from July 1 to July 15, 2024, coinciding with Swachhata Pakhwada. Screening activities were carried out across 27 locations in the Mumbai Metropolitan Region, including Mumbai, Thane, Navi Mumbai, Panvel, and Pen (Figure 1). These sites were purposively selected based on high public transport driver footfall, such as petrol stations, bus depots, and transport hubs.

2.1 Target Population and Sampling

The study population comprised taxi, auto-rickshaw, and bus drivers present at the selected screening sites during the campaign period. Convenience sampling was employed due to the outreach-based nature of the initiative. A total of 2,445 drivers were screened, reflecting expected participation based on available manpower, time constraints, and daily screening capacity during the campaign. Drivers who did not provide verbal consent and non-drivers were excluded.

2.2 Data collection

Temporary outreach booths were strategically set up at high-traffic public transport locations, including petrol stations, depots, and major transport hubs across the Mumbai Metropolitan Region. These locations were selected to maximize accessibility and participation among public transport drivers. Data were collected using a standardized, pre-tested screening form that captured demographic information, oral hygiene practices, tobacco and alcohol use, and clinical oral findings.

Oral visual examinations were conducted by trained dental professionals using disposable mouth mirrors and adequate natural or portable artificial light

FLOW CHART

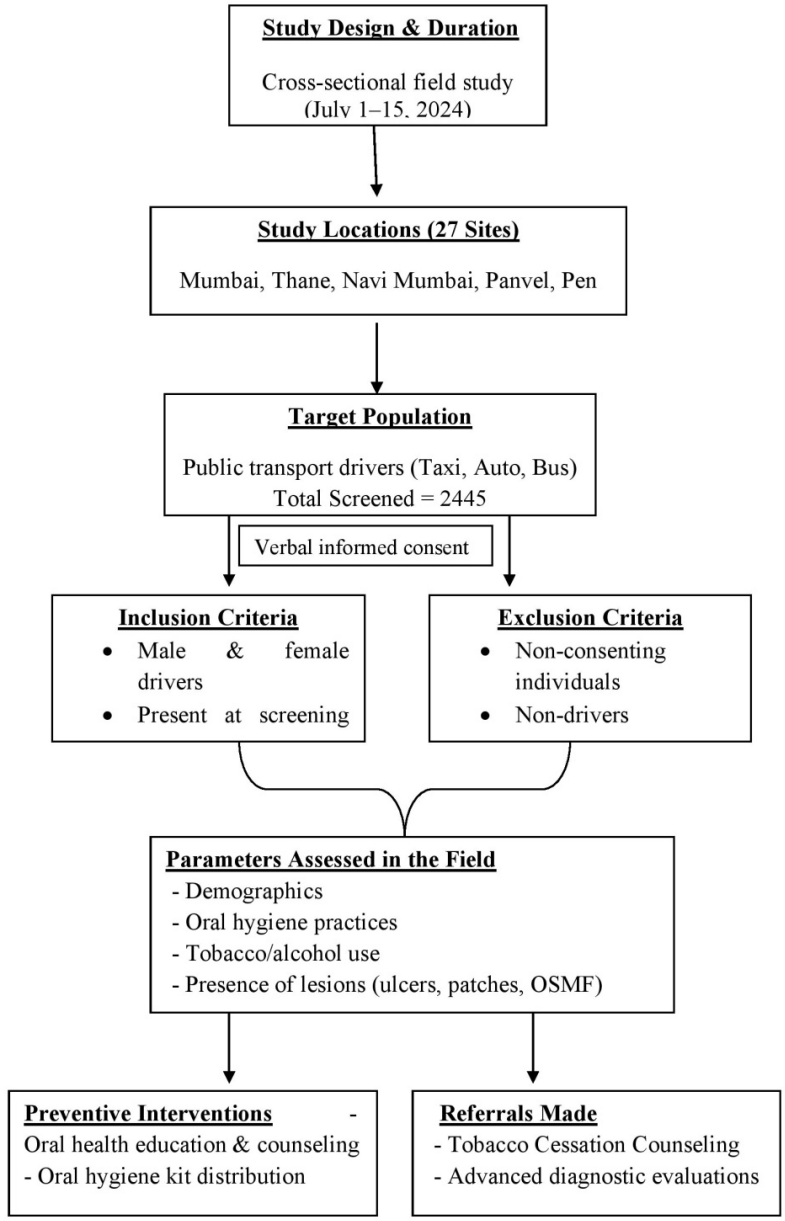

Figure 1: Flowchart Describing the Study Methods.

sources, following standard infection control practices. Although formal examiner calibration and intra-examiner reliability assessment were not feasible due to field conditions, all teams followed a uniform screening protocol to ensure consistency.

To minimize information and reporting bias, interviews were conducted in a non-judgmental manner, and data were recorded anonymously without personal identifiers. All participants received on-site oral health education, brief tobacco cessation counseling, and an oral hygiene kit containing a toothbrush, toothpaste, and tongue cleaner. Participants with tobacco habits were referred for tobacco cessation counseling, and those with suspicious lesions were referred for further diagnostic evaluation, including biopsy where indicated.

2.3 Data Parameters

The data collected encompassed a range of parameters to provide a comprehensive overview of the participants' oral health status and associated risk behaviours. Demographic information was recorded, with a particular focus on gender distribution. Details regarding oral hygiene practices were also gathered, including the cleaning method, such as using a toothbrush, finger, neem stick, or dental floss, and the

frequency of brushing.

Information on substance use formed a crucial component of the data collection. This included the use of smokeless tobacco products like gutka, paan masala, khaini, and betel quid; smoking habits involving cigarettes, bidis, and hookah; and alcohol consumption patterns.

Clinical examinations were conducted to identify the pathologies, such as white or red patches, ulcers, and signs of oral submucous fibrosis (OSMF). Tobacco use and alcohol use were defined based on self-reported current consumption. Oral lesions were defined as clinically visible mucosal abnormalities identified during visual examination, including white or red patches, ulcers, and features suggestive of oral submucous fibrosis. Referral for tobacco cessation counseling was provided to participants reporting tobacco use, while referral for biopsy was made for individuals with lesions suspicious for premalignant or malignant change.

2.4 Data Analysis

All collected data were entered into IBM SPSS Statistics software (version 29.0) for statistical analysis. Descriptive statistics, including frequencies and percentages, were used to summarise oral hygiene behaviours, tobacco and alcohol use, and the presence of clinical oral lesions

2.5 Ethical Considerations

Participation was voluntary, with verbal informed consent obtained from all individuals due to the non-invasive nature of screening. All data were anonymized to ensure confidentiality, and ethical oversight was provided by collaboration with the participating dental colleges and institutions. The study was conducted as a public health outreach activity.

3. RESULTS

This cross-sectional study was conducted across 27 locations in the Mumbai metropolitan region from July 1 to 15, 2024. A total of 2445 public transport drivers were screened, of which 1959 (80.1%) were males, and 486 (19.9%) were females (Figure 2). In the present study, 9.1 % participants were in the age group of less than 20 years, 27.4 % in the age group of 21-30 yrs, 25.4 % in the age group of 31-40 yrs, 21.8 % in the age group of 41-50 yrs and 16.3 % in the age group of > 50 yrs respectively. (Figure 3)

Toothbrushing was the predominant oral hygiene method, reported by 2,334 participants (Figure 4). A small proportion reported using a combination of brushing with other aids like finger, neem stick, and flossing; however, each of these alternative methods was utilized by less than 1% of the population. A total of 65 individuals did not respond to the question regarding their method of oral hygiene practices.

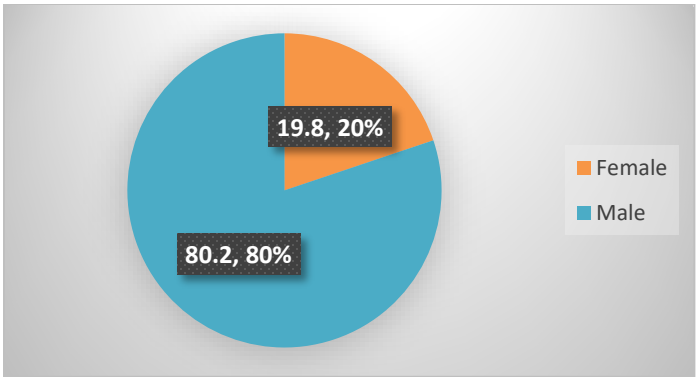

Figure 2: Gender-wise distribution of study participants

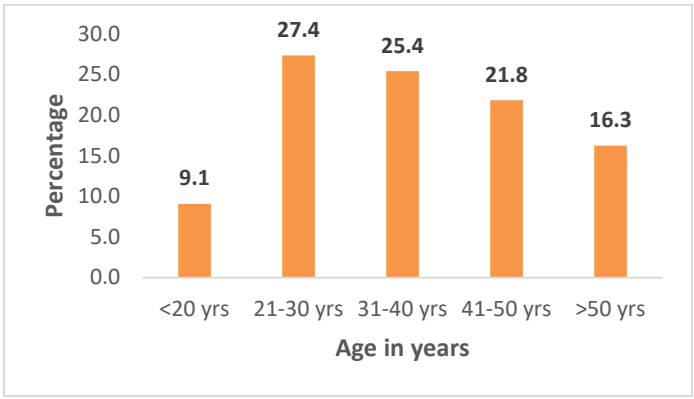

Figure 3: Age-wise distribution of study participants

Regarding brushing frequency (Figure 5), 2184 brushed once daily, 174 brushed twice daily, and only 3 brushed more than twice a day. Eighty-three individuals reported not brushing at all. These findings indicate a strong tendency to brush once a day in the study population.

Among the 571 participants who reported smokeless tobacco use (Figure 6), gutka emerged as the most commonly used form, consumed by 267 individuals either alone or in combination with other variants such as khaini, pan masala, betel quid, and areca nut. Pan masala (36) and khaini (22) were the second and third most used smokeless forms, respectively. A small number of individuals (12) prefer to use mishri. This finding indicates that gutka dominates smokeless habits, followed by pan masala and khaini. A small number of participants (4) reported exclusive use of hookah. Smoking habits were reported by 232 participants (Figure 7), with cigarettes being the most frequently used form (162), followed by bidis (35). A small number (4) reported exclusive use of hookah.

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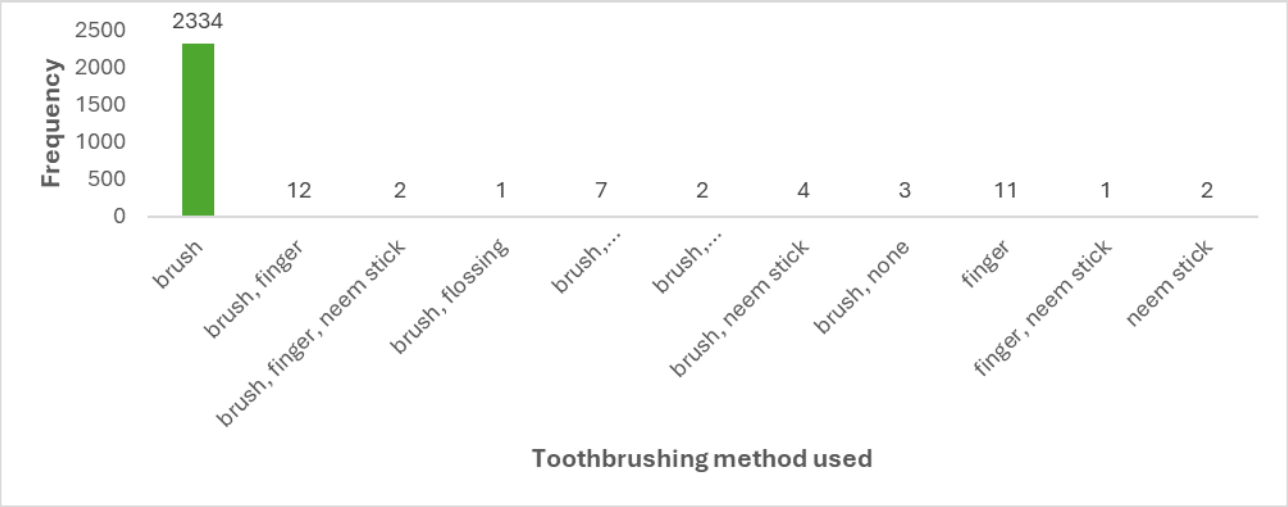

Figure 4: Oral hygiene aids used by study participants.

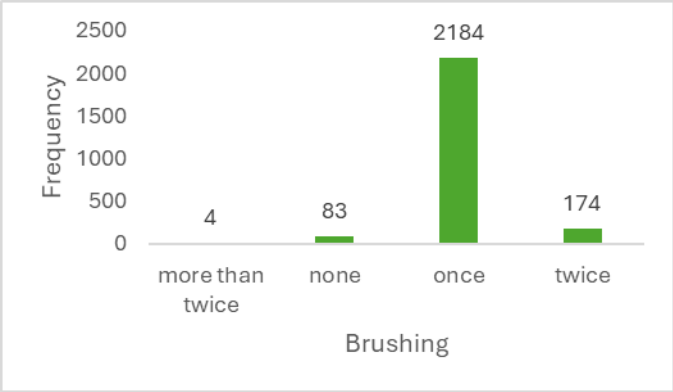

Figure 5: Toothbrushing frequency among study participants.

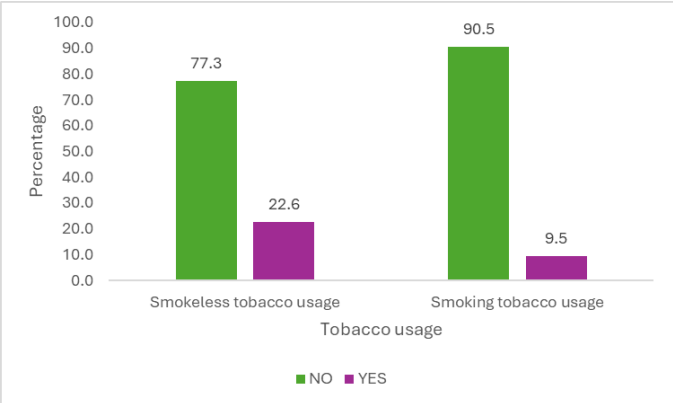

Figure 6: Usage of smokeless and smoking tobacco among study participants.

The screened population essentially does not exhibit alcoholism, with only 237 individuals, accounting for 10% of the population, showing this deleterious habit. These findings suggest that alcoholism is relatively uncommon within the study population.

Age-stratified analysis (Figure 8) revealed variations in both smokeless and smoked tobacco use among public transport drivers. Smokeless tobacco use increased progressively with age, from 11.5% among drivers aged less than 20 years to 25.6% among those aged over 50 years. The highest prevalence of smokeless tobacco consumption was observed in the >50 years age group, followed by drivers aged 41–50 years (24.5%) and 21–30 years (23.3%). Drivers aged 31–40 years reported a prevalence of 22.0%.

In contrast, smoked tobacco use showed a different age-related pattern. The highest prevalence of smoking was observed among drivers aged 21–30 years (11.7%), followed by those aged 31–40 years (10.0%). Lower smoking prevalence was noted among drivers aged 41–50 years (8.4%) and those over 50 years (8.8%), while the lowest prevalence was reported among drivers aged less than 20 years (4.6%). Overall, smokeless tobacco use was more prevalent than smoked tobacco use across all age groups.

Among the 785 individuals with any form of tobacco habit, 98 presented with lesions, representing 4.0% of the total screened population. 14 with ulcers, 83 with white patch/red patch lesions, while one individual showed OSMF (Figure 9). These findings indicate a notable association between tobacco use in any form and the presence of oral pathological conditions, underscoring the detrimental impact of tobacco on oral health. Six hundred one individuals with habits were referred for tobacco cessation counselling, whereas 184 individuals were referred for biopsy, along with the tobacco cessation counselling.

4. DISCUSSION

The "Chalo Smile" initiative screened 2445 public transport drivers in the Mumbai Metropolitan

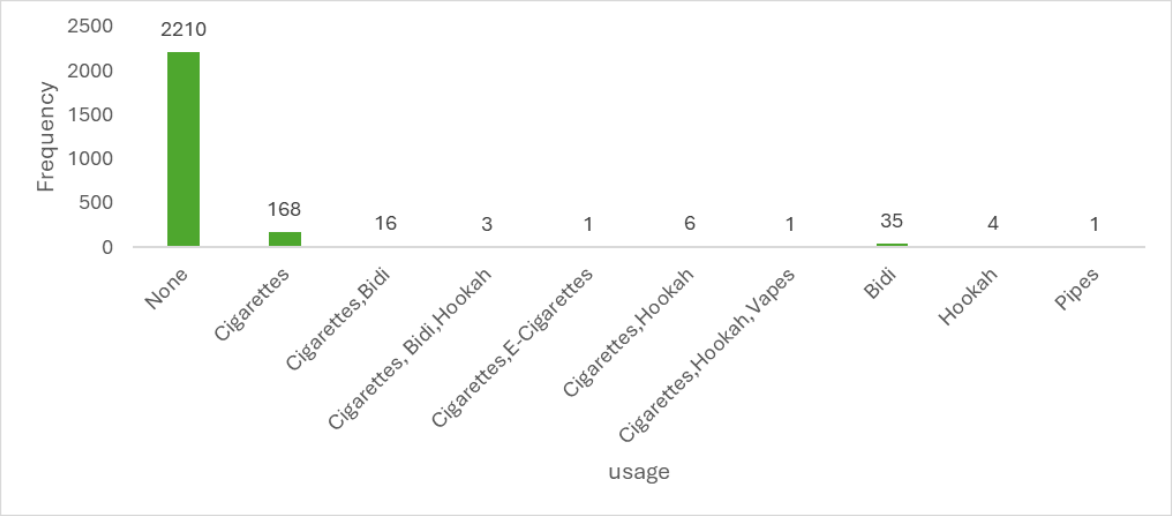

Figure 7: Smoking habit and tobacco usage among study participants.

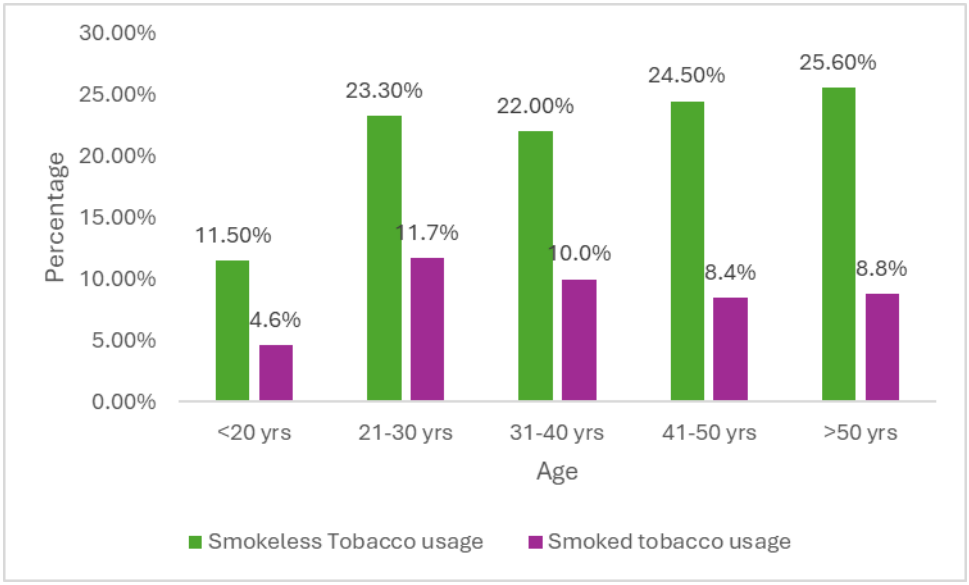

Figure 8: Age-wise distribution of smoking and smokeless tobacco usage among the study population.

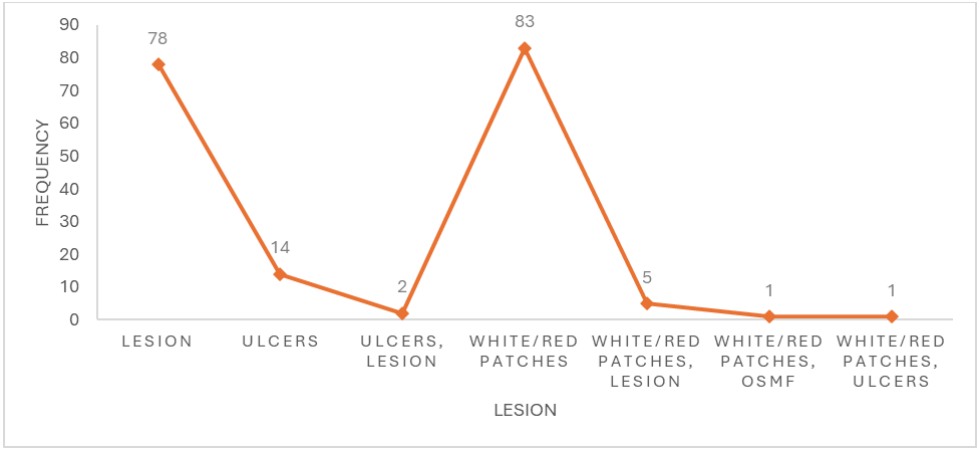

Figure 9: Distribution of oral lesions among study participants.

region, revealing substantial oral health challenges, particularly those linked to tobacco use. When compared with findings from previous studies involving similar occupational groups, the results of the present study underscore important public health implications.

In the present study, it was observed that 89.3% of drivers brushed their teeth once daily, while

only 7.1% brushed twice daily or more. This suboptimal oral hygiene behaviour is indicative of poor adherence to preventive oral hygiene practices and aligns with findings by Ahmed et al (Bawa & Srivastav, 2013), who reported that all bus drivers in their study brushed once daily. This suggests that awareness and practice of oral hygiene measures are limited among occupational groups such as public transport drivers. This behaviour may also be attributable to factors such as irregular work schedules, lack of oral health education, fatigue, or limited access to oral hygiene aids during long working hours.

Alcohol use was relatively uncommon in our study (10%), contrasting with the higher rates reported by Bawa & Srivastav et al (Patil & Yogeshkumar, 2023), where 23% of drivers consumed alcohol. Differences may reflect variations in study populations, increased public awareness, or underreporting. Despite its lower prevalence, alcohol remains a concern due to its synergistic carcinogenic effect when combined with tobacco.

We found that 32.1% of the participants used some form of tobacco, predominantly gutka (267 individuals), followed by paan masala and khaini. About 7.1% had oral pathologies, including lesions, white/red patches or ulcers. These findings differ from those of Patil et al (Ayyappa et al., 2019), who reported a tobacco use prevalence of 62.17% among auto-rickshaw drivers in Belagavi, with 30.17% showing oral premalignant lesions such as leucoplakia (18.83%) and OSMF (14%).

The lower prevalence of tobacco use in our study compared with previous research (Chandra & Govindraju, 2012; Ayyappa et al., 2019; Arora et al., 2018; Choudhury et al., 2022; John et al., 2016; Francis & Sp, 2024) may be attributed to several factors. Firstly, regional variations in tobacco use habits across different parts of India, such as the drivers in the Mumbai Metropolitan Region, may have had greater exposure to tobacco control messaging or access to cessation services. Secondly, methodological differences such as sample size, selection, and self-reporting bias may have influenced the results. Finally, evolving awareness and regulatory measures over time may have contributed to declining tobacco usage in metropolitan areas. Nevertheless, both our findings and previous literature confirm a strong association between smokeless tobacco use and oral lesions, reinforcing the need for tobacco cessation programs.

Overall, our results emphasize the need for targeted oral health promotion initiatives within this occupational group. Educational interventions, routine oral health screening at workplaces, and health policy reforms that incorporate oral hygiene into general occupational health programs could help improve oral hygiene practices, thereby reducing the burden of oral diseases among drivers. Furthermore, the data underscore the importance of tobacco cessation counselling, and community-level health education for public transport drivers (Mishra et al., 2022). The "Chalo Smile" project successfully addressed this gap in Mumbai and its peripheries, setting a benchmark for similar initiatives across India.

4.1 Limitations

This study had several limitations that should be acknowledged. First, data collection relied on self-reported responses, which may be influenced by recall bias or social desirability bias, particularly concerning sensitive habits like tobacco and alcohol use. Second, the study utilized convenience sampling based on participant availability at selected transport hubs, which may limit the generalizability of the findings to all public transport drivers in the region. Third, as the screenings were conducted only once during the campaign period, there was no opportunity for follow-up evaluations to assess progression or resolution of identified oral conditions. Additionally, the field-based nature of the study, conducted in remote or on-road environments, may have constrained the ability to carry out thorough clinical assessments. Finally, the lack of subgroup analyses by age, gender, or driving category (e.g., auto vs. taxi vs. bus drivers) limits the depth of insight into specific at-risk groups within the study population.

5. CONCLUSION

The "Chalo Smile" project screened 2,445 public transport drivers across 27 locations in the Mumbai Metropolitan Region. The campaign identified key risk factors, with 32.1% using tobacco (primarily gutka), 10% consuming alcohol, and 7.1% exhibiting oral pathologies such as white/red patches, ulcers, or signs of oral submucous fibrosis. Although 89.3% reported brushing once daily, only 7.1% practiced optimal oral hygiene by brushing twice daily. The initiative facilitated 601 referrals for tobacco cessation and 184 for biopsy.

These findings provide practical insights and programmatic implications for future programs to improve oral health among transport workers. The project lays a strong foundation for scaling community-level interventions to reduce tobacco-related oral diseases among transport workers. Continued efforts should focus on sustained education, early diagnosis, and targeted intervention

strategies to mitigate the burden of oral disease in this critical workforce.

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Corporate Partner: Hindustan Petroleum Corporation Limited.

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Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this manuscript.

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