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BMJ Open

The use of applied pressure ulcer preventive measures and bundles in home and community environments: a scoping review protocol

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The applied pressure ulcers preventive measures and bundles in the home and community environments: Scope Review Protocol

Abstract

Introduction

Several studies address the use of the pressure ulcers preventive measures and bundles for hospitalized patients. However, there is a gap in research regarding the use of the pressure ulcers preventive measures and bundles in the home and community environments. This review aims to identify, explore and map the literature on pressure ulcers preventive measures and bundles in the home and community environments.

Methods and analysis

This scoping review will follow the Joanna Briggs Institute (JBI) methodology for scoping reviews and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR). Modified PRISMA-P was used to guide the reporting of this scoping review protocol. In July 2024, a preliminary search was conducted. The electronic databases to be searched include LILACS, Scielo by Web of Science, Scopus, PubMed, Embase, CINAHL, Cochrane Library and Web of Science. The search will be restricted to studies in English, French, Portuguese, and Spanish, with no time restriction. Additional literature will be identified by searching the reference lists of identified studies. Studies will include reviews and original research in both published. Data extraction will be done by two independent reviewers. Key information, such as author, reference, and findings relevant to the review questions, will be obtained. The results will be presented as graphs, figures, and tables accompanied by a narrative summary.

Ethics and Dissemination

This review does not require ethics approval as data will be collated exclusively from peer-reviewed articles and thesis dissertations. A manuscript summarising the results of the review will be written and submitted to a peer-reviewed journal for publication. This scoping review will serve as a foundation for the development of

future primary research on pressure ulcer prevention to be used in home and community environments by laypeople.

Study registration This study was registered with Open Science Framework registry (osf.io/m5gvn) on 8 August 2024.

Strengths and limitations of this study

- This scoping review will systematically map preventive measures and bundles in the home environment preferably aimed at laypeople.
- Applying a rigorous, well-established methodological framework will ensure the production of a high-quality review.
- Many scoping reviews only include English language. This will include English, Portuguese and Spanish.
- Many people at-risk of developing PUs are cared for at home by laypeople however, there is limited evidence-based preventive strategies aimed at this specific population.

Keywords

Pressure ulcer; Pressure injury; Prevention; Patient Care Bundles; Home Environment; Community

Introduction

Pressure ulcers (PUs) are a significant health problem for bedridden patients, both in hospital and home settings, worldwide.^{1,2} PUs are identified as areas of localized damage to the skin and underlying tissues, caused by continuous pressure or shear forces applied to specific parts of the body, especially over bony prominences such as the sacrum, heels, elbows, and ears.³

A study found that 70.6% of patients with pre-existing PUs were living at home before hospital admission and only 21.4% had received home care services prior to admission.⁴ In Brazil, between January 2014 and July 2017, approximately 23,722 (17.6%) health care-related PU incidents were reported by the National Health Surveillance System (SNVS).⁵ Despite the limited number of studies on the prevalence

of PUs in community or home care services, one study indicates that PU prevalence ranges from 0.04–4.0% in community care settings in Ireland.⁶ In the UK, the prevalence is reported to be between 4.4–6.8% in community care and 4.6–7.5% in nursing homes.⁷

Historically, hospital settings adopt various preventive measures to reduce the incidence of PUs.^{8–10} However, there is limited focus on PU acquired or managed in home settings, where many PUs develop before hospital admission or after discharge.^{11,12}

It is important to emphasize the empowerment of patients and families in the care process, which is a prerogative of the World Health Organization within the Patient Safety program, one of whose main objectives is to reduce the risk of PU development.¹³ Educational interventions aimed at improving patients' and carers' knowledge are important so they can participate more effectively and efficiently in promoting their own health.¹⁴ Educating patients and caregivers before hospital discharge can improve patient outcomes and may reduce the risk of developing pressure ulcers in at-risk patients living at home.^{15,16}

Interventions for preventing PUs based on evidence have influenced the incidence, severity, and prevalence of PUs per patient. Support surfaces are deemed effective in lowering the incidence of PUs when compared to standard hospital surfaces, and it is advised to reposition patients regularly to reduce the risk of developing PUs.¹⁷

Another effective strategy for improving patient outcomes is the "bundle", approach which is set of evidence-based preventive interventions.¹⁸ These interventions, when applied systematically, may yield improved outcomes to patients. A well-known PU bundle in hospital settings is the SKIN bundle. It was developed through a partnership between the Institute for Healthcare Improvement and Ascension Health, the SKIN bundle is a strategy for identifying the best ways to prevent PUs.¹⁹ In this acronym, S stands for Surface, K for Keep Moving, I for Incontinence (increased moisture), and N for Nutrition and Hydration.¹⁹ Building on this initial work, the Healthcare Improvement Scotland, after discussions with experts, adapted the suggested model by adding another "S" for Skin to the protocol, thereby defining "SSKIN" as the aspects on which healthcare professionals should focus their interventions to prevent PUs.¹⁸ Each letter

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in the acronym represents the following interventions: Surface - Assess whether the mattresses and/or cushions are appropriate for the patient's needs and review the integrity of the material used to reduce the risk of pressure; Skin - Evaluate at-risk areas on the skin and monitor for changes; Keep Moving - Assess the patient's ability to move and change positions, thereby preventing the worsening of existing injuries or the development of new ones; Incontinence - Evaluate for the presence of urinary and/or faecal incontinence and manage skin moisture; Nutrition and Hydration - Ensure that the diet, fluids, and supplements are provided in appropriate quantities and manners.²⁰

The application of bundles has showed effective in preventing PUs; however, most studies on the efficacy of these care bundles in reducing the incidence of PUs are conducted in a hospital setting following educational interventions with healthcare professionals.²¹⁻²⁴ A gap in evidence can be observed regarding the implementation of bundles in the context of home care, especially when carried out by informal caregivers. Therefore, the aim of this scoping review is to identify, explore and map the literature on pressure ulcers preventive measures and bundles in the home and community environments.

Review question

1. Which PU preventive measures or bundles are used in the home environment?
2. Who are care bundles intended for in domestic environments (e.g., lay caregivers, healthcare professionals)?
3. What are the facilitators and barriers when applying preventive measures or bundles in the home environments?



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Methods and analysis

Joanna Briggs Institute (JBI) 2022 scoping review protocol methodology guided the development of this protocol.²⁵ We will adhere to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR)²⁶ and the JBI guidance for scoping reviews²⁷ to systematically conduct and report the review of published peer-reviewed articles. The review process will include the following stages: (1) development of the research question, (2) formulation of the search strategy, (3) establishment of inclusion and exclusion criteria, (4) data extraction, (5) data analysis and presentation of results, and (6) dissemination of findings. The study will be conducted between 2024 and 2025. Modified PRISMA-P was used to guide the reporting of this scoping review protocol. Ethical approval is not required for this type of study²⁸. The protocol was registered on the Open Science Framework (OSF) (<https://osf.io/m5gvn>).

A preliminary search of OSF, PROSPERO, MEDLINE, the Cochrane Database of Systematic Reviews, and JBI Evidence Synthesis was conducted and no current or in-progress scoping reviews or systematic reviews on the topic were identified.

Eligibility criteria

The eligibility criteria for this scoping review are based on the participants, concept, context framework as follows.²⁵ and can be seen in Table 1.

Table 1 – Eligibility criteria.

PCC	Inclusion Criteria	Exclusion Criteria
Population	In order to be included, the papers must focus on adults and the elderly at risk of developing PUs in the home and community environment.	Studies that do not explore PU preventive measures and preventive bundles as a primary objective. Studies that do not include patients at risk of developing a pressure ulcer or those with an existing PU.

Concept	This review will consider original articles that explore the use of PU preventive measures or preventive bundles in the home environment. Any single or combined intervention implemented with the aim of preventing PUs will be included.	We will exclude studies that included interventions other aetiologies.
Context	This review will consider studies undertaken in the home and community environments. This will include articles in English, Portuguese and Spanish. The publication period will not be limited.	We will exclude studies that were not in the home and community environment

Types of Sources

This review will consider any quantitative, qualitative or mixed-methods study design. A manual search will also be carried out in the bibliographic references of the selected articles.

Search strategy

The search strategy is being developed by the research team in collaboration with a librarian using Health Sciences Descriptors (DeCS), Medical Subject Headings (MeSH) and Emtree associated with the uncontrolled descriptor related to the SSKIN bundle. Despite this descriptor not being evident in the previously mentioned systems, it is relevant to the research question. Boolean operators AND and OR will be used to combine the descriptors.

A preliminary search was carried out on 7th July 2024 for BVS (Biblioteca Virtual em Saúde), Scielo (Scientific Electronic Library Online) via Web of Science, SCOPUS, PubMed, Embase, CINAHL (Cumulative Index to Nursing and Allied Health Literature), Cochrane Library (The Cochrane Central Register of Controlled Trials - CENTRAL), and Web of Science. The search strategy, including all identified keywords and index terms, will be adapted for each included database AND/OR information source (Supplemental file 1). Hand searching of citations and reference lists of included

documents will also be conducted. Email will be sent to authors of works that are not available in full.

Articles included will be restricted to the English, Portuguese, French and Spanish language. Articles published from database inception to August 2024 will be included.

Supplemental file 1: Search strategy, 2024.

Data base	Search strategy
BVS and SciELO via Web of Science	(Úlcera por Pressão OR Pressure Ulcer OR Úlcera por Presión OR Escara de Decúbito OR Escara de Pressão OR Escaras de Pressão OR Lesão por Pressão OR Úlcera de Decúbito OR Úlcera de Pressão OR Úlceras de Decúbito OR Úlceras por Pressão) AND (Pacientes Domiciliares OR Homebound Persons OR Personas Imposibilitadas OR Pacientes Retidos em Casa OR Pacientes de Resguardo em Casa OR Pessoas Confinadas em Domicílio OR Pessoas Confinadas no Lar OR Pessoas em Tratamento Domiciliar)
	(Úlcera por Pressão OR Pressure Ulcer OR Úlcera por Presión OR Escara de Decúbito OR Escara de Pressão OR Escaras de Pressão OR Lesão por Pressão OR Úlcera de Decúbito OR Úlcera de Pressão OR Úlceras de Decúbito OR Úlceras por Pressão) AND Prevenção OR (Pacotes de Assistência ao Paciente OR Patient Care Bundles OR Paquetes de Atención al Paciente OR paquetes de medidas asistenciales OR paquetes de medidas terapéuticas OR Conjunto de Cuidados OR Conjunto de Cuidados de Pacientes OR Conjunto de Intervenções OR Pacote de Assistência ao Paciente OR Pacotes de Assistência OR Pacotes de Assistência aos Pacientes OR Pacotes de Cuidados OR Pacotes de Cuidados de Pacientes OR Pacotes de Intervenções OR Bundle, Care OR Bundle, Patient Care OR Bundles, Care OR Bundles, Patient Care OR Care Bundle OR Care Bundle, Patient OR Care Bundles OR Care Bundles, Patient OR Patient Care Bundle)
Cohrane, PubMed, Scopus, CINAHL, Embase and Web of Science	("Pressure Ulcer" OR "Pressure Ulcers" OR "Ulcer, Pressure" OR "Bed Sores" OR "Bed Sore" OR "Sore, Bed" OR Bedsore OR Bedsores OR "Decubitus Ulcer" OR "Decubitus Ulcers" OR "Ulcer, Decubitus" OR "Pressure Sore" OR "Pressure Sores" OR "Sore, Pressure" OR "Decubitus Sore" OR "Decubitus Sores" OR "Sore, Decubitus" OR "Pressure Injury" OR "Injury, Pressure" OR "Pressure Injuries" OR "decubital ulcer" OR "decubital ulcer" OR "decubitus ulceration" OR "decubitus ulcer" OR "sore, pressure" OR "ulcus decubitus" OR decubitus OR community pressure ulcer prevention OR ulcer risks in the Community OR health-care community) AND "prevention" OR ("Patient Care Bundles" OR "SSKIN bundle" OR "Bundle, Patient Care" OR "Bundles, Patient Care" OR "Care Bundle, Patient" OR "Care Bundles,

	Patient" OR "Patient Care Bundle" OR "Care Bundles" OR "Bundle, Care" OR "Bundles, Care" OR "Care Bundle" OR "healthcare bundle" OR "patient care bundles")
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Study/Source of Evidence selection

Following the search, all identified citations will be collated and uploaded into EndNote Web (Thomson Reuters, USA) and duplicates will be removed. Following the search, all identified articles will be collated and uploaded into Rayyan® (Rayyan Systems, Cambridge, USA),²⁹ and the titles and abstracts will be assessed by two independent reviewers. In case of disagreements, a third researcher will arbitrate. Reasons for exclusion of sources of evidence at full text that do not meet the inclusion criteria will be recorded and reported in the scoping review. After applying the eligibility criteria, the studies will be read in full by the reviewers, and the articles that do not meet the inclusion criteria will be removed. The results of the search and the study inclusion process will be reported in full in the final scoping review and presented in a Preferred Reporting Items for Systematic Reviews and Meta-analyses extension for scoping review (PRISMA-ScR) flow diagram.²⁶

Data Extraction

Data will be extracted from papers included in the scoping review by two independent reviewers using a data extraction tool developed by the reviewers made specifically for this research in Microsoft Excel and based on the model available in the JBI manual. The data extracted will include specific details about the participants, concept, context, study methods, and key findings relevant to the review question such as the measures/regimen used to prevent PU.

A draft extraction form is provided (Supplemental file 2). The draft data extraction tool will be modified and revised as necessary during the process of extracting data from each included evidence source. Modifications will be detailed in the scoping review. Any disagreements that arise between the reviewers at any stage of the process will be resolved through discussion, or, if necessary, through consultation with a third researcher.

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Supplemental file 2 - Data extraction instrument.

Source details	Autor/year
	Country
	Aims/purpose
	Design
	Data collection methods
	Care setting
	Population/sample
	Method
	Theoretical frameworks
Research question 1: Which PU preventive measures or bundles are used in the home environment?	Interventions
	Duration of interventions
	Primary outcome
	Secondary outcomes
	Measurements
	Assessment interval
	Results
	Limitations
	Conclusion/recommendations
Research question 2: Who are care bundles intended for in the home and community environments (e.g., lay caregivers, healthcare professionals)?	Professional (type)
	Patient
	Lay caregiver (paid/non-paid; relationship to the patient)
Research question 3: What are the facilitators and barriers when applying preventive measures or bundles in the home and community environments?	Guidance given to the patient or caregiver
	User-friendliness of the preventive measures
	Challenges in implementing the preventive measures

Data Analysis and Presentation

The final report will follow the PRISMA-ScR guidelines. The results will be presented as graphs, figures, and tables accompanied by a narrative summary. For the research question three, a thematic analysis with visual representations highlighting key data extraction categories will be performed.

Patient and public involvement

Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Ethics statements

Ethical approval is not necessary for this scoping review. The dissemination strategy includes peer-review publication in an international journal. Furthermore, the results of the review will also be presented in the form of oral and poster presentations at scientific conferences.

Patient consent for publication

Not applicable.

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Contributors

FTR, AMVB and RAA conceptualised and designed this study. AMVB, FTR, RTO and JA developed the research questions and the methods. AMVB, MAGA contributed to methods design. FTR and RTO drafted and edited the manuscript and, JA, MAGA, AVMB and RAA provided critical revisions. The final version was read and approved by all authors.

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Conflicts of interest

There is no conflict of interest in this project.

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The applied pressure injuries preventive measures and bundles in the home and community environments: scoping review protocol

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The applied pressure injuries preventive measures and bundles in the home and community environments: Scoping Review Protocol

Abstract

Introduction

Several studies address the use of pressure injury preventive measures and bundles for hospitalized patients. However, there is a gap in research regarding the use of pressure injury preventive measures and bundles in the home environment. This review aims to identify, explore and map the literature on pressure injury preventive measures and bundles in the home and community environments.

Methods and analysis

This scoping review will follow the Joanna Briggs Institute (JBI) methodology for scoping reviews and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR). Modified PRISMA-P was used to guide the reporting of this scoping review protocol. In July 2024, a preliminary search was conducted. The electronic databases to be searched include LILACS, Scielo by Web of Science, Scopus, PubMed, Embase, CINAHL, Cochrane Library and Web of Science. The search will be restricted to studies in English, Portuguese, and Spanish, with no time restriction. Additional literature will be identified by searching the reference lists of identified studies. Studies will include reviews and original research in both published. Data extraction will be done by two independent reviewers. Key information, such as author, reference, and findings relevant to the review questions, will be obtained. The results will be presented as graphs, figures, and tables accompanied by a narrative summary.

Ethics and dissemination

Ethics approval is not required. Results will be disseminated via conference presentations and publication in a peer-reviewed journal.

Study registration

This study was registered with the Open Science Framework registry (osf.io/m5gvn) on 8 August 2024.

Strengths and limitations of this study

- The review will follow rigorous and well-established methodological frameworks.
- Studies in English, Portuguese, and Spanish will be included to enhance comprehensiveness.
- The search strategy was carefully tailored to all languages and developed in collaboration with research librarians and an international research team.
- A comprehensive summary of the available preventive measures available for the home environment will be provided.

Keywords

Pressure injury; Pressure ulcer; Prevention; Patient Care Bundles; Home Environment; Community

Introduction

Pressure injuries (PIs) are a significant health problem for bedridden patients, both in hospital and home settings, worldwide.^{1,2} PIs are identified as areas of localized damage to the skin and underlying tissues, caused by continuous pressure or shear forces applied to specific parts of the body, especially over bony prominences such as the sacrum, heels, elbows, and ears.³

A study found that 70.6% of patients with pre-existing PIs were living at home before hospital admission and only 21.4% had received home care services before admission.⁴ In Brazil, between January 2014 and July 2017, approximately 23,722 (17.6%) healthcare-related PI incidents were reported by the National Health Surveillance System (SNVS).⁵ Despite the limited number of studies on the prevalence of PIs in community or home care services, one study indicates that PI prevalence

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ranges from 0.04–4.0% in community care settings in Ireland.⁶ In the UK, the prevalence is reported to be between 4.4–6.8% in community care and 4.6–7.5% in nursing homes.⁷

Historically, hospital settings have adopted various preventive measures to reduce the incidence of PIs.^{8–10} However, there is limited focus on PI acquired or managed in home settings, where many PIs develop before hospital admission or after discharge.^{11,12}

It is important to emphasize the empowerment of patients and families in the care process, which is a prerogative of the World Health Organization within the Patient Safety program, one of whose main objectives is to reduce the risk of PI development.¹³ Educational interventions aimed at improving patients' and carers' knowledge are important so they can participate more effectively and efficiently in promoting their health.¹⁴ Educating patients and caregivers before hospital discharge can improve patient outcomes and may reduce the risk of developing pressure injuries in at-risk patients living at home.^{15,16}

Interventions for preventing PIs based on evidence have influenced the incidence, severity, and prevalence of PIs per patient. Support surfaces are deemed effective in lowering the incidence of PIs when compared to standard hospital surfaces, and it is advised to reposition patients regularly to reduce the risk of developing PIs.¹⁷

Another effective strategy for improving patient outcomes is the "bundle", approach which is a set of evidence-based preventive interventions.¹⁸ These interventions, when applied systematically, may yield improved outcomes for patients. A well-known PI bundle in hospital settings is the SKIN bundle. It was developed through a partnership between the Institute for Healthcare Improvement and Ascension Health, the SKIN bundle is a strategy for identifying the best ways to prevent PIs.¹⁹ In this acronym, S stands for Surface, K for Keep Moving, I for Incontinence (increased moisture), and N for Nutrition and Hydration.¹⁹ Building on this initial work, Healthcare Improvement Scotland, after discussions with experts, adapted the suggested model by adding another "S" for Skin to the protocol, thereby defining "SSKIN" as the aspects on which healthcare professionals should focus their interventions to prevent PIs.¹⁸ Each letter in the acronym represents the following interventions: Surface - Assess whether the

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mattresses and/or cushions are appropriate for the patient's needs and review the integrity of the material used to reduce the risk of pressure; Skin - Evaluate at-risk areas on the skin and monitor for changes; Keep Moving - Assess the patient's ability to move and change positions, thereby preventing the worsening of existing injuries or the development of new ones; Incontinence - Evaluate for the presence of urinary and/or faecal incontinence and manage skin moisture; Nutrition and Hydration - Ensure that the diet, fluids, and supplements are provided in appropriate quantities and manners.²⁰

The application of bundles has shown effective in preventing PIs; however, most studies on the efficacy of these care bundles in reducing the incidence of PIs are conducted in a hospital setting following educational interventions with healthcare professionals.^{21–24} A gap in evidence can be observed regarding the implementation of bundles in the context of home care, especially when carried out by informal caregivers. Therefore, this scoping review aims to identify, explore and map the literature on pressure injury preventive measures and bundles in the home and community environments.

Review question

1. Which PI preventive measures or bundles are used in the home environment?
2. Who are care bundles intended for in domestic environments (e.g., lay caregivers, healthcare professionals)?
3. What are the facilitators and barriers when applying preventive measures or bundles in the home environment?



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Methods and analysis

The Joanna Briggs Institute (JBI) 2022 scoping review protocol methodology guided the development of this protocol.²⁵ We will adhere to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Extension for Scoping Reviews (PRISMA-ScR)²⁶ and the JBI guidance for scoping reviews²⁷ to systematically conduct and report the review of published peer-reviewed articles. The review process will include the following stages: (1) development of the research question, (2) formulation of the search strategy, (3) establishment of inclusion and exclusion criteria, (4) data extraction, (5) data analysis and presentation of results, and (6) dissemination of findings. The study will be conducted between 2024 and 2025. Modified PRISMA-P was used to guide the reporting of this scoping review protocol. Ethical approval is not required for this type of study²⁸. The protocol was registered on the Open Science Framework (OSF) (<https://osf.io/m5gvn>).

A preliminary search of OSF, PROSPERO, MEDLINE, the Cochrane Database of Systematic Reviews, and JBI Evidence Synthesis was conducted and no current or in-progress scoping reviews or systematic reviews on the topic were identified.

Eligibility criteria

The eligibility criteria for this scoping review are based on the participants, concept and context framework as follows ²⁵ and can be seen in Table 1.

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Table 1 – Eligibility criteria.

PCC	Inclusion Criteria	Exclusion Criteria
Population	Studies with adults and elderly bedridden/chairfast people or those with reduced mobility in the home environment receiving intervention to prevent PIs.	Studies including existing PIs.
Concept	Original studies exploring the use of PI preventive measures or preventive bundles in the home environment.	Studies with preventive measures for medical device-related PIs only, case reports, event summaries and manuscripts unavailable in full.
Context	This review will consider studies undertaken in the home environment with no time limit.	Studies that were not published in English, Portuguese and Spanish will be excluded.

Types of Sources

This review will consider any quantitative, qualitative or mixed-methods study design. A manual search will also be carried out in the bibliographic references of the selected articles.

Search strategy

The search strategy is being developed by the research team in collaboration with a librarian using Health Sciences Descriptors (DeCS), Medical Subject Headings (MeSH) and EMTREE associated with the uncontrolled descriptor related to the SSKIN bundle. Despite this descriptor not being evident in the previously mentioned systems, it is relevant to the research question. Boolean operators AND and OR will be used to combine the descriptors.

A preliminary search was carried out on 7th July 2024 for BVS (Biblioteca Virtual em Saúde), Scielo (Scientific Electronic Library Online) via Web of Science, SCOPUS, PubMed, Embase, CINAHL (Cumulative Index to Nursing and Allied Health Literature),

Cochrane Library (The Cochrane Central Register of Controlled Trials - CENTRAL), and Web of Science. The search strategy, including all identified keywords and index terms, will be adapted for each included database AND/OR information source (Supplemental file 1). Hand-searching of citations and reference lists of included documents will also be conducted. Email will be sent to authors of works that are not available in full.

Articles included will be restricted to the English, Portuguese and Spanish languages. Articles published from database inception to August 2024 will be included.

Study/Source of Evidence Selection

Following the search, all identified citations will be collated and uploaded into EndNote Web (Thomson Reuters, USA) and duplicates will be removed. Following the search, all identified articles will be collated and uploaded into Covidence®,²⁹ and the titles and abstracts will be assessed by two independent reviewers. In case of disagreements, a third researcher will arbitrate. Reasons for the exclusion of sources of evidence in full text that do not meet the inclusion criteria will be recorded and reported in the scoping review. After applying the eligibility criteria, the studies will be read in full by the reviewers, and the articles that do not meet the inclusion criteria will be removed. The results of the search and the study inclusion process will be reported in full in the final scoping review and presented in a Preferred Reporting Items for Systematic Reviews and Meta-analyses extension for scoping review (PRISMA-ScR) flow diagram.²⁶

Data Extraction

Data will be extracted from papers included in the scoping review by two independent reviewers using a data extraction tool developed by the reviewers made specifically for this research in Microsoft Excel and based on the model available in the JBI manual. The data extracted will include specific details about the participants, concept, context, study methods, and key findings relevant to the review question such as the measures/regimen used to prevent PI.

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A draft extraction form is provided (Supplemental file 2). The draft data extraction tool will be modified and revised as necessary during the process of extracting data from each included evidence source. Modifications will be detailed in the scoping review. Any disagreements that arise between the reviewers at any stage of the process will be resolved through discussion, or, if necessary, through consultation with a third researcher.

Data Analysis

The final report will follow the PRISMA-ScR guidelines. The results will be presented as graphs, figures, and tables accompanied by a narrative summary. For research question three, a thematic analysis with visual representations highlighting key data extraction categories will be performed.

Patient and public involvement

Patients and/or the public were not involved in the design, conduct, reporting, or dissemination plans of this research.

Ethics statement

Ethical approval is not necessary for this scoping review. The dissemination strategy includes peer-reviewed publication in an international journal. Furthermore, the results of the review will also be presented in the form of oral and poster presentations at scientific conferences.

Patient consent for publication

Not applicable.

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Contributors

FTR, AMVB and RAA conceptualised and designed this study. AMVB, FTR, RTO and JA developed the research questions and the methods. AMVB, MAGA contributed to methods design. FTR and RTO drafted and edited the manuscript and, JA, MAGA, AVMB and RAA provided critical revisions. The final version was read and approved by all authors. FTR is responsible for the overall content (as guarantor).

Acknowledgements

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Funding

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors

Conflicts of interest

There is no conflict of interest in this project.

Supplemental file 1: Search strategy, 2024.

Database	Search strategy
BVS and SciELO via Web of Science	(Úlcera por Pressão OR Pressure Ulcer OR Úlcera por Presión OR Escara de Decúbito OR Escara de Pressão OR Escaras de Pressão OR Lesão por Pressão OR Úlcera de Decúbito OR Úlcera de Pressão OR Úlceras de Decúbito OR Úlceras por Pressão) AND (Pacientes Domiciliares OR Homebound Persons OR Personas Imposibilitadas OR Pacientes Retidos em Casa OR Pacientes de Resguardo em Casa OR Pessoas Confinadas em Domicílio OR Pessoas Confinadas no Lar OR Pessoas em Tratamento Domiciliar)
	(Úlcera por Pressão OR Pressure Ulcer OR Úlcera por Presión OR Escara de Decúbito OR Escara de Pressão OR Escaras de Pressão OR Lesão por Pressão OR Úlcera de Decúbito OR Úlcera de Pressão OR Úlceras de Decúbito OR Úlceras por Pressão) AND Prevenção OR (Pacotes de Assistência ao Paciente OR Patient Care Bundles OR Paquetes de Atención al Paciente OR paquetes de medidas asistenciales OR paquetes de medidas terapéuticas OR Conjunto de Cuidados OR Conjunto de Cuidados de Pacientes OR Conjunto de Intervenções OR Pacote de Assistência ao Paciente OR Pacotes de Assistência OR Pacotes de Assistência aos Pacientes OR Pacotes de Cuidados OR Pacotes de Cuidados de Pacientes OR Pacotes de Intervenções OR Bundle, Care OR Bundle, Patient Care OR Bundles, Care OR Bundles, Patient Care OR Care Bundle OR Care Bundle, Patient OR Care Bundles OR Care Bundles, Patient OR Patient Care Bundle)
Cochrane, PubMed, Scopus, CINAHL, Embase and Web of Science	("Pressure Ulcer" OR "Pressure Ulcers" OR "Ulcer, Pressure" OR "Bed Sores" OR "Bed Sore" OR "Sore, Bed" OR Bedsore OR Bedsores OR "Decubitus Ulcer" OR "Decubitus Ulcers" OR "Ulcer, Decubitus" OR "Pressure Sore" OR "Pressure Sores" OR "Sore, Pressure" OR "Decubitus Sore" OR "Decubitus Sores" OR "Sore, Decubitus" OR "Pressure Injury" OR "Injury, Pressure" OR "Pressure Injuries" OR "decubital ulcer" OR "decubital ulcer" OR "decubitus ulceration" OR "decubitus ulcer" OR "sore, pressure" OR "ulcus decubitus" OR decubitus OR community pressure ulcer prevention OR ulcer risks in the Community OR health-care community) AND "prevention" OR ("Patient Care Bundles" OR "SSKIN bundle" OR "Bundle, Patient Care" OR "Bundles, Patient Care" OR "Care Bundle, Patient" OR "Care Bundles, Patient" OR "Patient Care Bundle" OR "Care Bundles" OR "Bundle, Care" OR "Bundles, Care" OR "Care Bundle" OR "healthcare bundle" OR "patient care bundles")

Supplemental file 2 - Data extraction instrument.

Source details	Author/year
	Country
	Aims/purpose
	Design
	Data collection methods
	Care setting
	Population/sample
	Method
	Theoretical frameworks
Research question 1: Which PI preventive measures or bundles are used in the home environment?	Interventions
	Duration of interventions
	Primary outcome
	Secondary outcomes
	Measurements
	Assessment interval
	Results
	Limitations
Research question 2: Who are care bundles intended for in the home and community environments (e.g., lay caregivers, healthcare professionals)?	Conclusion/recommendations
	Professional (type)
	Patient
Research question 3: What are the facilitators and barriers when applying preventive measures or bundles in the home and community environments?	Lay caregiver (paid/non-paid; relationship to the patient)
	Guidance is given to the patient or caregiver
	User-friendliness of the preventive measures
	Challenges in implementing the preventive measures

BMJ Open

The application of pressure injury preventive measures and bundles in home and community environments: a scoping review protocol

Journal:	<i>BMJ Open</i>
Manuscript ID	bmjopen-2024-096224.R2
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Date Submitted by the Author:	31-Jan-2025
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Primary Subject Heading:	Nursing
Secondary Subject Heading:	Public health
Keywords:	Wounds and Injuries, Preventive Health Services, Nursing research

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The application of pressure injury preventive measures and bundles in home and community environments: a scoping review protocol

Abstract

Introduction

Several studies address the use of pressure injury preventive measures and bundles for hospitalized patients. However, there is a gap in research regarding the use of pressure injury preventive measures and bundles in the home environment. This scoping review aims to identify, explore and map the international literature on pressure injury preventive measures and bundles in the home and community environments.

Methods and analysis

Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) will be used to guide the reporting of this scoping review. Joanna Briggs Institute (JBI) guide will inform the methods. Modified PRISMA-P will be used to guide the reporting of this scoping review protocol. In July 2024, an initial search was carried out. The search will be conducted in electronic databases such as LILACS, SciELO, Scopus, PubMed, Embase, CINAHL, Cochrane Library, and Web of Science. The search will be restricted to studies in English, Portuguese, and Spanish, with no time restriction. Additional literature will be retrieved by reviewing the reference lists of the selected studies based on their titles. Two independent reviewers will carry out the data extraction process. Essential details, including the author, reference and findings pertinent to the review questions, will be collected. The findings will be displayed through graphs, tables and figures, supplemented by a narrative summary.

Ethics and dissemination

As this review will be conducted using secondary data, ethical approval is not required. Results will be shared with the international scientific community through conference presentations and publication in a high-impact journal.

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Study registration

This scoping review was registered with the Open Science Framework registry (osf.io/m5gvn) on 8 August 2024.

Strengths and limitations of this study

- This study will follow rigorous and well-established methodological frameworks.
- Studies in English, Portuguese, and Spanish will be included to enhance comprehensiveness.
- The search strategy was carefully tailored to all languages and developed in collaboration with research librarians and an international research team.
- A comprehensive summary of the available preventive measures available for the home environment will be provided.

Keywords

Pressure injury; Pressure ulcer; Prevention; Patient Care Bundles; Home Environment; Community.

Introduction

Pressure injuries (PIs) are a significant health problem for bedridden patients, both in hospital and home settings, worldwide.^{1,2} PIs are wounds that develop in the skin and underlying tissues due to prolonged pressure or shear forces on specific areas of the body, primarily over bony prominences such as the sacrum, heels, ears, and elbows.³

A study found that 70.6% of patients with pre-existing PIs were living at home before hospital admission and only 21.4% had received home care services before admission.⁴ In Brazil, between January 2014 and July 2017, approximately 23,722 (17.6%) healthcare-related PI incidents were reported by the National Health Surveillance System (SNVS).⁵ Despite the limited number of papers on the prevalence of PIs in community or home care services, one study indicates that PI prevalence ranges from 0.04 to 4.0% in community care settings in Ireland.⁶ In the UK, the

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prevalence is reported to be between 4.4 to 6.8% in community care and 4.6 to 7.5% in nursing homes.⁷

Historically, hospital settings have adopted various preventive measures to reduce the incidence of PIs.^{8–10} However, there is limited focus on PI acquired or managed in home settings, where many PIs develop before hospital admission or after discharge.^{11,12}

It is important to emphasize the empowerment of patients and families in the care process, which is a prerogative of the World Health Organization within the Patient Safety program, one of whose main objectives is to reduce the risk of PI development.¹³ Educational interventions aimed at improving patients' and carers' knowledge are important so they can participate more effectively and efficiently in promoting their health.¹⁴ Educating patients and caregivers before hospital discharge can improve patient outcomes and may reduce the risk of developing pressure injuries in at-risk patients living at home.^{15,16}

Interventions for preventing PIs based on evidence have influenced the incidence, severity, and prevalence of PIs per patient. Support surfaces are deemed effective in lowering the incidence of PIs when compared to standard hospital surfaces, and it is advised to reposition patients regularly to reduce the risk of developing PIs.¹⁷

Another effective strategy for improving patient outcomes is the "bundle", approach which is a set of evidence-based preventive interventions.¹⁸ These interventions, when applied systematically, may yield improved outcomes for patients. A well-known PI bundle in hospital settings is the SKIN bundle. It was developed through a partnership between the Institute for Healthcare Improvement and Ascension Health, the SKIN bundle is a strategy for identifying the best ways to prevent PIs.¹⁹ In this acronym, S stands for Surface, K for Keep Moving, I for Incontinence (increased moisture due to urine or feces), and N for Nutrition and Hydration.¹⁹ Building on this initial work, Healthcare Improvement Scotland, after discussions with experts, adapted the suggested model by adding another "S" for Skin to the protocol, thereby defining "SSKIN" as the aspects on which healthcare professionals should focus their interventions to prevent PIs.¹⁸ Each letter in the acronym represents the following interventions: Surface - Assess whether the mattresses and/or cushions used are in

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accordance with the patient's needs and review the integrity of the material used to reduce the risk of pressure; Skin - Evaluate at-risk areas on the skin and monitor for changes; Keep Moving - Assess the patient's ability to move and change positions, thereby preventing the worsening of existing injuries or the development of new ones; Incontinence - Evaluate for the presence of urinary and/or faecal incontinence and manage skin moisture; Nutrition and Hydration - Ensure that the diet, fluids, and supplements are provided in appropriate quantities and manners.²⁰

The application of bundles has shown effective in preventing PIs; however, most studies on the efficacy of these care bundles in reducing the incidence of PIs are conducted in a hospital setting following educational interventions with healthcare professionals.²¹⁻²⁴ A gap in evidence can be observed regarding the implementation of bundles in the context of home care, especially when carried out by informal caregivers. Therefore, this scoping review aims to identify, explore and map the international literature on pressure injury preventive measures and bundles in the home and community environments.

Review question

1. Which PI preventive measures or bundles are used in the home environment?
2. Who are care bundles intended for in domestic environments (e.g., lay caregivers, healthcare professionals)?
3. What are the facilitators and barriers when applying preventive measures or bundles in the home environment?



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Methods and analysis

The Joanna Briggs Institute (JBI) 2022 scoping review protocol methodology guided the development of this protocol.²⁵ We will adhere to the guidelines outlined in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR)²⁶ and the JBI guidance for scoping reviews²⁷ to systematically conduct and report the review of published peer-reviewed articles. A modified version of PRISMA-P was utilized to structure the reporting of this scoping review protocol.²⁸ The review process will include the following stages: (1) development of the research question; (2) formulation of the search strategy; (3) establishment of eligibility criteria; (4) data extraction; (5) data analysis and presentation of results; and (6) dissemination of findings. The study will be conducted between 2024 and 2025. Modified PRISMA-P was used to guide the reporting of this scoping review protocol. As this review will be conducted using secondary data, ethical approval is not required. The protocol was registered on the Open Science Framework (OSF) (<https://osf.io/m5gvn>).

A preliminary search was conducted in OSF, PROSPERO, MEDLINE, the Cochrane Database of Systematic Reviews, and JBI Evidence Synthesis and no ongoing or completed literature reviews of any type were identified on this topic.

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Eligibility criteria

The eligibility criteria for this study are structured according to the participants, concept, and context framework,²⁵ as outlined in Table 1.

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Table 1 – Eligibility criteria.

PCC	Inclusion Criteria	Exclusion Criteria
Population	Studies with adults and elderly bedridden/chairst people or those with reduced mobility in the home environment receiving intervention to prevent PIs.	Studies including existing PIs.

Concept	Original studies exploring the use of PI preventive measures or preventive bundles in the home environment.	Studies with preventive measures for medical device-related PIs only, case reports, event summaries and manuscripts unavailable in full.
Context	This review will include studies conducted in the home environment, with no time limit.	Studies that were not published in English, Portuguese and Spanish will be excluded.

Types of Sources

This review will include studies with quantitative, qualitative, or mixed-method designs. Additional literature will be retrieved by reviewing the reference lists of the selected studies based on their titles.

Search strategy

The search strategy is being developed by the research team in collaboration with a librarian using Health Sciences Descriptors (DeCS), Medical Subject Headings (MeSH) and Emtree associated with the uncontrolled descriptor related to the SSKIN bundle. Despite this descriptor not being evident in the previously mentioned systems, it is relevant to the research question. Boolean operators AND and OR will be used to combine the descriptors.

A preliminary search was carried out on 7th July 2024 for BVS (Biblioteca Virtual em Saúde), Scielo (Scientific Electronic Library Online) via Web of Science, SCOPUS, PubMed, Embase, CINAHL (Cumulative Index to Nursing and Allied Health Literature), Cochrane Library (The Cochrane Central Register of Controlled Trials - CENTRAL), and Web of Science. The search strategy will be customized for each selected database AND/OR information source, incorporating all identified keywords and index terms (Supplemental File 1). Additionally, a hand search of citations and reference lists from the included documents will be conducted. Authors of studies that are not available in full will be contacted via email.

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Articles included will be restricted to the English, Portuguese and Spanish languages. Articles published from the inception of each database up to August 2024 will be included.

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Study/Source of Evidence Selection

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After completing the search, all identified citations will be gathered and uploaded into EndNote Web® (Thomson Reuters, USA), where duplicate entries will be removed. Following the search, all identified articles will be collated and uploaded into Covidence®,²⁹ and the titles and abstracts will be assessed by two independent reviewers. In case of disagreements, a third researcher will arbitrate. The reasons for excluding full-text sources that do not meet the inclusion criteria will be documented and reported in the scoping review. Once the eligibility criteria are applied, the reviewers will conduct a full reading of the studies, and any articles that fail to meet the inclusion criteria will be excluded. The search results and study selection process will be fully detailed in the final scoping review and visually represented using a PRISMA-ScR flow diagram.²⁶

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Data Extraction

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Two independent reviewers will extract data from the studies included in this review using a data extraction tool specifically designed for this research in Microsoft Excel. This tool was developed by the reviewers based on the model provided in the JBI manual. The following data will be collected: information on the studied population, concept, context, study methods, and key findings relevant to the review question, such as the interventions used to prevent PI.

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We have created a preliminary extraction form (Supplemental file 2), which will be reviewed and modified if necessary. Any modifications made will be detailed in the scoping review. Any disagreements between reviewers at any stage of the process will be resolved through discussion. If consensus cannot be reached, a third researcher will be consulted for resolution.

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Data Analysis

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The PRISMA-ScR guidelines will be followed to guide the final report of this study. The findings will be displayed through graphs, figures, and tables, complemented by a

narrative summary. For research question three, a thematic analysis with visual representations highlighting key data extraction categories will be performed.

Patient and public involvement

Patients and/or the public were not involved in the design, execution, reporting, or dissemination of this research.

Ethics and dissemination

As this review will be conducted using secondary data, ethical approval is not required. The dissemination strategy includes publication in a high-impact journal. Additionally, the review's findings will be shared through oral and poster presentations at scientific conferences.

Ethics statement

Patient consent for publication

Not applicable.

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Contributors

FTR, AMVB and RAA conceptualised and designed this study. AMVB, FTR, RTO and JA developed the research questions and the methods. AMVB, MAGA contributed to methods design. FTR and RTO drafted and edited the manuscript and, JA, MAGA, AVMB and RAA provided critical revisions. The final version was read and approved by all authors. FTR is responsible for the overall content (as guarantor).

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Conflicts of interest

There is no conflict of interest in this project.

For peer review only

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Supplemental file 1: Search strategy, 2024.

Database	Search strategy
BVS and SciELO via Web of Science	(Úlcera por Pressão OR Pressure Ulcer OR Úlcera por Presión OR Escara de Decúbito OR Escara de Pressão OR Escaras de Pressão OR Lesão por Pressão OR Úlcera de Decúbito OR Úlcera de Pressão OR Úlceras de Decúbito OR Úlceras por Pressão) AND (Pacientes Domiciliares OR Homebound Persons OR Personas Imposibilitadas OR Pacientes Retidos em Casa OR Pacientes de Resguardo em Casa OR Pessoas Confinadas em Domicílio OR Pessoas Confinadas no Lar OR Pessoas em Tratamento Domiciliar)
	(Úlcera por Pressão OR Pressure Ulcer OR Úlcera por Presión OR Escara de Decúbito OR Escara de Pressão OR Escaras de Pressão OR Lesão por Pressão OR Úlcera de Decúbito OR Úlcera de Pressão OR Úlceras de Decúbito OR Úlceras por Pressão) AND Prevenção OR (Pacotes de Assistência ao Paciente OR Patient Care Bundles OR Paquetes de Atención al Paciente OR paquetes de medidas asistenciales OR paquetes de medidas terapéuticas OR Conjunto de Cuidados OR Conjunto de Cuidados de Pacientes OR Conjunto de Intervenções OR Pacote de Assistência ao Paciente OR Pacotes de Assistência OR Pacotes de Assistência aos Pacientes OR Pacotes de Cuidados OR Pacotes de Cuidados de Pacientes OR Pacotes de Intervenções OR Bundle, Care OR Bundle, Patient Care OR Bundles, Care OR Bundles, Patient Care OR Care Bundle OR Care Bundle, Patient OR Care Bundles OR Care Bundles, Patient OR Patient Care Bundle)
Cochrane, PubMed, Scopus, CINAHL, Embase and Web of Science	("Pressure Ulcer" OR "Pressure Ulcers" OR "Ulcer, Pressure" OR "Bed Sores" OR "Bed Sore" OR "Sore, Bed" OR Bedsore OR Bedsores OR "Decubitus Ulcer" OR "Decubitus Ulcers" OR "Ulcer, Decubitus" OR "Pressure Sore" OR "Pressure Sores" OR "Sore, Pressure" OR "Decubitus Sore" OR "Decubitus Sores" OR "Sore, Decubitus" OR "Pressure Injury" OR "Injury, Pressure" OR "Pressure Injuries" OR "decubital ulcer" OR "decubital ulcer" OR "decubitus ulceration" OR "decubitus ulcer" OR "sore, pressure" OR "ulcus decubitus" OR decubitus OR community pressure ulcer prevention OR ulcer risks in the Community OR health-care community) AND "prevention" OR ("Patient Care Bundles" OR "SSKIN bundle" OR "Bundle, Patient Care" OR "Bundles, Patient Care" OR "Care Bundle, Patient" OR "Care Bundles, Patient" OR "Patient Care Bundle" OR "Care Bundles" OR "Bundle, Care" OR "Bundles, Care" OR "Care Bundle" OR "healthcare bundle" OR "patient care bundles")

Supplemental file 2 - Data extraction instrument.

Source details	Author/year
	Country
	Aims/purpose
	Design
	Data collection methods
	Care setting
	Population/sample
	Method
	Theoretical frameworks
Research question 1: Which PI preventive measures or bundles are used in the home environment?	Interventions
	Duration of interventions
	Primary outcome
	Secondary outcomes
	Measurements
	Assessment interval
	Results
	Limitations
Research question 2: Who are care bundles intended for in the home and community environments (e.g., lay caregivers, healthcare professionals)?	Conclusion/recommendations
	Professional (type)
	Patient
Research question 3: What are the facilitators and barriers when applying preventive measures or bundles in the home and community environments?	Lay caregiver (paid/non-paid; relationship to the patient)
	Guidance is given to the patient or caregiver
	User-friendliness of the preventive measures
	Challenges in implementing the preventive measures