

Falls in institutionalized older adults: risks, consequences and antecedents

Quedas em idosos institucionalizados: riscos, consequências e antecedentes
Caídas de personas mayores institucionalizadas: riesgos, consecuencias y antecedentes

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ABSTRACT

Objective: To analyze the occurrence of falls in institutionalized elderly addressing the risks, consequences and antecedents. **Method:** Cross-sectional study carried out with 45 older adults in Long-Term Care Facilities for the Older adult in João Pessoa, Brazil, in June and July 2016. A socio-demographic questionnaire and the Berg Balance Scale were applied, classifying as risk of fall scores lower than 45. Descriptive statistics and tests were conducted: independent t-test, Anova (Tukey), Chi-square, Mann Whitney. Statistically significance was $p < 0.05$. Data were processed in SPSS version 19.0. **Results:** A total of 66.7% (30) falls occurred, 20% (9) of them in the external area, with 66.7% (30) of the participants having hypertension as a previous disease and, as consequence, the fracture was highlighted with 11.2% (5). The Berg Scale had different scores when compared to the falls suffered by the elderly and previous diseases influenced the occurrence of falls ($p < 0.05$). **Conclusion:** It is necessary to implement public financing policies or partnerships that allow environments adaptations aiming at reducing the risks of falls. **Descriptors:** Accidental Falls; Homes for the Aged; Risk; Aged; Nursing.

RESUMO

Objetivo: Analisar a ocorrência de quedas em idosos institucionalizados quanto aos riscos, consequências e antecedentes. **Método:** Estudo transversal, realizado com 45 idosos em Instituições de Longa Permanência para Idosos em João Pessoa/PB, Brasil, em junho e julho de 2016. Aplicou-se questionário sociodemográfico e Escala de Equilíbrio de Berg classificando risco de quedas quando escore inferior a 45. Realizou-se estatística descritiva e testes: *t* independente, Anova (Tukey), Qui-quadrado, Mann Whitney. Considerado significativamente estatístico $p < 0,05$ e processados no SPSS versão 19.0. **Resultados:** As quedas ocorreram em 66,7% (30), sendo 20% (9) na área externa, 66,7% (30) com doença prévia hipertensão e como consequência destacou-se fratura com 11,2% (5). A Escala de Berg avaliou pontuações diferentes ($p < 0,05$) quando comparadas às quedas sofridas pelos idosos, e as doenças prévias influenciaram ocorrência de quedas ($p < 0,05$). **Conclusão:** Necessita-se implementar políticas públicas de financiamento ou parcerias que possibilitem adaptação dos ambientes visando a redução dos riscos de quedas.

Descritores: Acidentes por Quedas; Instituição de Longa Permanência para Idosos; Risco; Idoso; Enfermagem.

RESUMEN

Objetivo: Analizar los riesgos, consecuencias y antecedentes de caídas en personas mayores institucionalizadas. **Método:** Se trata de un estudio transversal, realizado entre 45 personas mayores e internadas en Instituciones de Cuidado a Largo Plazo en João Pessoa, Paraíba, Brasil, entre junio y julio de 2016. Se aplicó el cuestionario sociodemográfico y la Escala de Equilibrio de Berg clasificando el riesgo de caídas cuando la puntuación era inferior a 45. Se utilizó la estadística descriptiva y las pruebas: *t* de Student independiente, Anova (Tukey), distribución de Pearson (ji-Cuadrado), Mann Whitney y se consideró significativamente estadístico $p < 0,05$. Se procesó en el SPSS versión 19.0. **Resultados:** Las caídas ocurrieron en el 66,7% de las personas mayores (30), el 20% (9) en el área externa y el 66,7% (30) con enfermedad previa de hipertensión; cabe resaltar fracturas en el 11,2% (5). La Escala de Berg evaluó puntuaciones

diferentes ($p < 0,05$) al comparar las caídas sufridas por las personas mayores resaltando que las enfermedades previas influenciaron el suceso de caídas ($p < 0,05$). **Conclusión:** Es necesario implantar políticas públicas de financiación o crear asociaciones que posibiliten la adaptación de los diversos ambientes con el objetivo de reducir los riesgos de caídas.

Descriptores: Accidentes por Caídas; Institución de Cuidado a Largo Plazo para Personas Mayores; Riesgo; Persona Mayor; Enfermería.

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INTRODUCTION

The aging of the population is seen as a great triumph for mankind and, at the same time, as a challenge to the quality of life and well-being of the population. In Brazil, it is estimated that there are approximately 17.6 million older adults, and this population will grow 16 times by 2025, ranking sixth in the world regarding older adults population⁽¹⁾.

Due to the significant increase in the longevity and consequent growth of the older adults population, there is a greater demand for long-term care facilities for the older adult (LTCF) in Brazil; in several situations admittance in a LTCF is an expected and volunteer alternative, capable of assuring a good quality of life to the older adult⁽²⁾.

According to ANVISA (National Health Surveillance Agency), LTCFs are governmental or non-governmental institutions intended for the collective residence of older adults with or without family support, in a condition of freedom, dignity and citizenship. In summary, a LTCF is a collective residence that attends independent older adults in a situation of family and/or income difficulties, as well as those with difficulties to perform activities of daily living, who need long-term care⁽³⁾.

Institutionalization may be a contributing factor to the risk of falls, since the change from the family environment to an LTCF can lead to psychological, cognitive and functional changes that may be associated with isolation and lack of physical activities. Added to this, the fear of falling is frequent in institutionalized elderly and considered as a risk factor for the individual's independence⁽⁴⁾.

A fall is defined as the unintentional movement of the body to a level lower than the initial position, without proper correction in time. It is determined by several factors that may compromise stability, ie, the mechanisms involved in maintaining posture. It is considered an important cause of morbidity and mortality in the elderly population and one of the main clinical and public health problems due to its high incidence, complications and high care costs⁽⁵⁾.

Falls are more common in older women. Women with nutritional dysfunctions, four or more comorbidities and symptoms of depression are more likely to experience falls⁽⁶⁾.

Approximately 17% of the recorded cases of falls are suffered by older adults living alone, and almost half of them have a level of education lower than Elementary Education. Among the older adults, the most common comorbidities that can trigger falls are: cardiovascular disease; osteoarthritis and osteoporosis⁽⁶⁾.

The etiology of falls is multifactorial and is related to intrinsic factors such as vision impairments, balance or walking disorders and extrinsic factors such as environmental risks. The factors inherent to the person are responsible for most of the falls suffered

by institutionalized older adults, while extrinsic factors are more responsible for falls of older adults living in the community⁽⁷⁾.

Falls are the most common cause of accidents that can have serious consequences, such as fear of falls, fractures, loss of independence or even mortality. Approximately 25% of people over 65 years of age fall every year, and about 20% of falls require medical attention⁽⁸⁾.

Falls are the most common cause of injuries and hospitalizations in older adults and also a major factor for disability and dependence. They represent one of the main medical misfortunes observed in this population and are considered a public health problem because of its high incidence⁽⁹⁾.

Therefore, due to the importance of this event in older adults health and the expenses generated to the public expenses with the treatment of these individuals, it is essential to study falls in older adults, in order to reduce or control the determinant factors.

Considering that the occurrence of falls and the magnitude of their risk factors may vary according to the living arrangement, with an impact on the aging process, the guiding question of this study emerges: What is the prevalence of falls in older adults in long-term care facilities? What factors contribute to the occurrence of falls in older adults in long-term care facilities?

From this perspective, the hypotheses of the study are:

1. H1: The mean age of the elderly who fell is different.
H0: The mean age of the elderly who fell is the same.
2. H1: The mean amount of medication among the elderly is different when correlated to falls. The amount of medication influenced the falls.
H0: The mean amount of medication among the elderly is equal when correlated to falls. The amount of medication did not influence the falls.
3. H1: Previous diseases influenced the occurrence of falls.
H0: Previous diseases did not influence the occurrence of falls.
4. H1: The Berg Scale score is related to the falls in older adults.
H0: The Berg Scale score is not related to the falls in older adults.

OBJECTIVE

To analyze the occurrence of falls in institutionalized older adults addressing the risks, consequences and antecedents.

METHOD

Ethical aspects

The research followed the ethical standards established by Resolution 466/2012 of the Brazilian National Health Council, which refers to the Guidelines and Norms Regulating Research Involving

Human Beings⁽¹⁰⁾. In addition, it complied with the provisions of the Older adults Statute regulated by Law 10.741/2003⁽¹¹⁾.

The research project was approved by the Research Ethics Committee of the University Center of João Pessoa.

Design, study setting and period

This is a cross-sectional quantitative study carried out in two Long-Term Care Facilities in the city of João Pessoa / PB, Brazil. Data collection was conducted in June and July 2016.

Population or sample; inclusion and exclusion criteria

The inclusion criteria were being 60 years or older and having preserved cognitive activity (criterion reported by the health care team). The exclusion criteria were: not residing in a long-term care facility, not signing the Consent Form and having altered cognitive capacity.

The study population consisted of 50 older adults who met the inclusion criteria; after sample calculation with 95% confidence and 5% margin of error, a sample of 45 elderly subjects was obtained. This procedure was performed in the program Statdisk U.S.A for Windows.

Study protocol

Two instruments were used. One was a socio-demographic questionnaire containing the variables: gender, age, level of education, previous diseases (diabetes, hypertension, acute myocardial infarction, osteoporosis, arthritis, arthrosis, labyrinthitis), use of medication organized according to the drug class as categorized by the National Relation of Essential Medication - Rename⁽¹²⁾. The following variables are also added: falls, medical referral and consequences.

The second instrument was the Berg Balance Scale, a scale with maximum score of 56, composed by 14 items evaluated by an ordinal scale of five alternatives ranging from 0 to 4 points. It contemplates activities such as reaching, turning, transferring, standing still and standing up⁽¹³⁾.

The items evaluated in the Berg Scale include the individual's ability to maintain positions of increasing difficulty, such as the decrease of the base of support to sit, reaching a comfortable posture, standing with the feet together and maintaining posture in a single leg. The most difficult items are: retrieving an object from the floor, how well can the individual move from sitting to standing or transfer from chair to chair, among others. To apply the test a chronometer and a ruler were used, and its performance lasted 15 minutes⁽¹³⁾.

The Berg scale was adapted for application in Brazil⁽¹³⁾, presenting 14 items with scores from 0 to 4, "zero" being moderate or maximum need for assistance to perform the activity and "four" the ability to perform the task without assistance. The score differs regarding the time to perform activity and the assistance needed. The risk of falls is set when the score is below 45 points.

Statistical analysis

Frequency and descriptive statistics were used with mean, standard deviation, minimum and maximum. In addition, to verify the relationship between the variables, tests were used for the hypotheses listed. The independent t-test was used to verify the association of age with the falls suffered. The Anova test (Tukey) was used to

verify the relation of the use of medication with the falls. The chi-square test was to verify the relationship of previous diseases with falls, and the Mann Whitney test was used to verify the relationship of the Berg Scale score with the falls suffered. For all these tests, a $p < 0.05$ was considered statistically significant. These procedures were processed in SPSS version 19.0 for Windows.

RESULTS

The older adults in this study were 79.8 ± 9.4 years and 62.2% (28) were female. The socio-demographic characteristics are shown in Table 1.

Table 1 – Socio-demographic characteristics of institutionalized elderly, João Pessoa, Paraíba, Brazil, 2016 (N = 45)

Variables	n	%
Marital Status		
Single	19	42.2
Widowed	20	44.4
Divorced	5	11.1
Married	1	2.2
Level of Education		
Illiterate	16	35.6
Literate	13	28.9
High School	8	17.8
Higher Education	5	11.1
Complete Primary Education	3	6.7
Children		
No	26	57.8
Yes	19	42.2

Table 2 – Previous diseases of institutionalized older adults, João Pessoa, Paraíba, Brazil, 2016 (N = 45)

Previous disease	n	%
Diabetes mellitus		
Yes	15	33.3
No	30	66.7
Hypertension		
Yes	30	66.7
No	15	33.3
Acute myocardial infarction		
Yes	2	4.4
No	43	95.5
Osteoporosis		
Yes	5	11.1
No	40	88.9
Arthritis		
Yes	9	20
No	36	80
Arthrosis		
Yes	9	20
No	36	80
Labyrinthitis		
Yes	2	4.4
No	43	95.6

Regarding previous diseases, 82.2% (37) of the participants reported having one, as shown in Table 2.

Regarding the event "fall", 66.7% (30) of the older adults reported falls. The location, referral and consequences are shown in Table 3.

Table 3 – Location, referral and consequences of falls suffered by elderly, João Pessoa, Paraíba, Brazil, 2016 (N = 45)

Variables	n	%
Location of the fall		
External area	9	20
At home	1	2.2
Did not answer	7	15.6
Room	6	13.3
Cafeteria	1	2.2
In the street	6	13.3
Referral		
Family health unit	2	4.4
Local treatment	18	40
Hospital	10	22.2
Consequences		
Cut on arm	2	4.4
Cut on face	1	2.2
Pain	3	6.7
Fracture	5	11.2
Inflammation of the coccyx	1	2.2
Dislocation of arm	1	2.2
Fear of falling	1	2.2

Regarding the variable "medication used", Table 4 presents the drug classes.

The Berg Scale obtained a mean score of 38.46 ± 16.25 , with a minimum of zero and a maximum of 56. Among the older adults, 51.1% were classified as having risk of falls and 48.9% with absence of risk.

When correlating "fall" variable with age, amount of medications used and Berg Scale score, p values were obtained as shown in Table 5.

Table 4 – Use of medication by the institutionalized older adults assessed, João Pessoa, Paraíba, Brazil, 2016 (N = 45)

Variables	n	%
Use of medication		
Yes	37	82.2
No	6	13.3
Did not answer	2	4.4
Amount of medication used		
Not reported or none	8	17.8
One	5	11.1
Two	6	13.3
Three	7	15.6
Four	10	22.2
More than four	9	20
Drug class		
Analgesic	8	17.7
Anxiolytic	8	17.7
Antihypertensive	30	66.5
Antianemic	1	2.2
Anticholinergic	5	11
Antidiabetic	12	26.6
Anti-inflammatory	1	2.2
Antiparkinson	4	8.8
Antipsychotic	7	15.4
Anti-ulcers	4	8.9
Diuretic	16	35.6
Hypnotic	2	4.4
Neuroleptics	5	11
Bone calcium regulator	1	2.2
Vasodilator	5	11
Antiarrhythmic	1	2.2
Anticonvulsant	4	8.8
Antidepressant	2	4.4
Antiemetic	2	4.4
Vitamin	1	2.2
Antilipemic	6	13.2
Beta blocker	2	4.4
Antineoplastic	1	2.2
Phytotherapy	1	2.2

Note: *It is important to note that there were older adults who used more than one medication of the same type.

Table 5 – Association between the determinant variables for risk of falls in older adults, João Pessoa, Paraíba, Brasil, 2016 (N = 45)

Variables	Test	p value	Hypothesis
Age	Independent t-test	0.645	Accepted H_0 : The mean age of the elderly who fell is the same. Age did not influence the falls.
Amount of medication	Anova (Tukey)	0.834	Accepted H_0 : The mean amount of medication among the elderly is equal when correlated to falls. The amount of medication did not influence the falls.
Previous diseases	Chi-square	0.05	Rejected H_0 : Previous diseases influenced the occurrence of falls.
Berg Scale	Mann Whitney	0.007	Rejected H_0 : The Berg Scale presented different scores when compared to falls in older adults

DISCUSSION

Fall might have a negative impact on older adults mobility, and it may also lead to anxiety, depression and fear of falling again, thus increasing the risk of recurrence⁽¹⁴⁾.

The prevalence of women in the context of aging is due to the higher life expectancy of this gender. Still, there is no definitive explanation regarding the higher rate of falls among women; however, the lower quality and strength of muscle mass in women as well as the prevalence of chronic diseases may increase the likelihood of frailty in women⁽¹⁵⁾.

The variable "age" in the older adults of the present study did not present statistical significance in relation to falls, as demonstrated through the independent t-test. However, when correlated to the Berg Scale, there was a standard deviation in the score for the older adults between 80 and 89 years old, revealing the individual limitation of each one to perform the requested activities. This age range directly influences this scale, since it is one of the predictors for the risk of falls.

A cross-sectional study conducted with 7,315 older adults in 59 cities of the State of Rio Grande do Sul found a relationship between level of education and occurrence of falls among older adults, showing that individuals with more years of formal education presented lower risk of falling, which remained significant after adjusting the analysis. This situation may be related to the fact that elderly people with higher educational levels tend to have higher income and, consequently, better living conditions and access to health care⁽¹⁶⁾. This corroborates the present study, which found 66.7% of falls with 35.6% of the older adults being illiterate.

The prevalence of falls found in another study⁽¹⁷⁾ was 37.2%; a study with institutionalized older adults in Bahia⁽¹⁸⁾, found a 29.4% prevalence of the event. These data corroborated the present study, since the frequency of falls reached 30% of the institutionalized older adults.

Among the diseases listed by the elderly, hypertension (66.7%) stands out, which is a risk factor for falls, since to control the blood pressure level it is necessary to use antihypertensives that can cause postural hypotension (dizziness)⁽¹⁹⁾. The chi-square test $p < 0.05$ showed that the previous diseases variable influences the occurrence of falls. A study⁽²⁰⁾ conducted with 108 older adults observed that the alteration of parameters related to cardiovascular diseases and the use of medications are important factors for the risk of falls in the elderly.

The use of medication is an intrinsic factor strongly related to falls. However, no statistically significant relationship between the number of drugs used by the older adult and the presence of falls was found in this study.

Due to the diversity of diseases presented by the older adult, it is common to find "polypharmacy" among them. This is worrisome, since the effects of drug interaction are more pronounced in the older adult, due to changes resulting from the aging process in drug absorption, metabolism and elimination⁽¹⁷⁾.

Regarding the aspect of the location where the fall occurred, the item "ground surface type" and the material ceramic described the locations where there had more falls⁽²¹⁾. It is worth noting that the results were collected from the patients' charts in

the Geriatrics and Gerontology outpatient clinic of the Taguatinga Unit of the State Department of Health of the Distrito Federal.

In a study with 466 older adults in 23 long-term facilities in the city of Pelotas, RS, the results pointed to referral to the hospital in 56% of the cases in which the older adults suffered accidents due to falls and a 19.2% of fractures as an outcome⁽²²⁾. This information confirms the results showed in the present study, which exhibited fractures in 11.2% of the older adults falls.

The preventive measures in the institutions should be intensified since the fracture rates in this context are particularly high. Prevention should be the established intervention. Measures should be implemented immediately after institutionalization, as the risk of fractures is higher during the first months, which may be related to the individual's maladaptation to the new environment. Measures such as bed height adjustment, use of non-slippery material, adequate lighting, fixed floor mats and hip protectors can be made available to reduce these risks⁽²³⁾.

Limitation of movement is a relevant factor for the risk of fall⁽²⁴⁾, a result also found in this study through the Mann Whitney test, that found a p -value = 0.007 when correlated to Berg Scale score to the presence of falls.

Limitations of the study and contributions to nursing, health, or public policy

Although this study presents limitations regarding the cross-sectional design and the quantitative of the older adults, the findings suggest that measures regarding the physical, structural and biological conditions verified by the Berg Scale can be applied to this public. The knowledge and use of this instrument still contribute to the process of nursing care aimed at the elderly, especially in long-term care facilities.

In order to reduce the rate of falls, the nurse working in this area should conduct educational lectures with older adults and employees, illustrating the conditions with a higher incidence of events, demonstrating how to avoid them, and raising awareness focusing on prevention. In addition, nurses should evaluate the general health of individuals, with attention to factors that may compromise safety, including chronic or debilitating disorders, use of various medication and recent trauma.

It is necessary to implement public policies and find financial support or partnerships that allow the implementation of such interventions to prevent falls in all long-term facilities.

CONCLUSION

The objective of this study was to analyze the occurrence of falls in institutionalized elderly people, addressing the risks, consequences and antecedents. A total of 66.7% (30) older adults fell, 20% (9) of them in the external area, with 66.7% (30) of the participants having hypertension as a previous disease and, as consequence, fracture was highlighted with 11.2% (5).

After statistical tests, this study can affirm that the Berg Scale had different scores when compared to falls occurred by the older adults and that previous diseases influenced the occurrence of falls.

The long-term facility must bring safety measures to the environment, such as: non-slippery floors, support bars, danger signs and, if necessary, isolation of extreme cases areas.

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