Evaluating Oral Cancer Risk Factors in Adult Populations- Silent Threats in Rural Lives

Prof.Malarkodi.M[1], Ms. Dona[2], Ms. Drisya[3], Ms. Elamathi[4], Dr. S. Madhavi[5], Prof. Anuradha M.[6]
Ms. Umamalini S.[7], Ms. Priyadharshini M.[8]
[1] *Professor& Head Dept of Community Health Nursing, KMCH college of Nursing*
[2,3,4] *Dept of Nursing, KMCH college of Nursing*
[5] *Principal, KMCH college of Nursing*
[6,7,8] *Dept of Community Health Nursing, KMCH College of Nursing*

***Abstract*—This study was conducted to evaluate the risk factors associated with oral cancer among adults living in a rural community. The objectives included identifying the major risk factors, determining their prevalence among the adult population, examining the relationship between demographic variables and the level of oral cancer risk, and providing information, education, and communication (IEC) to improve community awareness. A descriptive research design was adopted for the study. A total of 200 participants were selected using a purposive sampling technique. The assessment focused on identifying oral cancer risk factors and lesions by analysing demographic characteristics, lifestyle habits such as tobacco use, alcohol consumption, and dietary patterns, along with their association with oral cancer risk. The findings revealed that approximately 60–70% of participants were aged between 40 and 70 years, and more than half (50–60%) were male. About 60% had primary education, while nearly 20% were illiterate, particularly among older individuals. Regarding lifestyle habits, 40–45% of participants were smokers, 30–35% used smokeless tobacco, 20–25% chewed betel nut or areca nut, and 35–40% consumed alcohol. Based on risk assessment scores, around 65–70% of participants were categorized as having low risk, 20–25% had moderate risk, and approximately 20% had no risk. Notably, 98% of the population exhibited oral lesions. Among the 200 participants, 48 had pigmented lesions and 70 presented with white patches. The study highlights those middle-aged and older adults, particularly males, constitute the majority of the at-risk population. Lower levels of education may contribute to reduced awareness of oral health and risk behaviour. The high prevalence of tobacco use, alcohol consumption, and betel nut chewing indicates significant behavioural risk factors associated with oral diseases. Although a large proportion of participants fell into the low-risk category, the presence of a considerable number with moderate risk underscores the need for continued attention and intervention.**

***Index Terms*—Oral cancer, risk factors, rural community, tobacco use, alcohol consumption, areca nut.**

I. INTRODUCTION

Oral cancer is one of the most common malignancies worldwide and remains a major contributor to morbidity and mortality. India bears a significant share of the global burden, with higher incidence rates reported in rural populations. Recent global estimates from the Global Cancer Observatory (GLOBOCAN, 2020) reported more than 377,000 new cases and approximately 177,000 deaths annually due to oral cancer worldwide. India accounts for nearly one-third of the global oral cancer burden. The Indian Council of Medical Research (ICMR) reported that oral cancer is the second most common cancer among men and the fourth most common cancer among women in the country. The high burden is closely associated with widespread use of smokeless tobacco, betel quid, and alcohol. Rural populations are disproportionately affected due to sociocultural practices, poverty, and limited access to health care services. The WHO (2022) has described oral cancer as a disease of social inequality, with higher incidence and mortality observed in rural and socioeconomically disadvantaged populations. Data from the National Family Health Survey-5 (NFHS-5, 2021) also revealed that the prevalence of tobacco and areca nut use is significantly higher in rural areas compared to urban populations.

In Tamil Nadu, oral cancer is one of the common cancers affecting adults, particularly males. The use of tobacco products, betel quid chewing and alcohol consumption are common habits in many communities. Studies conducted in Tamil Nadu have shown a considerable number of precancerous lesions such as leukoplakia and oral submucous fibrosis among individuals with tobacco habits. Despite the availability of healthcare facilities, many cases are diagnosed at later stages due to poor awareness and delayed health-seeking behaviour.

Considering the increasing burden of oral cancer and the high prevalence of risk factors among adults in rural communities, it is important to assess these risk factors to implement effective preventive strategies. Identifying the behavioural and lifestyle factors associated with oral cancer can help in developing targeted health education, screening programs and community awareness initiatives

Despite being largely preventable, oral cancer is often diagnosed at advanced stages due to delayed healthcare seeking behaviour and inadequate screening facilities. Rural populations are particularly vulnerable due to socio-economic constraints and limited access to healthcare services. Therefore, assessing the risk factors in these communities is essential for planning effective preventive interventions.

Objectives:

1. To determine the risk factors of oral cancer among adults in a rural community.
2. To associate demographic variables with the level of risk of developing oral cancer.

II. METHODS & MATERIAL

A descriptive cross-sectional study was conducted in rural areas of Coimbatore. The study population included 200 participants selected using convenient sampling Inclusion criteria individuals aged 30 years and above Both males and females who were residents of the selected rural community. Data were collected using a pre-tested structured questionnaire covering demographic details and Visual examination of oral cancer risk (oral lesions, lymph nodes, oral hygiene). The risk was assessed by visual oral examination checklist and scoring was done.

The scoring system is based on several component. 1, with score range of 0-2. The history of habits includes 4 items, with a total score range of 0-4. The final scoring 0 -normal,1-3-lowrisk,4-7 moderate risk,8 and above high risk. Data analysis was performed using SPSS. Descriptive statistics such as frequency, percentage, mean, and standard deviation were used. Associations between variables were assessed using appropriate statistical tests such as the chi-square test.

III. RESULTS AND DISCUSSION

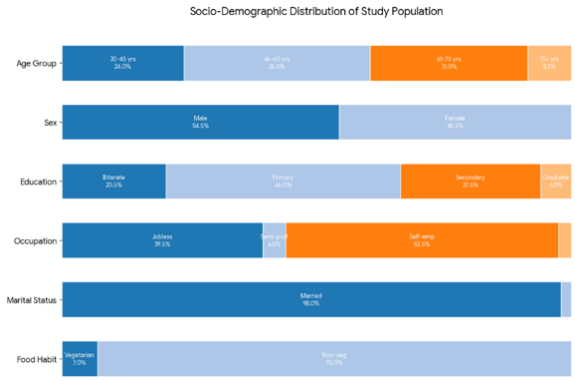

Figure1: Demographic Distribution of Participants

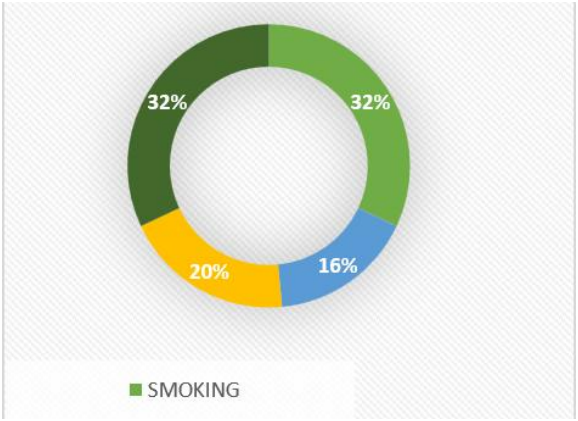

Figure:2 Distribution of Samples According to Their History of Habits.

The results indicate that tobacco chewing was the most common risk factor. A significant proportion of participants exhibited moderate to high risk levels. Multiple risk habits were commonly observed among individuals.

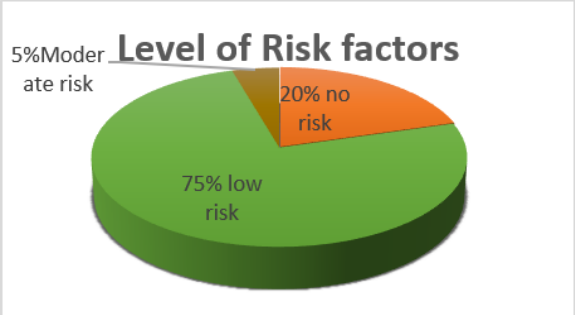

Figure:3 Distribution of samples according to their level of risk of oral cancer

The findings of the study are consistent with previous research highlighting tobacco and alcohol as major contributors to oral cancer. The high prevalence of areca nut chewing further increases the risk in rural populations. Poor oral hygiene and nutritional deficiencies also play a significant role in disease progression.

The association between demographic variables such as education and occupation suggests that socio-economic factors influence risk exposure. Limited awareness and lack of access to healthcare services.

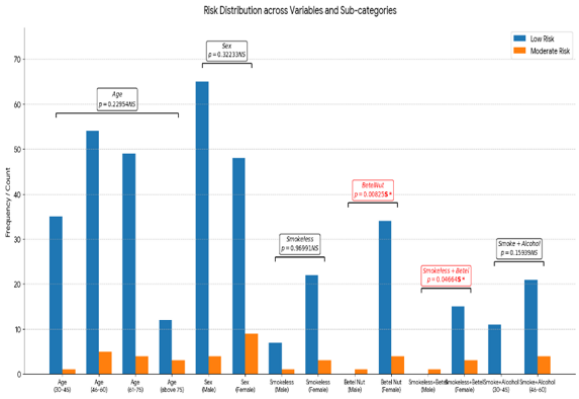

Figure 4: Association of level of risk with selected demographic variables.

The findings shows that there is a considerable significance is present between the demographic variables and the level of risk of developing oral cancer. It shows that there is a significant association is present between the habit of betal nut / areca nut chewing and risk development. And there is a significant association is present between habit of smokeless tobacco + betal nut / areca nut chewing and the risk development. The P- values are 0.00825 and 0.04664 respectively which is significant.

This study revealed that a considerable proportion of participants had low educational status (around 60% with primary education and 20% illiterate) and belonged to a rural community with a high prevalence of risk behaviours such as smoking (40–45%), smokeless tobacco use (30–35%), betel nut chewing (20–25%), and alcohol consumption (35–40%) .These findings indicate that limited awareness and unhealthy lifestyle practices are common among the study population.

Similarly, this study results are well consistent with the study of Farooq et al. (2024). A higher percentage of cases were observed among individuals with poor education (around 25-35%) and those with limited access to health care services (approximately 20-30%). These findings demonstrate the oral cancer occurs more frequently in socio-economically disadvantaged populations.

IV. CONCLUSION

The study concludes that oral cancer risk in rural communities is strongly associated with preventable lifestyle factors such as tobacco use, alcohol consumption, and poor oral hygiene. Early detection and community-based interventions are essential to reduce the disease burden.

RECOMMENDATIONS

- Conduct regular oral cancer screening camps in rural areas
- Strengthen tobacco and alcohol cessation programs
- Promote oral hygiene education through community health workers
- Encourage healthy dietary practices
- Develop targeted interventions for high-risk groups

REFERENCES

[1] Chaurasia, N. K., Upadhyaya, C., Dulal, S., Shakya, M., Adhikari, B. R., and Upreti, S., “Prevalence, Pattern and Risk Factors of Oral Cancer—A Single Institute-Based Study from Nepal,” Kathmandu University Medical Journal (KUMJ), vol. 21, no. 83, pp. 303–308, Jul.–Sep. 2023.

[2] Grigolato, R., Accorona, R., Lombardo, G., Corrocher, G., Garagiola, U., Massari, F., Nicoli, S., Rossi, S., and Calabrese, L., "Oral cancer in non-smoker non-drinker patients. Could comparative pet oncology help to understand risk factors and pathogenesis?," Critical Reviews in Oncology/Hematology, vol. 166, Art. no. 103458, Oct. 2021, doi: 10.1016/j.critrevonc.2021.103458.

[3] Heller, M. A., Nyirjesy, S. C., Balsiger, R., Talbot, N., VanKoevering, K. K., Haring, C. T., Old, M. O., Kang, S. Y., and Seim, N. B., "Modifiable risk factors for oral cavity cancer in non-smokers: A systematic review and meta-analysis," Oral Oncology, vol. 137, Art. no. 106300, Feb. 2023, doi: 10.1016/j.oraloncology.2022.106300.

[4] Mandrik, O., Roitberg, F., Lauby-Secretan, B., Parak, U., Ramadas, K., Varenne, B., Sankaranarayanan, R., and Carvalho, A. L., "Perspective on oral cancer screening: Time for implementation research and beyond," Journal of Cancer Policy, vol. 35, Art. no. 100381, Mar. 2023, doi: 10.1016/j.jcpo.2022.100381.

[5] Nguyen, T. P. A., Gautam, S., Mahato, S., Jensen, O. C., Haghighian-Roudsari, A., and Baygi, F., "Overview of oral health status and associated risk factors in maritime settings: An updated systematic review," PLoS One, vol. 18, no. 10, Art. no. e0293118, Oct. 2023, doi: 10.1371/journal.pone.0293118.

[6] Rumgay, H., Nethan, S. T., Shah, R., Vignat, J., Ayo-Yusuf, O., Chaturvedi, P., Guerra, E. N. S., Gupta, P. C., Gupta, R., Liu, S., Magnusson, C., Parascandola, D., Paulino, Y. C., Rezaei, N., Siddiqi, K., Warnakulasuriya, S., Lauby-Secretan, B., and Soerjomataram, I., "Global burden of oral cancer in 2022 attributable to smokeless tobacco and areca nut consumption: A population attributable fraction analysis," The Lancet Oncology, vol. 25, no. 11, pp. 1413–1423, Nov. 2024, doi: 10.1016/S1470-2045(24)00458-3.

[7] Singh, A. G., and Chaturvedi, P., "Areca nut and oral cancer," Oral Diseases, vol. 31, no. 5, pp. 1467–1472, May 2025, doi: 10.1111/odi.14943.

[8] Singh, K., Sharma, D., Kaur, M., Gauba, K., Thakur, J. S., and Kumar, R., "Effect of health education on awareness about oral cancer and oral self-examination," Journal of Education and Health Promotion, vol. 6, Art. no. 27, May 2017, doi: 10.4103/jehp.jehp_82_15.

[9] Uguru, C. C., Chukwubuzor, O., Otakhoigbogie, U., Ogu, U. U., and Uguru, N. P., "Awareness and knowledge of risk factors associated with oral cancer among military personnel in Nigeria," Nigerian Journal of Clinical Practice, vol. 26, no. 1, pp. 73–80, Jan. 2023, doi: 10.4103/njcp.njcp_322_22.

[10] Warnakulasuriya, S., and Chen, T. H. H., "Areca Nut and Oral Cancer: Evidence from Studies Conducted in Humans," Journal of Dental Research, vol. 101, no. 10, pp. 1139–1146, Sep. 2022, doi: 10.1177/00220345221092751.

[11] Xu, H., Gao, Z., Liu, H., An, L., Yang, T., Zhang, B., Liu, G., and Sun, D., "Associations of lifestyle factors with oral cancer risk: An umbrella review," Journal of Stomatology, Oral and Maxillofacial Surgery, vol. 126, no. 3S, Art. no. 102234, Jun. 2025, doi: 10.1016/j.jormas.2025.102234.

[12] Yu, Z., Ma, X., Xiao, H., Chen, Y., Wu, Y., He, J., and Cheng, P., "Disease burden and attributable risk factors of lip and oral cavity cancer in China from 1990 to 2021 and its prediction to 2031," Frontiers in Public Health, vol. 12, Art. no. 1419428, Sep. 2024, doi: 10.3389/fpubh.2024.1419428.