RIASE
REVISTA IBERO-AMERICANA DE SAÚDE E ENVELHECIMENTO
REVISTA IBERO-AMERICANA DE SALUD Y ENVEJECIMIENTO

HEALTH CONDITIONS ASSOCIATED WITH FALLS IN INSTITUTIONALIZED OLDER ADULTS

CONDIÇÕES DE SAÚDE ASSOCIADAS A QUEDAS EM PESSOAS IDOSAS INSTITUCIONALIZADAS

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Received/Recebido: 2024-11-21 Accepted/Aceite: 2024-11-21 Published/Publicado: 2024-11-21

DOI: http://dx.doi.org/10.60468/r.riase.2024.10(0).689.14-25

ABSTRACT

Introduction: Falls and chronic conditions are frequently observed among older adults living in long-term care facilities, representing serious public health issues.

Objective: This study aimed to analyze the association between health conditions and falls in institutionalized older adults.

Method: This is a cross-sectional study conducted in eight long-term care institutions in the metropolitan region of Natal, Brazil. Data were collected between February and December 2018 from the Health Booklet for Older Adults. The participants were older adults (≥ 60 years old) present at the institution at the time of data collection. For data analysis, Pearson's Chi-square test, Fisher's exact test, Spearman correlation, and odds ratio were used, considering a 5% significance level.

Results: Of the 267 participants, 62.2% had experienced falls, most of whom were female, over 80 years old, who fell indoors, and had hypertension and cognitive decline. The results showed an association between falls and the presence of hypertension (p = 0.010) and diabetes (p = 0.015), and that the absence of these conditions reduced the chances of falls by 1.5 (95% CI: 1.1-2.0) and 1.6 (95% CI: 1.1-2.5) times, respectively.

Conclusion: Falls were associated with hypertension and diabetes in institutionalized older adults, and not having these conditions reduces the likelihood of falling. Monitoring these conditions and including them in fall prevention protocols is necessary to prevent falls and their consequences.

Keywords: Accidental Falls; Aged; Chronic Disease; Homes for the Aged.

RESUMO

Introdução: Quedas e condições crônicas são frequentemente observadas em pessoas idosas que residem em instituições de longa permanência, sendo as mesmas graves problemas de saúde pública.

Objetivo: Este estudo teve como objetivo analisar a associação entre condições de saúde e quedas em pessoas idosas institucionalizadas.

Método: Trata-se de um estudo transversal realizado em oito instituições de longa permanência na região metropolitana de Natal, Brasil. Os dados foram coletados entre fevereiro e dezembro de 2018 na Caderneta de Saúde da Pessoa Idosa. Os participantes eram pessoas idosas (≥ 60 anos), presentes na instituição no momento da coleta de dados. Para a análise dos dados, foram utilizados os testes Qui-quadrado de Pearson, exato de Fisher, correlação de Spearman e o *odds ratio*, considerando um nível de significância de 5%.

Resultados: Dos 267 participantes, 62,2% sofreram quedas, dos quais, a maioria era do sexo feminino, com mais de 80 anos, que caíram dentro de casa e apresentavam hipertensão e declínio cognitivo. Os resultados mostraram uma associação entre quedas e a presença de hipertensão (p = 0,010) e diabetes (p = 0,015) e que, não apresentar essas condições, reduzem as chances de quedas 1,5, (IC 95% 1,1-2,0) e 1,6, (IC 95% 1,1-2,5) vezes, respectivamente.
Conclusão: As quedas foram associadas a hipertensão e diabetes nas pessoas idosas institucionalizadas e não as apresentar reduz as chances de a pessoa idosa cair. É necessário o monitoramento dessas condições e sua inclusão nos protocolos de prevenção de quedas, a fim de evitar a ocorrência das quedas e suas consequências.
Palavras-chave: Acidentes por Quedas; Doença Crônica; Idoso; Instituição de Longa Permanência para Idosos.

RESUMEN

Introducción: Las caídas y las condiciones crónicas son frecuentemente observadas en personas mayores que residen en instituciones de larga estancia, constituyendo graves problemas de salud pública.
Objetivo: Este estudio tuvo como objetivo analizar la asociación entre las condiciones de salud y las caídas en personas mayores institucionalizadas.
Método: Se trata de un estudio transversal realizado en ocho instituciones de larga estancia en la región metropolitana de Natal, Brasil. Los datos fueron recolectados entre febrero y diciembre de 2018 en la Cartilla de Salud de la Persona Mayor. Los participantes eran personas mayores (≥ 60 años), presentes en la institución en el momento de la recolección de datos. Para el análisis de los datos, se utilizaron las pruebas de chi-cuadrado de Pearson, exacta de Fisher, correlación de Spearman y el odds ratio, considerando un nivel de significancia del 5%.
Resultados: De los 267 participantes, el 62,2% sufrió caídas, de los cuales la mayoría eran mujeres, mayores de 80 años, que cayeron dentro de casa y presentaban hipertensión y deterioro cognitivo. Los resultados mostraron una asociación entre las caídas y la presencia de hipertensión (p = 0,010) y diabetes (p = 0,015), y que no presentar estas condiciones reduce las posibilidades de caídas en 1,5 (IC 95% 1,1-2,0) y 1,6 (IC 95% 1,1-2,5) veces, respectivamente.
Conclusión: Las caídas fueron asociadas a hipertensión y diabetes en las personas mayores institucionalizadas y no presentar estas condiciones reduce las probabilidades de que la persona mayor caiga. Es necesario el monitoreo de estas condiciones y su inclusión en los protocolos de prevención de caídas, con el fin de evitar la ocurrencia de caídas y sus consecuencias.
Descriptores: Accidentes por Caídas; Anciano; Enfermedad Crónica; Hogares para Ancianos.

INTRODUCTION

Falls among older adults have become increasingly frequent. They are considered a serious public health issue worldwide, leading to complications for older adults in functional, physical, psychological, and financial aspects[1]. This increases the demand for care and healthcare expenditures and contributes to the rising mortality rates due to falls among older adults in Brazil[2].

When falls occur in long-term care facilities for older adults (LTCFs), they become even more concerning. Residents of these institutions tend to be more vulnerable and frailer[3,4], and falls are one of the leading reasons for their institutionalization[1]. Additionally, a study on LTCFs revealed that 45.8% of residents had already experienced falls[5], highlighting the high prevalence of this event in this setting.

There are extrinsic and intrinsic factors that can contribute to the occurrence of falls in the older adult population. Extrinsic factors are those related to the environment and can affect the safety of older adults but are modifiable. Intrinsic factors, on the other hand, are more difficult to manage, as they pertain to individual characteristics and are not easily altered[6,7].

Intrinsic factors include age, the presence of disabilities – whether physical, visual, or auditory – and chronic conditions, which are also commonly observed in the older adult population. These factors are among the main causes of morbidity and mortality[8,9], making them highly relevant for public health due to the negative impact they can have when occurring concurrently. Therefore, this study aimed to analyze the association between health conditions and falls in institutionalized older adults.

MATERIAL AND METHODS

This is a cross-sectional study conducted in eight long-term care facilities for older adults (LTCFs) in the metropolitan region of Natal, Brazil. Data were collected between February and December 2018, using medical records and the Health Booklet for Older Adults (CSPI). The participants were individuals aged 60 years or older, considered older adults in Brazil[10], who were present in the LTCFs at the time of data collection.

To obtain the data, the 2017 version of the CSPI[11], developed by the Brazilian Ministry of Health, was used as the data collection instrument, supplemented with information from the admission forms of the older adults residing in the institutions. Data were collected by a previously trained multidisciplinary team.

The data collected included sociodemographic profiles, such as gender (female and male), age (categorized into age groups: 60-79 and ≥ 80), education (no schooling, 1 to 8 years of study), color/race (White, Non-White), and marital status (single, divorced/separated, and widowed), as well as health conditions with a medical diagnosis, including hypertension, diabetes, cognitive impairment, coronary disease, asthma, and chronic obstructive pulmonary disease (COPD), and history of falls.

The data obtained were tabulated and organized using Excel® 2010 (Microsoft Office), and descriptive and inferential statistical analyses were performed using the Statistical Package for Social Sciences (SPSS) version 21.0. Descriptive analyses were conducted on sociodemographic and health characteristics. Bivariate analyses were conducted to assess the association between the chronic conditions evaluated and fall, adopting a 5% significance level, using Pearson's Chi-square test, Fisher's exact test, and odds ratio (OR) with a 95% Confidence Interval (95% CI). Correlation analysis was performed using Spearman's correlation test, with weak correlation defined as < 0.30, moderate between 0.30 and 0.59, strong between 0.60 and 0.99, and perfect when equal to 1.0.

As this study involved human subjects, it was approved by the Research Ethics Committee of Hospital Onofre Lopes (CEP/HUOL/Brazil) under opinion No. 2.366.555 and CAAE: 78891717.7.0000.5292.

RESULTS

This study included 267 institutionalized older adults, the majority of whom were female (69.3%), over 80 years of age (54.3%), had some level of education (61.0%), were single (49.2%), and were of non-white race/color (51.2%). When analyzing the profile of those who experienced falls, it was found to be similar to the overall sample, except that falls were more frequent among those aged between 60 and 79 (32.6%). An association was found between the occurrence of falls and this age group (p = 0.005) (Table 1↗).

Among the older adults included in the study, 62.2% reported having experienced falls. Most falls occurred indoors (79.6%) and did not result in fractures (73.2%). However, when fractures did occur, they were primarily in the upper limbs (41.2%). Of those who suffered falls, 61.9% reported not having stopped performing activities due to fear of falling again, and the majority reported experiencing only one fall (82.5%) (Table 2↗).

When assessing the occurrence of falls concerning health conditions, it was found that falls were more frequent among individuals with hypertension (39.0%) and those with cognitive decline (36.0%). Associations were identified between the occurrence of falls and hypertension ($p = 0.010$) and diabetes ($p = 0.015$) (Table 3↗).

It was determined that not having hypertension (OR = 1.5, 95% CI 1.1-2.0) and diabetes (OR = 1.6, 95% CI 1.1-2.5) reduced the likelihood of falls among institutionalized older adults; however, having both conditions concurrently was not associated with falls (Table 3↗).

When assessing the correlation between falls and health conditions, a direct but weak correlation was found between the presence of hypertension ($p = 0.010$) and diabetes ($p = 0.015$) and the occurrence of falls in institutionalized older adults (Table 4↗).

DISCUSSION

When analyzing the association between health conditions and falls in institutionalized older adults, it was observed that the occurrence of falls is associated with the presence of hypertension and diabetes. Moreover, not presenting these two conditions in isolation reduces the likelihood of falls among institutionalized older adults.

Among the evaluated institutionalized older adults, most had experienced falls. A systematic review estimated the incidence of falls in long-term care facilities (LTCFs) to be 43%[12], while another study found that, within one year, 41.6% of residents suffered at least one fall, with 38.8% experiencing more than one fall[13]. This highlights the high occurrence of falls in this environment, attributable to the increased risk faced by institutionalized older adults due to advanced age, cognitive decline, comorbidity, and dependence[12].

When assessing the locations where falls are most frequent, the home environment is particularly notable. Falls typically occur in the bedroom and bathroom[5,14]. These areas require greater attention from the professionals involved in the care of older adults due to the increased risk of falls, especially since the organization of LTCFs resembles a domestic environment, albeit with the presence of professionals assisting with resident care. Therefore, environmental assessment is crucial to ensure the safety of older adults in LTCFs.

Considering the high risk in the home environment, it is important to assess older adults' self-perception of risk, considering that they should also be involved in the care process. A study identified that an unsatisfactory perception of risk is associated with lower education levels, low income, and a higher risk of falls, but not with health conditions[15]. This reflects the profile of the older adults included in the present study, who reside in philanthropic long-term care facilities (LTCFs) and predominantly have no or limited education. This situation can lead to recurrent falls, which is common among older adults with a history of falls, thereby increasing their risk of future falls[12].

Another important factor to consider after a fall occurs is the fear of falling again. Although this fear has been reported by only a few older adults, it can discourage them from engaging in daily activities, affecting various aspects of their lives and leading to a loss of independence and autonomy, social isolation, and decreased participation in activities of daily living due to insecurity, ultimately impacting their functional capacity[13,16].

It was noted that falls were more frequent among older adults with hypertension and cognitive decline. A systematic review identified an association between hypertension and an increased risk of falls in older adults[17]. However, a study involving older women found that those with controlled or uncontrolled hypertension were less likely to fall compared to those without hypertension[18], contrasting with the present study's finding that not having hypertension reduces the chances of falls. One possible reason for this discrepancy may be the treatment administered to older adults, which was not evaluated in this study but may indicate its efficacy, as well as the safety of institutionalized older adults.

Furthermore, a study observed that in hypertensive older adults, the presence of cognitive frailty increases the risk of falls[19], although institutionalized older adults with cognitive decline also face a higher risk of falling[20]. Given that these are two common conditions within this population, as corroborated in this study, it is essential to pay attention to older adults who already exhibit severe cognitive decline, but especially those in the early stages, to prevent falls and further deterioration of cognitive function.

The presence of hypertension and diabetes was associated with falls in the present study. Older adults who have experienced falls tend to have more associated comorbidities[18,20], and the presence of these comorbidities increases the risk of falls[21]. Nevertheless, when these two conditions were presented concurrently, they were not associated with the falls in the population studied. This may be due to better management of these conditions when they occur simultaneously, or it could be that, when isolated, they are more common among younger older adults who require a lower level of care, despite being at a higher risk of falling[22]. This underscores the need to consider all older adults residing in LTCFs as potentially at risk for falls, as well as the importance of including these conditions in risk assessments, especially when evaluating individuals with lower dependence and frailty.

As limitations of this study include its cross-sectional design, which provides only a snapshot of the health status of these individuals. Therefore, longitudinal follow-up of older adults is necessary to monitor falls and the factors that may contribute to their occurrence, as well as the consequences of falls for older adults. Investigating falls is of paramount importance, as it serves as an indicator of the safety and quality of care provided. It is essential to implement a culture of safety in LTCFs as a means of preventing falls and other health issues among institutionalized older adults.

CONCLUSION

Falls were associated with the presence of hypertension and diabetes in institutionalized older adults, provided that these conditions are not present in isolation, which reduces the chances of falling. The concurrent occurrence of these two conditions was not linked to falls. Although these are intrinsic factors for older adults, it is essential to adequately monitor comorbidities, regardless of age and level of dependence, to promote the safety of these individuals and ensure the quality of care provided in the institutional environment.

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MA: Conceptualization, formal analysis, writing – original draft.
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CS: Supervision, writing – review & editing.
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All authors have read and agreed with the published version of the manuscript.

Ethical Disclosures
Conflicts of Interest: The authors have no conflicts of interest to declare.
Financial Support: The present work was carried out with the support of the Coordination for the Improvement of Higher Education Personnel – Brazil (CAPES) – Financing Code 001.
Provenance and Peer Review: Not commissioned; externally peer reviewed.

Responsabilidades Éticas
Conflitos de Interesse: Os autores declararam não possuir conflitos de interesse.
Suporte Financeiro: O presente trabalho foi realizado com apoio da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – Brasil (CAPES) – Código de Financiamento 001.
Proveniência e Revisão por Pares: Não comissionado; revisão externa por pares.

Table 1 – Sociodemographic characteristics of institutionalized older adults according to the occurrence of falls. Natal, 2024.

Sociodemographic characteristics		Occurrence of falls		Total n (%)	p-value
		Yes n (%)	No n (%)		
Gender	Female	116 (43.4)	69 (25.8)	185 (69.3)	0.788
	Male	50 (18.7)	32 (12.0)	82 (30.7)	
Age group	60 to 79 years old	87 (32.6)	35 (13.1)	122 (45.7)	0.005
	≥ 80 years	79 (29.6)	66 (24.7)	145 (54.3)	
Schooling	No	52 (22.0)	40 (16.9)	92 (39.0)	0.177
	1 to 8 years	94 (39.8)	50 (21.2)	144 (61.0)	
Marital status	Single	79 (31.3)	45 (17.9)	124 (49.2)	0.159
	Divorced/ separated	28 (11.1)	25 (9.9)	53 (21.0)	
	Widow(er)	52 (20.6)	23 (9.1)	75 (29.8)	
Race/color	White	76 (30.2)	47 (18.7)	123 (48.8)	0.929
	Non-white	79 (31.3)	50 (19.8)	129 (51.2)	

Table 2 – History of falls in institutionalized older adults. Natal, 2024.

History of falls		n	%	p-value
Suffered a fall	Yes	166	62.2	< 0.001
	No	101	37.8	
Fall site	Indoors	109	79.6	< 0.001
	Outside home	28	20.4	
Caused fracture	Yes	37	26.8	< 0.001
	No	101	73.2	
Fracture region	Upper limbs	14	41.2	0.008
	Lower limbs	13	38.2	
	Pelvic region	4	11.8	
	Collarbone	3	8.8	
Stopped performing activities for fear of falling again	Yes	48	38.1	0.008
	No	78	61.9	
Have you suffered more than one fall	Yes	17	17.5	< 0.001
	No	80	82.5	

Table 3 – Association between chronic health conditions and the occurrence of falls in institutionalized older adults. Natal, 2024.

Health conditions		Occurrence of falls		Total n (%)	p-value RC (95% CI)
		Yes n (%)	No n (%)		
Cognitive decline	Yes	96 (36.0)	57 (21.3)	153 (57.3)	0.823
	No	70 (26.2)	44 (16.5)	114 (42.7)	
Hypertension	Yes	104 (39.0)	47 (17.6)	151 (56.6)	0.010
	No	62 (23.2)	54 (20.2)	116 (43.4)	1.5 (1.1-2.0)
Diabetes	Yes	54 (20.2)	19 (7.1)	73 (27.3)	0.015
	No	112 (41.9)	82 (30.7)	194 (72.7)	1.6 (1.1-2.5)
Coronary heart disease	Yes	9 (3.4)	8 (3.0)	17 (6.4)	0.417
	No	157 (58.8)	93 (34.8)	250 (93.6)	
Asthma	Yes	4 (1.5)	3 (1.1)	7 (2.6)	1.000
	No	162 (60.7)	98 (36.7)	260 (97.4)	
COPD	Yes	4 (1.5)	2 (0.7)	6 (2.2)	1.000
	No	162 (60.7)	99 (37.1)	261 (97.8)	
Associated conditions					
Hypertension and diabetes	Yes	39 (14.6)	18 (6.7)	57 (21.3)	0.273
	No	127 (47.6)	83 (31.1)	210 (78.7)	1.3 (0.8-1.9)

Note: OR – Odds ratio; 95% CI – 95% confidence interval; COPD – Chronic Obstructive Pulmonary Disease.

Table 4 – Correlation between health conditions and the occurrence of falls in institutionalized older adults. Natal, 2024.

Health conditions	Occurrence of fall	
	Rho	p-value*
Hypertension	0.158	0.010
Diabetes	0.149	0.015
Coronary heart disease	-0.050	0.419
Asthma	-0.017	0.782
COPD	0.014	0.819
Cognitive decline	0.014	0.824

* Spearman's correlation coefficient.
Note: COPD – Chronic Obstructive Pulmonary Disease.