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The use of compression therapy to treat limb wounds across Europe: a scoping review protocol

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The use of compression therapy to treat limb wounds across Europe: a scoping review protocol

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Abstract

Introduction:
Poor lower wound care is an avoidable patient harm. Compression therapy is an effective way of treating lower limbs wounds, but there it is not always used appropriately. There are many guidelines which set out how compression therapy should be used, but there is dearth of evidence about how it is actually used at a population level across Europe.

Aim:
The aim of this scoping review is to map the evidence relating to the use, misuse, and non-use of compression therapy to treat lower limb wounds across Europe.

Methods:
This scoping review will be conducted in line with the Joanna Briggs Institute and Preferred Items for Systematic Reviews and Meta-Analyses for Protocols and Scoping Reviews (PRISMA-ScR) guidance. A search for relevant publications will be conducted on variety of databases and key websites in order to identify a comprehensive range of relevant literature. Peer reviewed empirical papers, theoretical papers and other publications relating to the use of compression therapy across Europe will be considered for inclusion.

Ethics and dissemination:
Ethical and research governance for this scoping review is not required because we will only gather secondary data. Our results will be disseminated to the widest possible audience through an open access paper in a peer reviewed international journal, conference presentations, and a plain English summary. The results of this scoping review will be used by a panel of key opinion leaders from across Europe to develop a driver diagram to underpin subsequent lower limb wound care improvement efforts.

Strengths and limitations

- This protocol sets out the first scoping review that will systematically map evidence relating to the use of compression therapy for lower limb wound healing across Europe
- This scoping review will utilise a detailed search strategy designed to identify a comprehensive range of published peer reviewed publications and grey literature
- We will adhere to the best practice in conducting scoping reviews as set out by the Joanna Briggs Institute and the Preferred Items for Systematic Reviews for Scoping Reviews (PRISMA-ScR) guidance
- Only studies published in English will be included and therefore, this scoping review will not be able to provide an insight into publications in other languages
- The quality of evidence that we retrieve will not be assessed as this is a scoping review

Introduction

Poor lower limb wound care is an avoidable patient harm which has an adverse impact on a patient's quality of life and health care related outcomes (1, 2). One aspect of lower limb wound care that can be improved is the appropriate use of compression therapy (2). There are a variety of guidelines (3-5) which explain how compression therapy should be used to treat lower limb wounds. However, there have been some reports (6, 7) of the inappropriate use of compression therapy to treat venous leg ulcers and diabetic foot ulcers. There are also some anecdotal reports (1, 2) of compression therapy not being used to treat lower limb wounds for a variety of reasons including the view that patients refuse to have or cannot tolerate this treatment. The reported issues in the use of compression therapy contravene the global focus on universal health coverage (8) that improves population health and fosters the sustainable development of nations. Universal health coverage can only be achieved through the delivery of safe, fair, just affordable and equitable care (8). Therefore, it is it is vital that evidence-based compression therapy related improvement interventions are implemented to achieve lower limb wound care related universal coverage by reducing unwarranted variation.

Healthcare is delivered in systems that are complex and adaptive, therefore it is vital that quality improvement efforts are informed by theory and designed to improve practice at a system level (9, 10). The patient trajectory in healthcare is such that there are some aspects of care delivery which are uncertain and emergent (10-12). Healthcare is delivered in a pressurised context with a complex adaptive ecology (13-15) with emergent, uncertain elements arising from the contingencies of clinical practice (12) which can be codified, convoluted or concatenated. Consequently, healthcare delivery is predicated on a combination of formal processes and structures such as policies as well as negotiations and adaptation throughout the patient care trajectory (10, 12). Emergent aspects of healthcare organisation often exist outside of formal management structures and tend to be overlooked in managerial narratives and improvement efforts (10, 12). Emergent aspects of healthcare are often tacit and are sometimes referred to as *'fugitive knowledge'* or *'soft intelligence'* because they exist outside of formal knowledge systems and structures (16).

Healthcare systems are inherently fractal and self-similar, so improvement efforts need to be cognisant of individual, social and cultural factors that are at play in any given context (17, 18). There is also an emerging consensus that healthcare improvement efforts can only be effective when there is due awareness and recognition of the emergent, negotiated and tacit aspects that are inherent in the complexity of clinical practice (10). The most effective quality improvement interventions provide a set of principles that can be adapted and utilised to improve the quality of care in different contexts (9, 10). Given the harm that can be caused by poor lower limb wound care, there is an urgent need to identify the best available empirical evidence, relevant theory and other publications that can be used at a system level to improve the use of compression therapy in different contexts. It is important to scope the theoretical evidence and other evidence such as opinion papers on compression therapy given the emergent aspects of healthcare systems which are often tacit and are less likely to be established through formal means such as empirical studies.

Aim

There is a dearth of evidence on the use of compression therapy at a population level from across Europe. We intend to address this gap in wider literature in this scoping review by mapping the

literature relating to the use, misuse or non-use of compression therapy in lower limb wound healing. In order to achieve this aim, we intend to answer a sextuplet of related research questions (RQs), which are yet to be addressed in wider literature about compression therapy i.e.:

RQ1: What is the evidence about the use, misuse or non-use of high compression therapy and reduced compression therapy in lower limb wound healing across Europe?
RQ2: What factors influence the use of high compression therapy and reduced compression therapy in lower limb wound healing across Europe?
RQ3: What guidance is used to inform the use of high compression therapy and reduced compression therapy in lower limb wound healing across Europe?
RQ4: What are the barriers and facilitators related to the appropriate use of high compression therapy and reduced compression therapy in lower limb wound healing across Europe?
RQ5: What if any narratives about the use of high compression therapy and reduced compression therapy influence how they are used in patient care?

Methods

Design

We will undertake a scoping review in line with Joanna Briggs Institute (JBI) methods (19) as well as Preferred Items for Systematic Reviews and Meta-Analyses for Protocols and Scoping Reviews (PRISMA-ScR) guidance (20).

Search strategy and information sources

A three-step search for relevant published and unpublished literature will be conducted according the JBI methods (21). The initial search will be undertaken on PubMed and CINAHL to identify key search terms and Medical Subject Headings (MeSH) that can be used to obtain literature on the use, misuse or non-use of compression therapy to treat lower limb wounds. In the second stage of the literature search, our strategy and search terms will be adapted for each database or website. In this stage, we will search for relevant literature will be on EMBASE, Applied Social Sciences Index and Abstracts (ASSIA), Web of Science, Turning Research into Practice (TRiP), the Cochrane library and the JBI database of systematic reviews and evidence Syntheses. We will also search for relevant literature on key sites including Google Scholar, Ethos, OpenGrey, ProQuest Dissertations and Theses, in addition to hand searching the latest editions of relevant journals. In the final stage of the search, we will undertake back and forward chaining in order to identify any additional published or unpublished literature.

Screening and selection

All of retrieved citations will be exported to the review software Rayyan (22), in which any duplicates will be removed. The titles and abstracts of the remaining citations will be independently assessed against the inclusion criteria by two members of the project team (RS and NC). In cases where there is doubt about whether to consider a paper for inclusion, the full text of that publication will be

retrieved. Any differences of opinion about the inclusion of a paper in this scoping review will be resolved by an independent third reviewer (AH).

Inclusion and exclusion criteria

We will include published and unpublished literature on compression therapy from 1990 onwards in this scoping review. The first European studies and guidelines on the use of compression therapy were published were published in the 1990's (23-26), so we will search for literature published from the start of this decade. Only literature published in English will be considered for inclusion as there is no facility for translation. Our inclusion criteria for this scoping review are summarised in Table 1.

Table 1: Inclusion criteria

Population	Concept	Context	Type of studies and papers
Adults with lower limb wounds in Europe	Compression therapy or high compression therapy or reduced compression therapy	Hospital or Secondary care or Tertiary care or community or primary care or care home or nursing home or residential home or sheltered accommodation or hospice	Qualitative studies, quantitative studies, mixed method studies, Systematic reviews, Quality Improvement projects, audits, discussion papers, editorials guidelines, consensus statements, policies, case studies, opinion papers

Data extraction

We have developed a specially designed data extraction table for this scoping review to gather relevant information from each publication (see Appendix 1). As per JBI guidance (19), this data extraction tool maybe further refined and developed as the scoping review progresses. The authors of any publications with missing data will be conducted for further information by the project team where possible. In line with the principles of a scoping review, data will be extracted from all included publications irrespective of their quality. The data extraction will be undertaken by two members of the project team (RS & NC) to ensure that relevant data is extracted in appropriate manner. Any differences of opinion will be recorded and resolved by the third reviewer (AH).

Data presentation

The process by which publications are selected for inclusion in this scoping review will be summarised in a PRISMA flowchart (19). Pertinent data from included publications will be tabulated

in relation key concepts in the inclusion criteria, i.e. population, concept and context. Data will be tabulated and presented in a narrative format with accompanying text describing the relationship to the review questions.

Patient and Public involvement

The development and design of this scoping review protocol was not directly informed by patients or members of the public given our focus the use of compression therapy as an intervention to promote lower limb wound healing. However, the quality and safety of patient care with regard to the use of compression therapy to promote wound healing in the lower limb is a key focus in this scoping review.

Ethics and dissemination

Ethical and research governance approval is not required as we will be conducting a scoping review that will not gather any primary data. To the best of our knowledge, this is the first scoping review that has sought to establish what is known about the use of compression therapy for lower limb wound healing across Europe. Our scoping review will map what is known about the use, misuse or non-use of compression therapy to promote lower limb wound healing across Europe. Consequently, the results of this scoping review will be of interest to an international audience of healthcare professionals who are keen to improve the quality of lower limb wound care at a population level.

We intend to share the result of this scoping review with the widest possible audience. The results of this study will be disseminated via conference presentations, a peer- reviewed open access international journal publication and a report. A plain English summary of our results will also be prepared so that it can be translated and disseminated to people with lower limb wounds and their families across Europe. Our results will also be shared online via the European Wound Management Association website. We also intend for the findings of this scoping review to be used to inform efforts to improve the use of compression therapy in order to deliver the best possible patient outcomes across Europe. To this end, we will host a meeting of an interprofessional pan European key opinion leaders at the next European Management Wound Association conference to discuss our results in relation to expert opinion, and to identify key change concepts that can be integrated into a programme theory, in the form of a driver diagram (27, 28), to underpin future improvement initiatives.

Funding statement

This scoping review is a part of the European Wound Management Association compression therapy quality improvement project. This compression therapy quality improvement project is funded through an unrestricted educational grant from Essity, Hartmann and Urgo Medical. However, the views and opinions expressed therein are those of the authors, and do not necessarily reflect those of the European Wound Management Association, Essity, Hartmann or Urgo Medical. No funding bodies had any role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Competing interest statement

One of the authors, NC is employed by the European Wound Management Association. This scoping review is a part of the European Wound Management Association compression therapy quality improvement project funded through an unrestricted educational grant from Essity, Hartmann and Urgo Medical.

Acknowledgments

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Author Contributions

The scoping review was conceived and designed by RS. This study will be undertaken by RS, NC and AH. Data collected by RS, NC. Data analysis and interpretation conducted by RS, NC and AH. First draft of manuscript was written by RS. Authors who contributed to the writing of the manuscript: RS, NC and AH. ICMJE criteria for authorship met by: RS, NC and AH. Read and approved the manuscript as submitted: RS, NC and AH.

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Appendix 1: Data extraction form

Review details	
Reference ID:	Reviewer:
First Author:	Year:
Country:	

Study Details		
	Tick relevant box	
Inclusion criteria	**Yes**	**No**
Published in English		
Population		
Adult ≥ 18 years		
Lower Limb wounds e.g. venous leg ulcers, diabetic foot ulcers etc.		
Concept		
Compression therapy		
High compression therapy		
Reduced compression therapy		
Context		
Hospital		
Secondary care		
Tertiary care		
Community		
Primary care		
Care home		
Nursing home		
Residential home		
Sheltered accommodation		
Hospice		
Other		

Outcome			
		Tick relevant box	
		Yes	**No**
	Included in review		
	Included for background		
	Included for further discussion		
	Rationale for exclusion (if relevant)		

Study/Paper details					
Type of paper:					
Systematic Review or Meta-Analysis	Narrative review	Research study	Other		
☐	☐	☐	☐		
Study/Paper setting:					
Tertiary care setting	Secondary care setting	Primary care setting	Other setting	Mix/unclear	
☐	☐	☐	☐	☐	
Type of study participants recruited to:					
RCT	Pre/post	Qualitative	Survey	Other	Mix/unclear
☐	☐	☐	☐	☐	☐
Provide more detail here if the study is other or mix/unclear:					
Type or participants recruited (*tick all that apply*):					
Adults ≥ 18 years	Older people≥ 65 years	Considered a 'vulnerable' or hard to reach population	Not Applicable		
☐	☐	☐	☐		
Specify vulnerabilities or nature of population (if appropriate):					
Focus of results with regards to be use of compression therapy (*tick all that apply*):					
Use	Misuse	Non-use			
☐	☐	☐			
Details of results					

Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	1
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	4
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	4-5
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	Not applicable. This paper sets out the protocol
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	6
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	5
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	5
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	6
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	6
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	Not applicable
Critical appraisal of individual	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe	Not applicable

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
sources of evidence§		the methods used and how this information was used in any data synthesis (if appropriate).	
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	6
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	Not applicable
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	Not applicable
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	Not applicable
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	Not applicable
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	Not applicable
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	Not applicable
Limitations	20	Discuss the limitations of the scoping review process.	Not applicable
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	Not applicable
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	8

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

From: Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA Extension for Scoping Reviews (PRISMAScR): Checklist and Explanation. Ann Intern Med. 2018;169:467–473. doi: 10.7326/M18-0850.

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Abstract

Introduction:
Poor lower wound care is an avoidable patient harm. Compression therapy is an effective way of treating non-ischaemic lower limbs wounds, but there it is not always used appropriately. There are many guidelines which set out how compression therapy should be used, but there is dearth of evidence about how it is actually used at a population level across Europe.

Aim:
The aim of this scoping review is to map the evidence published in English relating to the use of compression therapy to treat lower limb wounds across Europe.

Methods:
This scoping review will be conducted in line with the Joanna Briggs Institute and Preferred Items for Systematic Reviews and Meta-Analyses for Protocols and Scoping Reviews (PRISMA-ScR) guidance. A search for relevant publications will be conducted on variety of databases and key websites in order to identify a comprehensive range of relevant literature. Peer reviewed empirical papers, theoretical papers and other publications in English relating to the use of compression therapy across Europe will be considered for inclusion.

Ethics and dissemination:
Ethical and research governance for this scoping review is not required because we will only gather secondary data. Our results will be disseminated to the widest possible audience through an open access paper in a peer reviewed international journal, conference presentations, and a plain English summary. The results of this scoping review will be used by a panel of key opinion leaders from across Europe to develop a driver diagram to underpin subsequent lower limb wound care improvement efforts.

Strengths and limitations

- This protocol sets out the first scoping review that will systematically map evidence published in English relating to the use of compression therapy for lower limb wound healing across Europe
- This scoping review will utilise a detailed search strategy designed to identify a comprehensive range of published peer reviewed publications and grey literature in English
- We will adhere to the best practice in conducting scoping reviews as set out by the Joanna Briggs Institute and the Preferred Items for Systematic Reviews for Scoping Reviews (PRISMA-ScR) guidance
- Only studies published in English will be included and therefore, this scoping review will provide an insight into what is published in English about use of compression in Europe, but will not establish the actuality of use because it will not include non-English language publications.
- The quality of evidence that we retrieve will not be assessed as this is a scoping review

Introduction

Poor lower limb wound care is an avoidable patient harm which has an adverse impact on a patient's quality of life and health care related outcomes (1, 2). One aspect of lower limb wound care that can be improved is the appropriate use of compression therapy (2). There are a variety of guidelines (3-5) which explain how compression therapy should be used to treat non-ischaemic lower limb wounds. However, there have been some reports (6, 7) of the inappropriate use of compression therapy to treat venous leg ulcers and diabetic foot ulcers. There are also some anecdotal reports (1, 2) of compression therapy not being used to treat lower limb wounds for a variety of reasons including the view that patients refuse to have or cannot tolerate this treatment. The reported issues in the use of compression therapy contravene the global focus on universal health coverage (8) that improves population health and fosters the sustainable development of nations. Universal health coverage can only be achieved through the delivery of safe, fair, just affordable and equitable care (8). Therefore, it is it is vital that evidence-based compression therapy related improvement interventions are implemented to achieve lower limb wound care related universal coverage by reducing unwarranted variation.

Healthcare is delivered in systems that are complex and adaptive, therefore it is vital that quality improvement efforts are informed by theory and designed to improve practice at a system level (9, 10). The patient trajectory in healthcare is such that there are some aspects of care delivery which are uncertain and emergent (10-12). Healthcare is delivered in a pressurised context with a complex adaptive ecology (13-15) with emergent, uncertain elements arising from the contingencies of clinical practice (12) which can be codified, convoluted or concatenated. Consequently, healthcare delivery is predicated on a combination of formal processes and structures such as policies as well as negotiations and adaptation throughout the patient care trajectory (10, 12). Emergent aspects of healthcare organisation often exist outside of formal management structures and tend to be overlooked in managerial narratives and improvement efforts (10, 12). Emergent aspects of healthcare are often tacit and are sometimes referred to as *'fugitive knowledge'* or *'soft intelligence'* because they exist outside of formal knowledge systems and structures (16).

Healthcare systems are inherently fractal and self-similar, so improvement efforts need to be cognisant of individual, social and cultural factors that are at play in any given context (17, 18). There is also an emerging consensus that healthcare improvement efforts can only be effective when there is due awareness and recognition of the emergent, negotiated and tacit aspects that are inherent in the complexity of clinical practice (10). The most effective quality improvement interventions provide a set of principles that can be adapted and utilised to improve the quality of care in different contexts (9, 10). Given the harm that can be caused by poor lower limb wound care, there is an urgent need to identify the best available empirical evidence, relevant theory and other publications that can be used at a system level to improve the use of compression therapy in different contexts. It is important to scope the theoretical evidence and other evidence such as opinion papers on compression therapy given the emergent aspects of healthcare systems which are often tacit and are less likely to be established through formal means such as empirical studies.

Aim

There is a dearth of evidence on the use of compression therapy at a population level from across Europe. We intend to address this gap in wider literature in this scoping review by mapping the

English language publications relating to the use of compression therapy in lower limb wound healing. In order to achieve this aim, we intend to answer five related research questions (RQs), which are yet to be addressed in wider literature about compression therapy i.e.:

RQ1: What is the evidence published in English about the use of high compression therapy and reduced compression therapy in lower limb wound healing across Europe?
RQ2: What factors are reported to influence the use of high compression therapy and reduced compression therapy in lower limb wound healing across Europe?
RQ3: What guidance is used to inform the use of high compression therapy and reduced compression therapy in lower limb wound healing across Europe?
RQ4: What are the barriers and facilitators related to the appropriate use of high compression therapy and reduced compression therapy in lower limb wound healing across Europe?
RQ5: What if any narratives about the use of high compression therapy and reduced compression therapy influence how they are used in patient care?

Methods

Design

We will undertake a scoping review in line with Joanna Briggs Institute (JBI) methods (19) as well as Preferred Items for Systematic Reviews and Meta-Analyses for Protocols and Scoping Reviews (PRISMA-ScR) guidance (20).

Search strategy and information sources

A three-step search for relevant published and unpublished literature will be conducted according the JBI methods (21). The initial search will be undertaken on PubMed and CINAHL to identify key search terms and Medical Subject Headings (MeSH) that can be used to obtain literature on the use, misuse or non-use of compression therapy to treat lower limb wounds. In the second stage of the literature search, our strategy and search terms will be adapted for each database or website. In this stage, we will search for relevant literature will be on EMBASE, Applied Social Sciences Index and Abstracts (ASSIA), Web of Science, Turning Research into Practice (TRiP), the Cochrane library and the JBI database of systematic reviews and evidence Syntheses. We will also search for relevant literature on key sites including Google Scholar, Ethos, OpenGrey, ProQuest Dissertations and Theses, in addition to hand searching the latest editions of relevant journals. In the final stage of the search, we will undertake back and forward chaining in order to identify any additional published or unpublished literature.

Screening and selection

All of retrieved citations will be exported to the review software Rayyan (22), in which any duplicates will be removed. The titles and abstracts of the remaining citations will be independently assessed against the inclusion criteria by two members of the project team (RS and NC). In cases where there is doubt about whether to consider a paper for inclusion, the full text of that publication will be

retrieved. Any differences of opinion about the inclusion of a paper in this scoping review will be resolved by an independent third reviewer (AH).

Inclusion and exclusion criteria

We will include published and unpublished literature on compression therapy from 1990 onwards in this scoping review. The first European studies and guidelines on the use of compression therapy were published were published in the 1990's (23-26), so we will search for literature published from the start of this decade. Only literature published in English will be considered for inclusion as there is no facility for translation. Our inclusion criteria for this scoping review are summarised in Table 1.

Table 1: Inclusion criteria

Population	Concept	Context	Type of studies and papers
Adults with lower limb wounds in Europe	Compression therapy or high compression therapy or reduced compression therapy	Hospital or Secondary care or Tertiary care or community or primary care or care home or nursing home or residential home or sheltered accommodation or hospice	Qualitative studies, quantitative studies, mixed method studies, Systematic reviews, Quality Improvement projects, audits, discussion papers, editorials guidelines, consensus statements, policies, case studies, opinion papers

Data extraction

We have developed a specially designed data extraction table for this scoping review to gather relevant information from each publication (see Appendix 1). As per JBI guidance (19), this data extraction tool maybe further refined and developed as the scoping review progresses. The authors of any publications with missing data will be conducted for further information by the project team where possible. In line with the principles of a scoping review, data will be extracted from all included publications irrespective of their quality. The data extraction will be undertaken by two members of the project team (RS & NC) to ensure that relevant data is extracted in appropriate manner. Any differences of opinion will be recorded and resolved by the third reviewer (AH).

Data presentation

The process by which publications are selected for inclusion in this scoping review will be summarised in a PRISMA flowchart (19). Pertinent data from included publications will be tabulated

in relation key concepts in the inclusion criteria, i.e. population, concept and context. Data will be tabulated and presented in a narrative format with accompanying text describing the relationship to the review questions.

Patient and Public involvement

The development and design of this scoping review protocol was not directly informed by patients or members of the public given our focus the use of compression therapy as an intervention to promote lower limb wound healing. However, the quality and safety of patient care with regard to the use of compression therapy to promote wound healing in the lower limb is a key focus in this scoping review.

Ethics and dissemination

Ethical and research governance approval is not required as we will be conducting a scoping review that will not gather any primary data. To the best of our knowledge, this is the first scoping review that has sought to establish what is known about the use of compression therapy for lower limb wound healing across Europe. Our scoping review will map what is known about the use, misuse or non-use of compression therapy to promote lower limb wound healing across Europe. Consequently, the results of this scoping review will be of interest to an international audience of healthcare professionals who are keen to improve the quality of lower limb wound care at a population level.

We intend to share the result of this scoping review with the widest possible audience. The results of this study will be disseminated via conference presentations, a peer- reviewed open access international journal publication and a report. A plain English summary of our results will also be prepared so that it can be translated and disseminated to people with lower limb wounds and their families across Europe. Our results will also be shared online via the European Wound Management Association website. We also intend for the findings of this scoping review to be used to inform efforts to improve the use of compression therapy in order to deliver the best possible patient outcomes across Europe. To this end, we will host a meeting of an interprofessional pan European key opinion leaders at the next European Management Wound Association conference to discuss our results in relation to expert opinion, and to identify key change concepts that can be integrated into a programme theory, in the form of a driver diagram (27, 28), to underpin future improvement initiatives.

Funding statement

This scoping review is a part of the European Wound Management Association compression therapy quality improvement project. This compression therapy quality improvement project is funded through an unrestricted educational grant from Essity, Hartmann and Urgo Medical. However, the views and opinions expressed therein are those of the authors, and do not necessarily reflect those of the European Wound Management Association, Essity, Hartmann or Urgo Medical. No funding bodies had any role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Competing interest statement

One of the authors, NC is employed by the European Wound Management Association. This scoping review is a part of the European Wound Management Association compression therapy quality improvement project funded through an unrestricted educational grant from Essity, Hartmann and Urgo Medical.

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Author Contributions

The scoping review was conceived and designed by RS. This study will be undertaken by RS, NC and AH. Data collected by RS, NC. Data analysis and interpretation conducted by RS, NC and AH. First draft of manuscript was written by RS. Authors who contributed to the writing of the manuscript: RS, NC and AH. ICMJE criteria for authorship met by: RS, NC and AH. Read and approved the manuscript as submitted: RS, NC and AH.

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Appendix 1: Data extraction form

Review details	
Reference ID:	Reviewer:
First Author:	Year:
Country:	

Study Details		
	Tick relevant box	
Inclusion criteria	**Yes**	**No**
Published in English		
Population		
Adult ≥ 18 years in Europe		
Lower Limb wounds e.g. venous leg ulcers, diabetic foot ulcers etc.		
Concept		
Compression therapy		
High compression therapy		
Reduced compression therapy		
Context		
Hospital		
Secondary care		
Tertiary care		
Community		
Primary care		
Care home		
Nursing home		
Residential home		
Sheltered accommodation		
Hospice		
Other		

Outcome			
		Tick relevant box	
		Yes	**No**
	Included in review		
	Included for background		
	Included for further discussion		
	Rationale for exclusion (if relevant)		

Study/Paper details					
Type of paper:					
Systematic Review or Meta-Analysis	Narrative review	Research study	Other		
☐	☐	☐	☐		
Study/Paper setting:					
Tertiary care setting	Secondary care setting	Primary care setting	Other setting	Mix/unclear	
☐	☐	☐	☐	☐	
Type of study participants recruited to:					
RCT	Pre/post	Qualitative	Survey	Other	Mix/unclear
☐	☐	☐	☐	☐	☐
Provide more detail here if the study is other or mix/unclear:					
Type or participants recruited (*tick all that apply*):					
Adults ≥ 18 years	Older people≥ 65 years	Considered a 'vulnerable' or hard to reach population	Not Applicable		
☐	☐	☐	☐		
Specify vulnerabilities or nature of population (if appropriate):					
Focus of results with regards to be use of compression therapy (*tick all that apply*):					
Use	Misuse	Non-use			
☐	☐	☐			
Details of results					

Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	1
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	4
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	4-5
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	Not applicable. This paper sets out the protocol
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	6
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	5
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	5
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	6
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	6
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	Not applicable
Critical appraisal of individual	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe	Not applicable

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
sources of evidence§		the methods used and how this information was used in any data synthesis (if appropriate).	
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	6
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	Not applicable
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	Not applicable
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	Not applicable
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	Not applicable
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	Not applicable
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	Not applicable
Limitations	20	Discuss the limitations of the scoping review process.	Not applicable
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	Not applicable
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	8

JBI = Joanna Briggs Institute; PRISMA-ScR = Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews.

* Where *sources of evidence* (see second footnote) are compiled from, such as bibliographic databases, social media platforms, and Web sites.

† A more inclusive/heterogeneous term used to account for the different types of evidence or data sources (e.g., quantitative and/or qualitative research, expert opinion, and policy documents) that may be eligible in a scoping review as opposed to only studies. This is not to be confused with *information sources* (see first footnote).

‡ The frameworks by Arksey and O'Malley (6) and Levac and colleagues (7) and the JBI guidance (4, 5) refer to the process of data extraction in a scoping review as data charting.

§ The process of systematically examining research evidence to assess its validity, results, and relevance before using it to inform a decision. This term is used for items 12 and 19 instead of "risk of bias" (which is more applicable to systematic reviews of interventions) to include and acknowledge the various sources of evidence that may be used in a scoping review (e.g., quantitative and/or qualitative research, expert opinion, and policy document).

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