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Clinical Significance of Oral Health Related Quality of Life for Oral Cancer Patients: A Systematic Review

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ABSTRACT

Background: *Oral cancer is relevant not only to medical practitioners but also to dentists because they have a responsibility in the early detection and prevention in the early stages of disease. Dentists are also responsible for supportive care and prosthetic rehabilitation of oral cancer patients undergoing treatment. However, more work is required on the clinical significance of quality of life for oral cancer patients. Few reviews have been conducted on the clinical significance of oral health related quality of life in oral cancer patients and hence there is minimal guidance on the support these patients need.*

Methods: *An electronic search was conducted on Google Scholar, PubMed, Biomedical central, JSTOR and Oxford Academic databases between October 2020 and November 2021 using the keywords "oral cancer", "oral health related quality of life" and "clinical significance". The search was limited to dental journals and MEDLINE and the information was extracted using the PRISMA guidelines.*

Results: *Nine articles out of eighty-eight were found to be most relevant and were included in the analysis. Surgery has had significantly ($p<0.05$) positive effects on the oral health related quality of life of oral cancer patients than patients who received radiotherapy. However, microvascular surgery seemed to negatively affect the quality of life than local reconstruction. Xerostomia was worst in patients undergoing head and neck radiotherapy, then those patients who only had oral surgery.*

Conclusion: *Evidence suggests that oral cancer patients' experience a negative impact to health-related quality of life especially in the first three months but the quality of life improves thereafter almost five years after oncological treatment.*

Keywords

Oral cancer, Oral health related quality of life, Clinical significance.

Introduction

The definition and concept of oral health related quality of life (OHRQOL) remains relatively vague despite having many publications and research [1]. It is however, a rapidly growing phenomenon with a growing body of research becoming evident in the last two decades. It first emerged in the early 1980s as an important aspect of health-related quality of life, which appeared in the late 1960s [2]. OHRQoL is a multidimensional construct that evaluates an individual's functional, emotional, psychological and social well-being [3]. It is applied in dental education, clinical practice and dental research, where research is presented in various fields, including

psychology, public health, and general healthcare [4].

Slade and Spencer introduced the impact of oral health on the quality of life in 1994, where they designed a 49 questions form known as the Oral Health Impact Profile (OHIP-49) to capture seven dimensions of health. The domains are self-reported functional limitations, physical pain, psychological discomfort, physical disability, psychological disability, social disability and overall handicap [5]. In 1997, Locker also outlined the shift from a disease-centred, biomedical approach to a patient-centred biopsychosocial approach in healthcare [4].

In 1997, Slade also reduced the OHIP-49 questionnaire to the most essential questions in OHIP-14 [5]. This revised form has been tested for reliability, validity, and precision and has been found to be useful in the clinical setting [5]. It has mainly been used in patients with head and neck cancer, although the studies are scarce [6]. In 2003, the World Health Organisation recognised it and applied it in its global health programs [3].

Although dental caries and periodontal diseases dominate public health problems, other oral diseases also contribute to the global burden of disease. Dental disease is measured to record the presence of disease, the extent and severity. This is done in an orderly fashion using a recording system (index) where indices are used to quantify a disease [7]. In the clinical setting, it is necessary to measure and record dental disease to aid diagnosis and treatment. Clinical parameters also measure individual treatment needs and outcome.

At population level, we measure disease to record the prevalence of disease, to understand the aetiology of certain diseases, to assess the population treatment need and to evaluate the effectiveness of health services and programmes. Epidemiological research also informs policy and assists in planning and implementation of prevention and control of disease or injury [8]. For instance, knowledge from epidemiologic studies is applied in public health field in health services assessment and planning.

Cancer poses a great public health challenge not only to medical practitioners but also to dental surgeons [9]. Oral cancer is relevant to dental surgeons, because they have a responsibility in the early detection and prevention, much as it is difficult to diagnose it in the early stages of disease. Dentists are also responsible for supportive care and prosthetic rehabilitation of patients undergoing treatment for oral cancers.

Oral cancer interferes with nutrition, speech, respiration and affects the facial appearance causing gross disfigurement [10]. Patient survival is dependent upon the stage at which it is detected and the treatment undertaken. The management modalities include surgery, chemotherapy and radiotherapy. Due to lack of knowledge and awareness of the diagnostic signs and symptoms, less than 50% of oral cancers are diagnosed in the early stages [11]. The consequences of delayed treatment are low survival rates and poor treatment outcomes [9], usually presenting in disabilities that influence the patient's ability to swallow, eat or speak.

Clinical practice is implicitly tied to the patient's quality of life and this shifts the focus to clinicians and researchers from the oral cavity alone to the patient as a whole. Researchers on the other hand should make positive contributions to the patient's quality of life, both in the laboratory and clinical settings. This is achieved by directing research questions and solutions on the patient's quality of life [4]. Oral health related quality of life is important in clinical decision making because it is a valid outcome measure of morbidity and mortality due to surgery, chemotherapy and radiotherapy. It is also used to examine trends in oral health, burden of disease, estimate population needs and implications to the practice of dentistry [12]. Therefore, OHRQoL remains an adjunct to measuring treatment outcomes and not a substitute for measuring disease or treatment outcomes [13].

As stated, oral cancers cause physical, functional and multiple psychosocial consequences that affect an individual. The physical alterations include appearance changes and/or pain. Functional changes occur in mastication, deglutition or phonation. Finally, psychosocial consequences include anxiety, depression or social functioning [6]. Clinicians and researchers must adopt a holistic approach instead of focusing only at the patients' oral cavities. They must consider the patient as a person and how treatment decisions will affect overall health and quality of life. While the clinician may objectively pronounce the patient's oral health as adequate, the patient may subjectively rate his/her oral health as poor based on appearance. Quality of life studies also provide a rapid, valid assessment of improvement to a busy clinician [4].

There is evidence to suggest that oral cancer patients tend to experience a negative impact to health-related quality of life especially in the first three months but the quality of life improves after almost five years after oncological treatment. For instance, in a recent prospective study of 93 patients in Helsinki University Hospital Finland, speech was the most affected dimension after microvascular reconstruction and a 4.9-year follow up period, indicating that the long-term quality of life was significantly reduced [14]. This was also the case in Brazil where the quality of life of head and neck patients got worse within the first month of treatment and this remained till the end of definitive management [5]. This goes to show that quality of life studies is an important indicator in the effectiveness of treatment and meeting patient's needs as was observed in a landmark randomized controlled trial conducted in the United Kingdom on 288 patients where head and neck cancer patients filled a patient concerns inventory (PCI) it was found to be helpful in managing patients' needs and expectations [15].

There was however, no agreement on the influence of race or skin colour on the quality of life but an explanation was proposed as a socioeconomic factor [10]. In spite of this, a multi-site prospective randomised clinical trial conducted in the United

States on 137 patients who had undergone radiotherapy found that white American patients had better scores on quality of life [16] and this may be related to black American having lower socioeconomic status than whites [17]. Hence, it would seem that socio-demographics play a role on the quality of life of patients with head and neck cancers.

Poor oral hygiene is one of the several factors that have an additive adverse outcome on oral cancer together with tobacco and alcohol. Poor oral hygiene causes the development of chronic inflammation such as periodontitis, which may lead to oncogenesis and oral squamous cell carcinoma (OSCC). Common indicators of oral hygiene include tooth-brushing, use of mouthwash and dental floss, wearing of denture, missing teeth, and gum bleeding. Poor oral hygiene was the most significant risk predictor of oral cancer. The oral health indicators in combination with smoking pose a higher risk of oral cancer [18]. For instance, a meta-analysis of 38 studies summarised that there was a high chance of developing oral cancer with *Porphyromonas gingivalis* (Pg) and *Prevotella intermedia* (Pi) infection than with *Tannerella forsythia* (Tf), *Aggregatibacter actinomycetemcomitans* (Aa), *Treponema denticola* (Td) and *Fusobacterium nucleatum* (Fn) infection (Xiao et al, 2020). This, in turn, often leads to oncogenesis and oral squamous cell carcinoma (OSCC) [18].

A recent randomised controlled trial conducted in the United Kingdom confirmed that obtaining information from a patient's perspective was effective in capturing the health concerns. This was after a patient concerns inventory comprising of 59 questions was administered [15]. In another randomised controlled study conducted in the United Kingdom involving 71 head and neck cancer patients, on the use of *Therabite* it was established that both groups increased their mouth opening to relieve trismus caused by the disease or by radiotherapy [19]. Consequently, it was also reported in a cohort study conducted in the United States that pre-operative teaching improved the post-operative expectations of oral cancer patients significantly ($p<0.05$) [20]. It is for this reason that this review aims at informing clinicians on the importance of oral health related quality of life as a measure of effectiveness of oral cancer management.

Methodology

This review involved an electronic search of Google Scholar, PubMed, Biomedical central, JSTOR and Oxford Academic databases with an aim of describing oral cancer with its impact on oral health related quality of life. The search terms used were "oral cancer", "oral health related quality of life" and "clinical significance" with a five-year period from 2016 to 2021 was selected with full text articles as filters. Upon reading the title and abstracts, several articles were excluded with nine articles being found to be most relevant.

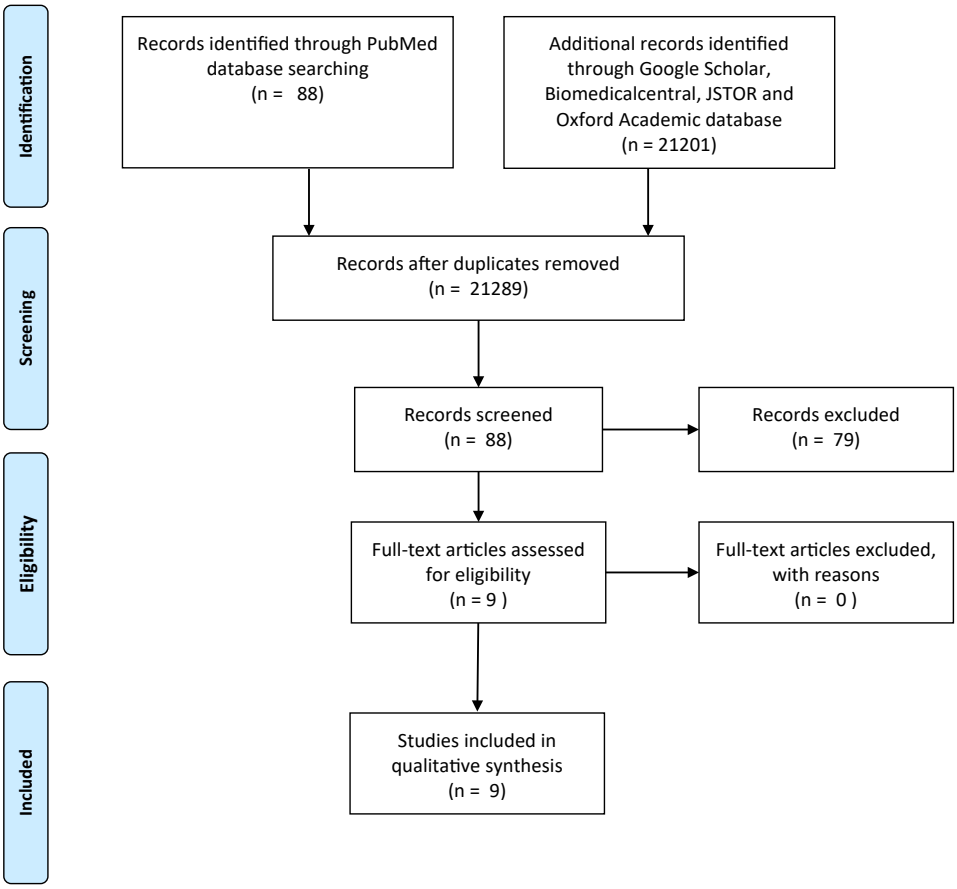

Figure 1: PRISMA Flow Diagram.

Main findings

Cancer patients' quality of life is affected significantly especially those in advanced stage, who suffer from decline in functional status and poorly controlled pain. Patients who undergo surgical treatment alone have higher quality of life scores than those treated with radiotherapy. Hence, quality of life for head and neck cancer patients does not return to normal and it affects the overall state of health [4]. The most common side effects are xerostomia, mucositis and speech impairment. In a prospective cohort study conducted on 93 patients in Finland after a follow-up period of 4.9 years after microvascular surgery, it was found that speech, eating and "usual activities" were significantly ($p=0.014$) affected [14]. In addition, a recent study conducted in Germany showed that speech, chewing, swallowing; taste and pain were found to have gotten significantly worse after microvascular reconstruction for oral cancer patients compared to those who underwent local reconstruction. This was assessed after using the University of Washington Quality of Life Questionnaire on 88 histologically confirmed patients [21].

Xerostomia was found to be the most common oral complication in patients undergoing radiotherapy of the head and neck region [5] in Brazil and Nairobi [22]. In Brazil, xerostomia had a negative impact on the quality of life ($p < 0.05$) as reported in a cross-sectional quantitative study of 40 patients who were evaluated using the oral health impact questionnaire (OHIP) [5]. A recent cohort study of 592 participants showed that women's self-perceived xerostomia was worse than for men [23]. Nevertheless, a relatively recent prospective randomised clinical trial of 137 showed that radiation induced xerostomia (RIX) improved over time for all the patients [16]. This indicated that there is some contention on the effects of xerostomia on the oral health related quality of life of head and neck cancer patients.

Mucositis is another severe complication of chemotherapy or radiotherapy. The pain associated with mucositis can be intense and affects mastication, eating, swallowing and thus quality of life [4]. For instance, in a cross-sectional study of 50 head and neck cancer patients who were undergoing radiotherapy, the oral health-related quality of life of patients with mucositis was significantly ($p = 0.037$) worse. Although it was also found, those patients with poor oral hygiene status had mucositis but the results were not statistically significant [24].

Speech impairment and usual activities were the most ($p < 0.001$) affected dimensions in head and neck cancer patients as evaluated by a prospective study of 93 oral cancer patients who had undergone microvascular reconstruction and were followed up for 4.9 years in Finland [14]. However, there was an improvement in implant supported prosthetic obturators placed after maxillectomy which appeared to improve chewing ability, oral functioning and patient satisfaction as found by a cross-sectional study of 19 edentulous maxillectomy patients [25].

Stress is another side effect of oral cancer treatment and was linked with oral health related quality of life with men reporting it more than women do. The perception of oral health related quality of life of men was better than for women as corroborated by a cohort study of 592 participants [23]. One study reported that patients' emotional functioning was adversely affected 7 to 11 years after the completion of surgery and radiotherapy. While another study demonstrated that chemotherapy-induced taste, aberrations contributed to the development of food avoidance and aversion, which can cause significant malnutrition [4].

Discussion

Head and neck cancers cause physical, functional and multiple psychosocial consequences that affect an individual. The physical alterations include appearance changes and/or pain. Functional changes occur in mastication, deglutition or phonation. Finally, psychosocial consequences include anxiety, depression or social functioning [6].

There is significant evidence to suggest that oral cancer patient's experience a negative impact to health related quality of life especially in the first three months but the quality of life improves after almost five years after oncological treatment. This is in agreement with the literature for instance, in a recent prospective study of 93 patients in Helsinki University Hospital Finland, speech was the most affected dimension after microvascular reconstruction and 4.9-years follow up period [14].

Stress was linked with oral health related quality of life with men reporting it more than women do. The perception of oral health related quality of life of men was better than for women as corroborated by a cohort study of 592 participants [23]. Another study reported that patients' emotional functioning was adversely affected 7 to 11 years after the completion of surgery and radiotherapy and that chemotherapy-induced taste aberrations contributed to the development of food avoidance and aversion, which can cause significant malnutrition [4].

Many studies have been conducted on the effects of several carcinogenic substances but few have assessed the effects of oral cancer from the patient's perspective so as to inform clinicians on its impact to health. To measure health and its determinants is of critical importance, to establish objective modes of assessment and improve health. Hence, epidemiological measures aid in the understanding of health and its determinants, not only disease and death, but also the quality of life.

The role of dental treatment is of paramount importance to improve the quality of life of an individual. This is also the case for oral cancer patients to reduce the risk of development of cervical caries, periodontitis and osteoradionecrosis in the course of oral cancer treatment. Although few studies to our knowledge have reported the effect of dental treatment in the improvement of oral health related quality of life, literature suggests that there are some contentious areas in the acceptability of oral health related quality of life research findings. This is because quality of life studies is a relatively new phenomenon globally.

What this review adds

In the past, oral health related quality of life was considered to be an area of "unimportance" but currently it has become an area of contention because of the fact that it is a relatively new phenomenon in medicine. Hence, this review adds to the body of knowledge on the effects of oral cancer on the quality of life of patients. This review has analysed the clinical significance of quality of life for oral cancer patients. The effects caused by radiotherapy of the head and neck region have a negative impact on the oral health related quality of life of oral cancer patients compared to patients who received surgical interventions alone. This however remains an area of contention and requires further research as to the impact to the quality of life.

Limitations

Very few studies have been included in the study because this is a new concept in oral health, which has not been very well documented in the literature.

Conclusion

Literature suggests that there is an improvement in the oral health related quality of life scores for oral cancer patients over time, which indicates that treatment has an impact on the quality of life of oral cancer patients. Oral hygiene and periodontal status have yet to be measured to establish whether dental treatment has, an effect on the oral health related quality of life of patients undergoing oral cancer treatment and this forms the basis for further research.

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