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Researching the level of agreement among experts on terms used to describe wounds: An international study

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Abstract

Establishing a common language that allows univocal and objective communication in describing wounds and their healing is of utmost importance in defining the diagnostic hypothesis and proper wound management. To measure the level of agreement on the description of wounds, an international study was performed among experts of different professional backgrounds on several common terms used to describe ulcerative lesions. A panel of 27 wound care experts anonymously completed a multiple-choice questionnaire on 100 images of 50 ulcerative lesions. The participants were asked to describe each image using a set of pre-defined terms. An expert data analyst interpreted the questionnaires to map the level of agreement on the used terminology. Our findings show a very low level of agreement among experts in using the proposed terminology to describe the wound bed, the wound edge, and the surrounding skin conditions. Efforts should be planned to find a consensus on the correct use of terminology for wound description. To this aim, partnership, consensus, and agreement with educators in medicine and nursing are necessary.

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Key Messages

- this study poses important questions regarding the use of language in practice and possibly its influence on our decision-making. A proper wound description is of utmost importance for selecting the most appropriate management plan in wound care
- a panel of 27 wound care experts anonymously describe 100 images of 50 ulcerative lesions using a set of pre-defined terms
- our findings show a very modest agreement on wound description among experts in wound care, and the causes of this modest level of agreement should be investigated
- we hypothesise that one of the causes may be the lack of shared terminology. Efforts should be planned to find a consensus on the correct use of wound description terminology in order to reach a common language for wound care. To achieve this, partnership, consensus, and agreement with educators in medicine and nursing are necessary

1 | INTRODUCTION

Management of chronic wounds represents a great challenge for modern medicine.[1] Chronic wounds can occur because of diabetes, immobility, infection, arterial or venous insufficiency and affect an increasing number of patients.[1] This condition can persist for years, with a significant impairment in patient quality of life and a growing cost burden on health care system.[2]

The Wound Healing Society defines *Wound Healing* as 'a complex dynamic process that results in the restoration of anatomic continuity and function'.[3] Several factors can influence the complexity of wound healing, including acute trauma, such as degloving or large-scale thermal injuries, underlying chronic conditions and complications caused by concomitant diseases.[4-6] Therefore, the complexity of this process requires multidisciplinary and inter-professional management to optimise care and improve clinical outcomes.[7,8] As a consequence, patients with chronic wounds are routinely treated by clinicians and nurses from different professional backgrounds and their own views on treatment strategies.[9]

While this is an enrichment leading to integrated and multidisciplinary care, it can cause profound misunderstanding among specialists who use various clinical terminology/language because of their different cultural backgrounds and expertise.[10]

However, establishing a common language that allows clear, univocal, and objective communication in describing wounds and their healing is of utmost importance in defining the diagnostic hypothesis and, consequently, the proper wound management. Moreover,

accurate use of terminology helps ensure consistency in assessment and reassessment, which is essential when different specialists deal with the same wound.[11] The improved communication among healthcare providers also resulted in better outcomes.[10]

The need for a common language in the assessment of wound healing has been known for decades.[3] It has been defined that a common approach should include a lexicon of wound description, a system of wound classification, a description of the processes affecting wound healing, and the assessment of the perilesional skin condition.[3,12] Accordingly, in the last decades, several lists of terms and definitions have been proposed to standardise the language in the wound care field.[10,11,13]

To measure the level of agreement on the description of wounds, an international study was performed among experts of different professional backgrounds on several common terms used to describe ulcerative lesions. This paper presents and critically discusses the overall results of this study. Agreement rates according to the different specialities of participants will be addressed in a subsequent paper.

2 | METHODS

2.1 | Project overview

Three of the authors (AG, DM, and CM) decided to undertake this project. They assembled an international panel of 27 wound care experts for different specialities (four dermatologists, three diabetic foot surgeons, five

general surgeons, five wound care nurses, four plastic surgeons, four angiologists, and two vascular surgeons) based on their level of expertise and research experience in the field.

Their identities were disclosed only at the submission of the paper. The experts anonymously completed a questionnaire on 100 images of 50 ulcerative lesions, randomly selected by a statistician from 250 images of 125 ulcerative lesions. The participants were asked to describe each image using a set of pre-defined terms.

An expert data analyst collected and interpreted the questionnaires to statistically map the level of agreement among the experts on the terminology used to describe ulcerated lesions. The statistical results were then sent anonymously to each panel member so that they could compare their answers with the overall statistical trend. Based on this, participants were given the possibility to change their initial answers. The reviewed questionnaires were collected and analysed to evaluate the level of agreement.

2.2 | Photographic images

Lesions were shown as photographs acquired in standardised conditions (dual camera 4.25 f/1.8; 4032 × 3024 pixels resolution; ISO 25; automatic white balancing; same internal light source for all photos; scale bar for the evaluation of the lesion size). Images were shot in double projection: frontal and tangential with a 90° angle. Images were sent on a cross-platform instant messaging application for smartphones. All participants confirmed the good definition and clarity of the images before completing the questionnaire.

2.3 | Questionnaire structure

The multiple-choice questionnaire contained specific terminology proposed to describe the photographic images (Appendix I). In particular, the participants were asked to describe the following:

- Wound bed, as defined by the World Union of Wound Healing Societies (WUWHS),[11,14] with the assignment of a percentage for each tissue condition (necrotic, sloughy, granulation, epithelialising) to reach a total of 100%;
- Wound bed, according to the appearance score defined by Falanga (A, B, C, D)[15];
- The main/prevalent clinical condition of wound margin/edge, according to a list of provided referenced terms: advancing/indistinct,[16,17] desiccation,[12]

sharp/not attached,[16,17] macerations,[12] erosion,[18] exuberant,[19] rolled/epibole,[12] undermined,[12] polycyclic,[20] hyperkeratosis,[17,21] and fibrotic[17];

- The main/prevalent clinical condition of surrounding skin, according to a list of provided referenced terms: healthy,[22] dry skin/xerotic,[12] hyperkeratosis/callus,[12] squamous,[23] white maceration,[12] red maceration,[12] dermatitis/eczema,[12] erosion/excoriation,[12] cellulitis,[24] hyperpigmentation,[22] hypopigmentation[22] white atrophy,[25] purple,[26] livedoid,[27] papillomatosis[28,29] and erythema.[22]

Regarding the wound margins/edge and the surrounding skin conditions, secondary/accessory conditions could also be indicated if deemed clinically relevant.

2.4 | Statistical analysis

Fleiss' kappa (κ)[30,31] was used to measure agreement on all evaluations. This measure uses a categorical rating scale to determine the level of agreement between two or more raters (also named 'judges' or 'observers'). Kappa values were interpreted as follows: ≤ 0 indicates no agreement; 0.01–0.20 none to the slight agreement; 0.21–0.40 fair agreement; 0.41–0.60 moderate agreement; 0.61–0.80 substantial agreement; 0.81–1.00 almost perfect agreement.

Description of the wound bed, according to WUWHS, requires the assignment of a percentage of each tissue condition to reach 100%. For the purpose of Fleiss' kappa calculation, we grouped the percentage scores into four categories, namely: 0%, 1–33%, 34–66%, and 67–100%. Therefore, an agreement was evaluated overall and according to all possible combinations of the presence of each tissue type.

3 | RESULTS

3.1 | Overall agreement

Panel agreement on the wound bed description was rated as none to slight according to the WUWHS ($\kappa = 0.138$, 95% CI: 0.135–0.142) and as fair according to Falanga's appearance score ($\kappa = 0.243$, 95% CI: 0.235–0.250). Agreement on the terminology used to describe the main/prevalent condition of wound margin/edge was none to slight ($\kappa = 0.170$, 95% CI: 0.165–0.176). Agreement on the terminology used to describe the main/prevalent condition of surrounding skin was fair ($\kappa = 0.219$, 95% CI: 0.214–0.224) (Figure 1).
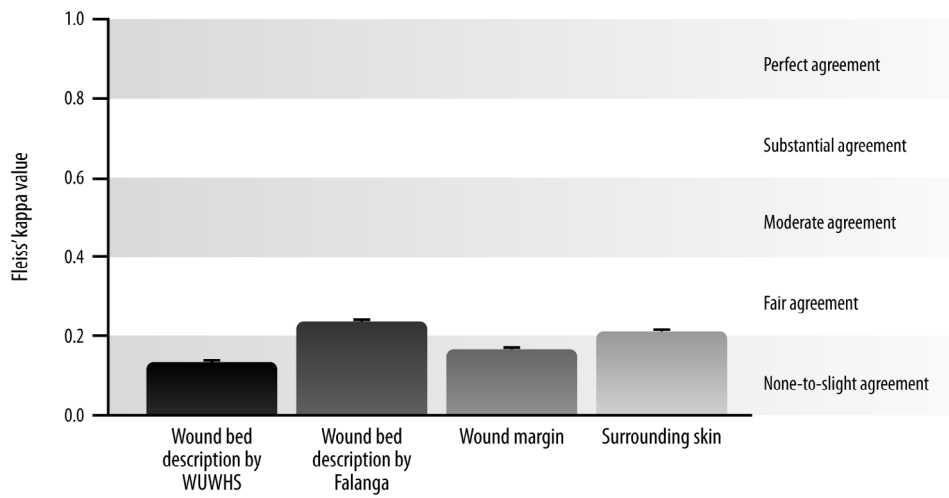
FIGURE 1 Fleiss' kappa values representing panel agreement on terminology to describe the wound bed according to the WUWHS definitions, Falanga's appearance score, the wound margin/edge, and the surrounding skin conditions.
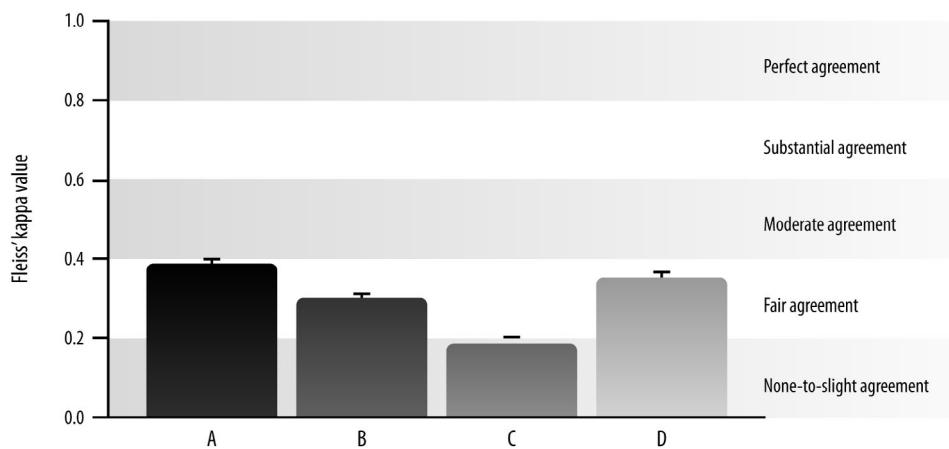

FIGURE 2 Fleiss' kappa values representing panel agreement on the appearance score defined by Falanga to describe the wound bed.

3.2 | Wound bed as defined by WUWHS

Agreement on the assessment of the percentage of each tissue type as defined by WUWHS (necrotic, sloughy, granulation, epithelialising) was none to slight for all combinations (Table S1), with three exceptions. Indeed, a fair agreement was reached for prevalent (67%–100%) granulation tissue ($\kappa = 0.293$, 95% CI: 0.278–0.307) and the combination of necrotic (1–33%) and sloughy (67–100%) tissues ($\kappa = 0.210$, 95% CI: 0.195–0.225), while the moderate agreement was reached for prevalent (67–100%) necrotic tissue ($\kappa = 0.493$, 95% CI: 0.478–0.507).

3.3 | Wound bed according to the appearance score defined by Falanga

The panel reported a fair agreement on using the 'A' (100% granulation tissue; $\kappa = 0.39$, 95% CI: 0.37–0.40), 'B' (50–100% granulation tissue; $\kappa = 0.30$, 95% CI: 0.28–0.31) and 'D' (any amount of granulation tissue;

$\kappa = 0.34$, 95% CI: 0.32–0.35) appearance score to describe the wound bed. The agreement was slight for the 'C' score (<50% granulation tissue; $\kappa = 0.18$, 95% CI: 0.16–0.19; Figure 2).

3.4 | Wound margin/edge

Among the 11 terms proposed for the description of wound edge, a fair agreement was reported for three (27%) terms ('advancing/indistinct', $\kappa = 0.29$, 95% CI: 0.27–0.30; 'exuberant', $\kappa = 0.22$, 95% CI: 0.20–0.23; 'maceration', $\kappa = 0.24$, 95% CI: 0.23–0.26) and a slight agreement for the other eight terms (73%; 'desiccation', $\kappa = 0.18$, 95% CI: 0.17–0.20; 'erosion', $\kappa = 0.15$, 95% CI: 0.13–0.16; 'fibrotic', $\kappa = 0.02$, 95% CI: 0.01–0.04; 'hyperkeratosis', $\kappa = 0.15$, 95% CI: 0.13–0.16; 'polycyclic', $\kappa = 0.04$, 95% CI: 0.03–0.06; 'rolled/epibole', $\kappa = 0.17$, 95% CI: 0.15–0.18; 'sharp/not attached', $\kappa = 0.06$, 95% CI: 0.04–0.07; 'undermined', $\kappa = 0.04$, 95% CI: 0.03–0.06; Figure 3).

FIGURE 3 Fleiss' kappa values representing panel agreement on the 11 terms proposed to describe the wound edge.
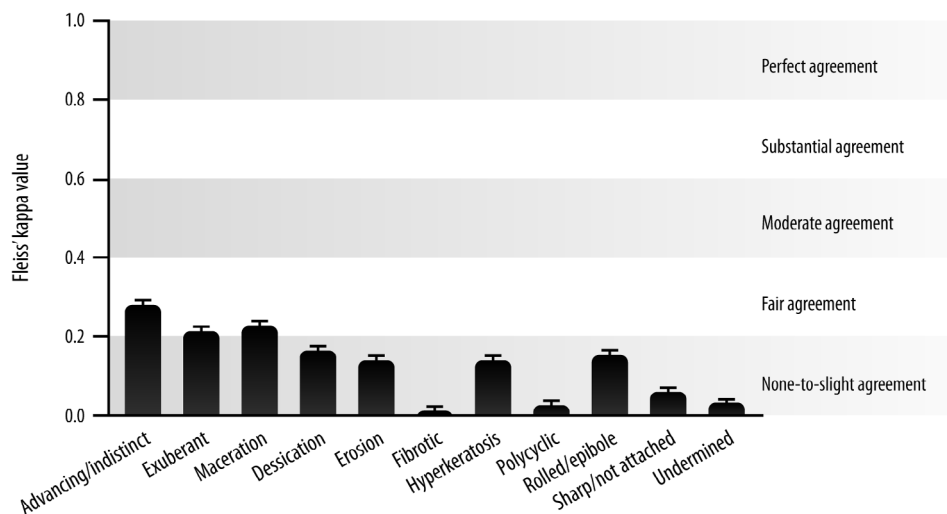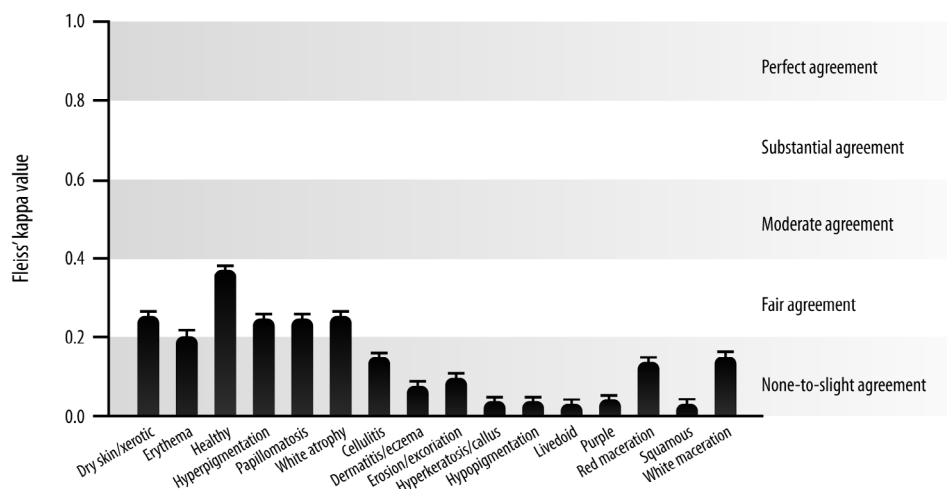
FIGURE 4 Fleiss' kappa values representing panel agreement on the 16 terms proposed to describe the surrounding skin conditions.

The agreement on the description of secondary/accessory conditions was ranked as 'none to slight' for all the 'main plus secondary' combinations ($\kappa = 0.080$, 95% CI: 0.077–0.084: Table S2).

3.5 | Surrounding skin conditions

Among the 16 terms proposed to the panel for the description of surrounding skin conditions, a fair agreement was reported for six terms (38%; 'dry skin/xerotic', $\kappa = 0.26$, 95% CI: 0.24–0.27; 'erythema', $\kappa = 0.22$, 95% CI: 0.21–0.24; 'healthy', $\kappa = 0.38$, 95% CI: 0.37–0.39; 'hyperpigmentation', $\kappa = 0.26$, 95% CI: 0.25–0.28; 'papillomatosis', $\kappa = 0.26$, 95% CI: 0.25–0.28; 'white atrophy', $\kappa = 0.27$, 95% CI: 0.25–0.28) and a slight agreement for the other 10 terms (62%; 'cellulitis', $\kappa = 0.16$, 95% CI: 0.14–0.17; 'dermatitis/eczema', $\kappa = 0.09$, 95% CI: 0.08–0.11; 'erosion/excoriation', $\kappa = 0.11$, 95%

CI: 0.10–0.13; 'hyperkeratosis/callus', $\kappa = 0.11$, 95% CI: 0.10–0.13; 'hypopigmentation', $\kappa = 0.05$, 95% CI: 0.04–0.07; 'livedoid', $\kappa = 0.04$, 95% CI: 0.02–0.05; 'purple', $\kappa = 0.06$, 95% CI: 0.05–0.08; 'red maceration', $\kappa = 0.15$, 95% CI: 0.13–0.16; 'squamous', $\kappa = 0.04$, 95% CI: 0.02–0.05; 'white maceration', $\kappa = 0.17$, 95% CI: 0.16–0.19; Figure 4).

The agreement on the description of secondary/accessory conditions was ranked as 'none to slight' for all the 'main plus secondary' combinations ($\kappa = 0.095$, 95% CI 0.092–0.098: Table S3).

4 | DISCUSSION

Members of interprofessional healthcare teams often develop different behaviours, beliefs, and clinical approaches according to their educational backgrounds.[32] These include differences in the description and communication of patient conditions.

Wound assessment can be defined as information obtained using observation, questioning, physical examination, and clinical investigations to formulate a management approach.[33]

Wound assessment must be reliable and accurate to ensure a proper treatment plan and early referral to a specialist service where appropriate. In addition, this is particularly relevant for telemedicine assessments (tele-vulnology), an increasingly used and widespread tool in European health plans, given the absence of the live visual assessment and, therefore, the inability to assess some parameters of exudate (eg, consistency and odour) and pain. Assessing a patient with a wound requires different clinical skills to ensure proper diagnosis and an appropriate treatment plan. The process should include a comprehensive patient assessment and wound evaluation, including the wound bed, wound edge, and peri-wound skin. The ultimate aim is to identify the underlying cause and any conditions that may hamper the healing process and to determine appropriate therapy based on the status of the wound.[7]

Therefore, the ability to describe different tissue types within a wound with uniform and standardised language is essential in the wound assessment process to determine the appropriate treatment. At the same time, the incorrect description can lead to ineffective treatment, with prolonged healing that can have serious consequences.[11,12]

However, despite the accepted notion that a shared language may positively affect collaboration within interprofessional healthcare teams, quantitative research on this topic is still scarce.[33,34] In particular, little investigation has been carried out to assess the variability of terms used in chronic wound description by medical professionals. Therefore, we performed an international study involving different experts in wound care to assess the level of agreement on the terminology used to describe ulcerative lesions. For instance, only the level of agreement on language for wound description was assessed, not the correctness of the provided description.

Overall, our findings show a very low level of agreement among experts in using the proposed terminology to describe the wound bed, the wound edge, and the surrounding skin conditions.

Among the systems for the description of the wound bed, a slightly better level of agreement was reached by Falanga's appearance scores A, B, and D, than by WHUWS. This suggests that the use of Falanga's appearance score is more consolidated in clinical practice because it is a user-friendly score published more than 20 years ago.[15] Indeed, the WHUWS wound bed classification system reached a moderate level of agreement only in cases where the percentage of necrosis was ≥67%

and a fair level of agreement only in cases where the percentage of granulation was ≥67%. These conditions are quite straightforward to recognise and are frequently encountered in clinical practice by all professionals involved in wound care.

Among the terms proposed to describe the wound margin and surrounding skin conditions, a fair agreement was reported for terms strictly related to wound care and widely used among the various healthcare professionals working in this field. These terms include advancing/indistinct, exuberant, and maceration for the wound margin; dry skin/xerotic, erythema, healthy, hyperpigmentation, papillomatosis, and white atrophy for the surrounding skin. Of note, the agreement on the description of secondary/accessory conditions was ranked as 'none to slight' for all the possible combinations. Indeed, only a few of the experts involved described a secondary condition of the margin and surrounding skin on the same wound, suggesting potential difficulties of this assessment for many professionals besides the lack of shared terminology. This may be because of the different levels of education and experience in treating skin diseases of the various professionals involved in wound care. The possible differences in agreement among professionals with different backgrounds will be investigated in a future analysis of our results.

Our findings show that healthcare professionals use various terminologies to describe the same wound. We hypothesise that one reason for the modest level of agreement among wound care experts may be the lack of consensus on the correct terminology to use. Consequently, a greater education on a univocal and objective clinical language for the assessment of wounds still represents an unmet need. Therefore, planning a consensus on correctly using wound assessment terminology is of utmost importance. Spreading a shared language will improve interprofessional team collaboration and enhance team performance in delivering better care.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

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