

Oral Cancer Care Model-Beyond Screening!

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Abstract: Oral cavity cancer (OCC) represents nearly 2 % of the global cancer burden, with over 377, 000 new cases and 177, 000 deaths worldwide annually (1). Oral cancer includes cancers of the lip, other parts of the mouth and the oropharynx and combined rank as the 13th most common cancer worldwide. An organized health care system is a primary requirement for any screening program. Fragmented, low-resource settings that lack workforce and technical facilities-and that are all too common in developing countries-are barriers to implementing cancer screening programs. The implementation of this model would establish a comprehensive sustainable system for reducing the burden of oral potential malignant disorders.

Keywords: cancer, screening, malignancy, oral cavity

1. Introduction

Oral cavity cancer (OCC) represents nearly 2 % of the global cancer burden, with over 377, 000 new cases and 177, 000 deaths worldwide annually (1). Oral cancer includes cancers of the lip, other parts of the mouth and the oropharynx and combined rank as the 13th most common cancer worldwide (2). Oral cancer is depicted by diverse geographic disparity in its incidence and prevalence, with a wide range of variation in its distribution across various parts of the world. Around the globe many people are suffering from oral pain and other problems of the mouth or teeth. This significant public health concern is growing rapidly in developing countries where oral health services are limited (3).

The WHO considers oral health to include the state of the mouth and teeth, and of orofacial structures that enable individuals to perform essential functions such as eating, breathing and speaking, and to encompass psycho social dimensions, such as self-confidence, well being and the ability to socialize and work without pain, discomfort and embarrassment (4). Oral health varies over the life course from early life to old age, is integral to general health and supports individuals in participating in society and achieving their potential. Poor oral health significantly impacts individuals, families, communities, populations, health systems, economies and societies at large.

Oral diseases including oral cancer and Non communicable diseases such as cardiovascular diseases, shares common risk factors including all forms of tobacco use, harmful alcohol use, high intake of free sugars and lack of exclusive breastfeeding (5). Other risk factors include insufficient oral hygiene for dental caries and severe periodontal diseases. Alterations in oral cavity bacterial microbiota to more pathogenic microbes in addition to known etiological factors, smoking, and alcohol consumption contribute to oral carcinogens (6). In addition to the above-mentioned traditional risk factors, diet is also involved in the etiology

of oral cancer. Additionally, the potential role of fatty acids in tumorigenesis has got increased interest. (7)

Oral cancer is considered a lifestyle disease. Behaviors such as alcohol consumption and smoking have been primarily associated with increased risk of oral cancer. Exposure to human papillomavirus (HPV), syphilis, oro-dental factors, dietary deficiencies, chronic candidiasis, and viruses are also important predisposing factors (8). Although globally declining in trend, the traditional habit of betel nut chewing is still prevalent in many parts of India and has been known to contribute to the risk. In the low socioeconomic population, knowledge and awareness of oral health may be limited, which may be further exasperated by the rural setting where timely diagnosis and treatment may be restricted due to lack of easily accessible health care service providers and facilities.

Early detection of oral cancer is important as diagnosis at late stages would significantly increase the treatment cost and associated morbidity and mortality rates. In several previous reports, more than half of the oral carcinomas were diagnosed at late stages (TNM Stages III and IV). A retrospective analysis of the Cancer Registry of Maharaj Nakorn Chiang Mai Hospital, Thailand, showed a higher predilection towards late diagnosis of oral squamous cell carcinoma, especially in patients aged ≥ 40 . Only 3/8 of the confirmed diagnoses occurred at Stage I or II, whereas 5/8 occurred at Stage III or IV (9). Late detection can also be attributed to the asymptomatic nature of the disease, especially during its early stages. Even when symptoms arise, patients may delay seeking medical consultation, which can further complicate the treatment (10). From the population-based cancer registry of Khon Kaen Province, the five-year survival rate of oral cancer was reported as 64.9% for Stage I and 13% for Stage IV (11). Therefore, initiatives for cancer prevention, especially early detection and intervention, are important to lessen cancer-related burdens on individuals and society.

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Adequate dental care before and after radiation reduces the risk of osteoradionecrosis and dramatically improves long-term outcomes⁽¹²⁾. Before radiation therapy, it is common practice to seek an evaluation with a dentist, so that any necessary extractions can be performed and allowed to heal before delivery of radiation therapy. Similarly, post-treatment follow-up evaluations are an opportunity to improve hygiene, prescribe fluoride, and provide preventative restorations. For this patient population, dental care is critical to avoid severe late complications.

Dental Oncology is a focus of dentistry dedicated to meeting the unique dental and oral health care needs that arise as a result of cancer therapy. It is devoted to improving the well-being and quality of life of people battling cancer⁽¹³⁾. Dental oncology goes beyond the scope of general dental treatment to include management of the soft tissues of the mouth and care for oral side effects specific to cancer therapy. It also emphasizes oral cancer prevention and early detection

Between 30 and 50% of oral cancers can currently be prevented by avoiding risk factors and implementing existing evidence-based prevention strategies. The oral cancer burden can also be reduced through early detection of cancer and appropriate treatment and care of patients who develop cancer. The knowledge, opinion, and practice of healthcare providers who serve as the closest and first point of call to many are essential to planning a training program for oral cancer detection and reduction of burden of oral cancer.

Challenges in reduction of Oral Cancer-

An organized health care system is a primary requirement for any screening program. Fragmented, low-resource settings that lack workforce and technical facilities-and that are all too common in developing countries-are barriers to implementing cancer screening programs⁽¹⁴⁾.

Tobacco and areca nut are used in various combinations, and our current research program also has identified combined use of areca nut and tobacco in sachets. Both are major risk factors for OC, and there is need to integrate tobacco and areca nut control strategies in the pursuit of effective OC control in India⁽¹⁵⁾. Although tobacco control programs are widely available, there are no control programs for areca nut; however, the need for a WHO framework on areca nut has been identified.

Despite the fact that the oral cavity is accessible for visual examination and that oral cancer and premalignant lesions have well-defined clinical diagnostic features, oral cancers are typically detected in their advanced stages. In fact, in India, 60–80% of patients present with advanced disease as compared to 40% in developed countries.

Despite the fact that oral cancer and consequences can be prevented, treated, and controlled, there exists a significant gap in the Indian public's knowledge, attitudes, and behaviours⁽¹⁶⁾. Efforts must be made to introduce a suite of preventive measures that has the potential to significantly reduce the burden and to help bridge the gap between research, development and public awareness.

The greatest threat of the oral cancer burden exists among the lower socioeconomic strata. This segment of the population is the most vulnerable because of higher exposure to the risk factor-tobacco-which complicates the situation further⁽¹⁷⁾. They have the most limited access to education, prevention and treatment. These disparities should be addressed to push for provision of easy, accessible, detection, and treatment services.

The screening of a large group of individuals for early detection of oral cancer can be challenging due to the required resources, capable personnel, and facilities. Opportunistic screening of oral cancer can be performed when individuals visit dental professionals. This method of screening is considered cost effective to identify potential lesions⁽⁸⁾; however, in developing countries the number of individuals who regularly visit dental clinics is low, and it is still questionable whether these individuals represent the general population.

Despite its importance, access to proper dental care is a significant challenge and many patients with cancer find themselves unable to maintain routine follow-up preventative care with a dentist. However, these patients may be willing and able to follow up with their oncology team for examinations and scans. For this reason, the oncology office may provide an opportunity to improve compliance with dental care.

Another constraint that can be taken into account is dentist attitude and perception toward screening of oral cancer. A study done in Udaipur concluded that reluctance of dentist in performing oral screening was due to lack of experience or provision of inappropriate knowledge of oral cancer screening techniques at dental schools⁽¹⁸⁾.

Several large-population-based oral cancer screening programs have been conducted with various levels of success. In a study carried out in Gujrat, India, 5214 trained village healthcare workers screened 2, 610, 423 individuals and referred 3309 individuals to tertiary care centers, among which 1890 (57.1%) were diagnosed positive for malignancy⁽¹⁸⁾. Similarly, in a study conducted in Kannur, Kerala, 1, 061, 088 individuals were surveyed by 6325 volunteers who identified 3226 patients, out of which 2507 attended subsequent screenings, and 13 were identified with oral cancer and 174 with precancerous lesions⁽¹⁹⁾. Besides initial screening, subsequent follow-ups of individuals, especially those with potentially pre-malignant lesions, play a pivotal role in the success of oral cancer studies. Derth of research citing more examples of this kind of oral cancer screening programme shows the need of continuum of research and policies in this era.

It is imperative that cost-effective oral cancer screening and awareness initiatives be introduced in high-risk populations such as those found in India. Several large population-based oral cancer screening programs have been carried out, either as opportunistic screenings or as population-wide screenings. Although these studies have confirmed the effectiveness of screening to detect oral cancer and precancerous lesions, only recently has a study from India demonstrated that oral cancer screening by trained health workers can lower

mortality of the disease-especially in individuals with a history of tobacco use. The lessons learnt from this population based study were⁽¹⁹⁾-

- 1) A committed group is essential for technical guidance, execution, co-ordination and responsible for evaluation and mid course correction if required, such as the RCC and their peripheral outfits.
- 2) Grass root level workers such as volunteers are essential in large numbers to motivate people for habit curtailment, attend for screening and prompt treatment as in a campaign.
- 3) Public education to be vigorously and continuously pursued especially in younger population.
- 4) Programme evaluation done periodically is essential.
- 5) Cancer screening and detection programmes address normal people.

To improve the oral health indicators of population and ensuring effective oral health care in various public health care delivery facilities across the country, National Oral Health Program (NOHP) was launched in the year 2014-15 to strengthen the public health facilities of the country for an accessible, affordable, acceptable, appropriate and comprehensive oral health care delivery, hence, improving the oral health status of the population across all age groups and reduce the oral disease burden⁽²⁰⁾.

In this article, a model will be proposed to define the roles of various public health professionals at discrete level of oral health care delivery facilities with goal of reducing burden of oral cancer from the country. A coordinated and collaborative approach between various stakeholders shall be adopted to reach the last mile of the society with special focus on socially, geographically, economically disadvantaged, children, pregnant women, elderly, individuals with special health care needs etc. Capacity of Programme Management at National, State and District levels shall be appropriately augmented for providing effective guidance and take-up the responsibility of implementing the commitments under the light of NOHP.

A Model to Reduce Oral Cancer Burden by 33% by 2030

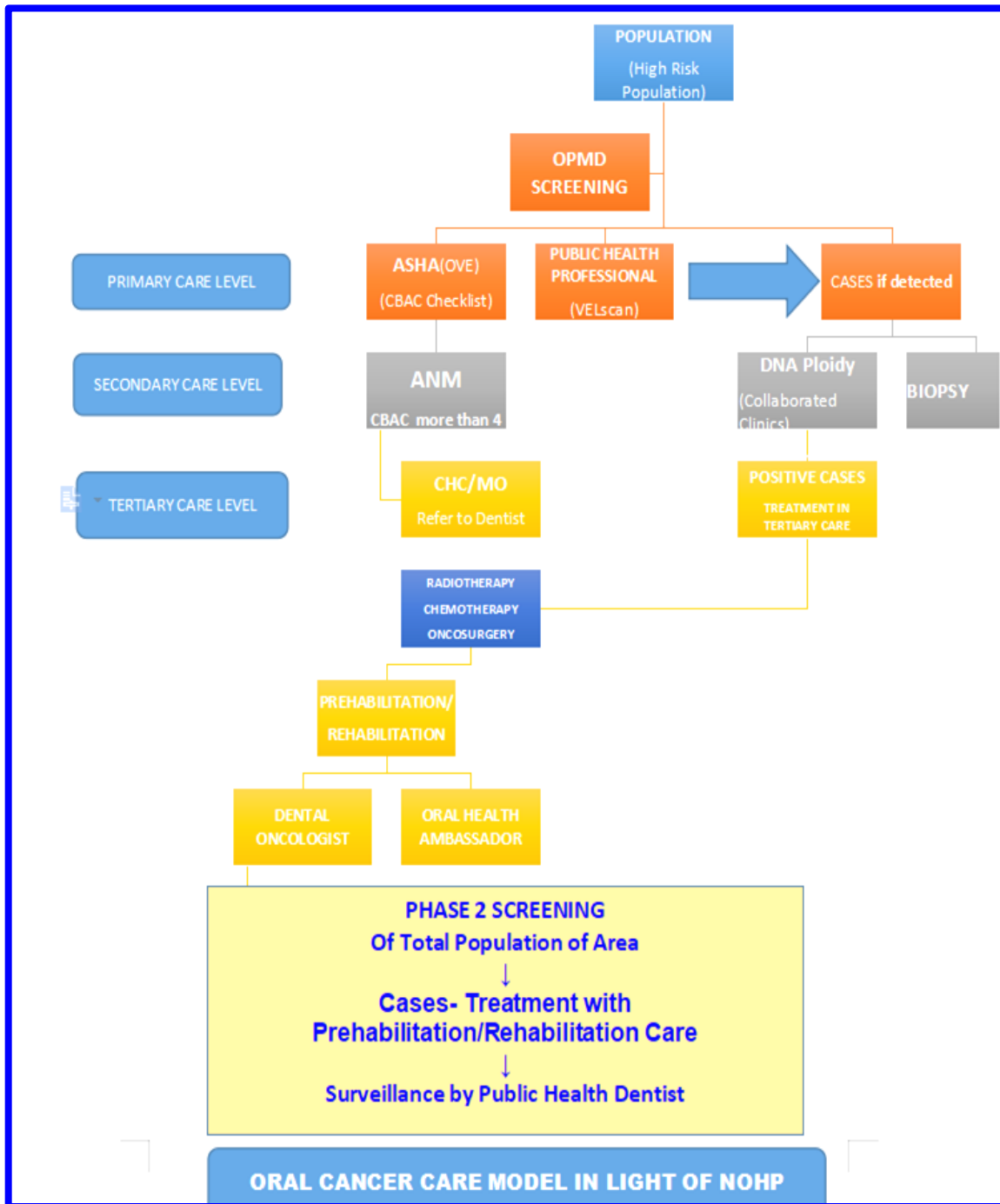
This model is developed for oral cancer screening that would be carried out at all the oral healthcare delivery levels in the line of objectives of the screening program for the community which are as follows⁽²¹⁾-

- Adopting a public health approach by addressing common risk factors through stopping use of all forms of tobacco, reducing alcohol consumption and improving access to effective prehabilitative and rehabilitative care for oral cancer.
- Planning oral health services as part of national health and improving integration of oral health services in primary health care as part of universal health coverage.
- Redefining oral health workforce models to respond to population needs and expanding competencies of non-dental healthcare workers to expand oral health service coverage; and
- Strengthening information systems by collecting and integrating oral health data into national health monitoring systems.

Action by Member States, international partners, civil society and private-sector stakeholders should be grounded in a set of guiding principles, which comprise a public health approach, an equity, lifecourse and people-centred approach, the integration of oral health with primary health care and NCDs, and strong leadership, collaboration and accountability⁽²⁰⁾.

The plan proposes six strategic action areas:

- 1) Oral health governance, leadership and resources;
- 2) Oral health promotion and oral disease prevention, life – course disease priorities and healthy settings;
- 3) Oral health workforce for universal coverage for oral health;
- 4) Essential oral health care and universal coverage for oral health;
- 5) Surveillance, monitoring and evaluation; and
- 6) Oral health research, digital innovation and emerging issues.



To start with, the model proposes a two phase approach of implementing it while carrying out Oral cancer screening programme. Preliminary discussion for program conception and feasibility assessment would be held among stakeholders and matters related to program implementation, finance, coordination, and monitoring would be planned. An orientation session would be conducted to emphasize the need and feasibility of early cancer detection at the community level with the utilization of limited resources existing in the healthcare delivery system.

The phase 1 will be carried out on High Risk population (patient with comorbidities, tobacco chewing habits, other factors) with guidelines of common risk factor approach. Local village healthcare personnel such as ASHA (Accredited Social Health Activist) will be screening the risk population of the respective area covered under them

through checklist for assessing risk factors among population. This will be conducted through CBAC (Community Based Assessment Checklist) Score ⁽²²⁾. The person having higher risk assessment score that is CBAC Score greater than 4 will be assigned to higher cadre like ANM (Auxiliary Nurse Midwives) or next level of screening and then referred through online platform by them to Public Health Professionals.

The public health professionals will be doing the screening of suggested population and person found with Oral Potentially Malignant Disorders (OPMD) / Oral cancer will be treated with radiotherapy, chemotherapy, oncosurgery as needed. The patient will also be made available of prehabilitation and rehabilitation facility providing a wholistic approach of treatment ⁽²³⁾.

After the phase I of the model, the phase II of the model will include the whole population of the community. Trained community volunteer groups will conduct a house-to-house survey and oral cavity examination. Depending on population and geographic area, Two or three volunteer groups were assigned to a ward and asked to complete the survey. Based on the CBAC score assessment, those requiring further examination would be selected.

People having the following signs, symptoms, or habits were invited to attend the oral health checkup camps. 1. A white patch or plaque in the oral cavity 2. A red patch or plaque in the oral cavity 3. A non healing oral ulcer of >2 weeks duration with or without pain 4. Burning sensation or dryness in the mouth 5. Inability to take hot or spicy food or restricted mouth opening or difficulty in tongue movements 6. An abnormal growth/swelling in the oral cavity with or without pain 7. Chronic tobacco and alcohol users (>20 years of use). All participants would be examined by doctors, and suspicious cases would be referred to nearest oral health care delivery centre present. All chronic tobacco users were given brief intervention on cessation and advised follow-up.

All patients confirmed of oral cancer or potentially malignant disorders would be referred to specialized medical and dental care delivery units that is tertiary level of oral healthcare facilities for further evaluation and management. The dental oncologist will be focusing on the prevention, diagnosis, and treatment of oral cancer. Most cancer patients will experience oral side effects; this is why a dental oncologist is part of the health care team responsible for treating cancer patients. These trained professionals monitor and treat any oral issues during the treatment. Unlike oncology, this branch of medicine assists with the oral effects of chemotherapy and radiation.

There will be provision of Oral health ambassadors who will be selected among community population. These ambassadors will be working as leaders in creating awareness within the community on various topics related to oral health such as ill effect of tobacco consumption on oral health / oral hygiene awareness. The oral health ambassadors will be trained by Public health Professionals regarding Oral health and in the wider picture about Oral Cancer.

Expected outcomes of the model

The implementation of this model would establish a comprehensive sustainable system for reducing the burden of oral potential malignant disorders.

Broadly, following outcomes are expected:-

- 1) Early detection and timely treatment leading to increased quality of life.
- 2) Lifestyle changes leading to reduction in exposure to risk factors and oral diseases.
- 3) Decrease in severity of pain and suffering due to oral diseases.
- 4) Providing user friendly health services to the elderly population of the country.
- 5) Decline in out-of-pocket expenditure on management of oral diseases.
- 6) Preventing delay in dental treatments by developing effective referral linkages in oral health care.

- 7) Improved accessibility and equitable oral health care services for poor, marginalised and other underprivileged population.

2. Conclusion

Traditionally the hospitals are recognised as sickness management centres and hence the antipathy for a normal person who is urged to attend a hospital for cancer detection should be recognised. As far as feasible the detection centres should function separate from the main treatment facilities.

India is one of the top three fastest-growing economies in the world today. Despite making rapid strides in the economy over the last few decades, India is still categorized under lower-middle-income countries (LMIC) by World Bank. Despite advances in economy, the investment on health-care delivery under public sector has always been around 2% of gross national product or less, while the WHO recommends this to be at least 5%–6%. It is expected that the proposed model will facilitate in repositioning exponentially increasing dental and public health workforce in various national health programs while fixing responsibility and accountability while empowering dentist. It will strengthen the existing health-care delivery in public sector while redressing the problem of unequal distribution of health workforce in the country. All these are expected to promote oral health and oral health related quality of life among general population. . Therefore, the compartmentalization involved in viewing oral health and diseases separately from the rest of the body must cease and an integrated approach to promote and prevent oral health along with general health should be used.

References

- [1] Miranda-Filho A, Bray F. Global patterns and trends in cancers of the lip, tongue and mouth. *Oral Oncol.*2020 Mar; 102: 104551.
- [2] Global oral health status report: towards universal health coverage for oral health by 2030. Executive summary. Geneva: World Health Organization; 2022.
- [3] Sarode G, Maniyar N, Sarode SC, Jafer M, Patil S, Awan KH. Epidemiologic aspects of oral cancer. *Dis Mon.*2020 Dec; 66 (12): 100988.
- [4] AAction plan for oral health in South-East Asia 2022–2030: towards universal health coverage for oral health. New Delhi: World Health Organization, Regional Office for South-East Asia; 2022. Licence: CC BY-NC-SA 3.0 IGO.
- [5] Wolf TG, Cagetti MG, Fisher JM, Seeberger GK, Campus G. Non-communicable Diseases and Oral Health: An Overview. *Front Oral Health.*2021 Sep 3; 2: 725460.
- [6] Fan Y, Qiu Y, Wang J, Chen Q, Wang S, Wang Y, Li Y, Weng Y, Qian J, Chen F, Wang J, Shi B, Pan L, Lin L, He B, Liu F. Association Between Dietary Fatty Acid Pattern and Risk of Oral Cancer. *Front Nutr.*2022 May 16; 9: 864098.
- [7] Heller MA, Nyirjesy SC, Balsiger R, Talbot N, VanKoeveering KK, Haring CT, Old MO, Kang SY, Seim NB. Modifiable risk factors for oral cavity cancer

- in non-smokers: A systematic review and meta-analysis. *Oral Oncol.*2023 Feb; 137: 106300.
- [8] Klongnoi B, Sresumatchai V, Khovidhunkit SP, Fuangtharnthip P, Leelarungsun R, Shrestha B. Pilot Model for Community Based Oral Cancer Screening Program: Outcome from 4 Northeastern Provinces in Thailand. *Int J Environ Res Public Health.*2021 Sep 6; 18 (17): 9390.
- [9] Komolmalai N., Chuachamsai S., Tantiwipawin S., Dejsuvan S., Buhngamongkol P., Wongvised C., Chitapanarux I., Iamaroon A. Ten-year analysis of oral cancer focusing on young people in Northern Thailand. *J. Oral Sci.*2015; 57: 327–334.
- [10] McGurk M., Scott S. E. The reality of identifying early oral cancer in the general dental practice. *Br. Dent. J.*2010; 208: 347–351. doi: 10.1038/sj.bdj.2010.345.
- [11] Sungwalee S., Vatanasapt P., Suwanrungruang K., Promthet S. Comparing survival of oral cancer patients before and after launching of the universal coverage scheme in Thailand. *Asian Pac. J. Cancer Prev.*2016; 17: 3541–3544.
- [12] Ward MC, Carpenter MD, Noll J, Carrizosa D, Moeller BJ, Helgeson ES, Lalla RV, Brennan MT. Oncologists' Perspective on Dental Care Around the Treatment of Head and Neck Cancer: A Pattern of Practice Survey. *JCO Oncol Pract.*2022 Jan; 18 (1): e28-e35. <https://medium.com/dental-oncology-what-s-teeth-got-to-do-with-it/f7d3767fac76>
- [13] Mandal R, Basu P: Cancer screening and early diagnosis in low and middle income countries: Current situation and future perspectives. *Bundesgesundheitsblatt Gesundheitsforschung Gesundheitsschutz* 61: 1505-1512, 2018.
- [14] Opportunistic Screening of Oral Potentially Malignant Disorders: A Public Health Need for India Priya Mohan, Ann Richardson, John D. Potter, Patricia Coope, and Margaret Paterson. *JCO Global Oncology* 2020: 6, 688-696
- [15] Ken Russell Coelho, "Challenges of the Oral Cancer Burden in India", *Journal of Cancer Epidemiology*, vol.2012, Article ID 701932, 17 pages, 2012.
- [16] Gelband H, Jha P, Sankaranarayanan R, et al., editors. Washington (DC): The International Bank Reconstruction and Development / The World Bank; 2015 Nov 1
- [17] Anandani C, Metgud R, Ramesh G, Singh K. Awareness of General Dental Practitioners about Oral Screening and Biopsy Procedures in Udaipur, India. *Oral Health Prev Dent.*2015; 13 (6): 523-30.
- [18] Philip, Phinse & Nayak, Priyakanta & Philip, Sairu & Parambil, NeethuAmbali & Duraisamy, Karthickeyan & Satheesan, Balasubramanian. (2018). Population-based cancer screening through community participation: Outcome of a district wide oral cancer screening program from rural Kannur, Kerala, India. *South Asian Journal of Cancer.* 7.244.10.4103/sajc.sajc_104_17.
- [19] <https://main.mohfw.gov.in/Major-Programmes/Non-Communicable-Diseases-Injury-Trauma/Non-Communicable-Diseases1/National-Oral-Health-Programme-NOHP>.
- [20] <https://www.cdc.gov/chronicdisease/resources/publications/factsheets/tobacco.htm>.
- [21] [http://namayush.gov.in/sites/default/files/doc/Community_based_assessment_checklist_\(CBAC\)_form.pdf](http://namayush.gov.in/sites/default/files/doc/Community_based_assessment_checklist_(CBAC)_form.pdf)
- [22] WHO. Oral health-Policy basis. [cited 2020 14 jul]. Available from: https://www.who.int/oral_health/policy/en/
- [23] Chandrashekar B R, Manjunath B C, Suma S. Public health dentists as nodal-officers for effective implementation of national health programs-A proposed model. *J Indian Assoc Public Health Dent* 2022; 20: 120-4