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Falls in older adults: from numbers to action

Abstract

The progressive aging of the population represents a growing challenge for healthcare systems and is associated with an increased prevalence of falls among older adults, particularly in institutional settings. Falls are considered by the World Health Organization (2021) a major public health problem due to their high incidence, morbidity, mortality, and negative impact on autonomy, functionality, and quality of life. Falls are the second leading cause of death from accidental injuries worldwide.

This article aims to analyze the main risk factors, consequences, and fall prevention strategies among institutionalized older adults, based on a project developed in a nursing home and day care center in an inland region of northern Portugal.

This is a descriptive study grounded in a literature review and observation of the institutional context. The results show that falls result from the interaction of multiple factors (intrinsic and extrinsic) and can be prevented through multidimensional interventions, particularly environmental adaptation, health education, and the promotion of functional autonomy.

It is concluded that implementing systematic preventive strategies can significantly contribute to reducing fall risk and improving the quality of life of institutionalized older adults.

Keywords: aging, falls, prevention, institutionalization, risk factors

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Introduction

Demographic aging is a global phenomenon, particularly pronounced in developed countries, including Portugal. This has resulted in a significant number of individuals requiring assistance in Long-Term Care Institutions for Older Adults (LTCIs), referred to in Portugal as Residential Structures for Older People (ERPI[1]).[1]

This process is associated with physiological, functional, and cognitive changes that increase older adults' vulnerability to adverse events, among which falls stand out.

It is estimated that approximately 28% to 35% of people over the age of 65 experience falls each year,[2–4] and this proportion rises to 32% to 42% among individuals over 70 years of age.[5–7] The frequency of falls increases with age and level of frailty.

Older adults living in nursing homes fall more frequently than those living in the community. Approximately 30% to 50% of institutionalized individuals experience falls each year, and 40% of them suffer recurrent falls[8] (World Health Organization, 2010). This is due to the combination of several factors, including:

- Changes in environment, often unfamiliar and poorly adapted;
- Reduced physical activity;
- Coexistence of multiple comorbidities.

The consequences range from physical injuries (fractures, bruises, contusions) to functional decline, increased dependence, and higher costs for healthcare systems. Therefore, it is essential to understand the factors associated with falls and develop effective prevention strategies.

This intervention project emerged within the context of professional training, aiming to raise awareness in the institutional community regarding this issue.

In addition to the general objective defined in the abstract, our project had the following specific objectives:

- To identify risk factors and the main consequences of falls among institutionalized older adults;
- To identify the profile of the older adult most susceptible to falls and the most frequent locations where falls occur within institutions.

Within the scope of our study, we developed and presented a Health Education plan identifying the main fall prevention measures for institutionalized older adults.

Methodology

A descriptive qualitative study was conducted. The study consisted of two phases: a literature review phase and an action-research phase.

The literature review included scientific articles, dissertations, and national and international institutional documents on falls among older adults, mostly published between 2020 and 2025.

The action-research phase took place in a nursing home and day care center located in an inland region of northern Portugal. During this phase, the institutional context was observed, and informal awareness-raising activities were carried out with professionals and older adults regarding fall prevention.

The target population for the field phase consisted of residents (aged over 60 years) and staff/caregivers from both institutions.

Given the awareness-based nature of the project, no statistically representative sample was applied. The intervention focused on the entire team and on older adults accessible for informal contact.

Data collection during the practical phase used low-cost and non-invasive methods:

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[1]The regulation of ERPI (Residential Structures for Older People) in Portugal is defined by Ordinance no. 67/2012, amended by Ordinance no. 349/2023 (13 November), which establishes strict standards regarding installation, organization, and functioning in order to ensure quality of care, humanization, and resident safety.

Non-participant observation:

Physical observation of the institutional environment in order to identify extrinsic risks (e.g., lighting quality, floor conditions, architectural barriers, presence of support bars).

Informal contacts:

Open interviews and conversations with staff members (social workers, assistants) and older adults, with the purpose of collecting perceptions about fall occurrence and circumstances.

Intervention development:

Based on literature data and local observation, educational materials were developed, including a Health Education Session Plan and an informative poster, aiming to raise awareness of preventive measures.

The project received prior authorization from institutional management. Participation of older adults and staff in informal contacts was voluntary, and confidentiality and anonymity were guaranteed for all involved, including omission of institutional names in the final report.

Literature review in scientific databases

Portugal presents a markedly high ageing index (192.4 older adults per 100 young people in 2024), which makes falls a strategic priority within the Active Ageing Action Plan 2023–2026.

In a study conducted in Portugal by Ana Lúcia Romão and Susana Nunes (2013), published in the *Portuguese Journal of Public Health* (2018), which involved a retrospective analysis of 153 reports of falls with injury the authors concluded that:

1. Most individuals were aged between 71 and 85 years (mean age: 72 years);

2. Autonomous movement to meet physiological needs (47.7%) was the most frequent reason, associated with the patient's health condition (67.3%);

3. Abrasions (28.1%) and bruises (28.1%) were the most common injuries. Cases involving moderate and severe injury generated the highest average costs, with severe orthopedic injuries being the most expensive for the institution;

4. Most falls occurred when the patient was alone, in the absence of healthcare professionals who could provide supervision, care, and monitoring.
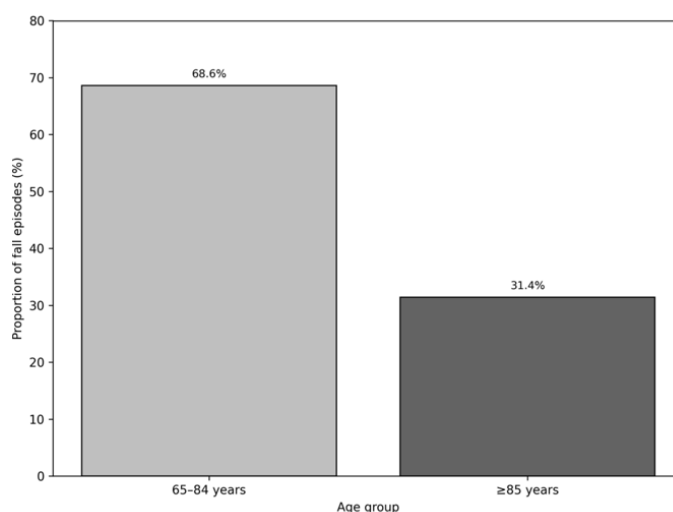
Another study, entitled *"Falls in older adults in Portugal: an epidemiological approach based on 2023 EVITA system data"*, published in issue no. 35 of the Epidemiological Bulletin *Observations* from the National Institute of Health Doutor Ricardo Jorge (INSA), revealed that falls among older adults tend to occur more frequently as age advances, particularly in places where individuals spend most of their time, such as the home and care institutions.

This study concluded that falls currently represent one of the main mechanisms of injury among older adults and are often responsible for emergency department admissions.

The aim of the study was to describe the epidemiological characteristics of falls among individuals aged 65 years and older who attended National Health Service emergency departments in Portugal in 2023, based on EVITA system data (*Epidemiology and Surveillance of Trauma and Accidents*).
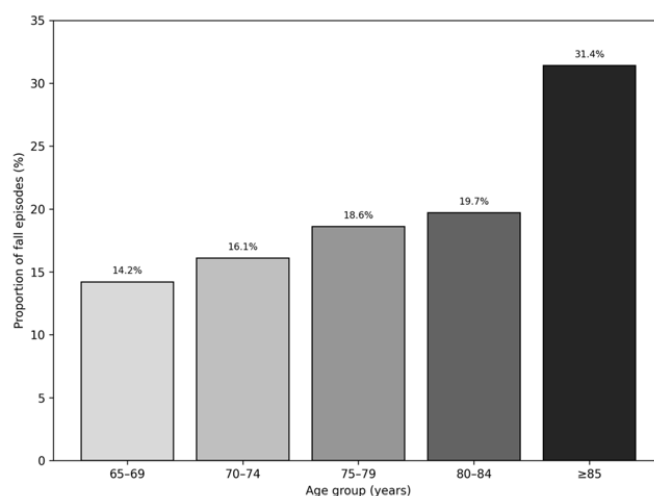
In 2023, 40,842 fall episodes among older adults requiring emergency services were recorded. According to the study, and observing Graph 1, a higher proportion of fall episodes was found in the age group ≥85 years (31.4%) compared to the group 65–84 years (68.6%). This difference was statistically highly significant ($p < 0.001$), indicating that the increase in falls with advancing age is a consistent phenomenon and unlikely to occur by chance. The Graph 2 immediately shows that:

- There is a progressive increase in the proportion of fall episodes with advancing age;

- The age groups from 65–69 to 80–84 years together account for 68.6% of episodes, with gradual growth across age classes;

- The ≥85 group clearly stands out, representing 31.4% of episodes, highlighting that falls.

Graph 1 Percentage distribution of fall episodes requiring emergency department care among individuals aged ≥65 years, by age group (65–84 years vs. ≥85 years), Portugal, 2023.
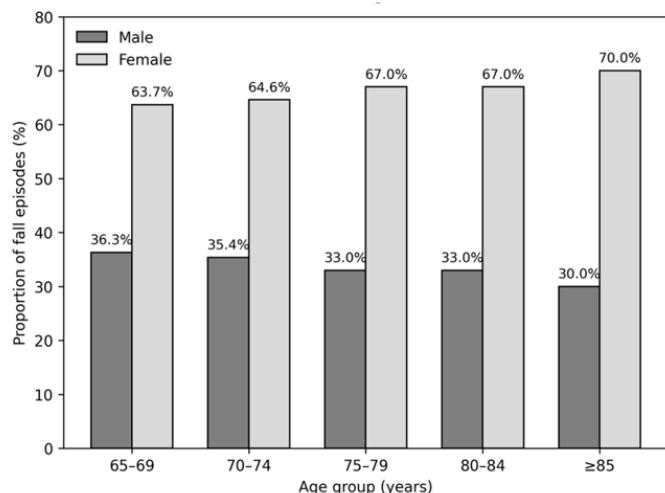
Source: Alves T et al.[1] Falls in older adults in Portugal: An epidemiological approach based on 2023 EVITA system data. *Epidemiological Bulletin Observations*, 13(35), 91–96.

Graph 2 Percentage distribution of fall episodes requiring emergency department care among individuals aged ≥65 years, by age groups from 65–69 to 80–84 years, versus ≥85 years, Portugal, 2023.

The same study (Graph 3) also reveals that, across all age groups, the proportion of falls is consistently higher among females. Furthermore, an increasing trend in the female proportion is observed with advancing age, reaching 70.0% in the ≥85 years group.

Graph 3 Percentage distribution of fall episodes by sex and by age groups from 65–69 to 80–84 years, versus ≥85 years, Portugal, 2023.

According to the same study, most falls occurred at home (63.9%), with this proportion increasing in the oldest age groups. Among individuals aged 80 years and older, falls in institutional areas and public spaces became particularly relevant, especially in nursing homes and residential care facilities.

The study highlights and reinforces the importance of prevention strategies focused on the environment and living conditions of the older population, as well as the need for healthcare planning within the context of demographic aging.

Reports and research studies further show that falls among patients/older adults account for a substantial proportion of preventable harm (World Health Organization, 2021).

According to the WHO (2021), a fall refers to the involuntary act of coming to rest on the ground or a lower level, excluding intentional changes in position to lean on furniture, walls, or other objects.

The analysis of the scientific literature, prioritizing articles published between 2020 and 2024, contributed to strengthening and detailing risk factors, as well as validating preventive interventions.

Nursing plays an essential role in the early identification of risk factors, the development of nursing diagnoses, and the implementation of preventive strategies. The nursing diagnosis "Risk for falls," proposed by NANDA-I, enables a systematic approach to identifying individuals susceptible to this event.

In the International Classification for Nursing Practice (ICNP®), an event refers to something that happens suddenly or a discrete occurrence in time. Within the "Focus" axis of the ICNP, a fall is described as an involuntary event in which an individual ends up on the ground or at a lower level. In Nursing Ontology, a fall is considered an event or episode.

Intrinsic and extrinsic risk factors

Review studies confirm that falls in LTCIs/ERPI are multifactorial events, with particular emphasis on the interaction between intrinsic and extrinsic factors affecting older adults, resulting in injuries and mobility restrictions.

Intrinsic factors include physiological changes associated with aging, chronic diseases, cognitive impairments, balance and gait disturbances, polypharmacy, and sensory deficits.

Extrinsic factors are related to the physical environment, namely inadequate lighting, slippery floors, loose rugs, absence of handrails, unstable furniture, and inappropriate footwear.

The use of multiple medications (polypharmacy) is consistently identified as a crucial risk factor, particularly among older adults with comorbidities. Reviews indicate the need for strict monitoring and management of medication (annual review), given the association of certain drugs with impaired balance and reduced alertness.

In addition to vision, gait, and balance deficits, fatigue is identified as a predictor of recurrent falls, significantly increasing risk. Other associated factors include negative self-perceived health status, urinary or fecal incontinence, and overall physical frailty.

Extrinsic risks remain an avoidable cause of falls. However, variation in the quality of institutional environments (urban versus rural settings, for example) suggests that facilities with fewer resources may have a greater number of uncorrected risk factors.

Among institutionalized older adults, simultaneous exposure to multiple risk factors significantly increases the likelihood of falls, making systematic risk assessment essential.

Interventions with levels of effectiveness and evidence

Systematic reviews confirm that the most effective interventions in institutional settings are multifaceted approaches, combining environmental modification with clinical and functional interventions:

Physical activity (Exercise)

Moderate physical activity is essential for good health and for preserving older adults' independence. Supervised exercise, particularly programs focused on balance training and muscle strengthening, has been shown to reduce the prevalence of falls among institutionalized older adults. Exercise improves functional capacity and agility, acting directly on intrinsic risk factors. Regular moderate activity and exercise also reduce the risk of falls and related injuries by helping control weight and maintaining healthy bones, muscles, and joints. Exercise can enhance balance, mobility, and reaction time. It may also increase bone mineral density in postmenopausal women and in individuals over 70 years of age.

Multidisciplinaryapproach:

Greater success in fall prevention is associated with interventions delivered by a qualified healthcare team (such as physiotherapists or nurses), reinforcing the need for individualized prevention protocols rather than standardized measures alone. Screening programs and environmental modifications are more effective when they involve a multidisciplinary approach and should be targeted at individuals with a history of falls or vulnerability to known risk factors. Most programs

focus on eliminating hazards such as loose rugs, excessive electrical cords in circulation areas, unstable furniture, and installing grab bars in bathrooms, along with raised toilet seats, handrails on both sides of staircases, and personal alarm systems to request assistance when needed.

According to the WHO (2021), underlying process failures include insufficient supervision of older patients, negligence in performing mobility assessments, and hazardous environments. Successful solutions have involved more cohesive teamwork, effective monitoring data, the establishment of an appropriate safety culture, a critical review of environmental risks, and the rigorous implementation of protocols based on best practices to prioritize fall prevention.

Results and discussion

Fieldwork conducted in the partner institutions revealed a high level of awareness of the problem among staff members. The profile of the most susceptible older adult, identified in the literature (advanced age, polypharmacy, and functional deficits), was confirmed through observation.

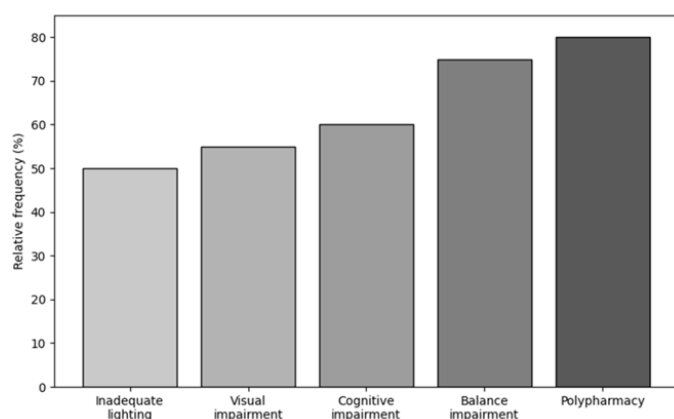### Need for a definition of falls

A clear definition of falls is an important requirement, as many studies fail to specify an operational definition, leaving room for multiple interpretations of the concept. Older adults tend to define a fall as a loss of balance, whereas healthcare professionals generally refer to events that result in injury and health damage. Therefore, an operational definition of falls, with explicit inclusion and exclusion criteria, is highly relevant (WHO, 2010).

Appropriate identification of risks

Risks within institutions must be properly identified and eliminated in order to prevent falls. Environmental factors combined with older adults' frailty (disabling conditions, dementia, unstable gait) and other conditions (such as polypharmacy) are responsible for a high number of falls.

Risk identification and the use of assessment scale - such as the Morse Fall Scale and the Johns Hopkins Fall Risk Assessment Tool (JH-FRAT) - can help reduce the number of fall incidents.

In Graph 4, we observe, some of the various risk factors associated with falls. According to Alves T et al.[1] studies indicate that the number of falls is expected to increase, not only due to the growing older population in the coming years, but also because of comorbidity, polypharmacy, and the frailty associated with aging.

Graph 4 Risk factors associated with falls

Source: Alves T et al.[1] Falls in older adults in Portugal: An epidemiological approach based on 2023 EVITA system data. *Epidemiological Bulletin Observations*, 13(35), 91–96.

In a study conducted by Nelson et al.[9] it is possible to develop programs and applications to automatically calculate the risk of falls among hospitalized older adults. One way to implement such an application is to use Semantic Web technologies to represent both the knowledge and rules contained in fall risk assessment scales, as well as patient data, through the use of ontologies.

Consequences of Falls

The consequences of falls may be physical, functional, psychological, and social. The most frequent injuries include bruises, abrasions, contusions, fractures, and traumatic brain injuries.

From a functional perspective, a decline in mobility and an increase in dependence in activities of daily living are often observed. Psychologically, the fear of falling again stands out, which may lead to social isolation, sedentary behavior, and loss of autonomy.

Prevention Strategies

Fall prevention should be based on a multidimensional approach, involving environmental adaptation, promotion of physical activity, health education, and engagement of the multidisciplinary team.

The intervention plan developed therefore focused on primary prevention measures addressing extrinsic risk factors, in accordance with international guidelines, including:

- The use of closed, non-slip footwear;

- Installation of grab bars in bathrooms;

- Ensuring adequate lighting.

The emphasis on maintaining autonomy in activities of daily living reinforces the need for mobility programs.

Health education directed at professionals, older adults, and caregivers increases health literacy and promotes safe behaviors. The promotion of functional autonomy, through maintaining daily living activities and engaging in appropriate physical exercise, also plays a central role.

The main limitation of the project was the restricted timeframe and some difficulty in translating theoretical knowledge into daily institutional practice. However, informal contacts allowed the initiation of an awareness-raising process among staff.

Another challenge relates to environmental hazards, which are almost always present in these settings, such as poorly lit corridors and lack of night lights, among others.

In Portugal, the Directorate-General of Health (DGS), following a joint proposal from the Department of Quality in Health, the Portuguese Medical Association, and the Portuguese Nursing Association, issued a guideline (Standard no. 008/2019, dated 9 December) entitled *"Prevention and Intervention in Adult Falls in Hospital Care"*. This document defines, among many other aspects, the basic precautions to be applied to all individuals, regardless of fall risk, in inpatient units.

In this standard, recommendation grades and levels of evidence were based on those defined by the Registered Nurses' Association of Ontario: *Preventing Falls and Reducing Injury from Falls* (4th ed.). Toronto, ON: Author. September 2017.

Conclusion

Falls among institutionalized older adults constitute a highly relevant public health problem, with a significant impact on quality of life and healthcare costs. Early identification of risk factors and the implementation of systematic preventive strategies are essential to reduce the incidence of falls.

The present study contributed to raising awareness and providing a theoretical framework regarding the problem of falls in institutionalized older adults, confirming their multifactorial nature and high prevalence. The review of scientific databases demonstrates that the most effective prevention in LTCIs/ERPI relies on the adoption of multifaceted intervention programs, with a crucial focus on supervised physical exercise and pharmacological management, in addition to essential environmental modifications.

It is recommended that institutions supporting older adults formally integrate the most recent scientific evidence, prioritizing individualized fall risk assessment and the implementation of regular, simple, and adapted exercise protocols, as a means to reduce dependence, improve quality of life, and decrease fall incidence within their population.

In the Global Action Plan for Patient Safety 2021-2030 entitled "Towards the Elimination of preventable harm in health care," the WHO (2021), in the leading indicators, refers to an indicator that relates to falls, namely indicator "3.6". Preventable deaths related to patient falls during hospitalization."[10-17]

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None.

Conflicts of interest

The authors declare that there are no conflicts of interest.

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