Comparative Analysis of the Quality of Life in the Pretreatment of Head and Neck Cancer Patients According to Tumor Site

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Abstract

Introduction   Head and neck cancer (HNC) and its treatment can cause physical, psychological, and quality of life (QoL) damage, because it can disturb the physiology of eating, breathing, speaking, and compromise self-image.

Objective   To evaluate the QoL of the pretreatment of patients diagnosed with head and neck cancer according to the anatomical location of the tumor.

Methods   A descriptive, cross-sectional study was performed on a sample of 144 patients undergoing pretreatment for cancer from February 2017 to July 2019. The University of Washington QoL Questionnaire (version 4) was used to assess the QoL. The anatomical location data were obtained from medical records. The ANOVA test was used to compare the differences in QoL according to tumor location.

Results   A total of 144 participants were included, 66 (45.5%) of whom had the primary tumor located in the mouth. The median age of the patients was 62 years, with a higher prevalence of male (75.7%), Black (78.5%), single/divorced/widowed people (59%), and illiterates (32.6%); most of them were smokers (84.7%) and alcohol drinkers (79.2%). The mean QoL score was 830 for mouth cancer, 858 for pharynx cancer, and 891 for laryngeal cancer patients.

Conclusion   Based on the results of this study, it can be concluded that the QoL of patients with head and neck cancer was not influenced by tumor location. The most affected domains in the three groups were pain, appearance, chewing, swallowing, and speech ($p < 0.05$).

Keywords
► quality of life
► head and neck cancer
► mouth cancer
► laryngeal cancer
► pharyngeal neoplasms

Introduction

Head and neck cancer (HNC) is considered one of the main types of cancer in Brazil and worldwide, because of its significant incidence, prevalence, and mortality. The World Health Organization (WHO) estimates there will be $\sim$ 27 million cases by 2030.[1] Currently, HNC represents 5% of cancers in the Western world and affects 1.7% of Brazil's population, encompassing a large and heterogeneous group of tumors.[2–4]

Head and neck cancer patients suffer from life-threatening issues due to the disease itself and the need for treatments– often mutilating – that can cause physical, psychological, and quality of life (QoL) impairment.[5,6] Because the tumor is located in the upper aerodigestive tract, it directly disturbs the physiology of chewing, swallowing, breathing, and speaking, in addition to interfering with aesthetic aspects, which are of primary value in the social relationships of these individuals.[5–8]

Quality of life assessment is of paramount importance in the treatment of HNC patients, especially those with oral, pharyngeal, and laryngeal cancer. Oral and pharyngeal tumors are a public health issue in that they figure as the 5th most frequent malignant neoplasms and the 7th leading cause of death worldwide, with 40% of HNC occurring in the oral cavity and 15% in the pharyngeal region.[9–11] Pharyngeal cancer stands out among the neoplasms that most often interfere with the QoL of patients, causing significant aesthetic and functional impairment.[11,12]

Quality of life is defined by the World Health Organization (WHO) as "*an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns*"[13].

Quality of life assessment can be conducted through the application of questionnaires, several of which are validated in the literature. Among them, one of the most widely used is the University of Washington QoL questionnaire (UW-QoL).[8]

The questionnaires cover topics related to general health and disease symptoms, allowing for the collection of clinical data, which can contribute to the improvement of therapeutic and preventive interventions, and help direct patients to appropriate care.[14]

We hypothesized that the health-related QoL of patients with HNC is influenced by tumor location. This project, thus, aimed to compare the QoL of patients diagnosed with HNC going through pretreatment according to tumor site.

Methods

After approval by the research ethics committee (REC) of State University of Feira de Santana, under the protocol number 1.621.470, this cross-sectional, descriptive study was initiated and consisted of the evaluation of 144 individuals diagnosed with HNC, from February 2017 to July 2019, who were treated at the High Complexity Oncology Unit of Santa Casa de Misericórdia de Feira de Santana, Dom Pedro

de Alcântara Hospital and MULTICLIN clinic, all located in the municipality of Feira de Santana, Bahia, Brazil.

We included patients over 18 years of age who had a histopathological diagnosis of squamous cell carcinoma (SCC) or adenocarcinoma whose primary site was the oral cavity, pharynx, or larynx at any clinical stage.

Patients were excluded if they refused to participate in the study; had autoimmune diseases, psychosis, anxiety disorders, or cognitive impairment; or needed palliative care.

Before starting data collection, researchers went through a process of orientation and calibration. One of the instruments used in the research was a self-completion questionnaire; however, as most participants had low education levels, the researchers sometimes had to apply the questionnaire as an interview. To avoid introducing bias, the researchers were told to ask each question up to three times without rephrasing it and, in case of noncomprehension even after the third time, they should replace any difficult word with an easier one without changing the meaning of the question. After such training, the researchers were asked to apply the questionnaire to some patients to ensure correct application.

Data collection was performed after the subjects were informed of the study aims and provided written informed consent by signing a document which contained all the necessary information to ensure the interviewed participants felt safe and comfortable to express their opinions without privacy concerns.

The individuals were informed that their participation was voluntary, and treatment was independent of their decision to participate in the research.

Data collection took place on the day the patients received the diagnosis and before treatment and participants were interviewed individually in a private room.

Two questionnaires were used for data collection. The first was designed to gather exploratory data, including sociodemographic (gender, skin color, marital status, education level, and professional status), life habits (smoke and drink), and clinical variables (tumor site and clinical staging). Then, the UW-QoL was applied, containing 12 questions related to specific functions of the head and neck, as well as to life activities, recreation, pain, appearance, swallowing, speech, taste, chewing, saliva, mood, and anxiety, to assess the QoL in the previous week, with scores ranging from zero (worst) to 100 (best). Composite scores were obtained by averaging the scores of each individual domain.

The quantitative variables were described by their central tendency and respective dispersion measures, while the nominal variables were described by their absolute values or percentages. The one-way analysis of variance (ANOVA) test was used to compare QoL scores according to tumor sites. The Student t-test for independent samples was used to compare clinical staging and QOL score. To compare tumor site and clinical staging, the Pearson chi-squared test was performed. P-values lower than 0.05 ($p < 0.05$) were used to indicate statistical significance. The IBM SPSS Statistics for Windows, Version 20.0 (IBM Corporation, Armonk, NY, USA) was used for the statistical analysis.

Table 1 Sociodemographic data of the studied sample of patients with mouth, pharyngeal, and laryngeal cancer

Variables	n	(%)
Gender		
Female	35	24.3
Male	109	75.7
Skin color		
White	31	21.5
Brown/black	113	78.5
Marital status		
Single/divorced/ widower	85	59.0
Married/stable union	59	41.0
Education level		
Illiterate	47	32.6
Knows how to read and write	46	31.9
Primary/secondary/higher education	51	35.4
Occupation		
Employed	28	19.4
Does not work due to health status	65	45.1
Does not work for other reasons	51	35.4

Feira de Santana-BA, 2019.

Table 2 Sample distribution by life habits

Habits	n	(%)
Do you smoke or did you stop smoking less than 3 years ago?		
Yes	122	84.7
No	22	15.3
Do you drink or did you stop drinking less than 1 year ago?		
Yes	114	79.2
No	30	20.8

Feira de Santana-BA, 2019.

Results

We evaluated 144 patients with a median age of 62 (54–68) years. The sociodemographic data, life habits, and clinical characteristics are detailed in ►**Tables 1**, **2**, and **3**.

All participants had SCC or adenocarcinoma whose primary site was the oral cavity, pharynx, or larynx, in any clinical condition, and had not undergone any previous cancer treatments.

When comparing primary tumor site with clinical staging, no difference was found between the groups ($p = 0.259$). However, when the overall QoL score was evaluated according to clinical staging, individuals with late-stage tumors were found to have worse QOL than those with early-stage cancer (►**Table 4**).

Table 3 Sample distribution by clinical characteristics

Variables	n	%
Topography		
Mouth	66	45.8
Pharynx	33	22.9
Larynx	45	31.3
Tumor size		
T1	14	9.7
T2	34	23.6
T3	52	36.1
T4	44	30.6
Regional lymph nodes		
N0	63	43.8
N1	29	20.1
N2a, b, or c	47	32.6
N3	5	3.5
Clinical staging		
Stages I and II	37	25.7
Stages III and IV	107	74.3

Feira de Santana-BA, 2019.

Table 4 Mean UW-QoL questionnaire (version 4) scores according to clinical staging

Clinical staging	Quality of Life M SD		p^a
Stages I and II	84.3	16.4	< **0.001**[*]
Stages III and IV	67.6	17.9	

Abbreviations: M, medium; SD, standard deviation.
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[a]Student t-test [*]$p < 0.005$

Patient QOL was analyzed by adding the points of each domain of the UW–QoL questionnaire (version 4) and determining the overall score. For oral cancer, the most frequently affected domains were pain and chewing. In larynx and pharynx cancer patients, anxiety was the most often affected domain. The domains that significantly differed between the three groups were pain, appearance, swallowing, chewing, and speech, with a p-value < 0.05 (►**Table 5** and **Graph 1**).

The mean composite QoL scores (►**Table 5**) were 70.5 for oral cancer, 71.5 for pharyngeal cancer, and 74.2 for laryngeal cancer patients. No statistically significant difference was observed between them ($p = 0.588$).

Discussion

In the current study, regarding sociodemographic variables, we noted the majority of HNC patients were male, with a ratio of 3 to 1 and a median age of 62 years, corroborating previous studies that recognize men to be more prone to neoplasms at these anatomical sites.[1,3,5,9,11,15–17] According

Table 5 Mean UW-QoL questionnaire (version 4) scores according to tumor site

UW-QoL 12 domains	Mouth	Pharynx	Larynx	p^a
Pain	54.1	60.6	68.8	0.043*
Appearance	81.8	71.9	85.8	0.046*
Activity	75.0	72.7	71.6	0.834
Recreation	71.5	67.4	67.8	0.747
Deglutition	68.7	68.3	83.02	0.033*
Chewing	40.9	68.18	87.8	< 0.001*
Speech	77.8	79.9	63.7	0.019*
Shoulder	86.8	84.8	82.2	0.754
Taste	71.1	75.7	83.0	0.246
Saliva	89.9	86.8	84.4	0.473
Humor	66.6	62.8	62.2	0.771
Anxiety	62.6	58.6	54.9	0.594
Composite score	70.5	71.5	74.2	0.588

Feira de Santana, BA, 2019.
[a]ANOVA test.
*$p < 0.05$.

to Vieira et al. (2012), HNC affects both genders and all races, being up to 3 to 4 times more frequent in men than in women and more common in Blacks and Asians. The incidence of HNC increases with age, and its occurrence is indeed higher in people over 50 years.[12,14,16,18]

Regarding carcinogenic habits, the ones most strongly associated with tumors of the mouth, pharynx, and larynx were alcohol and tobacco consumption; 84.7% of patients were current smokers or had quit the habit less than 3 years before, and 79.2% of them were alcohol drinkers or had stopped consuming alcohol less than 1 year before, allowing us to classify tobacco use as a high-risk practice in the development of mouth/pharynx/larynx cancer, as other studies have shown.[12,16,18–23]

According to Li, Yang, and Kao (2011), there is still no certainty regarding the etiology of cancer, and it is believed to be multifactorial, under both genetic and environmental influences.[24] Concerning HNC, several factors have already been identified as determinants in tumorigenesis, with tobacco and alcohol being the most prominent risk factors with mutagenic potential, accounting for 65 to 95% of these neoplasms.[16,25–27]

As marital status, most patients did not have a stable relationship (married/stable union), contrary to previous findings showing most participants had some type of stable relationship.[11,28] With regard to occupation and education level, only 28% of patients had a job, and 32% were illiterate. According to a study by Boing and Antunes (2011), there is an association between HNC and poverty, in which morbidity and mortality indicators are worse in areas with lower sociocultural and economic levels.[27] In Brazil, the illiteracy rates among oral cancer patients range between 28 and 74%.[29–32]

In our study, no statistical difference was found when comparing clinical staging with primary tumor site between groups. Similar results were reported in other studies involving head and neck cancer patients.[33,34]

Iryia et al.,[14] in 2017, compared the QoL in only 27 patients with HNC according to anatomical location and found no statistical difference between the groups. Thus, this study was performed with 144 patients to verify if increasing the sample number would lead to an observable statistical difference between the groups; however, the same result was found.

Patients classified as having advanced-stage disease, either by tumor size or the presence of cervical lymph node metastasis, were found to have worse QoL than those with early-stage tumors. This finding is in line with the results reported by Hammerlid et al. (2001), but it contradicts other studies.[9,35]
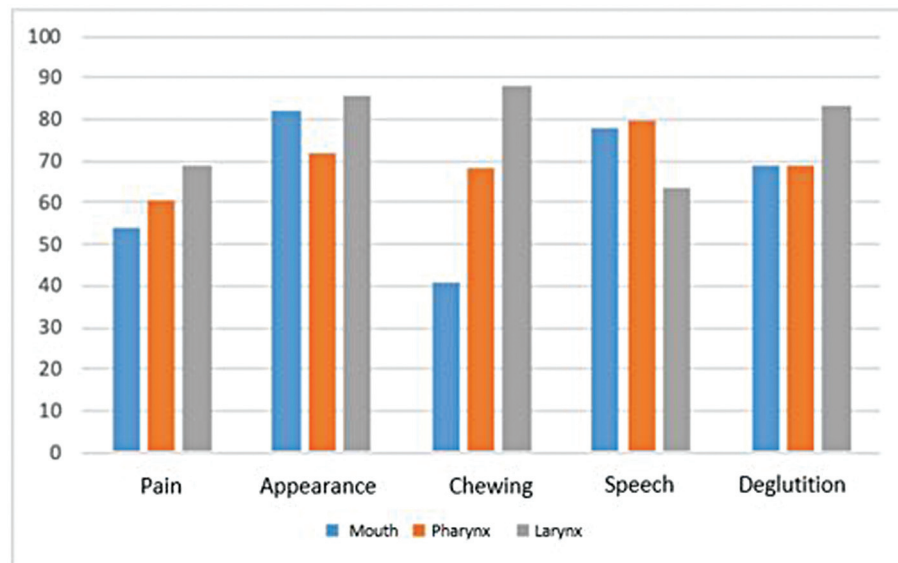
Graph 1 Mean quality of life scores for pain, appearance, chewing, speech, and swallowing domains, according to tumor site ($p < 0.05$).

In the present study, with the application of the UW–QoL, we observed the diagnosis of HNC had a negative impact on the QoL of patients, with the worst overall QoL scores in patients with oral cancer (70.5) and the best in patients with laryngeal cancer (74.2), but this difference was not statistically significant.

Regarding tumor topography, the mouth was the most frequent site (45.8%), followed by the larynx (31.3%) and pharynx (22.9%), which is consistent with previous studies.[12,17] The domains that significantly differed between these three sites were pain, appearance, swallowing, chewing, and speech, with lower scores in the pain and chewing domains for those with oral cancer, 54.1 and 40.9, respectively. Individuals with pharyngeal cancer had lower mean QoL scores, while those with laryngeal cancer had the lowest scores in the speech domain, when comparing the three tumor sites.

Although the present research does not provide data on tumor staging, factors related to QoL impairment in patients with oral cancer include lack of prevention and delay in diagnosis.[18] Periodic examinations and educational actions are simple and low-cost methods that can be used to potentially identify lesions in early stages, since cancer in this area is difficult to see, and the tumor is usually only perceived by patients when it leads to deformities, impaired function, or halitosis.[36,37]

We found that, for the UW-QoL domains pain and chewing, patients who presented with lesions in the mouth/pharynx had the worst scores, which is in line with the studies by Irya et al. (2017).[14] This is probably due to the effects of localized pain when swallowing and eating, and pain when speaking, resulting from the contact between the tongue and sore regions, which does not happen in laryngeal cancer patients.[38–40] All these factors added to the associated facial changes and emotional disorders caused by the disease significantly affect the patients' QoL.[16,37]

In laryngeal cancer, the domain associated with the worst QoL scores was anxiety, followed by humor and speech, a finding similar to that reported by Lima et al. (2011), with the caveat that in that study there were patients who underwent procedures such as tracheostomy, partial laryngectomy, radiotherapy, and chemotherapy.[21]

In this study, we observed the highest UW-QoL scores among larynx cancer patients in the appearance, saliva, taste, and swallowing domains, unlike in the study by Lima et al. (2011),[21] in which the best scores were found in the saliva, shoulder, and activity domains. Regarding the mouth and pharynx cancer groups, the highest scores were found in the saliva and shoulder domains, as in the findings reported in the study by Irya et al. (2017), in which the highest scores were found in the shoulder domain. However, these score differences were not found to be statistically significant in the present study.[14]

There are several concepts of what constitutes QoL, but the WHO (1995) defined it as "*an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns*"[13], and this largely depends on the perception of the study population, since sociocultural and economic factors, and not only the physical changes caused by the disease, affect the individual's QoL.[29,41]

Some potential limitations of this study should be highlighted. For example, the fact that most of our participants had low education levels resulted in difficulty reading and understanding the UW-QoL questionnaire, requiring another person to assist in its completion; this was mitigated through training and by the fact that the questionnaire was applied by only two researchers. In addition, previous studies have suggested tumor size may influence the analysis of QoL related to health status, and clinical staging was not considered in this study as these specific data were lost.

Assessing the impact of QoL losses associated with physical and psychological factors from the patient's perspective is very important in the planning of health services and programs, as it helps to direct the patient to appropriate care, reducing harm, mortality rates, and public spending.

Conclusion

The present study showed that HNC occurred more frequently in males, mainly due to a greater exposure to alcohol-tobacco synergism, which is, therefore, amenable to primary prevention measures. It is noteworthy that most patients were older adults (median age of 62 years), had low education levels, and no partner; thus, these patients should be seen as part of a vulnerable population.

Patients with early-stage disease were found to have better QoL than those with late-stage tumors, which underscores the importance of early diagnosis. Statistical significance was found for the pain, appearance, swallowing, chewing, and speech UW-QoL domains. The most frequently affected anatomical region was the oral cavity, when compared with other HNC sites, especially in the chewing category.

Based on the results of this study, it can be concluded that the QoL of patients with HNC was not influenced by tumor location. Currently, there are few published studies comparing the QoL of patients with HNC according to tumor site.

References

1 INCA. Instituto Nacional De Câncer. Estimativas 2018/2019. Incidências de câncer no Brasil. Rio de Janeiro: INCA; 2018

2   Casati MFM, Vasconcelos JA, Vergnhanini GS, et al. Epidemiologia do Câncer de Cabeça e Pescoço no Brasil: estudo transversal de base populacional. Rev Bras Cir Cabeça Pescoço 2012;41(04):186–191

3   Vieira SC, Lustosa AML, Barbosa CNB, et al. Oncologia básica. 1. ed. Teresina: Editora Dom Quixote; 2012

4   Arora N, Davessar JL, Singh J. Oral cancer profile in a tertiary care center. Int J Otorhinolaryngol Head Neck Surg 2017;3(02):343–346

5   Melo Filho MR, Rocha BA, Pires MBO, et al. Quality of life of patients with head and neck cancer. Rev Bras Otorrinolaringol (Engl Ed) 2013;79(01):82–88

6   Araújo SSC, Padilha MP, Baldisserotto J. Avaliação da condição de saúde bucal e da qualidade de vida de pacientes com câncer de cabeça e pescoço atendidos em um hospital público de Porto Alegre. Rev Bras Cancerol 2009;55(02):129–138

7   Silva MS, Castro EK, Chem C. Qualidade de vida e auto-imagem de pacientes com câncer de cabeça e pescoço. Univ Psychol 2012;11 (01):13–23

8   Vartanian JG, Carvalho AL, Furia CLB, et al. Questionários para a avaliação de Qualidade de Vida em pacientes com câncer de cabeça e pescoço validados no Brasil. Rev Bras Cir Cabeça Pescoço 2007;36(02):108–115

9   Gobbo M, Bullo F, Perinetti G, et al. Diagnostic and therapeutic features associated with modification of quality-of-life's outcomes between one and six months after major surgery for head and neck cancer. Rev Bras Otorrinolaringol (Engl Ed) 2016; 82(05):548–557

10   American Cancer Society. Cancer Facts & Figures 2013. Atlanta: American Cancer Society; 2013

11   Maciel CTV, Leite ICG, Soares RC, Campos RJDS. Análise da qualidade de vida dos pacientes com câncer de laringe em hospital de referência na região sudeste do brasil. Rev CEFAC 2013;15(04):932–940

12   Maciel SSV, Maciel WV, Silva RB, Sobral LV, Souza IRS, Siqueira MJ. Morbimortalidade por cânceres da boca e faringe em capitais brasileiras. Revista da AMRIGS 2012;56(01):38–45

13   The WHOQOL Group. The World Health Organization quality of life assessment (WHOQOL): position paper from the World Health Organization. Soc Sci Med 1995;41(10):1403–1409

14   Iriya PMO, Romaniszen LW, Fernandes TMF, Poleti ML. Health-related quality of life of patients with squamous cell carcinoma: a comparison according to tumor location. Braz Oral Res 2017;31:e105

15   Rigoni L, Bruhn RF, De Cicco R, Kanda JL, Matos LL. Quality of life impairment in patients with head and neck cancer and their caregivers: a comparative study. Rev Bras Otorrinolaringol (Engl Ed) 2016;82(06):680–686

16   Melo LC, Silva MC, Bernardo JMP, Marques EB. Perfil epidemiológico de casos incidentes de câncer de boca e faringe. RGO 2010;58 (03):351–355

17   Abed H, Reilly D, Burke M, Daly B. Patients with head and neck cancers' oral health knowledge, oral health-related quality of life, oral health status, and adherence to advice on discharge to primary dental care: A prospective observational study. Spec Care Dentist 2019;39(06):593–602

18   Sommerfeld CE, Andrade MGG, Santiago SM, et al. Qualidade de vida em pacientes com câncer de cabeça e pescoço. Rev Bras Cir Cabeça Pescoço 2012;41(04):172–177

19   American cancer society. Cancer facts & figures 2017. Atlanta, 2017. Disponível em: https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2017/cancer-facts-and-figures-2017.pdf. Acesso em: 14 set. 2018.

20   Almeida AÁ, Bandeira CM, Gonçalves AJ, Araújo AJ. Nicotine dependence and smoking habits in patients with head and neck cancer. J Bras Pneumol 2014;40(03):286–293

21   Lima MAG, Barbosa LNF, Sougey EB. Avaliação do Impacto na Qualidade de Vida em Pacientes com Câncer de Laringe. Rev SBPH (Belo Horizonte) 2011;14(01):18–40

22   Andreotti M, Rodrigues AN, Cardoso LMN, Figueiredo RAO, Eluf-Neto J, Wünsch-Filho V. Ocupação e câncer da cavidade oral e orofaringe. Cad Saude Publica 2006;22(03):543–552

23   Galbiatti ALS, Padovani JA Junior, Maníglia JV, Rodrigues CDS, Pavarino EC, Goloni Bertolo AM. Câncer de cabeça e pescoço: causas, prevenção e tratamento. Rev Bras Otorrinolaringol (Engl Ed) 2013;79(02):239–247

24   Li Y, Yang H, Cao J. Association between alcohol consumption and cancers in the Chinese population–a systematic review and meta-analysis. PLoS One 2011;6(04):e18776

25   Teixeira AKM, Almeida MEL, Holanda ME, Souza FB, Almeida PC. Carcinoma Espinocelular da Cavidade Bucal: um Estudo Epidemiológico na Santa Casa de Misericórdia de Fortaleza. Rev Bras Cancerol 2009;55(03):229–236

26   Cruz GD, Shulman LC, Kumar JV, Salazar CR. The cultural and social context of oral and pharyngeal cancer risk and control among Hispanics in New York. J Health Care Poor Underserved 2007;18(04):833–846

27   Llewellyn CD, Linklater K, Bell J, Johnson NW, Warnakulasuriya S. An analysis of risk factors for oral cancer in young people: a case-control study. Oral Oncol 2004;40(03):304–313

28   Chen MN, Ho KY, Hung YN, et al. Pre-treatment quality of life as a predictor of distant metastasis-free survival and overall survival in patients with head and neck cancer who underwent free flap reconstruction. Eur J Oncol Nurs 2019;41:1–6

29   Boing AF, Antunes JLF. Condições socioeconômicas e câncer de cabeça e pescoço: uma revisão sistemática de literatura. Cien Saude Colet 2011;16(02):615–622

30   Leite ICG, Koifman S. Survival analysis in a sample of oral cancer patients at a reference hospital in Rio de Janeiro, Brazil. Oral Oncol 1998;34(05):347–352

31   Kowalski LP, Franco EL, Torloni H, et al. Lateness of diagnosis of oral and oropharyngeal carcinoma: factors related to the tumour, the patient and health professionals. Eur J Cancer B Oral Oncol 1994;30B(03):167–173

32   Franco EL, Kowalski LP, Oliveira BV, et al. Risk factors for oral cancer in Brazil: a case-control study. Int J Cancer 1989;43(06): 992–1000

33   Liao LJ, Hsu WL, Lo WC, Cheng PW, Shueng PW, Hsieh CH. Health-related quality of life and utility in head and neck cancer survivors. BMC Cancer 2019;19(01):425–434

34   Hammerlid E, Bjordal K, Ahlner-Elmqvist M, et al. A prospective study of quality of life in head and neck cancer patients. Part I: at diagnosis. Laryngoscope 2001;111(4 Pt 1):669–680

35   Klug C, Neuburg J, Glaser C, Schwarz B, Kermer C, Millesi W. Quality of life 2-10 years after combined treatment for advanced oral and oropharyngeal cancer. Int J Oral Maxillofac Surg 2002;31 (06):664–669

36   Aquino RCA, Lima MLLT, Menezes CRCX, Rodrigues M. Alterações fonoaudiológicas e acesso ao fonoaudiólogo nos casos de óbito por câncer de lábio, cavidade oral e orofaringe: um estudo retrospectivo. Rev CEFAC 2016;18(03):737–745

37   Moraes TMN. Câncer de Boca: avaliação do conhecimento dos cirurgiões dentistas quanto aos fatores de risco e procedimentos de diagnósticos [dissertação]. São Paulo: University of São Paulo 2003. Doi: 10.11606/D.23.2003.tde-25032004-123308: 108p

38   Kowalski LP. Câncer De Cabeça E Pescoço. Em:Carrara-de-Angelis E, Furia CLB, Mourão LF, Kowalski LP. Atuação da Fonoaudiologia no Câncer de Cabeça e Pescoço. São Paulo: Lovise; 2000:19–25

39   Brown JS, Rogers SN, Lowe D. A comparison of tongue and soft palate squamous cell carcinoma treated by primary surgery in terms of survival and quality of life outcomes. Int J Oral Maxillofac Surg 2006;35(03):208–214

40   Curtis DA, Plesh O, Miller AJ, et al. A comparison of masticatory function in patients with or without reconstruction of the mandible. Head Neck 1997;19(04):287–296

41   Zatta LT, Carvalho Pires DV, Luz RA, Correia SF, Brito VW, Vasconcelos PP. Análise da produção científica nacional de Enfermagem sobre o instrumento genérico que avalia qualidade de vida: revisão de literatura. Rev Enferm UFPE3(02):127–132