

Original Research Article

PREVALENCE OF ORAL CARCINOMA AMONG YOUNGER INDIVIDUALS - A CROSS SECTIONAL STUDY

Running title: Prevalence of oral carcinoma among younger individuals

ABSTRACT -

Aim: To study the prevalence of oral cancer among younger individuals in India. **Introduction:** It helps us to study the prevalence, management, causative agents, signs and symptoms of oral cancer. Oral cancer is defined as an uncontrolled growth of tumour cells in the oral cavity. Cancer can occur in the tongue, lips, hard palate, and soft palate, floor of mouth, cheeks and mucosal layer. There is a wide range of variations in prevalence of oral cancer in different regions from minorities or sub-population. **Materials and methods:** The survey was carried out with Google forms and recorded 104 responses for 10 self prepared questionnaires. Responses collected were analyzed using SPSS software. The analysis shows that there was a significant awareness of oral cancer. **Results:** There was a significant level of awareness of oral cancer among younger individuals. The present observation shows statistically significant (0.032) between gender and awareness of prevalence by screening oral mucosa, by using Pearson Chi Square test with confidence level 95% with the value of 0.05. **Conclusion:** The important message is that early detection of asymptomatic early stages of cancer translates in general terms to satisfactory clinical outcome and cures in most cases.

KEYWORDS- Prevalence, Causative agents, Managements, Tumors, Clinical outcome.

INTRODUCTION-

Cancers are the most common cause of death in adults and are seen all ages. Oral cancer is one of the three most prevalent cancers in India. Causes of oral carcinoma can be alcoholism, tobacco

chewing, betelnut chewing, smokeless tobacco, etc., Oral cancer may also occur due to poor oral hygiene and poor diet. About 55-60% of oral cancer that occurs in India is squamous cell carcinoma.(1),(2). Previous studies have come up with a prediction that cancer may increase from 1 million to 1.7 million by the year 2035. And it also gives a proposal that cancer case prevalence is interrelated with the low income of the population.

Since a low income population is affected by factors like proper nutrition, healthcare, living surroundings and risk behaviors which contribute to the development of oral cancer. In recent years there has been no development in discovery of treatment of cancer strains (3). According to another study men are twice as likely to get oral cancer compared to women because of their risk behaviors. Basically oral cancer is divided into four stages. Treatment for oral cancer depends upon type, stage, and location of the tumor. It can be treated by surgery, radiotherapy, chemotherapy, targeted therapy, oral hygiene and nutrition. (4),(4,5),(6).

Apart from tobacco use and alcohol abuse, human papillomavirus has recently received special attention. HPV-16, a particular type of virus, has been indicated as an etiological agent for development of a subset of squamous cell carcinoma (7,8). There is a wide range of variations in prevalence of oral cancer in different regions from minorities or sub populations (9). The aim of the study is to create awareness on oral carcinoma and to study its prevalence in younger individuals in India (10).

The WHO (World Health Organisation) has conducted a GLOBAL ORAL HEALTH PROGRAMME which established a global surveillance system of oral cavity carcinoma in order to assess risk factors and to help the planning of effective national intervention programmes (11,12).

MATERIALS AND METHODS:

A descriptive cross sectional study was done to analyse knowledge, attitude, among younger individuals. Approval was obtained from the institutional board to conduct an online survey. The survey was carried among 104 younger individuals. The responses were collected, tabulated in the excel sheet and analyzed. Data was then entered into SPSS software version 23 and the results were obtained in bar graphs and pie charts. Chi square test was used to analyse and compare the educational level of students and their knowledge and awareness on oral cancers. The study was approved by Institutional Review Board, Saveetha Dental College and Hospitals, Saveetha Institute of Technical and Medical Sciences.

The following study was done using a survey containing the following self prepared questionnaire-

1. What are the major causative agents of oral cancer / carcinoma?
 - a) Tobacco chewing
 - b) Chain smoking
 - c) Usage of pan / gutkha
2. Is oral cancer / carcinoma a curable disease?
 - a) Yes
 - b) No
 - c) Maybe
3. At early stages of diagnosis is oral cancer completely curable?
 - a) Yes
 - b) No
 - c) Maybe
4. Is oral cancer a contagious disease?
 - a) Yes
 - b) No
 - c) Maybe
5. Are you aware of the diagnosis of oral carcinoma by screening oral mucosa?
 - a) Yes
 - b) No
6. Which method of treatment is more effective against oral cancer / carcinoma?
 - a) Surgery
 - b) Chemotherapy
 - c) Radiotherapy
7. How will you prevent yourself from oral cancer?
 - a) Education
 - b) Guidance from experts
 - c) Prevention of usage of tobacco products
 - d) All the above
8. How will you create awareness among others on oral cancer / carcinoma?
 - a) Education
 - b) Awareness programmes / camps

c) Social medias

9. Was this survey helpful to you in creating awareness on oral cancer/carcinoma ?

a) Yes

b) No

RESULTS -

The results for each questionnaire are discussed below according to the responses obtained from the online survey.

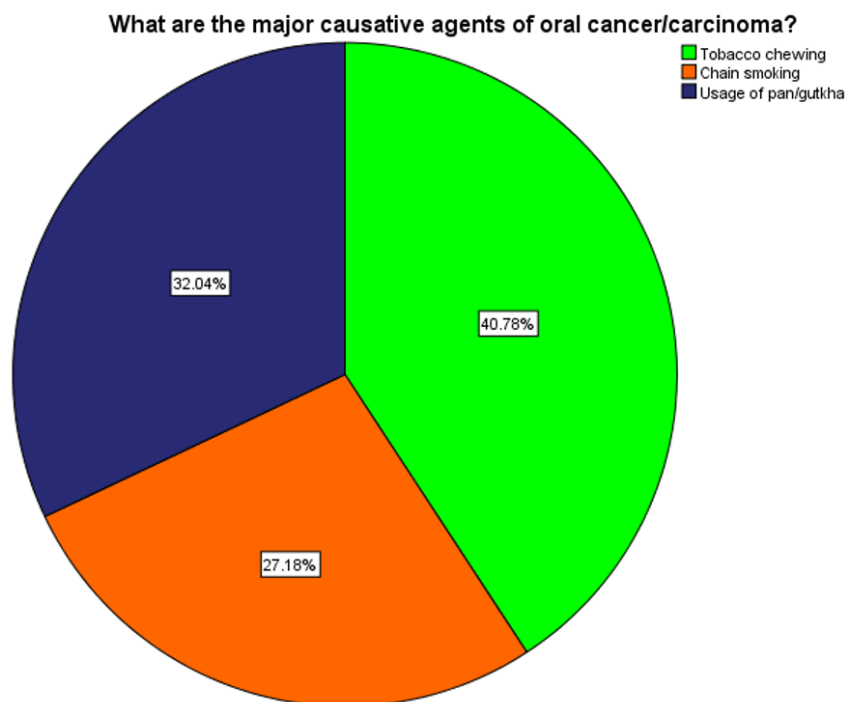


Figure 1 represents the different age groups and their responses to the question “major causative agents for oral cancer”. 40.78% of the population have stated that tobacco chewing (fluorescent green) is the major cause for oral carcinoma, 32.04% of the population have stated usage of pan/gutkha (dark blue) and 27.18% have stated chain smoking (orange) is the cause of oral cancer.

Which method of treatment is more effective against oral cancer/carcinoma ?

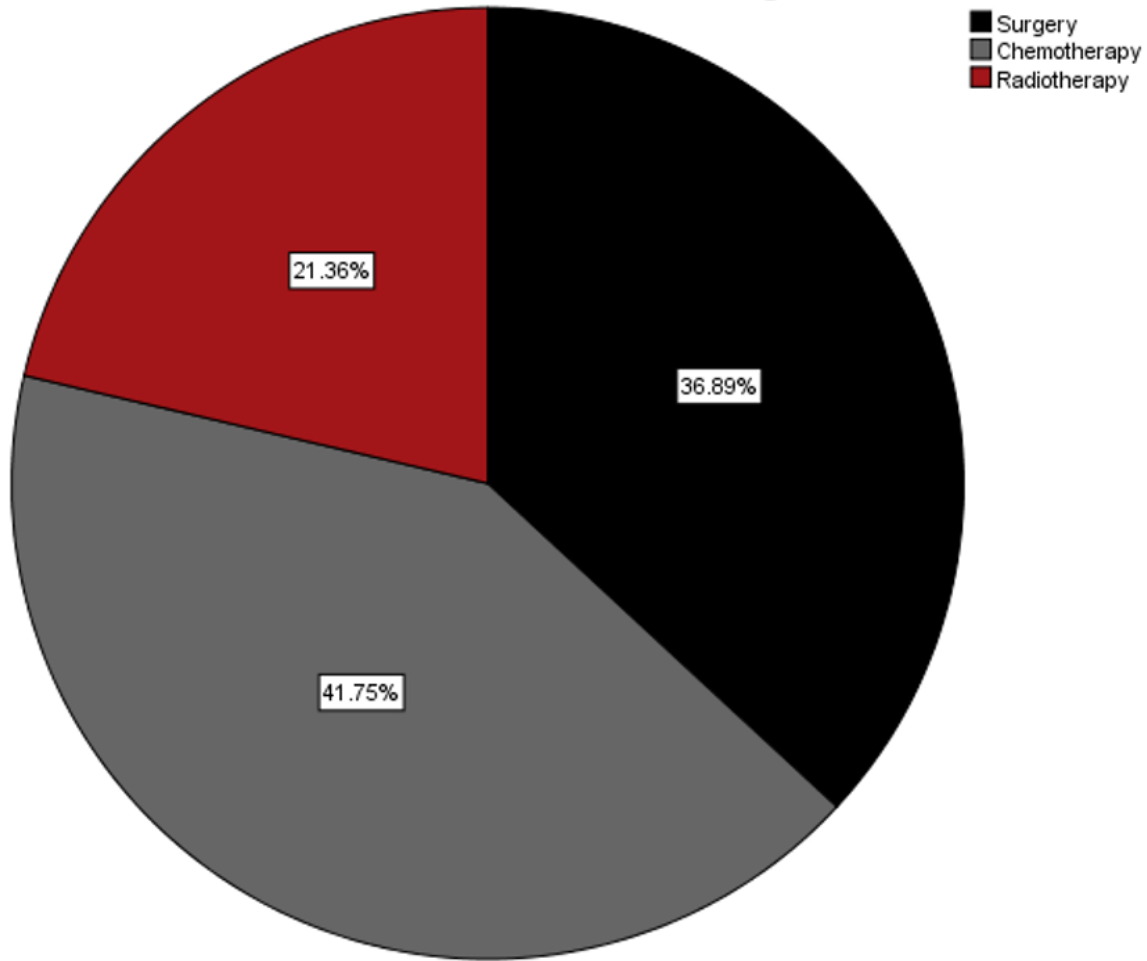


Figure 2 represents the responses to the question "treatment effective against oral cancer". Majority (41.75%) have said that chemotherapy (grey) is more effective in treating cancer, 36.89% have said that surgery (black) is more effective and 21.36% of the population have said radiotherapy (brown), a more effective treatment.

How will you prevent yourself from oral cancer/carcinoma ?

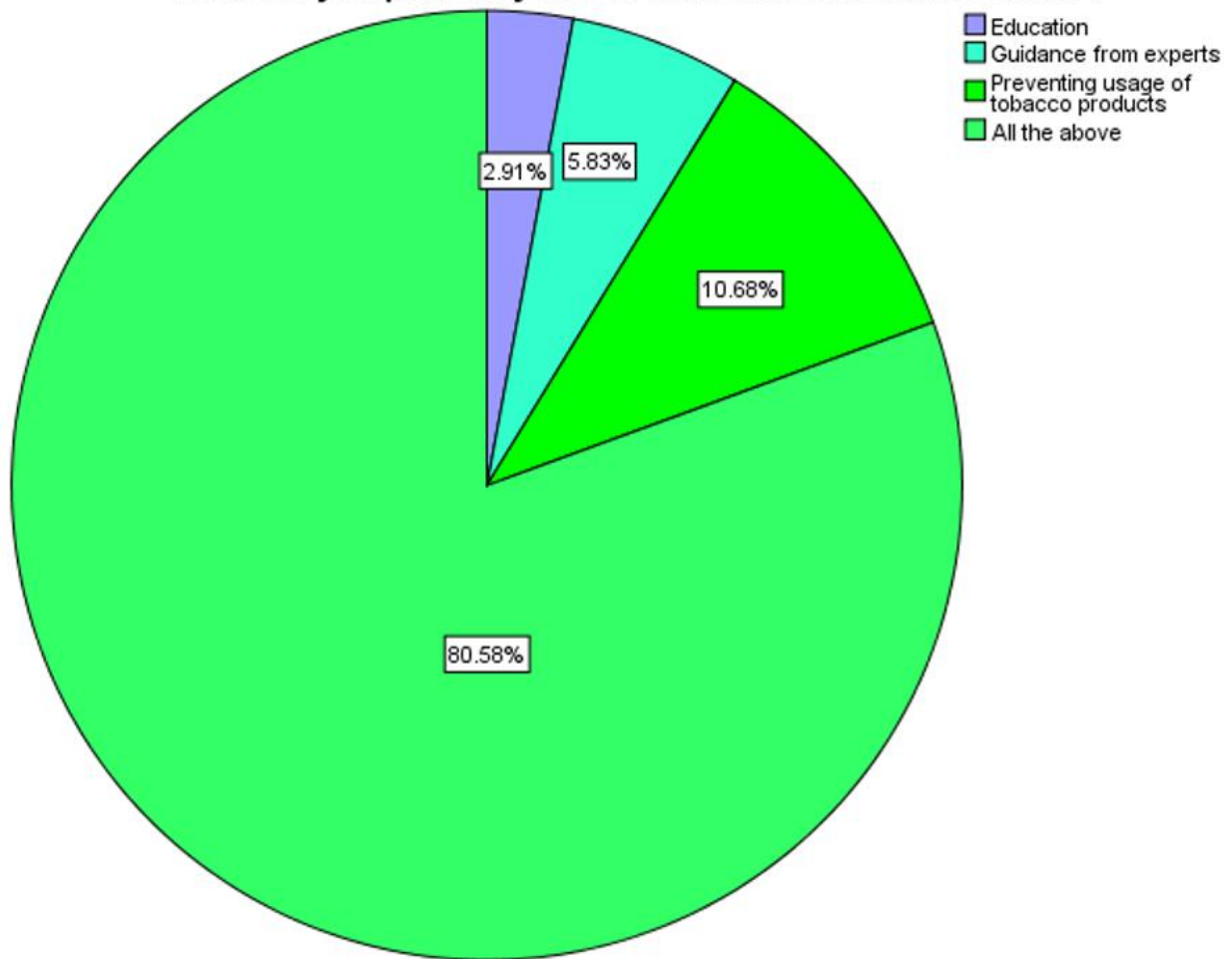


Figure 3 represents the responses to the question “Preventing you from Oral Carcinoma”. Nearly 2.91% of the population have said education (baby blue) can help prevent oneself from oral cancer, 5.83% have opted guidance from experts (fluorescent blue), 10.68% opted prevention of tobacco products (fluorescent green) and the majority (80.58%) of the population have said that education, guidance and prevention of usage of tobacco products all together (baby green) are important to prevent oneself from oral cancer.

How will you create an awareness among others on oral cancer / carcinoma ?

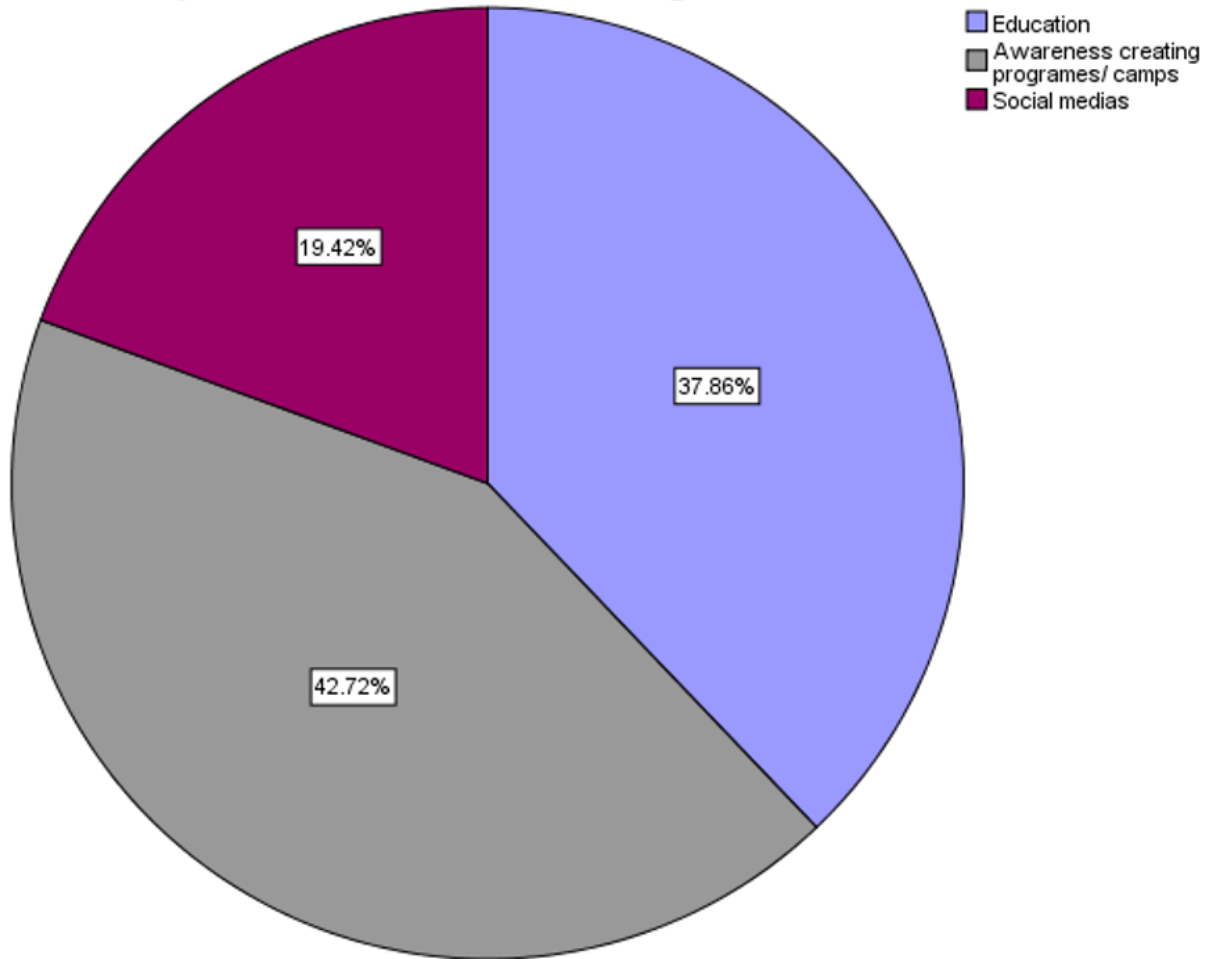


Figure 4 represents the responses to the question “Preventing others from Oral Carcinoma”. About 42.72% of the population have said that awareness programs and camps (slate grey) can help create awareness among others about cancer, 37.86% of the population have said that education (baby blue) and 19.42% have said social media (purple) can also help in creating awareness of oral cancer among others.

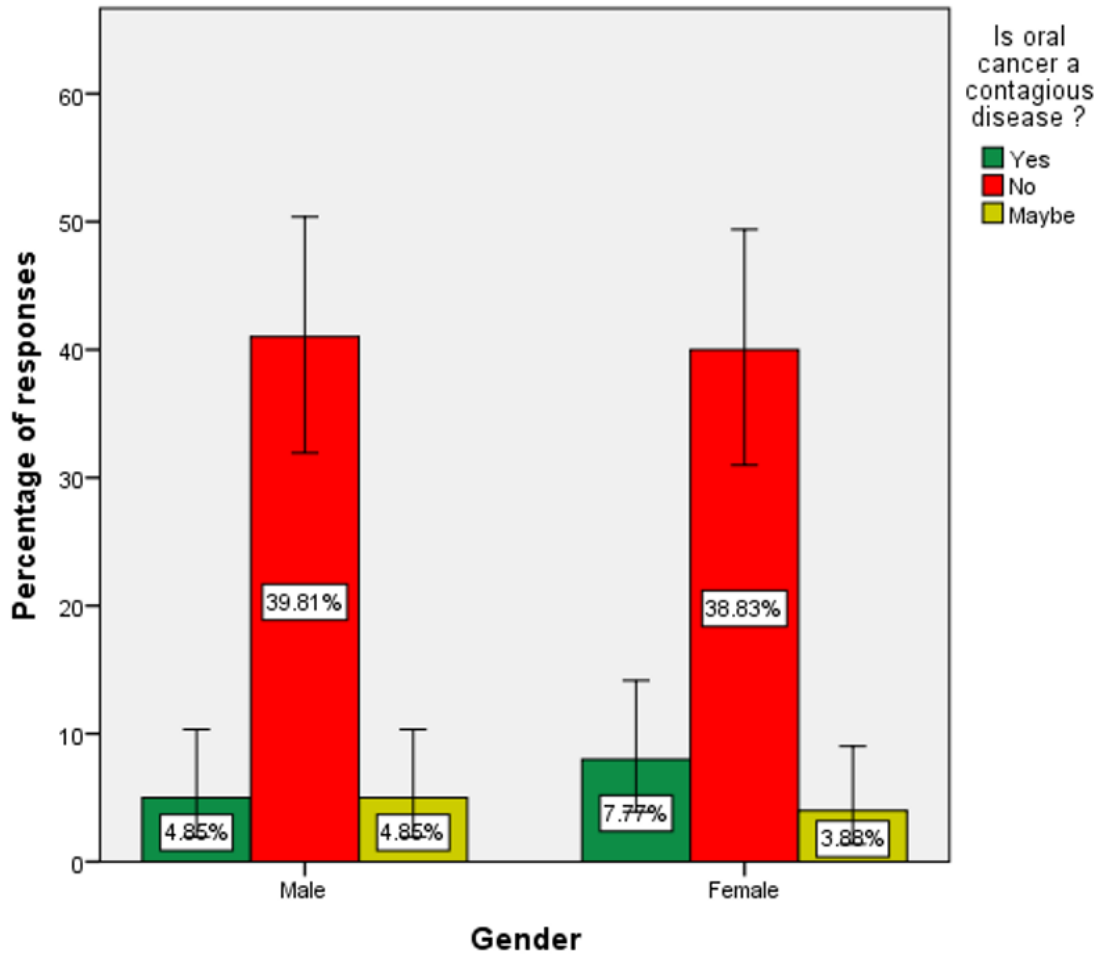


Figure 5 The bar graph represents the association between the gender and their responses to the question “Is Oral Cancer a contagious disease”. X axis represents gender and Y axis represents the percentage of responses. The present observation shows statistically non-significant (0.072) between gender and knowledge about oral cancer being a contagious disease, by using Pearson Chi Square test with confidence level 95% with the value of 0.05.

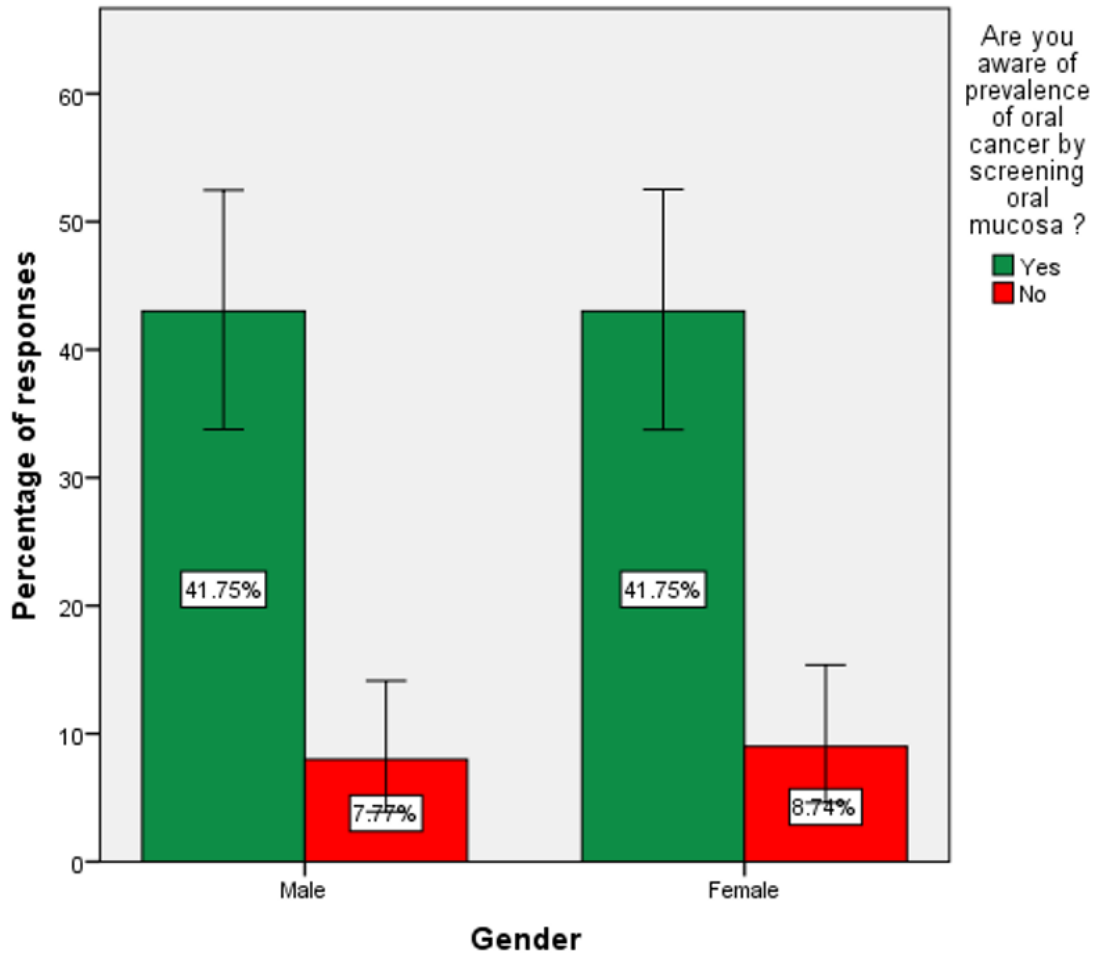


Figure 6 The bar graph represents the association between the gender and their responses to the question “Are you aware of the prevalence of Oral Cancer by screening Oral Mucosa?”. The X axis represents gender and the Y axis represents the percentage of responses. The present observation shows statistically significant (0.032) between gender and awareness of prevalence by screening oral mucosa, by using Pearson Chi Square test with confidence level 95% with the value of 0.05.

DISCUSSION -

About half of all tumors in the head and neck arise in the oral cavity, accounting for 5% of all tumors. Oral cancer is the world's sixth most common cancer. In 2012, 300,000 people were diagnosed with oral cavity and lip cancer, accounting for 2.1 percent of all cancer cases. One hundred and forty-five thousand people died from cancers of the mouth and lips. (13)

Tobacco use, including smokeless tobacco, and heavy alcohol intake have long been recognized as the primary etiologic factors in the development of oral cancer. A number of suspected risk factors, including chronic discomfort, poor oral hygiene, viral infection, occupational exposure, malnutrition, including low fruit and vegetable diets, and genetic factors, have also been identified(14). Tobacco use and alcohol consumption are the two most significant risk factors for squamous cell carcinoma, and they have a synergistic impact (15,16). According to the International Agency for Research on Cancer, cigarette smoke contains more than 60 carcinogens (17,18). The most popular etiological agents are alcohol and tobacco use. In Southeast Asia, chewing tobacco and betel quid are the most popular etiologic agents. Human Papillomavirus infection has become a prominent associated factor in non-smoking and non-drinking young people of both sexes in the last decade.(19,20)

Oral cancer prevalence has risen in women over the last few decades. Oral cancer treatment targets are clear: eliminate the cancer, maintain or restore shape and function, avoid or reduce treatment side effects, and prevent secondary tumours(21,22). Surgery, radiotherapy, and chemotherapy, either individually or in combination, are the medical options available to achieve these objectives.(23)

According to the tabulated results obtained through SPSS software it is clear that there is a significant level of awareness of oral cancers among younger individuals (24,25) (Figure 1-6). Chemotherapy of this disease remains a mainstay of treatment. It is important to understand the risks of secondary cancers that develop from primary cancers within the upper aero digestive tract as a result of cancerization (26, 27). The most important feature is that early detection of the asymptomatic early stage of cancers gives satisfactory outcomes for treatment and cures in most patients (28,29).

Limitations -

The survey was conducted only with a sample size of 104 people. This cannot be considered as the whole population representation and the result may change statistically. Perfect results can be obtained only with an even larger population.

Future scope -

In future, this study should be done on a large scale population for better results. As oral carcinoma is prevalent among all the age groups, the data obtained in the study must be again investigated in future.

CONCLUSION -

The present study thus concludes that, although the prevalence of oral cancer is not high compared to other entities, oral cancer poses significant mortality and morbidity in patients, especially when diagnosed at later stages of tumors. The study highlights some anatomical locations where oral cancers are frequently encountered. As a result, clinicians must not only pay attention to the teeth but also to the oral mucosal layers and other entities where lesions are often seen. Early detection of precancerous lesions or cancers increases the chance of patients being cured and greatly reduces mortality and morbidity.

REFERENCES -

1. Thomson P. Oral Cancer: From Prevention to Intervention. Cambridge Scholars Publishing; 2018. 291 p.
2. Sekar D, Lakshmanan G, Mani P, Biruntha M. Methylation-dependent circulating microRNA 510 in preeclampsia patients [Internet]. Vol. 42, Hypertension Research. 2019. p. 1647–8. Available from: <http://dx.doi.org/10.1038/s41440-019-0269-8>
3. Princeton B, Santhakumar P, Prathap L. Awareness on Preventive Measures taken by Health Care Professionals Attending COVID-19 Patients among Dental Students. *Eur J Dent.* 2020 Dec;14(S 01):S105–9.
4. Warnakulasuriya S, Greenspan JS. Textbook of Oral Cancer: Prevention, Diagnosis and Management. Springer Nature; 2020. 452 p.
5. Logeshwari R, Rama Parvathy L. Generating logistic chaotic sequence using geometric pattern to decompose and recombine the pixel values [Internet]. Vol. 79, Multimedia Tools and Applications. 2020. p. 22375–88. Available from: <http://dx.doi.org/10.1007/s11042-020-08957-9>
6. Paramasivam A, Priyadharsini JV, Raghunandhakumar S, Elumalai P. A novel COVID-19 and its effects on cardiovascular disease. *Hypertens Res.* 2020 Jul;43(7):729–30.
7. Johnson J, Lakshmanan G, Biruntha M, Vidhyavathi RM, Kalimuthu K, Sekar D. Computational identification of MiRNA-7110 from pulmonary arterial hypertension (PAH) ESTs: a new microRNA that links diabetes and PAH [Internet]. Vol. 43, Hypertension Research. 2020. p. 360–2. Available from: <http://dx.doi.org/10.1038/s41440-019-0369-5>
8. Ravisankar R, Jayaprakash P, Eswaran P, Mohanraj K, Vinitha G, Pichumani M. Synthesis, growth, optical and third-order nonlinear optical properties of glycine sodium nitrate single

- crystal for photonic device applications [Internet]. Vol. 31, Journal of Materials Science: Materials in Electronics. 2020. p. 17320–31. Available from: <http://dx.doi.org/10.1007/s10854-020-04288-5>
9. Wu S, Rajeshkumar S, Madasamy M, Mahendran V. Green synthesis of copper nanoparticles using and its antioxidant and antibacterial activity against urinary tract infection pathogens. *Artif Cells Nanomed Biotechnol.* 2020 Dec;48(1):1153–8.
 10. Rajkumar KV, Lakshmanan G, Sekar D. Identification of miR-802-5p and its involvement in type 2 diabetes mellitus. *World J Diabetes.* 2020 Dec 15;11(12):567–71.
 11. Lam B, Jamieson LM, Mittinty M. Black Lives Matter: A Decomposition of Racial Inequalities in Oral Cancer Screening. *Cancers* [Internet]. 2021 Feb 17;13(4). Available from: <http://dx.doi.org/10.3390/cancers13040848>
 12. Pujari GRS, Subramanian V, Rao SR. Effects of *Celastrus paniculatus* Willd. and *Sida cordifolia* Linn. in Kainic Acid Induced Hippocampus Damage in Rats [Internet]. Vol. 53, *Indian Journal of Pharmaceutical Education and Research.* 2019. p. 537–44. Available from: <http://dx.doi.org/10.5530/ijper.53.3.86>
 13. Kirita T, Omura K. *Oral Cancer: Diagnosis and Therapy.* Springer; 2015. 426 p.
 14. Chaturvedula BB, Muthukrishnan A, Bhuvaraghan A, Sandler J, Thiruvengkatachari B. *Dens invaginatus: a review and orthodontic implications* [Internet]. Vol. 230, *British Dental Journal.* 2021. p. 345–50. Available from: <http://dx.doi.org/10.1038/s41415-021-2721-9>
 15. Maheswari TNU, Nivedhitha MS, Ramani P. Expression profile of salivary micro RNA-21 and 31 in oral potentially malignant disorders [Internet]. Vol. 34, *Brazilian Oral Research.* 2020. Available from: <http://dx.doi.org/10.1590/1807-3107bor-2020.vol34.0002>
 16. Gudipani RK, Alam MK, Patil SR, Karobari MI. Measurement of the Maximum Occlusal Bite Force and its Relation to the Caries Spectrum of First Permanent Molars in Early Permanent Dentition [Internet]. Vol. 44, *Journal of Clinical Pediatric Dentistry.* 2020. p. 423–8. Available from: <http://dx.doi.org/10.17796/1053-4625-44.6.6>
 17. Pindborg JJ. *Oral Cancer and Precancer.* Butterworth-Heinemann; 1980. 177 p.
 18. Priyadharsini JV. In silico validation of the non-antibiotic drugs acetaminophen and ibuprofen as antibacterial agents against red complex pathogens [Internet]. Vol. 90, *Journal of Periodontology.* 2019. p. 1441–8. Available from: <http://dx.doi.org/10.1002/jper.18-0673>
 19. Jain A, Kotimoole CN, Ghoshal S, Bakshi J, Chatterjee A, Prasad TSK, et al. Identification of potential salivary biomarker panels for oral squamous cell carcinoma. *Sci Rep.* 2021 Feb 9;11(1):3365.
 20. Vikneshan M, Saravanakumar R, Mangaiyarkarasi R, Rajeshkumar S, Samuel SR, Suganya M, et al. Algal biomass as a source for novel oral nano-antimicrobial agent. *Saudi J Biol Sci.* 2020 Dec;27(12):3753–8.
 21. Barma MD, Muthupandiyam I, Samuel SR, Amaechi BT. Inhibition of *Streptococcus mutans*,

- antioxidant property and cytotoxicity of novel nano-zinc oxide varnish [Internet]. Vol. 126, Archives of Oral Biology. 2021. p. 105132. Available from: <http://dx.doi.org/10.1016/j.archoralbio.2021.105132>
22. Priyadharsini JV, Vijayashree Priyadharsini J, Smiline Girija AS, Paramasivam A. In silico analysis of virulence genes in an emerging dental pathogen *A. baumannii* and related species [Internet]. Vol. 94, Archives of Oral Biology. 2018. p. 93–8. Available from: <http://dx.doi.org/10.1016/j.archoralbio.2018.07.001>
 23. Hao S-P. Oral Cancer: Symptoms, Management and Risk Factors. Nova Science Pub Incorporated; 2013. 337 p.
 24. Alharbi KS, Fuloria NK, Fuloria S, Rahman SB, Al-Malki WH, Javed Shaikh MA, et al. Nuclear factor-kappa B and its role in inflammatory lung disease. *Chem Biol Interact*. 2021 Aug 25;345:109568.
 25. Rao SK, Kalai Priya A, Manjunath Kamath S, Karthick P, Renganathan B, Anuraj S, et al. Unequivocal evidence of enhanced room temperature sensing properties of clad modified Nd doped mullite Bi₂Fe₄O₉ in fiber optic gas sensor [Internet]. Vol. 838, Journal of Alloys and Compounds. 2020. p. 155603. Available from: <http://dx.doi.org/10.1016/j.jallcom.2020.155603>
 26. Davies A, Epstein J. Oral Complications of Cancer and Its Management. Oxford University Press; 2010. 312 p.
 27. Bhavikatti SK, Karobari MI, Zainuddin SLA, Marya A, Nadaf SJ, Sawant VJ, et al. Investigating the Antioxidant and Cytocompatibility of *Mimusops elengi* Linn Extract over Human Gingival Fibroblast Cells [Internet]. Vol. 18, International Journal of Environmental Research and Public Health. 2021. p. 7162. Available from: <http://dx.doi.org/10.3390/ijerph18137162>
 28. Brands M, Verbeek A, Geurts S, Merckx T. Follow-up after oral cancer treatment-Transition to a personalized approach. *J Oral Pathol Med* [Internet]. 2020 Dec 3; Available from: <http://dx.doi.org/10.1111/jop.13147>
 29. Marya A, Karobari MI, Selvaraj S, Adil AH, Assiry AA, Rabaan AA, et al. Risk Perception of SARS-CoV-2 Infection and Implementation of Various Protective Measures by Dentists Across Various Countries. *Int J Environ Res Public Health* [Internet]. 2021 May 29;18(11). Available from: <http://dx.doi.org/10.3390/ijerph18115848>