

RESEARCH ARTICLE (ORIGINAL)

Assessment of Home-Based Falls Among Older Adults: A Cross-Sectional Observational Study Based on a Reporting System

Avaliação das Quedas dos Idosos no Domicílio: Estudo Observacional Transversal Baseado num Sistema de Notificação

Evaluación de las caídas de personas mayores en el hogar: Estudio observacional transversal basado en un sistema de notificación

Soraya Coelho Gonçalves Machado¹

 <https://orcid.org/0009-0008-1803-3309>

Paulo Santos²

 <https://orcid.org/000-0002-2362-5527>

Marta Dora Ornelas^{1,3}

 <https://orcid.org/000-0002-9016-1785>

¹ Global Risk Management Commission, Health Service of the Autonomous Region of Madeira, Public Business Entity of the Autonomous Region of Madeira, Funchal, Portugal

² University of Porto, Faculty of Medicine, Department of Community Medicine, Information and Health Decision Sciences (MEDCIDS), Research in Innovation and Sustainable Health @ Research Centre for Innovation and Entrepreneurship (RISE-Health@RISE), Porto, Portugal

³ University of Madeira, Faculty of Life Sciences, Funchal, Portugal

Abstract

Background: Home-based falls among older adults are frequent and potentially serious events with clinical, functional, psychological, and economic consequences.

Objective: To identify factors associated with higher home-based fall-risk criticality among older adults in the Autonomous Region of Madeira.

Methodology: A cross-sectional observational study with an analytical component was conducted using retrospective clinical data extracted from validated clinical reports covering the period 2019–2022. Risk criticality was assessed through a risk-assessment matrix. Statistical association tests and multivariate logistic regression were applied.

Results: A total of 137 notifications were analyzed. Harm was reported in 79.5% of cases, with fractures sustained in 36%. Higher risk criticality levels were associated with the occurrence of fractures, multiple injuries, psychological harm, and economic consequences. Although polypharmacy and mobility impairments were common among patients, they were not directly associated with risk criticality.

Conclusion: Fall-risk criticality is influenced by multiple factors, the identification of which is essential for guiding effective prevention strategies. Reporting such events is crucial for designing targeted fall prevention interventions.

Keywords: accidental falls; elderly; risk assessment; home environment; patient safety

Resumo

Enquadramento: As quedas dos idosos no domicílio são eventos frequentes e potencialmente graves, com impacto clínico, funcional, psicológico e económico.

Objetivo: Identificar os fatores associados à maior criticidade do risco de quedas dos idosos no domicílio na Região Autónoma da Madeira.

Metodologia: Estudo observacional transversal com componente analítica, baseado em dados clínicos retrospectivos extraídos de notificações clínicas validadas entre 2019 e 2022. A criticidade foi determinada por matriz de risco. Foram aplicados testes estatísticos de associação e regressão logística.

Resultados: Foram analisadas 137 notificações. Em 79,5% destas, houve dano e em 36% ocorreu fratura. Verificou-se associação entre maior criticidade do risco e a presença de fraturas, lesões múltiplas, dano psicológico e económico. A polimedicação e alterações da mobilidade foram comuns, mas não se associaram diretamente à criticidade do risco.

Conclusão: A criticidade do risco de queda depende de múltiplos fatores, cuja identificação é essencial para orientar estratégias de prevenção eficazes. A notificação destes eventos é fundamental para o delineamento destas estratégias.

Palavras-chave: quedas acidentais; idosos; avaliação de risco; ambiente domiciliário; segurança do paciente

Resumen

Marco contextual: Las caídas de las personas mayores en el hogar son sucesos frecuentes y potencialmente graves, con repercusiones clínicas, funcionales, psicológicas y económicas.

Objetivo: Identificar los factores asociados a una mayor criticidad del riesgo de caídas de las personas mayores en el hogar en la Región Autónoma de Madeira.

Metodología: Estudio observacional transversal con componente analítico, basado en datos clínicos retrospectivos extraídos de notificaciones clínicas validadas entre 2019 y 2022. La criticidad se determinó mediante una matriz de riesgo. Se aplicaron pruebas estadísticas de asociación y regresión logística.

Resultados: Se analizaron 137 notificaciones. En el 79,5 % de ellas se produjeron daños y en el 36 % se produjeron fracturas. Se observó una asociación entre una mayor gravedad del riesgo y la presencia de fracturas, lesiones múltiples, daños psicológicos y económicos. La polimedicación y los cambios en la movilidad fueron comunes, pero no se asociaron directamente con la gravedad del riesgo.

Conclusión: La gravedad del riesgo de caída depende de múltiples factores, cuya identificación es esencial para orientar estrategias de prevención eficaces. La notificación de estos incidentes es fundamental para diseñar estas estrategias.

Palabras clave: caídas accidentales; personas mayores; evaluación de riesgo; entorno doméstico; seguridad del paciente

Corresponding author

Soraya Coelho Gonçalves Machado

E-mail: sorayacgmachado@gmail.com

Received: 06.07.25

Accepted: 22.01.26



Escola Superior de
Enfermagem de Coimbra

fct

Fundação
para a Ciência
e a Tecnologia

How to cite this article: Machado, S. C., Santos, P., Ornelas, M. D. (2026). Assessment of Home-Based Falls Among Older Adults: A Cross-Sectional Observational Study Based on a Reporting System. *Revista de Enfermagem Referência*, 6(5), e42235. <https://doi.org/10.12707/RVI25.56.42235>



Introduction

Falls among older adults represent a global public health problem. The World Health Organisation (WHO) estimates that between 28% and 35% of adults aged 65 and over experience at least one fall per year, a figure that increases to 42% after age 70 (World Health Organisation [WHO], 2023). In Europe, the average prevalence is approximately 30%, with no decreasing trend in recent years (Rommers et al., 2025). In Portugal, recent studies report a 34.9% rate of falls among individuals aged 85 years or older (Lourenço et al., 2023).

Population ageing is a global phenomenon with profound social, economic and health implications. The World Health Organisation estimates that, in the coming decades, the proportion of people over 65 years will increase significantly, reflected in a rise in the prevalence of chronic diseases, functional dependence and frailty (Seppala et al., 2022). Among the most frequent and concerning adverse events in this age group are falls (Zia et al., 2014), which represent the second leading cause of death from accidental injuries worldwide and are responsible for high clinical, social and economic costs (Alper et al., 2017). Falls in older adults are multifactorial, resulting from the interaction between intrinsic factors—such as gait disturbances, sensory deficits, polypharmacy, cardiovascular or neurodegenerative diseases—and extrinsic factors, such as the physical environment, inadequate lighting, absence of support structures or domestic obstacles (Cruz et al., 2020; LeivaCaro et al., 2015). The home is the setting where falls most frequently occur (60% to 80%), and also where their consequences are more likely to be neglected or underreported (Michalski et al., 2022; Niza et al., 2021). Through the analysis of voluntary notifications of home falls between 2019 and 2022 in the Autonomous Region of Madeira, this study aimed to identify factors associated with a higher criticality of fall risk among older adults at home. The study aims to strengthen the culture of safety, improve clinical surveillance, and support the implementation of person-centred prevention strategies.

Background

In the Autonomous Region of Madeira (RAM), the Regional Program for the Prevention of Falls in Older Adults (PRPQIRAM) and the Integrated Care Pathway for Falls (PAI das Quedas) represent pioneering initiatives that strengthen the culture of safety and multidisciplinary work within homecare services. The introduction of a risk-criticality matrix into the reporting process constitutes a methodological innovation, enabling the integration of the physical, psychological, and economic dimensions of harm. These strategies include individual risk assessment, home safety improvements, and active involvement of healthcare professionals, caregivers, and families. One of the central tools of this model is the computerised voluntary incident-reporting system integrated into the SESARAM HER+ application, which enables the recording of falls based on multiple clinical and contextual variables. The criticality of

fall risk is assessed using a matrix that combines the likelihood of harm with the severity of consequences (AlAama, 2011), providing a more holistic interpretation of the impact of the fall: physical, psychological, and economic. Despite the extensive literature on fall risk factors, studies analysing determinants of fall severity in the home environment remain scarce (Faleiros et al., 2018).

Research question

What are the possible determinants of the occurrence of falls among older adults living at home?

Methodology

A cross-sectional observational study with an analytical component was conducted using retrospective data extracted from the SESARAM and EPERAM Global Risk Management platform (HER+). The investigation followed the recommendations of the STROBE statement for observational studies.

Data Source and Inclusion Criteria

All notifications validated by clinical experts referring to users aged 65 years or older who experienced a fall at home between 2019 and 2022 were included. The selected event typology was *Patient fall*, classified under Clinical Risk.

Data Extraction and Coding

Data extraction was carried out by two independent researchers trained in risk management and epidemiology, using a predefined coding protocol. Variables were extracted directly from the HER+ dashboard in Excel® format and then processed using IBM® SPSS® version 28.0. The coding included sociodemographic variables (age, sex, municipality of residence), clinical variables (mental status, mobility, use of assistive devices, sensory impairments, elimination, heart rhythm, orthostatic hypotension, prescribed medication (type and number), presence of injury, number of affected body sites, fracture, pain, hematoma, psychological harm, and economic harm), and contextual variables (location of the fall, time of day, presence of a companion, and environmental factors as flooring, furniture, and lighting). Medications with the potential to cause falls were identified according to the Beers criteria: anxiolytics, antipsychotics, and antihypertensives. Intrinsic factors (gait disturbances, sensory deficits, polypharmacy, cardiovascular or neurodegenerative diseases) and extrinsic factors (physical environment, inadequate lighting, absence of supports or domestic obstacles) were also considered. Concordance between researchers was verified by a third reviewer, ensuring methodological rigour and reliability.

Operationalisation of the RiskCriticality Matrix

In this study, risk criticality was operationalised using a matrix combining severity of harm (1-*mild*; 2-*moderate or severe*; 3-*severe or very severe*; and 4-*death*) and the prob-

ability of occurrence (1-*very unlikely*; 2-*unlikely*; 3-*likely*; and 4-*very likely*). The resulting score was categorized as trivial (1): no specific action required, acceptable (2–3): periodic evaluations should be considered, moderate (4–6): implementation of riskreduction policies in the short or medium term, important (8–9): application of shortterm riskreduction measures and periodic evaluation, and unacceptable:(12-16) immediate action required. This approach aligns with the principles of the WHO's International Classification for Patient Safety (ICPS), which defines risk as the likelihood that an incident will

cause physical, psychological, or social harm. It highlights the importance of considering severity in clinical decision-making.

The use of criticality matrices has been recommended in health risk management protocols, as they provide an integrated assessment of the severity of adverse events and support the prioritisation of interventions. In the context of falls among older adults, this approach moves beyond a physicalinjury-centred perspective by incorporating psychological consequences and economic impact, dimensions often underestimated in traditional models.

Figure 1.

Matrix for evaluation of the criticality of falling risk

		PROBABILITY (P)			
S x P		Very Unlikely (1)	Unlikely (2)	Likely (3)	Very likely (4)
SEVERITY (S)	Mild (1)	Trivial (1)	Acceptable (2)	Acceptable (3)	Moderate (4)
	Moderate to severe (2)	Acceptable (2)	Moderate (4)	Moderate (6)	Important (8)
	Severe to very severe (3)	Acceptable (3)	Moderate (6)	Important (9)	Unacceptable (12)
	Death (4)	Moderate (4)	Important (8)	Unacceptable (12)	Unacceptable (16)

Ethical Considerations

The study was approved by the Health Ethics Committee (CES) and by the SESARAM, EPERAM Research Unit, under opinion no. S.23001719 dated 31/03/2023.

Statistical Analysis

Data were analysed using descriptive and inferential statistics. For categorical variables, the chi-square test was used, with verification of assumptions (independence and minimum expected frequency). For dichotomous variables that are not normally distributed, the Mann-Whitney U test was used.

Multivariate analysis was performed using adjusted logistic regression, considering risk criticality as the dependent variable (trivial/acceptable, moderate, important). Statistical significance was set at $p < 0.05$.

Results

Between 2019 and 2022, the Global Risk Management platform received 245 notifications of patient falls, reported by professionals from the Primary Healthcare Cluster of RAM (47 health centres). Of these, 147 were related to falls that occurred at home, and 137 concerned users aged 65 years or older.

Of the 137 falls at home, 19 occurred in 2019, 11 in 2020, 16 in 2021, and 91 in 2022. Most patients were female (73%) and had a mean age of 80.5 years (± 7.1). Most notifications referred to residents of the municipality of *Câmara de Lobos* (27%), followed by *Funchal* (22.6%), *Calheta* (15.3%), *Santa Cruz* (11.7%), *Porto Moniz* (9.5%), *Machico* (2.2%), and *Ribeira Brava* (0.7%). *Porto Santo* was the only municipality without any notifications.

The clinical characteristics of the patients included in the study are summarised in Table 1.

Table 1.*Clinical characteristics of patients who experienced falls*

	<i>n</i> (%)
Sex	
Male	37 (27,0)
Female	100 (73,0)
Age (mean, SD)	80,4 (± 7,1)
< 80 years old	63 (46,0)
≥ 80 years old	74 (54,0)
Uses a mobility device	8 (5,8)
Mental status disorder	26 (19,0)
Mobility impairment	100 (73,0)
Urinary and/or faecal elimination alteration	40 (29,2)
Altered heart rhythm and/or frequency	20 (14,6)
Orthostatic hypotension	24 (17,5)
Uncorrected visual and/or hearing impairment	47 (34,3)
Usual medication (n=154)	
Antihypertensives	44 (32,1)
Anxiolytics	35 (25,5)
Antidepressants	31 (22,6)
Oral antidiabetics/insulin	14 (10,2)
Diuretics	9 (6,6)
Anticonvulsants/antiepileptics	6 (4,4)
Analgesics	5 (3,6)
AntiParkinson drugs	5 (3,6)
Antipsychotics	5 (3,6)
Number of medications	
(n = 114)	
None	45 (39,5)
Up to 4 medications	67 (58,8)
≥ 5 medications	2 (1,7)

Note. SD = Standard deviation; n = Number; % = Percentage.

The majority of falls (59.5%) were associated with at least one intrinsic risk factor. The leading direct causes of health status were postural instability (43.2%), due to loss of balance or dizziness, and general debility (e.g., muscle weakness) in 12.7% of cases. In 33.9% of events, displacement-related problems, such as tripping or slipping, were the cause of the fall.

Many users presented two (44.7%) or three (9.41%) determinants/causal factors underlying the incident.

Environmental contributors included flooring characteristics (46.5%), furniture (45.5%), sanitary equipment (4%), and patient transport equipment, such as a wheelchair (4%). Other contributing factors cited by reporters were sleepiness/drowsiness (35.7%) and getting up without supervision (39.3%). In 25% of reports, the cause of the fall was unknown.

Visual and hearing devices were used by 65.7% of users. A total of 154 medications with the potential to induce falls were identified among 69 patients (50.4%), with

an average of 2.23 such medications per patient; two patients had more than five. Notably, 16.8% of records lacked information about the user's medication.

Of all notifications, 19 (13.9%) corresponded to witnessed falls—18 (94.7%) by a caregiver/family member and one by a healthcare professional during a home visit.

Most falls occurred in the bedroom (36.5%), in outdoor areas of the home (21.2%), and in the morning (65%). In 79.5% of notifications, harm occurred, and in 36% of these, a fracture was sustained. Pain was reported in 46.8%, and hematomas in 40.5%. Economic harm occurred in 8% of cases, and psychological harm, such as phthophobia (fear of falling again), in 14.6%.

A total of 111 post-fall injuries (81.1%) were reported; 52.6% occurred at a single body site and 28.5% at two or more sites. The most frequently affected areas were the thigh (21.6%), the skull (20.7%), and the face (15.3%). Regarding risk classification, 2 notifications (1.5%) presented trivial risk, 22 (15.3%) acceptable risk,

87 (63.5%) moderate risk, and 27 (19.7%) important risk. The sociodemographic and clinical characteristics according to the level of risk criticality are summarised in Table 2.

Table 2.

Sociodemographic and clinical characteristics by level of fallrisk criticality

	Trivial or Acceptable Risk	Moderate Risk	Important Risk	<i>p-value</i>
Age (years)	78,4 (± 6,6)	80,6 (± 7,0)	81,7 (±7,6)	0,101
Sex				
Female	16 (69,6)	65 (74,7)	19 (70,4)	0,986
Male	7 (30,4)	22 (25,3)	8 (29,6)	
Time of day				
Morning	16 (69,6)	55 (63,2)	18 (66,7)	0,066
Afternoon	1 (4,3)	20 (23,0)	7 (25,9)	
Night	6 (26,1)	12 (13,8)	2 (7,4)	
Clinical characteristics				
Uses a mobility device	2 (8,7)	3 (3,4)	3 (11,1)	0,629
Mental status disorder	3 (13,0)	19 (21,8)	4 (14,8)	0,944
Mobility impairment	15 (65,2)	65 (74,7)	20 (74,1)	0,514
Urinary and/or faecal elimination alteration	4 (17,4)	29 (33,3)	7 (25,9)	0,584
Altered heart rhythm and/or frequency	2 (8,7)	11 (12,6)	7 (25,9)	0,076
Orthostatic hypotension	6 (26,1)	10 (11,5)	8 (29,6)	0,606
Uncorrected visual and/or hearing impairment	7 (30,4)	32 (36,8)	8 (29,6)	0,903
≥1 medication with fallrisk potential	14 (66,7)	44 (61,1)	11 (52,4)	0,346
Consequences of the fall				
Presence of injury	9 (39,1)	75 (86,2)	27 (100,0)	< 0,001
Number of injury sites				
One	7 (77,8)	47 (62,7)	18 (66,7)	0,857
Two or more	2 (22,2)	28 (37,3)	9 (33,3)	
Presence of fracture	1 (11,1)	13 (17,3)	26 (96,3)	< 0,001
Economic harm	0 (0,0)	5 (5,7)	6 (22,2)	0,003
Psychological harm	0 (0,0)	9 (10,3)	11 (40,7)	< 0,001

No statistically significant differences were found regarding individual determinants. Generally, the consequences of the fall had a greater impact on users with higher levels of risk criticality.

Multivariate analysis showed that the presence of harm and fractures was associated with a higher risk of criticality. The detailed results are presented in Table 3.

Table 3.*Factors associated with higher risk criticality*

Risk Criticality	Factor	OR	95% CI	p-value
Moderate	Female sex	1,278	0,375 - 4,355	0,695
	Presence of harm	14,286	4,509 - 45,263	< 0,001
	Presence of fracture	1,076	0,115 - 10,043	0,949
	Female sex	10,264	0,839 - 125,628	0,068
Important	Presence of harm	-	-	.
	Presence of fracture	255,164	9,533 - 6830,165	0,001

Note. OR = Odds ratio; CI = Confidence interval.

Discussion

The results obtained are consistent with European evidence, which indicates that 15–20% of falls result in serious injuries (van der Velde et al., 2022). The predominance of women in the sample also aligns with Portuguese data, which indicates that 63% to 69% of reported fall cases occur among women (Lourenço et al., 2023). Guidelines from the WHO and the National Institute for Health and Care Excellence (NICE) highlight the need for integrated and personalised approaches focused on multidimensional assessment and medication review (WHO, 2021; NICE, 2025), supporting the relevance of the criticality matrix used in this study.

The higher prevalence of falls among older women has been widely documented (Michalski et al., 2022; Niza et al., 2021). This difference may be related to women's longer life expectancy, reduced bone mass after menopause, and higher levels of sarcopenia, which increase the risk of injuries, especially fractures (Niza et al., 2021; Santos et al., 2021). The predominance of the bedroom as the location of falls has also been reported by other authors (Michalski et al., 2022; Zia et al., 2014), and this raises important questions about the organisation of personal space, nighttime lighting, furniture positioning, and supervision of hygiene and sleep routines. In Madeira, the higher proportion of falls in outdoor areas may also be related to regional housing characteristics, such as external bathrooms or cultivation areas.

A high prevalence of intrinsic factors was identified, including mobility impairments, sensory deficits, and the use of medications with fallrisk potential (anxiolytics, antipsychotics, diuretics, antihypertensives), which is consistent with findings from LeivaCaro et al. (2015) and Cruz et al. (2020). Regardless of severity, and unlike other studies (Seppala et al., 2022), no significant differences were found in demographic or clinical characteristics, including mental status, mobility, polypharmacy, or sensory deficits. This suggests that although these factors may contribute to falls, they may not directly predict severity in the community setting. This divergence could be attributed to methodological differences, particularly how severity was operationalised using a criticality matrix. Psychological impact, such as fear of falling again, was

reported in almost 15% of cases, aligning with the 10%–20% range previously described (Trevisan et al., 2021). This fear is an important factor contributing to mobility restrictions and loss of autonomy, and is frequently underestimated.

Several limitations should be acknowledged. The retrospective, observational nature of the study precludes causal inference and may be affected by underreporting. Although there are approximately 50,000 older adults in the region, only 137 falls at home were reported over four years. This may reflect an institutional reporting culture that focuses on more severe events rather than all falls. Geographic variability in reporting also suggests uneven adherence among professionals.

Another limitation concerns missing data for some clinical variables, such as prescribed medication, which may have influenced the multivariate analysis. Furthermore, the study did not explore detailed social or environmental factors (e.g., socioeconomic status, housing type, home care support), which could improve understanding of the determinants of severity.

Even so, these limitations do not undermine the conclusions, as the study relied on real-world data from an institutional database, with notifications validated by experts, ensuring rigorous event classification. An additional strength is the inclusion of *risk criticality* as an evaluative variable, providing an innovative and holistic perspective by considering physical, economic, and emotional consequences. The specific context of RAM, with its structured regional fall-prevention programme and integrated care pathway, offers a unique setting that could be replicated elsewhere.

The results have practical implications for primary health-care, ageing policies, and prevention of adverse events at home. The criticality model can be used as a systematic riskstratification tool to prioritise interventions. Distinguishing between trivial, moderate, and important risks enables a structured, holistic assessment to allocate resources, such as home visits, preventive physiotherapy, or environmental adaptations, more efficiently.

For public health policy, the data reinforce the need for local prevention programmes focusing on surveillance, caregiver training, rehabilitation support, and medication review, particularly anxiolytics, antidepressants, and

antihypertensives (Zia et al., 2014; Seppala et al., 2022). Future studies should include longitudinal designs to identify risk trajectories and functional outcomes following falls. Strengthening reporting systems by incorporating environmental, social, and behavioural variables would also improve the understanding of risk severity. The use of digital tools, such as self-assessment apps or home sensors, could complement traditional home visits.

Conclusion

The application of the risk-criticality matrix to falls among older adults in the home environment enables identification of the most severe cases and the guidance of personalised preventive strategies. This model, combined with voluntary reporting and a multidisciplinary care approach, contributes to strengthening safety and quality of care.

More than merely preventing falls, it is essential to maintain proactive attention to their severity and impact through personalised, continuous and collaborative interventions, in which older adults, families and healthcare professionals act as co-authors in achieving quality ageing.

Authors' Contributions

Conceptualisation: Machado, S. C., Santos, P., Ornelas, M. D.

Data curation: Machado, S. C., Santos, P., Ornelas, M. D.

Formal analysis: Machado, S. C., Santos, P., Ornelas, M. D.

Methodology: Machado, S. C., Santos, P., Ornelas, M. D.

Project administration: Machado, S. C.

Resources: Machado, S. C.

Supervision: Santos, P., Ornelas, M. D.

Validation: Santos, P., Ornelas, M. D.

Visualisation: Machado, S. C., Santos, P., Ornelas, M. D.

Writing – original draft: Machado, S. C.

Writing – review & editing: Machado, S. C., Santos, P., Ornelas, M. D.

Thesis/Dissertation

Master's Thesis in Primary Health Care - "Determinants of the severity of falls among older adults in the home environment: an observational study" presented at the Faculty of Medicine of the University of Porto, 2023.

References

- Al-Aama, T. (2011). Falls in the elderly: spectrum and prevention. *Canadian Family Physician*, 57(7), 771–776. <https://www.cfp.ca/content/57/7/771>
- Alper, E., O'Malley, T. A., & Greenwald, J. L. (2017). Hospital discharge and readmission. In R. A. Williams (Ed.), *Patient safety and healthcare improvement at a glance* (pp. 64–67). Wiley-Blackwell. <https://doi.org/10.1002/9781118339913.ch16>
- Cruz, D. T., Ribeiro, L. C., Vieira, M. T., Teixeira, M. T. B., Leite, I. C., & Bastos, R. R. (2020). Prevalência de quedas e fatores associados em idosos. *Revista de Saúde Pública*, 54, 24. <https://doi.org/10.11606/S1518-8787.2020054001770>
- Faleiros, A. H., Pereira, A. E. M., Santos, C. A. d., Queiroz, M. L. d., & Araújo, C. L. d. O. (2018). O ambiente domiciliar e seus riscos para quedas em idosos: uma revisão integrativa da literatura. *Revista Kairós-Gerontologia*, 21(4), 409–424. <https://doi.org/10.23925/2176-901X.2018v21i4p409-424>
- Leiva-Caro, J. A., Lima, D. L., & Ferreira, J. G. (2015). O uso de medicamentos como fator de risco para quedas em idosos: revisão da literatura. *Revista de Saúde Pública do Paraná*, 16(1), 62–71. <https://doi.org/10.1590/S0102-311X2002000500029>
- Lourenço, C., Silva, A., & Ferreira, J. (2023). Epidemiology of falls among older adults in Portugal: Trends and implications for healthcare. *Healthcare*, 13(10), 1160. <https://doi.org/10.3390/healthcare13101160>
- Michalski, J., Lebioda, L. A., Bordin, R., Bernartt, M. d. L., Grden, C. R. B., & Bordin, D. (2022). Quedas Em Pessoas Idosas E Fatores De Risco Em Ambientes Domésticos. *Publicatio UEPG: Ciencias Biologicas e da Saude*, 28(2). <https://doi.org/10.5212/Publ.Biologicas.v.28.i2.0004>
- National Institute for Health and Care Excellence. (2025). Falls: assessment and prevention of falls in older people (*NICE Guideline NG249*). <https://www.nice.org.uk/guidance/ng249>
- Niza, C., Amaral, O., Coimbra, J. A., Brito, O. M., Esteves, M. J., & Ferreira, R. F. (2021). Risk of fall at home in elderly registered in day centers Risk of fall at home in elderly registered in day centers. *Millenium - Journal of Education, Technologies, and Health*, 2(9e), 207–216. <https://doi.org/10.29352/mill029e.25495>
- Rommers, E., De Pauw, R., Petrovic, M., & Cambier, D. (2025). Epidemiology of falls in community-dwelling older adults in Europe: a systematic review and meta-analysis. *Age Ageing*, 54(6). <https://doi.org/10.1093/ageing/afaf157>
- Santos, M. S., Ferreira, C. F., Ferreira, F. V., Dall'Agno, M.L., Wender C. O. (2021). Fatores associados a fratura de femur em uma coorte de mulheres idosas. *Reseac, Society and Development*, 10(10), e145101018439. <http://doi.org/10.33448/rsd-v10i10.18439>
- Seppala, L. J., Kamkar, N., van Poelgeest, E. P., Thomsen, K., Daams, J. G., Ryg, J., Masud, T., Montero-Odasso, M., Hartikainen, S., Petrovic, M., van der Velde, N., Petrovic, M., Nieuwboer, A., Vlaeyen, E., Milisen, K., Ryg, J., Kenny, R. A., Bourke, R., Hartikainen, S.,...Kobusingye, O. (2022). Medication reviews and deprescribing as a single intervention in falls prevention: a systematic review and meta-analysis. *Age Ageing*, 51(9). <https://doi.org/10.1093/ageing/afac191>
- Sousa, P., & Mendes, W. (Orgs.). (2019). *Segurança do paciente: conhecendo os riscos nas organizações de saúde* (2ª ed., rev. e atual.). Rio de Janeiro: Editora Fiocruz. <https://doi.org/10.7476/9788575416419>
- Trevisan, C., Ripamonti, E., Grande, G., Triolo, F., Ek, S., Maggi, S., Sergi, G., Fratiglioni, L., & Welmer, A. K. (2021). The Association Between Injurious Falls and Older Adults' Cognitive Function: The Role of Depressive Mood and Physical Performance. *J Gerontol A Biol Sci Med Sci*, 76(9), 1699–1706. <https://doi.org/10.1093/geronol/abgab061>
- World Health Organization. (2009). *Conceptual framework for the International Classification for Patient Safety*. Geneva: WHO. https://www.who.int/patientsafety/taxonomy/icps_full_report.pdf
- World Health Organization. (2023). Falls: Key facts. World Health Organization. <https://www.who.int/news-room/fact-sheets/detail/falls>
- van der Velde, N., Seppala, L., Petrovic, M., Ryg, J., Tan, M. P., Montero-Odasso, M., Martin, F. C., & Masud, T. (2022). Sustainable fall prevention across Europe: challenges and opportunities. *Ageing*

clinical and experimental research, 34(10), 2553–2556. <https://doi.org/10.1007/s40520-022-02178-w>

Zia, A., Kamaruzzaman, S. B., & Tan, M. P. (2014). Polypharmacy

and falls in older people: Balancing evidence-based medicine against falls risk. *Postgraduate Medicine*, 127(3), 330-337. <https://doi.org/10.1080/00325481.2014.996112>

