








Nursing interventions for fall prevention in hospitalized aged people: an integrative review

Intervenções de enfermagem para prevenção de quedas em pessoas idosas hospitalizadas: revisão integrativa

How to cite this article:

Rodrigues MMP, Veras RFS, Fernandes MGM, Pontes MLF, Andrade LL, Santos KFO, et al. Nursing interventions for fall prevention in hospitalized aged people: an integrative review. Rev Rene. 2023;24:e88610. DOI: <https://doi.org/10.15253/2175-6783.20232488610>

-  Mayara Muniz Peixoto Rodrigues¹
-  Rafaella Felix Serafim Veras¹
-  Maria das Graças Melo Fernandes¹
-  Maria de Lourdes de Farias Pontes¹
-  Lidiane Lima de Andrade²
-  Kamyla Félix Oliveira dos Santos¹
-  Jacira dos Santos Oliveira¹

*Extracted from the thesis “Prevenção de quedas em pessoas idosas hospitalizadas: construção de protocolo de intervenções de Enfermagem”, Universidade Federal da Paraíba, 2022.

¹Universidade Federal da Paraíba. João Pessoa, PB, Brazil.

²Universidade Federal de Campina Grande. Campina Grande, PB, Brazil.

Corresponding author:

Mayara Muniz Peixoto Rodrigues
Rua Etelvina Macedo de Mendonça, número 630,
Edifício Fit Jardim Botânico, apartamento 1103 Bloco B,
Torre – CEP: 58040-530. João Pessoa, PB, Brazil.
E-mail: mayara_muniz@hotmail.com

Conflict of interest: the authors have declared that there is no conflict of interest.

EDITOR IN CHIEF: Ana Fatima Carvalho Fernandes

ASSOCIATE EDITOR: Adriana Cristina Nicolussi

ABSTRACT

Objective: to identify nursing interventions for fall prevention in hospitalized aged people. **Methods:** integrative review developed on the Web of Science, MEDLINE/PubMed, SCOPUS, CINAHL and LILACS databases using the PICO strategy with controlled descriptors and their combinations using the Boolean operators AND and OR. Studies addressing interventions to prevent falls in aged people in the hospital setting were included, without geographical or language limitation, from 2004 with the creation of The World Alliance for Patient Safety. Three reviewers worked on the citations, using EndNote basic and Rayyan, reaching a final sample of 20 studies. **Results:** 202 nursing interventions were identified for fall prevention in hospitalized aged people, categorized into six domains of the Nursing Interventions Classification (Physiological: basic; Physiological: complex; Behavioral; Safety; Family; Health Systems). **Conclusion:** nursing interventions were identified for the prevention of falls in hospitalized aged people, which provides subsidies for the construction of care protocols and improvements in care. **Contributions to practice:** the results allow nurses to prevent the occurrence of falls, putting into practice consistent scientific findings from the planning of actions to the execution and reassessment of results with the team.

Descriptors: Aged; Hospitalization; Accidental Falls; Accident Prevention; Nursing.

RESUMO

Objetivo: identificar intervenções de enfermagem para prevenção de quedas em pessoas idosas hospitalizadas. **Métodos:** revisão integrativa desenvolvida nas bases de dados Web of Science, MEDLINE/PubMed, SCOPUS, CINAHL e LILACS utilizando a estratégia PICO com descritores controlados e suas combinações mediante os operadores booleanos AND e OR. Incluíram-se estudos abordando as intervenções para prevenção de quedas em pessoas idosas no contexto hospitalar, sem limitação geográfica ou de idioma, a partir de 2004 com a criação da *The World Alliance for Patient Safety*. Três revisores trabalharam nas citações, com uso do EndNote basic e Rayyan, alcançando amostra final de 20 estudos. **Resultados:** foram identificadas 202 intervenções de enfermagem para prevenção de quedas em pessoas idosas hospitalizadas, categorizadas em seis domínios da *Nursing Interventions Classification* (Fisiológico: básico; Fisiológico: complexo; Comportamental; Segurança; Família; Sistemas de Saúde). **Conclusão:** identificaram-se intervenções de enfermagem para prevenção de quedas em pessoas idosas hospitalizadas, o que fornece subsídios para construção de protocolos assistenciais e melhorias da assistência. **Contribuições para a prática:** os resultados permitem que o enfermeiro possa prevenir a ocorrência de quedas, pondo em prática achados científicos consistentes desde o planejamento de ações até a execução e reavaliação dos resultados com a equipe.

Descritores: Idoso; Hospitalização; Acidentes por Quedas; Prevenção de Acidentes; Enfermagem.

Introduction

Worldwide, the number of aged people is growing. In Brazil, it is the population segment with the highest increase: 4% per year in the period 2012 to 2022. This age group, which comprised 7.32% of the population in 2010, will increase to 15.52% in 2035 and is expected to reach 25.49% in 2060, an inversion of the age pyramid with an increase in the number of aged people related to other groups, because of the decrease in fertility and mortality at all ages⁽¹⁻²⁾.

Population aging is a natural and physiological phenomenon; and although it is desirable to have a long life, this growth brings with it social, economic, political and health implications. The COVID-19 pandemic has impacted the health of aged people, leaving them more vulnerable due to social isolation, which has impaired access to health services, socialization, and maintenance of living habits⁽³⁻⁴⁾.

Associated with population growth, the demands on health services increase due to the progressive decrease in biological activities, making aged people more vulnerable to the involvement of chronic non-communicable diseases. Affections related to physical and social circumstances are significant, as are their ethnic, cultural, and economic particularities. In addition to these declines, there are problems related to autonomy and independence to perform activities of daily living, which limits the aged to dependence on family members and/or caregivers, changes that expose them to the risk of falls, one of their biggest problems^(3,5-7).

The International Classification for Nursing Practice defines falls as “sudden descent of the body from a high level to a lower level due to imbalance, fainting or inability to sustain body weight and remain upright”. It is considered worldwide as the second leading cause of death by accidental or unintentional injury, with records of 37.3 million serious falls and 646,000 deaths per year⁽⁸⁻⁹⁾.

In Brazil, falls are the leading causes of notification in the Notivisa System of the National Health Surveillance Agency/*Agência Nacional de Vigilância*

Sanitária (ANVISA), which highlights the greater propensity to falls in hospitalized patients, due to weaknesses resulting from diseases, medications, and maladjustment to the environment, confirmed by data that, in 2017, of the 8,484 cases notified, 5.93% died⁽¹⁰⁻¹¹⁾.

Considered as a multifactorial event, falls in aged people can occur due to intrinsic risk factors, linked to physiological decline (hearing, vision, musculoskeletal system), morbidities, cognitive impairment, and extrinsic ones, related to social and environmental conditions (floor unevenness, poor lighting), inappropriate footwear, use of polypharmacy, among others. The consequences of this event can be physical (fractures, head injuries, reduced mobility) and psychological (fear of another fall, social isolation)⁽¹²⁻¹³⁾.

Hospitalizations of aged people who have suffered falls have increased, aggravating other health conditions, and impairing the quality of life of these individuals; in addition, the hospital environment itself has a direct impact on the risk of falls, and this leads to increased length of stay and hospital costs, an increase that influences the health indicator of quality of care^(11,14-15).

Given this context, surveillance for the prevention of falls in the hospital is essential, and the role of nursing is significant, to carry out an active search using validated instruments that identify aged people at risk, to build an action plan for fall prevention, to implement nursing interventions, to carry out periodic evaluation and to train professionals in the area on the subject⁽¹⁶⁻¹⁸⁾.

Nursing interventions are any treatments based on judgment and clinical knowledge that the nurse triggers to achieve the patient's results. They can occur directly or indirectly, aimed at individuals, families, or communities, and must be planned within a personalized care plan according to the identified needs and Nursing Diagnosis outlined so that it can be implemented by the team and evaluated regarding the expected results and those achieved⁽¹⁹⁾.

The relevance of this study is justified by the

fact that nursing performance without the support of theories and adequate standardization cultivates imperfect, negligent, or reckless professional practice, which can cause harm to people. Knowing the nursing interventions for the prevention of falls in hospitalized aged people will benefit the patient with scientific and practical quality care.

Considering the need to direct and standardize nursing care about actions to prevent falls, this study aimed to identify nursing interventions for fall prevention in hospitalized aged people.

Methods

This is an integrative review that followed these steps: knowledge of the phenomenon/elaboration of the guiding question; search for studies; evaluation of included studies; data analysis and extraction; and synthesis of results⁽²⁰⁾.

The PICo strategy was used, an acronym in which: P - population; I - phenomenon of interest; and Co - context. In the study: P - hospitalized elderly people; I - programs/protocols/guidelines/guidelines; Co - prevention of falls in the hospital setting. This resulted in the research question: What scientific evidence is available in the scientific literature related to programs, protocols, guidelines, and guidelines on fall prevention in hospitalized elderly people?

Publications were included that answered the guiding question, in all languages, without geographical or cultural limitation, with time delimitation referring to the elaboration of The World Alliance for Patient Safety by the World Health Organization (WHO) in 2004, which brought innovations regarding patient safety and actions aimed at reducing risks and reducing adverse events⁽²¹⁾. Review articles, theses, dissertations, comments, opinion articles, non-scientific productions were excluded.

The search was carried out between January and March 2021, in the databases Web of Science, Medical Literature Analysis and Retrieval System Online (MEDLINE) via PubMed, SCOPUS, Cumulative Index to Nursing and Allied Health Literature (CINAHL) and

Latin American and Caribbean Literature in Health Sciences (LILACS). The descriptors were delimited according to the Descriptors in Health Sciences and Medical Subject Headings, adapting them according to each database by using Boolean operators and, when necessary, synonyms, according to Figure 1.

PICo	Correspondents	Descriptors
Population	Hospitalized aged people	"Idoso" (<i>Anciano</i> , Aged), "Hospital" (<i>Hospitales</i> , Hospitals), "Hospitalização" (<i>Hospitalization</i> , <i>Hospitalización</i>)
Phenomenon of interest	Programs/protocols/ Guidelines/directives	"Protocolos" (<i>Protocolos</i> , Protocols), "Protocolos Clínicos" (<i>Protocolos Clínicos</i> , Clinical Protocols), "Guia de Prática Clínica" (<i>Guía de Práctica Clínica</i> , Practice Guideline), "Enfermagem" (<i>Enfermería</i> , Nursing), "Enfermagem Baseada em Evidências" (<i>Enfermería Basada en la Evidencia</i> , Evidence-Based Nursing), "Prática Clínica Baseada em Evidências" (<i>Práctica Clínica Basada en la Evidencia</i> , Evidence-based practice), "Terminologia Padronizada em enfermagem" (<i>Terminología Normalizada de Enfermería</i> , Standardized Nursing Terminology)
Context	Prevention of falls	"Acidentes por quedas" (<i>Accidentes por Caídas</i> , Accidental Falls), "Prevenção de Acidentes" (<i>Accident Prevention</i> , <i>Prevencción de Accidentes</i>)

Figure 1 – Descriptors selected for the study according to the PICo Strategy. João Pessoa, PB, Brazil, 2021

After the search, the identified citations were imported into the EndNote basic Reference Manager and, soon after, into the Rayyan Software, in which duplicates were identified and removed, and the subsequent phases of the review were carried out. The studies selected in the first stage were retrieved in full and evaluated according to the criteria established previously. Two independent reviewers participated in this stage; and when a consensus was not reached between them, a third reviewer was activated. The selection was structured according to the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA)⁽²²⁾.

A careful evaluation was carried out using rigorous and transparent methods of systematized literature search, with critical analysis of the studies and comprehensive and impartial synthesis of the available information on the topic for extraction of related data: care for the prevention of falls in hospitalized aged people. In addition, the details related to the publication were observed in relation to the inclusion and exclusion criteria of this review and for their description purposes, such as authors, phenomenon of interest, population, context, country of origin of the study, database, year, and language of publication.

Thus, these aspects were ensured through the rigor of the research methodology carried out, the adequate referencing and the treatment and presentation of the data, using the recommendations of the Joanna Briggs Institute (JBI). In addition, criteria related

to five levels of evidence were considered: 1) evidence obtained from experimental studies; 2) evidence obtained from quasi-experimental studies; 3) evidence obtained from analytical observational studies; 4) evidence obtained from descriptive observational studies; 5) evidence based on expert opinions or research databases⁽²³⁾.

Results

A total of 390 articles were retrieved, of which 30 were excluded due to duplication. After reading the titles and abstracts, 271 were excluded because they did not meet the established criteria. A total of 59 studies were eligible for full reading, of which 39 did not answer the guiding question of the review, resulting in a final sample of 20 articles (Figure 2).

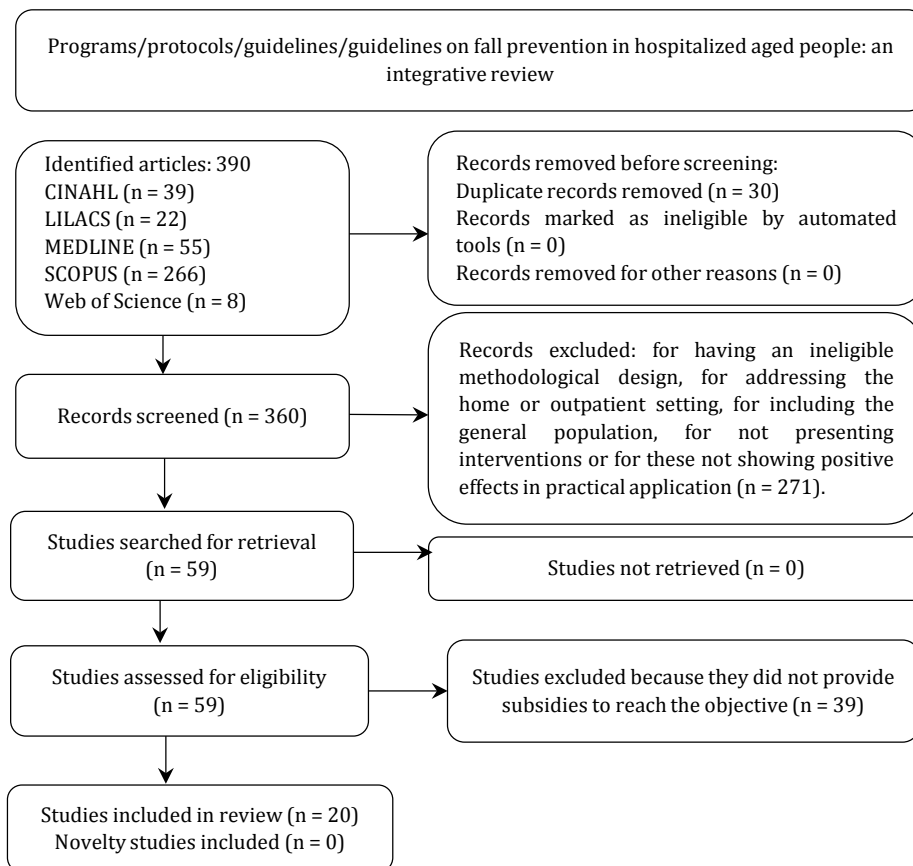


Figure 2 – Flowchart of article selection, adapted from the Preferred Reporting Items for Systematic Reviews and Meta-Analysis. João Pessoa, PB, Brazil, 2021

As for the period of publications, they were distributed from 2004 to 2020, with a higher concentration in the years 2008 and 2018 (three studies each). Among the authors involved with the publications, one author stood out with two research, 2018 and 2020, seeking the use of best practices for the prevention of falls in hospitals (Figure 3).

Regarding the institutions and countries where the studies were carried out, several universities and hospitals were involved, with a higher concentration in the United States (eight publications) and Australia

(three studies). As for the language, 18 studies were published in English and two in Spanish. There was a predominance of publications in the SCOPUS database, with nine published studies. Regarding the level of evidence, level 4 predominated, with descriptive or cross-sectional studies, identified in nine productions; followed by level 2, with case-control and quasi-experimental studies, in six publications; level 3, with cohort and observational studies, in six works; and level 1, with randomized clinical trials, in two articles (Figure 3).

Author/Year	Institution/Country	Language	Database	Study design/Level of evidence
Healey et al. 2004 ⁽²⁴⁾	York District Hospital/United Kingdom	English	SCOPUS	Randomized clinical trial/1
Mcfarlane-Kolb, 2004 ⁽²⁵⁾	Elouera Aged Care Centre/Australia	English	MEDLINE	Cohort study/3
Jeske et al. 2006 ⁽²⁶⁾	St. Luke's Medical Center/USA	English	SCOPUS	Descriptive study/4
Fonda et al. 2006 ⁽²⁷⁾	Caulfield General Medical Centre/ Australia	English	MEDLINE	Observational study/3
Koh et al. 2007 ⁽²⁸⁾	The University of Melbourne Australia	English	SCOPUS	Cohort study/3
Murphy et al. 2008 ⁽²⁹⁾	Penn State Hershey Medical Center/ USA	English	MEDLINE	Descriptive study/4
Krauss et al. 2008 ⁽³⁰⁾	Washington University School of Medicine/ USA	English	SCOPUS	Quasi-experimental study/2
Tzeng; Yin, 2008 ⁽³¹⁾	The University of Michigan/ USA	English	MEDLINE	Cross-sectional study/4
Koh et al. 2009 ⁽³²⁾	Women's and Children's Hospital/Singapore	English	SCOPUS	Case-control study/2
Dykes et al. 2010 ⁽³³⁾	Harvard Medical School/ USA	English	SCOPUS	Randomized clinical trial/1
Ireland et al. 2013 ⁽³⁴⁾	McMaster University School of Nursing/Canada	English	MEDLINE	Descriptive study/4
Hefner et al. 2015 ⁽³⁵⁾	The Ohio State University/ USA	English	WEB OF SCIENCE	Quasi-experimental study/2
Esparza-Bohórquez et al. 2017 ⁽³⁶⁾	Fundación Oftalmológica de Santander/Colombia	Spanish	LILACS	Descriptive study/4
Comino-Sanz et al. 2018 ⁽³⁷⁾	Institute of Health Carlos III/Spain	English	SCOPUS	Quasi-experimental study/2
Maia et al. 2018 ⁽³⁸⁾	University of São Paulo /Brazil	English	SCOPUS	Descriptive study/4
Walsh et al. 2018 ⁽³⁹⁾	University of California/ USA	English	SCOPUS	Quasi-experimental study/2
Ximenes et al. 2019 ⁽⁴⁰⁾	State University of Vale do Acaraú /Brazil	English	WEB OF SCIENCE	Methodological study/4
Fridman, 2019 ⁽⁴¹⁾	Hunter-Bellevue School of Nursing/ USA	English	CINAHL	Descriptive study/4
Alcañiz-Mesas et al. 2020 ⁽⁴²⁾	Complejo Hospitalario Universitario de Albacete/ Spain	English	MEDLINE	Quasi-experimental study/2
Coltters; Belmar, 2020 ⁽⁴³⁾	Clnica las Condes/Chile	Spanish	LILACS	Descriptive study/4

Figure 3 – Representation of the studies elected for the integrative review. João Pessoa, PB, Brazil, 2021

Based on the results of the sample, 202 interventions were listed for the prevention of falls in hospitalized aged adults, which were grouped and categorized according to six domains proposed by the

Nursing Interventions Classification (NIC), except for Domain 7 because it was not related to the research topic (Figure 4).

Domain	Interventions
Physiological: basic	<p>Review gait and mobility assessment.</p> <p>Consider consultation with physiotherapy and occupational therapy.</p> <p>Have fixed supports in bed to help patients transfer more independently.</p> <p>Review toileting protocols and practices for patients at risk of falls.</p> <p>Provide toileting assistance as needed (e.g., before shift change, at night).</p> <p>Implement a schedule of toileting and/or safety rounds, every hour, every 2 hours, during the day or every 4 hours at night.</p> <p>Determine the schedule of activities to be performed.</p> <p>Provide the patient with a walking aid if they use it at home.</p> <p>Use a transfer and walking gait belt.</p> <p>Encourage the patient to sit on the edge and swing their legs before standing.</p> <p>Continually assess continence status.</p>
Physiological: complex	<p>Review medication chart (if there are sedatives, antidepressants, diuretics, polypharmacy etc. and ask for medical review of the benefit of the prescription related to the risk of falls).</p>
Behavioral	<p>Verbally communicate about patient fall prevention at shift change.</p> <p>Distribute written information on fall prevention/educational booklet.</p> <p>Provide guidance and reinforcement of the fall prevention program.</p> <p>Conduct educational sessions (videos with recommendations, discussion on the importance of fall prevention, the role of fall risk assessment and identification of risk factors, skills needed and interventions).</p> <p>Institute patient education programs.</p> <p>Educate patients about fall risk and environmental modifications for safety.</p> <p>Use pamphlet/brochure on fall prevention to patient.</p> <p>Educate patient on the risk of injury.</p> <p>Advise use of non-slip, firm, well-fitting, flat shoes/socks (advise relatives on replacement if necessary).</p> <p>Instruct patient to request assistance with use of alarms/call light/bell.</p> <p>Discuss with patient about fall prevention and use of associated medications.</p>
Safety	<p>Maintain optimal lighting with night sensor.</p> <p>Use non-slip bedside and chair mats and review their use.</p> <p>Install non-slip flooring in the bathroom.</p> <p>Put up bathroom signs and raised toilet seats that “glow in the dark”.</p> <p>Maintain a safe environment (example. organized and clean space, stable furniture, clear path, adequate lighting, dry floor).</p> <p>Check and reduce risks in the environment by looking for simple causes of falls (example. clutter in the environment, loose cable, wet floor, “high gloss, high wax” floor cleaning finish).</p> <p>Place the mattress on the floor.</p> <p>Institute hourly fall risk assessment and mitigation (prevention, needs detection and management of adjustable fall risk factors).</p> <p>Maintain low bed, locked wheels, and floor cushions.</p> <p>Obtain electric low beds with 12 cm limit from the floor.</p> <p>Remove or add bed rails as appropriate.</p> <p>Keep the sheets adjusted.</p> <p>Use bed/chair exit alarm.</p> <p>Ensure call light/bell and items are within reach.</p> <p>Place dresser next to bed if indicated.</p> <p>Use bathroom door magnets to prevent doors from hitting patients.</p> <p>Keep the bed closer to the toilet.</p> <p>Implement an individual multifactorial plan.</p> <p>Assess risk on admission, after a fall and at transfer.</p> <p>Reassess risk when condition changes and every 72 hours.</p> <p>Assess fall risk with the Morse Fall Scale (on admission, daily, and with change in status) included in the Fall Prevention Protocol and electronic documentation in the Nursing Record system.</p> <p>Mandatory incorporation of fall risk assessment tool into nursing notes - on admission and at each shift change.</p> <p>Keep basic fall prevention implementation requirements simple, allowing a step-by-step approach and minimizing competing priorities.</p> <p>Place the patient in a room close to the nursing station.</p>

(the Figure 4 continue in the next page...)

Domain	Interventions
Family	Institute education programs for families. Discuss falls prevention and associated medication use with family. Deliver a leaflet to family informing them about falls and encouraging their involvement. Educate the family about the risk of injury. Distribute pamphlet/brochure on falls prevention to family members. Designate a “Falls Prevention” wallet holder in each ward.
Health systems	Signpost high-risk patients with color-coded identification bracelets. Improve fall reporting. Maintain activity level and needs on whiteboard, chart, and census board. Place registration alert sticker. Add reminders and identification systems (follow-up poster/icon, sign/poster/chart/sticker/magnet/sign on door/bed for those at risk). Distribute pamphlet/brochure on fall prevention to staff. Institute education programs for nursing staff. Assess staff knowledge. Train staff to ensure use of screening tool and documentation and empower them to access a range of possibilities. Educate staff on the needs of aged people, including fall risk, on new fall prevention strategies and assessment and recording strategies, through problem-based learning modules. Educate professionals on the use of the Morse Fall Scale and Fall Prevention Protocol. Reorganize the structure and systems of leadership and the Falls Committee. Recognize that falls prevention is a “continuous quality improvement process” that will require the allocation of resources to the point of care and training of the management team in this methodology, equipment, and ongoing support. Establish processes to provide regular and meaningful feedback to point of care staff on fall prevention. Report falls at multidisciplinary and quality improvement meetings/forums. Review hospital falls prevention policy. Conduct ward compliance audits. Make the Falls Prevention Protocol available on the intranet using a desktop icon for quick access, and update it based on evidence (as per risk factors). Establish the Falls Prevention Protocol. Include the main nursing interventions of the Falls Prevention Protocol in an electronic document in the system. Include, in the Falls Prevention Protocol, the main nursing interventions per patient, levels of risk of falls and risk factors. Establish protocols for post-fall reviews.

Figure 4 – Representation of the link between the interventions for fall prevention in hospitalized aged adults collected in the integrative review and the NCI domains. João Pessoa, PB, Brazil, 2021

Discussion

Considering the results of this research, the reflection on falls as a public health problem worldwide arises, which alerts to the need for actions to prevent them. Approximately 684,000 people lose their lives annually and 172 million acquire complications from falls, highlighting population aging and urbanization patterns as the main causes⁽⁴⁴⁾.

A large part of the sample of studies in this review took place in developed countries, in line with “Step safely: strategies for preventing and managing

falls across the life-course”⁽⁴⁴⁾. Regarding interventions for fall prevention, it is noteworthy that they allow the reduction of the rate of falls in services, with adjustments according to the needs of each individual and their respective risk factors^(27,44).

As previously described, nursing interventions were categorized and grouped into six domains of the NIC. They will act according to the Functional Consequences Theory to promote well-being in aged people under modifiable or treatable risk factors, which

should be based on behavioral, cultural, educational, clinical, environmental, and technological or exercise-based interventions⁽⁴⁴⁻⁴⁵⁾.

This theory also states that nurses can promote well-being through nursing interventions aimed at negative functional consequences, seeking to alleviate and/or avoid their occurrences to promote the quality of life of the aged people⁽⁴⁵⁾.

The first group of interventions encompassed actions related to the Physiological domain: basic, which brings together actions aimed at the class "Elimination control", interventions to establish and maintain regular patterns of intestinal and urinary elimination and control complications arising from altered patterns; directed to the class "Control of immobility", to control restrictions of body movement and sequelae; and to the class "Facilitation of self-care", to provide or assist routine activities of daily living.

The mobility of the aged people is emphasized as an essential care related to this aspect, since, due to the losses related to the aging process, these people experience difficulties or changes in walking. A study carried out at home with aged people in Portugal in 2021 found that 90% of them had difficulty walking and used walking aids, whether canes, wheelchairs, crutches, or tripods⁽⁴⁶⁾.

In this way, the interventions recommended by the authors could be implemented, such as reviewing the gait and mobility assessment, having fixed supports in bed to help patients transfer more independently, and using a transfer and walking gait belt^(25,27,35).

Thus, raising awareness about practices for self-care and care in fall prevention is essential. A study developed based on educational intervention with printed technology on actions for fall prevention in hospitalized patients demonstrated that this tool strengthens self-care⁽⁴⁷⁾.

The second group was linked to the Physiological domain: complex, involving care related to the class "Drug control", with interventions to facilitate the desired effects of pharmacological agents. Aged people are vulnerable to chronic non-communicable disea-

ses, and this condition requires the use of medications that may favor a higher risk of falling. Polypharmacy can alter the health conditions of these individuals, and it is important for nurses to act in the evaluation with a focus on preserving the functionality and cognition of the aged people, seeking to minimize the damage caused by pharmacotherapy⁽⁴⁸⁾. It is also worth mentioning the relevance of the discussion in a multi-professional team regarding the medications used by everyone, considering the clinical condition and risk benefit of drug therapy^(24-25,30).

The third group (Domain 3), Behavioral, brought together interventions related to the classes "Behavioral therapy", with actions to reinforce or promote desirable behaviors or change undesirable behaviors; "Improved communication", to facilitate the sending and receiving of verbal and non-verbal messages; and "Patient education", to facilitate learning about a given topic. Also, actions related to patient education in the hospital environment, emphasizing the need for educational actions involving all axes involved in care, such as: "distribute written information on fall prevention/educational booklet", "hold educational sessions" and "use pamphlet/brochure on fall prevention to the patient"^(32-33,37).

The use of educational technology in the hospital environment revealed the importance of the role of nurses in health education, using materials that are easy to understand by aged people for their empowerment and prevention of risks related to falls⁽⁴⁷⁾.

The fourth group had its interventions related to the Safety domain with "Risk control" on interventions to initiate risk reduction activities and maintain risk monitoring over time, totally related to the risk of falls. The hospital environment where patients, adults and aged people live is a space that often needs to undergo adaptations to achieve a level of safety as a form of prevention.

One approach to be used is the creation of environments that offer safety throughout the life of the aged in the prevention of falls. Nurses must act effectively in maintaining patient safety and educating the family and nursing staff about prevention

measures^(21,26,30-31,35). The hospitalization process is considered a health risk for aged people, since the environment can bring greater danger according to the individual's vulnerability and the instability that such a problem can cause⁽⁴⁹⁾.

The fifth group was linked to the Family domain and the "Lifelong care" class, which brings actions to facilitate the functioning of the family unit and promote the health and well-being of family members throughout life. Therefore, it is essential to create an individualized care plan according to the needs and risk factors that the aged person has, also involving their family for support in the implementation of fall prevention measures^(26-27,29,30,38).

A personalized care plan should be created based on the risk factors identified in that aged person. In this individualization of care, the patient and the family should be involved to achieve the implementation of specific measures in the prevention of falls with the support of the family. In addition to the relevance of the implementation of these interventions, it is necessary to monitor the actions, the investigation daily and in the change of clinical status, as well as the education of the patient and their family members⁽⁵⁰⁾.

The sixth group of actions was related to the domain Health systems and the classes "Health mediation", with interventions to facilitate the interface between the patient/family and the health system; the class "Health system control", bringing actions in to provide and improve support services for care delivery; and the last class "Information control", with actions to facilitate communication about health care. With most actions directed towards the establishment of a falls' prevention protocol for use in hospital institutions, as well as monitoring by health professionals, the use of interventions for prevention reflects the need for the entire health care team to be involved in the implementation of prevention measures^(29,37-38).

Through an organizational approach, adaptations can be made to the workflow, development of care protocols with scientific rigor, effective communication between members of the multi-professional team guiding collective decision-making, which has

the potential to strengthen the safety culture of the health institution⁽⁵⁰⁾.

The aspects mentioned, especially the care that the aged person needs in a situation of risk of falling and its possible consequences, provoke a discussion about the need for instruments, guidelines, theoretical models, interventions, and protocols that direct standardized nursing care, which will bring extensive benefits to the aged people.

Study limitations

The limitations of this review are related to the low level of evidence of the selected sample and the high number of international studies, which sometimes bring nursing interventions that consider advances in health services different from those found in the Brazilian reality, revealing the need for innovations to be implemented to improve care.

Contributions to practice

This study directs nursing interventions related to the practice of care for aged people in the hospital setting. In addition, it allows the idealization of strategies to prevent falls in hospitalized aged adults based on relevant international findings that may bring innovations to Brazilian nursing care.

Conclusion

A total of 202 nursing interventions were found for the prevention of falls in hospitalized aged people. They were grouped and categorized according to six NIC domains: Physiological: basic, with care that supports physical functioning; Physiological: complex, about care that supports homeostatic regulation; Behavioral, about care that helps psychosocial functioning and facilitates changes in lifestyle; Safety, focused on care that helps protect against harm; Family, with care that supports the family; and, finally, Health systems, aimed at care that supports the effective use of the health care system.

In summary, the nursing interventions selected in this study will serve as the basis for a methodological study to create and validate a care protocol aimed at preventing falls in aged people in the hospital setting.

Authors' contribution

Conception and design or analysis and interpretation of data: Rodrigues MMP, Veras RFS, Fernandes MGM, Pontes MLF, Andrade LL, Santos KFO, Oliveira JS.

Writing of the manuscript or relevant critical review of the intellectual content: Rodrigues MMP, Veras RFS, Fernandes MGM, Pontes MLF, Andrade LL, Santos KFO, Oliveira JS.

Final approval of the version to be published: Rodrigues MMP, Fernandes MGM, Pontes MLF, Oliveira JS. Agreement to be responsible for all aspects of the manuscript: Rodrigues MMP, Oliveira JS.

References

1. Instituto Brasileiro de Geografia e Estatística. Projeção da população do Brasil por sexo e idade para o período 2000-2060 [Internet]. 2018 [cited Apr 13, 2023]. Available from: https://ftp.ibge.gov.br/Projecao_da_Populacao/Projecao_da_Populacao_2013/nota_metodologica_2013.pdf
2. Mendes JLV, Silva SC, Silva GR, Santos NAR. O aumento da população idosa no Brasil e o envelhecimento nas últimas décadas: uma revisão da literatura. *Rev Educ Meio Amb Saúde* [Internet]. 2018 [cited Mar 10, 2023];8(113):13-26. Available from: <https://1library.org/document/y9rl1nry-o-aumento-da-populacao-idosa-no-brasil-e-o-envelhecimento-nas-ultimas-decadas-uma-revisao-da-literatura.html>
3. Veras RP, Oliveira M. Aging in Brazil: the building of a healthcare model. *Ciênc Saúde Coletiva*. 2018;23(6):1929-36. doi: <https://doi.org/10.1590/1413-81232018236.04722018>
4. Danis K, Fonteneau L, Georges S, Daniau C, Bernard-Stoecklin S, Domegan L, et al. High impact of COVID-19 in long-term care facilities, suggestion for monitoring in the EU/EEA. *Euro Surveill*. 2020;25(22). doi: <https://doi.org/10.2807/1560-7917.ES.2020.25.22.20009565>
5. Kazazi L, Foroughan M, Nejati V, Shati M. Association between age associated cognitive decline and health related quality of life among Iranian older individuals. *Electr Phys*. 2018;10(4):6663-71. doi: <https://doi.org/10.19082/6663>
6. World Health Organization. Ageing and health [Internet]. 2021 [cited Mar 15, 2023]. Available from: <http://www.who.int/news-room/fact-sheets/detail/ageing-and-health>
7. Medeiros CB, Alves MSCF, Moura LKB, Souza RK, da Silva EM. A perspectiva do usuário na atenção básica sobre o acolhimento ao idoso. *Rev Ciênc Plural*. 2019;4(3):43-56. doi: <https://doi.org/10.21680/2446-7286.2018v4n3ID17290>
8. World Health Organization. Falls [Internet]. 2018 [cited Mar 15, 2023]. Available from: <http://www.who.int/news-room/fact-sheets/detail/falls>
9. Garcia TR. Classificação Internacional para a Prática de Enfermagem (CIPE®): versão 2019/2020. Porto Alegre: Artmed; 2020.
10. Agência Nacional de Vigilância Sanitária. Boletim segurança do paciente e qualidade em serviços de saúde – incidentes relacionados à assistência à saúde [Internet]. 2018 [cited Mar 10, 2023]. Available from: <https://www.gov.br/anvisa/pt-br/centraisdeconteudo/publicacoes/servicos-desauade/publicacoes/boletim-seguranca-do-paciente/boletim-seguranca-do-paciente-e-qualidade-em-servicos-de-saude-n-20-incidentes-relacionados-a-assistencia-a-saude-2018.pdf/view>
11. Souza AB, Röhsig V, Maestri RN, Mutlaq MFP, Lorenzini E, Marin BA, et al. In hospital falls of a large hospital. *BMC Res Notes*. 2019;12(1):284. doi: <https://doi.org/10.1186/s13104-019-4318-9>
12. Severo IM, Kuchenbecker R, Vieira DFVB, Lucena AF, Almeida MA. Risk factors for fall occurrence in hospitalized adult patients: a case-control study. *Rev Latino-Am Enfermagem*. 2018;26:e3016. doi: <https://doi.org/10.1590/1518-8345.2460.3016>
13. Ang GC, Low SL, How CH. Approach to falls among the elderly in the community. *Singapore Med J*. 2020;61(3):116-21. doi: <https://dx.doi.org/10.11622/smedj.2020029>
14. Lelaurin JH, Shorr RI. Preventing falls in hospitalized patients: state of the science. *Clin Geriatr Med*. 2019;35(2):273-83. doi: <https://dx.doi.org/10.1016/j.cger.2019.01.007>

15. Silva AKM, Costa DCM, Reis AMM. Risk factors associated with in-hospital falls reported to the Patient Safety Committee of a teaching hospital. *Einstein*. 2019;17(1):eA04432. doi: https://doi.org/10.31744/einstein_journal/2019A04432
16. Oliveira DU, Ercole FF, Melo LS, Matos SS, Campos CC, Fonseca EAM. Evaluation of falls in hospitalized elderly. *Rev Enferm UFPE On Line*. 2017;11(Suppl 11):4589-97. doi: <https://dx.doi.org/10.5205/reuol.11138-99362-1-SM.1111sup201707>
17. Hill A, Etherton-Beer C, McPhail SM, Morris ME, Flicker L, Shorr R, et al. Reducing falls after hospital discharge: a protocol for a randomised controlled trial evaluating an individualised multimodal falls education programme for older adults. *BMJ Open*. 2017;7:e013931. doi: <https://doi.org/10.1136/bmjopen-2016-013931>
18. Oliveira ADG, Sousa ANB, Galdino SDAV. Nursing actions in the prevention of falls in the elderly: a narrative review of the literature. *Braz J Health Rev*. 2020;3(6):16260-9. doi: <https://doi.org/10.34119/bjhrv3n6-050>
19. Bulechek GM, Butcher HK, Dochterman JM. *Classificação das intervenções de enfermagem (NIC)*. Rio de Janeiro: Guanabara Koogan; 2020.
20. Mendes KDS, Silveira RCCP, Galvão CM. Use of the bibliographic reference manager in the selection of primary studies in integrative reviews. *Texto Contexto Enferm*. 2019;28:e20170204. doi: <https://doi.org/10.1590/1980-265X-TCE-2017-020415>
21. World Health Organization (WHO). World alliance for patient safety: forward programme [Internet]. 2005 [cited Jun. 13, 2023]. Available from: <https://apps.who.int/iris/bitstream/handle/10665/43072/9241592443.pdf>
22. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*. 2021;372:71. doi: <https://doi.org/10.1136/bmj.n71>
23. Joanna Briggs Institute. Levels of evidence [Internet]. 2013 [cited Apr 13, 2023]. Available from: https://jbi.global/sites/default/files/2019-05/JBI-Levels-of-evidence_2014_0.pdf
24. Healey F, Monro A, Cockram A, Adams V, Heseltine D. Using targeted risk factor reduction to prevent falls in older in-patients: a randomised controlled trial. *Age Ageing*. 2004;33(4):390-95. doi: <https://doi.org/10.1093/ageing/afh130>
25. Mcfarlane-Kolb H. Falls risk assessment, multitargeted interventions and the impact on hospital falls. *Int J Nurs Pract*. 2004;10(5):199-206. doi: <http://doi.org/10.1111/j.1440-172x.2004.00482.x>
26. Jeske L, Kolmer V, Muth M, Cerns S, Moldenhaur S, Hook ML. Partnering with patients and families in designing visual cues to prevent falls in hospitalized elders. *J Nurs Care Qual*. 2006;21(3):236-41. doi: <https://doi.org/10.1097/00001786-200607000-00008>
27. Fonda D, Cook J, Sandler V, Bailey M. Sustained reduction in serious fall-related injuries in older people in hospital. *Med J Aust*. 2006;184:379-82. doi: [10.5694/j.1326-5377.2006.tb00286.x](https://doi.org/10.5694/j.1326-5377.2006.tb00286.x)
28. Koh SSL, Manias E, Hutchinson AM, Johnston L. Fall incidence and fall prevention practices at acute care hospitals in Singapore: a retrospective audit. *J Eval Clin Pract*. 2007;13(5):722-7. doi: <https://doi.org/10.1111/j.1365-2753.2006.00743.x>
29. Murphy TH, Labonte P, Klock M, Houser L. Falls prevention for elders in acute care: an evidence-based nursing practice initiative. *Crit Care Nurs Q*. 2008;31(1):33-9. doi: <https://doi.org/10.1097/01.cnrq.0000306394.79282.95>
30. Krauss MJ, Tutlam N, Costantinou E, Johnson S, Jackson D, Fraser VJ. Intervention to prevent falls on the medical service in a teaching hospital. *Infect Control Hosp Epidemiol*. 2008;29(6):539-45. doi: <https://doi.org/10.1086/588222>
31. Tzeng H, Yin CY. Heights of occupied patient beds: a possible risk factor for inpatient falls. *J Clin Nurs*. 2008;17(11):1503-9. doi: <https://doi.org/10.1111/j.1365-2702.2007.02086.x>
32. Koh SLS, Hafizah N, Lee JY, Loo YL, Muthu R. Impact of a fall prevention programme in acute hospital settings in Singapore. *Singapore Med J* [Internet]. 2009 [cited Apr 4, 2023];50(4):425-32. Available from: <http://smj.sma.org.sg/5004/5004a15.pdf>
33. Dykes PC, Carroll DL, Hurley A, Lipsitz S, Benoit A, Chang F, et al. Fall prevention in acute care hospitals: a randomized trial. *JAMA*. 2010;304(17):1912-8. doi: <https://doi.org/10.1001/jama.2010.1567>
34. Ireland S, Kirkpatrick H, Boblin S, Robertson K. The real world journey of implementing fall prevention best practices in three acute care

- hospitals: a case study. *Worldviews Evid Based Nurs.* 2013;10(2):95-103. doi: <https://dx.doi.org/10.1111/j.1741-6787.2012.00258.x>
35. Hefner JL, McAlearney AS, Mansfield J, Knupp AM, Moffatt-Bruce SD. A falls wheel in a large academic medical center: an intervention to reduce patient falls with harm. *J Healthc Qual.* 2015;37(6):374-80. doi: <https://doi.org/10.1097/jhq.0000000000000011>
36. Esparza-Bohórquez M, Granados OLM, Serrano SME, Peñaloza JS. Prevención de caídas y lesiones derivadas en adultos mayores hospitalizados: experiencia de cuidado de enfermería de la aplicación de una guía de buenas prácticas en la Fundación Oftalmológica de Santander (FOSCAL). *MedUNAB.* 2017;20(2):174-81. doi: <https://doi.org/10.29375/01237047.3246>
37. Comino-Sanz IM, Sánchez-Pablo C, Albornos-Muñoz L, Beistegui IA, Jiménez VMM, Uribealago PL, et al. Falls prevention strategies for patients over 65 years in a neurology ward: a best practice implementation project. *JBISIRIR-2017-003628*. *JBISIRIR-2017-003628*. doi: <https://doi.org/10.11124/JBISIRIR-2017-003628>
38. Maia FOM, Cruz DALM, Shimoda GT, Sichieri K, Iida LIS. Falls prevention strategies for adult inpatients in a university hospital of São Paulo, Brazil: a best practice implementation project. *JBISIRIR-2017-003556*. *JBISIRIR-2017-003556*. doi: <https://doi.org/10.11124/jbisrir-2017-003556>
39. Walsh CM, Liang LJ, Grogan T, Coles C, McNair N, Nuckols TK. Temporal trends in fall rates with the implementation of a multifaceted fall prevention program: persistence pays off. *J Comm J Qual Patient Saf.* 2018;44(2):75-83. doi: <https://doi.org/10.1016/j.jcq.2017.08.009>
40. Ximenes MAM, Fontenele NAO, Bastos IB, Macêdo TS, Galindo Neto NM, Caetano JA, et al. Construction and validation of educational booklet content for fall prevention in hospitals. *Acta Paul Enferm.* 2019;32(4):433-41. doi: <https://dx.doi.org/10.1590/1982-0194201900059>
41. Fridman V. Redesigning a fall prevention program in acute care: building on evidence. *Clin Geriatr Med.* 2019;35(2):265-71. doi: <https://doi.org/10.1016/j.cger.2019.01.006>
42. Alcañiz-Mesas AI, García-González M, Zúñiga-Blanco L, Barrio-Pintado MB, Íñigo-Cruces L, Folguera-Arnau M, et al. Implementation experience of a guideline on fall prevention in Centres Committed to Excellence in Care®. *Enferm Clin.* 2020;30(3):185-97. doi: <https://doi.org/10.1016/j.enfcli.2020.03.015>
43. Colters MC, Belmar VA. Experiencia de implementación de una guía para la prevención de caídas como trabajo interdisciplinar en una unidad de cuidados del adulto mayor. *Med UNAB.* 2020;23(1):95-106. doi: <https://dx.doi.org/10.29375/01237047.3610>
44. World Health Organization. Step safely: strategies for preventing and managing falls across the life-course [Internet]. 2021 [cited Mar 20, 2023]. Available from: <https://www.who.int/publications/i/item/978924002191-4>
45. Miller CA. *Nursing for wellness in older adults.* Philadelphia: Wolters Kluwer; 2019.
46. Carochinho ARP, Caldeira E, Jacob S. Quedas dos idosos no domicílio. *Rev Ibero-Am Hum Ciênc Educ.* 2022;8(3):58-71. doi: <https://dx.doi.org/10.51891/rease.v8i3.4537>
47. Ximenes MAM, Brandão MGSA, Macêdo TS, Costa MMF, Galindo Neto NM, Caetano J, et al. Effectiveness of educational technology for preventing falls in a hospital environment. *Acta Paul Enferm.* 2022;35:eAPE01372. doi: <https://doi.org/10.37689/acta-ape/2022A001372>
48. Correia W, Teston, APM. Aspectos relacionados à polifarmácia em idosos: um estudo de revisão. *Braz J Dev.* 2020;6(11):93454-69. doi: <https://doi.org/10.34117/bjdv6n11-674>
49. Miranda AP, Athayde IF, Barbosa MEI. Risk factors contributing to falls in the elderly. *Nursing [Internet].* 2018 [cited Apr 12, 2023];21(238):2063-67. Available from: http://www.revistanursing.com.br/revistas/238-Marco2018/fatores_de_risco.pdf
50. Luzia MF, Prates CG, Bombardelli CF, Adorna JB, Moura GMSS. Characteristics of falls with damage to hospitalized patients. *Rev Gaúcha Enferm.* 2019;40(spe):e20180307. doi: <https://doi.org/10.1590/1983-1447.2019.20180307>



This is an Open Access article distributed under the terms of the Creative Commons