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ASSESSMENT OF THE USE OF UNNA BOOT IN THE TREATMENT OF CHRONIC LEG ULCERS IN ADULTS: SYSTEMATIC REVIEW PROTOCOL

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Keywords:	wound healing, Unna Boot, inelastic compression, Leg ulcer, bandagens

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ABSTRACT

Objective: This review aims to determine the effectiveness of the treatment of wound healing in venous leg ulcers by assessing the quality of the evidence available.

Methods: A literature search in PubMed, CINAHL, Scopus, Web of Science, Cochrane Library, BVS/BIREME, Embase, ProQuest, BDTD, Thesis and Dissertation Catalog, Sao Paulo Research Foundation Research Foundation/Thesis and dissertation, OPEN THESIS, A service of the U.S. National Institute of Health, Center for Reviews and Dissemination- University of New York and SciElo published in the last 10 years. To be included, studies need to be primary (original), and Controlled Trials or Observational studies (cross sectional, case-control or longitudinal studies). Exclusion will include leg ulceration due to different causes, such as pressure, arterial, diabetic or mixed an etiology leg ulcer.

Results: The primary outcome measures are the proportions of wounds with complete healing. Two reviewers will independently assess the quality of the included studies by using the standardized critical appraisal instruments from the Joanna Briggs Institute. Data synthesis will be performed using a narrative summary and quantitative analysis.

Ethics and dissemination This systematic review does not require ethical approval, as individual patient data will not be collected. Dissemination of findings will be through publications in peer-reviewed journal.

PROSPERO registration number CRD42019127947

Strengths and limitations of this study

- To know the effectiveness of Unna boot dressing in the management of VLU will contribute to the use of a low-cost alternative to wound healing.VLUs has not been studied; our systematic review will be the first to answer the question.
- The eligibility criteria used may not result in the selection of studies that are homogeneous in methods limiting the ability to draw reliable conclusions.
- Limitation: Only article published in English, Spanish, and Portuguese will be considered.

BACKGROUND

Venous leg ulcers cause significant social and economic impact due to their recurrent nature and the long time elapsed between their opening and healing. VLU is a result of venous hypertension caused by chronic venous insufficiency. The consequences of venous insufficiency include edema, dermatitis, hyperpigmentation, skin fibrosis and subcutaneous tissue of the leg and, finally, ulceration (1–4).

Compression therapy is the most important measure of the treatment of a person with VLU because it contributes to the venous return, improving stasis and edema, which translates into better clinical conditions in the lesion and helps shorting the healing time (4–6). Unna Boot is an inelastic compression therapy that acts to increase compression and promote drainage and venous support, improving healing of the ulcer (5).

The compression during rest and muscle contraction, acts on the macrocirculation, increasing the venous return, and on the tissue pressure, supporting the reabsorption of the edema and the return

of the fluids located in the interstitial spaces to the interior of the vascular and lymphatic system. This process promotes the healing of the lesion and prevents inflammation (7–9).

The Unna boot consists of a low compression gauze gauze (18-24 mmHg); the composition varies between the handmade form, which requires previous thermal heating, and the industrial one, that is ready for use, contains 10% of oxide of zinc, gum acacia, glycerol, castor oil and deionized water (10,11). According to studies, the use of the Unna boot is effective in promoting the satisfaction related to minimum wound care, rapid development of granulation tissue, improvement in comfort and lower costs relative to other compressions that have the same objective(7,10,12,13).

This systematic review aims to critically evaluate the effectiveness of Unna Boot on the treatment of chronic leg ulcers in adults by assessing the quality of the evidence available. Specific question addressed by the review is: Is the use of Unna Boot effective in the treatment of chronic leg ulcers in adults?

METHODS

This protocol has been registered with the PROSPERO (CRD42019127947) and will be reported following the Preferred Reporting Items for Systematic Review and meta-Analysis Protocols (PRISMA) (14,15). This review will be report following standardised critical appraisal instruments from Joanna Briggs Institute (16,17).

Patient and Public Involvement

No patients or public were directly involved in the development of this systematic review protocol.

SEARCH STRATEGIES

We will systematically and electronically conduct searches on the following databases: PubMed (1999- 2019),PubMed/PMC(1999- 2019), Virtual Health Library (BVS / BIREME) (1999- 2019), The Cumulative Index to Nursing and Allied Health Literature (CINAHL) (1999- 2019), Scopus (1999- 2019), Web of Science (1999-2019), MEDLINE (CAPES) (1999- 2019), Embase(1999- 2019), Cochrane Library (1999- 2019), ProQuest (1999- 2019), Brazilian Digital Library of Theses and Dissertations (BDTD) (1999- 2019), CAPES / Thesis and Dissertation Catalog (1999- 2019) Sao Paulo Research Foundation/ Thesis and dissertation (1999-2019), OPEN THESIS (1999- 2019), A service of the U.S. National Institutes of Health (Clinical Trial)(1999- 2019), Centre for Reviews and Dissemination - University of York(1999- 2019), Scientific Electronic Library (SciELO)(1999- 2019).

SELECTION CRITERIA

All Unna Boot related human studies for treating venous leg ulcers will be included.

STUDY DESIGN

To be included, studies need to be primary (original), Controlled Trials or Observational studies (cross sectional, case-control or longitudinal studies). Theses studies will be used to assessing the effectiveness of Unna Boot on the healing of venous leg ulcers. Eligible studies must be in Portuguese, Spanish or English language.

TYPE OF PARTICIPANTS

The participants are all adults' patients with venous leg ulcers on any location and of size. We will accept study authors' diagnostic criteria for the wound aetiology. The intervention of interest is Unna boot. Exclusion will include leg ulceration due to different causes, such as pressure, arterial, diabetic or mixed aetiology leg ulcers.

INTERVENTION

The intervention will include Unna boot treatment of venous leg ulcers. Information about the time of use, initial wound size, sociodemographic and clinical will be documented.

COMPARATOR

Studies comparing any other type of dressing, topical agent, placebo or standard treatment will be included in this review.

OUTCOME MEASURES

The primary outcome measures are the proportions of wounds with complete healing. We will consider the proportion of ulcers healed during follow-up and frequency of complete healing during the study. The rate of adverse effects and events (e.g. the wound infection rate and signs and symptoms of clinical infection**)** will be documented**.** Additional outcome(s), such as Quality of life (measured using generic questionnaire or a disease-specific questionnaire). And Pain (e.g. at dressing change or over the course of treatment) will be only included in validated questionnaires or visual analogue scales. Change in ulcer size will be consider using data on the change (and percentage change) in ulcer size, with adjustment for baseline size (we will contact study authors to request adjusted means when not available).

STUDY SELECTION AND DATA MANAGEMENT

Two review authors will independently assess the titles and abstracts of studies found during the searches for potential inclusion in this review. Disagreements will be discussed during consensus meetings with a third review author. Potential relevant studies will be examined in full by two review authors. The studies that meet the eligibility criteria will be included in the review. Disagreements will be discussed at consensus meetings with a third review author.

DATA EXTRACTION

For data extraction: extracted information will include the study setting, study characteristics (authors, year of publication, country of publication, study design), details of the intervention and

control, research design, inclusion and exclusion, outcomes, characteristics of the examined patient demographics (number of subjects, gender, mean age, comorbidities, number of wounds treated), wound characteristics (mean wound duration, mean wound size) losses to follow-up, sensitivity analysis performed, author conclusions and conflicts of interest. Data extraction will again be performed independently by two reviewers, and any discrepancies will be resolved through group discussion.

ASSESSMENT OF RISK OF BIAS OF INCLUDED STUDIES

Two reviewers will independently assess the quality of the included studies by using the standardized critical appraisal instruments from the Joanna Briggs Institute (JBI) (16,17). The instruments require the following data: title, authors, year of publication, journal, methodology, method, data analysis employed, configuration, geographical and cultural context, participants, interventions, main results and conclusions of authors and reviewers. After extracting the data, a level of credibility will be assigned to each finding, and the results will be synthetized through groups of data from primary studies. Disagreements between reviewers over the quality checklist will be resolved through discussion.

DATA ANALYSIS AND SYNTHESIS

Data synthesis will be performed using a narrative summary and quantitative analysis. A meta-analysis considering models of random-effects will be employed to compare among groups based on outcome variables, if studies included in the review disclose sufficient data.

DISCUSSION

This review aims to determine the effectiveness of the treatment of wound healing in VLU. This assessment will be performed by evaluating the total proportion of completely closed wounds relative to that of the start of treatment. Although studies have shown good results with

granulation tissue formation and wound healing (10,18), the effectiveness is currently unclear. To our knowledge, this is the first systematic review to evaluate the effectiveness of the Unna boot on wound healing. The result of this review may help health professionals and educators in the indication of the use of inelastic compression for patients with VLU in reality where financial resources are scarce.

AUTHORS CONTRIBUTION

This study was conceptualized by MHML, TP, FCIC, and MFG, PPA developed the search strategy. FA and MGBS completed the search and drafted the protocol. APD, ARSOK, MGBS and HCO critically appraised the protocol and also contributed to its development by revising subsequent versions. MHM; ARSOK and HCO will contribute equally to the data collection and analysis, as well as the interpretation of the reviewAll authors will revise critically the review and will read and approved the final manuscript.

ACKNOWLEDGEMENTS

Not applicable.

FUNDING

There is no funding received for this study.

COMPETING INTERESTS

The authors declare that they have no competing interests.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

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Reporting checklist for protocol of a systematic review.

Based on the PRISMA-P guidelines.

Instructions to authors

Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below.

Your article may not currently address all the items on the checklist. Please modify your text to include the missing information. If you are certain that an item does not apply, please write "n/a" and provide a short explanation.

Upload your completed checklist as an extra file when you submit to a journal.

In your methods section, say that you used the PRISMA-Preporting guidelines, and cite them as:

Moher D, Shamseer L, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart LA. Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) 2015 statement. Syst Rev. 2015;4(1):1.

		Reporting Item	Page Number
Title			
Identification	#1a	Identify the report as a protocol of a systematic review	01

Update	#1b	If the protocol is for an update of a previous systematic review, identify as such **none**
Registration		
	#2	If registered, provide the name of the registry (such as PROSPERO) and registration number **CRD42019127947**
Authors		
Contact	#3a	Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author **title page**
Contribution	#3b	Describe contributions of protocol authors and identify the guarantor of the review **09**
Amendments		
	#4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments **none**
Support		
Sources	#5a	Indicate sources of financial or other support for the review **07**
Sponsor	#5b	Provide name for the review funder and / or sponsor **07**

Role of sponsor or funder	#5c	Describe roles of funder(s), sponsor(s), and / or institution(s), if any, in developing the protocol 07
Introduction		
Rationale	#6	Describe the rationale for the review in the context of what is already known 02
Objectives	#7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO) 03
Methods		
Eligibility criteria	#8	Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review 03-04
Information sources	#9	Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage 03-04
Search strategy	#10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated 03-04

Study records - data management	#11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	04
Study records - selection process	#11b	State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)	04
Study records - data collection process	#11c	Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	05-06
Data items	#12	List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications	
Outcomes and prioritization	#13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	04-05
Risk of bias in individual studies	#14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	06
Data synthesis	#15a	Describe criteria under which study data will be quantitatively synthesized	05-06

Data synthesis	#15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as I2, Kendall's τ)	05-06
Data synthesis	#15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)	05-06
Data synthesis	#15d	If quantitative synthesis is not appropriate, describe the type of summary planned	05-06
Meta-bias(es)	#16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)	05-06
Confidence in cumulative evidence	#17	Describe how the strength of the body of evidence will be assessed (such as GRADE)	06

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Primary Subject Heading:	Nursing
Secondary Subject Heading:	Evidence based practice, Dermatology, Global health
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ABSTRACT

Introduction: Chronic venous insufficiency is an anomaly of the normal functioning of the venous system caused by valvular incompetency with or without obstruction of venous flow. This condition can affect either or both of the superficial and the deep venous systems. Venous dysfunction can even result in congenital or acquired disorders, and its complications include venous leg ulcers. The objective of this systematic review is to determine the effectiveness of Unna Boot in the treatment of wound healing of venous leg ulcers by assessing the quality of the available evidence.

Methods and analysis: A literature search in PubMed, CINAHL, Scopus, Web of Science, Cochrane Library, BVS/BIREME, Embase, ProQuest, BDTD, Thesis and Dissertation Catalog, Sao Paulo Research Foundation Research Foundation/Thesis and dissertation, OPEN THESIS, A service of the U.S. National Institute of Health, Center for Reviews and Dissemination-University of New York and SciElo published in the last 10 years. The review will include primary studies (original), and Controlled Trials or Observational studies (cross sectional, case-control or longitudinal studies) with venous leg ulcers. Exclusion will include leg ulceration due to different causes, such as pressure, arterial, diabetic or mixed an etiology leg ulcer. Data synthesis will be performed using a narrative summary and quantitative analysis.

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PROSPERO registration number CRD42019127947

Strengths and limitations of this study

- To know the effectiveness of Unna boot dressing in the management of Venous Leg Ulcers (VLU) will contribute to the use of a low-cost alternative to wound healing. VLUs has not been studied; our systematic review will be the first to answer the question.
- The eligibility criteria used may not result in the selection of studies that are homogeneous in methods, limiting the ability to draw reliable conclusions.
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BACKGROUND

The VLU cause significant social and economic impact due to their recurrent nature and the long time elapsed between their opening and healing. VLU is a result of venous hypertension caused by chronic venous insufficiency. The consequences of venous insufficiency include edema, dermatitis, hyperpigmentation, skin fibrosis and subcutaneous tissue of the leg and, finally, ulceration (1–4).

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inelastic compression therapy that acts to increase compression and promote drainage and venous support, improving healing of the ulcer (5).

The compression during rest and muscle contraction, acts on the macrocirculation, increasing the venous return, and on the tissue pressure, supporting the reabsorption of the edema and the return of the fluids located in the interstitial spaces to the interior of the vascular and lymphatic system. This process promotes the healing of the lesion and prevents inflammation (7–9).

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This systematic review aims to critically evaluate the effectiveness of Unna Boot on the treatment of chronic leg ulcers in adults by assessing the quality of the evidence available. Specific question addressed by the review is: Is the use of Unna Boot effective in the treatment of chronic leg ulcers in adults?

METHODS

This protocol has been registered with the PROSPERO (CRD42019127947) and will be reported following the Preferred Reporting Items for Systematic Review and meta-Analysis Protocols (PRISMA) (14,15). This review will be report following standardized critical appraisal instruments from Joanna Briggs Institute (16,17).

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SELECTION CRITERIA

All human studies about Unna Boot, treatment that combines zinc oxide paste and compression bandages, for treating VLU will be included.

STUDY DESIGN

To be included, studies need to be primary (original), Controlled Trials or Observational studies (cross sectional, case-control or longitudinal studies). These studies will be used to assessing the effectiveness of Unna Boot on the healing of VLU. Eligible studies must be in Portuguese, Spanish or English language.

TYPE OF PARTICIPANTS

The participants are all adult patients with VLU of any location and of size. We will only accept studies in which authors used ultrasound to confirm wound etiology. The intervention of interest is Unna boot. We will exclude studies about leg ulceration due to different causes, such as pressure, arterial, diabetic or mixed etiology leg ulcers.

INTERVENTION

The intervention will include Unna boot treatment of VLU. Information about the time of use, initial wound size, sociodemographic and clinical will be documented.

COMPARATOR

Studies comparing any other type of dressing, topical agent, placebo or standard treatment will be included in this review.

OUTCOME MEASURES

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AUTHORS CONTRIBUTION

This study was conceptualized by MHML, TP, FCIC, and MGBS, PPA developed the search strategy. CSBP, MGBS FA completed the search and drafted the protocol. APD, ARSOK, MGBS and HCO critically appraised the protocol and also contributed to its development by revising subsequent versions. MHML; ARSOK and HCO will contribute equally to the data collection and analysis, as well as the interpretation of the review. All authors will revise critically the review and will read and approved the final manuscript.

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Not applicable.

FUNDING

There is no funding received for this study.

COMPETING INTERESTS

The authors declare that they have no competing interests.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

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Instructions to authors

Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below.

Your article may not currently address all the items on the checklist. Please modify your text to include the missing information. If you are certain that an item does not apply, please write "n/a" and provide a short explanation.

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In your methods section, say that you used the PRISMA-Preporting guidelines, and cite them as:

Moher D, Shamseer L, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart LA. Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) 2015 statement. Syst Rev. 2015;4(1):1.

		Reporting Item	Page Number
Title			
Identification	#1a	Identify the report as a protocol of a systematic review	01

Update	#1b	If the protocol is for an update of a previous systematic review, identify as such **none**
Registration		
	#2	If registered, provide the name of the registry (such as PROSPERO) and registration number **CRD42019127947**
Authors		
Contact	#3a	Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author **title page**
Contribution	#3b	Describe contributions of protocol authors and identify the guarantor of the review **09**
Amendments		
	#4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments **none**
Support		
Sources	#5a	Indicate sources of financial or other support for the review **07**
Sponsor	#5b	Provide name for the review funder and / or sponsor **07**

Role of sponsor or funder	#5c	Describe roles of funder(s), sponsor(s), and / or institution(s), if any, in developing the protocol	07
Introduction			
Rationale	#6	Describe the rationale for the review in the context of what is already known	02
Objectives	#7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	03
Methods			
Eligibility criteria	#8	Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review	03-04
Information sources	#9	Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage	03-04
Search strategy	#10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	03-04

Study records - data management	#11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	04
Study records - selection process	#11b	State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)	04
Study records - data collection process	#11c	Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	05-06
Data items	#12	List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications	
Outcomes and prioritization	#13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	04-05
Risk of bias in individual studies	#14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	06
Data synthesis	#15a	Describe criteria under which study data will be quantitatively synthesized	05-06

Data synthesis	#15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as I2, Kendall's τ)	05-06
Data synthesis	#15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)	05-06
Data synthesis	#15d	If quantitative synthesis is not appropriate, describe the type of summary planned	05-06
Meta-bias(es)	#16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)	05-06
Confidence in cumulative evidence	#17	Describe how the strength of the body of evidence will be assessed (such as GRADE)	06

BMJ Open

ASSESSMENT OF THE USE OF UNNA BOOT IN THE TREATMENT OF CHRONIC VENOUS LEG ULCERS IN ADULTS: SYSTEMATIC REVIEW PROTOCOL

Journal:	*BMJ Open*
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Primary Subject Heading:	Nursing
Secondary Subject Heading:	Evidence based practice, Dermatology, Global health
Keywords:	wound healing, Unna Boot, inelastic compression, Leg ulcer, bandagens

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ASSESSMENT OF THE USE OF UNNA BOOT IN THE TREATMENT OF CHRONIC VENOUS LEG ULCERS IN ADULTS: SYSTEMATIC REVIEW PROTOCOL

ABSTRACT

Introduction: Chronic venous insufficiency (CVI) is an anomaly of the normal functioning of the venous system caused by valvular incompetency with or without obstruction of venous flow. This condition can affect either or both of the superficial and the deep venous systems. Venous dysfunction can even result in congenital or acquired disorders, and its complications include venous leg ulcers (VLU). The objective of this systematic review is to determine the effectiveness of Unna Boot in the treatment of wound healing of VLU by assessing the quality of the available evidence.

Methods and analysis: A literature search in PubMed, CINAHL, Scopus, Web of Science, Cochrane Library, BVS/BIREME, Embase, ProQuest, BDTD, Thesis and Dissertation Catalog, Sao Paulo Research Foundation Research Foundation/Thesis and dissertation, OPEN THESIS, A service of the U.S. National Institute of Health, Center for Reviews and Dissemination-University of New York and SciElo published in the last 10 years. The review will include primary studies (original), and Controlled Trials or Observational studies (cross sectional, case-control or longitudinal studies) with VLU. Exclusion will include leg ulceration due to different causes, such as pressure, arterial, diabetic or mixed-etiology leg ulcer. Data synthesis will be performed using a narrative summary and quantitative analysis.

Ethics and dissemination This systematic review does not require approval by ethics committee, as individual patient data will not be collected. Dissemination of findings will be through publications in peer-reviewed journal and/or via conference presentation.

PROSPERO registration number CRD42019127947

Strengths and limitations of this study

- To know the effectiveness of Unna boot dressing in the management of VLU will contribute to the use of a low-cost alternative to wound healing. VLUs has not been studied; our systematic review will be the first to answer the question.
- The eligibility criteria used may not result in the selection of studies that are homogeneous in methods, limiting the ability to draw reliable conclusions.
- Limitation: Only article published in English, Spanish and Portuguese will be considered.

BACKGROUND

CVI is a condition that affects the venous system of the lower limbs, resulting in pain, skin changes, and ulcerations (1). Abnormalities and weaknesses in the surface vein wall may hinder the blood flow from the deepest veins to the heart. In that case, venous valve insufficiency is the main cause of impaired flow in the deep veins of the lower limbs. When this problem occurs, the superficial veins become engorged with blood, and the walls become dilated and permeable to the release of substances normally contained in the vessel (2,3). Deep veins are most affected by acute obstruction (deep vein thrombosis) or chronic damage (stenosis, occlusion) caused by post-thrombotic changes or trauma (4-7).

Acute and chronic deep vein obstruction limits blood flow, resulting in increased venous pressure with muscle contraction and secondary muscle pump dysfunction (5-8). CVI can be diagnosed using ultrasound techniques to detect venous reflux and blood accumulation in the deep veins of the legs (4,5). External compressive therapy is recommended to reverse the high pressure of the venous system to prevent complications, such as VLU, or to improve venous return to close such ulcers. (7-9).

Compressive therapies can be elastic, inelastic and pneumatic. Among inelastic therapies, there are several brands available in the market, such as econo-paste® (Hartmann), gelocast (BSN medical®) Viscopaste® (Smith & Nephew) and Flexdress® (ConvaTec). These products, known as Unna Boot, are bandages consisting of a low compression gauze (18-24 mmHg) and impregnated with oxide of zinc, gum acacia, glycerol, castor oil and deionized water, resulting in a semi-solid mold for external compression (10,11).

Unna Boot is an inelastic compression therapy that acts to increase compression and promote drainage and venous support, improving healing of the ulcer (6,10,11). The compression during rest and muscle contraction, acts on the macrocirculation, increasing the venous return, and on the tissue pressure, supporting the reabsorption of the edema and the return of the fluids located in the interstitial spaces to the interior of the vascular and lymphatic system. This process promotes the healing of the lesion and prevents inflammation (7–9,11). According to studies, the use of the Unna boot is effective in promoting the satisfaction related to minimum wound care, rapid development of granulation tissue, improvement in comfort and cost savings compared to similar compressions (8,11).

This systematic review aims determine the effectiveness of Unna Boot in the treatment of wound healing of VLU by assessing the quality of the available evidence. Specific question addressed by the review is: Is the use of Unna Boot effective in the treatment of chronic VLU in adults?

METHODS

This protocol has been registered with the PROSPERO (CRD42019127947) and will be reported following the Preferred Reporting Items for Systematic Review and meta-Analysis Protocols (PRISMA) (12,13). This review will be report following standardized critical appraisal instruments from Joanna Briggs Institute (JBI) (14,15).

PATIENT AND PUBLIC INVOLVEMENT

No patients or public were directly involved in the development of this systematic review protocol.

SEARCH STRATEGIES

We will systematically and electronically conduct searches on the following databases: PubMed (1999- 2019), PubMed/PMC(1999- 2019), Virtual Health Library (BVS / BIREME) (1999- 2019), The Cumulative Index to Nursing and Allied Health Literature (CINAHL) (1999- 2019), Scopus (1999- 2019), Web of Science (1999-2019), MEDLINE (CAPES) (1999- 2019), Embase (1999- 2019), Cochrane Library (1999- 2019), ProQuest (1999- 2019), Brazilian Digital Library of Theses and Dissertations (BDTD) (1999- 2019), CAPES / Thesis and Dissertation Catalog (1999- 2019) Sao Paulo Research Foundation / Thesis and dissertation (1999-2019), OPEN THESIS (1999- 2019), A service of the U.S. National Institutes of Health (Clinical Trial) (1999- 2019), Centre for Reviews and Dissemination - University of York (1999- 2019), Scientific Electronic Library (SciELO) (1999- 2019).

SELECTION CRITERIA

The inclusion criteria will be: All human studies about inelastic compression therapy, treatment that combines zinc oxide paste and compression bandages for treating VLU; medical diagnosis of CVI by Doppler ultrasound examination.

The searches were conducted evaluating the period from January 2006 to January 2019.

STUDY DESIGN

To be included, studies need to be primary (original), Controlled Trials or Observational studies (cross sectional, case-control or longitudinal studies). These studies will be used to assessing the effectiveness of Unna Boot on the healing of VLU. Eligible studies must be in Portuguese, Spanish or English language.

TYPE OF PARTICIPANTS

The participants are all adult patients with VLU of any location and size. We will only accept studies in which authors used Doppler ultrasound to confirm wound etiology. The intervention of interest is Unna boot. We will exclude studies about leg ulceration of different causes, such as pressure, arterial, diabetic or mixed etiology leg ulcers.

INTERVENTION

The intervention will include Unna boot treatment of VLU. Information about the time of use, initial wound size, sociodemographic and clinical will be documented.

COMPARATOR

Studies comparing any other type of dressing, topical agent, placebo or standard treatment will be included in this review.

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ACKNOWLEDGEMENTS

Not applicable.

FUNDING

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COMPETING INTERESTS

The authors declare that they have no competing interests.

ETHICS AND DISSEMINATION

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		Reporting Item	Page Number
Title			
Identification	#1a	Identify the report as a protocol of a systematic review	01

Update	#1b	If the protocol is for an update of a previous systematic review, identify as such **none**
Registration		
	#2	If registered, provide the name of the registry (such as PROSPERO) and registration number **CRD42019127947**
Authors		
Contact	#3a	Provide name, institutional affiliation, e-mail address of all protocol authors; provide physical mailing address of corresponding author **title page**
Contribution	#3b	Describe contributions of protocol authors and identify the guarantor of the review **09**
Amendments		
	#4	If the protocol represents an amendment of a previously completed or published protocol, identify as such and list changes; otherwise, state plan for documenting important protocol amendments **none**
Support		
Sources	#5a	Indicate sources of financial or other support for the review **07**
Sponsor	#5b	Provide name for the review funder and / or sponsor **07**

Role of sponsor or funder	#5c	Describe roles of funder(s), sponsor(s), and / or institution(s), if any, in developing the protocol	07
Introduction			
Rationale	#6	Describe the rationale for the review in the context of what is already known	02
Objectives	#7	Provide an explicit statement of the question(s) the review will address with reference to participants, interventions, comparators, and outcomes (PICO)	03
Methods			
Eligibility criteria	#8	Specify the study characteristics (such as PICO, study design, setting, time frame) and report characteristics (such as years considered, language, publication status) to be used as criteria for eligibility for the review	03-04
Information sources	#9	Describe all intended information sources (such as electronic databases, contact with study authors, trial registers or other grey literature sources) with planned dates of coverage	03-04
Search strategy	#10	Present draft of search strategy to be used for at least one electronic database, including planned limits, such that it could be repeated	03-04

Study records - data management	#11a	Describe the mechanism(s) that will be used to manage records and data throughout the review	04
Study records - selection process	#11b	State the process that will be used for selecting studies (such as two independent reviewers) through each phase of the review (that is, screening, eligibility and inclusion in meta-analysis)	04
Study records - data collection process	#11c	Describe planned method of extracting data from reports (such as piloting forms, done independently, in duplicate), any processes for obtaining and confirming data from investigators	05-06
Data items	#12	List and define all variables for which data will be sought (such as PICO items, funding sources), any pre-planned data assumptions and simplifications	
Outcomes and prioritization	#13	List and define all outcomes for which data will be sought, including prioritization of main and additional outcomes, with rationale	04-05
Risk of bias in individual studies	#14	Describe anticipated methods for assessing risk of bias of individual studies, including whether this will be done at the outcome or study level, or both; state how this information will be used in data synthesis	06
Data synthesis	#15a	Describe criteria under which study data will be quantitatively synthesized	05-06

Data synthesis	#15b	If data are appropriate for quantitative synthesis, describe planned summary measures, methods of handling data and methods of combining data from studies, including any planned exploration of consistency (such as I2, Kendall's τ)	05-06
Data synthesis	#15c	Describe any proposed additional analyses (such as sensitivity or subgroup analyses, meta-regression)	05-06
Data synthesis	#15d	If quantitative synthesis is not appropriate, describe the type of summary planned	05-06
Meta-bias(es)	#16	Specify any planned assessment of meta-bias(es) (such as publication bias across studies, selective reporting within studies)	05-06
Confidence in cumulative evidence	#17	Describe how the strength of the body of evidence will be assessed (such as GRADE)	06

BMJ Open

ASSESSMENT OF THE USE OF UNNA BOOT IN THE TREATMENT OF CHRONIC VENOUS LEG ULCERS IN ADULTS: SYSTEMATIC REVIEW PROTOCOL

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ASSESSMENT OF THE USE OF UNNA BOOT IN THE TREATMENT OF CHRONIC VENOUS LEG ULCERS IN ADULTS: SYSTEMATIC REVIEW PROTOCOL

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ASSESSMENT OF THE USE OF UNNA BOOT IN THE TREATMENT OF CHRONIC VENOUS LEG ULCERS IN ADULTS: SYSTEMATIC REVIEW PROTOCOL

ABSTRACT

Introduction: Chronic venous insufficiency (CVI) is an anomaly of the normal functioning of the venous system caused by valvular incompetency with or without obstruction of venous flow. This condition can affect either or both of the superficial and the deep venous systems. Venous dysfunction can even result in congenital or acquired disorders, and its complications include venous leg ulcers (VLU). The objective of this systematic review is to determine the effectiveness of Unna Boot in the treatment of wound healing of VLU by assessing the quality of the available evidence.

Methods and analysis: A literature search in PubMed, CINAHL, Scopus, Web of Science, Cochrane Library, BVS/BIREME, Embase, ProQuest, BDTD, Thesis and Dissertation Catalog, Sao Paulo Research Foundation Research Foundation/Thesis and dissertation, OPEN THESIS, A service of the U.S. National Institute of Health, Center for Reviews and Dissemination-University of New York and SciElo published in the last 10 years, the period from January 1999 to March 2019. The review will include primary studies (original), and Controlled Trials or Observational studies (cross sectional, case-control or longitudinal studies) with VLU. Exclusion will include leg ulceration due to different causes, such as pressure, arterial, diabetic or mixed-etiology leg ulcer. Data synthesis will be performed using a narrative summary and quantitative analysis.

Ethics and dissemination This systematic review does not require approval by ethics committee, as individual patient data will not be collected. Dissemination of findings will be through publications in peer-reviewed journals and/or via conference presentation.

PROSPERO registration number CRD42019127947

Strengths and limitations of this study

- Knowing the effectiveness of Unna boot dressing in the management of VLU will contribute to the use of a low-cost alternative to wound healing. VLUs has not been studied; our systematic review will be the first to answer the question.
- The eligibility criteria used may not result in the selection of studies that are homogeneous in methods, limiting the ability to draw reliable conclusions.
- Limitation: Only article published in English, Spanish and Portuguese will be considered.

BACKGROUND

CVI is a condition that affects the venous system of the lower limbs, resulting in pain, skin changes and ulcerations (1). Abnormalities and weaknesses in the surface vein wall may hinder the blood flow from the deepest veins to the heart. In that case, venous valve insufficiency is the main cause of impaired flow in the deep veins of the lower limbs. When this problem occurs, the superficial veins become engorged with blood, and the walls become dilated and permeable to the release of substances normally contained in the vessel (2,3). Deep veins are most affected by acute obstruction (deep vein thrombosis) or chronic damage (stenosis, occlusion) caused by post-thrombotic changes or trauma (4-7).

Acute and chronic deep vein obstruction limits blood flow, resulting in increased venous pressure with muscle contraction and secondary muscle pump dysfunction (5-8). CVI can be diagnosed using ultrasound techniques to detect venous reflux and blood accumulation in the deep veins of the legs (4,5). External compressive therapy is recommended to reverse the high pressure of the venous system to prevent complications, such as VLU, or to improve venous return to close such ulcers. (7-9).

Compressive therapies can be elastic, inelastic and pneumatic. Among inelastic therapies, there are several brands available in the market, such as econo-paste® (Hartmann), gelocast (BSN medical®) Viscopaste® (Smith & Nephew) and Flexdress® (ConvaTec). These products, known as Unna Boot, are bandages consisting of a low compression gauze (18-24 mmHg) and impregnated with oxide of zinc, gum acacia, glycerol, castor oil, and deionized water, resulting in a semi-solid mold for external compression (10,11).

Unna Boot is an inelastic compression therapy that acts to increase compression and promote drainage and venous support, improving healing of the ulcer (6,10,11). The compression, during rest and muscle contraction, acts on the macrocirculation, increasing the venous return, and on the tissue pressure, supporting the reabsorption of the edema and the return of the fluids located in the interstitial spaces to the interior of the vascular and lymphatic system. This process promotes the healing of the lesion and prevents inflammation (7–9,11). According to studies, the use of the Unna boot is effective in promoting the satisfaction related to minimum wound care, rapid development of granulation tissue, improvement in comfort and cost savings compared to similar compressions (8,11).

This systematic review aims to determine the effectiveness of Unna Boot in the treatment of wound healing of VLU by assessing the quality of the available evidence. Specific question

addressed by the review is: Is the use of Unna Boot effective in the treatment of chronic VLU in adults?

METHODS

This protocol has been registered with the PROSPERO (CRD42019127947) and will be reported following the Preferred Reporting Items for Systematic Review and meta-Analysis Protocols (PRISMA) (12,13). This review will be report following standardized critical appraisal instruments from Joanna Briggs Institute (JBI) (14,15).

PATIENT AND PUBLIC INVOLVEMENT

No patients nor the general public were directly involved in the development of this systematic review protocol.

SEARCH STRATEGIES

We will systematically and electronically conduct searches on the following databases: PubMed (1999- 2019), PubMed/PMC(1999- 2019), Virtual Health Library (BVS / BIREME) (1999- 2019), The Cumulative Index to Nursing and Allied Health Literature (CINAHL) (1999- 2019), Scopus (1999- 2019), Web of Science (1999-2019), MEDLINE (CAPES) (1999- 2019), Embase (1999- 2019), Cochrane Library (1999- 2019), ProQuest (1999- 2019), Brazilian Digital Library of Theses and Dissertations (BDTD) (1999- 2019), CAPES / Thesis and Dissertation Catalog (1999- 2019) Sao Paulo Research Foundation / Thesis and dissertation (1999-2019), OPEN THESIS (1999- 2019), A service of the U.S. National Institutes of Health (Clinical Trial) (1999- 2019), Centre for Reviews and Dissemination - University of York (1999- 2019), Scientific Electronic Library (SciELO) (1999- 2019). The full search strategy is displayed in online supplementary file (appendix 1).

SELECTION CRITERIA

The inclusion criteria will be: All human studies about inelastic compression therapy, treatment that combines zinc oxide paste and compression bandages for treating VLU, and in which medical diagnosis of CVI by Doppler ultrasound examination was used.

The searches were conducted evaluating the period from January 1999 to March 2019.

STUDY DESIGN

To be included, studies need to be primary (original), Controlled Trials or Observational studies (cross sectional, case-control or longitudinal studies). These studies will be used to assessing the effectiveness of Unna Boot on the healing of VLU. Eligible studies must be in Portuguese, Spanish or English language.

TYPE OF PARTICIPANTS

The participants are all adult patients with VLU of any location and size. We will only accept studies in which authors used Doppler ultrasound to confirm wound etiology. The intervention of interest is Unna boot. We will exclude studies about leg ulceration of different causes, such as pressure, arterial, diabetic or mixed etiology leg ulcers.

INTERVENTION

The intervention will include Unna boot treatment of VLU. Information about the time of use, initial wound size, sociodemographic and clinical will be documented.

COMPARATOR

Studies comparing any other type of dressing, topical agent, placebo or standard treatment will be included in this review.

OUTCOME MEASURES

The primary outcome measures are the proportions of wounds with complete healing. We will consider the proportion of ulcers healed during follow-up and frequency of complete healing

during the study. The rate of adverse effects and events (e.g. the wound infection rate and signs and symptoms of clinical infection**)** will be documented**.** Additional outcome(s), such as Quality of life (measured using generic questionnaire or a disease-specific questionnaire), and Pain (e.g. at dressing change or over the course of treatment) will be only included in validated questionnaires or visual analogue scales. Change in ulcer size will be considered using data on the change (and percentage change) in ulcer size, with adjustment for baseline size (we will contact study authors to request adjusted means when not available).

STUDY SELECTION AND DATA MANAGEMENT

Two review authors will independently assess the titles and abstracts of studies found during the searches for potential inclusion in this review. Disagreements will be discussed during consensus meetings with a third review author. Potentially relevant studies will be examined in full by two review authors. The studies that meet the eligibility criteria will be included in the review. Disagreements will be discussed in consensus meetings with a third review author.

DATA EXTRACTION

For data extraction: extracted information will include the study setting, study characteristics (authors, year of publication, country of publication, study design), details of the intervention and control, research design, inclusion and exclusion, outcomes, characteristics of the examined patient demographics (number of subjects, gender, mean age, comorbidities, number of wounds treated), wound characteristics (mean wound duration, mean wound size) losses to follow-up, sensitivity analysis, author conclusions and conflicts of interest. The disease type and stages of VLU will be identified in the studies by clinical, etiological, anatomical and pathological elements (CEAP) for classification of chronic venous insufficiency (4), and an attempt will be made to identify whether the second component of compression was short-stretch or long-stretch bandage. The origin of the ulcer will be identified and grouped in primary, post-thrombotic

disease and recurrent as needed. Failed attempts will be discussed. Data extraction will again be performed independently by two reviewers, and any discrepancies will be resolved through group discussion.

ASSESSMENT OF RISK OF BIAS OF INCLUDED STUDIES

Two reviewers will independently assess the quality of the included studies by using the standardized critical appraisal instruments from the JBI (14,15). The instruments require the following data: title, authors, year of publication, journal, methodology, method, data analysis employed, configuration, geographical and cultural context, participants, interventions, main results and conclusions of authors and reviewers. After extracting the data, a level of credibility will be assigned to each finding, and the results will be synthetized through groups of data from primary studies. Disagreements between reviewers over the quality checklist will be resolved through discussion.

DATA ANALYSIS AND SYNTHESIS

Data synthesis will be performed using a narrative summary and quantitative analysis. A meta-analysis considering models of random-effects will be employed to compare among groups based on outcome variables, if studies included in the review disclose sufficient data.

DISCUSSION

This review aims to determine the effectiveness of Unna Boot of the treatment of wound healing in VLU. This assessment will be performed by evaluating the total proportion of completely closed wounds relative to that of the start of treatment. Although studies have shown good results with granulation tissue formation and wound healing (11,16), the effectiveness is currently unclear. To our knowledge, this is the first systematic review to evaluate the effectiveness of the Unna boot on wound healing. The result of this review may help health professionals and

educators recommend the use of inelastic compression for patients with VLU, especially where financial resources are scarce.

AUTHORS CONTRIBUTION

This study was conceptualized by MHML, TP, FCIC, and MGBS, PPA developed the search strategy. CSBP, MGBS, FA completed the search and drafted the protocol. APD, ARSO-K, MGBS and HCO critically appraised the protocol and also contributed to its development by revising subsequent versions. MHML; ARSO-K and HCO will contribute equally to the data collection and analysis, as well as the interpretation of the review. All authors will revise critically the review and will read and approved the final manuscript.

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Not applicable.

FUNDING

No funding was received for this study.

COMPETING INTERESTS

The authors declare that they have no competing interests.

ETHICS AND DISSEMINATION

This systematic review does not require approval by ethics committee, as individual patient data will not be collected. Dissemination of findings will be through publications in peer-reviewed journals and/or via conference presentation.

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Appendix 1

Supplementary file

We will systematically and electronically search the following data base:

PubMed (1999- 2019),PubMed/PMC(1999- 2019), Virtual Health Library (BVS / BIREME) (1999- 2019), The Cumulative Index to Nursing and Allied Health Literature (CINAHL) (1999- 2019), Scopus (1999- 2019), WEB OF SCIENCE (1999- 2019), MEDLINE (CAPES) (1999- 2019), Embase(1999- 2019), Cochrane Library (1999- 2019), ProQuest (1999- 2019), Brazilian Digital Library of Theses and Dissertations (BDTD) (1999- 2019), CAPES / Thesis and Dissertation Catalog (1999- 2019) Sao Paulo Research Foundation/ Thesis and dissertation (1999- 2019), OPEN OPEN THESIS (1999- 2019), A service of the U.S. National Institutes of Health (Clinical Trial) (1999- 2019), Centre for Reviews and Dissemination - University of York(1999- 2019),Scientific Electronic Library (SCIELO)(1999- 2019).

The search strategy will include only terms relating to or describing the intervention, as follow:

PubMed: ((((("Unna Boot") OR "Unna's boot") OR "Unna's paste") OR "Unna paste")) AND (((((Wound Healing[MeSH Terms]) OR "Wound Healing"[Title/Abstract]) OR "Healing, Wound"[Title/Abstract]) OR "Healings, Wound"[Title/Abstract]) OR "Wound Healings"[Title/Abstract])) AND ((((((((((((((((((((((((Varicose Ulcer[MeSH Terms]) OR "Varicose Ulcer"[Title/Abstract]) OR "Ulcer, Varicose"[Title/Abstract]) OR "Ulcers, Varicose"[Title/Abstract]) OR "Varicose Ulcers"[Title/Abstract]) OR "Venous Stasis Ulcers"[Title/Abstract]) OR "Stasis Ulcer, Venous"[Title/Abstract]) OR "Stasis Ulcers, Venous"[Title/Abstract]) OR "Ulcer, Venous Stasis"[Title/Abstract]) OR "Ulcers, Venous Stasis"[Title/Abstract]) OR "Venous Stasis Ulcer"[Title/Abstract]) OR "Venous Hypertension Ulcers"[Title/Abstract]) OR "Hypertension Ulcer, Venous"[Title/Abstract]) OR "Hypertension Ulcers, Venous"[Title/Abstract]) OR "Ulcer, Venous Hypertension"[Title/Abstract]) OR "Ulcers, Venous Hypertension"[Title/Abstract]) OR "Venous Hypertension Ulcer"[Title/Abstract]) OR "Venous Ulcer"[Title/Abstract]) OR "Ulcer, Venous"[Title/Abstract]) OR "Ulcers, Venous"[Title/Abstract]) OR "Venous Ulcers"[Title/Abstract]) OR "Stasis Ulcer"[Title/Abstract]) OR "Stasis Ulcers"[Title/Abstract]) OR "Ulcer, Stasis"[Title/Abstract]) OR "Ulcers, Stasis"[Title/Abstract])),

PubMed/PMC: ((((((("Unna Boot") OR "Unna's boot") OR "Unna's paste") OR "Unna paste")) AND (((((Wound Healing[MeSH Terms]) OR "Wound Healing"[Title/Abstract]) OR "Healing, Wound"[Title/Abstract]) OR "Healings, Wound"[Title/Abstract]) OR "Wound Healings"[Title/Abstract])) AND ((((((((((((((((((((((((Varicose Ulcer[MeSH Terms]) OR "Varicose Ulcer"[Title/Abstract]) OR "Ulcer, Varicose"[Title/Abstract]) OR "Ulcers, Varicose"[Title/Abstract]) OR "Varicose Ulcers"[Title/Abstract]) OR "Venous Stasis Ulcers"[Title/Abstract]) OR "Stasis Ulcer, Venous"[Title/Abstract]) OR "Stasis Ulcers, Venous"[Title/Abstract]) OR "Ulcer, Venous Stasis"[Title/Abstract]) OR "Ulcers, Venous Stasis"[Title/Abstract]) OR "Venous Stasis Ulcer"[Title/Abstract]) OR "Venous Hypertension Ulcers"[Title/Abstract]) OR "Hypertension Ulcer, Venous"[Title/Abstract]) OR "Hypertension Ulcers, Venous"[Title/Abstract]) OR "Ulcer, Venous Hypertension"[Title/Abstract]) OR "Ulcers, Venous Hypertension"[Title/Abstract]) OR "Venous Hypertension Ulcer"[Title/Abstract]) OR "Venous Ulcer"[Title/Abstract]) OR "Ulcer, Venous"[Title/Abstract]) OR "Ulcers, Venous"[Title/Abstract]) OR "Venous Ulcers"[Title/Abstract]) OR "Stasis Ulcer"[Title/Abstract]) OR "Stasis Ulcers"[Title/Abstract]) OR "Ulcer, Stasis"[Title/Abstract]) OR "Ulcers, Stasis"[Title/Abstract])),

Virtual Health Library (BVS / BIREME): (tw:("Unna Boot" OR "Unna's boot" OR "Unna's paste" OR "Unna paste" OR "Bota de Unna" OR "Bota de Unna")) AND (tw:("Wound Healing" OR "Cicatrización de Heridas" OR cicatrização)) AND (tw:("Varicose Ulcer" OR "Úlcera Varicosa" OR "Úlcera Varicosa")) AND (instance:"regional"),

CINAHL: "Unna Boot" OR "Unna's boot" OR "Unna's paste" OR "Unna paste" AND (MH "Wound Healing") OR "Wound Healing" OR "Healing, Wound" OR "Healings, Wound" OR "Wound Healings" AND (MH "Venous Ulcer") OR Varicose Ulcer OR "Ulcer, Varicose" OR "Ulcers, Varicose" OR "Varicose Ulcers" OR "Venous Stasis Ulcers" OR "Stasis Ulcer, Venous" OR "Stasis Ulcers, Venous" OR "Ulcer, Venous Stasis" OR "Ulcers, Venous Stasis" OR "Venous Stasis Ulcer' OR "Venous Hypertension Ulcers" OR "Hypertension Ulcer, Venous" OR "Hypertension Ulcers, Venous" OR "Ulcer, Venous Hypertension" OR "Ulcers, Venous Hypertension" OR "Venous Hypertension Ulcer" OR "Venous Ulcer Ulcer, Venous" OR "Ulcers, Venous"

OR "Venous Ulcers" OR "Stasis Ulcer" OR "Stasis Ulcers" OR "Ulcer, Stasis" OR "Ulcers, Stasis",

Scopus: ((ALL ("Unna Boot" OR "Unna's boot" OR "Unna's paste" OR "Unna paste")) AND (TITLE-ABS-KEY (bandages OR bandage OR dressings OR dressing))) AND (TITLE-ABS-KEY ("Wound Healing" OR "Healing, Wound" OR "Healings, Wound" OR "Wound Healings")) AND (TITLE-ABS-KEY ("Varicose Ulcer" OR "Ulcer, Varicose" OR "Ulcers, Varicose" OR "Varicose Ulcers" OR "Venous Stasis Ulcers" OR "Stasis Ulcer, Venous" OR "Stasis Ulcers, Venous" OR "Ulcer, Venous Stasis" OR "Ulcers, Venous Stasis" OR "Venous Stasis Ulcer" OR "Venous Hypertension Ulcers" OR "Hypertension Ulcer, Venous" OR "Hypertension Ulcers, Venous" OR "Ulcer, Venous Hypertension" OR "Ulcers, Venous Hypertension" OR "Venous Hypertension Ulcer" OR "Venous Ulcer Ulcer, Venous" OR "Ulcers, Venous" OR "Venous Ulcers" OR "Stasis Ulcer" OR "Stasis Ulcers" OR "Ulcer, Stasis" OR "Ulcers, Stasis")),

WEB OF SCIENCE: TÓPICO: ("Unna Boot" OR "Unna's boot" OR "Unna's paste" OR "Unna paste")Índices=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Tempo estipulado=Todos os anos AND TÓPICO: ("Wound Healing" OR "Healing, Wound" OR "Healings, Wound" OR "Wound Healings")Índices=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH, ESCI Tempo estipulado=Todos os anos AND TÓPICO: ("Varicose Ulcer" OR "Ulcer, Varicose" OR "Ulcers, Varicose" OR "Varicose Ulcers" OR "Venous Stasis Ulcers" OR "Stasis Ulcer, Venous" OR "Stasis Ulcers, Venous" OR "Ulcer, Venous Stasis" OR "Ulcers, Venous Stasis" OR "Venous Stasis Ulcer" OR "Venous Hypertension Ulcers" OR "Hypertension Ulcer, Venous" OR "Hypertension Ulcers, Venous" OR "Ulcer, Venous Hypertension" OR "Ulcers, Venous Hypertension" OR "Venous Hypertension Ulcer" OR "Venous UlcerUlcer, Venous" OR "Ulcers, Venous" OR "Venous Ulcers" OR "Stasis Ulcer" OR "Stasis Ulcers" OR "Ulcer, Stasis" OR "Ulcers, Stasis")

MEDLINE (CAPES): ("Unna Boot" or "Unna's boot" or "Unna's paste" or "Unna paste").af. AND Wound Healing.mp. or exp *Wound Healing/ OR ("Wound Healing" or "Healing, Wound" or "Healings, Wound" or "Wound Healings").af. AND "Varicose Ulcer".mp. or exp *Varicose Ulcer/ OR ("Varicose Ulcer" or "Ulcer, Varicose" or

"Ulcers, Varicose" or "Varicose Ulcers" or "Venous Stasis Ulcers" or "Stasis Ulcer, Venous" or "Stasis Ulcers, Venous" or "Ulcer, Venous Stasis" or "Ulcers, Venous Stasis" or "Venous Stasis Ulcer" or "Venous Hypertension Ulcers" or "Hypertension Ulcer, Venous" or "Hypertension Ulcers, Venous" or "Ulcer, Venous Hypertension" or "Ulcers, Venous Hypertension" or "Venous Hypertension Ulcer" or "Venous Ulcer Ulcer, Venous" or "Ulcers, Venous" or "Venous Ulcers" or "Stasis Ulcer" or "Stasis Ulcers" or "Ulcer, Stasis" or "Ulcers, Stasis"),

Embase: ('unna boot'/exp OR 'unna boot'/syn OR 'unna boot':ti,ab,kw) AND ('wound healing'/exp OR 'wound healing'/syn OR 'wound healing':ti,ab,kw) AND ('varicosis'/exp OR 'varicosis'/syn OR 'varicosis'),

Cochrane Library: ("Unna Boot" OR "Unna's boot" OR "Unna's paste" OR "Unna paste" OR "Bota de Unna") OR ("Unna Boot" OR "Unna's boot" OR "Unna's paste" OR "Unna paste" OR "Bota de Unna"):ti,ab,kw) AND ("wound healing" OR "healing, wound" OR "healings, wound" OR "wound healings") OR ("wound healing" OR "healing, wound" OR "healings, wound" OR "wound healings"):ti,ab,kw) AND ("Varicose Ulcer" OR "Ulcer, Varicose" OR "Ulcers, Varicose" OR "Varicose Ulcers" OR "Venous Stasis Ulcers" OR "Stasis Ulcer, Venous" OR "Stasis Ulcers, Venous" OR "Ulcer, Venous Stasis" OR "Ulcers, Venous Stasis" OR "Venous Stasis Ulcer" OR "Venous Hypertension Ulcers" OR "Hypertension Ulcer, Venous" OR "Hypertension Ulcers, Venous" OR "Ulcer, Venous Hypertension" OR "Ulcers, Venous Hypertension" OR "Venous Hypertension Ulcer" OR "Venous Ulcer Ulcer, Venous" OR "Ulcers, Venous" OR "Venous Ulcers" OR "Stasis Ulcer" OR "Stasis Ulcers" OR "Ulcer, Stasis" OR "Ulcers, Stasis") OR ("Varicose Ulcer" OR "Ulcer, Varicose" OR "Ulcers, Varicose" OR "Varicose Ulcers" OR "Venous Stasis Ulcers" OR "Stasis Ulcer, Venous" OR "Stasis Ulcers, Venous" OR "Ulcer, Venous Stasis" OR "Ulcers, Venous Stasis" OR "Venous Stasis Ulcer" OR "Venous Hypertension Ulcers" OR "Hypertension Ulcer, Venous" OR "Hypertension Ulcers, Venous" OR "Ulcer, Venous Hypertension" OR "Ulcers, Venous Hypertension" OR "Venous Hypertension Ulcer" OR "Venous UlcerUlcer, Venous" OR "Ulcers, Venous" OR "Venous Ulcers" OR "Stasis Ulcer" OR "Stasis Ulcers" OR "Ulcer, Stasis" OR "Ulcers, Stasis"),

ProQuest:("Unna Boot" OR "Unna's boot" OR "Unna's paste") AND ("Wound Healing" OR "Healing, Wound" OR "Healings, Wound" OR "Wound Healings") AND ("Varicose Ulcer" OR "Ulcer, Varicose" OR "Ulcers, Varicose" OR "Varicose Ulcers" OR "Venous Stasis Ulcers" OR "Stasis Ulcer, Venous" OR "Stasis Ulcers, Venous" OR "Ulcer, Venous Stasis" OR "Ulcers, Venous Stasis" OR "Venous Stasis Ulcer" OR "Venous Hypertension Ulcers" OR "Hypertension Ulcer, Venous" OR "Hypertension Ulcers, Venous" OR "Ulcer, Venous Hypertension" OR "Ulcers, Venous Hypertension" OR "Venous Hypertension Ulcer" OR "Venous Ulcer Ulcer, Venous" OR "Ulcers, Venous" OR "Venous Ulcers" OR "Stasis Ulcer" OR "Stasis Ulcers" OR "Ulcer, Stasis" OR "Ulcers, Stasis")

BDTD:"Bota de Unna" AND Cicatrização AND "Úlcera Varicosa",

Thesis and Dissertation Catalog: "Bota de Unna" AND Cicatrização AND "Úlcera Varicosa",

Sao Paulo Research Foundation/ Thesis and dissertation: "Bota de Unna" AND Cicatrização AND "Úlcera Varicosa",

OPEN THESIS: ("Unna Boot" OR "Unna's boot" OR "Unna's paste" OR "Unna paste") AND "Wound Healing" AND "Varicose Ulcer", Clinical Trial:"Unna Boot" OR "Unna's boot" OR "Unna's paste" OR "Unna paste" AND "Wound Healing" AND "Varicose Ulcer",

Centre for Reviews and Dissemination - University of York: ("Unna Boot" OR "Unna's boot" OR "Unna's paste" OR "Unna paste") AND ("Wound Healing" OR "Healing, Wound" OR "Healings, Wound" OR "Wound Healings") AND ("Varicose Ulcer" OR "Ulcer, Varicose" OR "Ulcers, Varicose" OR "Varicose Ulcers" OR "Venous Stasis Ulcers" OR "Stasis Ulcer, Venous" OR "Stasis Ulcers, Venous" OR "Ulcer, Venous Stasis" OR "Ulcers, Venous Stasis" OR "Venous Stasis Ulcer" OR "Venous Hypertension Ulcers" OR "Hypertension Ulcer, Venous" OR "Hypertension Ulcers, Venous" OR "Ulcer, Venous Hypertension" OR "Ulcers, Venous Hypertension" OR "Venous Hypertension Ulcer" OR "Venous UlcerUlcer, Venous" OR "Ulcers, Venous" OR "Venous Ulcers" OR "Stasis Ulcer" OR "Stasis Ulcers" OR "Ulcer, Stasis" OR "Ulcers, Stasis"),

Scientific Eletronic Library Online (SCIELO): ("Unna Boot" OR "Unna's boot" OR "Unna's paste" OR "Unna paste" OR "Bota de Unna" OR "Bota de Unna") AND ("Wound Healing" OR "Cicatrización de Heridas" OR Cicatrização) AND ("Varicose Ulcer" OR "Úlcera Varicosa" OR "Úlcera Varicosa")