









VALIDATION WITH SPECIALISTS OF AN INSTRUMENT TO CLASSIFY THE COMPLEXITY OF ACUTE AND CHRONIC WOUNDS

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ABSTRACT

Objective: To validate the construction of a scale to classify the degree of complexity of acute and chronic wounds. **Methodology:** Methodological study developed in: situational diagnosis of the literature in search of instruments that classify injuries due to pregnancy signs, bibliographic research, construction of the scale and content validation of the scale with twelve judges. The Microsoft Power Point 2013 program was used to construct the technology, the snowball technique with 12 judges with expertise in the thematic area of acute and chronic injuries for validation. **Results:** The concordance rate among judges was considered to be greater than 0.80, for validation, the scale presented a global content validity index (CVI) of 0.99, presenting a great index in isolation, becoming validated. **Conclusion:** The scale was validated in objective, structure, presentation and relevance, which makes it possible to be an instrument that will contribute to the public and private system.

DESCRIPTORS: Wounds and Injuries. Validation Study. Enterostomal therapy.

VALIDAÇÃO COM ESPECIALISTAS DE UM INSTRUMENTO PARA CLASSIFICAR A COMPLEXIDADE DE FERIDAS AGUDAS E CRÔNICAS

RESUMO

Objetivo: Validar a construção de uma escala para classificar o grau de complexidade de feridas agudas e crônicas. **Metodologia:** Estudo metodológico desenvolvido em: diagnóstico situacional da literatura em busca de instrumentos que classificassem lesões por sinais de gravidade, pesquisa bibliográfica, construção da escala e validação de conteúdo da escala com 12 juízes. Utilizou-se o programa Microsoft Power Point 2013 para construção da tecnologia e da técnica snowball com 12 juízes com expertise na área temática de lesões agudas e crônicas para a validação. **Resultados:** Considerou-se a taxa de concordância entre os juízes superior a 0,80 para validação. A escala apresentou o índice de validade de conteúdo (IVC) global de 0,99, apresentando um ótimo índice isoladamente, tornando-se validada. **Conclusão:** A escala foi validada em objetivo, estrutura, apresentação e relevância, o que viabiliza ser um instrumento que contribuirá para o sistema público e privado.

DESCRIPTORIOS: Ferimentos e lesões. Estudo de validação. Estomaterapia.

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VALIDACIÓN CON ESPECIALISTAS DE UN INSTRUMENTO PARA CLASIFICAR LA COMPLEJIDAD DE HERIDAS AGUDAS Y CRÓNICAS

RESUMEN

Objetivo: Validar la construcción de una escala para clasificar el grado de complejidad de las heridas agudas y crónicas. **Metodología:** Estudio metodológico desarrollado en: diagnóstico situacional de la literatura en busca de instrumentos que clasifiquen lesiones por signos de embarazo, investigación bibliográfica, construcción de la escala y validación de contenido de la escala con doce jueces. Se utilizó el programa Microsoft Power Point 2013 para construir la tecnología y técnica de bola de nieve con 12 jueces con experiencia en el área temática de lesiones agudas y crónicas para su validación. **Resultados:** La tasa de concordancia entre jueces se consideró mayor a 0,80, para la validación la escala presentó un índice de validez del contenido global de 0,99, presentando un gran índice de forma aislada, siendo validada. **Conclusión:** La escala fue validada en objetivo, estructura, presentación y pertinencia, lo que posibilita ser un instrumento que contribuirá al sistema público y privado.

DESCRIPTORES: Heridas y lesiones. Estudio de validación. Estomaterapia.

INTRODUCTION

Wounds are generically defined as injuries that interrupt tissue continuity, being able to reach from the superficial layers such as the dermis and epidermis, or reach deeper structures such as muscles, tendons, and bones. Such disorders can be classified based on a multitude of variables, notable in clinical use being the length of healing and etiology¹.

As for the length of healing, they are classified as acute and chronic. With acute lesions, which are treated and healed in a short period of time, responding quickly to the therapy applied. And chronic wounds, also known as hard-to-heal wounds, being more likely to take more than six weeks to repair, are associated with complications and comorbidities, as well as relapses². As for etiology, they are almost always related to comorbidities, the most common being pressure injuries, diabetic injuries, venous and/or arterial origin injuries³.

However, the ranking as to the degree of complexity of wounds has not been described, in light of the scientific literature, in a scale or instrument to be used in health services. The proposal that comes close to the classification idealized in this research is the categorization into complex wounds, which, according to the National Institute for Health Research, are injuries with partial or total loss of skin thickness and that heal by secondary intention⁴.

Authors state that the categorization of complex lesions is not limited to skin thickness loss alone. These wounds can also be characterized by exposure of tendons, bones, or neurovascular bundles⁵.

In this context, the following question arises as a problematization of this research essay: What elements and signs of severity are used to characterize the complexity of a wound? Can they be compiled into an instrument to be used in clinical practice?

The need to create this scale emerged from the professional experiences of the authors of this article in the outpatient service implemented by the Enterostomal Therapy Nursing Laboratory (LENFE) of the Universidade Regional do Cariri (URCA), which provides specialized care in the areas of wounds, stomas, pelvic floor dysfunctions, and clinical podiatry to the population of the metropolitan region of Cariri, Brazil. Regarding the care of people with wounds, there was a gap to establish the complexity of the injuries and, thus, direct the care according to the degree of training of the team composed of nursing students, generalist nurses, graduate students in enterostomal therapy, and enterostomal therapist nurses. Thus, the need to build a scale to standardize three degrees of complexity of an acute or chronic wound emerged, seeking the compilation and integration of such information, which will enable the use of this scale in any health service, whether specialized or not.

It is worth mentioning that this standardization of wounds in three degrees of complexity (low, medium, and high) took into consideration the clinical variables predictive of severity pointed out by the literature with the purpose of directing the professional qualification necessary to establish the care, besides suggesting the periodicity in which this care should be implemented.

In this way, this assistive technology will be used as an ally to organize the work process in environments that attend people with injuries in several stages and etiologies, being an instrument that can contribute in a positive way to the public and private systems. Considering that the scale will facilitate the communication between the members of the nursing team in health services, besides improving the communication between professional-patient about the clinical picture, improving professional competence and patient safety, conferring quality care and optimizing time and resources.

So, the objective of this research was to validate the development of a scale to classify the degree of complexity of acute and chronic wounds.

METHODS

This is a methodological study focused on the construction and validation of an assistive technology, which process was guided by the theoretical framework of content validity⁶.

The research was developed in four stages: 1. Situational assessment of the literature; 2. Bibliographic research; 3. Development of assistance technology; 4. Content validation by judges.

In stage 1, a situational diagnosis was made through literature review, in search of instruments that classified injuries by signs of severity, in which scales directed to etiologies were found.

In stage 2, a bibliographic search was performed in PubMed, LILACS and Cochrane databases, with the descriptors “Management”, “Wound healing” and “Tool” using the Boolean operator AND, using the filters: full text and papers published in the last 10 years. A total of 401 articles were found, and, after analyzing the titles and abstracts, 38 articles were selected for full reading, using as exclusion criteria all articles that did not present scales as a form of acute and chronic wound management. For the LILACS and Cochrane searches, the same descriptors and criteria were used, but no articles were found. The search and selection process for the studies was performed using the Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA) instrument.

In stage 3, the process of building the technology “Wound Complexity Assessment Scale” was carried out, based on the information retrieved in the previous stages. The visual part of the instrument was built in the Microsoft Power Point 2013 software, using the colors green, yellow and red as severity indicators, where green is mild, yellow is intermediate and red is severe.

In stage 4, the content validation of the scale was performed with twelve judges, all nurses, who were distributed among the areas of research, teaching and assistance in enterostomal therapy. Validation by the judges took place in November 2021.

The validation judges were carefully selected, and the group included: enterostomal therapists, dermatology nurses, master’s and doctoral degree holders, and generalist nurses with extensive experience in wound care. This is a very favorable aspect, since it was possible to bring together diverse expertise for the evaluation of the material.

For validation, 25 judges were recruited from various Brazilian states, identified by the Lattes platform. The first contact was sent by e-mail and the following recruitment occurred using the snowball technique⁷, in which judges are invited to participate and the recommendation of other participants is requested⁸. The survey was mediated through Google Forms. Of the 25, only 12 finished filling out the document and sent it in. All who agreed to participate in the survey were in agreement with the Informed Consent Form and obtained a minimum score of five points according to Table 1.

Table 1. Selection criteria for the judges. Crato, Ceará - Brazil, 2022.

Criteria	Score
Having a PhD with a thesis in the area of interest*.	4 points
Having a Ph.D. degree	3 points
Having a Master's degree with a dissertation in the area of interest*.	3 points
Having a Master's degree	2 points
Having the title of Specialist in Enterostomal Therapy or Dermatology	2 points
Publication of an article in a reference journal in the area of interest*	2 points
At least two years of professional experience (care of acute and chronic injuries)	2 points

Source: Elaborated by the authors. * Area of interest: acute and chronic injury care.

The electronic form for evaluation and validation involved, besides the judges' sociodemographic data, three blocks for the validation of the proposed instrument. Block 1: purpose; block 2: structure; and block 3: relevance. For each of them questions were directed based on the Likert scale, which should be answered according to a score from 1 to 4 (1: totally inadequate, 2: moderately inadequate, 3: partially adequate, 4: totally adequate).

As for the organization and analysis of the validation data, the calculation of the content validity index (CVI) was used. For the calculation, the sum of the responses scoring 3 and 4 on each item in the questionnaire should be used and divided by the total number of responses. Validation of new instruments needs to be at a concordance degree value of 0.80 or higher⁹.

This scale was designed to be used by nurses during the care of patients with acute and chronic wounds, and can be applied at all levels of health care.

Regarding the ethical and legal aspects of the research, the study was approved by the Research Ethics Committee of URCA, under opinion number 3,155,662.

RESULTS

The data are displayed in two distinct categories: creation and validation of the scale.

Creating the scale

To develop the instrument, a literature search was conducted between April and May 2021.

Of the 38 articles found, 20 papers included wound management tools. After careful reading, respecting the inclusion criteria: "Evaluation scales that have a scoring system in the classification" and "Scales with a directly proportional scoring system", and the exclusion criteria: "Subjective scales" and "Forms," six scales were selected for the study. They are: Bates-Jensen Wound Assessment Tool (BWAT)^{10,11}, DESIGNE-R^{12,13}, Diabetic Foot Ulcer Assessment Scale (DFUAS)¹⁴, Transepidermal Water Loss (TEWL)¹⁵, Pressure Ulcer Scale for Healing (PUSH)¹⁶, Leg Ulcer Measurement Tool (LUMT)^{14,16} (Table 2).

To develop the instrument to assess wound complexity proposed by the study, the following analyses were performed from the selected scales: the characters of signs of severity, such as size, edges, depth, among others, that were repeated more than once among the scales, would be chosen to illustrate the proposed instrument, resulting in the following characters: Size, Depth, Edges, Maceration, Tissue Type, Exudate, Inflammation/Infection. Of those selected, the scores of each item were also analyzed to perform the suggestive classification into low, medium and high complexity in isolation on each item.

Table 2. Exhibition of management scales. Crato-CE, Brazil, 2022.

Scale	Characters/items
Bates-Jensen Wound Assessment Tool (BWAT) ^{10,11}	Size
	Depth
	Edges
	Weakening
	Type of necrotic tissue
	Amount of necrotic tissue
	Type of exudate
	Amount of exudate
	Color of the skin around the wound
	Edema
	Hardened peripheral tissue
Designe-R ^{12,13}	Granulation tissue
	Epithelialization
	Depth
	Amount of exudate
	Size
Diabetic Foot Ulcer Assessment Scale (DFUAS) ¹⁴	Inflammation/infection
	Granulation tissue
	Necrotic tissue
	Pocket
	Depth
	Size
	Inflammation/infection
	Granulation ratio
Transepidermal Water Loss (TEWL) ¹⁵	Type of necrotic tissue
	Ratio of necrotic tissue
	Maceration
	Type of edge
	Tunnel
Pressure Ulcer Scale for Healing (PUSH) ¹⁶	Maceration
	Size
	Amount of exudate
Leg Ulcer Measurement Tool (LUMT) ^{16,14}	Type of tissue
	Type of exudate
	Amount of exudate
	Size
	Depth
	Weakening
	Type of necrotic tissue
	Amount of necrotic tissue
	Type of granulation tissue
	Amount of granulation
	Edges
	Perilesional skin
	Type of leg edema
	Location of the edema
Bioburden management (microbial burden)	
Pain	
Frequency of pain	
Quality of life	

Source: Elaborated by the authors.

Assuming that all the scales that were used as a basis work by directly proportional summation, where the lowest score refers to the mildest phase of the wound and the highest score refers to its most severe phase, the scores in between the mild phase (low

complexity) and the severe phase (high complexity) can be considered as being of medium complexity. In this context, it is important to report that the suggestion regarding the frequency of lesion reassessment according to the level of complexity was an inference of opinion from experts involved in the construction process of this assistive technology.

The instrument was constructed in the Microsoft Power Point 2013 software, in two slides. The first one brings the guide for the use of the tool, and the second one brings the tool itself, using the colors green, yellow, and red as complexity indicators, where green is low complexity, yellow is medium complexity, and red is high complexity, as shown in Fig. 1.

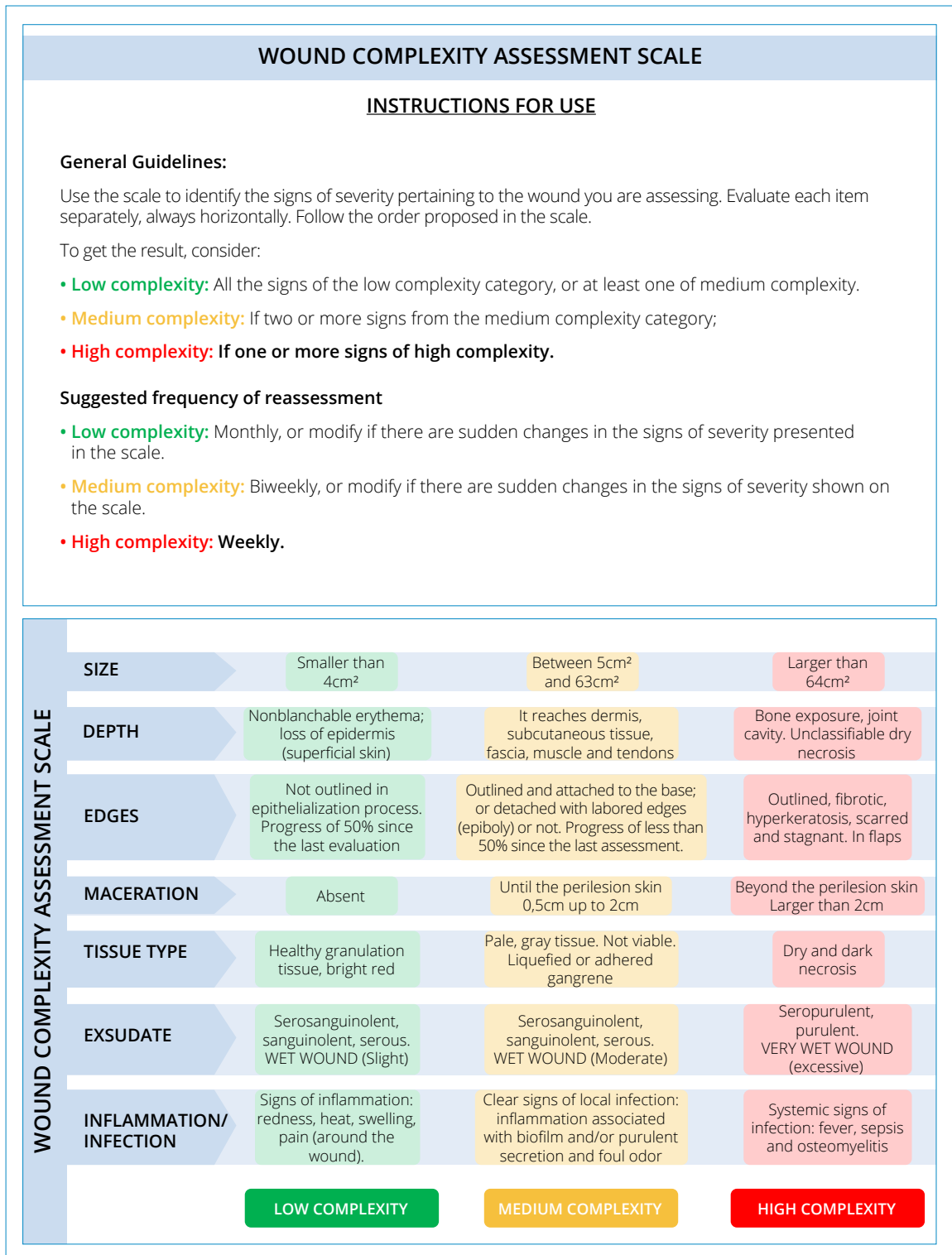


Figure 1. Wound Complexity Assessment Scale.
Source: Elaborated by the authors.

Validating the scale

After the scale development process, the instrument was submitted for validation. At this stage, it was evaluated by 12 subject-matter expert judges, of whom 10 (83%) were female and 2 (16.7%) were male. Their ages ranged from 26 to 56 years. As for academic qualifications, 6 (50%) had a master's degree; 4 (33.3%) had a graduate degree in the research area, and 2 (16.7%) had a doctorate. Regarding work as a nurse in years, 4 (33.3%) had worked for more than 20 years; 4 (33.3%) between 10 and 15 years; 2 (16.7%) between 1 and 5 years; 1 (8.3%) between 5 and 10 years; and 1 (8.3%) between 15 and 20 years. As for experience in acute and chronic injury management, 100% said they had it.

Table 3 shows the overall CVI of 0.99, which can be considered as valid.

Table 3. Evaluation of the variables present in the scale and their respective CVIs. Crato, Ceará - Brazil, 2022.

Variables	CVI	Global CVI
Purpose	The instrument (Wound Complexity Assessment Scale) is presented as an adequate tool for its purpose.	1.0
	The model is suitable for use by teams that follow and treat tissue injuries.	1.0
	The instrument covers the area of care that it addresses.	1.0
	It can generate useful data for the nurse/enterostomal therapist's decision making for the flow management of the unit in which they work.	1.0
	The items are relevant and sufficient to identify the complexity of tissue injuries.	0.91
Structure and Presentation	The instrument directs the professional to the best conduct to be taken, according to the complexity identified.	0.91
	The instrument can be used in the practice of nurses and enterostomal therapist nurses.	1.0
	The information covered in the items is clear and objective.	1.0
	It enables the establishment of a common language for the other members of the health team.	1.0
	The size of the instrument is adequate.	1.0
	It presents a logical sequence of the content.	1.0
	The instrument is easy to read and understand.	1.0
	The information is well structured in concordance and spelling.	1.0
The information in the instrument is scientifically correct.	1.0	
Relevância	The number of pages is adequate.	1.0
	The items are relevant enough to identify the degree of complexity of the lesion in a first consultation/evaluation.	1.0
	The instrument addresses information necessary for the management and direction of care for people with wounds.	1.0
	The material is suitable for use as one part of the assessment process of the patient with an injury.	1.0

Source: Elaborated by the authors.

As for the field in the survey open for suggestions, some judges gave important observations for the improvement of the scale (Table 4).

Table 4. Judges' recommendations for improvement of the scale. Crato, Ceará - Brazil, 2022.

Section	Suggestions	Evaluation
Purpose	"I suggest better management of the text size to improve applicability."	Accepted.
	"I suggest evaluation of the low complexity lesion every 20 days for better control."	Partially accepted because the scale presents instructions for adapting the evaluation time in the event of worsening of clinical signs.
	"I suggest, for better use of the scale, adding a follow-up table, as it will help identify more quickly which classification, day and previous characteristics of the injury, as well as visually facilitating the use with regard to evolutions, since medical records are usually long. Do not add one more instrument, but a table of classifications."	Partially accepted for inadequacy to the technology proposal.
Structure and Presentation	"In 'high complexity' use a darker color to highlight the information."	Accepted.
	"I suggest revising the information 'Medium complexity: if two or more medium complexity signals between the Medium and Low categories', in order to make it clearer, making it more explicit what the expression 'between the Medium and Low categories' refers to. Wouldn't it be among all categories?" "I suggest proofreading for spelling and grammar."	Partially accepted, because in medium complexity no score from high complexity is considered.
	"I suggest you could make some of the terms more scientific, since the scale is aimed at professionals, especially nurses. Ex.: 'bad odor,' I believe you can use 'fetid odor.'"	Accepted.

Source: Elaborated by the authors.

DISCUSSION

The development and validation of the assistive technology "Wound Complexity Assessment Scale" was validated and obtained an overall CVI of 0.99 and 88.89% of the items evaluated obtained a CVI equivalent to 1, thus no changes or exclusion of items was necessary at the end of the process, but the judges' recommendations were well received and used totally or partially for the improvement of the final version of the scale. To this end, a detailed methodology was applied in order to ensure the scientific information conveyed¹⁷, in addition to presenting a material that is accessible and easy to understand for the various levels of professionals who will deal with it.

The Brazilian Federal Council of Nursing (COFEN) brings the regulation that provides, through resolution 567/2018, the protagonism and performance of nurses in the evaluation and care of wounds, and this requires the use of technologies that positively impact the treatment of people with skin lesions, from a careful analysis¹⁸, as is the case of the developed and validated scale.

Thus, much is said about the use of scales to classify, measure or characterize wound healing, but such instruments are always directed to a specific etiology or etiological group of acute and chronic injuries¹⁹.

The wound classification is an important way of systematizing care, necessary for the process of evaluation and registration. Assessing the complexity of the lesion is crucial for choosing the appropriate therapy, controlling costs for that lesion, besides helping and providing an opportunity for better communication between professional-professional and professional-patient, promoting more effective treatment with a minimum margin of error²⁰.

Among the various instruments already developed, validated and protocolized as standards in health services, the scale is one of the methods that suggest an efficient characterization of injuries, whether in summation, as *Designe-R*^{12,13}, *DFUAS*¹⁴ or *LUMT*^{14,16}, or interpreted subjectively as *TIME*¹⁶, which are ways to direct assistance in the best way.

The Wound Complexity Assessment Scale brings an assessment perspective based on subjectivity guided by the description of symptoms presented for complexity in three levels, since studies have evidenced low knowledge regarding the assessment and treatment of injuries²¹.

A study conducted in 2021²² certifies that it is fundamental in wound treatment to provide assistance based on a protocol that contemplates the advance of technology of care, the standardization of a method and its correct applicability, because it allows for the reestablishment of epithelial integrity more effectively, with less treatment time, better financial cost-benefit and recognition of the work done by nurses.

Given this, the need for practical application of the instrument in care institutions is evident, since it guides the applicability of specific treatment, distinguishes the clientele, promotes the prevention and treatment of wounds, that is, it systematizes all the necessary protocol on the specialized care offered to the patient²³.

In addition, the therapeutic plan, especially for more complex lesions, requires the integration of a multidisciplinary team, with emphasis on direct and continuous monitoring by the nurse. In this sense, the instrument will promote orientation for the nursing team, the client's health status, and characteristics that provide effective treatment and complete rehabilitation¹⁸.

Regarding the flow of care, patients with injuries that require assistance have as their entrance door Primary Health Care, which articulates the flow of Unified Health System users, and which, allied to the Health Care Network, provides monitoring, guidance and dressings²⁴.

In this perspective, it is important to include strategies such as the accurate situational diagnosis of complex injuries, the structuring of a commission with the objective of prevention and, above all, with the continuous training of the care teams.

As limitations of the study, there is a need for other types of psychometric tests for the scale to validate the construct, such as Cronbach's alpha. Also, interobserver and intraobserver tests were not performed to check the reliability of the instrument. Another limitation of the study is the absence of pre-testing, and a final pre-tested version of the instrument has not yet been obtained.

CONCLUSION

The objective of building a classification scale that addresses complexities as the final categorization and the internal validation of this instrument was achieved, being the first to be developed and validated in the national territory on the topic of complex wounds.

The scale was validated in its objective, structure, presentation and relevance, which makes it viable as an instrument that will contribute to the public and private systems, in view of allowing the classification of wound complexity from objective data and thus correlating the care to be provided with the academic training/titling, which will provide integration of the nursing team in conducting tissue repair.

AUTHORS' CONTRIBUTION

Conceptualization: Sampaio LRL and Carvalho TB; **Methodology:** Sampaio LRL, Carvalho TB, Silva FM and Pinheiro WR; **Investigation:** Sampaio LRL, Carvalho TB, Silva FP; Silva ACO; Oliveira VAA and Dantas TP; **Writing – First draft:** Sampaio LRL and Carvalho TB; **Writing – Review & Editing:** Sampaio LRL, Carvalho TB, Silva FM and Pinheiro WR; **Supervision:** Sampaio LRL.

AVAILABILITY OF RESEARCH DATA

Data will be available on request.

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