

## Scientific evidence on factors associated with the quality of life of radiodermatitis patients



*Evidências científicas sobre os fatores associados à qualidade de vida de pacientes com radiodermatite*

*Evidencias científicas sobre los factores asociados a la calidad de vida de pacientes condermatitis*

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### ABSTRACT

**Objective:** To analyze in the literature the factors associated with the quality of life of patients with radiodermatitis.

**Method:** Integrative literature review of the MEDLINE, CINAHL, Web of Science and IBECs databases between 2007 and 2016.

**Results:** Fourteen studies that met the established inclusion criteria, with a predominance of randomized clinical trials, level of evidence II 1 were analyzed. Among the factors that compromised the quality of life were pain, pruritus, alteration of the body image and emotional reactions such as anxiety and depression symptoms stand out. The laser therapy, the emu oil and intensity-modulated radiotherapy represented the interventions that favored the improvement of the quality of life.

**Conclusion:** Radiodermatitis causes significant impairments to the quality of life of cancer patients, requiring multiprofessional interventions and new studies aimed at the prevention and treatment of the lesion.

**Keywords:** Neoplasms. Radiodermatitis. Quality of life.

### RESUMO

**Objetivo:** Analisar fatores de sofrimento e estratégias defensivas dos enfermeiros que atuam em uma emergência de um hospital universitário.

**Método:** Investigação qualitativa, com referencial teórico da Psicodinâmica do Trabalho, realizada em um setor de emergência hospitalar do Sul do Brasil. As informações foram obtidas por meio de entrevistas com 18 enfermeiros no ano 2015, utilizando como método a análise temática.

**Resultados:** A partir da análise emergiram duas categorias: Sofrimento no Trabalho e Estratégias Defensivas utilizadas pelos enfermeiros. Na primeira, surgiram quatro subcategorias: a superlotação e sobrecarga de trabalho, sentimento de frustração e insegurança e conflitos entre profissionais. Na segunda, Estratégias Defensivas, surgiram duas subcategorias; Estratégias Individuais e Coletivas.

**Considerações finais:** O sofrimento no trabalho desencadeia desgaste físico e emocional, tornando necessário o uso de estratégias coletivas e individuais que ofertam estabilidade, dentro e fora do ambiente de trabalho. Portanto, cuidar do trabalhador significa promover a saúde em seu processo de trabalho.

**Palavras-chave:** Enfermagem. Serviço hospitalar de emergência. Saúde mental. Saúde do trabalhador.

### RESUMEN

**Objetivo:** Analizar en la literatura los factores asociados a la calidad de vida de pacientes con radiodermatitis.

**Método:** Revisión integradora de la literatura llevada a cabo a través de las bases de datos MEDLINE, CINAHL, Web of Science y IBECs, entre 2007 y 2016.

**Resultados:** Se analizaron 14 estudios, que cumplieron con los criterios de inclusión establecidos, con predominio de ensayos clínicos randomizados y nivel de evidencia II 1. Entre los factores que comprometieron la calidad de vida se destacaron el dolor, prurito, la modificación de la imagen corporal y las reacciones emocionales como síntomas de ansiedad y depresión. La laserterapia, el aceite de emú y la radioterapia de intensidad modulada representaron las intervenciones que favorecieron mejorar la calidad de vida.

**Conclusión:** La radiodermatitis acarrea pérdida significativa en la calidad de vida de los pacientes oncológicos, siendo necesaria intervenciones multi-profesionales y nuevos estudios volcados a la prevención y al tratamiento de la lesión.

**Palabras clave:** Neoplasias. Radiodermatitis. Calidad de vida.

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## INTRODUCTION

Radiotherapy represents a therapeutic modality for the treatment of different types of cancer, although it entails complications, side effects and adverse reactions. Among the most common events, radiodermatitis is defined as a set of cutaneous lesions due to intense exposure to ionizing radiation<sup>(1-2)</sup>.

These cutaneous repercussions are present in 95% of patients undergoing radiotherapeutic treatment, and they usually develop after the second week of treatment, being limited to the radiation field, and ranging from benign erythema, dry or wet desquamation, dermis exposure and fluid leakage to necrosis, deep ulceration and local infection<sup>(1,3-4)</sup>.

The risk factors that determine and potentiate the degree of skin toxicity include intrinsic and extrinsic conditions, such as age, nutritional status, stage and location of the tumor, presence of comorbidities and immunotherapy, irradiated volume, total and fractional radiation dose, adequacy to self-care, and concomitant chemotherapy<sup>(5)</sup>.

The treatment is based on the clinical experience of the nurse, the degree of skin toxicity, ranging from grade I to IV and the availability of topical products such as interactive coverages, moisturizers and anti-inflammatory agents<sup>(6)</sup>. Having that said, nursing care is based on the prevention through the hygiene and hydration of the irradiated area, the use of protocols, patient and family guidelines on skin care and early interventions that promote skin integrity and Quality of Life (QL)<sup>(7-8)</sup>.

In this context, the concepts associated with QL were developed and applied to patients, aiming at individualizing the health care and to consider subjectivity through the use of validated tools, instruments and scales to explore the effects of disease and treatment<sup>(9-10)</sup>.

The QL measurement represents an important resource to assess the therapeutic results

from the patient's perspective, to plan the rehabilitation process, to monitor the signs and symptoms of the disease, as well as the side effects of the treatment, allowing the definition of behaviors and the assessment of care, consolidating the practice based on evidence<sup>(11)</sup>.

Thus, in search for evidence to improve the care provided, this study has as objective to analyze in the literature the factors associated to the quality of life of radiodermatitis patients.

## METHOD

In order to reach the proposed objective, an integrative review of the literature based on the theoretical framework of Whittemore and Knafl was done<sup>(12)</sup>. It is a broad method that allows the inclusion of studies of different methodological approaches, enabling the synthesis and analysis

of the knowledge produced and providing more effective and cost-effective interventions<sup>(13)</sup>.

The review carefully followed six steps: selection of the guiding question; sampling or searching in the literature; selection, in pairs, of the surveys that composed the sample; extraction of data from the included studies; assessment and interpretation of the results; and presentation of the review or synthesis of the knowledge produced<sup>(12)</sup>.

In order to prepare the guiding question the PICO strategy was used, defining as population "cancer patients", phenomenon of interest "radiodermatitis" and context "quality of life". Thus, this research was conducted from the following research question: What are the scientific evidence on factors associated with the quality of life of radiodermatitis patients?

The following inclusion criteria were defined: articles of primary studies indexed in the databases described, published in the period from 2007 to 2016, in English, Portuguese or Spanish language, with full text available and covering the subject under study. The exclusion criteria were focused on literature review studies and duplicate articles.

The bibliographic survey was carried out between March and April 2017 in the electronic databases *Medical Literature Analysis and Retrieval System on-line* (MEDLINE via PubMed), *Cumulative Index to Nursing and Allied Health Literature* (CINAHL-Ebsco), *Web of Science Bibliographic Index* "Español en Ciencias de la Salud" (IBECS via Virtual Health Library).

The controlled and uncontrolled descriptors were selected after consulting the terms from the Health Sciences Descriptors (DeCS), *Medical Subject Headings* (MeSH) and *List of Headings of CINAHL Information Systems*, as described in Chart 1.

The articles were accessed through the Journal Portal of Capes. The selection was carried out independently by two reviewers, who after reading titles, abstracts and inclusion of the productions, obtained an agreement index superior to 80%.

The search totaled 114 productions, of which 26 met the inclusion criteria and were selected for this study. After reading the texts in full, 12 publications were excluded, nine of them duplicated in the databases, and three, because they included secondary studies, such as literature review. Thus, 14 articles composed the sample and were analyzed. Figure 1 describes the path taken to select the studies, according to the base consulted.

For the analysis of the Level of Evidence (LE), the classification of the evidence was used according to the methodological design: I 1 - Systematic review, containing only randomized controlled clinical trials; II 1 - At least one randomized controlled trial; III 1 - Controlled, well-delineated clinical trials without randomization; III 2 - Well-designed cohort studies or case-control, analytical studies, preferably

from more than one research center or group; III 3 - Multiple time series and results in uncontrolled experiments; IV 1 - Opinion of respected authorities, descriptive studies or expert committee reports<sup>(14)</sup>.

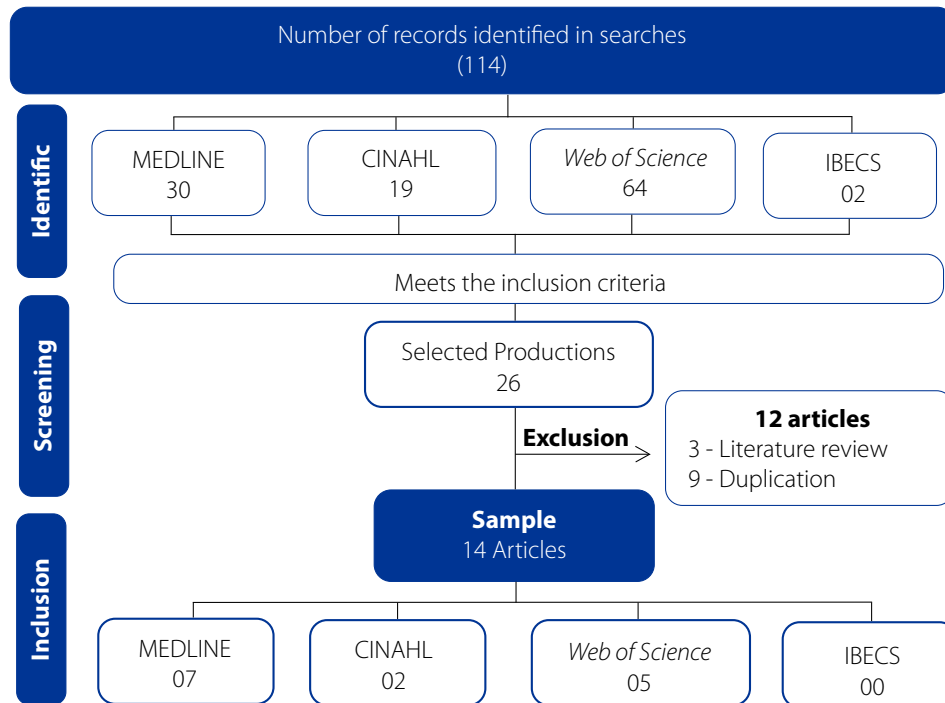
The data extraction was carried out with the aid of an instrument containing information about authors, country and year of publication; databases and periodicals; research and sample design; main findings and conclusions of the studies.

MeSH and CINAHL List		
<b>P</b>	DC	Neoplasms
	DNC	Neoplasias; Tumors; Cancers
<b>I</b>	DC	Radiodermatitis
	DNC	Radiation induced dermatitis; Radiation recall dermatitis; Radiation recall reactions
<b>Co</b>	DC	Quality of Life
	DNC	Life quality; Health related quality of life
<b>Search expression</b> MEDLINE via PubMed		((("Neoplasms"[Mesh]) OR (((("neoplasias") OR "tumors") OR "cancers")))) AND (((("Radiodermatitis"[Mesh]) OR (((("radiodermatitides") OR "radiation induced dermatitis") OR "radiation recall dermatitis") OR "radiation recall reactions"))) AND (("Quality of Life"[Mesh]) OR ("life quality") OR "health related quality of life"))
<b>Search expression</b> <i>Web of Science</i>		(TS=(Neoplasms) OR TS=(Neoplasias) OR TS=(Tumors) OR TS=(Cancers)) AND ( TS=(Radiodermatitis) OR TS=(Radiation induced dermatitis) OR TS=(Radiation recall dermatitis) OR TS=(Radiation recall reactions)) AND ( TS=(Quality of Life) OR TS=(Life quality) OR TS=(Health related quality of life))
<b>Search expression</b> CINAHL		((MH "Neoplasms+") OR "Neoplasms" OR "Neoplasias" OR "Tumors" OR "Cancers") AND ((MH "Radiodermatitis") OR "Radiodermatitis" OR "Radiation induced dermatitis" OR "Radiation recall dermatitis" OR "Radiation recall reactions") AND ((MH "Quality of Life+") OR "Quality of Life" OR "Life quality" OR "Health related quality of life")
DeCS		
<b>P</b>	DC	Neoplasias
	DNC	Cancer; Neoplasms; Tumor; Tumors; Malignant tumors; Neoplasia; Benign neoplasm; Malignant neoplasm; Malignancy
<b>I</b>	DC	Radiodermatitis
	DNC	Radiation-Induced Dermatitis; Radiation Dermatitis; Recall Radiation Dermatitis; Reaction due to Regress Radiation
<b>Co</b>	DC	Quality of Life
	DNC	Quality of Life Related to Health
<b>Search expression</b> IBECS via BVS		(mh:(Neoplasias)) OR (tw:(Cancer)) OR (tw:(Neoplasmas)) OR (tw:(Tumor)) OR (tw:(Tumors)) OR (tw:(Malignant tumors)) OR (tw:(Neoplasia)) OR (tw:(Benign Neoplasia)) OR (tw:(Malignant Neoplasia)) OR (tw:(Malignancy)) AND (tw:(Radiodermatitis)) OR (mh:(Radiation-Induced Dermatitis)) OR (tw:(Regress Radiation Dermatitis)) OR (tw:(Recall Radiation Dermatitis)) OR (tw:(Reaction due to Regress Radiation)) AND (tw:(Quality of Life)) OR (tw:(Quality of Life Related to Health))

**Chart 1** - Controlled and uncontrolled descriptors used to construct the search strategy in the MEDLINE, CINAHL, Web of Science and IBECS databases

Source: Research data, 2017.

Caption: CD (Controlled Descriptor); NCD – Non-controlled Descriptor.



**Figure 1** - Identification, sorting and inclusion process of the scientific productions available in the databases investigated  
Source: Research data, 2017.

The data were analyzed and synthesized in a descriptive way and the selected productions were organized in spreadsheets in Microsoft Excel, proceeding to the construction of frames according to the variables identified. In addition, the ordering of the material and the classification by semantic similarity were carried out, which allowed the construction of thematic categories.

## RESULTS

The results showed a predominance of randomized clinical trials with level of evidence II 18 (57.14%)<sup>(15-22)</sup>, published in the International Journal of Radiation Oncology

Biology Physics 5 (35.71%)<sup>(16-17,19,21,23)</sup>, in English 14 (100%)<sup>(15-28)</sup> and between the years 2013 and 2014 6 (42.85%)<sup>(16-19,23,25)</sup>. To assess the QL, the most used instrument was the European Organization for Research and Treatment of Cancer: Quality of Life Questionnaire C-30 (EORTC QLQ C-30) 7 (50%)<sup>(18,20-22,24-26)</sup>.

The synthesis of knowledge was formulated in two categories: Factors that compromise the QL of patients with radiodermatitis; Interventions that promote QL for patients with radiodermatitis. Chart 2 presents the distribution of the selected studies according to main author, periodical, year of publication, design, sample (n), instrument used to measure QL, main results and NE.

Category 1 – Factors that compromise the QL of radiodermatitis patients			
Main author, periodical and year	Design, sample (n)	Instrument and main results	NE
Younus J <sup>(24)</sup> <i>Complement Ther Med.</i> 2015	Control case study (49)	<b>EORTC (QLQ-C30)</b> Pain, itching and fatigue.	<b>III 2</b>
Bazire L <sup>(15)</sup> <i>Radiother Oncol.</i> 2015	Randomized clinical trial (278)	<b>Dermatology Life Quality Index (DLQI)</b> Pain and high levels of cutaneous toxicity.	<b>II 1</b>

Hindley A <sup>(16)</sup> <i>Int J Radiat Oncol Biol Phys.</i> 2014	Randomized clinical trial (120)	<b>DLQI</b> Symptoms of anxiety and depression.	<b>II 1</b>
Chan RJ <sup>(17)</sup> <i>Int J Radiat Oncol Biol Phys.</i> 2014	Randomized clinical trial (174)	<b>Skindex-16</b> Pain, pruritus and high levels of cutaneous toxicity.	<b>II 1</b>
Sharp L <sup>(18)</sup> <i>Eur J Oncol Nurs.</i> 2013	Randomized clinical trial (411)	<b>EORTC (QLQ-C30)</b> Pain and sensitivity change.	<b>II 1</b>
Sharp L <sup>(25)</sup> <i>Breast</i> 2013	Control case study (390)	<b>EORTC (QLQ-C30)</b> Severe skin reactions, elevated levels of pain, and altered sleep patterns.	<b>III 2</b>
Dragun AE <sup>(23)</sup> <i>Int J Radiat Oncol Biol Phys.</i> 2013	Cohort Study (42)	<b>Breast Cancer-Specific Quality of Life Questionnaire (QLQ-BR23)</b> Pain, fatigue, edema, local infection and presence of comorbidities.	<b>III 2</b>
Kirova YM <sup>(26)</sup> <i>Radiotherapy and Oncology.</i> 2011	Prospective Study (93)	<b>EORTC (QLQ-C30)</b> Pain, pruritus, irregular sleep and impaired cognitive functioning. High incidence of injury.	<b>III 2</b>
Schnur JB <sup>(27)</sup> <i>Psycho-Oncology</i> 2010	Qualitative study (20)	<b>Interview</b> Pain, discomfort, alteration of body image and emotional reactions.	<b>III 2</b>
Theberge V <sup>(21)</sup> <i>Int J Radiat Oncol Biol Phys.</i> 2009	Randomized clinical trial (84)	<b>EORTC (QLQ-C30)</b> Edema, pain, discomfort and location of cancer (breast).	<b>II 1</b>
<b>Category 2 - Interventions promoting QL for patients with radiodermatitis</b>			
Censabella S <sup>(28)</sup> <i>Suppor Care Cancer.</i> 2016	Cohort study (79)	<b>Skindex-16</b> Laser therapy that reduced complications such as cutaneous toxicity and promoted greater satisfaction with treatment.	<b>III 2</b>
Rollmann DC <sup>(19)</sup> <i>Int J Radiat Oncol Biol Phys.</i> 2014	Randomized clinical trial (42)	<b>Skindex-16</b> EMU oil reduced skin toxicity, presenting viability and safety in the treatment of radiation-related dermatitis.	<b>II 1</b>
Sharp L <sup>(20)</sup> <i>Eur J Cancer.</i> 2011	Randomized clinical trial (200)	<b>EORTC (QLQ-C30)</b> The application of QL measurement instruments to provide care planning and care routine.	<b>II 1</b>
Pignol P <sup>(22)</sup> <i>J Clin Oncol.</i> 2008	Randomized clinical trial (331)	<b>EORTC (QLQ-C30); (QLQ-BR23)</b> Radiation therapy modulated by intensity favored the distribution of the radiation dose and reduced the incidence of moist desquamation.	<b>II 1</b>

**Chart 2** - Synthesis of the productions included in the literature review (n=14) on the factors associated with the quality of life of radiodermatitis patients

Source: Research data, 2017.

## DISCUSSION

The radiation therapy is one of the main therapeutic methods for the treatment of cancer, with positive results in the reduction of morbidity and mortality indicators, but it has adverse effects such as radiodermatitis that compromises the functional capacity and quality of life of patients.

It has been observed that these skin reactions have increased considerably and may be associated with the high incidence of cancer, the presence of risk factors and the absence of protocols for the prevention and treatment of the lesion. This statement can be justified in the findings of this study, in which the majority of the productions were randomized clinical trials, level of evidence II 1<sup>(15-22)</sup> and that involved significant samples<sup>(15-18,20,22,25)</sup>.

The predominance of studies with high methodological quality allowed the generalization of the results and gathered evidence capable of subsidizing the decision-making in the provision of care, being fundamental for the performance of the care with safety, effectiveness and quality. However, it is important to emphasize the importance of cohort and observational studies, which require less cost and time, and are constantly used to assess the results of exposure to risks and indicators of prognosis<sup>(29)</sup>.

Regarding the QL, it was observed that the theme has been attracting interest among researchers in the area of health and nursing, due to the increasing number of productions and the various factors that potentiate this adverse event, being able to generate dependence on care and losses physical, mental and social health.

### Factors that compromise the QL of patients with radiodermatitis

The results showed that radiodermatitis represents the main secondary event due to the radiotherapy treatment, with an incidence of 93%<sup>(26)</sup> and which impairs the quality of life of patients, since the physical symptoms, changes in body image, emotional reactions and risk of infection can lead to social isolation and require prolongation or interruption of the treatment.

Among the factors that compromised the QL, it was observed that elevated levels of pain were the most reported and had significant associations with the physical limitations imposed by the lesion, thus contributing to a worse quality of life<sup>(15,17-18,21,23-27)</sup>. In addition, other factors were identified, including pruritus<sup>(17,23,26)</sup>, discomfort<sup>(21,27)</sup>, fatigue<sup>(23-24)</sup>, sensitivity change<sup>(18)</sup>, in the body image<sup>(17)</sup> and in the pattern of sleep and rest<sup>(25-26)</sup>.

Despite the high incidence of pain in patients with radiodermatitis, one of the major problems is the underdiagnoses, which can be associated with different factors, such as the use of ineffective strategies for assessment, difficulty or reluctance to express symptoms, concern related to the dependence of analgesic drugs and fear of drug reactions<sup>(30)</sup>.

In addition, it was possible to observe that there is a compromise of the psychological well-being characterized by reactions and emotional stress that modify life priorities and trigger fear of the unknown, symptoms of anxiety and depression, uncertainties and low self-esteem<sup>(16,27)</sup>.

Another study showed that these factors are directly related to the degree of cutaneous toxicity, and its severity was enhanced by the presence of risk factors, such as advanced age, obesity, smoking and adjuvant chemotherapy<sup>(23)</sup>.

In patients with breast cancer, it was observed that the cutaneous manifestations were

more severe, since the field for radiation incidence directly influences the high degrees of toxicity in the skin and that in regions with little adipose tissue and with presence of folds, it is common the constant humidity and friction<sup>(21)</sup>.

Thus, it can be verified that the serious reactions represented a potential source for infections, requiring effective interventions, among them the adoption of adjuvant therapies such as antibiotics and topical products<sup>(23)</sup>. Thus, nursing care should be directed to identify the patient's needs, minimize the limitations imposed by the disease and treatment, and encourage self-care.

### Interventions that promote QL for patients with radiodermatitis

As for the interventions that promoted QL for patients with radiodermatitis, it should be highlighted the behaviors based on the multiprofessional approach such as laser therapy, emu oil as topical therapy and intensity-modulated radiotherapy, for providing physical well-being, reduction of degrees of cutaneous toxicity and to reflect on maintaining the functional capacity and independence.

The laser therapy was described as one of the main interventions for the promotion of QL, in which its application in patients with breast cancer showed significantly better results than those only under standard care<sup>(28)</sup>.

This therapeutic modality has been constantly incorporated in the treatment of wounds with the objective of promoting the improvement of inflammatory processes, reducing pain, preventing the formation of edema, as well as preserving adjacent tissues and nerves, resulting in a satisfactory healing process<sup>(30)</sup>.

Also in women with breast cancer, it was possible to observe improvement of the lesions and reduction of cutaneous toxicity by applying products based on emu oil, which was configured as a viable and safe alternative for the treatment of radiation-associated dermatitis, since it had direct benefits in reducing inflammation and improving the healing process<sup>(19)</sup>.

It should be highlighted that a study was included in this category because it considered the measurement of quality of life, although not directly reflecting its improvement, it enables the identification of the individual needs of the patients, monitoring the adverse effects resulting from the treatment, diagnosing the severity and prognosis of the disease and directing care planning and routine care<sup>(20)</sup>.

Therefore, the measurement can be carried out through the application of instruments developed, adapted and validated for different contexts and realities, aimed at identifying aspects that interfere in the life of patients and subsidize a safe and quality care.

Among the most used instruments, the EORTC (QLQ-C30), which represents one of the effective methods to assess the damages caused by cutaneous toxicity, allowing to identify the domains and symptoms related to the QL most affected by the presence of the lesion<sup>(20)</sup>.

It is a tool developed in 1993, translated and validated for Brazil and recognized as valid and reliable for assessing the quality of life in cancer patients. Composed of 30 items, it presents five functional scales, three of symptoms and one that assesses the overall health status and quality of life in the last four weeks of treatment<sup>(31-32)</sup>.

Another intervention tested in patients with breast cancer was the intensity-modulated radiotherapy, described as a technique that guarantees the homogeneous distribution of the radiation dose, allowing the reduction of cases of skin desquamation, pain symptoms and ensuring a better quality of life<sup>(22)</sup>.

## ■ CONCLUSION

The results of this study showed that the radiodermatitis causes harm to patients, in which the factors that most affected their QL were the physical symptoms of pain, discomfort, fatigue, emotional reactions and altered sensitivity, body image and sleep. It was also verified that behaviors based on the multiprofessional approach such as laser therapy, the topical application of emu oil and intensity-modulated radiotherapy were shown to be effective in promoting QL.

As a limitation, it was highlighted the absence of Brazilian productions on the theme. Therefore, additional

research is needed to develop strategies and protocols for the prevention and treatment of the lesion, the qualification of care and the improvement of patients' quality of life.

## ■ REFERENCES

1. Bray FN, Simmons BJ, Wolfson AH, Nouri K. Acute and chronic cutaneous reactions to ionizing radiation therapy. *Dermatol Ther (Heidelb)*. 2016;6(2):185-206. doi: <http://dx.doi.org/10.1007/s13555-016-0120-y>.
2. Ryan JL. Ionizing radiation: the good, the bad, and the ugly. *J Invest Dermatol*. 2012;132(3 Pt 2):985-93. doi: <https://dx.doi.org/10.1038/jid.2011.411>.
3. Schneider F, Danski MTR, Vayego SA. Usage of *Calendula officinalis* in the prevention and treatment of radiodermatitis: a randomized double-blind controlled clinical trial. *Rev Esc Enferm USP*. 2015;49(2):221-8. doi: <http://dx.doi.org/10.1590/S0080-623420150000200006>.
4. Huang A, Glick SA. Genetic susceptibility to cutaneous radiation injury. *Arch Dermatol Res*. 2017;309(1):1-10. doi: <http://dx.doi.org/10.1007/s00403-016-1702-3>.
5. Castro MF, Martín-Gil B. Efectividad del tratamiento tópico en pacientes com câncer de mama que sufren radiodermatitis: una revisión sistemática. *Enferm Clin*. 2015;25(6):327-43. doi: <http://dx.doi.org/10.1016/j.enfcli.2015.06.003>.
6. Matsubara MGS, Villela DL, Hashimoto SY, Reis HCS, Saconato RA, Denardi UA, et al. Feridas e estomas em oncologia: uma abordagem interdisciplinar. São Paulo: Lemar; 2012.
7. Melo AM, Alves DS, Pereira A, Lacerda EC. A new perspective in the treatment of radiodermatitis. *Indian J Cancer*. 2015;52(4):544-5. doi: <http://dx.doi.org/10.4103/0019-509X.178421>.
8. Andrade KBS, Francz ACL, Grellmann MS, Belchior PC, Oliveira JA, Wassita DN. Nursing consultation: evaluation of adherence to self-care in patients undergoing radiotherapy. *Rev Enferm UERJ*. 2014;22(5). doi: <http://dx.doi.org/10.12957/reuerj.2014.11227>.
9. Delgado-Sanz MC, Garcia-Mendizabal MJ, Pollan M, Foriaz MJ, Lopez-Abente G, Aragones N, et al. Health-related quality of life in Spanish breast cancer patients: a systematic review. *Health Qual Life Outcomes*. 2011;9:3. doi: <http://dx.doi.org/10.1186/1477-7525-9-3>.
10. Baena-Canada JM, Estalella-Mendoza S, Gonzalez-Guerrero M, Exposito-Alvarez I, Rosado-Varela P, Benitez-Rodriguez E. [Influence of clinical and biographical factors on the quality of life of women with breast cancer receiving adjuvant chemotherapy]. *Rev Calid Asist*. 2011;26(5):299-305. Spanish. doi: <http://dx.doi.org/10.1016/j.cali.2011.04.005>.
11. Correia FR, De Carlo MMR. Evaluation of quality of life in a palliative care context: an integrative literature review. *Rev Latino-Am Enfermagem*. 2012;20(2):401-10. doi: <http://dx.doi.org/10.1590/S0104-11692012000200025>.
12. Whittemore R, Knaf K. The integrative review: updated methodology. *J Adv Nurs*. 2005;52(5):546-53. doi: <http://dx.doi.org/10.1111/j.1365-2648.2005.03621.x>.
13. Mendes KDS, Silveira RCCP, Galvão CM. [Integrative literature review: a research method to incorporate evidence in health care and nursing]. *Texto Contexto Enferm*. 2008;17(4):758-64. Portuguese. doi: <http://dx.doi.org/10.1590/S0104-07072008000400018>.
14. Karino ME, Felli VEA. Enfermagem baseada em evidências: avanços e inovações em revisões sistemáticas. *Cienc Cuid Saúde*. 2012;11(supl):11-5. doi: <http://dx.doi.org/10.4025/ciencucidsaude.v11i15.17048>.

15. Bazire L, Fromantin I, Diallo A, De la Lande B, Pernin V, Dendale R, et al. Hydro-sorb(R) versus control (water based spray) in the management of radio-induced skin toxicity: results of multicentre controlled randomized trial. *Radiother Oncol.* 2015;117(2):229-33. doi: <https://doi.org/10.1016/j.radonc.2015.08.028>.
16. Hindley A, Zain Z, Wood L, Whitehead A, Sanneh A, Barber D, et al. Mometasone furoate cream reduces acute radiation dermatitis in patients receiving breast radiation therapy: results of a randomized trial. *Int J Radiat Oncol Biol Phys.* 2014;90(4):748-55. doi: <https://doi.org/10.1016/j.ijrobp.2014.06.033>.
17. Chan RJ, Mann J, Tripcony L, Keller J, Cheuk R, Blades R, et al. Natural oil-based emulsion containing allantoin versus aqueous cream for managing radiation-induced skin reactions in patients with cancer: a phase 3, double-blind, randomized, controlled trial. *Int J Radiat Oncol Biol Phys.* 2014;90(4):756-64. doi: <https://doi.org/10.1016/j.ijrobp.2014.06.034>.
18. Sharp L, Johansson H, Hatschek T, Bergenmar M. Smoking as an independent risk factor for severe skin reactions due to adjuvant radiotherapy for breast cancer. *Breast.* 2013;22(5):634-8. doi: <https://doi.org/10.1016/j.breast.2013.07.047>.
19. Rollmann DC, Novotny PJ, Petersen IA, Garces YI, Bauer HJ, Yan ES, et al. Double-blind, placebo-controlled pilot study of processed ultra emu oil versus placebo in the prevention of radiation dermatitis. *Int J Radiat Oncol Biol Phys.* 2015;92(3):650-8. doi: <http://dx.doi.org/10.1016/j.ijrobp.2015.02.028>.
20. Sharp L, Johansson H, Landin Y, Moegelin IM, Bergenmar M. Frequency and severity of skin reactions in patients with breast cancer undergoing adjuvant radiotherapy, the usefulness of two assessment instruments - a pilot study. *Eur J Cancer.* 2011;47(18):2665-72. doi: <http://dx.doi.org/10.1016/j.ejca.2011.06.039>.
21. Theberge V, Harel F, Dagnault A. Use of axillary deodorant and effect on acute skin toxicity during radiotherapy for breast cancer: a prospective randomized noninferiority trial. *Int J Radiat Oncol Biol Phys.* 2009;75(4):1048-52. doi: <http://dx.doi.org/10.1016/j.ijrobp.2008.12.046>.
22. Pignol JP, Olivotto I, Rakovitch E, Gardner S, Sixel K, Beckham W, et al. A multi-center randomized trial of breast intensity-modulated radiation therapy to reduce acute radiation dermatitis. *J Clin Oncol.* 2008;26(13):2085-92. doi: <http://dx.doi.org/10.1200/JCO.2007.15.2488>.
23. Dragan AE, Quillo AR, Riley EC, Roberts TL, Hunter AM, Rai SN, et al. A Phase 2 trial of once-weekly hypofractionated breast irradiation: first report of acute toxicity, feasibility, and patient satisfaction. *Int J Rad Oncol Biol Phys.* 2013;85(3):E123-8. doi: <http://dx.doi.org/10.1016/j.ijrobp.2012.10.021>.
24. Younus J, Lock M, Vujovic O, Yu E, Malec J, D'Souza D, et al. A case-control, mono-center, open-label, pilot study to evaluate the feasibility of therapeutic touch in preventing radiation dermatitis in women with breast cancer receiving adjuvant radiation therapy. *Complement Ther Med.* 2015;23(4):612-6. doi: <http://dx.doi.org/10.1016/j.ctim.2014.11.003>.
25. Sharp L, Finnla K, Johansson H, Abrahamsson M, Hatschek T, Bergenmar M. No differences between Calendula cream and aqueous cream in the prevention of acute radiation skin reactions-results from a randomised blinded trial. *Eur J Oncol Nurs.* 2013;17(4):429-35. doi: <http://dx.doi.org/10.1016/j.ejon.2012.11.003>.
26. Kirova YM, Fromantin I, De Rycke Y, Fourquet A, Morvan E, Padiglione S, et al. Can we decrease the skin reaction in breast cancer patients using hyaluronic acid during radiation therapy? results of phase III randomised trial. *Radiother Oncol.* 2011;100(2):205-9. doi: <http://dx.doi.org/10.1016/j.radonc.2011.05.014>.
27. Schnur JB, Ouellette SC, Dilorenzo TA, Green S, Montgomery GH. A qualitative analysis of acute skin toxicity among breast cancer radiotherapy patients. *Psychooncology.* 2011;20(3):260-8. doi: <http://dx.doi.org/10.1002/pon.1734>.
28. Censabella S, Claes S, Robijns J, Bulens P, Mebis J. Photobiomodulation for the management of radiation dermatitis: the DERMIS trial, a pilot study of MLS® laser therapy in breast cancer patients. *Support Care Cancer.* 2016;24(9):3925-33. doi: <http://dx.doi.org/10.1007/s00520-016-3232-0>.
29. Lazzano-Ponce E, Fernández E, Salazar-Martínez E, Hernández-Ávila M. Estudios de cohorte: metodología, sesgos y aplicación. *Salud Pública Méx.* 2000;42(3):230-41. doi: <http://dx.doi.org/10.1590/S0036-3634200000300010>.
30. Andrade FSSD, Clark RMO, Ferreira LF. Effects of low-level laser therapy on wound healing. *Rev Col Bras Cir.* 2014;41(2):129-33. doi: <http://dx.doi.org/10.1590/S0100-69912014000200010>.
31. Aaronson N, Ahmedzai S, Bergman B, Bullinger M, Cull A, Duez NJ, et al. The European Organization for Research and Treatment of Cancer QLQ-C30: a quality-of-life instrument for use in international clinical trials in oncology. *J Natl Cancer Inst.* 1993;85(5):365-76. doi: <https://doi.org/10.1093/jnci/85.5.365>.
32. Brabo EP. Validação para o Brasil do questionário de qualidade de vida para pacientes com câncer de pulmão QLQ LC 13 da Organização Europeia para a Pesquisa e Tratamento do Câncer [dissertação]. Rio de Janeiro (RJ): Universidade Estadual do Rio de Janeiro; 2006.

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