

NURSING DIAGNOSIS RELATED TO THE ADVERSE EFFECTS OF RADIOTHERAPY

DIAGNÓSTICOS DE ENFERMAGEM RELACIONADOS AOS EFEITOS ADVERSOS DA RADIOTERAPIA

DIAGNÓSTICOS DE ENFERMERÍA RELACIONADOS CON LOS EFECTOS ADVERSOS DE LA RADIOTERAPIA

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ABSTRACT

Radiotherapy is frequently used in cancer treatment, but it often causes several adverse effects, both immediate and late ones. Objective: To construct nursing diagnoses related to the adverse effects of radiotherapy. Methodology: This is a descriptive, exploratory study, consisting of three stages: literature review on the adverse effects of radiotherapy using textbooks on oncology, and fully available articles from Lilacs and Bdenf databases; selection of empirical indicators, and construction of the nursing diagnoses, according to the ICNP® 2011. Results: 97 diagnoses were constructed considering five different adverse effects (xerostomia, radiodermatitis, trismus, mucositis, and osteoradionecrosis). Conclusion: The previously elaborated diagnoses will be able to guide adequate interventions, allowing for individualized care, and contributing for the effective establishment of the nursing consultation at the Radiotherapy sector.

Keywords: Radiotherapy; Adverse Effects; Nursing Diagnosis.

RESUMO

A radioterapia é muito utilizada no tratamento do câncer, mas costuma acarretar inúmeros efeitos adversos, tanto imediatos quanto tardios. Objetivo: elaborar diagnósticos de enfermagem relacionados aos efeitos adversos da radioterapia. Metodologia: trata-se de um estudo exploratório-descritivo, que percorreu três etapas: revisão da literatura sobre efeitos adversos da radioterapia, por meio de livros-textos de Oncologia e artigos completos das bases de dados Lilacs e Bdenf; seleção dos indicadores empíricos e composição dos diagnósticos de enfermagem de acordo com a CIPE® 2011. Resultados: elaboraram-se 97 diagnósticos a partir de cinco efeitos adversos (xerostomia, radiodermite, trismo, mucosite e osteorradionecrose). Conclusão: os diagnósticos previamente elaborados poderão nortear adequadas intervenções, permitindo o cuidado individualizado e contribuindo para a efetiva implantação da consulta de enfermagem no setor de radioterapia.

Palavras-chave: Radioterapia; Efeitos Adversos; Diagnósticos de Enfermagem.

RESUMEN

La radioterapia es muy utilizada en el tratamiento de cáncer pero suele acarrear efectos adversos inmediatos o tardíos. El objeto del presente estudio fue elaborar diagnósticos de enfermería relacionados con los efectos adversos de la radioterapia. Se trata de un estudio exploratorio descriptivo en tres etapas: revisión de la literatura sobre los efectos adversos de la radioterapia, por medio de libros textos de oncología y artículos completos de las bases de datos Lilacs y Bdenf; selección de los indicadores empíricos y composición de los diagnósticos de enfermería en conformidad con la CIPE® 2011. Se elaboraron 97 diagnósticos a partir de 5 efectos adversos (xerostomia, radiodermatitis, trismo, mucositis y osteorradionecrosis). Los diagnósticos previamente elaborados podrán orientar intervenciones adecuadas que permitan el cuidado individualizado y que contribuyen a establecer la consulta de enfermería en el sector de radioterapia.

Palabras clave: Radioterapia; Efectos Adversos; Diagnóstico de Enfermería.

INTRODUCTION

The World Health Organization (WHO) estimates nearly 27 million new cases of cancer by the year 2030. The greatest effect of such increase will happen in low-and middle-income countries. In Brazil, the estimates for the years 2012 and 2013 were approximately 518,510 new cases of cancer, reinforcing the magnitude of this disease as a public health issue in the country. In Espírito Santo, the occurrence of about 10,740 new cases was estimated for that same period.¹

Cancer treatment can be local (surgery, radiotherapy) or systemic (chemotherapy). They are used together in the treatment of malignant neoplasms, the only variable being the importance of each one and the order of their indication.² Radiotherapy is one of the major therapeutic modalities for the treatment of neoplasms. It is a localized treatment, which uses ionizing radiation produced by devices or emitted by natural radioisotopes. It is mostly performed out of hospital.³

It is believed that 50% of patients with cancer will need radiotherapy. However, despite being an effective treatment, it brings some acute and chronic manifestations, known as adverse effects, with the main ones being: skin reactions (radiodermatitis, erythema), nausea, mucositis, xerostomia, fatigue, anorexia, diarrhea and dysphagia.² Prevention and control of these effects are critical, because they may limit the treatment, lead to the need for temporary or permanent withdrawal, decrease the patient's motivation to continue with the treatment planning, thus compromising local tumor control rates and survival.⁴

Therefore, the nursing team must act to minimize these effects and serve as a link, working on specific care, on patient and family education. The nursing consultation in the radiotherapy department deserves special attention because it is the most specific activity performed by nurses in the sector. The patient seeks the nursing consultation in order to obtain information for the practice of self-care and to face care. Thereby, the nursing consultation customizes nursing care in the radiotherapy department.⁵

In order to organize and systematize nursing care, the nursing process or nursing consultation, a methodological tool, is used. It is organized into five interrelated, interdependent and recurring steps, namely: data collection (or history), diagnosis, planning, implementation and evaluation.⁶

The use of classification systems or taxonomies related to the nursing process provides benefits, such as planning security, implementation and evaluation of nursing work, improved communication and quality of documentation, visibility of nursing actions and development of electronic records and service organization.⁷

Nevertheless, the existence of various classification systems to describe nursing practice led the International Council of Nurses (ICN) to the conclusion that nursing needed an international classification system for practice, considering a suggestion made by WHO.⁸

In this sense, the ICN developed the International Classification for Nursing Practice (ICNP®) in an international project. Among the existing classifications, the ICNP® is the only internationally validated classification and was approved in late 2008 for inclusion in the WHO Family of International Classifications, becoming the standard terminology that represents the domain of practice and unifies nursing in a worldwide level.⁹

The ICN emphasizes that, in order to fulfill its objectives, ICNP® should be incorporated into the daily activities of nurses in the health and educational institutions, in order to keep up with the changing demands of the profession, which makes it a major challenge for professionals, who should adopt strategies to promote this practice.^{8,9}

Given the above, and considering the importance of the nursing consultation in radiotherapy, the aim of this study was to construct nursing diagnoses related to the adverse effects of radiotherapy.

METHODS

This was a descriptive-exploratory study, consisting of three stages: literature review on the adverse effects of radiotherapy using textbooks on Clinical Oncology, manuals by the Ministry of Health and scientific articles from Latin American and Caribbean Health Sciences Literature (LILACS) nursing databases (Bdenf). The following descriptors were used: radiotherapy and adverse effects. Inclusion criteria were: fully available articles in the databases searched, in Portuguese, English and Spanish. The final sample consisted of 12 articles and two books.

It is important to mention that the current articles did not provide the definitions and descriptions of the clinical characteristics of radiotherapy complications, therefore it was necessary to use references, such as textbooks and older articles, which defined the complications, enabling the identification of empirical indicators needed to construct the diagnoses.

Considering the identification and definition of the adverse effects, the empirical indicators were selected. In the hierarchy of nursing knowledge, empirical indicators are the criteria and/or experimental conditions used to observe or to measure the concepts of a theory.¹⁰ In this study, empirical indicators were considered as clinical manifestations, signs and symptoms of basic human needs affected due to the adverse effects of radiotherapy.

Based on the empirical indicators, the researchers developed the nursing diagnoses using terms from the Seven-Axis Model of ICNP® version 2011 and the literature of the area, as recommended by the ICN. For diagnoses, one should necessarily include a term from the focus axis and a term from the judgment axis; if necessary, terms of the other axes should be included (location, means, client, time).¹¹

RESULTS AND DISCUSSION

Considering the literature review, it was found that radiotherapy is a treatment widely used for malignant neoplasms⁵, however, short, medium and long-term adverse effects are important limiting factors of treatment, because they have consequences in the quality of life of the patients, and therefore this population demands multidisciplinary follow-up.¹²

In Table 1, the adverse effects related to radiotherapy identified in the literature review are observed.^{2,4,12-21} Five effects were identified, namely: mucositis, radiodermatitis, trismus, xerostomia and osteoradionecrosis. Such effects were defined, which allowed for the description of empirical indicators, i.e., signs and symptoms that affect patients' basic human needs.

For the adverse effect, mucositis, six empirical indicators were identified (inflammation, edema, erythema, pain, ulceration and hemorrhage in the oral mucosa).

For radiodermatitis, three indicators were identified: dermis inflammation, skin erythema and risk for dermatitis.

Regarding trismus, five manifestations were observed: edema of masticatory muscles, pain in masticatory muscle, difficulty in speech, impaired oral hygiene and difficulty eating.

For xerostomia, four empirical indicators were identified: dry oral cavity, difficulty chewing, difficulty swallowing, and impaired articulation.

With regard to osteoradionecrosis, the following indicators were identified: bone necrosis, bone pain, bone edema, bone fracture, loss and suppuration of the bone structure.

Based on the empirical indicators, the respective axes of focus, judgment and location were identified in order to enable the construction of nursing diagnoses, as shown in Table 2.

Table 3 presents the diagnoses based on the adverse effects related to radiotherapy. Ninety-seven nursing diagnoses were constructed according to the ICNP® terms. For the adverse effect mucositis, 24 diagnoses were constructed. In the case of radiodermatitis, 12 were constructed; and for trismus, 25 diagnoses. Regarding xerostomia, 17 diagnoses were constructed; in relation to osteoradionecrosis, 19 nursing diagnoses.

Mucositis is an inflammatory reaction of the oral mucosa characterized by erythema and edema of the mucosa, commonly followed by ulceration and peeling, which continues until the therapy is complete. It can result in ulceration, dysphagia, loss of taste, and difficulty eating. It is a debilitating effect of cancer treatments such as radiotherapy and chemotherapy, very common (affects more than 40% of patients) and painful.^{13-15,20}

Radiation, when in doses between 40 and 65 Gy, promotes degenerative inflammatory reaction, especially of the serous acinar cells of the salivary glands, leading to decreased salivary flow which, together with the patient's anxiety and depression, triggers xerostomia. It comprises the state in which salivary flow is less than 0.3 mL/min, leading to change of tasting, dysphagia, loss of appetite and weight, adversely affecting the quality of life of the patient, because liquefaction and lubrication of food does not occur, and, associated with mucosal irritation, makes swallowing painful.^{12,18}

Table 1 - Description of the adverse effects and empirical indicators related to radiotherapy. Vitória, Espírito Santo. Mar-Jun/2012

Adverse effect	Literature definition	Empirical indicators
Mucositis	Inflammation of the mucous lining ¹³ . Inflammation of the oral mucosa, which is manifested as edema, erythema, ulceration, hemorrhage and pain. ^{2,14,15}	Inflammation of the oral mucosa; oral edema of oral mucosa; erythema of oral mucosa; pain in oral mucosa; ulceration of the oral mucosa and hemorrhage in the oral mucosa
Radiodermatitis	Destruction of the basal cell layer of the epidermis (loss of permeability) with exposure of the dermis (inflammatory process) and manifests as erythema, which may or may not evolve to dermatitis. ^{15,18}	Dermis inflammation; skin erythema; risk for dermatitis
Trismus	The masticatory muscles, while inside the radiation field, present edema, cellular destruction and fibrosis. ¹⁶ Limitation of mouth opening, which makes it difficult to eat, verbalize, practice dental treatment, oral hygiene and causes intense discomfort. ^{12,19-21}	Pain in masticatory muscle; edema of masticatory muscles; difficulty in speech; impaired oral hygiene; difficulty eating
Xerostomia	Dry oral cavity resulting from decreased salivary gland function. ^{13-15,20} Xerostomia causes difficulty chewing, swallowing and articulation, not affecting the physiological aspects of food transportation, but the sensory process and comfort during eating. ^{4,12}	Dry oral cavity; difficulty chewing; difficulty swallowing; and impaired articulation.
Osteoradionecrosis	Osteoradionecrosis is the ischemic bone necrosis due to radiation, resulting in pain and possible substantial loss of bone structure. ^{20,21} It can also result in edema, suppuration and pathological fractures. ^{15,16}	Bone necrosis; bone pain; bone edema; bone fracture; loss and suppuration of the bone structure.

Table 2 - Description of the empirical indicators and the ICNP® 2011 axes. Vitória, Espírito Santo. Mar-Jun/2012

Empirical indicators	Focus Axis	Judgment Axis	Location Axis
Inflammation of the oral mucosa; Edema of oral mucosa; Erythema of oral mucosa; Pain in oral mucosa; Ulceration of the oral mucosa and hemorrhage in the oral mucosa	Inflammation; Edema; Erythema; Pain; Ulceration; Hemorrhage	Light; Moderate; Severe; Risk.	Oral mucous membrane; Oral cavity.
Dermis inflammation; Skin erythema; Risk for dermatitis	Inflammation; Heat erythema; Eczema.	Light; Moderate; Severe; Risk.	Skin.
Pain in masticatory muscle; Edema of masticatory muscles; Difficulty in speech; Impaired oral hygiene; Difficulty eating.	Pain; Edema; Dysarthria; Discomfort with oral hygiene; Self-care; Eating.	Light; moderate; severe; risk. Effective; Ineffective; risk.	Masticatory muscle; Oral cavity.
Dry oral cavity; difficulty chewing; difficulty swallowing; impaired articulation.	Chewing; swallowing; tasting; articulation contracture; dry mucous membrane.	Effective; impaired; risk; Light; moderate; severe.	Maxillary bone.
Bone necrosis; bone pain; bone edema; bone fracture; loss and suppuration of the bone structure.	Bone pain; edema; fracture; necrosis; loss of bone structure*	Light; moderate; severe; risk; partial; total.	Bone.

Table 3 - Adverse effects and nursing diagnoses according to the ICNP® 2011. Vitória, Espírito Santo. Mar-Jun/2012

Adverse effect	Nursing diagnoses
Mucositis	Light inflammation of the oral mucosa; moderate inflammation of the oral mucosa; severe inflammation of the oral mucosa; risk for inflammation of the oral mucosa; light erythema of oral mucosa; moderate erythema of oral mucosa; severe erythema of oral mucosa; risk for erythema of oral mucosa; light pain in oral mucosa; moderate pain in oral mucosa; severe pain in oral mucosa; risk for pain in oral mucosa; light edema of oral mucosa; moderate edema of oral mucosa; severe edema of oral mucosa; risk for edema of oral mucosa; light ulceration of the oral mucosa; moderate ulcer in the oral mucosa; severe ulcer of the oral mucosa; risk for ulcer in the oral mucosa; light hemorrhage in the oral mucous membrane; moderate hemorrhage in the oral mucous membrane; severe hemorrhage in the oral mucous membrane; risk for hemorrhage in the oral mucous membrane.
Radiodermatitis	Light skin inflammation; moderate skin inflammation; severe skin inflammation; risk for skin inflammation; Light heat erythema on the skin; moderate heat erythema on the skin; heat erythema on the skin; risk for heat erythema; light skin eczema; moderate skin eczema; severe skin eczema; risk for skin eczema.
Trismus	Light edema of masticatory muscle; moderate edema of masticatory muscle; severe edema of masticatory muscle; risk for edema of masticatory muscle; light pain in masticatory muscle; moderate pain in masticatory muscle; severe pain in masticatory muscle; risk for pain in masticatory muscle; light moderate dysarthria; severe dysarthria; risk for dysarthria; light discomfort in the oral cavity; moderate discomfort in the oral cavity; severe discomfort in the oral cavity; risk for discomfort in the oral cavity; effective oral hygiene; ineffective oral hygiene; risk for ineffective oral hygiene; effective self-care; ineffective self-care; risk for ineffective self-care; effective eating; ineffective eating; risk for ineffective eating.
Xerostomia	Light dry oral mucous membrane; moderate dry oral mucous membrane; severe dry oral mucous membrane; risk for dry oral mucous membrane; effective swallowing; impaired swallowing; risk for impaired swallowing; effective chewing; impaired chewing; risk for impaired swallowing; impaired effective tasting; impaired tasting; risk for impaired tasting; light maxillary articulation contracture; moderate maxillary articulation contracture; severe maxillary articulation contracture; risk for maxillary articulation contracture.
Osteoradionecrosis	Light bone pain; moderate bone pain; severe bone pain; risk for bone pain; light bone edema; moderate bone edema; severe bone edema; risk for bone edema; partial bone fracture; total bone fracture; risk for bone fracture; light bone necrosis; moderate bone necrosis; severe bone necrosis; risk for bone necrosis; light loss of bone structure; moderate loss of bone structure; severe loss of bone structure; risk for loss of bone structure.

Radiodermatitis can also occur after radiation exposure and is characterized by initial erythema, progressive edema, hyperpigmentation, dry or moist desquamation and ulceration, depending on the dose of radiation.^{2,21} It happens

due to destruction of the basal cell layer of the epidermis (loss of permeability), exposing the dermis (inflammatory process). It manifests as erythema, which may or may not evolve into dermatitis.^{14,16}

Osteoradionecrosis is one of the most serious complications of radiotherapy, with a more pronounced effect in the elderly. Ionizing radiation makes vascular channels narrower, which decreases blood flow. Thereby, the pathogenesis of osteoradionecrosis depends on the degree of impairment of vascularization, as well as the decrease of viable osteocytes and osteoblasts in the bone affected. Signs and symptoms include edema, soft tissue erythema, exposure of necrotic bone, trismus, ulceration, pain, intra and extraoral suppuration, paresthesia and pathological fracture.^{17,21}

Radiation-induced trismus, which occurs three to six months after completion of treatment, has significant impact on the quality of life of patients, because it hinders the mandibular mobility, compromises oral hygiene, speech and nutrition, and impairs rehabilitation. The masticatory muscles, while inside the radiation field, present edema, cellular destruction and fibrosis.^{12,19,20}

Considering these results, the use of nursing diagnosis may favor the autonomy of nurses, serving as a reference for the development of nursing interventions, enabling nurses' exercise of critical thinking and clinical judgment.

Moreover, authors state that the nursing process guides the way nurses think dynamically, in order to make appropriate decisions about what the care needs are (diagnoses), what outcomes are to be achieved (outcomes) and about the best care to meet those needs related to the desirable outcomes (interventions).^{6,7}

It is important to mention that the application of the nursing process improves the quality of nursing records, favoring the evaluation of care and directing the actions of assistance. The respect to the individuality of the patient is considered. It should be noted that individualized care articulates a favorable relationship with the multidisciplinary team, patient and family, favoring the humanization of care.²²

A study concluded that nurses believe in the importance of the nursing process, state that it improves the quality of care, promotes independence and enables the unification of language. However, it was found that most nurses had no knowledge about the process, because 70% could not name a nursing diagnosis and also did not use them in care, and 56% did not perform any of phases.²³

Nurses want to practice all phases of the nursing process, planning, investigating, diagnosing and evaluating interventions. However, they cannot find the path due to a series of factors that separate theory from practice. Thus, the process is said to be implemented, but what is seen is a partial way of working, with the performance of one or other stage.²⁴

In this sense, it is observed that nurses recognize the nursing process as a tool for care planning that assists in structuring and organizing the service, because it orders the actions implemented by the team and written actions.

Finally, the nursing process is an essential instrument for the organization of clinical practice and the ICNP® uses practical methods for the construction of diagnoses and selection of interventions that facilitate nursing care systematization.²⁵

CONCLUSION

It can be concluded that radiotherapy is a widely used treatment modality in cancer treatment, but often leads to both immediate and late adverse effects, five of which were evidenced in this study: mucositis, radiodermatitis, trismus, xerostomia and osteoradionecrosis. Considering these adverse effects, 97 nursing diagnoses were constructed.

This finding strengthens the understanding of the importance of nursing diagnosis construction in the care process, since the correct identification of a diagnosis is essential to guide appropriate interventions and thus allows for the provision of individualized care, guided by the actual patient's demands.

Thereby, previously constructed diagnoses related to the side effects can guide nurses' clinical reasoning in the planning of nursing interventions, contributing to the effective implementation of the nursing consultation in the radiotherapy department. Their development reinforces the importance of using a uniform language by nurses in order to facilitate communication and improve care. The ICNP®, a methodological tool, internationally adopted for nursing practice, allowed for language standardization. The 2011 version includes terms of nursing practice, with its language being simple and easy to understand, which favored the construction of the diagnoses.

This study is expected to motivate professionals to study the ICNP® and subsequently develop validation studies of these diagnoses, contributing for the improvement of this nursing classification.

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