

Marla Smille Pedrosa Cruz ¹
Tércio Guimarães Reis ²
José de Bessa-Júnior ¹
Antoniél Campos Oliveira ³
Alice Nobre Dantas ³
Marluce Matos Macedo ³
Márcio Campos Oliveira ¹

Associação entre qualidade de vida e fatores psicológicos em pacientes diagnosticados com câncer de cabeça e pescoço

Association between quality of life and psychological factors in patients diagnosed with head and neck cancer

RESUMO

Objetivo: O objetivo deste estudo foi avaliar a associação entre qualidade de vida e fatores psicossociais em pacientes com diagnóstico de câncer de cabeça e pescoço. **Métodos:** Este estudo transversal foi realizado com 148 pacientes. Um formulário foi preenchido com dados sociodemográficos e condições clínicas dos prontuários dos pacientes. O Questionário de Qualidade de Vida da Universidade de Washington (UW-QOL) (versão 4) foi utilizado para avaliar a qualidade de vida (QV) e a Escala Hospitalar de Ansiedade e Depressão foi usada para estudar os fatores psicológicos. Para analisar a associação entre QV em todos os domínios, incluindo as subescalas de Função Física e Função Sócioemocional do UW-QOL, com ansiedade e depressão, o Teste T-Student foi utilizado para comparações entre médias das variáveis independentes. **Resultados:** Na amostra, 45,2% dos pacientes tinham câncer de boca e 74,3% apresentavam câncer nos estádios III e IV. Quanto aos fatores psicológicos, 32,4% dos pacientes eram ansiosos e 31,1% tinham depressão. Foi observado que indivíduos com ansiedade e depressão tinham pior qualidade de vida na maioria dos domínios e nas subescalas de QV. **Conclusão:** Fatores psicológicos como ansiedade e depressão têm forte relação com baixa qualidade de vida em pacientes com câncer de cabeça e pescoço.

Palavras-chave: Ansiedade. Depressão. Neoplasias de Cabeça e Pescoço. Qualidade de Vida

ABSTRACT

Objective: The aim of this study was thus to assess the association between quality of life and psychological factors in patients diagnosed with head and neck cancer. **Methods:** This cross-sectional study was conducted with 148 patients. A form was filled out with data on patient sociodemographic and clinical conditions from medical records. The University of Washington Quality of Life Questionnaire (UW-QOL) (version 4) was used to assess quality of life (QOL), and the Hospital Anxiety and Depression Scale was used to evaluate psychological factors. To analyze the association of QOL in all domains, including the Physical Function and Socioemotional Function subscales of the UW-QOL, with anxiety and depression, the Students t-test for comparisons between independent sample means was performed. **Results:** In our sample, 45.2% of patients had oral cancer, and 74.3% presented with stage III and IV HNC. Regarding psychological factors, 32.4% of patients were anxious, and 31.1% of them had depression. We observed individuals with anxiety and depression had worse quality of life in almost all domains and in the quality of life subscales. **Conclusion:** Psychological factors, such as anxiety and depression, have a strong relationship with low quality of life in patients with head and neck cancer.

Keywords: Anxiety. Depression. Head and Neck Neoplasms. Quality of Life

¹ Universidade Estadual de Feira de Santana, Saúde - Feira de Santana - Bahia - Brasil.

² Unidade de Alta Complexidade em Oncologia, Hospital - Feira de Santana - Bahia - Brasil.

³ Núcleo de Pesquisa em Câncer de Cabeça e Pescoço - Feira de Santana - Bahia - Brasil.

Correspondência:

Marla Smille Pedrosa Cruz.
E-mail: m.smille@hotmail.com

Este artigo foi submetido no SGP (Sistema de Gestão de Publicações) da RBTC em 3 de Fevereiro de 2022. cod. 285.

Artigo aceito em 4 de Agosto de 2023.

DOI: 10.5935/1808-5687.20220015

INTRODUCTION

Head and neck cancer (HNC) is a generic term defined on an anatomical-topographical basis to describe malignant tumors of the upper aerodigestive tract. This anatomical region includes the oral cavity, the pharynx, and the larynx, as well as salivary and thyroid glands (Dobrossy, 2005).

In Brazil, according to INCA (National Cancer Institute) estimates for 2018 and 2019, 634,880 new cases of cancer are expected each year. Globally, cancer of the oral cavity stands out among HNC, ranking 5th overall in the male population, while larynx cancer ranks 8th overall among men. In women, cancers of the oral cavity and the larynx are the 12th and 17th most frequently diagnosed cancers, respectively (INCA, 2017).

Despite a relatively lower incidence than that of other primary sites, a diagnosis of HNC has a relevant impact due to the morbidity and mortality associated with this neoplasia (Chu et al., 2011). Because of the topography of the primary site of this type of cancer, resulting symptoms directly compromise patient quality of life: local pain, dyspnea, chronic fatigue, bleeding, intermittent cough, dysphagia, and dysphonia (Markkanen- Leppänen et al., 2006).

Quality of life (QOL) is defined as an individual's perception of their position in life, in the context of their culture and value system in which they are inserted, and in relation to their goals, expectations, standards, and concerns. It is a comprehensive concept, influenced in a complex way by physical health, psychological state, level of independence, social relationships, and relationships with the individual's environment (World Health Organization [WHO], 1993).

Quality of life evaluation in patients with HNC has become an increasingly important topic in several studies (Moreno and Lopes, 2002; Mehanna and Morton, 2006; Vilaseca et al., 2006), because, in addition to contributing to treatment monitoring, it enables health professionals to understand how patients experience disease progression and the consequences of their treatment.

In a 2016 systematic review, which studied the psychological variables associated with quality of life after primary treatment for head and neck cancer, depression was associated with worse QOL results

in cross-sectional studies. High levels of anxiety and anguish (anxiety combined with depression scores) were also observed to be associated with a decrease in QOL among HNC survivors (Dunne et al., 2017).

The experience of psychological distress, particularly depression, is very common among cancer patients and can occur throughout the course of the disease, often persisting months after treatment completion. The basis for this distress is multifaceted, and it may occur because of the diagnosis itself, sequelae of the disease and its treatment, decreased QOL, or the possibility of progression, recurrence, or death (Massie, 2004).

Depression in patients with HNC is estimated to be more prevalent than in other types of cancer (Massie, 2004). Estimates vary according to the evaluation method (self-report questionnaires or diagnostic interviews), but approximately 15% to 50% of patients with HNC suffer some degree of depression at some point over the course of the disease (Haisfield-Wolfe et al., 2009), which may affect the immune system, adherence to treatment, self-care behavior, resocialization, and QOL (Howren et al, 2013).

The aim of this study was thus to assess the association between quality of life and psychological factors in patients diagnosed with head and neck cancer.

MATERIALS AND METHODS

STUDY DESIGN AND POPULATION

This was a cross-sectional study including 148 individuals diagnosed with head and neck cancer from February 2017 to September 2019. The patients included were those over 18 years of age with a histopathological diagnosis of squamous cell carcinoma or adenocarcinomas whose primary site was the oral cavity, larynx, or pharynx, who did not have any underlying immunological disease, psychosis, anxiety disorders, cognitive impairments, drug addictions, and were not on corticosteroids, anxiolytics, or antidepressants.

DATA COLLECTION

Before starting data collection, the researchers went through a calibration and orientation process.

One of the instruments used in the research was a questionnaire to be filled out by the research subject; however, since most of them had low education levels, the researchers were then responsible for applying the questionnaire and were told to ask the questions up to three times, and, in case of noncomprehension, they should replace the word that was difficult to understand with an easier one.

Data collection occurred on the day of diagnosis, and the participants were interviewed individually. A form was filled out with data on patient sociodemographic and clinical conditions from medical records and included the following information: age, sex, race, marital status, current occupation, place of residence, education, income, habits, TNM staging (tumor size and extent, metastatic cervical lymph nodes, and presence of distant metastasis) based on the 2002 AJCC/UICC classification (American Joint Committee on Cancer/ International Union Against Cancer), primary site, treatment plan, presence or absence of flaps for reconstruction, concomitant neck dissection, and associated tracheostomy.

Participants were interviewed individually in a private room, where the application of the University of Washington Quality of Life Questionnaire (UW-QOL) (version 4) was carried out. This questionnaire consists of twelve questions related to specific functions for the head and neck region, as well as related to activity, recreation, pain, mood, and anxiety, with each question including three to five response categories with a score ranging from zero (worst) to 100 (best); a composite score is also calculated as the mean of the twelve domains. The UW-QOL can be categorized into two subscales: Physical Function and Socioemotional Function, and the score for each subscale is the mean of their six domains. The Physical Function subscale contains the following six domains: speech, chewing, appearance, saliva, taste, and swallowing. The Socioemotional Function subscale comprises the domains pain, activity, recreation, shoulder, mood, and anxiety.

On the same day, it was applied the Hospital Anxiety and Depression Scale, which has 14 items, seven of which are aimed at assessing anxiety (HADS-A) and seven for depression (HADS-D). Each of its items can be scored from zero to three, making up a maximum score of 21 points for each

scale. For the assessment of the frequency of anxiety and depression, responses to the HADS items were obtained. The cutoff points proposed by Zigmond and Snaith (1983) were adopted for both subscales as follows: without anxiety from 0 to 7, with anxiety > 7 (HADS-anxiety); without depression from 0 to 7, with depression > 7 (HADS-depression).

STATISTICAL ANALYSIS

Quantitative variables were described by their central tendency and respective dispersion measures, while the nominal variables were described by their absolute values or percentages.

To analyze the association of quality of life in all domains, including the Physical Function and Socioemotional Function subscales of the Washington Questionnaire, with anxiety and depression as measured by the Hospital Anxiety and Depression Scale, the Student's t-test for comparisons between independent sample means was performed.

The area under the ROC curve (AURC), sensitivity, and specificity were described to evaluate the diagnostic accuracy of the single UW-QOL questions about anxiety and depression. A stepwise regression analysis was used to establish a regression model for the prediction of better QOL. To assess quality of life in this model, the UW-QOL Physical Function subscale was used so as to remove socioemotional issues. The included variables were anxiety, depression, clinical staging, sex, and anatomical site of the tumor (oral cancer and non-oral cancer). Ninety-five percent confidence intervals were used as a measure of the precision of results. P values less than 0.05 ($p < 0.05$) were considered significant. MedCalc Statistical Software version 19.2.3 (MedCalc Software Ltd, Ostend, Belgium) and GraphPad Prism version 8.0.0 for Windows (GraphPad Software, San Diego, California USA) were used for statistical analysis.

RESULTS

We evaluated 148 patients with a median age of 62 [54-69] years. Sociodemographics and clinical characteristics are detailed in Tables 1 and 2. The median composite quality of life score as assessed by the Washington Questionnaire was 75 [58.5-87.3]; the median Physical Function subscale score was 79

Table 1. Sociodemographic characteristics.

Variables	n	%
Sex		
Male	113	76.4
Female	35	23.6
Ethnicity		
Brown	71	48.0
Black	46	31.1
White	31	20.9
Marital status		
Married or in a stable relationship	60	40.5
Single	56	37.8
Widower	18	12.2
Divorced	14	9.5
Education		
Illiterate	50	33.8
Can read and write	46	31.1
Primary	36	24.3
Secondary	15	10.1
Higher	1	0.7
Income		
Less than one minimum wage	48	32.4
One minimum wage	71	48.0
Two or more times the minimum wage	29	19.6
Smoking		
Smoker or abstinent for less than three years	127	85.9
No	21	14.1
Drinking		
Drinker or abstinent for less than one year	120	81.2
No	28	18.8

[63.8-93.7]; and the median Socioemotional Function subscale score was 70 [52.8-87.5]. The prevalence of anxiety and depression according to HADS scores was respectively 32.4% (48) and 31.1% (46).

And it was found that 48% (13) of patients with anxiety were also depressed ($p=0,003$). Table 3 shows the comparison between depression and quality of life domains, including the Physical Function and Socioemotional Function subscales of the Washington Questionnaire. A statistically significant association was found for both subscales and almost all domains, except for the shoulder domain, suggesting individuals

Table 2. Clinical characteristics.

Variables	n	%
Topography		
Mouth	67	45.2
Pharynx	34	23.0
Larynx	47	31.8
Tumor size		
T1	14	9.5
T2	35	23.6
T3	55	37.2
T4	44	29.7
Regional lymph nodes		
N0	65	43.9
N1	31	20.9
N2a, b, or c	47	31.8
N3	5	3.4
Clinical staging		
Stages I and II	38	25.7
Stages III and IV	110	74.3

with depression have worse quality of life than those without depression.

The comparison between anxiety and quality of life domains, including the Physical Function and Socioemotional Function subscales of the Washington Questionnaire, is detailed in Table 4. We observed both subscales and almost all domains, except for the chewing and saliva domains, had a statistically significant association, indicating anxious individuals have worse quality of life than subjects without anxiety.

After adjusting for confounders (age, sociodemographics, and clinical characteristics), subjects with advanced-stage disease, depression, and anxiety were found to be less likely to have high quality of life, while women and those with non-oral HNC had a greater chance to have better QOL. The magnitude of these associations is described in Table 5.

The single UW-QOL question about anxiety had excellent diagnostic accuracy in detecting anxiety, when compared to HADS-A. The AUROC was 70% (95% CI: 0.61 to 0.76; $p < 0.001$). Its diagnostic properties are detailed in Table 6.

Furthermore, the single UW-QOL question about depression had even better diagnostic accuracy in

Table 3. Mean scores for the domains and subscales of the University of Washington Quality of Life Questionnaire by the presence or absence of depression.

Variables	With depression M (SD)	Without depression M (SD)	p ¹
<i>Pain</i>	53.2 (29.6)	65.9 (29.1)	0.016*
<i>Appearance</i>	74.4 (27.6)	83.5 (22.3)	0.035*
<i>Activity</i>	57.6 (32.0)	80.6 (24.8)	< 0.001*
<i>Recreation</i>	53.2 (29.1)	76.7 (28.6)	< 0.001*
<i>Deglutition</i>	64.5 (32.5)	77.1 (28.9)	0.020*
<i>Chewing</i>	52.1 (42.1)	66.1 (38.6)	0.049*
<i>Speech</i>	63.8 (35.7)	78.5 (25.1)	0.005*
<i>Shoulder</i>	78.2 (37.3)	88.2 (28.0)	0.073
<i>Taste</i>	55.7 (42.8)	85.6 (28.3)	0.000*
<i>Saliva</i>	79.7 (28.5)	90.8 (20.0)	0.007*
<i>Humor</i>	42.9 (32.7)	75.0 (30.2)	< 0.001*
<i>Anxiety</i>	44.2 (39.8)	67.0 (36.8)	0.001*
<i>Physical Function</i>	65.0 (22.2)	80.3 (17.3)	< 0.001*
<i>Socioemotional Function</i>	54.9 (18.0)	75.5 (18.9)	< 0.001*

¹Student's t-test result for comparison of independent sample means; *p < 0.05.

Table 4. Mean scores for the domains and subscales of the University of Washington Quality of Life Questionnaire by the presence or absence of anxiety.

Variables	With anxiety M (SD)	Without anxiety M (SD)	p ¹
<i>Pain</i>	50.5 (30.2)	67.5 (28.0)	0.001*
<i>Appearance</i>	73.4 (25.9)	84.2 (22.9)	0.011*
<i>Activity</i>	56.7 (29.5)	81.5 (25.5)	< 0.001*
<i>Recreation</i>	49.4 (30.7)	79.0 (25.8)	< 0.001*
<i>Deglutition</i>	62.4 (33.5)	78.3 (27.8)	0.003*
<i>Chewing</i>	57.2 (41.2)	64.0 (39.6)	0.343
<i>Speech</i>	62.5 (35.5)	79.4 (24.5)	< 0.001*
<i>Shoulder</i>	75.6 (38.1)	89.6 (26.6)	0.011*
<i>Taste</i>	63.8 (41.2)	82.3 (31.9)	0.003*
<i>Saliva</i>	84.7 (26.6)	88.6 (21.8)	0.340
<i>Humor</i>	45.8 (33.1)	74.2 (31.0)	< 0.001*
<i>Anxiety</i>	41.0 (39.1)	69.0 (35.8)	< 0.001*
<i>Physical Function</i>	67.3 (20.2)	79.5 (19.0)	0.001*
<i>Socioemotional Function</i>	53.2 (17.7)	76.8 (17.8)	< 0.001*

¹Student's t-test result for comparison of independent sample means; *p < 0.05.

Table 5. Adjusted odds ratio from logistic regression analysis of variables (female sex, anatomical tumor site, clinical staging, depression, and anxiety) associated with quality of life in individuals with head and neck cancer.

Variables	OR	95% CI	p value
Anxious	0.25	0.07 – 0.81	0.021*
Depressive	0.34	0.09 – 1.24	0.104
Advanced-stage HNC	0.09	0.03 – 0.25	< 0.001*
Women	2.63	0.92 – 7.53	0.070
Non-oral anatomical site	5.17	1.80 – 14.80	0.002*

CI: confidence interval; OR: odds ratio; *p < 0.05.

Table 6. Diagnostic properties of the single anxiety question in the Washington Questionnaire when compared to the Hospital Anxiety Scale.

Anxiety score	Sensitivity	95% CI	Specificity	95% CI
100	100	92.6 – 100	0	0.0 – 3.6
67	56.2	36.0 – 56.3	76.0	66.4 – 84.0
33	39.5	25.8 – 54.7	85.0	76.5 – 91.4
0	0	0.0 – 7.4	100	96.4 – 100

detecting depression cases (a score > 7 in HADS-D). The AURC was 75.5% (95% CI: 0.67 to 0.82; p < 0.001). Its diagnostic properties are detailed in Table 7.

DISCUSSION

Table 7. Diagnostic properties of the single depression question in the Washington Questionnaire when compared to the Hospital Depression Scale.

Depression score	Sensitivity	95% CI	Specificity	95% CI
100	100	92.3 – 100	0.0	0.0 – 3.6
75	71.7	56.6 – 84.0	68.6	58.7 – 77.5
50	63.0	47.5 – 76.8	85.2	76.9 – 91.5
25	10.8	3.6 – 23.6	96.8	90.3 – 98.9
0	0.0	0.0 – 7.7	100	96.4 – 100

Regarding sociodemographic data, lifestyle, and clinical characteristics of the studied population, our findings corroborate those of several studies that evaluated these features in individuals with head and neck cancer (Qiu et al. 2014; Alvarez-Camacho et al., 2016; Gobbo et al., 2016; Rocha et al., 2017).

However, with regard to tumor site, a study by Kelly et al. (2007) found a discordant picture, in that most patients had laryngeal cancer (41%), followed by pharyngeal (30.6%) and oral (19.65%). Another study with different results was that by Alvarez-

Camacho et al. (2016), which found most cases to be of pharyngeal cancer, followed by laryngeal and

oral. In our study, however, most patients had oral cancer, followed by laryngeal and pharyngeal.

The word “anguish” was chosen by the National Comprehensive Cancer Network to describe the psychological, social, or spiritual aspects that interfere with the ability to deal with the treatment of cancer and its physical symptoms. This term was used because it carries no stigmatized connotations, and patients are comfortable with its use. Anguish extends from common feelings of vulnerability, sadness, and fear, to disabling problems such as depression, anxiety, and panic (Holland and Bultz, 2007).

We evaluated psychological factors (anxiety and depression) and quality of life, and their relationship in patients with HNC at the time of diagnosis. Anxiety and depression are the most common psychological issues among cancer patients. In fact, anxiety and depression can influence patient immune status, affecting the course of the disease, having been linked to poor nutrition and poor survival (Britton et al., 2012; So et al., 2010; Lazure et al., 2009). The prevalence rate of depression found through HADS in our study was 32.4%, a figure similar to those of previous studies with patients with HNC, ranging from 20 to 43% (Haisfield-Wolfe et al., 2009; Kelly et al., 2007; Britton et al., 2012; Hong et al., 2013; Chiou et al., 2013; Almstahl et al., 2016; Holtmaat et al., 2017).

As regards HADS-anxiety, we found anxiety in 31.1% of patients, which is in line with results found in the literature, varying from 24 to 46% (Britton et al., 2012; Hong et al., 2013; Almstahl et al., 2016; Holtmaat et al., 2017). These data show individuals with HNC have a high prevalence of psychological changes (anxiety and depression). We believe this is due to the fear of the diagnosis itself and the consequences of the disease and its treatment. These factors make patients even more susceptible to immune system disturbances and lead them to difficulties in adhering to treatment, thus hindering their response to cancer therapy.

In addition, patients with head and neck cancer have lower socioeconomic and educational levels when compared to other cancer patients, and this leads to a higher prevalence of psychological issues (Hassanein et al., 2005). Our findings also support these observations. Knowledge of the social issues

these individuals face is therefore important for better management of cases by health professionals.

In this study, a comparison was made between the UW-QOL domains, including the Physical Function and Socioemotional Function subscale scores, and the HADS anxiety and depression subscales. Anxious and depressive patients were found to have poor quality of life in almost all domains and both UW-QOL subscales. Similar results were found in other studies that included this type of analysis (Chiou et al., 2013; Hassanein et al., 2005; Neilson et al., 2010). These data indicate psychological factors, such as anxiety and depression, influence patient quality of life. The importance of this association resides in the assessment of the need for monitoring or psychological/psychiatric treatment of these individuals in an attempt to improve their response to cancer treatment and their quality of life.

In a study of 102 patients with head and neck cancer, Neilson et al. (2010) analyzed quality of life in relation to anxiety and depression and found high frequencies of these psychological issues were strongly correlated with poor quality of life. The same was found in a study by Hassanein et al. (2005) with 173 patients with oral cancer.

In our sample, patients who were diagnosed with stage III and IV HNC were found to be less likely to have high quality of life according to the Physical Function subscale than those with early-stage cancer, as in the studies by Beisland et al. (2013) and Bonzanini et al. (2020), in which individuals with late-stage tumors were found to have poor quality of life.

We found depression and anxiety to have a negative correlation with high quality of life as measured by the Physical Function subscale, while female sex and non-oral HNC were found to be positively correlated with high quality of life in our sample. These results are in line with the literature in relation to depression and anxiety (Chiou et al., 2013; Hassanein et al., 2005; Neilson et al., 2010, Kung et al., 2006) and also female sex (Bonzanini et al., 2020). This suggests a greater need for monitoring and assessing quality of life of male individuals with advanced-stage cancer who present with depression and anxiety through the application of validated questionnaires.

The questions about mood (depression) and anxiety in the UW-QOL and in the HADS subscales

were found to have high diagnostic accuracy of 70% and 75%, respectively, indicating these UW-QOL questions are adequate as an assessment tool for these domains. This study thus also validates the UW-QOL anxiety and depression domains, with good agreement observed between the UW-QOL and the HADS, allowing the former to be used as an instrument to screen HNC patients for anxiety and depression.

STUDY LIMITATIONS

One of the limitations of our study was the fact that because our population was mostly made up of patients with low education levels, some of them may not have had a perfect understanding of the questions. This issue was mitigated by our strategy of repeating the question up to three times and replacing difficult words with synonyms more accessible to the subject in question when necessary.

CLINICAL IMPLICATIONS

The knowledge that patients with head and neck cancer with anxiety and depression have a low quality of life makes necessary psychological monitoring and/or treatment during cancer treatment. Thus, patients diagnosed with anxiety and depression were referred to the specialized psychology service.

CONCLUSION

We showed psychological factors (anxiety and depression) have a strong relationship with low quality of life in patients with head and neck cancer. A strong correlation between low quality of life and advanced-stage disease as well as a negative association of female sex and non-oral HNC with low quality of life were also observed, suggesting the need for a better HNC screening system. In addition, this study validates the UW- QOL anxiety and depression domains as accurate instruments aimed at detecting the most severe cases.

Our findings support the psychological monitoring of HNC patients is fundamental not only to help the patient's emotional well-being, but to help with the prospects of healing, reducing symptoms of anxiety and depression, so as to improve their quality of life and potentially enhance survival rates.

ACKNOWLEDGMENTS

The authors would like to thank the staff of Head and Neck Cancer Research Center who have helped us during the research. And we would like to thank the High Complexity Oncology Unit of Santa Casa de Misericórdia de Feira de Santana, Dom Pedro de Alcântara Hospital and MULTICLIN clinic who gave us the location for our research.

STATEMENT OF ETHICS

This study was independently reviewed and approved by the Research Ethics Committee of State University of Feira de Santana (1.621.470). All subjects agreed voluntarily to participate in this study and provided written informed consent in full accordance with ethical principles.

CONFLICT OF INTEREST STATEMENT

All authors declare no conflict of interests

FUNDING SOURCES

This work was supported by Fundação de Amparo a Pesquisa do Estado da Bahia (FAPESB).

DATA AVAILABILITY STATEMENT

All data generated or analysed during this study are included in this article. Further enquiries can be directed to the corresponding author.

REFERENCES

- Almstahl, A., Alstad, T., Fagerberg-Mohlin, B., Carlén, A., Finizia, C. (2016). Explorative study on quality of life in relation to salivary secretion rate in patients with head and neck cancer treated with radiotherapy. *Head Neck*. 38(5):782-791.
- Alvarez-Camacho, M., Gonella, S., Ghosh, S. et al. (2016). The impact of taste and smell alterations on quality of life in head and neck cancer patients. *Qual Life Res*. 25(6):1495-1504. doi:10.1007/s11136-015-1185-2.
- Beisland, E., Aarstad, A.K., Osthus, A.A., Aarstad, H.J. (2013) Stability of distress and health-related quality of life as well as relation to neuroticism, coping and TNM stage in head and neck cancer patients during follow-up. *Acta Otolaryngol*. 133(2):209-217.
- Bonzanini, L.I.L., Soldera, E.B., Ortigara, G.B., et al. (2020). Effect of the sense of coherence and associated factors in

- the quality of life of head and neck cancer patients. *Braz. oral res.* 34: e009.
- Britton, B., Clover, K., Bateman, L. et al. (2012). Baseline depression predicts malnutrition in head and neck cancer patients undergoing radiotherapy. *Support Care Cancer.* 20(2):335-342. doi:10.1007/s00520-011-1087-y.
- Chiou, W. Y., Lee, M. S., Ho, H. C., Hung, S. K., Lin, H. Y., Su, Y. C., Lee, C. C. (2013). Prognosticators and the relationship of depression and quality of life in head and neck cancer. *Indian Journal of Cancer.* 50(1):14-20.
- Chu, K. P., Shema, S., Wu, S., Gomez, S.L., Chang, E.T., Le, Q.T.(2011). Head and neck cancer-specific survival based on socioeconomic status in Asians and Pacific Islanders. *Cancer.* 117(9):1935-1945. doi:10.1002/cncr.25723.
- Dobrossy, L.(2005). Epidemiology of head and neck cancer: Magnitude of the problem. *Cancer and Metastasis Reviews.* 24: 9-17.
- Dunne, S, Mooney O, Coffey L, et al. (2017). Psychological variables associated with quality of life following primary treatment for head and neck cancer: a systematic review of the literature from 2004 to 2015. *Psychooncology.* 26(2):149-160. doi:10.1002/pon.4109.
- Gobbo, M., Bullo, F., Perinetti, G., Gatto, A., Ottaviani, G., Biasotto, M. et al. (2016). Características terapêuticas e diagnósticas associadas a modificações nos resultados da qualidade de vida entre um e seis meses após cirurgia de grande porte para câncer de cabeça e pescoço. *Braz. j. otorhinolaryngol.* 82(5): 548-557.
- Haisfield-Wolfe, M.E., McGuire, D.B., Soeken, K., Geiger-Brown, J., De Forge, B.R. (2009). Prevalence and correlates of depression among patients with head and neck cancer: a systematic review of implications for research. *Oncol Nurs Forum.* 36(3):E107-E125. doi:10.1188/09.ONF.E107-E125.
- Hassanein, K.A., Musgrove, B.T., Bradbury, E. (2005). Psychological outcome of patients following treatment of oral cancer and its relation with functional status and coping mechanisms. *J Craniomaxillofac Surg.* 33(6):404-409.
- Holland, J.C., Bultz, B.D. (2007). National comprehensive Cancer Network (NCCN). The NCCN guideline for distress management: a case for making distress the sixth vital sign. *J Natl Compr Canc Netw.* 5(1):3-7.
- Holtmaat, K., van der Spek, N., Cuijpers, P., Leemans, C.R., Verdonck-de Leeuw, I.M. (2017). Posttraumatic growth among head and neck cancer survivors with psychological distress. *Psychooncology.* 26(1):96-101.
- Hong, J., Tian, J., Zhang, W., et al. (2013). Patient characteristics as indicators for poor quality of life after radiotherapy in advanced nasopharyngeal cancer. *Head Neck Oncol.* Feb 06;5(2):17.
- Howren, M.B., Christensen, A.J., Hynds, K.L., Van Liew, J.R., Funk, G.F. (2013). Influence of pretreatment social support on health-related quality of life in head and neck cancer survivors: results from a prospective study. *Head Neck.* 35(6):779-787. doi:10.1002/hed.23029.
- INCA. Coordenação de Prevenção e Vigilância. (2017). *Estimativa 2018: incidência de câncer no Brasil / Instituto Nacional de Câncer José Alencar Gomes da Silva.* Coordenação de Prevenção e Vigilância. – Rio de Janeiro: INCA. Available from: <http://www.inca.gov.br/estimativa/2018/estimativa-2018.pdf>.
- Kelly, C. et al. (2007). Deterioration in quality of life and depressive symptoms during radiation therapy for head and neck cancer. *Otolaryngology Head and Neck Surgery.* 136(1):108-11.
- Kung, S., Rummans, T.A., Colligan, R.C. et al. (2006). Association of optimism- pessimism with quality of life in patients with head and neck and thyroid cancers. *Mayo Clin Proc.* 81(12):1545-1552.
- Lazure, K.E. et al. (2009). Association between depression and survival or disease recurrence in patients with head and neck cancer enrolled in a depression prevention trial. *Head Neck.* 31(7); 888-92.
- Markkanen-Leppänen, M., Mäkitie, A.A., Haapanen, M.L., Suominen, E., Asko- Seljavaara, S.(2006). Quality of life after free-flap reconstruction in patients with oral and pharyngeal cancer. *Head Neck.* 28(3):210-216. doi:10.1002/hed.20329.
- Massie, M.J. (2004). Prevalence of depression in patients with cancer. *J Natl Cancer Inst Monogr.* 2004;(32):57-71. doi:10.1093/jncimonographs/lgh014.
- Mehanna, H.M., Morton, R.P. (2006). Does Quality of Life Predict Long-term Survival in Patients With Head and Neck Cancer? *Arch Otolaryngol Head Neck Surg.*;132(1):27-31. doi:10.1001/archotol.132.1.27.
- Moreno, A.B., Lopes, C.S. (2002). Avaliação da qualidade de vida em pacientes laringectomizados: uma revisão sistemática. *Cad. Saúde Pública* [Internet]. Feb [cited 2020 May 21] ; 18(1): 81-92.
- Neilson, K.A., Pollard, A.C., Boonzaier, A.M. et al. (2010). Psychological distress (depression and anxiety) in people with head and neck cancers. *Medical Journal of Australia.* 193(5):48-51.
- Qiu, S.S., Cambeiro, M., Hontanilla, B.(2014). Comparison of quality of life in head and neck stage IV squamous cell cancer patients treated with surgery and reconstruction versus radical radiotherapy. *Ann Plast Surg.* 73(2):205-209. doi:10.1097/SAP.0b013e318270449e.
- Rocha, B.Q.C., Eneas, L., Oliveira, R.G., Junqueira, R.B., Verner, F.S. (2017). Características epidemiológicas de pacientes portadores de neoplasias de cabeça e pescoço submetidos à radioterapia em Juiz de Fora – MG. *Hu Rev.*43(1).
- So, W.K., Marsh, G., Ling, W.M. et al. (2010). Anxiety, depression and quality of life among Chinese breast cancer patients during adjuvant therapy. *Eur J Oncol Nurs.* 14(1):17-22. doi:10.1016/j.ejon.2009.07.005.
- Vilaseca, I., Chen, A.Y., Backscheider, A.G. (2006). Long-term quality of life after total laryngectomy. *Head Neck.* 28(4):313-320. doi:10.1002/hed.20268.

WHO (World Health Organization).(1993). *WHOQOL Focus Group Work*. Available from: <<http://www.who.int/mas/mnh/mhp/ql.htm>>.

Zigmond, A.S., Snaith, R.P. (1983). The hospital anxiety and depression scale. *Acta Psychiatr Scand.*67(6):361-370. doi:10.1111/j.1600-0447.1983.tb09716.x.