



VALIDITY AND RELIABILITY OF THE EXPECTED RESULTS OF THE EVALUATION OF CHRONIC WOUND HEALING (RESVECH 2.0)

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ABSTRACT

Introduction: Wounds that are difficult to heal are a health problem due to their high prevalence and multifactorial etiologies. Treatment begins with the prescription of the appropriate therapeutic agent, followed by the use of instruments that allow the professional to document wound assessments. **Objective:** The study aims to evaluate the reliability and validity of the Brazilian version of the RESVECH 2.0 instrument in the context of difficult-to-heal wounds. **Methods:** A methodological study was carried out. Initially, participants were interviewed in order to establish a profile; then evaluations of difficult-to-heal wounds of any etiology (n = 179) were performed with RESVECH 2.0 and Pressure Ulcer Scale for Healing 3.0 (PUSH 3.0) instruments. **Results:** The psychometric properties evaluated were convergent construct validity, interobserver reliability and internal consistency. Internal consistency reliability showed the values of 0.561 and 0.535. Interobserver reliability showed a Kappa value ranging from 0.14 to 0.76 and an intraclass correlation coefficient (ICC) of 0.87. For convergent construct validity, Spearman's correlation coefficient was applied to RESVECH 2.0 and PUSH 3.0 scores (n = 150); the coefficient obtained was 0.717. **Conclusion:** It is concluded that the instrument showed evidence of reliability and validity.

DESCRIPTORS: Wounds and injuries. Healing. Evaluation of research programs and tools. Enterostomal therapy.


VALIDADE E CONFIABILIDADE DO INSTRUMENTO RESULTADOS ESPERADOS DA AVALIAÇÃO DA CICATRIZAÇÃO DE FERIDAS CRÔNICAS (RESVECH 2.0)

RESUMO

Introdução: As feridas de difícil cicatrização incidem em uma problemática de saúde devido a sua elevada prevalência e etiologias multifatoriais. O tratamento se inicia na prescrição do agente terapêutico apropriado, sucedido do uso de instrumentos que permitam ao profissional documentar as avaliações da ferida. **Objetivo:** O estudo tem como objetivo avaliar a confiabilidade e validade da versão brasileira do instrumento RESVECH 2.0 no contexto das feridas de difícil cicatrização. **Método:** Realizou-se um estudo metodológico. Inicialmente, foi aplicada uma entrevista nos participantes com o intuito de estabelecer um perfil; após, foram realizadas as avaliações das feridas de difícil cicatrização de qualquer etiologia (n = 179) com os instrumentos RESVECH 2.0 e Pressure Ulcer Scale for Healing 3.0 (PUSH 3.0). **Resultado:** As propriedades psicométricas avaliadas foram a validade do construto convergente, confiabilidade interobservadores e consistência interna. A confiabilidade de consistência interna apresentou os valores de 0,561 e 0,535. A confiabilidade interobservadores

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apresentou um valor Kappa que varia entre 0,14 e 0,76 e um coeficiente de correlação intraclasse (ICC) de 0,87. Para a validade de construto convergente, foi aplicado o coeficiente de correlação de Spearman para os dados dos escores dos instrumentos RESVECH 2.0 e PUSH 3.0 (n = 150), coeficiente obtido foi igual a 0,717. **Conclusão:** Conclui-se que o instrumento demonstrou evidências de confiabilidade e validade.

DESCRITORES: Ferimentos e lesões. Cicatrização. Avaliação de programas e instrumentos de pesquisa. Estomaterapia.

VALIDEZ Y FIABILIDAD DE LOS RESULTADOS ESPERADOS DE LA EVALUACIÓN DE LA CICATRIZACIÓN CRÓNICA DE HERIDAS (RESVECH 2.0)

RESUMEN

Introducción: Las heridas de difícil cicatrización constituyen un problema de salud por su alta prevalencia y etiologías multifactoriales. El tratamiento comienza con la prescripción del agente terapéutico adecuado, seguido por el uso de instrumentos que permiten al profesional documentar la evaluación de la herida. **Objetivo:** El estudio pretende evaluar la fiabilidad y validez de la versión brasileña del instrumento RESVECH 2.0 en el contexto de heridas de difícil cicatrización. **Método:** Se realizó un estudio metodológico. Inicialmente, se aplicó una entrevista a los participantes para establecer un perfil; a continuación, se realizaron las evaluaciones de las heridas de difícil cicatrización de cualquier etiología (n = 179) con los instrumentos RESVECH 2.0 y Pressure Ulcer Scale for Healing 3.0 (PUSH 3.0). **Resultados:** Las propiedades psicométricas evaluadas fueron la validez de construto convergente, la fiabilidad interobservador y la consistencia interna. La fiabilidad de la consistencia interna presentó los valores de 0,561 y 0,535. La fiabilidad interobservador presentó un valor Kappa que osciló entre 0,14 y 0,76 y un coeficiente de correlación intraclase (CCI) de 0,87. Para la validez de construto convergente, se aplicó el coeficiente de correlación de Spearman a los datos de las puntuaciones de los instrumentos RESVECH 2.0 y PUSH 3.0 (n = 150); el coeficiente obtenido fue de 0,717. **Conclusión:** Se concluye que el instrumento mostró indicios de fiabilidad y validez.

DESCRIPTORES: Heridas y lesiones. Cicatrización. Evaluación de programas e instrumentos de investigación. Estomaterapia.

INTRODUCTION

Wounds that are difficult to heal are a health problem due to their high prevalence and multifactorial etiologies. This scenario concerns managers due to the high cost required for treating individuals within institutions, characterizing it as a public health problem¹.

While wound care is a multibillion-dollar worldwide misfortune, in the US alone, 5.7 million people are affected (about 2% of the population) at an annual cost of US\$20 billion. A report from the UK suggested that the treatment and care of difficult-to-heal wounds account for 3% of healthcare spending in developed countries².

The term “*chronic wounds*” was changed to “*wounds that are difficult to heal*”, as they are wounds that do not respond to standardized care³. The treatment of wounds that are difficult to heal begins with the prescription of the appropriate therapeutic agent, followed by the use of instruments that allow the professional to document the assessments of the wound and consequently facilitate the identification of its characteristics that indicate positive or negative evolution⁴.

There are three instruments available in the Brazilian literature for this assessment: Bates-Jensen Wound Assessment Tool (BWAT), Pressure Ulcer Scale for Healing (PUSH 3.0) and RESVECH 2.0⁵.

In 2001, the Pressure Sore Status Tool (PSST) was revised and renamed BWAT to treat wounds of different etiologies and not just pressure injuries (PI)⁶.

The PUSH 3.0 scale, created in 1996, was translated into Brazilian Portuguese in 2005 and referred to as an instrument that safely and quickly measures PIs. The PUSH 3.0 scale is practical, easy to apply, and allows a brief assessment of different

types of injuries⁷. In 2009, the PUSH 3.0 scale was followed by an interobserver reliability test in individuals with chronic leg ulcers, exposing adequate measurement properties⁸.

In 2011 was developed the scale named “*Resultados Esperados de la Valoración y Evolución de la Cicatrización de las Heridas Crónicas 2.0*” (RESVECH 2.0)⁵, which was culturally adapted to the Portuguese language in 2018⁴.

The RESVECH instrument was created and validated by Juan Carlos Restrepo-Medrano, in his doctoral thesis in 2011. This instrument was developed sequentially from three stages: a systematic review of the literature, development of the measurement index of the healing process of PIs and lower limb ulcers and, later, the validation of the constructed tool⁹.

Intending to produce a consensus among professionals when dealing with wounds that are difficult to heal, the instrument adapted with validity and reliability becomes an ideal tool to be used in any scope and type of injury that is difficult to heal¹⁰.

Thus, the purpose of the research was to evaluate the convergent construct validity, interobserver reliability and internal consistency of the Brazilian version of the RESVECH 2.0 instrument in the context of assessing wounds that are difficult to heal in outpatient follow-up.

METHOD

Type of Study

It was methodological research with a quantitative approach. The methodological study covers established investigations in the quality and development of methods, providing control of rigorous and high-quality research¹¹.

The study was carried out in an outpatient wound unit in a city in the inner part of São Paulo. This unit is a reference for the 32 health units in the town. It has a multidisciplinary team (stoma therapist nurse, nursing technicians and assistants, vascular surgeon, plastic surgeon, nutritionist, social worker, podiatrist, physiotherapist and psychologist) to care for people with wounds of the health network. This location was chosen due to the convenience of the unit providing comprehensive care to people in the community with wounds of different etiologies and guidelines for prevention. Data collection took place between July and August 2021.

The study included 129 individuals over 18 years with difficult-to-heal wounds that had developed for at least six weeks. People with acute injuries were excluded. Of these 129 people with lesions that are difficult to heal, a total of 179 wounds were evaluated.

Study participants were recruited according to the day their consultations at the service were scheduled. Sampling was done for convenience. The sample size was estimated according to the previous study of the development of the RESVECH 2.0 instrument, which used a minimum number of 34 people to carry out reliability⁸.

Concerning validity, according to the study “Guide of the European Group of Measuring Instruments Researchers”, a sample of 100 individuals was used for the sample calculation and for the appointment of minimum necessary values to achieve more satisfactory results and due to the availability of time for data collection. This guide indicates the ideal number of people to conduct this type of study¹².

The adapted RESVECH 2.0 instrument and PUSH 3.0 were used for data collection. The first version of RESVECH consisted of nine components: lesion dimensions; depth/tissues affected; edges; perilesional maceration; tunnel; type of tissue in the wound bed; exudate; infection/inflammation (signs of biofilm), and frequency of pain in the last ten days. A score is obtained that can vary from 0 to 40, with the lowest score being a healed wound and the highest score being the worst state of the wound¹³.

After evaluations of the psychometric measures, the RESVECH 1.0 instrument required changes, resulting in the RESVECH 2.0 version. The new version comprises six criteria: lesion dimensions; depth and tissues affected; edges; type of tissue in the wound bed; exudate, and infection/inflammation (a sign of biofilm). Its total score ranges from 0 to 35 points, and zero is considered a determination of complete healing. The criteria are evaluated using a Likert scale¹⁴.

The RESVECH 2.0 presented, in its first analysis, a Cronbach's alpha of 0.74 and demonstrated reliability to the instrument. It was also seen that this value increases as the lesion evolves positively. This instrument proved to be sensitive to internal variations of the study sample and exposed correlation between its variables⁹.

The RESVECH 2.0 instrument was developed to analyze the tissue repair process of difficult-to-heal wounds of any etiology¹⁰. It was adapted to the Portuguese language of Brazil satisfactorily following the conditions of the recommended international bibliography, based on a methodological study following the process of cultural adaptation through the stages: translation, synthesis of translations, back-translations and a committee of experts⁴.

For the application of this instrument, the wound was evaluated according to the six domains¹⁰. The application steps are:

- Domain 1: this is the analysis of the lesion size: it should be measured using a metric ruler, checking the area (length and width) and multiplying them together to obtain the result in cm². Finally, the measurement corresponding to the result obtained is selected on the instrument¹⁵.
- Domain 2: after its measurement, the depth and affected tissues are evaluated. Initially, the wound is cleaned, and then the clinical evaluation of the tissue compromise is performed, aiming at the most injured tissue¹⁵.
- Domain 3: consists of assessing the condition of the edges of the lesion, seeking to identify the compromised edge. The edges comprise the tissue area of the margin with the wound bed, which can be classified as unidentified, diffuse, delimited, damaged, or thickened¹⁵.
- Domain 4: the worst tissue in the wound bed is identified. Being classified in a score from 0 to 4 according to the type of tissue present: Necrotic (dry necrosis), necrotic tissue (wet necrosis), granulation tissue, epithelial tissue, and closed/healed tissue¹⁵.
- Domain 5: only one option is selected to assess the exudate and its quantity after removing the dressing and before any topical application. The scores range from 0 to 3, emphasizing dry exudate and a large amount of exudate, which have identical scores as they characterize the worst scenario. At this evaluation stage, the classifications are divided into exudate: dry, wet, small, medium or large amount¹⁵.
- Domain 6: the characteristics found in the wound are indicated; thus, possible infections/inflammations (signs of biofilm) are evaluated, considering 14 sub-items: increased pain, perilesional erythema, perilesional edema, increased temperature, increased exudate, purulent exudate, friable tissue or tissue that bleeds easily, stagnant wound non-progressive tissue, biofilm-compatible tissue, odor, hyper granulation, increased wound size, satellite lesions, tissue pallor¹⁵.

The PUSH 3.0 instrument was adapted to the Portuguese language in 2005, renamed Instrument for the Evaluation of UP 3.08. Initially, it was adjusted only for the assessment of PI and then for chronic leg ulcers. The high levels of agreement between nurses and stoma therapists confirmed the instrument's interobserver reliability for use in chronic wounds as well¹⁶.

Three items for wound assessment are presented: total wound area, amount of exudate and appearance of the wound bed¹⁷. The PUSH 3.0 scale was chosen for this study because it stands out among the analyzed studies (about 40% use the PUSH 3.0 scale as a reference). In addition to being the most recurrent instrument in the surveyed studies, it was also used to evaluate the widest variety of wounds¹⁸.

An assistant nurse and a specialist TiSOBEST stoma therapist nurse carried out the collected data. In the nursing course curriculum, it is emphasized that the nurse experienced theoretical-practical concepts and clinical experiences in people with wounds. Interobserver reliability comprises having two or more observers independently apply the measurements to the same people to check whether the scores are consistent with each other¹⁰.

After orientation regarding the study, a previous interview was carried out with the participants. The wound was cleaned, and later the professionals applied the RESVECH 2.0 scale; the PUSH 3.0 scale was used only by the clinical nurse.

Evaluation of the measurement properties of RESVECH 2.0

Reliability

Reliability was calculated using two procedures: homogeneity (internal consistency) and interobserver agreement.

Internal consistency was measured using Cronbach's alpha, whose values vary from 0.00 to 1.00. Higher Cronbach's alpha values point to more excellent instrument reliability and, therefore, greater measurement accuracy. It is established for all reliability indices that the closer they are to 1.00, the more substantial the evidence of good reliability⁹. This statistical test was applied to both evaluators.

Despite being widely used to assess internal consistency, The interpretation of Cronbach's alpha has yet to have a consensus. Although studies determine that values greater than 0.7 are ideal, Souza et al. consider values below 0.70 but close to 0.60 as satisfactory¹⁹.

The interobserver reliability was calculated by measuring the Kappa concordance index and the intraclass correlation coefficient (ICC), which concern a measure of concordance between the evaluators and can present a maximum value equal to 1.00¹⁰. Higher Kappa values indicate more excellent questionnaire reliability and measurement accuracy. Kappa values for the agreement were considered: between 0.0 and 0.20 insignificant; between 0.21 and 0.40 median; between 0.41 and 0.60 moderate; between 0.61 and 0.80 substantial and between 0.81 and 1.00 almost perfect²⁰.

Convergent validity was analyzed through the correlation between the total score of the RESVECH 2.0 instrument and the total score of the PUSH 3.0 wound assessment questionnaire. Considering the non-normal distribution of the sample, Spearman's correlation coefficient was used for non-parametric tests. In general, for Spearman's coefficients, the following values were considered: between 0 and 0.3 (or 0 and -0.30) are biologically negligible; between 0.31 and 0.50 (or -0.31 and -0.50) are weak correlations; between 0.51 and 0.70 (or -0.51 and -0.70) are moderate; between 0.71 and 0.90 (or -0.71 and -0.90) are strong correlations²¹.

Data were entered into the Microsoft Office Excel 2021 program and evaluated using the SAS version 9.2 software. For sociodemographic and clinical variables, position and dispersion measures were used for continuous data, and relative and absolute frequencies were used for categorical variables.

The Research Ethics Committee approved the study with opinion number 4,527,063. The Terms of Free and Informed Consent (TFIC) contained all the data regarding the study as well as being signed by the professionals; upon patient participation, their signature was requested, and a copy of the TFIC was given to the participant. All ethical precepts of Resolution n° 466/2012 were respected.

RESULTS

Sociodemographic and clinical data of the participants

Interviews were conducted with 129 patients, of which male patients were predominant (64.3%). The average age was 63.6 years. Most were married (49.61%) and had incomplete primary schooling (29.46%).

Regarding the classification of the etiology of the wounds, venous ulcers prevailed (32.6%), followed by diabetic foot ulcers (24.9%), trauma (14.53%), LP (6.15%), arterial ulcers (6.15%), mixed ulcer ((3.91%) and other etiologies such as burns, surgical wounds and the like (15.64%).

As for the time elapsed since the beginning of the wounds, it is noted that 65 (50.4%) of the people had one or more injuries for less than one year, and 26 (20.2%) had one or more wounds for more than five years.

Analysis of measurement properties

Reliability was assessed using internal consistency (Cronbach's alpha coefficient applied to the two observers) to analyze the psychometric properties of RESVECH 2.0 and interobserver agreement (Kappa coefficient and intraclass correlation coefficient). Convergent construct validity was assessed using Spearman's correlation coefficient.

Reliability

Cronbach's alpha coefficient was estimated at 0.561 for rater 1 and 0.535 for rater 2, suggesting moderate internal consistency.

In the analysis of interobserver reliability, both evaluators showed a substantial agreement regarding the dimensions of the lesion and Depth/Tissues affected, a moderate agreement regarding the Type of Tissue in the Wound Bed and Exudate, and an insignificant concordance regarding inflammation. According to Table 1, it is possible to verify the Kappa values for each item.

Table 1. Cohen's Kappa coefficient (n = 179). Sorocaba, SP, 2021.

RESVECH 2.0 Items	Kappa concordance coefficient (K)	Concordance
Wound dimensions	0,76	Substantial
Depth/tissues affected	0,64	Substantial
Edges	0,36	Good
Type of tissue in the wound bed	0,55	Mild
Exudate	0,41	Mild
Infection/inflammation	0,14	Insignificant

Source: Elaborated by the authors.

The ICC was also used for interobserver reliability. The result obtained was equal to 0.87 with a confidence interval of 95%, with lower and upper limits equal to 0.83 and 0.91, respectively, indicating good agreement between measurements.

Convergent validity

Spearman's correlation coefficient was estimated between the RESVECH 2.0 and PUSH 3.0 scores to assess the convergent construct validity, considering the responses of 150 participants. The coefficient obtained was equal to 0.717 with a p-value < 0.0001 (substantial degree), exposing a significant relationship between the instruments.

DISCUSSION

Evaluating and documenting wounds is based on the knowledge that is the basis for all these measurements, with measuring instruments being an option for assessing the entire healing process and qualifying care for people with wounds⁸.

Regarding the measurement properties of RESVECH 2.0, the instrument showed good reliability values when applied to different etiologies by the evaluators. The evaluations of 179 wounds, with a heterogeneous sample, contributed to a variety of conditions that the evaluators were challenged to analyze when faced with the application of RESVECH 2.0.

In a study carried out in 2010, during a review of the RESVECH 2.0 scale, Restrepo-Medrano obtained a Cronbach's alpha of 0.64¹². In 2019, the author carried out new research intending to validate the RESVECH 2.0 instrument in Colombia to evaluate the healing process in chronic wounds, obtaining a Cronbach's alpha of 0.74⁹. In the current study, the interobserver reliability using Cronbach's alpha coefficient was 0.561 for the specialist nurse and 0.535 for the clinical nurse, obtaining moderate internal consistency. It is noteworthy that the internal consistency analysis concerns the items' homogeneity, showing whether the instrument elements measure the same property¹¹.

This instrument is a practical tool with good acceptability; it is easy to use, and nurses can use it to evaluate all wound etiologies. In 2012, a study showed that the validation of the scale departed from reliability criteria, pointing to good internal consistency, with Cronbach's alpha for the first observer of 0.735 and 0.741 for the second¹⁴. Another study in 2015 aimed to validate and adapt the RESVECH 2.0 scale for the Portuguese population also showed good internal consistency. Its Cronbach's alpha reached 0.786 at the beginning of the study, increasing progressively as the lesions were monitored²².

An instrument is reliable when its measures accurately reflect the standards of the evaluated attribute. The smaller the variation it produces in repeated measurements, the greater its reliability⁸.

For interobserver reliability, the ICC obtained was equal to 0.87 with a confidence interval of 95%, with lower and upper limits equivalent to 0.83 and 0.91, respectively. According to the manual of systematic reviews for psychometric assessment studies developed by the initiative^{22,23}, an ICC greater than or equal to 0.70 indicates good agreement between measurements. A good correlation between the observed measures was considered for the ICC, exposing a positive correlation. Given the data acquired within our analysis, the RESVECH 2.0 scale adapted for Brazil presents internal consistency and interobserver reliability data suitable for its use.

The Kappa coefficient was also used to evaluate interobserver reliability, ranging from 0.76 to 0.14. In the previous study carried out for the classification items of the scale, the coefficient varied between 0.78 and 0.96¹⁴. The first criteria proposed were according to the degree of agreement they suggest: values greater than 0.61 represent substantial agreement, values above 0.41 represent moderate agreement, values below 0.20 represent low agreement, and values between 0.21 and 0.40 represent good agreement²⁰.

Interobserver reliability promotes excellent relevance for the use of the instrument in clinical practice, as it provides evidence for using RESVECH 2.0 in research focused on the evaluation of healing characteristics, as well as for mapping venous ulcers under treatment and for other etiologies, for supporting nurses and providing an assessment of the quality of therapy¹⁵. Thus, the RESVECH 2.0 instrument can be applied by different observers, and professional training is essential to standardize the evaluation of the scale components.

Convergent construct validity was assessed using correlations between RESVECH 2.0 and PUSH 3.0. This instrument was chosen for measuring constructs related to RESVECH 2.0, and we sought to correlate them to demonstrate how much the two scales would be linked to other measures of the same construct. For this, the evaluations of the 150 lesions were considered to be submitted to the Spearman correlation calculation, with the correlation of the total scores of RESVECH 2.0 and PUSH 3.0 being performed. As a result, a coefficient of 0.717 was obtained (strong degree²¹ with p-value < 0.0001).

A study aiming to evaluate the clinical profile of a sample of individuals with wounds that are difficult to heal using the RESVECH 2.0 scale performed Pearson's correlation between the dimensions of the RESVECH 2.0 and the homonymous dimensions of the BWAT, which presented data greater than 0.90, except for the item "Edges" which was 0.79 (still a strong correlation). The total score of both scales is strong ($r = 0.84$; $p < 0.001$)²⁴.

As for the total score, it promotes a classification from 1 to 7, giving dimensions from 0 to ≥ 100 cm² representing an adequate range referring to the areas of wounds in Brazil¹⁴, while on the PUSH 3.0 scale¹⁸, in the item referring to the parameter length \times width, there is a classification from 1 to 10, ranging from 0 to > 24 cm².

For the assessment of the item "Depth/tissues affected", the involvement of the dermis/epidermis, subcutaneous tissue, muscle tissue, bones and/or annexes are considered. Measurements of the size and depth of the wound are fundamental tools for the evolution of the healing process, as they provide objective information on the reduction of the injured area and the increase in scar tissue. However, when performed in isolation, they do not allow a greater understanding of the elements and the evaluation of the healing process¹⁸.

RESVECH 2.0 does not evaluate centimeters of depth, being restricted to the evaluation in cm² referring to the area of the wound. Thus, as a suggestion for future adaptation of the instrument, there is a need to incorporate the evaluation of length \times width \times depth. The PUSH 3.0 scale also does not verify the depth of the lesion.

About the item referring to the margin, it is analyzed whether the edges are indistinguishable, diffuse, delimited, damaged or thickened. PUSH 3.0 does not have an item for evaluating wound edges. Edge conditions indicate possible key markers for healing²⁵.

In RESVECH 2.0, the item "Type of tissue in the wound bed" presents a score from 0 to 4, taking into account: necrotic, necrotic tissue, granulation tissue, epithelial tissue and closed/healed tissue. The PUSH 3.0 scale also assesses tissue types in the following order: closed wound, epithelial tissue, granulation tissue, slough, and necrotic tissue. Tissue

type is a crucial indicator in the healing process²⁶. It allows nurses to identify which stage of healing the wound is in to make objective decisions regarding the treatment of the injury²⁷.

Regarding the item “Exudate”, a score between 0 and 3 was evaluated, taking into account dry, wet wounds with small, medium and large amounts of exudate. For this assessment, the nurses, after removing the dressing, inspected the condition of the covering versus the amount of exudate. The PUSH 3.0 scale evaluation considers quantity as absent, small, moderate and large¹⁶. The exudate is another tool used to monitor the evolution of wound healing, as it is one of the main parameters for the evaluation of difficult-to-heal wounds, given that its characteristics point to the presence of pathogenic organisms and/or inflammation in the wound¹³. In 2007, the World Union of Wound Healing Societies published a guiding consensus regarding the management of exudate, intending to assess the quantity and its respective characteristics. This document was used to determine this subitem in the RESVECH 2.0 scale in its Spanish version 28.

The item “Infection/inflammation” may have been compromised because it has 14 subtopics: increased pain, perilesional erythema, perilesional edema, increased temperature, increased exudate, purulent exudate, friable or easily bleeding tissue, stagnant or non-progressing wound, tissue compatible with biofilm, odor, hypergranulation, increased wound size, satellite lesions and tissue pallor. The PUSH 3.0 instrument does not assess signs of infection and inflammation in lesions.

The study has some limitations. The participating nurse received prior practical training in the care of people with wounds in the wound clinic with the specialist nurse. Although this aspect is not established as a requirement for the use of RESVECH 2.0, this preparation may have influenced the performance of the scale. On the other hand, the need for more literature referring to RESVECH 2.0 in evaluating different types of injuries makes it difficult to discuss the findings.

This study is one of the first to verify the validity of RESVECH 2.0 in the translated and adapted version for the Brazilian reality, applied in the different etiologies of wounds that are difficult to heal. Thus, there is a need for new studies that confirm its validity and recommend it for managerial use more than in evaluation and documentation protocols.

CONCLUSION

The findings allow us to conclude that the RESVECH 2.0 scale showed good measurement properties evaluated through homogeneity and substantial interobserver agreement concerning the items, as well as significantly correlated with the domains of the PUSH 3.0 instrument, confirming its convergent construct validity. Thus, the Brazilian version of the RESVECH 2.0 scale is reliable and valid for the Portuguese language.

It is hoped that the research will help in actions that contribute to the evaluation of tissue repair of difficult-to-heal wounds for better assistance to people with injuries. Future research in other populations using other types of instrument validation is suggested.

CONFLICT OF INTEREST

The authors declare no conflicts.

AUTHORS' CONTRIBUTION

Conceptualization: Cruz FMV, Domingues EA and Oliveira UA; **Methodology:** Cruz FMV, Domingues EA, São João TM and Oliveira UA; **Research:** Cruz FMV and Oliveira UA; **Writing – First version:** Cruz FMV, Domingues EA, São João TM and Oliveira UA; **Writing – Reviewing & Editing:** Domingues EA, São João TM and Oliveira UA; **Resources:** Domingues EA, São João TM and Oliveira UA; **Supervision:** Oliveira UA.

DATA AVAILABILITY STATEMENT

Data will be available upon request.

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