

## Nursing Consultation in the Head and Neck Cancer Radiotherapy: a Cost-Health Utility Relationship Analysis

Consulta de Enfermagem na Radioterapia de Câncer de Cabeça e Pescoço: Análise Dentro do Conceito Custo-Utilidade em Saúde

Consulta de Enfermería en la Radioterapia de Cáncer de Cabeza y Cuello: Análisis Dentro del Concepto Costo-Utilidad en Salud

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### ABSTRACT

**Objective:** This study aimed to describe the use of the University of Washington Quality of Life Questionnaire, limited to head and neck cancer, in nursing consultation applied to radiotherapy. **Methods:** A cohort and prospective study with a descriptive/exploratory quantitative approach was carried out with 10 patients under head and neck radiotherapy assisted at the Radiotherapy Service in a University Hospital, aged from 35 to 70 years old, at the treatment onset and in the cancer stages III, IVA, IVB or IVC from August to December 2016. **Results:** The difference in utility in the start and final stages of the treatment was important to quantify the nursing consultation impact. The Utility increased as the adverse events of therapeutics decreased during the nursing consultation. **Conclusion:** This study made possible the utilization of the concept of Utility by the nurses during nursing consultation applied to radiotherapy, in order to quantify and follow up the enhancement of the life quality.

**Descriptors:** Head and neck cancer, Nursing processes, Radiotherapy, Biomedical technology assessment.

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## RESUMO

**Objetivo:** Descrever o uso do Questionário de Qualidade de Vida da Universidade de Washington, específico para Câncer de Cabeça e Pescoço, na consulta de enfermagem em Radioterapia. **Método:** Estudo transversal, prospectivo, de abordagem quantitativa do tipo descritiva-exploratório com 10 pacientes em radioterapia de cabeça e pescoço atendidos num Serviço de Radioterapia de um Hospital Universitário, entre 35 a 70 anos de idade, em início de radioterapia, com estadiamentos: III, IVA, IVB ou IVC, entre agosto e dezembro de 2016. CEPHUPE parecer 1.649.577. **Resultados:** A diferença de utilidade encontrada no início e ao final do tratamento foi importante para quantificar o impacto da consulta de enfermagem. O aumento da Utilidade acompanhou a diminuição dos eventos adversos da terapêutica, durante a consulta de Enfermagem. **Conclusão:** Este estudo possibilitou ao enfermeiro, a utilização do conceito de Utilidade para quantificar e acompanhar a melhora da Qualidade de vida, nas consultas de Enfermagem na Radioterapia.

**Descritores:** Neoplasias de cabeça e pescoço, Processos de enfermagem, Radioterapia, Avaliação da Tecnologia Biomédica.

## RESUMEN

**Objetivo:** Describir el uso del Cuestionario de Calidad de Vida de la Universidad de Washington, específico para Câncer de Cabeza y Cuello, en la consulta de enfermería en Radioterapia. En el presente trabajo se analizaron los resultados obtenidos en el análisis de los resultados obtenidos en el estudio de los resultados obtenidos en el estudio, III, IVA, IVB o IVC, entre agosto y diciembre de 2016. CEPHUPE opinión 1.649.577. Resultados: La diferencia de utilidad encontrada al inicio y al final del tratamiento fue importante para cuantificar el impacto de la consulta de enfermería. El aumento de la Utilidad acompañó la disminución de los eventos adversos de la terapéutica, durante la consulta de Enfermería. Conclusión: Este estudio posibilitó al enfermero, la utilización del concepto de Utilidad para cuantificar y acompañar la mejora de la Calidad de vida, en las consultas de Enfermería en la Radioterapia.

**Descriptores:** Neoplasias de cabeza y cuello, Procesos de enfermería, Radioterapia, Evaluación de la Tecnología Biomédica.

## INTRODUCTION

According to the National Institute of Cancer (NIC), 6,360 new cases of laryngeal cancer in men and 990 new cases in women were expected in 2016, as well as 11,140 cases of oral cancer in men and 4,350 in women.<sup>1</sup>

Head and neck cancer have various particularities, as the head and neck are areas next to important organs, such as the mouth, pharynx, larynx, esophagus, skin, among others, which affect patients' quality of life negatively. The consequences of this disease can be speech, deglutition, and nutrition difficulties; visual appearance with the scar formations; and radiodermatitis.<sup>2</sup>

Radiotherapy is one of the treatment options for head and neck cancer, which can be adjuvant or neo-adjuvant with other therapies, such as chemotherapy or surgery offered by the Sistema Único de Saúde (SUS) [Unified Health System].<sup>3</sup>

Radiotherapy can result in adverse effects, such as radiodermatitis, skin flaking, xerostomia, mucositis, hoar-

seness, cough, dysphagia, odynophagia, taste decreasing, anxiety, and depression, which are associated with various aspects such as personal, entertainment, and work activities.<sup>2,4</sup>

During the ionizing radiation treatment for head and neck cancer, nursing consultation is carried out by a nurse who provides health education by means of guidance, nursing diagnostics, and interventions. Besides, together with the multi-professional radiotherapy team, the nurse prescribes and executes care actions in order to minimize or prevent undesirable consequences of the treatment. These care implementations are relevant for the maintenance of patients' quality of life.<sup>5-6</sup>

The objective of radiotherapy in patients in advanced stages is increase the survival time with quality of life. To accomplish this, many questionnaires for quality of life assessment have been validated in Brazil, including the ones for head and neck cancer. This may be important for nursing consultation because such questionnaires will help with the assessment and care plan for these patients.<sup>7</sup>

For patients, quality of life is a variable and subjective concept, being a particularity which involves the patients' social, cultural, economic and psychological life.<sup>2</sup> As a subjective concept, which may change from person to person, it must be valued in nursing consultation, since the cancer treatment may affect patients regarding the aspects mentioned above. Researchers use these tests when they analyze the quality of life according to the patient's view when those are submitted to therapeutic interventions.<sup>8-9</sup>

The nursing professional is an active and relevant professional in radiotherapy, since he works with a multi-professional team and can provide nursing consultation. As a result, the intervention aims to guide and minimize adverse events happening during the treatment, making it possible nursing diagnoses.<sup>5</sup> He develop management, administrative and care activities for radiotherapy patients. Therefore, he is the most qualified professional to carry out, during nursing consultation, the Health Technology Assessment, thus being able to intervene with more security and effectiveness, creating indicators for cost or effectiveness future works, or both.<sup>10-1</sup>

The identification and allocation of the SUS resources has been a challenge to managers in order to maximize the health technology offer. This shows that the studies about economic assessment are important for the harmonization of health demands and for the population welfare in shortage resource scenarios.<sup>12-3</sup>

Utility is a health parameter for measuring both morbidity and mortality changes (quality and quantity changes, respectively) at the same time. It can range from 0 to 100, for some authors, and from 0 to 10 for others, being 0 meaning death and 100 or 10 meaning perfect health. This parameter may be converted to an indicator of intervention called Quality-Adjusted Life Year (QALY),

which is the best indicator for evaluating chronic diseases. Since diseases have various result indicators, the use of a unit common to them is fundamentally important.<sup>11</sup> On the other hand, the need for evaluating these patients' quality of life has been observed, but there are a few questionnaires related to psychometric utility measurements validated for cancer patients in Brazil.<sup>8,14</sup>

These tests produce a concept used for evaluating certain preferences in health given the uncertainties. Moreover, this parameter is used considerably for Cost-Utility Analysis.<sup>15-6</sup>

The objective of this study was to describe the use of the University of Washington Quality of Life Questionnaire (UW-QOL) in head and neck cancer and radiotherapy associated to nursing consultation.

## METHODS

A transversal and prospective study with the quantitative and descriptive approach was carried out. The sample was composed of 10 patients undergoing head and neck radiotherapy attended at a Radiotherapy Service in a big College Hospital in the State of Rio de Janeiro, Brazil. The inclusion criteria were: patients aged from 35 to 70 years old in the beginning of radiotherapy and included in the cancer stages III, IVA, IVB or IVC.<sup>17</sup>

The main sample exclusion criterion was the patients in the initial head and neck cancer stage. This is because the patients in the initial stages do not show excessive morbidity during the treatment, leading to no significant difference between the initial and final scores.<sup>2</sup>

The study was approved by the institution's Research Ethics Committee, obeying the Resolutions No. 466/2012 and 510/2016 of the Health National Council (HNC), which approves the guidelines and norms regulating research involving human beings,<sup>18</sup> according to the Legal Opinion No. 1.649.577. An institutional authorization for the technician of the Radiotherapy Service was obtained as well.

Data were collected during the nursing consultations from August to December 2016, according to the established therapeutics from the radiation oncologist.

To analyze the utility score, a UW-QOL were applied at the start and the end of treatment. The time interval was necessary so that the result of the nursing intervention and therapeutics could show significant changes in the decrease of observed morbidities during the nursing consultation, and consequently in the utility scores. The questionnaire was composed of 12 domains, being validated and adapted to Brazil. Each domain has a specific scoring according to the morbidities of head and neck cancer, which varies according to each of the patient's weight factor. The results were scored from 0 (death) to 100 (healthy person).<sup>7,19-20</sup>

Data were collected at the start and the end of treatment in order to evaluate the utility gain due to the nursing and

therapeutic intervention adopted. The utility score is important for calculating the QALY after those interventions.<sup>9-11</sup>

## RESULTS AND DISCUSSION

As shown in Table I, the majority of patients (70% of the study patients) were males. Furthermore, according to the estimates from the National Cancer Institution, the incidence of head and neck cancer is bigger for men, since this type of cancer is related to a person's lifestyle, such as using tobacco, alcohol, and being infected by the HPV virus. According to the disease natural history, the population affected by head and neck cancer are in the 40-70 age range. In this study, we found that the population average age was 63.9 years old, varying from 49 to 82 years old.<sup>1,21-3</sup>

**Table I:** Patients' profiles assisted by the Radiotherapy Service

| Patient (N) | Sex | Age | Tumor type   | Treatment onset |
|-------------|-----|-----|--------------|-----------------|
| 1           | M   | 70  | Larynx       | 11/15/2016      |
| 2           | M   | 60  | Larynx       | 11/16/2016      |
| 3           | F   | 71  | Larynx       | 11/17/2016      |
| 4           | F   | 72  | Ear          | 11/18/2016      |
| 5           | M   | 49  | Mouth floor  | 11/19/2016      |
| 6           | M   | 60  | Tongue base  | 11/20/2016      |
| 7           | F   | 82  | Nasal cavity | 11/21/2016      |
| 8           | M   | 57  | Larynx       | 11/22/2016      |
| 9           | M   | 65  | Cranium      | 11/23/2016      |
| 10          | M   | 53  | Larynx       | 11/24/2016      |

About 50% of the patients treated by radiotherapy were diagnosed with laryngeal cancer. By comparing this finding with head and neck cancer incidence data in Brazil in 2016, 6,360 new cases of laryngeal cancer in males and 990 in women have been estimated. Thus, the estimated risk will be 6.43 cases per 100 thousand males and 0.94 cases for 100 thousand women.<sup>1,22,24</sup>

The life and utility scores obtained by UW-QOL throughout nursing consultation are presented in Table II.

**Table II:** Utility scores of the start and the end of radiotherapy in the studied population in Rio de Janeiro, 2016.

| Patient | Utility score      | Utility score           |
|---------|--------------------|-------------------------|
|         | radiotherapy onset | radiotherapy conclusion |
| 1       | 36.4               | 50                      |
| 2       | 49.25              | 67.3                    |
| 3       | 34.6               | 42                      |
| 4       | 79.9               | 86.8                    |
| 5       | 75.75              | 78.5                    |
| 6       | 50                 | 57.3                    |
| 7       | 63                 | 69.5                    |
| 8       | 33.25              | 52                      |
| 9       | 66                 | 72.25                   |
| 10      | 54.9               | 73                      |

The majority of patients' utilities is relatively low at the start of radiotherapy. This means that in the advanced cancer stages, the natural history morbidities greatly influenced the patients' quality of life. The main patients' complaints were: dysphagia, odynophagia, dysphasia, dyslalia, cough and hoarseness due to the affected organs near the tumor. Moreover, during the nursing consultation, the anxiety degree was relatively high due to disease discovery, fear of treatment and therapeutic responses.<sup>9</sup> Depending on the tumor location, the treatment effects are many: fibrosis, mucositis, radiodermatitis, xerostomia, tissue atrophy, osteonecrosis, and condroncrosis.<sup>16,25-6</sup>

The results in Table II are in a good agreement with literature because of the high number of head and neck cancer anatomic alterations, in which both the disease morbidity and adverse effects cause a great impact on the quality of life. Our findings during the nursing consultation confirm the morbidity and adverse effects caused by radiotherapy.<sup>26-7</sup>

We found that the patient 4 and patient 5 had a utility value greater than the others. This was because the two patients were submitted to a neoadjuvant treatment, that is, the surgery before radiotherapy, minimizing thus some of the morbidities of the natural history of head and neck cancer.<sup>2,28</sup> The radiotherapy objective in these cases is minimize the tumor relapse risk,<sup>29</sup> consequently increasing the utility which, in turn, improves the quality of life after the surgery.<sup>28</sup> We noticed this throughout nursing consultation, which highlighted the decrease of pain and other symptoms generating a utility score higher in these patients.

There was a utility increase on the remaining patients because of two main reasons: radiotherapy effects and nursing consultation, which minimized treatment adverse events.<sup>27-30</sup>

When a patient arrives at the Radiotherapy Service to be treated, he is assisted by a multidisciplinary team composed of a nurse, a physician, a radiotherapist, a physiatrist, and a radiotherapy technician. Then, this patient is submitted to initial nursing consultation in order to discover nursing problems, which will be treated until the end of radiotherapy. Without nursing assistance, it is impossible to evaluate the care effectiveness offered.<sup>5-6,8</sup>

For a better understanding, Table III presents the utility scores and the treatment adverse effects in each study patient in the start and the end of treatment.

**Table III.** Utility, morbidity (Morbi) and adverse events (AE) found in the start and in the end of the treatment.

| Patient | Initial Utility (IU) | AE/Morbi   | Final Utility (FU) | AE/Morbi   |
|---------|----------------------|--|--------------------|--|
| 1       | 36.4                 | Xerostomia<br>Dysphagia<br>Hoarseness<br>Cough                 | 50                 | Cough<br>Mucositis                                     |
| 2       | 49.25                | Xerostomia<br>Hoarseness<br>Cough<br>Anxiety                   | 67.3               | Dysphagia<br>Hoarseness<br>Radiodermatitis<br>Anorexia |
| 3       | 34.6                 | Dysphagia  | 42                 | Dysphagia<br>Cough<br>Mucositis<br>Speech alterations  |
| 4       | 79.9                 | Otalgia<br>Odynophagia<br>Speech alterations                   | 86.8               | Otalgia<br>Odynophagia<br>Radiodermatitis              |
| 5       | 75.75                | Xerostomia<br>Dysphagia<br>Anxiety                             | 78.5               | Anxiety<br>Dysphagia<br>Pain                           |
| 6       | 50                   | Xerostomia<br>Dysphagia<br>Odynophagia                         | 57.3               | Xerostomia<br>Dysphagia<br>Dysphonia                   |
| 7       | 63                   | Anxiety<br>Speech alterations<br>Asthenia                      | 69.5               | Speech alterations<br>Asthenia                         |
| 8       | 33.25                | Xerostomia<br>Dysphagia<br>Odynophagia<br>Anorexia<br>Asthenia | 52                 | Xerostomia<br>Dysphagia<br>Anorexia                    |
| 9       | 66                   | Cough<br>Xerostomia<br>Anxiety                                 | 72.25              | Cough<br>Xerostomia<br>Pain<br>Fatigue                 |
| 10      | 54.9                 | Dysphagia<br>Odynophagia<br>Anxiety<br>Speech alterations      | 73                 | Odynophagia<br>Radiodermatitis<br>Speech alterations   |

As can be seen from Table III, the utility values increased at the end of the treatment, whereas the number of adverse events decreased. Patients 1,2,3, 8 e 10 have acquired laryngeal cancer as well. Among the common morbidities and adverse events, we highlight xerostomia, dysphagia, hoarseness, cough, odynophagia, and anxiety. These signs and events match with the head and neck physiopathology, as well as with the adverse events presented in the therapeutics adopted.<sup>2,4,27</sup>

During the first nursing consultation session, patient 1 revealed a white discharge from the mouth followed by cough, which interrupted his speech. Hoarseness and dysphagia were also present, making him an apathetic person. Pain, deglutition, and humor were the domain that most contributed to the low utility of the patient 1. After the nursing and radiotherapy interventions, his hoarseness, dysphagia, and xerostomia improved, allowing him to communicate normally with the team, and nourish solid food less painfully, as indicated by the utility increase from 36.4 to 50.

Patient 3 used a tracheostomy cannula that hindered his speech and caused him discomfort, mucositis, cough followed by a thick-yellow discharge, dysphagia, and dysphonia. This condition strongly influenced the low utility found. In this case, the nursing consultation

aimed the proper cannula handling and actions to avoid associated problems, such as: mucositis, and infection and injury of trachea.<sup>31</sup> The appearance, humor, and anxiety domains showed a low utility score, thus stressing out that the use of cannula affected patient's self-image and self-care due to his concern about the device substitution, which was guided throughout his nursing consultation. After tracheostomy, a person loses his capacity of emitting sounds and shows an altered physical image of him. Then, he will need readaptation and emotional support for adapting to a new physical image.<sup>32</sup>

Patient 10 was submitted to laryngectomy, and as a result, he used non-verbal language for communication, which was understandable only for his relatives. The lack of larynx affected his routine and quality of life, as shown by the lowest score found in the speech understanding domain. Also, this surgery interfered in his daily life, preventing him from communicating with other people. This produced a need within the patient 10 for a new learning and adaptation process which many times was followed by a loss of self-esteem, depression and social isolation.<sup>33</sup>

The concept of laryngectomy is much more than a surgical procedure that causes multiple and significant mutilations. The impact caused by patients' lack of larynx includes professional, social, and leisure aspects, requiring adaptation to achieve a satisfactory result in their self-esteem.<sup>32</sup>

We observed that the neoadjuvant therapeutics is important for head and neck cancer patients' morbidity reduction. Patients 4, 5, and 10 were submitted to surgery before radiotherapy. We found that the utility score of these patients was higher than those who did not submit to interventions before since the neoadjuvant therapeutics favors the decrease of disease's morbidity.

It was observed that the initial adverse events in patients 4 and 5 decreased significantly at the end of the treatment. During the nursing consultation, we informed the patients about the signs and symptoms that could show up throughout the treatment, as well as how to prevent them or to minimize them with the aid of a medical composed of an explanatory leaflet, artificial saliva, xylocaine, hydrating cream, etc. The utility increased as these treatment signs and symptoms decreased. The patient 5 expressed that the xerostomia was his principal nuisance because of his difficulty to chew solid food or other foods of his preference, causing him pain and a screeching sensation during deglutition. After the end of the treatment, the final utility score increased due to the nurse's assistance in order attenuate some radiotherapy effects.

Separate the adverse effects of the radiotherapy from those inherently caused by the head and neck cancer is a difficult task since both effect types follow radiotherapy concurrently.<sup>2</sup> The most undesired effects found

in this study were: mucositis, dysphagia, radiodermatitis, anorexia, and speech alterations, which affected the communication process.<sup>16,25-6</sup> Initially, the patients were afflicted with the signs and symptoms of the disease, but throughout radiotherapy, some of these signs and symptoms decreased or other expected radiotherapy effects appeared. Therefore, during nursing consultation, the nurse guides the patients towards the care in order to decrease the disease symptomatology and its undesired effects, providing in his care plan the care actions to prevent and treat the adverse events.<sup>6</sup>

Some of the interviewed patients showed more knowledge about the disease, and their anxiety degree was lower than the others who did not possess previous knowledge about it.<sup>2-3,7</sup> We can state that the nursing consultation was important since the nurse plays a role as an educator, clarifies doubts and guide towards all procedures to which the patient will be submitted, as confirmed by the increase of the study patients' utility.<sup>34</sup>

## CONCLUSIONS

Nurses have an important role in head and neck cancer patient's quality of life, since they are professionals who participate in all nursing assistance modalities, including ambulatory assistance, during nursing consultation.<sup>6,34-6</sup> To manage adverse events, nurses need to obtain technical knowledge about oncology; interpersonal relationship abilities, which facilitate the communication process between patient; and abilities to evaluate health technologies, for example, cost-benefit, security aspects, effectiveness, and social impact with an emphasis on ethical aspects.<sup>35-7</sup>

The UW-QOL is an important ally for planning the nursing care in radiotherapy, which quantifies the impact of nurse's support to patients and can be a decision tool. More importantly, the UW-QOL individualizes this impact according to patients' view about the quality of life, considering their cultural values and the impact of the disease in their viewpoint.

This information will be able to guide the nursing support and the development of the nursing care plan, considering the aspects involving the subjectivity of each patient throughout the treatment, which increased their quality of life.

Moreover, the care technology in nursing practice has a great importance in chronic disease interventions, consequently providing an impact in the final costs of the therapeutics. The use of the questionnaire may make it possible to develop new studies about Health Technology Assessment, mainly Utility Cost.

Despite the positive results, more studies about using the UW-QOL as an auxiliary tool in care planning, nursing consultation, and radiotherapy are necessary.

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