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INTEGRATIVE REVIEW ARTICLE

PREVALENCE AND RISK FACTORS OF FALLS IN ELDERLY AT HOME: AN INTEGRATIVE REVIEW OF LITERATURE

PREVALÊNCIA E FATORES DE RISCO DE QUEDA EM IDOSOS NO DOMICÍLIO: REVISÃO INTEGRATIVA DA LITERATURA

PREVALENCIA Y FACTORES DE RIESGO DE CAÍDAS EN PERSONAS MAYORES EN SU CASA: UNA REVISIÓN INTEGRADORA DE LA LITERATURA

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ABSTRACT

Objective: analyzing the scientific literature related to the prevalence and to the factors of risk of falls in the elderly. **Method:** an integrative literature review held in October 2014 in BDNF, LILACS, MEDLINE and CINAHL databases, for articles published in the last five years, in Portuguese, English or Spanish and that would discuss about home falls of elderly. **Results:** 16 articles were selected, who pointed out as the main factors associated with falls in the elderly at home: cognitive, visual acuity, home environment and decreased physical strength changes. The increased risk of fall is associated with female gender, older age, and higher dependency of care. **Conclusion:** it is important to consider changes at home that make a healthy and safe environment, facilitating the circulation of the elderly and the development of activities of daily living, decreasing the risk of falls. **Descriptors:** Accidents on Falls; Patient Safety; Nursing; Elderly.

RESUMO

Objetivo: analisar a produção científica relacionada à prevalência e aos fatores de risco de queda domiciliar em idosos. **Método:** revisão integrativa da literatura realizada em outubro de 2014 nas bases de dados BDNF, LILACS, MEDLINE e CINAHL, em busca de artigos publicados nos últimos cinco anos, em português, inglês ou espanhol e que versassem sobre quedas de idosos em domicílio. **Resultados:** foram selecionados 16 artigos, que apontaram como principais fatores associados a quedas em idosos no domicílio: alterações cognitivas, acuidade visual, ambiente domiciliar e diminuição da força física. O risco aumentado de queda está associado ao sexo feminino, idade mais avançada, e maior dependência de cuidados. **Conclusão:** é importante considerar alterações no domicílio que o tornem um ambiente mais saudável e seguro, facilitando o trânsito dos idosos e o desenvolvimento de atividades de vida diárias, diminuindo o risco de quedas. **Descritores:** Acidentes por Quedas; Segurança do Paciente; Enfermagem; Idoso.

RESUMEN

Objetivo: analizar la literatura científica relacionada con la prevalencia y los factores de riesgo de la caída en casa en los ancianos. **Método:** una revisión integradora de la literatura realizada en octubre de 2014 en las bases de datos BDNF, LILACS, MEDLINE y CINAHL, en la búsqueda de artículos publicados en los últimos cinco años, en Portugués, Inglés o Español y que estudiaran las caídas de ancianos en el hogar. **Resultados:** se seleccionaron 16 artículos, que señalaron como los principales factores asociados a las caídas en los ancianos en el hogar: los cambios cognitivos, la agudeza visual, el ambiente en el hogar y la disminución de la fuerza física. El aumento del riesgo de caída se asocia con el sexo femenino, la edad más avanzada, y una mayor dependencia de atención. **Conclusión:** es importante tener en cuenta los cambios en el hogar que hacen un ambiente sano y seguro, lo que facilita la circulación de las personas mayores y el desarrollo de las actividades de la vida diaria, disminuyendo el riesgo de caídas. **Descriptores:** Accidentes en las Caídas; Seguridad del Paciente; Enfermería; Ancianos.

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INTRODUCTION

Human aging occurs in a gradual process, ie a process which does not turn back, an irreversible and uncontrollable human physiology; however, it does not result in total disability of the elderly. Nevertheless, the chances of fractures occurred are even higher when the seniors are in full activity.¹

Population aging is a reality experienced by most developed and developing countries, including Brazil. With the aging process, several chronic diseases can arise and, equally, reducing the effectiveness of various systems, including sensory (vestibular, visual, somatosensory).²⁻³

Changing systems, coupled with the inability to elect important sensory information, can contribute to the occurrence of falls in the elderly, as they are responsible to a large extent of increased body oscilation and imbalances.²

The drop is characterized as an abrupt change position unintentionally, which has as a result the change in position of an individual to a lower level in relation to its initial position. This event may be a result of both internal factors and external.⁴

Falls can have serious consequences in this population, since in old age there is a decrease of hormones that assist the fixing of calcium in the bones, increasing the risk of osteoporosis, and therefore of bone fractures.

Falls constitute a major cause of morbidity and mortality in the elderly population. Approximately 30% of persons over 65 years old and 50% of those over 80 suffer at least an annual decline. In Brazil, in the period 1996-2005, 22,5% (9.249) of the elderly deaths were due to falls.³⁻⁵

The falls are therefore considered as a major public health problem, not only because of its frequency and morbidity, but also the high socioeconomic costs stemming from the injuries.⁶ This reflects the lack of adaptation and lack of knowledge of risk factors and physiology of aging, which contributes to the occurrence of falls and may lead the longevity to death.

In addition to physical consequences, falls can also provide psychological trauma to the elderly, such as the post-fall syndrome, which generates a great insecurity, fear and anxiety, after a difficult rehabilitation, given the possibility of a new fracture.⁷

Basic care such as good nutrition, exercise, a satisfactory night's sleep and reducing remedies for sleep, which cause adverse events such as dizziness, hypotension, alteration of balance and muscle tone, can reduce accidents by falls at home.³

Therefore, this article emerges is the following research question: How is the production of knowledge about the prevalence of risk factors of fall at home in the elderly?

OBJECTIVE

- Analyzing the scientific literature related to the prevalence and home fall risk factors in the elderly.

METHOD

It was used as a methodological use of integrative literature review as one of the most extensive research methods related to the review, which synthesizes data able to provide a broader understanding of the phenomenon and/or analyzed health problem.

The review was operationalized through the following steps: problem formulation, data collection, data evaluation, analysis, interpretation and presentation of results. The research problem started from the question: How is the production of knowledge on the prevalence and home fall risk factors in the elderly?

Data were collected in October 2014 in the databases BDNF, LILACS, MEDLINE and CINAHL. The inclusion criteria were: articles published from 2009 to 2014 referring to the fact that it is concentrated a large number of research in the health area, in Portuguese, English or Spanish, and had relation to the research topic. The repeated articles, errata, letters, editorials and comments to the editor were excluded. For enabling search, we used the following descriptors: Accidental Falls, Elderly, and Risk Factors. These were combined using the Boolean operator.

For data collection, we developed an instrument whose variables were: publication title, journal, database in which it was found, year of publication, article type, author (s), the study objectives and risk factors for elderly falls at home.

After election of the articles to be worked (n = 16), they were read and analyzed based on theoretical knowledge of

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the researcher. Data interpretation and discussion of results occurred from other bibliographies of Nursing and Gerontology, concerning the accidents from falls.

RESULTS

During the search there were found 4.605 publications in which 4,589 were excluded for not meeting the eligibility criteria defined in the previous step. Thus, only 16

studies formed the corpus of analysis of this work. Of these, eight were recovered via CINAHL, four in MEDLINE and four in LILACS. A higher quantity of articles dated 2011 (n = 4) and 2013 (n = 4); written in English (n = 11); and published in 15 different journals, seven of the areas geriatrics/gerontology, four nurses, three public health and one facing the home care, as shown in Figure 1.

Title	Journal	Year	Author(s)	Objective
Residential Light and Risk for Depression and Falls: Results from the LARES Study of Eight European Cities ⁸	Public Health Rep.	2011	Brown MJ, Jacobs D	Examining the relationship between inadequate natural residential light and risk for depression and falls.
Quedas de idosos: identificação de fatores de risco extrínsecos em domicílios ⁹	Rev. pesqui. cuid. fundam. (Online)	2014	Bizerra, CDA, Gonçalves, RF, Carmo, AFS, Mendes, RNC, Moura, LA	Identifying extrinsic risk factors that predispose the occurrence of falls of the elderly in home environment.
Environmental Assessment and Modification as Fall-Prevention Strategies for Older Adults ¹⁰	Clin Geriatr Med.	2010	Pynoos J, Steinman BA, Nguyen AQ, 2010	Discussing the role of evaluation of the residence in environmental modification in reducing the risks of falls.
Fall Risk in Older Adults: Roles of Self-Rated Vision, Home Modifications, and Limb Function ¹¹	J Aging Health	2009	Steinman BA, Pynoos J, Nguyen AQ	Assessing the direct effects of vision, home modifications and the functioning of the lower and upper members and their amendments on the risk of falling in the elderly.
Older people living at home: associations between falls and health complaints in men and women ¹²	J Clin Nurs	2013	Hedman AM, Fonad E, Sandmark H	Investigating the association between falls selfreferred and health complaints and investigate gender differences in associations of risk of falls.
Automated Technology for In-home Fall Risk Assessment and Detection Sensor System ¹³	J Gerontol Nurs	2013	Rantz MJ, Skubic M, Abbott C, Galambos C, Pak Y, Ho DKC et al	Testing a system of sensors to assess and detect risk of falling in the elderly.
Falls in older people receiving in-home informal care across Victoria: Influence on care recipients and caregivers ¹⁴	Australas J Ageing	2012	Meyer C, Dow B, Bilney BE, Moore KJ, Bingham AL, Hill KD	Investigating the frequency, circumstances and factors associated with the risk of falls in elderly people who receive their care caregivers.
Housing Conditions and Risk: Reporting on a European Study of Housing Quality and Risk of Accidents for Older People ¹⁵	J Hous Elderly	2011	Braubach M, Power A	Investigating the conditions of housing and risk of accidents to elderly.
Does Fall History Influence Residential Adjustments? ¹⁶	Gerontologist.	2011	Leland N, Porell F, Murphy SL	Determine whether the elderly are associated with changes in the residence.
Home safety, safe behaviors of elderly people, and fall accidents at home ¹⁷	Educ Gerontol	2010	Erkal S	Analyzing safety at home and behaviors against falls of elderly.
Older Adults' Attitudes Toward Home Modifications for Fall	J Hous Elderly	2010	Kruse RL, Moore CM, Tofle RB, LeMaster JW,	Determining the attitudes of seniors in relation to home

Prevention ¹⁸			Aud M, Hicks LL et al	modifications for the prevention of falls.
Falls Risk Assessment and Modification ¹⁹	Home Health Care Manag Pract	2012	Flores EK	Giving health care providers at home an update about the risk factors for falls, reviewing the recommendations of the current guidelines for the prevention of falls, providing a step-by-step approach to evaluate patients and applying the clinical literature to reduce falls in elderly patients living at home.
Falls in the elderly and its relationship with functional capacity ²⁰	Rev. Latino-Am. Enfermagem	2012	Fhon JRS, Wehbe SCCF, Vendruscolo TRP, Stackfleth R, Marques S et al	Determining the prevalence of falls in the elderly and its relationship with functional capacity.
Circumstances and consequences of falls in the elderly of Florianópolis ⁴	Rev. bras. epidemiol.	2013	Antes DL, d'Orsi E, Benedetti TRB	Investigating the circumstances and consequences of falls and factors associated with limitations to perform activities after the fall.
Prevalence of falls and associated factors in elderly ²¹	Rev. Saúde Pública	2012	Cruz DT, Ribeiro LCR, Vieira MT, Teixeira MTB, Bastos RR, Leite ICG	Estimating the prevalence of falls in the elderly and analyzing associated factors.
Factors that predispose the falls in the elderly residents in the Western region of Santa Maria, RS ²²	Rev. Bras. Geriatr. Gerontol.	2011	Piovesan, AC, Pivetta, HMF, Peixoto	Investigating the incidence of falls in the elderly and the risk factors that predispose; developing strategies for the prevention of falls in the elderly.

Figure 1. Characterization of selected publications. Brazil, 2014.

Regarding the indicative rating of quality of Higher Education Personnel Training Coordination (Capes), which assesses Periodicals an alphanumeric scale - A1, best quality, A1, B1, B2, B3, B4, B5 and C, lower quality²³, the articles were published in scientific journals of good quality. Considering the best Qualis shown for any assessment area related to health, two articles were published in journals with Qualis A1 (Nursing) and one in periodic B2 (Nursing). The rest were published in journals qualified as A2 and B1. It is noteworthy that four journals are not listed in WebQualis system that presents this laminating quality.

Regarding the method, five papers used a qualitative approach, three of the descriptive type, a review and a case study. Among the nine quantitative, one comes up for trial, a case-control, two cohorts, and the other (n = 6) are cross-sectional epidemiological studies.

Regarding the proposed objectives, it was revealed that the majority addressed the

prevalence and identification of risk factors of elderly falls.

Risk factors of falls of elderly found households and/or analyzed in the studies selected were: cognitive, visual acuity, home environment (light, provision of furniture and objects, floors, lack of grab bars), decreased physical strength of upper and lower limbs, and self-perception of health and osteoporosis condition.

The correlational studies found greater risk of falling among older elderly, women and among those with higher dependency care. The prevalence of falls in the elderly population ranged from 19% to 75%. With regard to the time of the falls, it was found that they occurred mainly in the yard and bathroom, while the elderly walked and whose main event was the stumbling block.

Studies show that the integrated risk management programs that emphasize various interventions, including evaluation by a trained professional and modifications to homes, are most effective for reducing falls among the elderly in homes. The healthy housing conditions are important to

minimize the risk factors and therefore maximize the supports of home ownership and avoid fractures and hospitalizations.

DISCUSSION

The elderly account for two thirds of the world population, a phenomenon that prints the need for further studies of this population and the health problems they face, such as the occurrence of falls, which are the most serious and frequent domestic accidents among the elderly and considered one of the main external causes of morbidity and mortality in this population segment.²⁴⁻²⁵

This study identified a higher prevalence of falls among elderly women and older, as well as study in a long term care facility for the elderly (LTCF) in Rio Grande do Sul.²⁶ Regarding the gender, this could be explained, at least partly due to women undertake more activities in the home environment, making them more likely to have domestic accidents.²⁰

In the present study, there was also increased risk of falls among those with lower degree of independence to perform activities of daily living, a result that confirms review study that also associated high risk with the presence of chronic disease and medication use benzodiazepines.²⁵

Among the main factors related to falls in the home environment is decreased visual acuity, which interferes with balance and gait, which are related to cognitive function in the elderly and account for 20% of home accidents from falls.²² Vision is one of the five most important senses for an individual, it is essential for the realization of all that is around, so it controls the cognitive function of the elderly.

With advancing age, the elderly are more disposed to serious diseases such as cataracts, glaucoma and retinopathy, which can lead to a compromised ability to judge a home in fall. These diseases lead to impairment of spatial interpretation because of the decreased visual acuity, restriction of the visual field, increased susceptibility to light, poor depth perception or instability in determining the look.²²

Other home in falls risk factors were mentioned by the publications that made up the show of this study, such as environmental, especially when it comes to

architectural and furniture inadequacies and lack of protection devices. Similar results were found in other studies that have cited also as additional risks, the presence of stairs and carpets in areas of access to rooms and absent or poor lighting.^{9,25,27} These environmental risk factors, combined with factors pathological increase the chances risk of falls and therefore fractures and fractures that can result in death. Thus, it is important to note that an elderly person with need-free environments to be able to get around properly and without accidents.

Regarding the rooms in the household, the bathroom is where there is the most frequent inadequacies, taking the long-lived to be more disposed to falls. The main inadequacies identified were: handrail absences (handrail) and non-slip mat; presence of frames, access doors with broken or rounded knobs and slippery or uneven floors.^{9,25}

The bathroom is one of the sites considered most dangerous to the elderly; it is the place they most accesses during the day and evening. The lack of support bar provides an increase falls precisely because the bathroom floor is a slippery area due to the extensive passage of water through the shower. Therefore it is important that families are aware of these inadequacies.

Another relevant fact is found that the elderly do not fall only when performing hazardous activities, but mainly considered routine activities, such as a short stroke inside the house.⁴ A simple shift can result in serious fractures that can compromise temporarily or permanently, motor functions. In addition, often the elderly the psychological ends up being affected, making it difficult, and in their rehabilitation.

Aging, in addition to bringing changes in gait, actually increases the possibility of tripping. During this stage of life, there is a decrease in the flexibility and mobility of the hip and knee, limitation of dorsiflexion range of ankles, decreased strength, alteration of balance and dizziness. These alterations are responsible to a large extent by tripping or slipping and therefore falls.^{4,20,28}

Previous fracture history was also associated with increased risk for falls in elderly.^{25,29} When the elder already have a primary fracture, he is weaker and weak to do his daily activities. Therefore, it

becomes prone to a new fall and have more severe fractures than the first.

Study showed that 19% of falls resulted in some kind of serious fractures in the elderly.²¹ Generally women are suffering more falls because of osteoporosis and are also the most in need as a result of falls, medical care and hospitalization.¹⁰

Research results showed that falls on the same level accounted for almost 40% of hospitalizations of seniors and 35% of deaths, indicating that the circumstances of the fall are relatively routine.¹¹ Another recent report found that 50% of hospitalized elderly due to falls die within a year, usually because of complications of the same.¹²

Other traumas from falls of elderly people not only fractures were identified by systematic review, namely: soft tissue injuries, bruises, sprains, wounds and abrasions, muscle and neurological damage. And as consequences: immobilization, emergence of other diseases, pain, functional and physical activity decline, activities of abandonment, sadness, behavior change, and also feelings of helplessness, fear and sadness preceding the loss of autonomy and independence.³⁰

The loss of autonomy and independence prints the need for help from family and/or caregivers to develop daily activities as found by a survey that showed that 11% of the investigated elderly needed help of any family to be able to walk, many of them precisely because of previous falls consequences.⁸

These data confirm that falls in the home are constant and very common. In this case, it is important to emphasize that the family needs to be oriented with respect to the aging process and also about the problems associated with it. The mentioned factors should be taken into greater consideration when you have an elderly in their own homes, as small items in inappropriate places can lead to major fractures that often are irreversible. And so, the family should be counseled about the necessary adjustments within the home.

Given this scenario, health systems and its professionals must be prepared to act in preventing falls and the treatment and rehabilitation of its consequences. Proposals for action aimed at preventing falls, with emphasis on health promotion and adoption of measures to cool the risk factors have direct benefits not only for the elderly and

families, but also for health and society systems, which also suffer impacts as a result of falls, especially socioeconomic.

The promotion and prevention should be worked daily in view of the rapid increase in the elderly population. It is estimated that by 2020, Brazil will be the sixth country in the world in number of elderly. This scenario brings with it discussions related to social inequality, poverty and fragility of public institutions.¹³ This is because the aging population suffers lower contributions to social safety, in that it will have to shell out more and bigger government spending on health care.¹⁴ Aging impairs the motor and mental functions of the individual, making it difficult its membership and acceptance by the labor market.¹⁶

Health promotion activities that support better quality of life to the elderly population may trigger direct benefits not only to her but also to society in general.

CONCLUSION

The higher prevalence of elderly falls in households is associated with female sex, due to endogenous factors (menopause, low female hormones that predispose to osteoporosis) and social habits (increased participation of women in the development of household chores); older age, given the greater impairment of cognitive systems and muscle and bone fragility; and previous episodes of falls.

With respect to risk factors for falls, they can be intrinsic, arising from the aging process itself, and therefore physiological factors, but differ depending on gender, age and functional status of the elderly; and extrinsic factors, usually associated with the home itself.

Among the intrinsic factors, the most mentioned were: decreased visual acuity, reduced muscle flexibility, bone fragility and impaired balance. Among the extrinsic, the most important relate to the provision of furniture and objects inside the residence, absence or inadequacy of light, and no devices support.

It is important to consider changes at home to make a healthy and safe environment, facilitating the delivery of the elderly and the development of activities of daily living and consequently decreased the risk factors for falls. Promotion and prevention actions should be implemented by family members and health professionals, who play a fundamental role in health

education, which promotes the knowledge, observance to the changes imposed by aging and self-care.

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