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Raising Awareness of Oral Precancer and Cancer Among Indian Long-Distance Heavy Vehicle Drivers: A Neglected Group

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Abstract

Long-distance heavy vehicle drivers are often a marginalized group, with limited research on their awareness and understanding of oral cancer. This survey, part of a larger research project funded by the ICMR, aimed to assess the knowledge, attitudes, and awareness of oral cancer among truck drivers who regularly stop in and around Pondicherry. A total of 2340 truck drivers participated by completing a pre-validated questionnaire. Responses were analyzed based on frequency and total knowledge scores, with means and standard deviations. Approximately 67.7% of participants were aware of oral pre-cancer and cancer. Only 8.9% correctly identified smoking, smokeless tobacco, and alcohol as potential causes of oral cancer, and most respondents attributed this condition mainly to smokeless tobacco. Only 16% of the participants believed that oral cancer is preventable. Regarding attitudes toward oral cancer awareness, 94.1% expressed interest in learning more, while 59% showed no interest in gaining more knowledge. The mean knowledge score of the participants was 6.35 ± 4.21. A positive correlation was found between age and knowledge scores (0.65; P = 0.002), while education level showed a negative correlation (-0.202; P = 0.000). The results indicate a significant gap in oral cancer awareness among long-distance truck drivers in India and emphasize the need for targeted educational initiatives focused on prevention and early diagnosis in this group.

Keywords: Oral precancer, Oral cancer, Awareness, Knowledge, Prevention, Truck drivers

Introduction

Oral cancer remains a significant health issue worldwide, with India and its neighboring countries recording some of the highest rates of both incidence and mortality, placing it among the top three cancers globally [1]. Early detection and prevention are essential in managing oral cancer effectively. Raising awareness and understanding about oral cancer is a key step in preventing it [2]. Unfortunately, awareness and health-seeking behaviors are often lacking in many developing countries, making it crucial to implement proper educational programs [3]. Long-distance truck drivers, a subgroup of transport workers, often face numerous stressors, including extended hours on the road, irregular schedules, and financial struggles. These drivers are also frequently isolated from their families for long periods, which adds to their emotional stress [4]. To cope with these challenges and stay alert, many drivers turn to substances like tobacco, alcohol, and other drugs, sometimes becoming dependent [5]. Tobacco use, in particular, is common among these workers, as it helps manage hunger, reduce stress, and maintain energy while driving [6-12].

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Research has shown that tobacco use is prevalent among truck drivers, with 31.4% of drivers in Chennai using smoking tobacco, and 62.8% using smokeless tobacco products [7]. Similarly, a study in Mumbai reported that 75.3% of truck drivers used smokeless tobacco [8]. This high prevalence places truck drivers at a greater risk of developing oral precancer and cancer. Despite this, there is a lack of studies investigating the awareness and attitudes of truck drivers in India toward oral cancer and precancer.

This paper is part of a larger research project, funded by the Indian Council of Medical Research (ICMR), which aims to assess the knowledge, attitudes, and perceptions of long-distance truck drivers regarding oral cancer and precancers. The study focuses on exploring self-screening and preventive care models to promote oral cancer awareness in this often-overlooked population.

Materials and Methods

This study is a part of the self-screening and care for oral cancer prevention and eradication (SCOPE) project, which focuses on long-distance heavy vehicle drivers, a marginalized population. The study was approved by the institutional ethics committee and received permission from the Heavy Vehicle Operators Association to conduct the research.

The study included drivers who were members of the Heavy Vehicle Operators Association and had been away from home for a minimum of three months. Participants were recruited from truck laybys in Pondicherry, Cuddalore, Thindivanam, and Villupuram, located along the Chennai national highways. All necessary permissions were obtained from the relevant authorities before conducting the study at these locations.

A total of 2,350 drivers and their assistants were invited to participate in the survey. Informed consent was obtained after explaining the study's objectives and methodology. The survey used a pre-validated questionnaire, which featured closed-ended questions. The first question assessed the participant’s knowledge of oral cancer, and follow-up questions were given only to those who affirmed their understanding. The survey was carried out by two trained dental specialists and a research assistant, all specifically prepared for the task.

Initial participation was low, and it took time to convince participants about the importance of the study. The survey was conducted in three languages (English, Tamil, and Hindi) based on participant preferences. The questions were printed in written form, and responses were recorded by the research assistant in an online database.

The responses were quantified into numerical scores ranging from 4 to 15, with lower scores indicating poor knowledge and higher scores representing better knowledge. After the initial survey, a follow-up awareness program was held to inform participants about oral cancer and precancer. The information gathered was then analyzed using SPSS software, version 19.0, to assess the knowledge levels of the participants.

Results and Discussion

The survey was completed by 2,340 participants, with ages ranging from 18 to 77 years. The group included lorry drivers, cleaners, and mechanics, with some vehicles having two drivers and one cleaner, while others had one driver and two assistants. Typically, each vehicle had between 2 to 4 individuals. The age of participants fell between 18 and 65 years.

To assess their socioeconomic status, a modified Kuppuswamy scale was used, and their educational background was compared to the knowledge scores. Among the participants, 3.4% were illiterate, 27.2% had completed primary education, 46.2% had completed middle school, and 18.6% had finished high school. Around 3.6% had received an intermediate or diploma qualification, and 0.5% were graduates.

In terms of tobacco use, 15.1% of the participants reported no use of tobacco products, while the remaining respondents used either smoking or smokeless tobacco, or both **(Table 1)**.

Table 1. Frequency distribution based on education and tobacco and 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

Upon analyzing the survey responses, 67.7% of participants were aware of oral cancer, while 32.3% reported not knowing it. Regarding the causes of oral cancer, 36.6% identified smoking as a cause, 46.8% pointed to chewing tobacco, 7.7% believed alcohol consumption was a cause, and only 8.9% correctly identified all of the above as potential causes **(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 %

In response to what they thought oral cancer could be, 21.1% of participants identified it as tissue growth, 24.8% believed it could be an ulcer, and 35.3% thought a red lesion could indicate oral cancer. Meanwhile, 11.7% suggested that white color changes in the mouth could be a sign, and 5.4% linked reduced mouth opening to the condition, while only 1.7% thought a white lesion could be oral cancer.

Regarding their understanding of oral cancer's severity, 43.3% agreed that it could be fatal, while 52.9% believed prevention was possible. Only 3.7% thought that early detection could lead to treatment **(Table 2)**.

When asked about oral cancer treatment, 39.4% thought medications could cure it, 45.4% believed surgery was the answer, and 15.2% felt a combination of both was required. Concerning attitudes toward awareness, 94.1% expressed interest in learning more about oral cancer, while 59% showed no interest in gaining further knowledge **(Table 2)**.

The knowledge scores were computed based on participants' responses. The lowest score was 5, and the highest was 9. 13.41% scored 4, 39.57% scored 5, and 35.56% scored 6. Only 7.01%, 3.24%, and 1.21% achieved scores of 7, 8, and 9, respectively. The average knowledge score for the group was 6.35 ± 4.21 **(Figure 1)**.

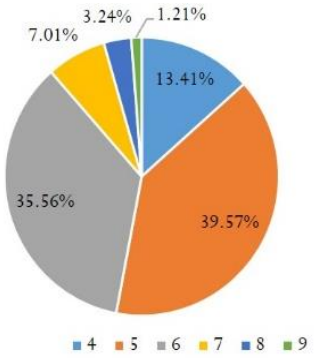

Figure 1. Frequency distribution of total knowledge score of the population

In examining the relationship between participants' age and their total knowledge scores, a positive correlation was found (0.65; P = 0.002), suggesting that older individuals tended to have more knowledge. Conversely, a negative correlation was observed between education level and total knowledge scores (-0.202; P = 0.000), indicating that those with lower educational attainment had less knowledge.

Regarding participants' willingness to learn more about oral cancer, the mean knowledge score for those not interested in gaining more knowledge was 4.42 ± 0.89, while it was 5.53 ± 0.94 for those willing to learn more. This 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 considered a marginalized group, even in Western countries. In India, approximately 9.3 million truck drivers are registered, but this sector often lacks sufficient medical attention, primarily because of the drivers' extended time spent on the road. As a result, they too can be classified as a marginalized population. The demanding nature of their work, combined with long hours away from family, often leads them to adopt various unhealthy habits, including alcohol and tobacco use. The long-term consumption of alcohol and tobacco is notably prevalent among this group. Tobacco and tobacco-related products are recognized as the leading causes of oral cancer, which is a major health concern in India, contributing significantly to morbidity and mortality.

India's diverse ethnic, socioeconomic, and cultural backgrounds contribute to the complexity of tackling health challenges like oral cancer. Prevention is key to controlling the disease, and it is concerning that there is no substantial data on initiatives designed to educate truck drivers about oral cancer or specific models targeting oral cancer prevention for this group. In response, we initiated the "self-screening and care for oral cancer prevention and eradication (SCOPE)" project, funded by the ICMR, aimed at developing a tailored approach for long-distance heavy vehicle drivers. This study represents part of the broader project that explores the knowledge, attitudes, and perceptions of long-distance truck drivers in India regarding oral cancer and precancers.

Among the surveyed population, only 15.1% were not involved in tobacco use. The remainder engaged in smoking, smokeless tobacco, or both. This finding aligns with a study conducted among Brazilian truck drivers, where tobacco use was also prevalent (21.1%). In Chennai, tobacco use among truck drivers was notably higher, with 31.4% smoking and 62.8% using smokeless tobacco. Similarly, in Mumbai, the prevalence of smokeless tobacco use among truck drivers was 75.3%. These statistics are concerning, as tobacco consumption is a known major cause of oral cancer. Interviews with truck drivers revealed that tobacco use helped them stay awake during long night drives, while alcohol consumption was often used to cope with the stress of long hours.

The survey conducted from 2022 to 2023 included 2,340 participants. Educational levels varied: 3.4% of the population were illiterate, 27.2% had completed primary school, 46.2% had attended middle school, and 18.6% had completed high school. Furthermore, 3.6% had an intermediate or diploma qualification, and 0.5% had attained a degree. These findings are similar to those from a study of Nigerian truck drivers, where 69.81% had a high school education, and 8.3% had post-secondary education.

Regarding oral cancer awareness, 67.7% of participants had heard of the disease, while 32.3% were unaware. However, when analyzing the knowledge scores, 13.41% scored a 4, 39.57% scored a 5, and 35.56% scored a 6. Only a small percentage achieved scores of 7 or higher, indicating that while most participants had some awareness of oral cancer, their knowledge was generally poor to average. This finding aligns with a study by Fernanda *et al*. [13], where 64.4% of participants lacked formal knowledge about oral cancer.

In our study, the average knowledge score was 6.35 ± 4.21. For comparison, Oyapera A's research among transport workers in Nigeria recorded a lower mean score of 3.41 ± 2.64 out of a possible 15 [14]. Similarly, Sunar *et al*. [15] discovered that 79% of truck drivers lacked adequate knowledge regarding oral cancer risk factors. We observed a positive correlation between age and total knowledge score (0.65; P = 0.002), indicating that older participants had a better understanding. However, a negative correlation emerged when comparing education

levels to total scores (-0.202; P = 0.000), suggesting that lower education levels were linked to lower knowledge of oral cancer. While studies by Rupel *et al*. [16] and Azimi *et al*. [17] indicated that gender and education played significant roles in oral cancer awareness, our findings contradicted this, showing that education status negatively correlated with knowledge. Azimi *et al*. [17] also noted that individuals with less than a high school education were less aware of oral cancer's signs and risks.

The results highlight that many participants had poor knowledge of oral cancer, including its symptoms, causes, prevention, and treatment. This lack of awareness calls for urgent educational interventions aimed at improving early detection and prevention of oral cancer within this community. The National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases, and Stroke (NPCDCS) works to address knowledge gaps in these areas, and raising awareness is a central strategy of this initiative [18, 19]. Including oral cancer prevention as a key target within the NPCDCS would help reduce the incidence of the disease in vulnerable populations. The findings from this study may inform efforts to educate and screen high-risk groups, ultimately leading to quicker diagnosis and intervention.

Conclusion

This study underscores the critical lack of awareness about oral cancer and precancers among the truck driver population in India. Most participants were unaware of the signs, risks, or treatment options associated with oral cancer. Given the high prevalence of tobacco use within this group, a targeted screening program for oral cancer and precancer is crucial. Such programs should focus on providing education and supporting tobacco cessation to help mitigate the risks associated with oral cancer.

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