

Role Of Oral Physicians In Delivering Palliative Care In Terminally Ill Head And Neck Cancer Patients: A Comprehensive Review

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KEYWORDS:

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ABSTRACT:

The most frequent oral signs of terminally ill head and neck cancer patients include mucositis, xerostomia, nausea, vomiting, candidiasis, nutritional deficits, dehydration, and dysgeusia. Oral mucositis is one of the most common side effects in 75–99% of people who have undergone head and neck chemotherapy and radiotherapy. Management of oral mucositis is necessary to achieve nutrition and phonation. There is currently a scarcity of information regarding the palliative and preventive therapies that oral physicians should administer to patients who are terminally ill. The integration of oral physicians into palliative care teams for terminally ill cancer patients is crucial. Their expertise in managing oral health issues can improve these patients' overall quality of life. Palliative Care and Cancer Organizations should prioritize the inclusion of oral physicians in interdisciplinary palliative care teams, recognizing the holistic nature of patient well-being and the potential impact on both physical and emotional aspects of their final journey.

INTRODUCTION:

Cancer is the second leading cause of mortality worldwide. Cancer poses the highest clinical, social, and economic burden in terms of cause-specific Disability-Adjusted Life Years (DALYs) among all human diseases. A new systematic analysis in 2019 estimated that 9.6 million people will die from cancer annually and around 17 million people will be diagnosed with the condition.^[1] This means that there is an urgent need for enough palliative care to help people through their cancer treatment. WHO defines palliative care as “An approach that improves the quality of life of the patients and their families, in the face of problems arising with life-threatening diseases through prevention and relief of suffering, early identification, impeccable assessment and treatment of pain and other physical symptoms, spiritual, psychological and social”.^[2]

Most medicinal substances have an impact on the oral mucosa's epithelium, which can lead to mucositis, xerostomia, and taste changes. According to a recent review, chemotherapy frequently results in xerostomia and transient hypofunction of the salivary glands.^[3] Taste is essential for the production of saliva, and saliva is essential for taste perception. Additionally, they may result in excruciating pain and chronic nutritional issues, which frequently fuel weight loss, exhaustion, diminished quality of life, and a persistently unfavourable effect on social function. Systematic oral care regimens are rare, and patient's medical records frequently lack adequate documentation of their oral health and oral hygiene. We have only found a small number of studies evaluating oral morbidity in patients with tumors outside of the head and neck region getting palliative care, thus this may be truer in the later stages of the disease.^[4,5]

Oral mucositis is one of the side effects that 75 99% of people who have head and neck radiation and chemotherapy will suffer. There is currently a dearth of information regarding the preventive and curative therapies that oral physicians should administer to patients who are close to death. Because research often fails to account for this variation, it is difficult to tailor oral treatments to the specific needs of different patient groups. Thus, it is evident that additional research in this area is needed.^[6] An oral physician is a trained practitioner to diagnose and manage patients with disorders involving the maxillofacial region. The oral physician has received additional specialized training and experience in diagnosing and managing head and neck pathologies. The role of oral physician in palliative care encompasses pre-treatment counseling, during the treatment, and post-treatment follow-up thereby alleviating pain intensity and enhancement of oral function, which are crucial for patient well-being and improving the overall quality of life.^[7] The goal of the current review is to compile the published comprehensive evidence on the importance of oral physicians in delivering palliative care to terminally ill cancer patients. This review will serve to recognize, prevent, and manage the oral manifestations in terminally ill cancer patients as a primary goal.

ORAL EFFECTS OF PATIENTS IN PALLIATIVE CARE FOR CANCERS:

An important but sometimes disregarded component of palliative care is oral health. Due to their illness, their therapies, or their diminished ability to take care of themselves, many patients have serious oral side effects. These oral diseases can worsen one's quality of life by making it harder to swallow, talk, and eat. Oral effects can have a significant psychological impact, causing embarrassment, social isolation, and distress. Figure 1 illustrates some of the notable common yet morbid oral manifestations secondary to palliative radiotherapy and chemotherapy.

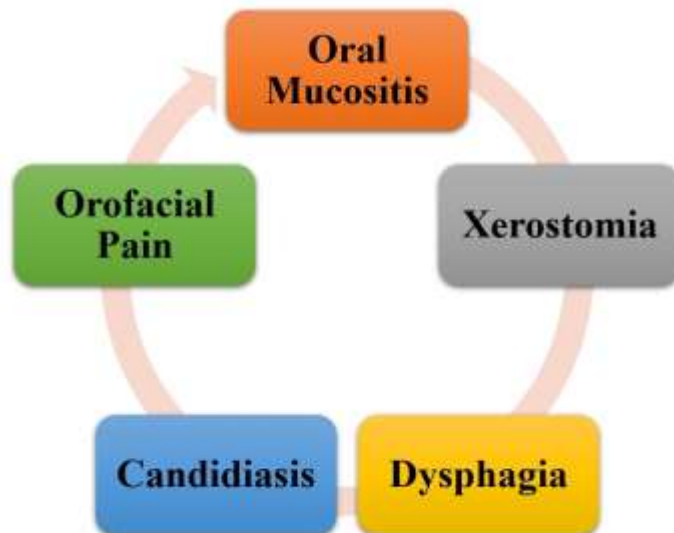


Figure 1: Common oral manifestations of patients in palliative chemoradiotherapy

Oral Mucositis:

Chemotherapy and radiotherapy, commonly used to treat head and neck cancer, usually have an adverse impact on the oral cavity. In some cases, these treatments may be continued into the palliative period to alleviate discomfort and enhance function. Chemotherapy can cause tissue atrophy in the oral cavity due to increased mitotic turnover. Radiotherapy causes sclerosis of tiny arteries that vascularize the oral tissues. Although several scales exist in the literature to assess the severity of mucositis, the scale commonly adopted is that of the World Health Organization (WHO) which includes both subjective and objective assessments of oral mucositis^[8] as shown in Table 1.

Table 1: WHO severity classification of Oral Mucositis

GRADE 0	No oral mucositis
GRADE 1	Erythema and soreness
GRADE 2	Ulcers, able to eat solids
GRADE 3	Ulcers, requires a liquid diet (due to mucositis)
GRADE 4	Ulcers, alimentation not possible (due to mucositis)

Stempniewicz et al, 2019^[9] suggested a five-phase model for understanding the pathophysiology of oral mucositis development. The start phase involves radio or chemotherapy-induced DNA damage to basal epithelial, submucosal, and endothelial cells. Damaged cells release mediators that bind to particular receptors, resulting in inflammation and toxicity. Oxidative stress damages cell membranes, activates macrophages, and activates transcription factors, including nuclear factor (NF)- κ B, which plays a key role in the inflammatory pathways associated with mucositis. Activation leads to higher levels of proinflammatory cytokines, including tumor necrosis factor TNF- α , IL-6, and IL-1 β . It increases cyclooxygenase-2 (COX-2) activity in submucosal fibroblasts and endothelial cells.^[10] The ulcerative phase involves loss of mucosal integrity and microbiological colonization by oral bacteria. Ulcer repair involves epithelial proliferation, hematopoietic recovery, local microbial reestablishment, and the absence of wound healing inhibitors such as infection or mechanical irritation.^[11]

Oral mucositis management focuses on symptom management and preventing consequences, including pain control, nutritional assistance, and secondary infection prevention or treatment. The Mucositis Study Group of the Multinational Association for Supportive Care in Cancer and the International Society of Oral Oncology (MASCC/ISOO) has developed clinical practice guidelines for the management of mucositis.^[12] With the available recent evidence, the management of oral mucositis according to the WHO classification of mucositis is summarized as follows.

For grades 1 and 2, soluble paracetamol (1g) can be used as a mouthwash four times daily. NSAIDs are avoided due to risks of bleeding and kidney impairment, while antibiotics are prescribed for secondary infections.^[13] Topical application of Vitamins A and E coupled nanoparticles was efficacious in preventing and reducing the onset of oral mucositis.^[14,15] In grade 3 and 4 cases, stronger pain relief such as 30 mg oxycodone twice daily or 120 mg morphine at night per day until the pain score reduces, may be necessary, and in persistent cases, additional opioids like fentanyl patches or patient-controlled analgesia may be considered. Mouth rinse like Benzylamine hydrochloride 0.15% oral solution every 1.5-3 hours as needed, and bicarbonate oral rinses are highly recommended in the management of oral mucositis whereas chlorhexidine mouthwashes are not recommended for patients with or recovering from cytotoxic induced mucositis as they inhibit mucosal regrowth. According to recent data, patients with hematologic malignancies (such as lymphoma and multiple myeloma) undergoing high-dose chemotherapy and total body irradiation before autologous hematopoietic cell transplantation experienced a significantly lower incidence of WHO grade 3 and 4 oral mucositis when administered IV recombinant human keratinocyte growth factor-1 (Palifermin, Amgen, Thousand Oaks).^[16]

Xerostomia:

Xerostomia, often known as dry mouth, is diagnosed when a patient reports having a dry mouth despite the oral mucosa seeming moist. Salivary gland hypofunction is defined as a salivary flow rate of less than 0.7 ml/min. Palliative care patients frequently experience xerostomia due to pharmaceutical use, specifically analgesics, antidepressants, diuretics, and antiemetics.^[17] Using alcohol mouthwashes may worsen the illness. Xerostomia can impact a patient's quality of life by limiting their eating, talking, and socializing capacity. Dental caries is substantially higher in xerostomia patients. Additionally, xerostomia individuals

favor softer, cariogenic meals. Palliative oral healthcare providers should attempt to keep the oral cavity moist. The main mode of symptomatic treatment is by constant hydration, use of artificial sialogogues, salivary substitute, and pharmacological management with cholinergic-mimetic medicines such as pilocarpine 5 mg thrice a day for 3 months or cevimeline 30 mg thrice a day.^[18] Other treatment modalities include Acupuncture, Transcutaneous Electrical Nerve Stimulation (ALTENS) and acupuncture alone are new approaches for treating xerostomia, particularly in post-radiotherapy palliative care cancer patients.^[19] Both have the advantage of allowing patients to receive treatment at home, eliminating the need for hospitalization.

Dysphagia:

There are two stages of dysphagia: oesophageal and oropharyngeal. The oropharyngeal phase can be disrupted by poor dentition, inadequate salivation, improper muscle action, and a blocked oral pathway, which can result in pain from fungal infections, herpes, or ulcers. Food chewing issues might be brought on by tooth loss, poorly fitting dentures, cavities, or advanced periodontal disease. Dentists who provide palliative care must assess function and pain. In order to restore oral function, dental caries and periodontal disease must be treated. The patient's longevity and prognosis should be taken into consideration while replacing teeth with prosthetics. The majority of patients receiving palliative care might not be suitable candidates for crowns or implants, but they might benefit from detachable partial dentures.^[20]

Candidiasis:

Often referred to as oral thrush, it affects 70–85% of patients receiving palliative care. Lack of dental hygiene, hyposalivation/xerostomia, anaemia, immunosuppression, long-term use of corticosteroids, broad-spectrum antibiotics, nutritional inadequacies, diabetes mellitus, and wearing dentures are among the factors that predispose people. Clinically, there are three types of candidiasis: hyperplastic, atrophic, and pseudomembranous. A combination of systemic and topical drugs can be used to treat candidiasis. Nystatin suspension (swish three to five times a day), sugar-free fruit drink that contains frozen nystatin suspension, nystatin vaginal suppository, clotrimazole vaginal suppository, clotrimazole troche, and 1% clotrimazole vaginal cream (applied to dentures for a week) are examples of topical treatments.^[21] Divyadharshini et al suggested that clotrimazole had a greater antifungal efficacy against *Candida albicans* than probiotics.^[22]

In individuals who are resistant, systemic therapies include Amphotericin B (0.25-1.5 mg/kg intravenously), Fluconazole (100-200 mg on day 1 and 50-100 mg/day orally for 1-2 weeks), Itraconazole (100-200 mg/day orally for 1-2 weeks), and Ketoconazole (200-400 mg orally for 1-2 weeks). Recently, it was shown that oral thrush might be effectively treated with a single 150 mg dosage of fluconazole. In order to avoid denture-related candidiasis, proper denture care is crucial. Dentures should be stored in a separate jar with water and a 0.12% chlorhexidine solution for the entire night.^[23]

Orofacial Pain:

Cancer patients may experience oral discomfort as a result of their primary illness or as a side effect of chemotherapy, radiation therapy, surgery, or targeted therapies.^[24] Evidence indicates that the molecular processes causing cancer discomfort may overlap. Furthermore, the degree, nature, and significance of cancer pain are probably influenced by the intricate micro-neuroanatomy that innervates the oral cavity.^[25] ET-1 is one of the most researched mediators of cancer pain.^[26] Prostate, breast, colon, hepatocellular, pancreatic, endometrial, lung, pheochromocytoma, and oral squamous cell carcinoma are among the malignancies that release ET-1.^[27] The level of pain in Head and Neck Cancer (HNC) patients undergoing RT rises during therapy, peaks at the two-week mark, and continues at the three-month mark.^[28] Approximately 80% of patients experience both continuous and intermittent episodes of pain, with over half reporting continuous pain. Nearly three-quarters of patients choose neuropathic pain descriptors, indicating that neuropathic pain is prevalent in HNC patients throughout treatment.^[25] The Indian Society for the Study of Pain (ISSP) Cancer Pain Special Interest Group recommendations (2019) offer therapeutic

guidance for palliative care pain treatment. ISSP supports using the stepladder analgesic paradigm [Figure 2] to address cancer pain in ambulatory palliative care patients.^[29]

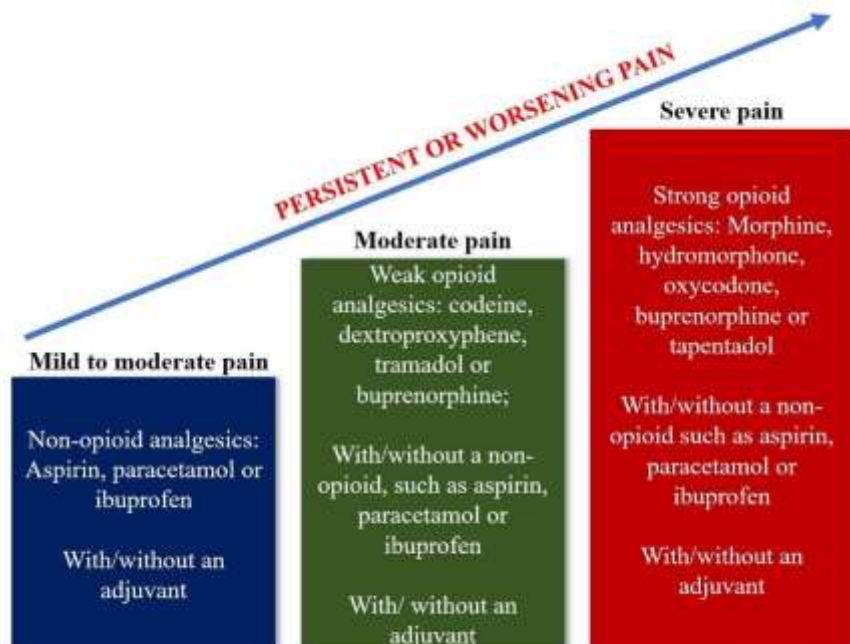


Figure 2: Stepladder Analgesic Paradigm for Management of Orofacial Pain (Pic courtesy: Yang J et al, 2020)

ROLE OF ORAL PHYSICIANS IN PALLIATIVE CARE:

In the comprehensive care of terminally ill cancer patients, oral physicians play a crucial role, because they perform extensive oral examinations and take thorough histories, which are often neglected. Their knowledge is crucial for implementing a patient-centered, compassionate dental care strategy during palliative care.^[30] Oral physicians can oversee telemedicine sessions by providing remote monitoring and advice on dental care. They can also create customized treatment programs based on the requirements of each patient, use high-dose anesthetics in pain management procedures, and use unconventional methods to lessen suffering. Furthermore, their participation in incorporating technology like virtual reality and smartphone apps can improve patient engagement.^[31]

Additionally, oral physicians play a crucial role in the creation of specific oral hygiene products and the management of mobile dentistry clinics, guaranteeing that patients hygiene products and the operation of mobile dental units, ensuring that patients receive necessary care in their preferred settings. By incorporating mindfulness and relaxation techniques into dental care, oral physicians further alleviate the anxiety and stress associated with treatment, improving the overall quality of life for these vulnerable patients.^[32] Table 2 illustrates the proposed future recommendations for all oral physicians that will benefit the delivery of meticulous palliative care in terminally ill cancer patients.

Table 2: Future Recommendations for Oral Physicians in Palliative Care

RECOMMENDATIONS	APPROACHES
Telehealth Consultations and Monitoring	Implement telehealth consultations for oral assessments, allowing remote monitoring and guiding oral care routines.

Personalized Oral Care Plans	Develop personalized oral care plans tailored to the specific needs and conditions of each terminally ill cancer patient.
Pain Management Strategies	Use of novel anesthetics, topical agents, or alternative techniques to minimize discomfort during dental interventions. Explore and implement pain management strategies specifically tailored for oral care procedures in terminally ill cancer patients.
Technology-Assisted Oral Care	Embrace technological advancements like mobile apps or virtual reality to guide patients through oral care routines. Gamification and interactive platforms can make oral care more engaging and less intimidating for patients
Innovative Oral Hygiene Products	To develop specialized oral hygiene products designed for the unique needs of terminally ill cancer patients - softer toothbrushes, alcohol-free mouthwashes, and other products that are gentle yet effective.
Mobile Dental Units for On-Site Care	Introduce mobile dental units equipped to provide on-site oral care to patients in hospices, palliative care facilities, or even in their homes
Mindfulness and Relaxation Techniques	Integrate mindfulness and relaxation techniques into dental appointments to help alleviate anxiety and stress associated with oral care which involves creating a calming environment, and providing guided meditation.

Dignity Therapy:

It is a brief, customized intervention designed to lessen suffering in patients with terminal illnesses by giving them a feeling of purpose and meaning. Dignity care is a much-needed and appreciated addition to the all-encompassing care of patients in need of palliative care. With open communication, treatment can address parts of the condition that limit life, even in acute care settings. One aspect of palliative care that is often acknowledged as needing improvement is psychological distress at the end of life. Dignity therapy may be able to fill this gap and provide a remedy.^[33]

CONCLUSION:

The integration of oral physicians into palliative care teams for terminally ill cancer patients is crucial. Their expertise in managing oral health issues can significantly enhance the overall quality of life for these patients. Palliative care and cancer organizations should prioritize the inclusion of oral physicians into palliative care teams, recognizing the holistic nature of patient well-being and the potential impact on both the physical and emotional aspects of their final journey.

REFERENCES:

1. Global Burden of Disease Cancer Collaboration, Fitzmaurice C, Abate D, Abbasi N, Abbastabar H, Abd-Allah F, Abdel-Rahman O, et al. Global, regional, and national cancer incidence, mortality, years of life lost, years lived with disability, and disability-adjusted life-years for 29 cancer groups, 1990 to 2017: A systematic analysis for the Global Burden of Disease study: A systematic analysis for the global burden of disease study. *JAMA Oncol.* 2019 Dec 1;5(12):1749–68.
2. Palliative care [Internet]. [cited 2024 Oct 24]. Available from: <https://www.who.int/news-room/fact-sheets/detail/palliative-care#:~:text=Palliative%20care%20is%20an%20approach,associated%20with%20life%2Dthreatening%20illness.>
3. Walsh M, Fagan N, Davies A. Xerostomia in patients with advanced cancer: a scoping review of clinical features and complications. *BMC Palliat Care.* 2023 Nov 11;22(1):178.
4. World Medical Association. Declaration of Venice on terminal illness. *Br Med J (Clin Res Ed).* 1983 Nov 26;287(6405):1646.
5. WMA - The World Medical Association-WMA Declaration on End-of-Life Medical Care [Internet]. [cited 2024 Oct 24]. Available from: <https://www.wma.net/policies-post/wma-declaration-on-end-of-life-medical-care/>
6. Tolentino E de S, Centurion BS, Ferreira LHC, Souza AP de, Damante JH, Rubira-Bullen IRF. Oral adverse effects of head and neck radiotherapy: literature review and suggestion of a clinical oral care guideline for irradiated patients. *J Appl Oral Sci.* 2011 Oct;19(5):448–54.
7. Srividya A, Chaudhry A. Dentists role in psychological screening and management of head-and-neck cancer patients undergoing radiotherapy - narrative review. *Indian J Palliat Care.* 2023 Jul;29(3):250–5.
8. Bell A, Kasi A. Oral mucositis. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2024.
9. Stempniewicz A, Ceranowicz P, Warzecha Z. Potential therapeutic effects of gut hormones, ghrelin and obestatin in oral mucositis. *Int J Mol Sci.* 2019 Mar 27;20(7):1534.
10. Revathi B, Dharman S, Selvaraj J. Evaluation of biomarkers of oxidative stress levels in chemoradiotherapy induced oral mucositis in Head and Neck cancer patients - A hospital based prospective study. *HIV Nurs.* 2022 Dec 30;22(2):4105–11.
11. Shankar A, Roy S, Bhandari M, Rath GK, Biswas AS, Kanodia R, et al. Current trends in management of oral mucositis in cancer treatment. *Asian Pac J Cancer Prev.* 2017 Aug 27;18(8):2019–26.
12. Elad S, Cheng KKF, Lalla RV, Yarom N, Hong C, Logan RM, et al. MASCC/ISOO clinical practice guidelines for the management of mucositis secondary to cancer therapy. *Cancer.* 2020 Oct 1;126(19):4423–31.
13. Brown TJ, Gupta A. Management of cancer therapy-associated oral mucositis. *JCO Oncol Pract.* 2020 Mar;16(3):103–9.

14. Dharman S, Maragathavalli G, Shanmugam R, Shanmugasundaram K. Current perspectives of nanotherapies in the prevention and treatment of radiotherapy/chemotherapy-induced oral mucositis in head and neck cancer—A narrative review. *J Int Oral Health*. 2023 Nov;15(6):491–9.
15. Chaitanya NC, Muthukrishnan A, Babu DB, Kumari CS, Lakshmi MA, Palat G, et al. Role of vitamin E and vitamin a in oral mucositis induced by cancer chemo/radiotherapy-a meta-analysis. *Journal of clinical and diagnostic research: JCDR*. 2017;11(5).
16. Vadhan-Raj S, Goldberg JD, Perales MA, Berger DP, van den Brink MRM. Clinical applications of palifermin: amelioration of oral mucositis and other potential indications. *J Cell Mol Med*. 2013 Nov;17(11):1371–84.
17. Villa A, Connell CL, Abati S. Diagnosis and management of xerostomia and hyposalivation. *Ther Clin Risk Manag*. 2015;11:45–51.
18. Kapourani A, Kontogiannopoulos KN, Barmapalexis P. A review on the role of pilocarpine on the management of xerostomia and the importance of the topical administration systems development. *Pharmaceuticals (Basel)*. 2022 Jun 18;15(6):762.
19. Kasat V, Gupta A, Ladda R, Kathariya M, Saluja H, Farooqui AA. Transcutaneous electric nerve stimulation (TENS) in dentistry- A review. *J Clin Exp Dent*. 2014 Dec;6(5):e562–8.
20. Patterson JM, Lawton M. Dysphagia advances in head and neck cancer. *Curr Otorhinolaryngol Rep*. 2023 Feb 15;11(2):1–8.
21. Williams D, Lewis M. Pathogenesis and treatment of oral candidosis. *J Oral Microbiol*. 2011 Jan 28;3(1):5771.
22. Divyadharsini V, UmaMaheswari TN, Rajeshkumar S. Comparison of antifungal activity of probiotics, coconut oil and clotrimazole on candida albicans – an in vitro study. *J Indian Acad Oral Med Radiol*. 2022 Oct;34(4):385–9.
23. Garcia-Cuesta C, Sarrion-Pérez MG, Bagán JV. Current treatment of oral candidiasis: A literature review. *J Clin Exp Dent*. 2014 Dec;6(5):e576–82.
24. Al-Ansari S, Zecha JAEM, Barasch A, de Lange J, Rozema FR, Raber-Durlacher JE. Oral mucositis induced by anticancer therapies. *Curr Oral Health Rep*. 2015 Dec;2(4):202–11.
25. Epstein JB, Miaskowski C. Oral pain in the cancer patient. *J Natl Cancer Inst Monogr*. 2019 Aug 1;2019(53):lgz003.
26. Barr TP, Kam S, Khodorova A, Montmayeur JP, Strichartz GR. New perspectives on the endothelin axis in pain. *Pharmacol Res*. 2011 Jun;63(6):532–40.
27. Pickering V, Jordan RCK, Schmidt BL. Elevated salivary endothelin levels in oral cancer patients--a pilot study. *Oral Oncol*. 2007 Jan;43(1):37–41.
28. Epstein JB, Wilkie DJ, Fischer DJ, Kim YO, Villines D. Neuropathic and nociceptive pain in head and neck cancer patients receiving radiation therapy. *Head Neck Oncol*. 2009 Jul 14;1(1):26.
29. Yang J, Bauer BA, Wahner-Roedler DL, Chon TY, Xiao L. The modified WHO analgesic ladder: Is it appropriate for chronic non-cancer pain? *J Pain Res*. 2020 Feb 17;13:411–7.
30. Kudva A, Ghoshal A, Mishra P, John AR, Saran T, Roy S, et al. Oral health in cancer palliative care: cross-sectional study. *BMJ Support Palliat Care*. 2024 Jan 22;spcare – 2023–004454.
31. N. CB. Role of oral medicine specialist in palliative care. *World J Pharm Pharm Sci*. 2017 Apr 1;6(4):947–58.
32. Silva ARP, Bodanezi AV, Chrun ES, Lisboa ML, de Camargo AR, Munhoz EA. Palliative oral care in terminal cancer patients: Integrated review. *World J Clin Cases*. 2023 May 6;11(13):2966–80.
33. Chochinov HM, Hack T, Hassard T, Kristjanson LJ, McClement S, Harlos M. Dignity therapy: a novel psychotherapeutic intervention for patients near the end of life. *J Clin Oncol*. 2005 Aug 20;23(24):5520–5.