

RESEARCH ARTICLE (ORIGINAL) 

## Prevalence and characterization of home and leisure accidents of Community-dwelling older people: An observational cross-sectional study

*Prevalência e caracterização de acidentes domésticos e lazer de idosos em contexto comunitário: Estudo observacional transversal*

*Prevalencia y caracterización de los accidentes domésticos y de ocio de las personas mayores en entornos comunitarios: Un estudio observacional transversal*

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### Abstract

**Background:** Population aging contributes to an increase in home accidents, with serious personal, family, and social consequences.

**Objectives:** To assess the prevalence and characteristics of home accidents in older people using functional units of a Health Center.

**Methodology:** Cross-sectional, observational study with a non-probability convenience sample of 139 older people.

**Results:** Falls at home are the most prevalent home accident in the past 12 months, as a consequence of slipping. Some low but statistically significant associations were observed between the number of falls, risk of falling, and fear of falling, and between age, risk of falling, and fear of falling.

**Conclusion:** The results indicate that nurses, integrated into interdisciplinary teams, should take appropriate measures. Further longitudinal studies will allow monitoring the measures adopted and the necessary adaptations to prevent and reduce the risk of falling and improve the quality of life of the aging population.

**Keywords:** aged; accidents, home; accidental falls; prevalence; risk factors; community

### Resumo

**Enquadramento:** O envelhecimento da população contribui para o aumento de acidentes domésticos, com graves consequências pessoais, familiares, sociais.

**Objetivos:** Avaliar a prevalência e características de acidentes domésticos em pessoas idosas clientes de unidades funcionais de um Centro de Saúde.

**Metodologia:** Estudo observacional transversal, amostra não probabilística, por conveniência, de 139 pessoas idosas.

**Resultados:** As quedas no domicílio são os acidentes domésticos com maior prevalência nos últimos 12 meses, em sequência de escorregamento. Observaram-se algumas associações baixas, mas estatisticamente significativas, entre o número de quedas, o risco de queda e medo de cair, e entre a idade, o risco de queda e medo de cair.

**Conclusão:** Os resultados observados implicam medidas adequadas por parte dos enfermeiros, integrados em equipas interdisciplinares. A realização de novos estudos de cariz longitudinal, permitirá a monitorização das medidas adotadas e as adaptações necessárias para prevenir e diminuir o risco de queda, e melhorar a qualidade de vida da população envelhecida.

**Palavras-chave:** idoso; acidentes domésticos; acidentes por quedas; prevalência; fatores de risco; comunidade

### Resumen

**Marco contextual:** El envejecimiento de la población contribuye a aumentar los accidentes domésticos, con graves consecuencias personales, familiares y sociales.

**Objetivos:** Evaluar la prevalencia y las características de los accidentes domésticos en las personas mayores de las unidades funcionales de un centro de salud.

**Metodología:** Estudio observacional transversal, muestra no probabilística, por conveniencia, de 139 personas mayores.

**Resultados:** Las caídas en el domicilio son los accidentes domésticos más frecuentes en los últimos 12 meses, después de los resbalones. Se observaron algunas asociaciones bajas pero estadísticamente significativas entre el número de caídas, el riesgo de caídas y el miedo a caerse, y entre la edad, el riesgo de caídas y el miedo a caerse.

**Conclusión:** Los resultados observados implican que los enfermeros, integrados en equipos interdisciplinarios, toman las medidas adecuadas. Otros estudios longitudinales permitirán hacer un seguimiento de las medidas adoptadas y de los ajustes necesarios para prevenir y reducir el riesgo de caídas y mejorar la calidad de vida de la población envejecida.

**Palabras clave:** anciano; accidentes domésticos; accidentes por caídas; prevalencia; factores de riesgo; comunidad



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## Introduction

Population aging has increased significantly in recent decades and contributed to the growing prevalence of falls at home, affecting all of society with severe personal, family, and social consequences. This reality, which is expected to worsen in the next years, brings about an urgent need for multidisciplinary intervention in the prevention of these accidents (Instituto Nacional de Estatística [INE], 2020). Home and leisure accidents (HLAs) have been a concern of national and international organizations, which, through surveillance and data recording systems collected in hospital emergency services, have been monitoring this ever-aggravating phenomenon (Direção-Geral da Saúde [DGS], 2012).

In Portugal, 26681 home accidents were recorded from 2013 to 2015, mainly associated with falls, whose highest prevalence is in the age group above 75 years, being in line with the European reality regarding the most frequent type of injury in this type of accident (Alves et al., 2017). Given the relevance of this problem, an observational study was conducted with older people aged over 65 years. It is part of the institutional project Anos de Vida: CSI (Casa Segura Para Idosos) [Years of Life: Safe Home for Older People] under the National Program for Accident Prevention - COM MAIS CUIDADO [WITH MORE CARE] project, which aims at the promotion of older people's autonomy and independence to safely achieve gains in years of independent life (DGS, 2012).

This study aims to assess the prevalence and characterize home accidents among older people who are users of the functional units of a Health Care Center of central Portugal.

## Background

Population aging is an emerging global phenomenon, with economic, social, and healthcare repercussions.

Portugal maintains the trend of demographic aging, with an increase in the median age of the resident population from 43.5 to 45.5 years between 2014 and 2019 and an increase of 30% in the aging index, which was 152.3% in 2017 (INE, 2020).

Despite the socioeconomic improvements seen in recent decades, home, leisure, and work accidents remain a major cause of mortality, morbidity, and disability. Fatal accidents are the most observable facet of the phenomenon. However, for each individual who loses their life in an accident, there is a much larger number with a temporary or permanent disability, leading to many human, social, and productivity losses. For instance, from 2008 to 2010, more than 233,000 people died from accidents in the European Union, 42% of which were due to HLA. These accidents also led to a significant increase in hospitalizations and days of hospitalization during this period (DGS, 2012).

In this context, national systems for the surveillance and recording of home accidents were created, currently called EVITA - Epidemiology and Surveillance of Trauma

and Accidents, based on data collection in samples from emergency services of the National Health Service (NHS), presenting, over the years, reports with increasingly more accurate results, but always very worrying and demonstrative of their growth and respective repercussions (Alves et al., 2017, 2019).

Within the scope of the National Program for Accident Prevention, the *COM MAIS CUIDADO* [WITH MORE CARE] project was created in 2012, in a partnership between the DGS and MAPFRE Foundation, for the prevention of home accidents in older people, for the implementation of effective fall prevention measures, with a focus on improving autonomy and mobility, with individual and collective health gains (DGS, 2012).

The number of HLA victims who need to use an emergency service has been increasing in recent years and, in 2019, 195,400 Portuguese were registered with an HLA, with the home being the place where it most often occurs (45%). This HLA is more common in the age group of over 65 years (29%) and in the female gender (65%). Among the different HLA, falls are the most repeated source of injury resulting from this type of accident, with a higher percentage in women (74%), compared to men (62%). The distribution of the different injury mechanisms changes with age. In fact, although there is a high proportion (greater than 49%) of accidental falls in all age groups, the age group of 65 and older stands out (88%; Alves et al., 2019).

Falls in older people are considered one of the most relevant public health issues, due to their physical, social, and economic repercussions. As a result of falling, older people may suffer numerous consequences, such as loss of mobility, fear of falling again, social isolation, and the need for hospitalization, among many others.

According to Oliveira et al. (2018), falls are a complex phenomenon with multifactorial etiology and dynamic interaction, which should be considered in fall risk assessment. The risk factors for falls among people aged 65 and older are referred to by several authors and are classified into intrinsic and extrinsic (Sousa et al., 2016). Risk factors are multiple, although most are biophysiological characteristics. In this dimension, and due to a greater number of factors, the risk of falling and the consequent injury increases (Oliveira et al., 2018).

Some recent studies in this area, like the one by Oliveira et al. (2018), identified more than one risk factor for falls in each dimension in a sample of 31 older people. The authors observed a decrease in walking speed, assessed by the Timed up and go (TUG) test, where values above 12.6 seconds should be considered high risk for falls, and low confidence in performing activities/fear of falling, assessed by the Portuguese version of the Falls Efficacy Scale (FES). The authors also observed poly medication and non-adoption of safety behaviors in older people.

In a study with a sample of 369 older people, 34.5% of whom were at risk of falling, Costa (2019) observed that 33.9% of people admitted to having fallen at least once in the past 12 months, mainly: indoors (58.4%), walking (50.4%), by "slipping" (33.6%), and by "tripping" (32.8%); with an average of 5.71 days of disability in

performing activities of daily living (ADLs). A total of 53.6% of falls resulted in injury, 37.3% in traumatic wounds, and 23.9% in fractures, with the most prevalent body areas being the upper limbs (43.8%). Of the 33.9% of fall victims with at least one episode in the last 12 months, 77.6% needed to use health services. A correlation between fall risk and age was also observed ( $p = 0.000$ ), being higher in older people. Individual, family, and community interventions, with the use of community partnerships, based on health planning for fall prevention are considered fundamental.

According to the Registered Nurses' Association of Ontario (2017), fall prevention in older people involves programs with 3 essential phases: identification of risk factors for falls, decrease in the incidence of falls and decrease in the incidence of fall injuries.

According to Sousa et al. (2017), among other strategies, intervention programs should include a physical exercise program, aimed at intrinsic factors, namely the musculoskeletal dimensions and conditioning (e.g.: general exercise, strength training, resistance training, specific exercises - dance, Tai Chi), balance (balance training, vibration platform), walking, combined exercises (flexibility, balance, and resistance), medication (management and adjustment of polymedication, adjustment of psychotropic medication, vitamin D supplements), and referral to other professionals (eye screening, cardiology consultation, podiatry consultation...).

In terms of extrinsic risk factors for falling, namely those of the surrounding environment, Chamusca (2019), in a study with a sample of 661 elderly people, states that participants reported not having obtained information about the arrangement of furniture in the house (13.8%), use of non-slip mat in the bathroom/shower (11.4%), and use of safety devices in the bathroom (12.8%). The author recognizes the lack of information among older people about preventive measures, as well as about the need to readjust their homes and consider the correct implementation and subsequent effectiveness of fall prevention measures.

Azevedo (2015) recommends interventions aimed at removing dangerous objects, with the active participation of older people in assessing the environment, in order to understand the social and physical impact of the environmental elements. This author also suggests modifications that facilitate older people's daily activities, namely: removal of carpets, use of appropriate and safe footwear (e.g. slippers or high-heeled shoes), leveling of circulation surfaces, avoidance of the use of stairs, and use of support bars and supports in strategic locations. With the increase in the older population, preventing older adults from falling is an ever more concerning challenge for health care teams. For Enderlin et al. (2015), the number of falls and the severity of injuries can be decreased by identifying, removing, and/or modifying various risk factors and implementing risk reduction interventions. Nurses caring for this population are in a pivotal position to screen, educate, and intervene for better outcomes, and use existing information and resources in collaboration with other healthcare professionals to

optimize safety in an aging population.

For Powell-Cope et al. (2018), nurses play an important role in helping older people and their caregivers understand the importance of modifications to their homes to prevent falls. The same authors note that because some seniors are reluctant to change in their homes, the potentially serious consequences of a fall should be emphasized and the help of caregivers, family members, and friends should be required.

## Research questions

What are the prevalence and characteristics of home and leisure accidents in the past 12 months in older people aged 65 years or more?

Is there an association between the sociodemographic variables (age, gender, area of residence, marital status, education) and the number of home accidents (falls, burns, poisoning, suffocation)?

Is there an association between the sociodemographic variables (age, gender, residence area, marital status, education), TUG, and FES?

Is there an association between the number of home accidents, TUG, and FES?

## Methodology

This is an observational, cross-sectional, and descriptive-correlational study, integrated into a larger project and in conjunction with other programs developed in Community Care Unit (*Unidade de Cuidados na Comunidade - UCC*) of a CS in central Portugal.

The population of this study was composed of people aged over 65 years, living with their families in the municipality and area of coverage of the CS, who went for medical consultation between October and December 2020. The non-probabilistic and convenience sample included all patients who met the exclusion/inclusion criteria and were willing to participate voluntarily in the study during that period.

Inclusion criteria were health center users, older than 65 years, with the functional capacity to move to perform the tests, evaluated through the ability to perform the TUG, demonstrated on site, and cognitive capacity to answer the questionnaires, who presented a score  $\geq 15$  points in the Mini-Mental State Examination (MMSE). Exclusion criteria were older people with total mobility dependence (unable to walk) and those in wheelchairs. The data collection form included questionnaires recommended by the DGS (2012): sociodemographic questions, characterization of individual risk of home accidents (CRIAD), TUG, Assessment of fall risk in polymedicated patients (ARQDP), and Portuguese version of FES (Melo, 2011). A pre-test of the data collection form was performed with the participation of 10 patients with the characteristics of the study sample before starting the data collection process.

The fundamental rights of human beings, as defined by

the codes of ethics, were considered and respected, and the approval of the Ethics Committee of the Health Sciences Research Unit: Nursing (UICISA: E), Differentiated Unit of the Nursing School of Coimbra (opinion no. 804/08-2021) was obtained. The informed consent was presented and signed by all participants.

Data were statistically processed using the Statistical Package for the Social Sciences (SPSS), version 25.0. Descriptive statistical tests were used, namely for continuous variables with frequency tables (absolute and relative), measures of central tendency such as the mean, measures of dispersion or variability such as the standard deviation, and the corresponding minimum and maximum values. In the inferential analysis, for association tests, Spearman's correlation coefficient ( $r_s$ ) was applied for ordinal/interval variables. A value of  $p < 0.05$  was set

as the critical significance value of the test results.

## Results

The study sample consists of 139 older people, 34 (24.5%) men and 105 (75.5%) women, with a mean age of 78.88 years ( $SD = 7.86$ ), of which the majority are older than 80 years ( $n = 61$ ; 43.9%). Most reside in urban areas ( $n = 82$ ; 59%), are widowed ( $n = 69$ ; 49.6%), have completed primary school ( $n = 88$ ; 63.3%), live with a partner ( $n = 61$ ; 43.9%), do not care for anyone ( $n = 126$ ; 90.6%), have no informal caregiver ( $n = 112$ ; 79.9%). Among those who care for someone, 6.5% ( $n = 9$ ) care for the wife/husband, and of those who have an informal caregiver, the majority is the daughter/son ( $n = 19$ ; 13.7%; Table 1).

**Table 1**

*Sociodemographic characterization of the sample (N = 139)*

Variable	n	%	Variable	n	%
<b>Age (years)</b>			<b>Cohabiting</b>		
65–74	42	30.2	Couple	61	43.9
75–84	55	39.6	Extended family	27	19.4
≥ 85	42	30.2	Alone	37	26.6
<b>Gender</b>			Other	14	10.1
Female	105	75.5	<b>Takes care of someone</b>		
Male	34	24.5	Yes	13	9.4
<b>Residential area</b>			No	126	90.6
Rural	57	41.0	<b>Person requiring care</b>		
Urban	82	59.0	Daughter/son	1	0.7
<b>Marital status</b>			Mother/father-in-law	1	0.7
Single	1	0.7	Wife/Husband	9	6.5
Married/Cohabiting	65	46.7	Others	2	1.4
Widowed	69	49.6	<b>Informal caregiver</b>		
Divorced/Separated	4	2.9	Yes	27	19.4
<b>Schooling</b>			No	112	79.9
None	17	12.2	<b>Who takes care</b>		
Primary school	88	63.3	Daughter/Son	19	13.7
Secondary school	24	17.3	Wife/Husband	5	3.6
Higher education	10	7.1	Nephew	1	0.7
			Others	2	1.4

Concerning HLA in the last 12 months, falls are the most reported accidents, with a prevalence of 45.3% ( $n = 63$ ), followed by burns, with 6 older people (4.7%) reporting 1 episode, and 4 (2.7%) reporting 2 burn episodes, 1 drug poisoning, and 1 electric shock.

Falls are reported mostly as one fall episode ( $n = 43$ ; 30.9%), occurring inside the house ( $n = 46$ ; 33.09%), caused by slipping ( $n = 43$ ; 33.09%), in which 24.6% ( $n = 24$ ) became dependent for ADL and only 10.07% ( $n = 14$ ) had a fracture (Table 2).



**Table 2***Characterization of Individual Risk for Home Accident (N = 139)*

Variable	<i>M</i>	<i>SD</i>	<i>n</i>	%
<b>Number of falls</b>	0.73	1.11		
<b>Falls in the last 12 months</b>				
Yes			63	45.3
No			76	54.7
<b>Number of falls in the last 12 months</b>				
1 fall			43	30.9
2–3 falls			17	12.3
> 3 falls			3	2.1
<b>Location</b>				
Inside the house			46	33.1
At the entrance or in the backyard			3	2.2
Outside the house, outdoors			10	7.20
Outside the house, indoors			4	2.9
<b>Cause of the fall</b>				
Slipped			43	33.1
Tripped			11	2.15
Fainted			3	2.2
Got dizzy			3	2.2
Felt weak in the legs			3	2.2
<b>Consequences of the fall</b>				
Incapable of performing activities of daily living			34	24.6
Minor injury			7	5.0
Fracture			14	10.1
Unimportant			8	5.7

Moreover, women ( $n = 38$ ; 74%), those living in urban areas ( $n = 28$ ; 66.6%), and those aged 75–84 years ( $n = 63$ ; 45.3%) have the highest prevalence of falls in the last 12 months. In terms of absolute frequencies, the most reported pre-existing diseases are cardiovascular diseases (high blood pressure,  $n = 22$ ), followed by musculoskeletal and osteoarticular diseases (arthrosis,  $n = 15$ ), metabolic disorders (diabetes,  $n = 9$ ), and sensory changes, namely visual impairment (cataracts,  $n = 10$ ).

The TUG assessment revealed that the majority of the sample is independent for basic transfers ( $n = 81$ ; 58.3%). However, 20 older people (14.4%) have reduced mobility and 13 (9.4%) are dependent for performing many ADLs and mobility.

With regard to the assessment of the risk for falls in polymedicated patients, the higher number of negative answers (7 out of 11) shows that the likelihood of falling in our sample is not high. The highest percentage of positive answers (> 50%) were in items 2, 3, 6, and 9. This means that most take four or more medications daily ( $n = 90$ ; 64.7%), have difficulty walking or standing ( $n = 79$ ; 56.8%), have felt insecure on their own feet, weak,

or dizzy ( $n = 86$ ; 61.9%), and usually exercise less than two days a week ( $n = 76$ ; 54.7%).

Regarding fear of falling, FES shows a high overall value (80.28). These results reveal older people's confidence in performing most daily tasks. However, we note that the tasks in which they reported less confidence were *reaching high cupboards* ( $M = 7.13$ ;  $SD = 3.01$ ) and doing small shopping ( $M = 7.37$ ;  $SD = 3.40$ ). The task with the highest confidence was *walking indoors* ( $M = 8.83$ ;  $SD = 2.14$ ).

Table 3 presents the significant relationships between observed variables: low but significant associations, one of them negative, between the number of falls, the TUG ( $r_s = 0.287$ ;  $p < 0.01$ ), and the FES ( $r_s = -0.283$ ;  $p < 0.01$ ). These results suggest that more accidents in the past 12 months/higher number of falls are associated with greater dependence for ADLs and mobility, and greater fear of falling in performing them. We also observed low relationships between age and higher TUG ( $r_s = 0.329$ ;  $p < 0.001$ ) and FES ( $r_s = -0.328$ ;  $p < 0.001$ ) values. These results suggest that older age is related to a higher risk for falls (TUG) and less confidence in performing ten easy, ADL-related tasks (FES).

**Table 3***Relationships between number of falls and age with total TUG and FES (N = 139)*

Variables		TUG	FES
Accidents last 12 months – Number of falls	$r_s$	<b>0.287**</b>	<b>- 0.283**</b>
	$p$	0.01	0.01
Age	$r_s$	<b>0.329**</b>	<b>0.328**</b>
	$p$	0.000	0.000

Note:  $r_s$  = Spearman's correlation.

## Discussion

The distribution of our sample in terms of gender and age is similar to the national context. The older population is mostly composed of women whose life expectancy at birth was estimated at 80.80 years, being 77.78 years for men and 83.43 years for women in the period 2016–2018 (INE, 2020). More than half have completed primary school (63.3%), and 12.2% have no schooling at all, which is common in this age group (INE, 2020), and could be explained by the lack of literacy that occurred in the past.

The most commonly reported pre-existing diseases - heart diseases (hypertension), musculoskeletal and osteoarticular diseases (arthrosis), metabolic disorders (diabetes), and sensory impairment (cataracts) - fall within the top five diseases causing the most morbidity among older people in Portugal, namely Lombalgia/cervicalgia low back pain/neck pain, sense organ diseases, and diabetes (INE, 2020), and are corroborated by results from other studies (Cardoso et al., 2017). These diseases may predispose to changes in balance, functional dependence, and visual impairment, which are considered intrinsic risk factors for falls (Sousa, 2016).

Falls are clearly the most frequent HLA in our sample, with a high prevalence in the past 12 months (45.5%), which is in line with national records and studies (Alves et al., 2017; Alves et al., 2019; Cardoso et al., 2017; Costa, 2019; DGS, 2012; Oliveira et al., 2018) and with the European reality (EuroSafe, 2016). They present similar characteristics in terms of age (> 80 years), female gender, low education (primary school), fall location (inside the house), cause of the fall (slipping), and the incapability of performing ADLs as a consequence.

Although most of the sample presented as independent in basic transfers ( $n = 106$ ; 76.3%), 20 older people (14.4%) have reduced mobility and 13 (9.4%) are dependent for many ADLs and in mobility, that is, a quarter of our sample presents reduced mobility and, therefore, some risk of falling. These results corroborate Ferreira (2011), where most older people have reduced independence in ADLs, and the American Geriatrics Society (Oliveira et al., 2018), where people performing the TUG above 12.6 seconds should be considered at high risk of falling. It should be noted that the TUG instrument is recommended by several organisms and researchers as a good option to assess mobility and for being a good predictor of fall

risk (DGS, 2012; Oliveira et al., 2018). However, some authors warn about some limitations and avoid using it alone to identify individuals at high risk of falling in community settings (Barry et al., 2014).

Regarding fall risk assessment in polymedicated patients, most take four or more medications daily ( $n = 90$ ; 64.7%), have difficulty walking or standing ( $n = 79$ ; 56.7%), have felt insecure on their own feet, weak, or dizzy ( $n = 86$ ; 61.9%), and usually exercise less than two days a week ( $n = 76$ ; 54.7%). Polymedication, difficulty in walking/standing, insecurity, weakness/tiredness, and lack of physical exercise are also considered intrinsic risk factors by several authors (Oliveira et al., 2018; Sousa, 2016) and require special attention from nurses in interdisciplinary teams, including the caregivers. The early detection of signs and manifestations that require a more rigorous study and referral can prevent situations of higher fall risk (Powell-Cope et al., 2018).

With regard to the fear of falling, the sample showed an overall high level of confidence in performing the assessed ADLs (total FES = 80.28). The ADLs in which they reported lower confidence were *reaching high cupboards* and *doing small shopping*, and the most confident one was *walking inside the house*. The fear of falling/lack of confidence can evolve into ptophobia (phobic fear of falling), being also considered an intrinsic risk factor, associated with a perceived difficulty in performing the task and directly related to the feeling of risk (Oliveira et al., 2018; Sousa et al., 2016), possibly more present after a fall episode, which was not observed in our sample.

According to Vitorino et al. (2017), a higher number of falls, the female gender, a worse self-assessment of health status, and age seem to be associated with fear of falling. Therefore, health professionals should be aware of its presence because older people's emotional response to performing certain tasks and frequently avoiding some daily tasks may favor immobility and increase the physical decline associated with aging, reduced physical capacity, and social isolation, which may compromise their independence (Oliveira et al., 2018).

The introduction of interventions to control fear and prevent dependence and functional decline should include an adequate assessment with supervised physical exercise to strengthen upper and lower limb muscles, balance development, group educational activities, and modification of risk factors (Vitorino et al., 2017).

The significant relationships found between the number

of falls, TUG, and FES suggest that a greater number of falls is associated with greater dependence for ADLs and mobility and lower confidence in performing them. On the other hand, the significant relationships between age and higher TUG and FES values suggest that older age is associated with a higher risk of falling (TUG) and less confidence in performing ten easy ADL-related tasks (FES). These relationships converge with results found in other studies, where older age, female gender, functional frailty, fall location, and fear of falling, among other factors, are associated with the number of falls (Alves et al., 2017; Cardoso et al., 2017; Costa, 2019; EuroSafe, 2016; Oliveira et al., 2018).

A correct assessment of intrinsic and extrinsic risk factors, followed by interventions to remove and/or modify said factors, is key to decreasing the number of falls and the severity of injuries. Nurses are uniquely positioned to screen, educate, and intervene for better outcomes by using existing information and resources, in collaboration with other healthcare professionals and caregivers, optimizing safety in an aging population (Enderlin et al., 2015; Powell-Cope et al., 2018).

This study has some limitations, namely having used a non-probability convenience sample as it was only possible to collect data over the period of 3 months. Thus, we suggest the development of a more complex study using a randomized sample of 363 patients, based on a sampling error of 5% and a 95% CI for a population of 6542 enrolled older adults.

## Conclusion

In this study, falls clearly emerged as the ADL with the highest prevalence, with age (> 80 years), female gender, low education ( $\leq$  1-4 years), place of fall (inside the house), cause of fall (slipping), and the consequence of being incapable of performing ADLs being the most evident characteristics. The significant associations found between the number of falls and age and the results of TUG and FES suggest that a higher number of falls in the last 12 months are related to a higher dependence for ADLs and mobility, and lower confidence in performing them, and that higher age is related to a higher risk of falling and lower confidence in performing ADLs.

These results show that nurses in interdisciplinary teams must put greater attention to the dimension and characteristics of this phenomenon, with a correct, regular, and systematic assessment of intrinsic and extrinsic risk factors. The identification of older people at higher risk of falling, followed by the implementation of several strategies and interventions to remove and/or modify the above-mentioned factors, can prevent and reduce the number of falls and the severity of injuries and enhance safety in an increasingly aged population.

New longitudinal studies should be carried out, with random and representative samples of the population under study, with rigorous and validated assessment tools, including home environmental assessment, and the assessment of the results of the implemented measures,

allowing for the monitoring of their effectiveness and the necessary corrections and adjustments. These measures should include promoting safe behaviors among older people, improving the level of environmental safety, raising awareness among health professionals, caregivers, and family members in the approach to ADLs, with greater emphasis on falling at home, and promoting the regular practice of physical activity among older people.

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## References

- Alves, T., Rodrigues, E., Mexia, R., Neto, M., & Matias-Dias, C. (2019). Acidentes domésticos e de lazer: Uma ocorrência em Portugal com necessidade de abordagem interdisciplinar. *Boletim Epidemiológico*, 8(Supl 11), 80–83. <http://repositorio.insa.pt/handle/10400.18/7140>
- Alves, T., Rodrigues, E., Neto, M., Mexia, R., & Dias, C. M. (2017). Acidentes domésticos e de lazer: Resultados do sistema de vigilância EVITA apurados para o período 2013-2015. *Boletim Epidemiológico*, 18(2), 43–46. [http://repositorio.insa.pt/bitstream/10400.18/4718/1/Boletim\\_Epidemiologico\\_Observacoes\\_N18\\_2017\\_artigo10.pdf](http://repositorio.insa.pt/bitstream/10400.18/4718/1/Boletim_Epidemiologico_Observacoes_N18_2017_artigo10.pdf)
- Azevedo, L. S. (2015). *A queda no idoso: Fatores de risco e prevenção* [Master's Dissertation, Faculty of Medicine of Coimbra University]. Repositório Institucional da Faculdade de Medicina da Universidade de Coimbra. <https://eg.uc.pt/bitstream/10316/31984/1/Factores%20de%20risco%20e%20preven%C3%A7%C3%A3o%20.pdf>
- Barry, E., Galvin, R., Keogh, C., Horgan, F., & Fahey, T. (2014). Is the timed up and go test a useful predictor of risk of falls in community dwelling older adults: A systematic review and meta-analysis. *BMC Geriatrics*, 14(1), 14. <https://doi.org/10.1186/1471-2318-14-14>
- Cardoso, T., Martins, M., & Monteiro, M. (2017). Community care unit and elderly health promotion: An intervention program.



- Revista de Enfermagem Referência*, 4(13), 103–114. <https://doi.org/10.12707/RIV16071>
- Chamusca, D. (2019). *As condições habitacionais versus queda dos idosos: A enfermagem de reabilitação* [Master's Dissertation, Nursing School of Porto]. Repositório Institucional da Escola Superior de Enfermagem do Porto. <https://comum.rcaap.pt/handle/10400.26/29470>
- Costa, A. (2019). *Risco de queda no idoso em contexto comunitário* [Master's Dissertation, Polytechnic Institute of Viana do Castelo]. Repositório Institucional do Instituto Politécnico de Viana do Castelo. <https://comum.rcaap.pt/handle/10400.26/29470>
- Direção-Geral da Saúde. (2012). *Programa nacional de prevenção de acidentes*. <https://www.dgs.pt/paginas-de-sistema/saude-de-a-a-z/programa-nacional-de-prevencao-de-acidentes.aspx>
- Enderlin, C., Rooker, J., Ball, S., Hippensteel, D., Alderman, J., Fisher, S. J., McLeskey, N., & Jordan, K. (2015). Summary of factors contributing to falls in older adults and nursing implications. *Geriatric Nursing*, 36(5), 397–406. <https://doi.org/10.1016/j.gerinurse.2015.08.006>
- EuroSafe. (2016). *Injuries in the European Union: Summary of injury statistics 2012-2014*. <https://www.eurosafe.eu.com/key-actions/injury-data/reports>
- Ferreira, J. F. (2011). *Autonomia e funções cognitivas numa amostra de idosos de Coimbra sob resposta social* [Master's Dissertation, Miguel Torga Institute of Higher Education]. Repositório Institucional do Instituto Superior Miguel Torga. <http://repositorio.ismt.pt/handle/123456789/117>
- Instituto Nacional de Estatística. (2020). *Estatísticas demográficas: 2019*.
- Melo, C. (2011). Adaptação cultural e validação da escala “falls efficacy scale” de Tinetti. *Revista da Associação Médica Brasileira*, 55(1986), 192–196.
- Oliveira, T., Lavareda Baixinho, C., & Henriques, M. A. (2018). Risco multidimensional de queda em idosos. *Revista Brasileira em Promoção da Saúde*, 31(2), 1–9. <https://doi.org/10.5020/18061230.2018.7058>
- Powell-Cope, G., Thomason, S., Bulat, T., Pippins, K. M., & Young, H. M. (2018). Preventing falls and fall-related injuries at home. *American Journal of Nursing*, 118(1), 58–61. <https://doi.org/10.1097/01.NAJ.0000529720.67793.60>
- Registered Nurses' Association of Ontario. (2017). *Preventing falls and reducing injury from falls* (4a ed.). <https://rnao.ca/bpg/guidelines/prevention-falls-and-fall-injuries>
- Sousa, L. (2016). *Prevenção de quedas: Capacitar para prevenir* [Master's Dissertation, Polytechnic Institute of Santarém]. Repositório Institucional do Instituto Politécnico de Santarém. <https://repositorio.ipsantarem.pt/handle/10400.15/1663>
- Sousa, L., Marques-Vieira, C., & Soares Branco, P. (2017). Prevenir a queda: Um indicador da qualidade dos cuidados. In C. Marques-Vieira & L. Sousa (Eds.), *Cuidados de enfermagem de reabilitação à pessoa ao longo da vida* (pp. 559-570). Lusodidacta.
- Sousa, L., Marques-Vieira, C. M., Caldevilla, M. N., Henriques, C. M., Severino, S. S., & Caldeira, S. M. (2016). Risco de quedas em idosos residentes na comunidade: Revisão sistemática da literatura. *Revista Gaúcha de Enfermagem*, 37(4), e55030. <https://doi.org/10.1590/1983-1447.2016.04.55030>
- Vitorino, L. M., Teixeira, C. A., Boas, E. L., Pereira, R. L., Santos, N. O., & Rozendo, C. A. (2017). Fear of falling in older adults living at home: Associated factors. *Revista da Escola de Enfermagem da USP*, 51, e03215. <https://doi.org/10.1590/S1980-220X201622370321>