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REVIEW

Odor evaluation scales for odor in neoplastic wounds: an integrative review

Escalas de avaliação de odor em feridas neoplásicas: uma revisão integrativa

Escalas de evaluación de olores en heridas neoplásicas: una revisión integrativa

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ABSTRACT

Objective: Checking for the existence of assessment instruments for odor in neoplastic wounds. **Method:** Integrative review performed in the databases Lilacs, SCiELO, Ibecs and MedLine, including national and international publications. **Results:** 15 articles were analyzed, in its majority performed by nurses and being of the revision type. Nine scales were found, of which the majority assesses only the odor intensity. The scale most used to evaluate products and/or bandage covers for neoplastic injuries was the Odor Evaluation Guideline, of qualitative-quantitative nature, that establishes the symptom within four levels; only one of which being validated (Teler scale). **Conclusion:** The results of this study showed that, currently, there is only one scale that is validated for assessing odor in neoplastic wounds, pointing towards the need to develop new instruments that incorporate validated and reliable instruments in clinical practice.

Descriptors: Wounds and Injuries; Oncology; Nursing Assessment; Scales; Odorants.

RESUMO

Objetivo: Verificar a existência de instrumentos de avaliação do odor em feridas neoplásicas. **Método:** Revisão integrativa realizada nas bases de dados Lilacs, SCiELO, Ibecs e MedLine, incluindo publicações nacionais e internacionais. **Resultados:** Foram analisados 15 artigos, em sua maioria realizados por enfermeiros e do tipo revisão. Foram encontradas nove escalas, das quais a maioria avalia apenas a intensidade do odor. A escala mais utilizada para avaliar produtos e/ou coberturas nos curativos de feridas neoplásicas foi o guia de avaliação do odor, de natureza quali-quantitativa, que pontua o sintoma em quatro níveis; e apenas uma delas era validada (escala de Teler). **Conclusão:** Os resultados deste estudo demonstraram que até o momento só existe uma escala de avaliação do odor em feridas neoplásicas validada, apontando para necessidade de desenvolvimento de novas ferramentas que incorporem na prática clínica instrumentos validados e confiáveis.

Descritores: Ferimentos e Lesões; Oncologia; Avaliação em Enfermagem; Escalas; Odorantes.

RESUMEN

Objetivo: Verificar la existencia de instrumentos de evaluación del olor en heridas neoplásicas. **Método:** Revisión integrativa realizada en las bases de datos Lilacs, SCiELO, Ibecs y MedLine, incluyendo las publicaciones nacionales e internacionales. **Resultados:** Se analizaron 15 artículos, en su mayoría realizados por enfermeros y del tipo revisión Se encontraron nueve escalas, de las cuales gran parte evalúa sólo la intensidad del olor. La escala más utilizada para evaluar productos y/o coberturas en los curativos de heridas neoplásicas fue la guía de evaluación del olor, de naturaleza cuali-cuantitativa, que puntualiza el síntoma en cuatro niveles; y sólo una era validada (escala de Teler). **Conclusión:** Los resultados mostraron que hasta el momento

sólo existe una escala de evaluación del olor en heridas neoplásicas validada, apuntando a la necesidad de desarrollar nuevas herramientas que incorporen instrumentos validados y confiables en la práctica clínica.
Descriptores: Heridas y lesiones; Oncología; Evaluación en Enfermería; Escalas; Odorantes.

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INTRODUCTION

Cancer is a public health issue and, in that sense, the World Health Organization (WHO) estimates that its impact on the population will correspond to more than 20 million of new cases in 2025. The estimates for the next decades are no different, with developing countries being the most affected by this disease. In Brazil, for the period of 2016-2017, the emergence of about 600,000 cases is to be expected, including cases of non-melanoma skin cancer, aggravating this problem in the country[1].

Among patients with neoplasms, 5 to 10% develop wounds related to this disease, whether in consequence of a primary tumor or by a process of metastasis of malignant cells. These lesions affect the patient's quality of life in that they are a frequent cause of pain, disability, self-esteem and self-image modifications, social changes that stem from a need for hospitalizations, and distancing from social interaction[2]. With these wounds comes symptoms of difficult control that constantly remind the patient of the presence of the illness, such as odors, bleedings, exudates, pains, rashes and infections[3].

The genesis of neoplastic injuries is caused by the growth of the tumor, neovascularization, and invasion of tumor cells in healthy tissues, respectively. The uncontrolled growth of the tumor leads to occlusion of the blood vessels, which, by reducing the diffusion of oxygen, causes hypoxia and, consequently, forms necrotic tumor tissue on the injury, which can then be contaminated by bacteria, generating abundant exudate and foul odor, sometimes described as nauseating, which is characteristic of these wounds[4].

Odor is a constant day-to-day symptom of the patient with a neoplastic wound, causing nausea and unleashing the progressive worsening of their nutritional status, in addition to afflicting people with whom they interact, or even health professionals through direct contact[5].

This symptom requires a frequent assessment for identification of the appropriate conduct and of the necessary adjustments, considering the characteristics of the injury, and having as main goal the comfort of the patient[6]. This perspective is critical for healthcare professionals when facing clinical challenges, treating the causes, and controlling the bad odor, since this symptom is difficult to treat and brings social and psychological consequences for the patient, requiring a great deal of sensitivity and flexibility of all those involved in their care, as well as a holistic perspective towards the patient[3,7].

Odor evaluation, although difficult, is important for professionals who take care of these patients, since it favors a systematic, safe and efficient practice. It should, however, be based on reliable and validated instruments[8] in order to indicate the most effective treatment for odor control. Thus, the need to verify the existence of validated and reliable instruments or scales to measure odor is indispensable in its incorporation into the clinical practice; hence, this study aimed to verify the existence of odor evaluation instruments for neoplastic wounds.

This search in the literature performed through integrative review will benefit professionals involved in palliative care, especially nurses and patients being cared for.

OBJECTIVE

Verifying the existence of reliable and validated instruments for odor evaluation of neoplastic wounds.

METHOD

This is an integrative literature review based on a synthesis of the knowledge produced on the subject among different methodological approaches, constructed through a systematic and comprehensive analysis of the available studies in the scientific community[9].

The integrative literature review methodology consists of six steps: determination of the hypothesis/question of the review; selection of the samples to be reviewed; categorization and assessment of the studies; interpretation of the results; and presentation of the review or synthesis of knowledge[10]. This study sought to answer which are the scales and/or odor evaluation instruments for neoplastic injuries presented in the literature, and whether such instruments are validated.

The bibliographic search was conducted between September and October of 2016 in the databases Latin American and Caribbean Health Sciences Literature (Lilacs), Scientific Electronic Libray Online (SciELO), Spanish Bibliographic index in Health Sciences (Ibecs) and Medical Literature Analysis and Retrieval System Online (MedLine) , available directly on their websites or through Portal Capes, without time limit.

The topic of odor control, although widely discussed in developed countries, is not properly registered within the Health Sciences Descriptors (DeCS) or the Medical Subject Headings (MeSH). As a search strategy, the following keywords were used: wounds, Oncology, odor and evaluation, combined with each other or with the guiding question keywords: fungal, neoplastic, and malignant. The inclusion criteria adopted were: articles available in full, with free access, with mention of scales and/or odor-specific evaluation instruments for neoplastic wounds, published in national and international journals, and in Portuguese, Spanish or English. When the sample article referenced instruments of another author, the primary source articles were then sought by means of the reference presented. The following were excluded: repeated articles, reviews, congress proceedings, and incipient articles on the usage method of the proposed scales.

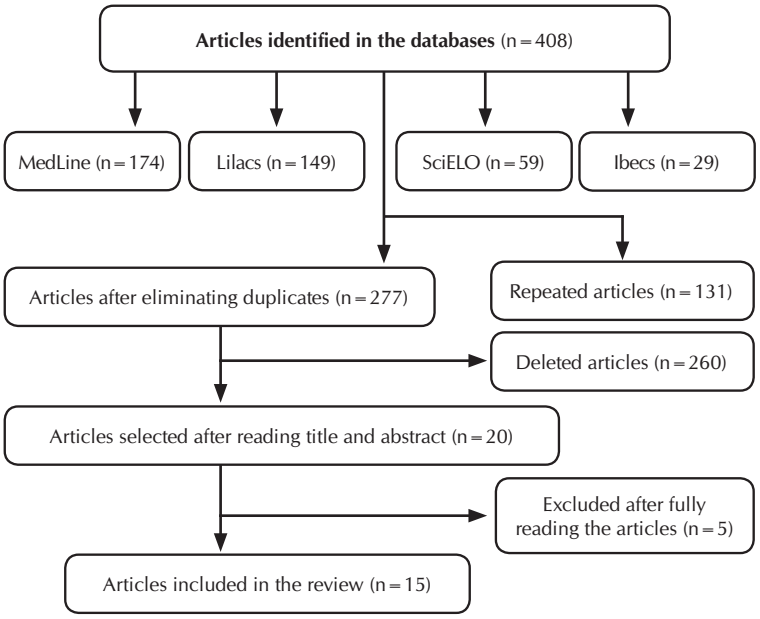

Figure 1 – Flowchart of the study selection process

408 articles were identified within the four databases consulted. After the search, the titles and abstracts were read and categorized according to the criteria of inclusion and exclusion determined, being then sorted by relevance and property with respect to the objective of this study, having a final sampling of 15 articles, as shown in Figure 1.

The articles chosen were then read and analyzed in full. For verifying the data, an instrument was elaborated with the following variables: article title, authors, journal, year of publication, country of origin, database where it was indexed, impact factor according to Journal Citation Reports (JCR), type/approach, and instrument or scale.

RESULTS

Regarding the number of articles by country of origin, it can be seen, in Chart 1, a higher production from the United Kingdom (40%)[11-16], followed by Brazil (13%)[4,17] and the United States of America (USA) (13%)[18-19], the remaining countries having only one publication each. As for the types of study found, the majority were reviews (47%)[4,11-12,14-15,17,20], with most of those being narrative reviews (33%)[4,11,14-15,20]. Regarding authorship, more than half of the articles was elaborated only by nurses (53%)[4,11-12,14-15,17,20-21], four of these written in partnership with doctors [13,18,22-23], and two other articles were produced exclusively by doctors[16,19].

It is noteworthy that the years of 2009 and 2014 have a higher number of publications when compared to other years. As for the databases, MedLine showed the highest number of articles (n = 12), followed by Lilacs (n = 2) and Ibecs (n = 1). Regarding the impact factor of the journals in the sample, the Cochrane Database of Systematic Reviews presented the highest factor (6.103). When considering the publications in the Nursing field, the International Journal of Nursing Studies[13] showed the highest impact factor, with 3.561.

Chart 2 lists the existing instruments for assessing odor of neoplastic injuries as presented by the sample articles. As is possible to observe, nine scales that presented a score of three to ten degrees were found[4,13,15-16,18-19,21-22,24]. Among these, the highest frequency consisted of scales with four degrees (33%)[15,19,22].

In Chart 2, within the scales found, seven are directed to evaluate specifically odor intensity[4,16,18-19,21-22,24], and only two measure the distance between the source and the observer[13,15]. As for the authorship, most of the scales did not present the author mentioned (56%)[4,16,18-19,22] and the most used among them was the Odor Evaluation Guideline[15](33%)[11,14,17,20,23]. Of the nine scales found, only one is validated[13].

Chart 1 – Characterization of sample articles, Recife, Brazil, 2016

Year	Title	Authorship	Country of origin	Type of study	Journal	Database	Impact factor
2016	Assessment and treatment of fungating, malodorous wounds	Leadbeater M[11]	United Kingdom	Narrative review	Br J Community Nurs*	MedLine	–
2015	Manejo de sinais e sintomas em feridas tumorais: revisão integrativa	Sacramento CJ, Reis PED, Simino GPR, Vasques CI[17]	Brazil	Integrative review	R Enferm Cent O Min*	Lilacs	–
2014	Topical agents and dressings for fungating wounds	Adderley UJ, Holt IGS[12]	United Kingdom	Systematic review	Cochrane Database Syst Rev	MedLine	6,103
2014	A prospective, descriptive cohort study of malignant wound characteristics and wound care strategies in patients with breast cancer	Fromantin I, Watson S, Baffie A, Rivat A, Falcou MC, Kriegel I et al.[22]	France	Prospective cohort study	Ostomy Wound Manage	MedLine	1,176
2012	Cuidados domiciliarios de enfermería a una mujer con una herida neoplásica en el ámbito de la atención primaria de la salud	Romero-Collado A[21]	Spain	Case study	Enferm Clin*	Ibecs	–
2011	The effect of honey-coated bandages compared with silver-coated bandages on treatment of malignant wounds: a randomized study	Lund-Nielsen B, Adamsen L, Kolmos HJ, Rørth M, Tolver A, Gottrup F[23]	Denmark	Prospective case-control study	Wound Repair Regen	MedLine	4,820

To be continued

Chart 1 (concluded)

Year	Title	Authorship	Country of origin	Type of study	Journal	Database	Impact factor
2009	Malignant fungating wounds: epidemiology, aetiology, presentation and assessment	S.Alexander S[20]	Australia	Narrative review	J Wound Care	MedLine	1,562
2009	Dimethyl trisulfide as a characteristic odor associated with fungating cancer wounds	Shirasu M, Nagai S, Hayashi R, Ochiai A, Touhara K[24]	Japan	Clinical trial	Biosci Biotechnol Biochem	MedLine	1,176
2005	Pacientes portadores de feridas neoplásicas em serviços de cuidados paliativos: contribuições para a elaboração de protocolos de intervenções de enfermagem	Firmino F[4]	Brazil	Narrative review	Rev Bras Cancerol*	Lilacs	–
2005	Effectiveness of a topical formulation containing metronidazole for wound odor and exudate control	Kalinski C, Schnepf M, Laboy D, Hernandez L, Nusbaum J, McGrinder B et al.[18]	USA	Prospective case-control study	Wounds	MedLine	0,450
2004	Wound care Research for Appropriate Products (WRAP): validation of the TELER method involving users	Browne N, Grocott P, Cowley S, Cameron J, Dealey C, Keogh A et al.[13]	United Kingdom	Methodological study	Int J Nurs Stud	MedLine	3,561
2001	Role of CarboFlex in the nursing management of wound odour	Williams C[14]	United Kingdom	Narrative review	Br J Nurs*	MedLine	–
2000	Bacteriology and treatment of malodorous lower reproductive tract in gynecologic cancer patients	Von Gruenigen VE, Coleman RL, Li AJ, Heard MC, Miller DS, Hemsell DL[19]	United States	Prospective case-control study	Obstet Gynecol*	MedLine	–
1995	Common problems in wound care: malodorous wounds	Haughton W, Young T[15]	United Kingdom	Narrative review	Br J Nurs*	MedLine	–
1992	A double-blind study of the efficacy of metronidazole gel in the treatment of malodorous fungating tumours	Bower M, Stein R, Evans TRJ, Hedley A, Pert P, Coombes RC[16]	United Kingdom	Prospective case-control study	Eur J Cancer	MedLine	6,163

*Note: *No impact factor through JCR.*

Chart 2 – Distribution of sample articles by author, scale and score, articles that used them, and objective of the usage, Recife, Brazil, 2017

Author	Scale/degrees	Sample (13)	
		Used by	Objective
Le Roux	Teler System: 5: Odorless; 4: Odor detected when removing bandage; 3: Evident odor when removing clothes; 2: Evident odor at the distance of "one arm"; 1: Evident odor when entering room; 0: Evident odor when entering ward	Browne, Grocott P, Cowley S, Cameron J, Dealey C, Keogh A et al.[13]	Validation as a method of evaluation on the performance of the curative
–	Gradual scale: I: Felt only after bandage removal; II: Felt without bandage removal; III: Foul and nauseating	Firmino F[4]	To describe the use of the scale for verifying odor intensity
Haughton W, Young T[15]	Odor evaluation guideline: Odorless: No odor is evident, even at the patient's bedside and with the bandage removed; Mild: Odor is evident at the patient's bedside and with the bandage removed; Moderate: Odor is evident when entering the room (6-10 feet of distance) and with the bandage removed; Strong: Odor is evident when entering the room (6-10 feet of distance) and with bandages on;	Leadbeater M[11]	To explain the evaluation and treatment of neoplastic wounds
		Sacramento CJ, Reis PED, Simino GPR, Vasques CI[17]	To identify nursing interventions to control or reduce signs and symptoms resulting from tumor wounds
		Alexander S[20]	To synthesize the literature on epidemiology, etiology, presentation and evaluation of neoplastic wounds
		Lund-Nielsen B, Adamsen L, Kolmos HJ, Rørth M, Tolver A, Gottrup F[23]	To compare the effect of bandage cover with honey and cover with silver in the treatment of malignant wounds
		Williams C[14]	To describe causes, methods of assessment and treatment strategies

To be continued

Chart 2 (concluded)

Author	Scale/degrees	Sample (13)	
		Used by	Objective
–	Four-level scale: None; Mild; Moderate; Intense	Fromantin I, Watson S, Baffie A, Rivat A, Falcou MC, Kriegel I et al.[22]	To evaluate the use of various local care procedures and characteristics of malignant wounds
	Four-level scale: 0: Absent; 1: Not offensive; 2: Offensive, but tolerable; 3: Offensive and intolerable	Von Gruenigen VE, Coleman RL, Li AJ, Heard MC, Miller DS, Hemsell DL[19]	To determine the bacteriology of lower genital tract cancers to guide potential treatment modalities and determine the impact of the treatment on quality of life
American Society for Testing and Materials	Odor Intensity Referencing Scale (OIRS): 0: Odorless; 1: Almost imperceptible; 2: Slight; 3: Moderate; 4: Strong; 5: Very strong	Shirasu M, Nagai S, Hayashi R, Ochiai A, Touhara K[24]	To evaluate the intensity and quality of the odor emitted by neoplastic wounds
American Nursing Association (ANA)	Result indicator associated to the objective: healing of wound by second intention: 1: Intense; 2: Substantial; 3: Moderate; 4: Scarce; 5: None	Romero-Collado A[21]	To describe the case of a patient with neoplastic wound
–	Visual analogue scale of 10 points: 0: Odorless; 1-4: Mild odor; 5-8: Moderate odor; 9-10: Grave odor	Kalinski C, Schnepf M, Laboy D, Hernandez L, Nusbaum J, McGrinder B et al.[18]	To evaluate the effectiveness of 0.75% metronidazole in odor eradication of patients with tumor wounds
–	Visual analogue scale of 10 points: 0 to 10 (where 0 = Absence of odor)	Bower M, Stein R, Evans TRJ, Hedley A, Pert P, Coombes RC[16]	To evaluate the effectiveness of metronidazole gel in palliation of offensive odor of fungal tumors

DISCUSSION

Management of neoplastic injuries with bad odor is one of the most difficult problems for nurses in hospitals and the community. This kind of professional requires not only the evaluation ability, but also having validated and reliable instruments to standardize interdisciplinary communication, and, thus, use suitable products to treat the symptom, ensuring a better quality of life for patients[18,20,22].

Regarding the origin of the publications found, it was verified that their majority came from the United Kingdom. This result may have been influenced by the characteristics of the disease, since cancer is linked to the influence of two elements of evolution of a society, the size and the age structure of the demographic component. The ageing of the world population is an essential component of risk in the projection of the total number of cases and deaths by this illness[25-26], a factor that could justify this concern and, consequently, occurring a greater number of searches on the subject in these countries, given their phenomenon of population ageing in relation to other countries.

With regard to studies conducted in Brazil, as a developing country, its socioeconomic status encompasses the growth and aging of the population that, in a concurrent manner, comes with the significant impact of chronic non-communicable diseases such as cancer, which, showing increasing numbers of new cases, represents the second most common cause of death in the country[27-28]. Such facts boosted the interest of the Brazilian academic community on the topic[29], seeing that is has the second largest number of articles about odor evaluation.

Regarding the year of publication, a greater interest in odor evaluation of neoplastic wounds was found beginning from the 2000s, even though, since the 90s, the WHO already provided guidance on the provision of palliative care, including control of physical symptoms such as odors associated with these wounds[4,30-31]. It is possible to ascribe the time lapse to the greater experience with the problem as a result of technological advances, of increasing post-diagnostic life expectancy, and consequent increase in the number of patients undergoing this regime[29].

The handling of bad odor is a matter of particular interest and relevance to the field of nursing, especially for the one involved with health care or domiciliary care, considering that these patients will be treated at this level of attention, and that the treatment of wounds, aside from constituting one of the tasks of the nurse, has been growing as expertise[29,32]. This fact would lead, consequently, to an increase in publications by these professionals, as seen in this research. However, regarding the type of study, most of the articles found were narrative

reviews, whose main objective is the initial knowledge on a particular subject, presenting weak evidences about the creation or validation of instruments for odor evaluation in neoplastic wounds[17,20,29].

Among the symptoms of these injuries, the bad odor is one of the most complex to tackle and that often causes the most discomfort to the patient and to the healthcare team[30,33]; clearly, bad odor is an extremely sensitive topic that should be explored carefully and with help of scientific criteria for decision-making and interventions. In addition, the lack of scales and/or instruments without validation processes can lead to erroneous conducts, such as failures in measurement and, consequently, in the prescription of bandage covers[14,17,20].

In this research, only scales and no instruments were found. The word "scale" means a set of standardized values with which can be measured a magnitude of the same nature – precisely what is observed in this study, since the scales presented described odor hierarchically[34].

On the other hand, the term instrument refers to the medium used to obtain a result, not being limited to just one characteristic assessed. In this specific case, it would not only be about an odor stratification, but all of its causes[34-35].

In this study, nine scales that predominantly evaluated odor through its intensity were found, as well as two that, in addition to the intensity, evaluated odor from the perspective of distance[13,15].

Six scales classified odor in a qualitative-quantitative manner[4,13,18-19,21,24], associating it with nominal (none, mild, absent, moderate, strong, and very strong), rational or numerical categories. Two scales evaluated odor in a qualitative manner[15,22], and only one of them[16] evaluated it in an exclusively quantitative manner, through an analogical visual scale of 10 points.

It is important to mention that evaluation instruments have been widely used for clinical practice, research, and to assist in making administrative and political decisions in many healthcare disciplines. Given this context, these evaluations can be directed towards crucial decisions concerning the effectiveness and quality of patient care, making it imperative that the scales be free of biases that can lead to inaccurate estimates[20,36].

In this way, although odor is a symptom expressed subjectively, being able to associate it to a measuring unit makes its use at first easier and favorable to standardization. However, it is noteworthy that only the parameters of intensity and distance are used on the scales presented, leaving aside other important aspects, such as the comparison to known products (cabbage, rotten meat, fish etc.) and the psychological aspects related to odor.

Among the scales found, the most cited by other studies was the Odor Evaluation Guideline[15], of qualitative-quantitative nature, which stratifies such a symptom in regards to intensity and distance from the observer (who feels) and the source of the odor (who causes). Despite being the most used[11,14,17,20,23] to evaluate the use of products and bandage covers applied on neoplastic wounds, this scale has not yet been validated, i.e. it does not display precision for the parameter of interest[37], which in theory compromises the results of the studies that used it.

Among the sample studies, the only validated scale was the Teler system[13], given it does not differ much from the Odor Evaluation Guideline[15], since it also evaluates symptom intensity and distance in qualitative-quantitative form, although stratifying it into six levels. This scale was validated for the development and testing of methodologies that identify the needs of patients and clinical in relation to neoplastic wound bandages.

Hence, despite having found a considerable number of evaluation scales, the majority was not developed properly nor validated[36]. A likely reason relates to the complexity of assessing something subjective, to the familiarization with the odor and to the low number of patients with odoriferous wounds[14,20] all of these being able to justify the fact that only one scale has been validated so far. Similarly, it could also justify the higher impact associated with the publication of this scale in relation to the specific area of nursing.

The impact factor is considered a good technical resource of scientific evaluation for publications[38]. In this regard, it was observed that the publication with the highest impact factor of the sample used the Odor Evaluation Guideline, although such a scale does not present appropriate psychometric properties.

It is therefore observable that, even in the absence of validation, the scales have been used in clinical practice as instruments for assessing efficiency of the conduct taken when handling odor, as well as in the measurement of the symptom, denoting the concern with the quality of life of patients with odoriferous wounds. However, the results found point to the need for the construction of proper instruments, from not only the perception of clinical professionals, but also the interaction with patients and caregivers, in order to evaluate the symptoms not only by perceived intensity and distance, but also to verify physical and psychological factors for achieving a holistic assessment[22,39].

Validation of measurement devices will create the opportunity for maintenance of continuous assessments, permeating the systematization of nursing care, which in turn creates quality indicators sensitive to care[40].

Study limitations

The limitations of this research are only limited by the use of articles available for free, adopted here as a criterion of inclusion due to the understanding of the authors that scientific knowledge must be disseminated widely and freely. However, it is of common perception the existence of many relevant studies with high cost of acquisition. These, in theory, can interfere with the results presented here.

Contributions to the Nursing field

This study allowed to find instruments or scales for odor measurement of neoplastic wounds that enable its incorporation in the clinical practice, in addition to identifying the scales and validated instruments, aside from the most used, in a way as to facilitate confronting this symptom and improve the quality of life of patients with neoplastic skin lesions.

CONCLUSION

With the goal of finding instruments or scales to measure odor of neoplastic wounds so as to incorporate validated and reliable instruments in the clinical practice, this study found

15 articles in the literature of the last 24 years, in its majority written by nurses, although most were in a literature review format. Among these, nine distinct scales that contemplated the intensity of the symptom as evaluation parameters and the distance between the patient and the observer in qualitative-quantitative manner were found.

Among the scales found, the most used to evaluate products and/or bandage covers of neoplastic injuries was the Odor Evaluation Guideline, a qualitative-quantitative scale still not validated, which situates the symptom within four levels. On the other hand, the only validated scale found in this study was the Teler system, which, however, is used/cited in only one study. Such a prospect makes urgent the pursuit of odor measurement instruments that are validated, standardized and, especially, that respond to the concerns of health professionals and other participants.

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