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Review

Cross-mapping to support clinical nursing practice in the prevention of falls in adults

Mapeamento cruzado para fundamentar a prática clínica de enfermagem na prevenção de quedas em adultos

Mapeo cruzado para apoyar la práctica clínica de enfermería en la prevención de caídas en adultos

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Abstract

Objective: To provide a basis for clinical nursing practice by cross-mapping the main risk factors for falls in adults with nursing interventions and activities. **Methods:** A methodological study carried out through an integrative literature review to identify the main risk factors and map them with the nursing interventions and activities of the Nursing Interventions Classification. **Results:** Were found 279 risk factors for falls which, after being grouped, resulted in 23 standard terms. These were mapped, resulting in 16 interventions and 125 nursing activities. Nursing interventions related to the Basic Physiological Domain were more prevalent, with the most prevalent activities corresponding to the classes "facilitating self-care" and "controlling elimination". The Safety domain, with the "fall prevention" intervention, had the highest number of nursing activities when compared to the other interventions. All the risk factors found in the review were included in the nursing diagnosis "Risk of falls in adults". **Conclusion:** The cross-mapping helped to identify the main nursing interventions and activities related to fall prevention in adults and could contribute to clinical nursing practice, as well as consolidating the nursing diagnosis "Risk of falls in adults".

Descriptors: Nursing; Accidental Falls; Risk Factors; Standardized Nursing Terminology; Accident Prevention.

Whats is already known on this?
Falls are one of the most reported events in the hospital environment and are potentially preventable. In this context, prevention is one of the international goals for promoting patient safety.

What this study adds?
The nursing interventions contained in this article can help to reduce the occurrence of falls through the clinical practice of nurses, based on the best scientific evidence.

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Resumo

Objetivo: *Fundamentar a prática clínica de enfermagem, por meio do mapeamento cruzado entre os principais fatores de risco para quedas em adultos, e as intervenções e atividades assistenciais.* ***Métodos:*** *Estudo metodológico realizado por meio de revisão integrativa de literatura para identificação dos principais fatores de risco e mapeamento com as intervenções e atividades de enfermagem da Nursing Interventions Classification.* ***Resultados:*** *Foram encontrados 279 fatores de risco para quedas que, depois de agrupados, resultaram em 23 termos padrão. Estes foram mapeados, resultando em 16 intervenções e 125 atividades de enfermagem. As intervenções de enfermagem relacionadas ao Domínio Fisiológico Básico apresentaram maior prevalência, sendo as atividades de maior predominância as correspondentes às classes "facilitação do autocuidado" e "controle da eliminação". O domínio Segurança com a intervenção "prevenção contra queda" contemplou o maior número de atividades de enfermagem quando comparado às demais intervenções. Todos os fatores de risco encontrados na revisão estavam contemplados no diagnóstico de enfermagem "Risco para quedas no adulto".* ***Conclusão:*** *O mapeamento cruzado auxiliou na identificação das principais intervenções e atividades de enfermagem relacionadas à prevenção de quedas no adulto e poderão contribuir com a prática clínica da enfermagem, além de consolidar o diagnóstico de enfermagem "Risco para quedas no adulto".*

Descritores: *Enfermagem; Acidentes por Quedas; Terminologia Padronizada em Enfermagem; Prevenção de acidentes.*

Resumén

Objetivo: *Proporcionar una base para la práctica clínica de enfermería mediante el mapeo cruzado de los principales factores de riesgo de caídas en adultos con las intervenciones y actividades de enfermería.* ***Métodos:*** *Estudio metodológico realizado mediante una revisión bibliográfica integradora para identificar los principales factores de riesgo y mapearlos con las intervenciones y actividades de enfermería de la Clasificación de Intervenciones de Enfermería.* ***Resultados:*** *Se encontraron 279 factores de riesgo de caídas que, tras ser agrupados, dieron lugar a 23 términos estándar. Estos fueron mapeados, resultando en 16 intervenciones y 125 actividades de enfermería. Las intervenciones de enfermería relacionadas con el Dominio Fisiológico Básico fueron más prevalentes, correspondiendo las actividades más prevalentes a las clases "facilitación de autocuidados" y "control de eliminación". El dominio Seguridad, con la intervención "prevención de caídas", tuvo el mayor número de actividades de enfermería en comparación con las demás intervenciones. Todos los factores de riesgo encontrados en la revisión se incluyeron en el diagnóstico enfermero "Riesgo de caídas en adultos".* ***Conclusión:*** *El mapeo cruzado ayudó a identificar las principales intervenciones y actividades de enfermería relacionadas con la prevención de caídas en adultos y podría contribuir a la práctica clínica de enfermería, así como a consolidar el diagnóstico de enfermería "Riesgo de caídas en adultos".*

Descriptores*: Enfermería; Accidentes por Caídas; Terminología Normalizada de Enfermería; Prevención de Accidentes.*

INTRODUCTION

A fall is the involuntary displacement of the body to a lower level than the initial position, caused by multiple factors that may or may not result in harm to the patient. In the hospital environment, it is one of the most reported adverse events, with rates ranging from 1.4 to 13 falls per thousand patients per day.[1-4]

Studies show that falls suffered by hospitalized patients can have numerous negative consequences, such as impairing patients' mobility and functional capacity, reducing independent living and quality of life. It also causes anxiety, depression and the fear of the event happening again, which increases the risk of another fall.[3-5]

In order to prevent falls, it is essential to identify risk factors, which are characterized as situations that increase the likelihood of the patient falling.[6-8] Falls are considered a multifactorial event, caused by the interaction of intrinsic risk factors (related to physiological issues, morbidities, problems with the musculoskeletal system, cognitive impairment) and extrinsic risk factors (resulting from environmental risks, such as floor conditions, poor lighting and unsuitable footwear).[5,8-9]

It is therefore up to nurses working in hospital institutions to promote strategies for preventing falls by identifying risk factors and drawing up a care plan with a view to patient safety.[10-11] To assist with care practice, the NANDA International (NANDA-I) taxonomy includes "Risk of falling in adults" as a nursing diagnosis, which helps to identify the individuals most susceptible to the event and then provides a basis for fall prevention strategies. Similarly, the Nursing Interventions Classification (NIC) describes the treatments carried out by nurses, allowing for the identification, organization, and documentation of nursing actions.[12,13]

The use of these standardized languages organizes the work process, allowing for a systematized approach, and enables actions and decisions related to nursing care to be based on scientific evidence, promoting continuity of care for the patient.[11,14]

Thus, the aim of this study was to provide a basis for clinical nursing practice by cross-mapping the main risk factors for falls in adults with interventions and care activities in order to standardize health actions and contribute to patient safety.

METHODS

This is a methodological study divided into three stages. The first was an integrative literature review to identify the main risk factors for falls in adults, adapted and following the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA), which is a theoretical-methodological framework based on a four-step flowchart and a 27-item checklist capable of guiding the correct conduct of review studies.[15]

In this first stage, six phases were covered for the purpose of explaining the investigated phenomena[16]: development of the research question; selection of the sample; categorization of the studies; critical analysis; interpretation of the results; and presentation of the review.

To develop the guiding question, the Patient-Intervention-Outcomes (PIO) strategy was used, a variation of the Patient-Intervention-Comparison-Outcomes (PICO) strategy, considering the acronym P (Population) - adult patient; the acronym I (Interest) - identification of risk factors; and the acronym O (Outcome) - prevention of falls.[17]

The following research question was therefore formulated: What risk factors are related to the occurrence of falls in adult patients?

The sample included articles published in full between 2017 and 2021, in Portuguese, English and Spanish, and which answered the research question. We excluded review articles, dissertations, theses, and other documents from the gray literature, as well as studies developed in the areas of pediatrics and neonatology.

Data was collected independently and paired by two researchers in February 2022. The databases used to search for the articles were Medical Literature Analysis and Retrieval System Online (MEDLINE), Latin American and Caribbean Literature on Health Sciences Information (LILACS) and Scientific Electronic Library Online (SCIELO).

For the review, we used the Health Science Descriptors (DeCS/MeSH) in Portuguese: "fatores de risco", "adulto" and "acidentes por queda" and in English: "risk factors" 'adult', "accidental falls". The Boolean resource AND was used to cross-reference the descriptors between the first, second and third descriptors.

The studies were selected by first reading of the titles and abstracts carried out by two independent researchers using the Rayyan Qatar Computing Research Institute (Rayyan QCRI) program. The selected studies were then read in full, and their reference lists were checked for the inclusion of new articles, resulting in the desired final sample.

The findings were analyzed using thematic analysis, in three phases: (1) pre-analysis, with floating reading of evidence; (2) organization of convergent information and exploration of the findings with grouping of convergences; and (3) treatment of the data, listing the categories. The information obtained was then interpreted and a synthesis of knowledge was presented.[18]

The data was entered into a spreadsheet developed using Microsoft Office Excel® 2013 software, which included the following items: year of publication; authors; title of the article; database and journals; methodology; and risk factors.

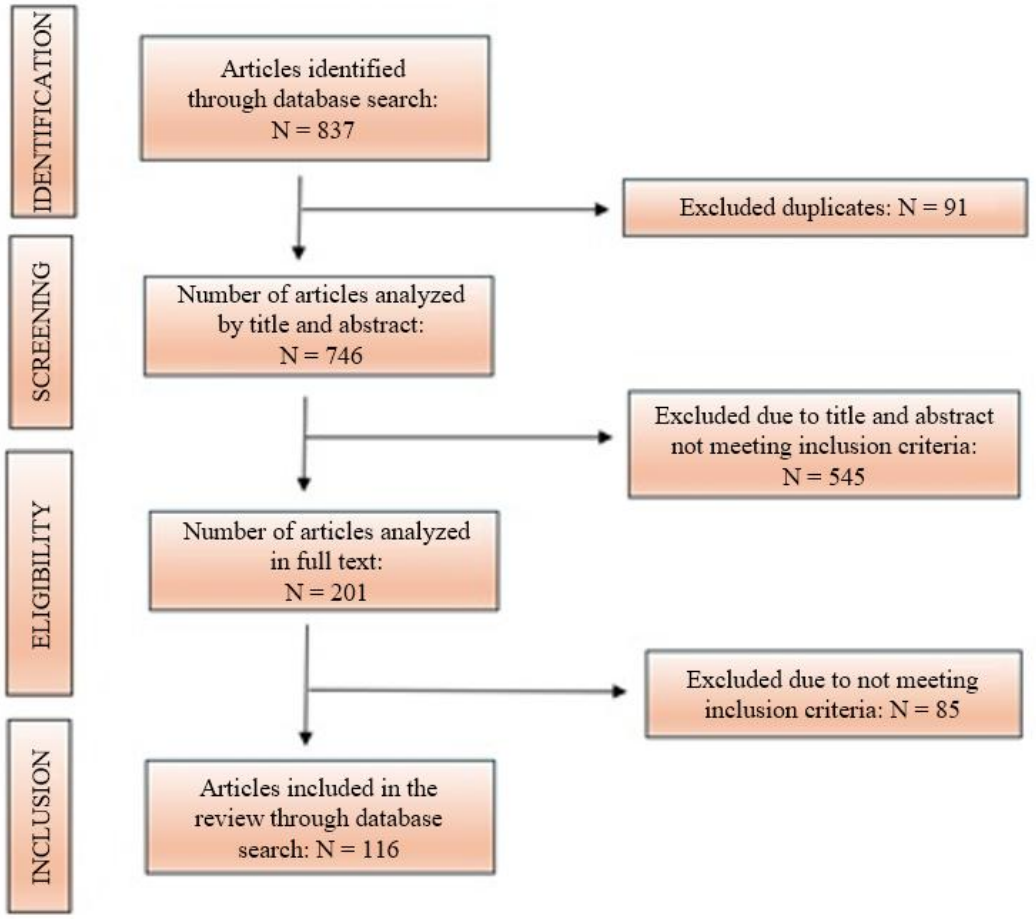
In the second stage, the risk factors found were grouped according to clinical similarities, and those that were duplicated were quantified and excluded. Next, standard terms identified in NANDA-I were selected to describe the grouped risk factors and facilitate the cross-mapping process.

In the third stage, the risk factors (standard terms) were mapped with the NIC nursing interventions and activities, respecting the six rules based on the characteristics of the data obtained and the classification used: 1) Determine a keyword (standard term) that clearly describes the risk factors for falls based on their clinical similarities; 2) Select the NIC interventions based on their similarity to the standard term; 3) List the activities corresponding to the NIC interventions based on the similarity between these and the standard term that describes the reality of nursing care practice; 4) Map the contributing factor to the risk of falls in different NIC interventions, when the actions and/or results are different; and 5) Identify the contributing factor to the risk of falls that, for whatever reason, cannot be mapped.[19,20]

RESULTS

Of the 837 articles found in the databases, 116 were selected to make up the integrative literature review, according to the flowchart in Figure 1.

Figure 1. Flowchart of the search process and selection of articles included in the integrative review. Vitória-ES, Brazil, 2024.



Source: elaborated by the authors.

Of the 116 articles selected, 27 (23.2%) were published in 2017; 23 (19.8%) in 2018; 24 (20.68%) in 2019; 28 (24.13%) in 2020; and 14 (12.06%) in 2021. As for the databases, three (2.5%) studies were accessed via LILACS; 87 (75%), via MEDLINE; 26 (22.4%), via SCIELO; and there was one accessed from other data sources.

A total of 279 risk factors for falls were found which, after being grouped according to clinical similarity, resulted in 23 standard terms (Chart 1).

Chart 1. Risk factors found in the integrative literature review for falls in adults and definition of the standard term in order of prevalence. Vitória-ES, Brazil, 2024.

Identified risk factors	Risk factors (standard term)	N
Treatment with antiepileptic drugs; Treatment with hypoglycemic agents; Treatment with hypothyroid agents; Cardiac glycosides; Class IA antiarrhythmics; Vasodilators used in heart disease; Antihypertensives; Diuretics; Beta-blockers; Calcium channel blockers; Agents acting on the renin-angiotensin system; Antiparkinsonian agents; Psycholytic agents; Anxiolytics; Opioids; Benzodiazepines; Antidepressants; Sedative hypnotics; Polypharmacy; Number of medications; Use of several drug classes; Use of multiple medications; Use of medications; Taking 4 or more medications; Taking more than 5 medications; Use of multiple medications; A greater number of prescribed medications;	Pharmaceutical preparations	53

Oral antiglycemic agents; Chemotherapy treatment; Intravenous infusion conditions; Intravenous infusion; Use of anticoagulants; Fall Risk-Increasing Drugs (FRID).		
Balance deficit; Worse balance in tandem; Impaired gait; Difficulty walking; Unstable gait; Balance difficulties; Impaired balance; Alteration in balance; State of balance; Balance problems; Staggering gait; Locomotion problems; Postural instability; Increased postural sway; Difficulty controlling trunk stability; Dizziness; Vertigo; Syncope.	Impaired postural balance	27
Older age; Elderly; Age group 75 and over.	Individuals aged >60 years	20
Reduced mobility; Impaired physical mobility; Decreased motor strength; Gait speed; Gait difficulty; Gait abnormality; Gait problem; Gait alteration; Unstable gait; Impaired gait; Locomotion problems; Shortened stride length; Lower limb amputation; Locomotion difficulty; Difficulty or need for assistance in walking; Loss of physical mobility; Devices that reduce mobility.	Impaired physical mobility	18
Diabetes mellitus.	Diseases of the endocrine system	13
Functional disability; Physical disability; Mental disability; Cognitive disability; Disability; Visual impairment; Visual impairment in both eyes; Visual disturbances; Hearing impairment.	Individuals with limitations	13
Urinary incontinence; Incontinence; Elimination disorders; Diseases of the genitourinary system; Overactive bladder; Bladder control problems; Urinary urgency.	Incontinence	12
Depression; Higher depression score; Depressive symptoms.	Depression	12
Depression; Higher score for depression.	Depressive symptoms	11
Low muscle strength; Weak knee extensor muscles; Decreased motor strength; Decreased strength; Decreased strength in extremities; Lower handgrip strength; Decreased motor strength; Decreased quadriceps strength; poorer lower limb physical performance.	Decreased lower extremity strength	10
Poor sleep quality; Sleep disorders; Sleep problems; Short sleep duration; Drowsiness; Insomnia.	Sleep disturbance	10
History of falls; History of previous falls.	Individuals with a history of falls	09
Obesity defined by body fat percentage; Sarcopenic obesity; Obesity; Gynoid obesity; Higher BMI; BMI ≥25; Higher body mass index.	Obesity	08
Low cognitive performance; Cognitive deficit; Functional and cognitive decline; Neurological risk condition; Dementia; Dementia diagnosis; Delirium.	Cognitive dysfunction	08
Mobility aids; use of walking aids; use of walking aids; use of canes; use of walking aids (canes, one or two crutches, walkers, and chairs); use of orthoses.	Walking aids	08
Pain; Claudication; Severe pain; Activity-limiting pain; Moderate low back pain; Severe low back pain.	Chronic musculoskeletal pain	08
Low confidence in balance; fear of falling; insecurity in walking.	Fear of falls	07
Support in activities of daily living (ADLs); Functional disability; Disability; Difficulties in physical function; Difficulty in performing executive functions.	Difficulty performing activities of daily living	07
Low level of education; Low education; Lower education; Lower level of education.	Individuals with a low level of education surgery	05
Hypoglycemia.	Hypoglycemia	05

Post-surgery; Being in post-surgery.	Individuals in the immediate postoperative period	05
Altered mental state; Bipolar disorder; Mental disability; Alteration of mental state.	Mental disorders	05
Psychomotor agitation or delirium; Altered mental state; Disorientation; Altered level of consciousness.	Agitated confusion	05

Legend: N: prevalence.
Source: prepared by the authors.

Afterwards, a cross-mapping was carried out between the standard terms (risk factors) and NIC interventions and activities, resulting in 16 nursing interventions and 125 activities, of which 11 (68.75%) interventions and 77 (61.6%) activities were found in the Basic Physiological domain, subdivided into five classes (activity and exercise control; control of elimination; control of immobility; promotion of physical comfort; facilitation of self-care); two (12.5%) interventions and 12 (9.6%) activities found in the Complex Physiological domain, subdivided into the following classes: Electrolyte and acid-based control, Medication administration; 03 (18.75%) interventions and 36 (28.8%) activities found in the Safety domain, subdivided into the class: Risk control. No indicators were mapped in the domains: Behavioral, Family, Health systems and Community, as shown in table 2.

Chart 2. Risk factors for falls and nursing interventions and activities. Vitória-ES, Brazil, 2024.

Domain 1: Basic Physiological		
Class A: Activity and Exercise Control		
Risk Factors	**Interventions**	**Nursing Activities**
Impaired postural balance; decreased lower limb strength; impaired physical mobility; difficulties performing activities of daily living; use of assistive walking devices; individual with limitations.	Exercise Therapy: Ambulation (0221)	• Dress the patient in loose-fitting clothing. • Assist the patient in wearing shoes that facilitate ambulation and prevent injury. • Provide a low-height bed, as appropriate. • Assist the patient to sit on the side of the bed to facilitate postural adjustments. • Provide guidance on available assistive devices, if appropriate. • Apply/provide an assistive device for ambulation if the patient is unable to maintain balance. • Assist the patient during initial ambulation and as needed. • Instruct the patient/caregiver on safe transfer and ambulation techniques. • Monitor the patient during use of crutches or other walking aids.
Class B: Elimination Control		
Risk Factors	**Interventions**	**Activities**
Impaired postural balance; decreased lower limb strength; impaired physical mobility; difficulties performing activities of daily living; incontinence; use of assistive walking	Self-Care Assistance: Toileting (1804)	• Remove essential clothing to allow elimination. • Assist the patient to use toilet/commode/bedpan/urinal at set intervals. • Facilitate perineal hygiene after elimination. • Implement a perineal hygiene routine, as appropriate. • Educate the patient/significant other on hygiene routines. • Establish toileting routines as necessary. • Provide assistive devices when appropriate.

devices; individual with limitations.		
Incontinence	Bowel Incontinence Care (0410)	• Determine the physical or psychological cause of fecal incontinence. • Eliminate the cause of incontinence (e.g., medication, infection, fecal impaction), if possible. • Instruct the patient or family to log bowel movements, as appropriate. • Schedule hygiene with a commode or bedpan at bedside, as needed. • Monitor for adequate bowel evacuation. • Monitor nutritional and fluid needs. • Monitor for medication side effects. • Provide incontinence pads, as necessary.
Incontinence	Urinary Incontinence Care (0610)	• Identify multifactorial causes of incontinence. • Monitor urinary output, including frequency, consistency, odor, volume, and color. • Modify clothing and environment to ensure easy toilet access. • Provide protective garments when necessary. • Implement scheduled or prompted voiding programs.
Class C: Immobility Control		
Risk Factors	**Interventions**	**Activities**
Impaired postural balance; decreased lower limb strength; impaired physical mobility; difficulties performing activities of daily living; obesity; use of assistive walking devices; individual with limitations.	Self-Care Assistance: Transfers (1806)	• Review medical record for activity orders. • Select appropriate transfer technique. • Instruct the individual on area-to-area transfer techniques. • Instruct the individual in the use of ambulation aids. • Provide assistive devices to aid in independent transfers, as appropriate. • Use proper body mechanics during movement. • Maintain proper body alignment during transfers. • Move the patient using a transfer board, as necessary. • Use a gait belt for assisted standing, as appropriate. • Assist the patient in ambulation using the caregiver's body as human support, if appropriate.
Impaired postural balance; decreased lower limb strength; impaired physical mobility; difficulties performing activities of daily living; obesity; use of assistive walking devices; individual with limitations; immediate postoperative individuals.	Transfers (0970)	• Plan the type and method of movement. • Discuss the transfer plan with the patient and assistants. • Adjust equipment height as needed and lock all wheels. • Raise bed rails opposite to the nurse's to prevent patient falls. • Maintain patient body alignment during movement. • Use transfer board as needed. • Use gait belt for assisted standing, as appropriate. • Use incubator, stretcher, or bed for moving weak, injured, or surgical patients. • Use wheelchair for non-ambulatory patients. • Lock wheels on wheelchair, bed, or stretcher

		during transfers.
Class E: Physical Comfort Promotion		
Risk Factors	**Interventions**	**Activities**
Chronic musculoskeletal pain	Pain Management: Chronic (1415)	• Use a valid and reliable chronic pain assessment tool. • Manage environmental factors that affect the pain experience. • Ask the patient about pain frequently, usually during vital signs or visits. • Ask the patient about acceptable pain levels and aim to maintain pain below that level. • Ensure analgesia is given before pain worsens or painful activities. • Avoid analgesics with adverse effects in elderly patients. • Prevent or manage medication side effects. • Evaluate pain control measures' effectiveness through ongoing monitoring. • Observe for signs of depression.
Class F: Self-Care Facilitation		
Risk Factors	**Interventions**	**Activities**
Impaired postural balance; difficulties performing activities of daily living; impaired physical mobility; dizziness when extending or turning neck; use of assistive devices; individuals with limitations; immediate postoperative individuals.	Self-Care Assistance (1800)	• Consider the patient's age when promoting self-care. • Monitor independent self-care ability. • Monitor the need for adaptive devices for personal hygiene, dressing, grooming, toileting, and eating. • Provide requested personal items. • Assist until the patient is fully independent. • Help the patient in the acceptance of dependency needs.
Impaired postural balance; difficulties performing activities of daily living; impaired physical mobility; dizziness when extending or turning neck.	Self-Care Assistance: Bathing/Hygiene (1801)	• Consider the patient's age in self-care promotion. • Determine the type and level of assistance needed. • Place towels, soap, deodorant, razor, and other items bedside or in the bathroom. • Provide requested personal items (e.g., deodorant, toothbrush, soap, shampoo, lotion, aromatherapy). • Facilitate independent bathing, as appropriate.
Sleep disturbance; depressive symptoms.	Sleep Enhancement (1850)	• Determine the patient's sleep/activity pattern. • Incorporate the sleep-wake cycle into care planning. • Explain the importance of adequate sleep. • Identify medication effects on sleep. • Monitor/document sleep pattern and total hours slept. • Adjust the environment to promote sleep. • Support patient's usual bedtime routines and

		comforting items. • Adjust medication timing to support sleep-wake cycle.
Domain 2: Complex Physiological		
Class G: Electrolyte and Acid–Base Control		
Risk Factors	**Interventions**	**Activities**
Hypoglycemia	Hypoglycemia Management (2130)	• Identify patients at risk for hypoglycemia. • Monitor blood glucose levels as indicated. • Monitor for signs and symptoms of hypoglycemia. • Administer intravenous glucose as indicated. • Maintain IV access as appropriate. • Protect from injury as needed. • Review events prior to hypoglycemia to determine likely cause.
Class H: Medication Control		
Risk Factors	**Interventions**	**Activities**
Pharmacological preparations	Medication Administration (2300)	• Inform the patient about the type of medication, the reason for administration, expected actions, and side effects before administering, as appropriate. • Educate the patient and family about the expected actions and side effects of the medication. • Validate and document the patient's and family's understanding of the expected actions and side effects. • Monitor the patient for therapeutic effects of all medications. • Monitor the patient for adverse effects, toxicity, and drug interactions.
Domain 4: Safety		
Class V: Risk Control		
Risk Factors	**Interventions**	**Activities**
Cognitive dysfunction; agitated confusion; fear of falling; uneven flooring; obesity; impaired postural balance; difficulties performing activities of daily living; impaired physical mobility; fainting sensation when extending the neck; fainting sensation when turning the neck; improperly placed non-slip materials on the floor.	Environmental Management (6480)	• Create a safe environment for the patient. • Identify patient safety needs based on their physical and cognitive function and behavior history. • Remove hazardous objects from the environment. • Use bed rails/padded side rails as appropriate. • Escort the patient during activities outside their hospital ward, as needed. • Provide low beds as appropriate. • Provide assistive devices as needed. • Arrange room furniture to accommodate the patient's or family's limitations. • Place frequently used items within reach. • Facilitate the use of personal items, such as pajamas, robes, and hygiene products. • Maintain consistency of the care team throughout the patient's stay.

Cognitive dysfunction; agitated confusion; fear of falling; uneven flooring; obesity; impaired postural balance; difficulties performing activities of daily living; impaired physical mobility; fainting sensation when extending the neck; fainting sensation when turning the neck.	Environmental Management: Safety (6486)	• Identify the patient's safety needs based on their physical and cognitive functioning and behavior history. • Identify environmental safety hazards. • Remove environmental hazards when possible. • Use protective devices to physically limit mobility or access to hazardous situations.
Cognitive dysfunction; agitated confusion; fear of falling; uneven flooring; obesity; impaired postural balance; difficulties performing activities of daily living; impaired physical mobility; fainting sensation when extending the neck; fainting sensation when turning the neck.	Fall Prevention (6490)	• Identify cognitive or physical deficits that may increase the patient's risk of falling in a specific environment. • Identify behaviors and factors that influence fall risk. • Assess the patient's confidence level with ambulation. • Place the patient close to the nursing station if possible. • Identify environmental features that may increase fall risk. • Monitor gait, balance, and fatigue level during ambulation. • Ask the patient to report perceived balance issues, as appropriate. • Assist unsteady individuals with ambulation. • Provide walking aids for stable ambulation. • Instruct the patient on how to use a cane or walker, as appropriate. • Encourage the patient to request assistance with movement, as appropriate. • Post reminders for the patient to ask for help before getting out of bed, as appropriate. • Use side rails of appropriate length and height to prevent falls from bed, as needed. • Position mechanical beds in the lowest setting. • Provide dependent patients with a way to request help when the caregiver is not present. • Assist with hygiene at regular and scheduled intervals. • Remove low-lying furniture that may pose a tripping hazard. • Ensure adequate lighting to improve visibility. • Ensure the patient wears properly fitting, securely fastened, non-slip footwear. • Educate family members about risk factors for falls and how to reduce them.

		• Post signs alerting staff that the patient is at high risk for falls.

Source: elaborated by the authors.

DISCUSSION

This study identified the main interventions and activities for fall prevention in adults through cross-mapping with the risk factors found in the literature, which can support nursing clinical practice. Among the 279 risk factors for falls, the most prevalent were: pharmacological preparations, impaired balance, advanced age, impaired physical mobility, and incontinence.

Risk factors are important guides for planning nursing activities. Situations were identified that cause changes and require assistance to promote patient self-care, such as impaired physical mobility, decreased functional capacity, polypharmacy, incontinence, and advanced age. The association of one or more of these predictors increases the need for care, and it is up to the nurse to act preventively to reduce the risk of falls.[21–23]

The risk factors identified in this study were mapped and compared to the nursing interventions found in the NIC, with the "Basic Physiological" domain being the most prevalent, particularly "Class F – Self-Care Facilitation," which includes three interventions and 19 nursing activities.[12]

Thus, the nursing activities for fall prevention found in this study are consistent with other studies that describe preventive actions as encompassing adjustments to the physical environment centered on individual needs, health monitoring, and surveillance, with health education playing a central role.[10–11,14]

Similarly, it is essential to implement nursing interventions aimed at "self-care assistance: transfers," "self-care assistance: toileting," and "exercise therapy: ambulation," considering that some risk factors, such as decreased muscle strength, impaired physical mobility, and postural imbalance, impact patient autonomy and reduce the ability to perform activities of daily living, in addition to predisposing individuals to falls and fractures.[24]

It is worth emphasizing that advanced age is a relevant factor in the occurrence of falls, which justifies the high number of studies involving older adults.[7–9,23,25–28] However, even though the risk of falling increases with age, this adverse event has multifactorial causes, involving a complex interaction among its predictors.[5–8] In fact, aging alone should not be the sole determinant for justifying fall prevention interventions. A thorough assessment is essential for the implementation of effective preventive measures.[8,29]

Other physiological components found in this review may contribute to the occurrence of falls, such as fecal or urinary incontinence, sleep disturbance, and pain. In this regard, it is essential to implement actions that promote a standardized sleep-wake cycle, provide care to promote bowel and bladder continence, and manage pain.

It is important to highlight that incontinence is one of the most common problems affecting the elderly population, and it contributes to an increased number of trips to the bathroom. This situation increases the chance of tripping or falling, especially at night when lighting is low and visibility may be impaired.[29]

With regard to comorbidities, depression and diabetes mellitus were the most prevalent diseases associated with increased fall risk, followed by disorders related to mental health conditions. It is noteworthy that certain medications increase the risk of falls, such as oral hypoglycemics, antihypertensives, psychotropics, and diuretics. In these cases, the nurse's role in monitoring, surveillance, and promoting self-care is fundamental.[7,27–30]

Nursing professionals, due to their close and prolonged contact with patients, must remain alert to identify risks related to the administration of certain medications,[10,11,27] especially when patients routinely and simultaneously use four or more drugs, since polypharmacy is also a risk factor.[7,31] Therefore, nursing actions that support medication preparation, administration, effectiveness assessment, and management of side effects strengthen patient safety during hospitalization and can reduce harm from falls.[32]

Although the Basic Physiological domain of the NIC had the highest prevalence of nursing interventions, a significant number of interventions were also found in the Safety domain, aimed at protection from harm. In this domain, "Class V – Risk Control" stood out, with the objective of reducing risks and monitoring them over time.

The activities under the "fall prevention" intervention are directly linked to the "Risk for Falls in Adults" nursing diagnosis. These activities are broad and comprehensive and can be developed across

various healthcare settings.[12]

Nursing activities offer precautions for patients with different fall risk factors, which may relate to cognitive, environmental, balance, transfer, and the assistive device dimensions.[6,32]

Regarding the limitations of this study, the authors focused on primary studies and restricted the languages included. Thus, grey literature and articles in languages that did not meet the inclusion criteria were not considered.

This study contributed to identifying the main vulnerabilities and susceptibilities of patients at risk of falling, as well as the key nursing interventions for preventing such incidents. Additionally, it demonstrated that the cross-mapping method is effective for supporting clinical practice and can feasibly be applied to other areas of nursing, promoting evidence-based practice.

CONCLUSION

Cross-mapping was effective in identifying the main nursing interventions and activities related to fall prevention in adults, which can support nursing clinical practice.

It is worth noting that all risk factors found in the literature review were described under the risk factors, associated conditions, and at-risk populations in the NANDA-I nursing diagnosis "Risk for Falls in Adults," validating the use of this taxonomy in clinical nursing practice.

Thus, it is the nurse's responsibility to provide care based on the best clinical evidence and, consequently, to develop and implement care plans aimed at protecting patients from adverse events.

It is important to continue conducting studies to expand the scientific knowledge on adult fall prevention, in order to deepen discussions that can contribute to health promotion and improve the quality of care.

CONTRIBUITIONS

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REFERENCES

1. World Health Organization. Falls. Genebra: WHO. 2019. Available from: http://www.who.int/news-room/fact-sheets/detail/falls.

2. Dornelles C, Aguiar JRV, Matos MB, Prado ARA. As quedas de pacientes no ambiente hospitalar entre os anos de 2009 a 2019: uma revisão integrativa. Revista Uruguaya de Enfermería. 2022;17(1):e2022v17n1a1. Available from: http://rue.fenf.edu.uy/index.php/rue/article/view/346/419. DOI: 10.33517/rue2022v17n1a11.

3. Luzia MF, Prates CG, Bombardelli CF, Adorna JB, Moura GMSS. Características das quedas com dano em pacientes hospitalizados. Revista Gaúcha de Enfermagem. 2019;40(spe):e20180307. Available from: https://doi.org/10.1590/1983-1447.2019.20180307.

4. Veras RFS, Rodrigues MMP, Teófilo TJS, Chaves BJP, Ferreira IKV, Oliveira JS. Estratégias de prevenção de quedas em ambiente hospitalar: revisão integrativa. International Journal of Development Research. 2020;10(05):35800-35805. Available from: https://www.journalijdr.com/estrat%C3%A9gias-de-preven%C3%A7%C3%A3o-de-quedas-em-ambiente-hospitalar-revis%C3%A3o-integrativa.

5. Zhao YL, Bott M, He J, Kim H, Park SH, Dunton N. Evidence on Fall and Injurious Fall Prevention Interventions in Acute Care Hospitals. J Nurs Adm. 2019;49(2):86-92. DOI: 10.1097/NNA.0000000000000715. Available from: https://journals.lww.com/jonajournal/Abstract/2019/02000/Evidence_on_Fall_and_Injurious_Fall_Prevention.8.aspx.

6. Ximenes MAM, Aguiar JR, Bastos IB, Sousa LV, Caetano JA, Barros LM. Risco de queda de pacientes hospitalizados: fatores de risco e atuações de enfermagem. Rev Bras Promoc Saúde. 2019;32:9003. Available from: https://ojs.unifor.br/RBPS/article/view/9003.

7. Silva IRG, Dias CMD, Silva TP, Carvalho DNR, Aguiar VFF, Lima FC. Avaliação da mobilidade e fatores desencadeantes de quedas em idosos. Cienc Cuid Saúde. 2020; 190. Available from: https://periodicos.uem.br/ojs/index.php/CiencCuidSaude/article/view/48469.

8. Silva EM, Sakai AM, Trelha CS, Cabrera MAS, Dellaroza MSG. Medidas de Prevenção de Queda em idosos hospitalizados. Enferm. Foco. 2020; 11 (6), 172-8. Available from: http://revista.cofen.gov.br/index.php/enfermagem/article/view/3419/1071.

9. Santos PHF, Stival MM, Lima LR, Santos WS, Vope CRG, Rehem TCMSB, Funghetto SS. Nursing diagnosis Risk for Falls in the elderly in primary health care. Revista Brasileira de Enfermagem. 2020;73(Suppl 3):e20180826. DOI: 10.1590/0034-7167-2018-0826. Available from: https://doi.org/10.1590/0034-7167-2018-0826.

10. Gorreis TF, Gonçalves RMV, Souza E, Rodrigues NH. Estratégias de enfermagem na prevenção de quedas em pacientes idosos hospitalizados: revisão narrativa. Revista Brasileira de Enfermagem. 2021; 74 (Suppl 2), e20200904. Available from: https://doi.org/10.1590/0034-7167-2020-0904.

11. Chaves OBBM, Oliveira JS, Oliveira SHS, Perreira MA, Santos IBC, Ramos NM. Risco de queda no perioperatório: mapeamento cruzado de intervenções e atividades de Enfermagem. REME – Rev Min Enferm. 2020;24:e-1291. DOI: 10.5935/1415-2762.20200020

12. Butcher HK, Bulechek G, Dochterman J, Wagner C. Classificação das Intervenções de Enfermagem - NIC. 7ª ed. Rio de Janeiro: Elsevier; 2020.

13. Herdman TH, Kamitsuru S, Lopes CT (org.). Diagnósticos de enfermagem da NANDA-I: definições e classificação - 2021-2023. Porto Alegre: Artmed; 2021.

14. Chaves OBBM, Oliveira JS, Oliveira SHS, Perreira MA, Santos IBC, Ramos NM. Risco de queda no perioperatório: validação de intervenções e atividades de enfermagem. Enferm Foco. 2020;11(6):199-206. Available from: http://revista.cofen.gov.br/index.php/enfermagem/article/view/3952/1075.

15. Page MJ, Mckenzie J, Bossuyt P, Boutron I, Hoffmann T, Mulrow CD, Shamseer L, Tetzlaff JM, Akl EA, *et al*. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ. 2021;372:n71. DOI: 10.1136/bmj.n71

16. Souza MT, Silva MD, Carvalho R. Revisão integrativa: o que é e como fazer. Einstein (São Paulo) [Internet]. 2010 [cited 2023 Feb 21];8(1):102-6. DOI: https://doi.org/10.1590/s1679-45082010rw1134

17. Sousa LMM, Marques JM, Firmino CF, Frade F, Valentim OS, Antunes AV. Modelos de formulação da questão de investigação na prática baseada na evidência. Revista investigação em enfermagem. 2018; 31, 9. Available from: https://repositorio-cientifico.essatla.pt/bitstream/20.500.12253/1287/1/artigo31-39.pdf.

18. Minayo MCS. Amostragem e Saturação em Pesquisa Qualitativa: Consensos e Controvérsias. Revista Qualitativa. 2017;5(7):1-12. Available from: https://www.researchgate.net/publication/315756131.

19. Lucena AF, Barros ALBL. Mapeamento cruzado: uma alternativa para a análise de dados em enfermagem. Acta Paulista de Enfermagem. 2005;18(1):82-8. DOI: 10.1590/S0103-21002005000100011.

20. Moorhead S, Delaney C. Mapping nursing intervention data into the Nursing Interventions Classification (NIC): process and rules. Nurs Diagn. 1997;8(4):137-44. DOI: 10.1111/j.1744-618x.1997.tb00468.x.

21. Miranda GBS, Borges NGS, Ribeiro NMS. Impacto do tempo de hospitalização na mobilidade e na qualidade de vida de idosos. Revista de Ciências Médicas e Biológicas. 2019;18(3);330-4. DOI: 10.9771/cmbio.v18i3.34417.

22. Oliveira DO, Yamashita FC, Lima MCC, Pivetta NRS, Nascimetno MA, Santos NQ, Nascimento Júnior, JRA. Relação entre funcionalidade, risco de quedas e medo de cair: estudo transversal com idosos. Saúde (Sta. Maria). 2022;48(1). Available from: https://periodicos.ufsm.br/revistasaude/article/view/48180.

23. Almeida AF, Pinheira V, Cordeiro N. Relação entre mobilidade funcional e a polimedicação para risco de quedas em idosos. International Journal of Developmental and Educational Psychology Revista de Psicologia. 2019;3(2):265-76 DOI: 10.17060/ijodaep.2019.n2.v2.1917.

24. Barbosa AS, Chaves EHB, Ribeiro RG, Quadros DV, Suzuki LM, Magalhães AMM. Caracterização dos incidentes de quedas de pacientes adultos internados em um hospital universitário. Revista Gaúcha de Enfermagem. 2019;40(spe):e20180303. DOI: 10.1590/1983-1447.2019.20180303.

25. Canuto CPAS, Oliveira LPBA, Medeiros MRS, Barros WCTS. (). Segurança do paciente idoso hospitalizado: uma análise do risco de quedas. Revista da Escola de Enfermagem da USP. 2020;54:e03613. DOI: 10.1590/S1980-220X2018054003613.

26. Pereira ES, Chaves SP, Alves A, Cavalcante ACD. Intervenções de enfermagem ao idoso hospitalizado com risco de queda. Revista Nursing. 2020;23(265):4205-4212. Available from: https://www.revistas.mpmcomunicacao.com.br/index.php/revistanursing/article/view/634/62.

27. Silva R, Meireles I, Pessanha C, Alvez R, Silva A, Silva R. Impacto da polifarmácia e do uso de medicamentos na estratificação do risco de quedas de pacientes no ambiente hospitalar. SciELO Preprints. 2020. DOI: 10.1590/ScIELOPreprints.1050.

28. Gonçalves ERS, Gaspar ACM, Vechia ADRD, Azevedo RCS, Reiners AAO. Environmental risk factors, prevalence and consequences of falls in the elderly's home. Rev Enferm UFPI. 2020;9:e10458. DOI: 10.26694/reufpi.v9i0.10458.

29. Andrade CCS, Andrade CHS, Andrade EA. A importância da assistência de enfermagem e nutrição na prevenção de quedas em idosos. Revista Artigos. Com. 2021;30:e8129. Available from: https://acervomais.com.br/index.php/artigos/article/view/8129.

30. Tavares GMS, Zanferari ELS, Ostroski IM, Ferreira FV, Diesel SO, Santos GM. Como a polifarmácia afeta o controle do equilíbrio corporal de pessoas idosas? Revista Kairós-Gerontologia. 2021;24(2):269-283 DOI: 10.23925/2176-901X.2021v24i2p269-283269.

31. Bittencourt VLL, Battisti IDE, Petri AA, Colet CF, Stumm EMF, Loro MM, Winkelmann ER. (2020). Risco de quedas associado a terapia medicamentosa em pacientes hospitalizados. Mundo Saude. 44, 115-132. DOI: 10.15343/0104-7809.202044115125.

32 Ximenes MAM, Brandão MGSA, Macêdo TS, Costa MMF, Galindo Neto NM, Caetano JA, Oriá MOB, Barros LM. Efetividade de tecnologia educacional para prevenção de quedas em ambiente hospitalar. Acta Paulista de Enfermagem. 2020;35:eAPE01372. DOI: 10.37689/acta-ape/2022AO01372.

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