Original Article

Oral Precancer and Cancer Awareness Among Indian Long Distance Heavy Vehicle Drivers – A Marginalized Population

Sivaramakrishnan Muthanandam[1], Jananni Muthu[2*], Bontha Veerabahu Babu[3], Suganya Rajaram[1], Shivashankar Kengadharan[4]

[1]Department of Oral and Maxillofacial Pathology and Oral Microbiology, Sri Balaji Vidyapeeth University, Pondicherry, India. [2]Department of Periodontology, Sri Balaji Vidyapeeth University, Pondicherry, India. [3]Division of Socio-Behavioural & Health Systems Research (SB&HSR), Indian Council of Medical Research, New Delhi, India. [4]Department of Public Health Dentistry, Sri Balaji Vidyapeeth University, Pondicherry, India.

Abstract

Long-distance heavy vehicle drivers are marginalized population. Literature search revealed lack of data on this group's awareness, attitude and knowledge about oral cancer. This survey assessed the same among the mentioned who stop in and around Pondicherry. This is a part of the larger research project, funded by ICMR. 2340 heavy vehicle operators responded to a pre-validated questionnaire. The responses were expressed as frequency of means and total knowledge scores were expressed as mean and standard deviations. 67.7% of the participants knew what is oral pre-cancer and cancer. A small 8.9% responded that all smoking, smokeless tobacco, and alcohol can be a cause of oral cancer whilst the majority chose smokeless tobacco as the cause. Only 16% thought that oral cancer is preventable. Responding to questions that could reflect their attitude towards oral cancer awareness, 94.1% were willing to know more about oral cancer and 59% did not want to know about oral cancer. The mean knowledge score of the group is 6.35 ± 4.21. On correlating the age to total knowledge score, a positive correlation was observed (0.65; p = 0.002), but education status and total scores showed a negative correlation (-0.202; p=0.000). Awareness about oral cancer is inadequate among long-distance truck drivers in India. The majority of the population is not aware of the risks, signs, or treatment options of oral pre-cancer and cancer. Results indicate that we need to carry out educational campaigns aiming at the prevention and early diagnosis of oral cancer in this population.

Keywords: *Oral cancer, Oral precancer, Cancer prevention, Awareness, Knowledge, Truck drivers*

Introduction

Globally, there are significant variations in oral cancer indices and mortality rates; nevertheless, India and its neighbouring nations have the highest rates of both incidence and prevalence of oral cancer, making it one of the top three cancer kinds.[1] The real challenge in the control of oral cancer lies in early diagnosis and prevention. Assessment of existing awareness about oral cancer and the creation of the right awareness is considered one of the primary steps in its prevention.[2] Awareness and health-seeking practices are poor in many developing countries, necessitating the need for proper awareness programs.[3]

Long-distance heavy vehicle drivers are transport workers who are on the road for prolonged periods away from home base. This population is stressed by long and irregular working hours, minimal income, feel of being away from family for a long, etc.[4] To overcome these and to avert sleep during work, they are commonly reported to use various substances such as tobacco, alcohol, drugs, etc to an extent of becoming addicted.[5] Apart from these, it is also reported that they use tobacco as a means to cope with hunger & frustration, increase energy & awareness, boost morale, for relaxation, or something to do while driving.[6]

Prevalence of tobacco use was reported to be 31.4% for smoking and the rest 62.8% for smokeless tobacco products among routine Truck drivers in Chennai.[7] The prevalence of smokeless tobacco use among truck drivers in Mumbai was reported to be 75.3%.[8] Hence it can be assumed that this is a population at risk for oral precancer and cancer. A literature search revealed no studies regarding the awareness and attitude of this population in India towards oral cancer and precancer.

Rather than the aforementioned, we suggested investigating Self-Screening & Care for Oral Cancer Prevention & Eradication (SCOPE) – A Model for Long Distance Heavy Vehicle Drivers: A Marginalised Population. The Indian

How to cite this article: Muthanandam S, Muthu J, Babu BV, Rajaram S, Kengadharan Sh. Oral Precancer and Cancer Awareness Among Indian Long Distance Heavy Vehicle Drivers – A Marginalized Population. Clin Cancer Investig J. 2024;13(3):1-5. https://doi.org/10.51847/SWOyiJX8bo

Address for correspondence:
Jananni Muthu,
Department of Periodontology, Sri Balaji Vidyapeeth University, Pondicherry, India.
E-mail: jannpearl@gmail.com

Access this article online

Website: www.ccij-online.org

DOI: 10.51847/SWOyiJX8bo

Quick Response Code:

Council of Medical Research (ICMR) funded this investigation. This paper presents a part of the project that aims to assess the knowledge, attitude, and perception of long-distance heavy vehicle drivers regarding oral cancer and precancers in India.

Materials and Methods

This observational, cross-sectional cohort study is part of a larger research project, Self-Screening & Care for Oral Cancer Prevention & Eradication (SCOPE) – A Model for Long Distance Heavy Vehicle Drivers: A Marginalized Population. Prior permission from the Heavy Vehicle Operators Association was obtained for the implementation of the research project. This research was approved by the institutional ethical committee. We included those participants who were registered with the Heavy Vehicle Operators Association and were on roads, away from home for a minimum of 3 months. Heavy vehicle drivers who stopped by industries in Cuddalore, Pondicherry, and truck laybys on Thindivanam, and Villupuram Chennai national highways were selected. The study was conducted in the industrial premises or on the Truck laybys after prior and due permissions from the concerned authorities.

A total of 2350 willing participants were asked to participate in the survey. Informed consent was obtained from the participants of the study subjects after explaining to them the aim of the study and the methods employed. Both drivers and assistants per vehicle were included in the study. The survey was conducted using a pre-validated questionnaire. There were items on the questionnaire that only had one possible answer. First, what knowledge do you have regarding oral cancer? The remaining survey questions were presented to those who selected "yes." Two dental specialists with training and a research assistant specifically trained for the assignment conducted the entire survey.

The willingness to participate was less and they had to be explained in detail about the importance and usefulness of the project. It took some time to convince the people. The survey was conducted using three languages based on the comfort of the participants: English, Tamil, and Hindi. The questions were given in printed form and their verbal responses were recorded by the project assistant directly into the online forms. Only a few people were of languages other than the three used. The responses for each item were converted into numerical scores and were totaled to arrive at the knowledge score of the individual. The minimum score was 4 and the maximum score was 15. The scores were not further categorized for interpretation but the scores that were closer to 4 were considered as poor knowledge and as scores increased, it was interpreted as an increase in knowledge the scores toward 15 were considered good knowledge.

Following the first round of survey completion, a programme to raise awareness about oral precancer and cancer was held. Interpersonal communication provided accurate information about tobacco hazards to those who were ignorant of them or uninformed about them. The gathered information was imported into SPSS Version 19.0 and used for analysis.

Results and Discussion

A total of 2340 subjects partook in the survey. The participant's age ranged from 18 years to 77 years. They comprised Lorry drivers, lorry cleaners, and/or mechanics. Few long-distance vehicles had 2 drivers and 1 cleaner, few had 1 driver and 2 accompanying persons. Overall, there was a minimum of 2 people to a maximum of 4 people per vehicle. The age ranged from 18-65 years.

The socioeconomic status of the group was assessed using a modified Kuppuswamy scale.[9] Here their educational status is used to compare the knowledge scores. 3.4% of the population were illiterate. 27.2% had completed primary school, 46.2% had completed middle school and 18.6% had completed High school. 3.6 & had intermediate or diploma and 0.5% were graduates. Of the entire population surveyed, only 15.1% had no tobacco-related habits. The rest were using smoking, smokeless, or both forms of tobacco at the time of the survey **(Table 1)**.

Table 1. Frequency distribution based on education & tobacco & related habits

	Frequency	Percentage
TYPE OF HABIT		
Nil	341	14.5
Smoking	370	15.7
Smokeless	665	28.3
Both	964	41.0
EDUCATION STATUS		
Illiterate	80	3.4
Primary school certificate	640	27.2
Middle school certificate	1086	46.2
High school certificate	438	18.6
Intermediate or Diploma	85	3.6
Graduate	11	.5

On analyzing the survey responses, 67.7% knew about oral cancer and 32.3% answered that they did not have any knowledge of oral cancer. On analysis of their responses to their knowledge on causes of oral cancer, 36.6% of participants answered that smoking causes oral cancer, 46.8% responded that chewing tobacco can be the cause, 7.7& thought that consumption of alcohol causes oral cancer, and only meager 8.9% responded that all of the above can be a cause **(Table 2)**.

Table 2. Frequency of responses regarding knowledge, awareness, and attitude towards oral precancer and cancer and its treatment modalities

	Yes		No	
	n	%	n	%
Do you know about oral cancer / Pre cancer?	1592	67.7 %	748	32.3%

Which of the following do you think causes oral cancer / Pre cancer?				
Smoking	848	36.6 %	-	-
Chewing tobacco	1101	46.8 %	-	-
Alcohol	182	7.7 %	-	-
Any of above	209	8.9 %	-	-
Which of the following do you think is oral cancer / Pre cancer?				
Growth of tissue	496	21.1 %	-	-
Ulcer	584	24.8 %	-	-
Red color change	829	35.3 %	-	-
White color change	275	11.7 %	-	-
Reduced mouth opening	128	5.4 %	-	-
Any of the above	28	1.7 %	-	-
What do you think about the following statements?				
Oral cancer can kill	1015	43.3 %		
Oral cancer prevention is possible	1238	52.9 %		
Oral cancer treatment is possible if detected early	87	3.7 %		
Which of the following do you think is the treatment for oral cancer?				
Medicines	923	39.4 %		
Surgery	1064	45.4 %		
Both	353	15.2 %		
Would you like to know more about oral cancer?	2201	94.1 %	139	5.9 %

For the question of what they thought might be oral cancer, 21.1% of participants answered that it is the growth of tissue, 24.8 participants thought that an ulcer might be oral cancer 35.3% answered that a red lesion could be oral cancer and 11.7 % responded that white color changes could be oral cancer. 5.4. % answered reduced mouth opening and 1.7% for white lesion to be oral cancer. Regarding their responses to statements on oral cancer, 43.3% thought that oral cancer could kill, 52.9% agreed to the statement that oral cancer prevention is possible and 3.7% agreed that oral cancer treatment is possible if detected early **(Table 2)**.

On assessing their knowledge regarding the treatment of oral cancer, 39.4% responded medicines are the cure, 45.4% thought that surgery is the treatment and 15.2% responded that the treatment of oral cancer involved both medicine and surgical approaches. Responding to questions that could reflect their attitude towards oral cancer awareness, 94.1% were willing to know more about oral cancer and 59% did not want to know about oral cancer **(Table 2)**.

The total knowledge scores for each individual were calculated by summing the scores for each response. The minimum obtained score was 5 and the maximum obtained score was 9. 13.41% obtained a score of 4, 39.57% obtained 5, and 35.56% obtained 6. A total knowledge score of 7, 8, and 9 were scored by 7.01%, 3.24%, and 1.21% respectively. The mean score of the group is 6.35 ± 4.21 **(Figure 1)**.

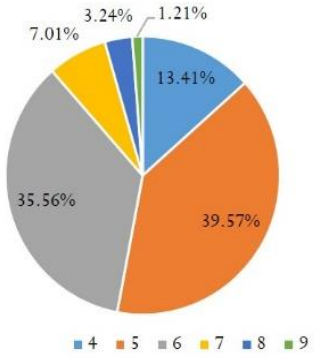

Figure 1. Frequency distribution of total knowledge score of the population

On correlating the age of participants to their total knowledge score, a positive correlation was observed (0.65; p = 0.002), but a negative correlation was observed with education status and total scores (-0.202; p=0.000). As age advanced, they were better informed. On comparing the attitude of the subjects (those who were willing and not willing to know more about oral cancer) to the total knowledge score, the mean total score of those who responded negatively was 4.42 ± 0.89 and 5.53 ± 0.94 for positive responders. This mean difference was statistically significant (p = 0.001) **(Table 3)**.

Table 3. Correlation between age, knowledge score, and education

		Age	Total score	Education
Age	Pearson Correlation	1	.065**	-.093**
	p-value		.002	.000
	N	2337	2337	2337
Total score	Pearson Correlation	.065**	1	-.202**
	p-value	.002		.000
	N	2337	2340	2340
Education	Pearson Correlation	-.093**	-.202**	1
	p-value	.000	.000	
	N	2337	2340	2340

Long-distance heavy vehicle drivers are identified marginalized population in Western countries. Overall 9.3 million truck drivers are registered in India and this sector has received scant routine medical attention, the main reason being that they spend a long time on the roads.[10] Hence they can be regarded as a marginalized population in India too. Working on heavy vehicles is demanding both physically and mentally. Due to long working hours and away from home and family, they tend to develop a variety of adverse habits. Long-term use of alcohol, tobacco, and tobacco-related habits are prevalent among this population.[7, 8] Tobacco and related products rank first among the etiologic factors for oral cancer. Oral cancer is one of the types of cancer that causes morbidity and mortality in the Indian sub-continent. In India, the wide ethnic, socioeconomic, and cultural group exists.

The key to control lies in prevention. To the best of our knowledge, there is no data on steps taken to educate them regarding oral cancer or a targeted model for oral cancer prevention for this marginalized population. So we designed a project, Self-Screening & Care for Oral Cancer Prevention & Eradication (SCOPE) – A Model for Long Distance Heavy Vehicle Drivers: A Marginalized Population which is funded by the Indian Council of Medical Research (ICMR), Gov. of India. This paper presents findings from part of the project aiming to assess the knowledge, attitude, and perception of long-distance heavy vehicle drivers regarding oral cancer and precancers in India.

Of the entire population surveyed, only 15.1% had no tobacco-related habits. The rest were using smoking, smokeless, or both forms of tobacco at the time of the survey. A survey of Brazilian truck drivers reported a prevalence of 21.1%.[11] However, a high prevalence of tobacco use was reported: 31.4% for smoking and the rest 62.8% for smokeless tobacco products among routine Truck drivers in Chennai.[7] The prevalence of smokeless tobacco use among truck drivers in Mumbai was reported to be 75.3%.[8] Of truck drivers in Dakshina Karnataka, 26.6% were current users of tobacco.[5] A similar high prevalence of tobacco-related habits and alcohol was reported by truck drivers across India.[10] This high level of tobacco consumption is of concern as it is identified as a major etiology of oral cancer. In an interview truck drivers stated that tobacco acted as a stimulant helping them stay awake while driving at night and alcohol is used as the resort of relief after long working hours.

A total of 2340 participants were included in the survey from a period of 2022 - 2023. 3.4% of the population were illiterate. 27.2% had completed primary school, 46.2% had completed middle school and 18.6% had completed High school. 3.6% had intermediate or diploma and 0.5% were graduates. A study reported that 69.81% of Nigerian truck drivers had a high school education and 8.3% had post-secondary school education.[12]

Regarding their knowledge of oral cancer, 67.7% knew about oral cancer and 32.3% answered that they did not have any knowledge of oral cancer. But on analyzing the overall knowledge score, 13.41% obtained a score of 4, 39.57% obtained 5, and 35.56% obtained 6. A total knowledge score of 7, 8, and 9 were scored by 7.01%, 3.24%, and 1.21% respectively. Since most scores were towards 5, the knowledge can be considered to be poor to average. Though most of them knew about oral cancer, only a few had factual knowledge. Similar results were reported by Fernanda *et al*.: 64.4% did not have any formal knowledge about oral cancer.[13]

The mean knowledge score in our study was 6.35 ± 4.21. Oyapera A has reported a mean knowledge score of 3.41 ± 2.64 out of 15 among Transport workers in Nigeria.[14] Sunar *et al*. reported that 79% of truck drivers did not have adequate knowledge about risk factors for oral cancer.[15] On correlating the age of participants to their total knowledge score, a positive correlation was observed (0.65; p = 0.002). On correlating education status with total scores, a negative correlation emerged (-0.202; p=0.000). The knowledge of the truck driver population was influenced by age: as age advanced, they were better informed. Rupel *et al*.[16] and Azimi *et al*.[17] reported that among the random population, oral cancer a*wareness was significantly influenced by gender and higher education, but not by age*.[16] This study showed a negative correlation between education status and total knowledge scores. Azimi *et al*. reported that participants with less than a high school education were significantly less aware, and had much less knowledge, of the signs and risk factors of oral cancer.[17]

As a result, most participants knew very little about oral cancer, including its symptoms, causes, treatment options, and prevention. The findings suggest that educational initiatives aimed at preventing and early diagnosing oral cancer in this community are necessary. The National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) operates to identify the gaps in the knowledge of the people regarding the said ailments generation of awareness is one of the key strategies of the program.[18, 19] The need for a reduction in the incidence of oral cancer among such marginalized populations should be included in NPCDS targets. An overall health promotion strategy to reduce cancers should include oral cancer as a priority. The findings of this study may help to fill in information about high-risk groups with low cancer awareness. Going a step further, this study will enhance prevention by identifying oral cancer early and requiring quick referrals.

Conclusion

The results of this study demonstrate that this underprivileged Indian population does not have enough knowledge regarding mouth cancer and precancer. The majority of the participants are not aware of the risks, signs, or treatment options of cancer. Said that they use tobacco and related products frequently and also have fair to poor knowledge about oral cancer and pre-cancer, a targeted screening approach for oral precancer and cancer is very essential and this program should aim to impart knowledge and assist them in habit cessation.

Acknowledgments
None.

Conflict of interest
None.

Financial support
This project is funded by the Indian Council of Medical Research (ICMR), Gov of India. Self-Screening & Care for Oral Cancer Prevention & Eradication (SCOPE) – A Model for Long Distance Heavy Vehicle Drivers: A Marginalized Population. (IRISCell – 2021-14081).

Ethics statement
This study was initiated after obtaining clearance from the

Institutional Ethical Committee. IGIDSIEC2019NRP05FASMOPM.

References

1. Sankaranarayanan R, Ramadas K, Thomas G, Muwonge R, Thara S, Mathew B, et al. Effect of screening on oral cancer mortality in Kerala, India: A cluster-randomised controlled trial. Lancet. 2005;365(9475):1927-33.
2. Sahu DP, Subba SH, Giri PP. Cancer awareness and attitude towards cancer screening in India: A narrative review. J Family Med Prim Care. 2020;9(5):2214-8.
3. Montazeri A, Vahdaninia M, Harirchi I, Harirchi AM, Sajadian A, Khaleghi F, et al. Breast cancer in Iran: Need for greater women awareness of warning signs and effective screening methods. Asia Pac Fam Med. 2008;7:6.
4. Okpataku CI. Pattern and reasons for substance use among long-distance commercial drivers in a Nigerian city. Indian J Public Health. 2015;59(4):259-63.
5. Madonna A, Shetty P, Shetty UA. Targeted screening programme for early detection of oral malignant and potentially malignant lesions using the oral rub and rinse technique among truck drivers in Dakshina Kannada district− A cross-sectional study. J Orofac Sci. 2019;11(2):89-92.
6. Rose S, Wojcik J. The health habits and physical activity of student truck drivers. Winthrop McNair Res Bull. 2015;1:68-76.
7. Kumar PD, Loganathan K, Kannan R, Roa UD, Bhagiyalakshmi AN. "Vaai Ganam"-A screening program for early detection of oral potentially malignant disorders and oral cancer among truck drivers in Chennai–A cross-sectional survey. Int J Occup Saf Health. 2024;14(1):117-23.
8. Neha K, Kunal O, Neha G, Lakshman S, Paul S. Prevalence of smokeless tobacco use and oral pre-malignant lesions among heavy load truck drivers and general male population in Mumbai, India. Tob Induc Dis. 2021;19(1):A100. doi:10.18332/tid/141034
9. Wani RT. Socioeconomic status scales-modified Kuppuswamy and Udai Pareekh's scale updated for 2019. J Family Med Prim Care. 2019;8(6):1846-9.
10. Chanda S, Radhawa S, Bambhra H, Fernandas T, Dogra V, Hegde S. Bridging the gaps in health services delivery for truck drivers of India through mobile medical units. Indian J Occup Environ Med. 2020;24(2):84-90.
11. Fernandas IA, Alves RG, Lucchese R, Vera I, de Brito R, Ramos CB, et al. Epidemiology of tobacco use and nicotine dependence in truck drivers. Rev Saude Publica. 2023;56:108.
12. Ajayi AP, Mazinyo SP. Socioeconomic situation and substance use disorder influence on safety practices among truckers. Open Transp J. 2020;14(1):75-85.
13. Fernanda Z, Lucio AM, da Cruz AE, Silvio RC. Knowledge and risk factors of oral cancer in prevention program for truck drivers. Odontol Clin Cient. 2011;10(3):233-6.
14. Oyapero A, Oyapero O, Akinleye AI. Characteristics, demographic factors and predictors of oral cancer knowledge and risk perception among road transport workers in Nigeria. In:Raphael D, Kapalanga J, Meunier Y(eds) Perspectives on International Research on Science in Africa. London: Cambridge Scholars Publishing; 2021.pp 1-29.
15. Sunar S, Gayathri R, Vishnu V. Awareness of smoking and oral cancer among economically backward society – A survey. Drug Inven Today. 2019;11(5):1127.
16. Rupel K, Biasotto M, Gobbo M, Poropat A, Bogdan Preda MT, Borruso G, et al. Knowledge and awareness of oral cancer: A cross-sectional survey in Trieste, Italy. Front Oral Health. 2023;4:1056900.
17. Azimi S, Ghorbani Z, Ghasemi E, Tennant M, Kruger E. Disparities in oral cancer awareness: A population survey in Tehran, Iran. J Cancer Educ. 2019;34(3):535-41.
18. Patil KM, Swaroop N, Arin K, Agarwal P, Jayanna K, Damme W. A narrative review of gaps in the provision of integrated care for non-communicable diseases in India. Public Health Rev. 2020;41:8.
19. Government of India. National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS). 2020. Available from: http://www.nrhmhp.gov.in/sites/default/files/files/NCD_Guidelines.pdf