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REVIEW ARTICLE

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Deficiencies in reporting inclusion/exclusion criteria and characteristics of patients in randomized controlled trials of therapeutic interventions in pressure injuries: a systematic methodological review

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Abstract

Wound care is a complex procedure and the related research may include many variables. Deficiencies in the sample inclusion and exclusion criteria may limit the generalizability of randomized controlled trials (RCTs) for wound patients in the real world. This study aimed to evaluate deficiencies in reporting the inclusion and exclusion criteria and the characteristics of patients in RCTs of pressure injuries (PI) therapeutic interventions. We conducted a systematic methodological review in which 40 full text RCTs of PI treatment interventions published in English, from 2008 to 2020, were identified. Data on the general characteristics of the included RCTs and data about inclusion/exclusion criteria and characteristics of patients were collected. The inclusion/exclusion criteria were categorized into five domains (definition of disease, precision, safety, ethical/legal and administrative). Study duration (in weeks) was 8.0 (quartile 1: 2.0; quartile 3: 48.0); only 5.0% of the trials mentioned race, skin colour or ethnicity, and 37.5% reported the duration of the wound. Only 9 (22.5%) studies reported the drugs that the included patients were using and 10 (25.0%) RCTs reported adverse events. The presence of the five domains was observed only in 12.5% of RCTs and only 12 (30.0%) had the precision domain. Much more research is required in systematic assessments of the external validity of trials because there is substantial disparity between the information that is provided by RCTs and the information that is required by clinicians. We concluded that there are deficiencies in reporting of data related to inclusion/exclusion criteria and characteristics of patients of RCTs assessing PI therapeutic interventions.

KEYWORDS
pressure injury, randomized clinical trial, review, treatment outcome, validity of results

Key Messages

- There is substantial disparity between the information that is provided by RCTs and the information that is required by clinicians.
- There are deficiencies in reporting of data related to inclusion/exclusion criteria and characteristics of patients of RCTs assessing PI treatment interventions.
- More rigour in the description of participant information is required so that the results of the RCTs can meet the needs of clinicians and guide healthcare decisions.

1 | INTRODUCTION

Pressure injuries (PIs) occur frequently and greatly increase the costs of medical and nursing care, and are one of the main causes of morbidity, especially in the elderly.[1,2]

There is much primary research on PI treatment, and a recent study has shown that there is a heterogeneity of outcomes in RCTs on PI therapeutic intervention in adults, many of which have not been fully reported.[3] Large and well-planned randomized controlled trials (RCTs) should be the necessary support and source for clinical practice, as they demonstrate the efficacy and safety of a given treatment. RCTs and their generated evidence are the source of knowledge for healthcare professionals and healthcare providers, such as governments and policy makers to recommend therapies.[4]

However, it is documented that funding agencies, ethics committees, medical journals, pharmaceutical industry and governments neglect to adequately consider external validity, which has received little attention.[4,5]

The external validity or generalizability and applicability of a study, which is more appropriate to say, is when the results that the study has can be used and generalized to other situations, other times and other people.[6] This is a frequent criticism for clinical trials, systematic reviews and medical guidelines: reporting the determinants of generalizability is rarely adequate.

Treating wounds is an admittedly complex process with many factors involved. Deficiencies in reporting sample inclusion and exclusion criteria can hinder and limit the extrapolation and use of results from RCTs to the real-world wound care patient.[7] Hence, the method and results of some RCTs, although useful for showing effectiveness in ideal situations does not help to establish this same outcome in patients who are routinely encounter in wound care centres.

There are concerns about the need to properly conduct and report RCTs in wound care, as well as the generalizability of the study results. Brölmann et al. published fundamentals for RCT in wound care, to help to reach a higher standard of evidence and allow meta-analysis of data. Among the various criteria, they reinforce the need to clearly define the inclusion and exclusion criteria, such as aetiology of the wound, wound size, duration of the wound, previous treatment received (e.g., debridement and standard treatment), and prognostic factors that may impair wound healing (e.g., smoking, diabetes, obesity, weight loss, use of systemic corticosteroids, radiation therapy).[8]

An adequate and comprehensive description of the eligibility criteria to include patients in the study is necessary for the correct interpretation of the study. A clear understanding of these criteria is one of the necessary elements in judging who a trial's results apply to—that is, the trial's generalizability (or applicability) and relevance to clinical practice. Other aspects of the trial such as the social, economic, cultural and climatic setting can also affect the external validity of a study.[9] Inappropriate reporting of data related to external validity was found in RCTs assessing venous leg ulcers (VLU) interventions[10] and deficiencies in the completeness of outcomes results for intervention studies of PI.[3]

Reliable analyses of the generalizability and applicability of RCTs results are essential if treatments are to be used correctly in as many patients as possible in routine clinical practice.[11]

2 | AIM

This study evaluated deficiencies in reporting the sample inclusion and exclusion criteria and the characteristics of patients in RCTs on pressure injuries (PI) therapeutic interventions. The specific aims included to assess the adequacy of reporting specific patient characteristics in

the included studies and create a score for the five domains of the exclusion criteria.

3 | HYPOTHESIS

The hypothesis is that in studies of therapeutic interventions for PI there will be deficiencies in reporting inclusion/exclusion criteria and characteristics of patients.

4 | METHODS

4.1 | Study design and eligibility criteria

This systematic methodological review follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020)[12] for items about to meta-epidemiological studies. It is following the guideline for reporting meta-epidemiological studies.[13]

We selected articles published in English from January 2008 to December 2020. This time-frame was chosen because it is part of the period during which there have been several published articles addressing the completeness of reporting or adherence to various reporting guidelines.[14] Our inclusion and exclusion criteria are in the Box 1.

BOX 1 Inclusion and exclusion criteria for the RCTs.

Inclusion criteria: RCTs about PI therapeutic interventions such as dressings, medications and care guidelines (for example turn charts, turning regime, etc) for adults and elderlies, published in English, between January 2008 and December 2020. Only RCTs from PI stages 2–4 were included. Stage 1 was not included because interventions for this stage are more related to preventing progression to open wounds than to treatment for ulcer healing, with different results.

Exclusion criteria: RCTs that include chronic ulcers of different etiologies or studies whose primary objective refers to an economic evaluation for PI prevention and treatment, or whose are not fully accessible. Pressure injuries related to medical devices and RCTs focused on Skin injuries related to medical adhesives (MARSI) were also excluded.

A RCT was defined as a prospective study to evaluate the effectiveness, efficacy, or safety of an intervention and with the allocation of the intervention described by phrases such as "randomly allocated", "randomly allocated" or "randomized allocation", and with a comparator group. The comparator group can be placebo, another treatment, a different dose of the same treatment, usual care, historical control or just lack of treatment.[6]

4.2 | Patient and public involvement

Patients and public were not involved as this study was a systematic review of the published literature.

4.3 | Search strategy and article selection

For the search strategy, terms such as "pressure ulcer", "pressure injury", "randomized clinical trials", "treatment" and "adults" were included. The following databases were searched from January 2008 to December 2020: Medline, Cochrane, Cinahl, Embase, Scopus and Web of Science. The search strategy applied to these databases are shown in the Box 2.

The studies were selected in two stages: screening of the title and abstract, followed by screening of the full text. The screening was carried out in duplicate and the researchers resolved any discrepancies by consensus or by consulting a third author. The selection and organization of articles was supported using the Rayyan tool (available from https://www.rayyan.ai/) developed by the Qatar Computing Research Institute.[15]

4.4 | Data extraction

The data extraction of each article was performed using a standardized Microsoft Excel® spreadsheet generated by an electronic form (Google Form). Two reviewers summarized the data and any disagreement was resolved by consensus. If consensus was not reached, a third author was contacted.

With the form was piloted with data from 15 randomly selected studies to check the consistency of the form before proceeding with complete data extraction and to ensure that all reviewers extracted data consistently, using an unambiguous and error-free data extraction form.

The following data were extracted:

- General characteristics of included RCTs

Bibliometric information and other details were extracted from each RCT: author, year of publication,

BOX 2 Research search strategy.

Data Collection Period: February 1st, 2021

Keywords: Randomized clinical trial, Pressure Ulcer, Adult, Elderly, Therapeutics, Disease Management

Time restriction: January 1st, 2008 to December 31st, 2020

Descriptors

Medline	(Randomized Controlled Trial [Publication Type] OR Randomized Controlled Trials as Topic) AND (Pressure Ulcer [Mesh]) AND (Adult [Mesh] OR Aged [Mesh]) AND (Therapeutics [Mesh] OR Disease Management [Mesh])
Embase	'randomized controlled trial'/exp AND 'decubitus'/exp AND ('aged'/exp OR 'adult'/exp) AND ('therapy'/exp OR 'disease management'/exp)
Cochrane	Randomized Controlled Trial in All Text AND Pressure ulcer in All Text AND Adult or Aged in All Text AND Therapeutics OR Disease Management in Title Abstract Keyword - with Cochrane Library publication date Between Jan 2008 and Dec 2020 (Word variations have been searched)
Scopus	(randomized AND controlled AND trial) AND (pressure AND ulcer) AND (aged OR adult) AND (therapeutic OR disease AND management)
Web of science	(Randomized Controlled Trial) AND (Pressure Ulcer) and (Adult or Aged) AND (Therapeutics OR Disease Management)
CINAHL	(Randomized Controlled Trial) AND (Pressure Ulcer) AND (Adult OR Aged) AND (Therapeutics OR Disease Management)

publication journal, total number of patients recruited in the study, if the study was sponsored by industry, journal impact factor (website Journal Citation Reports: https://jcr.incites.thomsonreuters.com), whether the study cited the use of CONSORT and whether the study was a single-centre or multicentre trial and in which country or countries the study was conducted.

- Deficiencies in reporting inclusion/exclusion criteria and characteristics of patients

As there is previous experience related to data extraction to verify external validity,[10] supported by the CONSORT tool[6] and previous references,[5,16] data extraction was built per included study based on these variables that may reflect the generalizability and applicability of the findings in the context of patients with PI:

1. Settings (outpatients and inpatients);
2. Recruitment process (number of eligible patients, number of refusals, failure to screen and length of the recruitment period);
3. Number of inclusion/exclusion criteria;
4. Patient data (age, sex, ethnicity [or race or skin colour, as chosen by the studies], BMI, comorbidities and concomitant medications);
5. Data on the wound (size, location, duration, and instrument for monitoring wound evolution);
6. Safety data (adverse events).

4.5 | Assessment of trial inclusion/exclusion criteria

The exclusion and inclusion criteria for the data extraction instrument were extracted. However, and according to the previous reference,[10] only the exclusion criteria were maintained to facilitate the analysis. The list of inclusion criteria was then inverted to exclusion criteria only so that we could provide a summary of exclusion criteria. For example, only patients older than 18 years were included, this was changed to: patients under 18 were excluded.

The exclusion criteria were categorized into five domains, according to reference,[17] and separated into: A (patient-related) and B (wound-related). The reported data were noted as "specified" and "unspecified". The following are the domains considered as related to inclusion/exclusion criteria.

Domain 1. Definition of disease: eligibility criteria that define the medical condition of interest and represent factors that would be considered in clinical practice.

This included patient-specific factors (A), for example, immobility in general, or immobility caused by some specific factor, such as a critical patient or with spinal cord injury, and wound specific factors (B), for example, wound size, duration and localization.

Domain 2. Precision: eligibility criteria concerned with the scientific validity of the study. These criteria attempt to diminish the variability in the study by either making the patient population more homogenous or reducing measurement error. Precision criteria involve factors that would not ordinarily be considered in clinical practice. For example: patients with a previous malignancy.

Domain 3. Safety: eligibility criteria that exclude persons thought to be unduly vulnerable to treatment in general or one of the study treatments.

Domain 4. Ethical and legal: eligibility criteria that are required to ensure conformity with national regulations governing the conduct of human experimentation, for example: the patient consents to the study.

Domain 5. Administrative: eligibility criteria which attempt to ensure the smooth functioning of the study. Administrative criteria include measures aimed at ensuring compliance with treatment and follow-up fall into this category. For example: patient is accessible geographically for follow-up.

4.6 | Assessment of some other characteristics related to deficiencies in reporting inclusion/exclusion criteria and characteristics of patients

How the study outcomes are evaluated can also influence their external validity. Therefore, two other items were included:

4.6.1 | Time points that were used for analysis of outcomes

We checked whether the authors specified the time points to be used in their analysis. When the authors declare the time of judgement of the outcome, it was considered as 'specified'.

4.6.2 | Specific technique or instrument used to measure the outcomes

To measure results appropriately, a scale, scoring system, questionnaire or other tool can be used. This information was 'unspecified' when it was not reported. We considered instruments to assess the risk of developing pressure injuries and instruments to assess wound progress.

5 | STATISTICS

The descriptive statistics of categorical data were presented as numbers, with respective percentages and 95% confidence intervals (95% CI).

We used the Kolmogorov–Smirnov test for normality and reported medians and quartiles as appropriate. We described the number of inclusion/exclusion criteria described per study and the proportion of studies that describe settings, recruitment process, patient data, wound data, and safety data.

We computed the proportion (percentage) of studies with complete 'fully specified' characteristics and criteria reported (i.e., all five inclusion/exclusion criteria domains reported).

We planned to perform multivariate analysis between variables (with the score of the five domains of the exclusion criteria, allowing the analysis of existing relationships by reducing the data set's dimensionality.[18] After univariate analysis for the categorical variables, we intended to include them in perceptual map analysis it they presented a p-value fewer than 0.10. However, it was not possible to do the multivariate analysis. The variables analysed were: year of publication (2018–2014; 2015–2020); journal that endorses CONSORT; sample size (<100; ≥ 100); IF (<2; ≥ 2); industry-sponsored.

The data were analysed by IBM® SPSS® Statistics, version 27.0 (SPSS, Inc. Chicago, Illinois, USA).

6 | ETHICAL CONSIDERATION

As this is a study of published data, ethics committee approval is not required.

7 | RESULTS

According to the applied search strategy, 490 articles were identified in the different databases and 389 articles were excluded - most of them clinical trials about chronic ulcers of other non-pressure aetiologies, focused on cost-effectiveness or related to prevention. Forty-two articles were retained for analysis, but two others were excluded, totalling 40 articles for the final analysis, as shown in Figure 1.

Table 1 show the characteristics of the 40 included studies. Only 22.5% (9) of them were published in journals that follow CONSORT and 52.5% (21) were published after 2015. The median IF was 2.1 (quartile

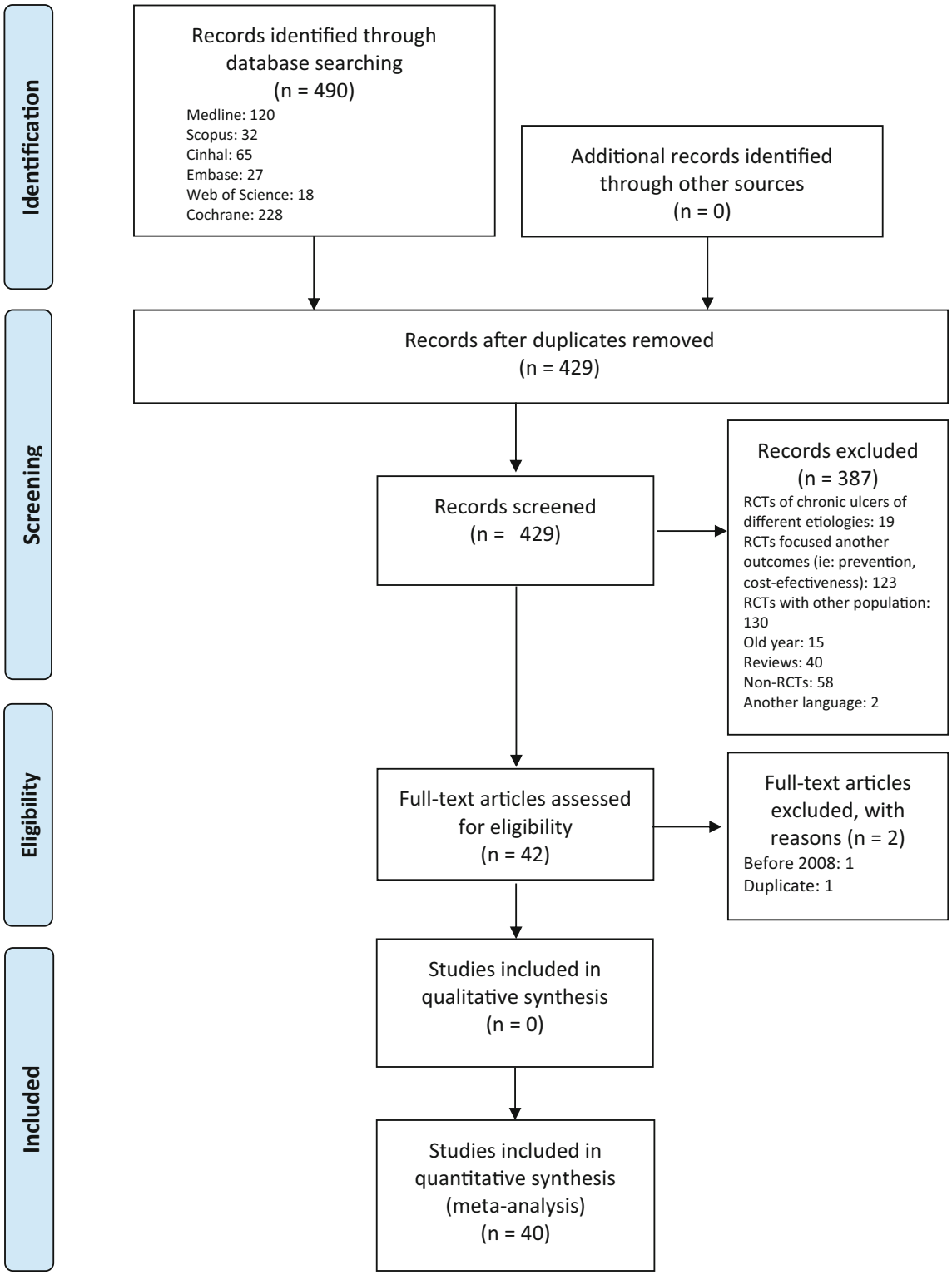

FIGURE 1 Diagram showing the selection procedure of the studies, according to the Prisma flow model.[12]

1 [q1] 1.5; quartile 3 [q3] 2.8). Most of the RCTs had less than 100 participants (80.0%) and the sample size median was 43 ([q1] 27; [q3] 76). Only 32.5% (13) were conducted in more than one centre and 42.5% (17) included PI on stages 2–4.

Table 2 shows that 35.0% (14) of the patients were from hospital units (inpatients) followed by 25.0% (10) from long-term or rehabilitation units. Screening (number of patients evaluated to be included) had a median of 54.5 ([q1] 30.0; [q3] 127.5). Most trials reported

TABLE 1 Characteristics of RCTS about therapeutical interventions for pressure injuries.

Data	Frequency $N = 40$	Percentage (IC 95%)
Impact factor (IF) of the journal		
<1.0	2	5.0 (1.4–16.5)
≥1.0 e <3.0	28	70.0 (54.6–81.9)
≥3.0	6	15.0 (7.1–29.1)
Without IF	4	10.0 (3.9–23.0)
The journal endorses the CONSORT	9	22.5 (12.3–37.5)
Year of publication		
2008–2014	19	47.5 (32.9–62.25
2015–2020	21	52.5 (37.5–67.1)
Continent where the study was made		
Asia	17	42.5 (28.5–57.8)
Europe	7	17.5 (8.7–31.9)
North America	6	15.0 (7.1–29.1)
Oceania	4	10.0 (3.9–23.0)
Not declared	6	15.0 (7.1–29.1)
Sample size		
<100 participants	32	80.0 (65.2–89.5.)
≥100 participants	8	20.0 (10.5–34.8)
Multicentric study	13	32.5 (20.1–48.0)
Funding status		
Only other funding different of industry[a]	6	15.0 (7.1–29.1)
Only Industry	7	17.5 (8.7–31.9)
Industry and others	2	5.0 (1.4–16.5)
No funding	4	10.0 (3.9–23.0)
Not declared	21	52.5 (37.5–67.1)
Pharmacological intervention	14	35.0 (22.1–50.5)
Type of interventions		
Topic therapy	14	35.0 (22.1–50.5)
Systemic therapy	10	25.0 (14.2–40.2)
Physical therapy	8	20.0 (10.5–34.8)
Negative pressure therapy	3	7.5 (2.6–19.9)
Others	5	12.5 (5.5–26.1)
Stage of pressure injury		
Only stage 2	4	10.0 (3.9–23.0)
Only Stage 3	1	2.5 (0.4–12.9)
Stages 2 and 3	4	10.0 (3.9–23.0)
Stages 2, 3 and 4	17	42.5 (28.5–57.8)
Stages 3 and 4	9	22.5 (12.3–37.5)
Not declared	5	12.5 (5.5–26.1)

[a]Funding from government, hospital and university.

the number of patients eligible for the study (97.5%), but only 15.0% reported difficulties in including participants. The median number of people who were randomized and who declined participation were 42.5 ([q1] 27.2; [q3] 76.5) and 4 ([q1] 0.0; [q3] 12.5), respectively. The median of study duration was 8.0 weeks ([q1] 2.0; [q3] 48.0).

Regarding the characteristics of the participants, only 5.0% (2) of the trials mentioned race, skin colour or ethnicity and 37.5% (15) reported the duration of the wound. None study reported the socioeconomic conditions of the patients included and only 9 studies (22.5%) reported the drugs that the included patients were using. The median for the number of patient-specific factors (A) was 4.0 ([q1] 2.2; [q3] 6.0) and number of Wound specific factors (B) was 4.0 ([q1]1.0; [q3] 4.7).

In 65% (26) percent of the studies, the researchers applied an instrument (scale) to monitor the evolution of the wound, with only 23.0% of these instruments being validated; 22.5% (9) of the studies assessed the patient PI development risk through a scale during the assistance, being the Braden scale the most frequent (7). Only 25.0% (10) reported adverse events.

The inclusion and exclusion criteria transformed in exclusion criteria were gathered and listed in the five domains, as shown in Table 3. The presence of the five complete domains was observed only in 12.5% (5) of clinical trials; the administrative domain and the ethical and legal were the domains that had less reports in the studies (42.5% each) and the least reported domain was precision (30.0%).

In the univariate analysis, the following *p*-values (CI 95%) were found for the influence on the reporting of 5 or 4 domains, respectively: year of publication 0.37 and 0.193; journal that endorses CONSORT 0.473 and 0.249; sample size 0.188 and 0.208; IF 0.376 and 0.226; industry-sponsored 0.434 and 0.469. Therefore, no significant factor ($p < 0.1$) was found to influence reporting 5 or 4 domains.

8 | DISCUSSION

Our study showed that there is a deficiency in reporting inclusion and exclusion criteria and patient characteristics in pressure injury treatment intervention trials. The main deficiencies were in relation to the precision domain, clinical characteristics of patients, such as comorbidities, medication use, socioeconomic condition, and ethnicity. The reporting of adverse events and the precision domain were also deficient.

Deficiency in reporting inclusion and exclusion criteria and patient characteristics are related to the concept of

TABLE 2 Settings, recruitment process, characteristics of patients, wound characteristics and adverse events reported in RCTS for therapeutics interventions in pressure injuries.

Data	Frequency $N = 40$	Percentage (CI 95%)
Settings		
Intensive care unit	5	12.5 (5.5–26.1)
Home care	3	7.5 (2.6–19.9)
Long term care/ Rehabilitation institution	10	25.0 (14.2–40.2)
Inpatient	14	35.0 (22.1–50.5)
Spinal cord injury unit	2	5.0 (1.4–16.5)
Outpatient	2	5.0 (1.4–16.5)
Not declared	4	10.0 (3.9–23.0)
Recruitment process		
RCTs that reported number of eligible patients	39	97.5 (87.1–99.6)
RCTs that reported number of people who declined participation	34	85.0 (71.0–93.0)
RCTs that reported number of randomized patients	40	100.0 (91.2–100.0)
RCTs that reported recruitment time	28	70.0 (54.6–81.9)
RCTs that reported difficulties for inclusion in the study	6	15.0 (7.1–29.1)
RCTs that reported length of study	35	87.5 (73.9–94.5)
Characteristics of patients included		
RCTs that reported age of participants	35	87.5 (73.9–94.5)
RCTs that reported ethnicity or race	2	5.0 (1.4–16.5)
RCTs that reported comorbidities	23	57.5 (42.2–71.5)
RCTs that reported BMI	12	30.0 (18.1–45.4)
RCTs that reported concomitant medications	9	22.5 (12.3–37.5)
RCTs that report socioeconomic characteristics	0	0.0 (0.0–8.8)
Comorbidities		
Spinal cord injury	8	34.8 (18.8–55.1)
Diabetes Mellitus and Cardiac Problem	7	30.4 (15.6–50.9)
Cancer	1	4.3 (0.8–21.0)
Chronic obstructive pulmonary disease/ Respiratory problems, Mobility impairments, Cardiac general problems, History of femur fracture	1	4.3 (0.8–21.0)
Other comorbidities	6	26.1 (12.5–46.8)
Wound characteristics		
RCTs that reported localization	28	70.0 (54.6–81.9)
RCTs that reported wound size	18	45.0 (30.7–60.2)
RCTs that reported wound duration	15	37.5 (24.2–53.0)
RCTs that reported use of Instrument for monitoring wound evolution	26	65.0 (49.5–77.9)
RCTs that reported adverse events	10	25.0 (14.2–40.2)

external validity, that is, applicability and generalizability of results. However, external validity is a difficult and far-reaching concept. Although it can be defined in general terms as above, it is much more difficult to quantify accurately. The determinants of internal validity, on the other hand, are clearer and, therefore, can be evidenced by the first principles and quality indices developed. An RCT requires clinical knowledge, rather than statistical expertise, and usually depends on the clinical condition being studied and its management in routine clinical practice. External validity, in turn, is also highly dependent on the perspective of the individual performing the analysis. For one healthcare professional and a specific patient, the result may be almost perfectly applicable, while for another, the applicability may be difficult to consider.[19]

Two concepts are important: 1. when the results of a trial are valid for patients other than those in the original study population in a treatment environment that is, in all aspects, equal to the treatment environment in the original study ('external validity'). 2. when the results are valid for patients who are in a treatment environment different from the population of the original study ("applicability").[16]

Applicability and generalizability are a matter of judgement. Therefore, it is essential that there is a complete description of the inclusion and exclusion criteria, as well as the environment, the proposed treatments and how these interventions took place, the definition of results and the period of recruitment and follow-up. The proportion of participants in the control group is also relevant. The number of patients who refuse to enter the

TABLE 3 Frequency of inclusion/exclusion criteria domain in RCTS for therapeutics interventions in pressure injuries.

Inclusion/exclusion criteria domain	Frequency $N = 40$	Percentage (CI 95%)
RCTs that reported the domain		
Domain 1: Definition of disease	39	97.5 (87.1–99.6)
Domain 2: Precision	12	30.0 (18.1–45.4)
Domain 3: Safety	40	100.0 (91.2–100.0)
Domain 4: Ethical and legal	17	42.5 (28.5–57.8)
Domain 5: Administrative	17	42.5 (28.5–57.8)
Total number of domains reported		
One	1	2.5 (0.4–12.9)
Two	11	27.5 (16.1–42.8)
Three	15	37.5 (24.2–53.0)
Four	08	20.0 (10.5–34.8)
Five	05	12.5 (5.5–26.1)

Note: *Domain 1*. Definition of disease: eligibility criteria that define the medical condition of interest and represent factors that would be considered in clinical practice; *Domain 2*. Precision: eligibility criteria concerned with the scientific validity of the study. These criteria attempt to diminish variability in the study by either making the patient population more homogenous or reducing measurement; error; *Domain 3*. Safety: eligibility criteria that exclude persons thought to be unduly vulnerable to treatment in general or one of the study treatments; *Domain 4*. Ethical and legal: eligibility criteria that are required to ensure conformity with national regulations governing the conduct of human experimentation; *Domain 5*. Administrative; eligibility criteria which attempt to ensure the smooth functioning of the study.

trial is relevant to generalization as it may indicate preferences for acceptability of an intervention.[6]

In a study that evaluated the reporting of data related to factors that affect external validity in RCTs about interventions for the treatment of active VLU found that there are inadequate reports of data related to external validity and that there is significant variability in the index cut off point of ankle-brachial pressure for inclusion or exclusion, making it difficult to generalize the findings.[10] In another study in which the percentage of individuals who would be excluded from wound treatment RCTs was determined, more than 50% of the study population would have been excluded in 15 of the 17 RCTs. When the less clinically relevant exclusion criteria were removed, 14 of the 17 RCTs would still have excluded between 25% and 50% of the study population.[7]

Although it is difficult to specify which aspect of external validity is the most important, there is a study that focused on three important components that are probably indispensable to assessing the external validity of a trial: the participants, the description of the experimental treatment, and the context of care (centres, setting, care providers' expertise).[20] In our study, the description of the difficulties for the inclusion of patients, ethnicity or race, and other characteristics of patients were not adequately reported.

In this regard, nonreporting of major comorbidities and current medications is a concern for estimating external validity. In the VLU study,[10] only five studies reported on patient medications, corroborating our results, where only 22.5% RCTs reported it. Although the RCT ensures that variables such as medications are similar between treatment groups, we know little of the types of medications people are prescribed to, thereby limiting assessment of external validity.

Having adverse event data is crucial to showing the effectiveness of an intervention and it is correct to exclude patients who may be at high risk for adverse events in the RCT intervention. However, when it comes to wounds, excluding many patients seems not to be consistent with reality and routine, since the objective is to treat the greatest number of patients, and most of them do not have an immediate life-threatening condition. But it is true that, to avoid type II errors (in which a study design can make an intervention appear ineffective), comorbidities that impact too much on wound healing may not be accepted.[7] And then this makes it much more difficult to extrapolate the results for the general population because a large part of the population that needs treatment and has significant comorbidities is being excluded. Experts report that the patient population included in the trials may not be representative of the general population of patients with chronic wounds, but this concern has not been methodically assessed.[7] This ratifies the relevance of this study which shows deficiencies in the criteria related to the characteristics of patient and wounds to point out the discrepancies and the difficulty of extending the results. Even, the reporting of adverse effects in RCTs and systematic reviews is often deficient as well.[11]

More studies are still needed to assess the generalizability and applicability of the results of wound care outcomes, as studies begin to show a lot of discrepancy between the information provided by these RCTs and the information actually required by the clinician.[21,22] A checklist of items that need to be included in the reporting of RCTs can be useful.[23] And one explanation for this disparity may be the underutilization in practice of many interventions that have been shown to be beneficial in trials and are recommended in guidelines.[19]

RCTs cannot be expected to produce results that are directly relevant to all patients and all settings, but to be externally valid. They must at least be designed and reported in a way that allows physicians to assess whom they can reasonably be expected to be applied.[11] Because of this, not reporting the characteristics of the patients

correctly, the characteristics of the wounds and rightly choosing the inclusion and exclusion criteria have a direct impact on clinical practice because these RCTs need to provide information for adequate judgement.

Future research may focus on providing more evidence on how various factors, such as those investigated in this paper, affect generalizability and applicability, and affect the conversion of research results into implementation.[5]

This is the first systematic methodological review to assess how the reporting of inclusion and exclusion criteria and patient characteristics is done in RCTs on pressure injuries. As a limitation, only RCTs published in English and therapeutic interventions were considered.

Another limitation refers to the heterogeneity of the studies included in this review, with an evaluation of different interventions, the inclusion of populations with different stages of PI and different settings, making it difficult to compare the different studies.

Our results reinforce the need for RCTs to be performed as recommended in the SPIRIT 2013 statement[24] and reported as per the CONSORT 2010 statement.[6]

9 | CONCLUSION

There are deficiencies in reporting of data related to generalizability and applicability of the findings in RCTs that evaluate PI treatment interventions. The characteristics of patients and wounds were poorly reported, as well as the reporting of adverse events. The inclusion and exclusion criteria were flawed especially regarding the precision criteria. More rigour in the description of participant information is required so that the results of the RCTs can meet the needs of clinicians and guide healthcare decisions.

CONFLICT OF INTEREST STATEMENT

The authors have no conflicts of interest to declare.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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