Systematic or Integrative Review

EPIDEMIOLOGY OF ACCIDENTAL FALLS AMONG THE ELDERLY: SURVEY OF THE PERIOD 2003-2012

EPIDEMIOLOGIA DO EVENTO QUEDA EM IDOSO: TRAÇADO HISTÓRICO ENTRE OS ANOS DE 2003 E 2012

EPIDEMIOLOGÍA DEL EVENTO CAÍDAS DE ADULTOS MAYORES: TRAZADO HISTÓRICO ENTRE LOS AÑOS 2003 Y 2012

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ABSTRACT

Integrative review of scientific studies on the epidemiology of falls among the elderly in the 2003-2012 period. We searched the following databases: PubMed; CINAHL; Scopus; LILACS; BDENF; and SciELO. We found 1786 articles. Out of these, 58 were analyzed, of which 46.55% came from SciELO and the majority were in Portuguese. The year with most articles was 2010, with 24.14%. The method of analysis followed Ganong (1987). The following categories emerged: characteristics and circumstances of falls in the elderly; incidence and prevalence of falls in the elderly; epidemiology of falls in community-dwelling elderly; and epidemiology of falls among institutionalized elderly. Epidemiological studies show events that revolve around a certain event and they need to be investigated. The incidence and prevalence of non-communicable and chronic degenerative diseases, together with the manifestations of aging itself, increase the likelihood of falls and severity of injuries. Falls compromise the functional capacity, autonomy and perceived quality of life for the elderly.

Keywords: Accidental Falls; Aged; Aging; Demographic Aging; Epidemiology.

RESUMO

Revisão integrativa que objetivou conhecer estudos científicos acerca da epidemiologia do evento queda em idosos, no período de 2003-2012. Pesquisou-se nas bases de dados: PubMed; CINAHL; Scopus; LILACS; BDENF e SciELO. Encontraram-se 1.786 artigos. Destes, foram analisados 58, dos quais 46,55% constaram na SciELO e predominou o idioma português. No ano 2010 destacaram-se 24,14% de artigos. O método de análise foi o de Ganong (1987). Emergiram as categorias: características e circunstâncias das quedas dos idosos; incidência e prevalência das quedas dos idosos; epidemiologia das quedas em idosos na comunidade; e epidemiologia das quedas em idosos institucionalizados. Verificou-se que estudos epidemiológicos revelam acontecimentos que permeiam determinado evento e despertam a necessidade de investigá-los. Percebeu-se que incidência e prevalência de doenças crônicas não transmissíveis e degenerativas, somadas às manifestações decorrentes do próprio envelhecimento, aumentam a probabilidade de quedas e agravamento das lesões. As quedas comprometem a capacidade funcional, autonomia e percepção de qualidade de vida dos idosos.

Palavras-chave: *Acidentes por Quedas; Idoso; Envelhecimento; Envelhecimento da População; Epidemiologia.*

RESUMEN

Se trata de una revisión integradora cuyo objetivó fue conocer los estudios científicos sobre la epidemiología del evento caídas de adultos mayores entre los años 2003 y 2012. Se investigaron seis bibliotecas virtuales: PubMed; CINAHL; Scopus; LILACS; BDENF y SciELO. Fueron encontrados 1.786 artículos; 58 fueron analizados, 46.55% de ellos en SciELO, la mayoría de los artículos estaba en idioma portugués. El 24,14 % de los artículos eran de 2010. Fue utilizado el método de análisis de Ganong (1987). Del análisis surgieron las siguientes categorías: características y circunstancias de las caídas de los adultos mayores; incidencia y prevalencia de las caídas de los adultos mayores; epidemiología de las caídas de los adultos mayores en la comunidad; epidemiologia de las caídas de los adultos mayores institucionalizados. Fue constatado que los estudios epidemiológicos revelan hechos subyacentes a un evento específico y muestran la necesidad de investigarlos. La incidencia y prevalencia de enfermedades crónicas no transmisibles y degenerativas sumada a las manifestaciones del propio envejecimiento aumentan la probabilidad de las caídas y de que las lesiones sean más graves. Las caídas comprometen la capacidad funcional, la autonomía y la percepción de la calidad de vida de los adultos mayores.

Palabras clave*: Accidentes por Caídas; Anciano; Envejecimiento, Envejecimiento de la Población; Epidemiología.*

INTRODUCTION

Modifications in the structure of age groups of the population of developing countries have played a key role in demographic and epidemiologic transitions. The first is made evident by the increase in the number of elderly people and their life expectancy; whereas the second is seen in the gradual decrease of infectious or contagious diseases and the increase in degenerative and chronic non-communicable diseases (NCDs).[1]

According to the World Health Organization (WHO), an elderly person is an individual of 60 years of age or older in developing countries and 65 years or older in developed countries.[2] In addition to the chronological perspective, these are individuals in the process of personal development, with a significant accumulated life experience. They are also individuals presenting physiological degeneration that are not necessarily diseases, but that makes them more vulnerable. On the other hand, some of these individuals bring NCDs acquired in adult life to old age, which makes them more fragile and with higher risk of adverse events such as accidental falls.[3]

The Brazilian government began to care for the elderly's health since the 1988 Constitution. After this historical milestone, the Ministry of Health published the Ordinance 810/89, which governs the standardization and operation of elderly assistance. In 1993, the Organic Social Welfare Law (Lei Orgânica de Assistência Social, LOAS), Law 8.742/93, based on the policy of social welfare, was sanctioned and guaranteed rights to the elderly. In 1994, Federal Law 8.842/94 was sanctioned, announcing the National Policy for the Elderly (Política Nacional do Idoso, PNI), being the first specific law to guarantee the rights of the elderly in Brazil. In 1999, the international year of the elderly, Ordinance 1.395/99 of the Ministry of Health, with the National Policy for Elderly Health (Política Nacional de Saúde do Idoso, PNSI) was approved. In 2003, the National Council for Elderly Rights (Conselho Nacional dos Direitos do Idoso, CNDI) was created, approved under decree 4.227. Still in 2003, the Statute of the Elderly (Estatuto do Idoso), Law 10.741/03. In 2005, the Brazilian government adopted WHO's proposal entitled "Active ageing: a policy framework." In 2006, the National Policy for Elderly Health was reformulated and the National Policy for the Health of the Elderly Person (Política Nacional de Saúde da Pessoa Idosa, PNSPI), was approved, through Ordinance 2.528/06. Thus we can se an increasing preoccupation from administrators and health professionals to implement strategies to promote, protect and recuperate the health of the elderly, seeking improvement in their quality of life, integrated with their families and collaborating for their insertion and permanence in the community.

Brazil still needs to systematize the operation of these policies within its health system in order to meet the demands of this segment of the population. We can see that in the last three decades, and especially in the last two, that some initiatives, both public and private, have sought to promote health, prevent diseases and external injuries, and control NCDs in this age group. Brazil has been implementing a comprehensive plan of action and a vigilance system for NCDs and their risk factors. In order to devise strategies to better assist the elderly, however, it must be understood that the natural process of ageing triggers physiological alterations in the organic functions of the elderly.

Therefore, the elderly's structural and functional alterations advance in the same proportion as their chronological age. These are natural alterations of senescence and make the elderly more susceptible to disabling events, notable among them, accidental falls.[4]

Falls occur in the elderly population progressively, and they lead to increasing fragility and vulnerability, which will be reflected in decreased functional capacity, autonomy, mobility for social interaction and quality of life.[5]

Falls are cited by researchers in gerontology and geriatrics as an imminent problem to elderly heath. They are one of the main clinical and public health problems in developing countries, because they are quite common and compromise the elderly's health. Complications from falls are present in almost all records. The elderly themselves perceive falls as something negative, and can even mean a threat to their identity.[6]

There is a high incidence of falls in the elderly population. On a physiological level, women's bone mass decrease quicker than men's, which make them more prone to falls.[7] Elderly women with nutritional dysfunctions, four or more comorbidities, and depression, are twice as likely to fall. Fall prevention must be reinforced so as to guarantee the elderly better quality of life, autonomy, and independence.[7]

It is undeniable that the increased elderly population means increased incidence of long-term problems, which will require significant expenses with treatment. From this perspective, our study's aim was to investigate the scientific studies on the epidemiology of the fall in the elderly, in the period 2003-2012.

METHODOLOGY

This is an integrative literature review. This method consists in the culling and critical analysis of studies on a given topic. The integrative review allows for the promotion of possible adjustments in health assistance, and the identification of flaws that can sometimes be used to justify a new investigation. There is also the possibility to incorporate and apply its results in practice.[8]

We used the protocol for integrative literature review proposed by Ganong,[9] which included: the establishment of inclusion and exclusion criteria of the studies; pre-reading to select articles for the corpus; analysis of all studies included in the review; analysis and interpretation of the results; and a synthesis.

With this review, we sought to answer the question, what is the state of the art in the scientific literature of the epidemiology of falls in elderly people, between the years 2003-2012?

The time frame of the articles was of 10 years (2003-2012) and our data collection took place in July 2012 and July 2013, since some journals publish their issues of a certain year up to six months in the following year. The survey was carried out in five online databases: PubMed/Medline (*National Library of Medicine and National Institutes of Health/Medical Literature Analysis and Retrieval System Online*); *Cumulative Index to Nursing and Allied Health Literature* (CINAHL); Scopus; Latin American and Caribbean Center on Health Sciences (LILACS), and Nursing Database (Base de Dados de Enfermagem, BDENF) and the virtual library *Scientific Electronic Library Online* (SciELO).

The access to the databases was as follows: to access PubMed/Medline, the PubMed portal was used; LILACS and BDENF through Virtual Health Library (VHL); for CINAHL and Scopus, we used Portal CAPES; and SciELO through its own virtual library.

Our search parameters used combinations of five descriptors (aged, ageing, population ageing, accidental fall, elderly health), and one keyword (fall) in Portuguese, Spanish, and English, these descriptors being present in Health Sciences Descriptors (Descitores em Ciências da Saúde, DeCS) and Medical Subject Headings (MeSH). In the search, combinations of the descriptors were used with the Boolean operators (and, or, not or and not), respecting the differences between the databases.

Inclusion criteria were: online texts, published in scientific journals available in the selected databases, within the timeframe 2003-2012, in Portuguese, English or Spanish, on the theme of the epidemiology of accidental falls in the elderly population. Exclusion criteria were: editorials, letters, reviews, reports of experiences and theoretical reflections, dissertations, theses and monographs, abstracts in event annals, expanded abstracts, and studies published in other languages. Figure 1 shows the flow chart of the path taken in the research.

There were meetings between the authors to assess and select the studies in the corpus, by peer consensus. In the following step, articles were read in order to verify if were, in fact, according to the review's objectives. Duplicates were selected according to the database of greater indexation. After a brief reading of the 224, only 166 were verified to be pertinent to our review. Out of these, 58 were about epidemiology of accidental falls and thus comprised the corpus of the study. Once the sample size was defined, articles were stored in physical and virtual databases.

The method used to analyze the articles was the framework proposed by Ganong,[9] because it is the most adequate tool for the proposed objectives. A table was devised with the following information: title of the article, database, authors, publication year, study objective, methodology, theoretical framework, results, analysis, and narrative excerpts. In the following stage, results were analyzed and interpreted, which required a return to the initial aims of the research to maintain clarity. After this process, we devised four categories: characteristics, circumstances, and consequences of elderly accidental falls; incidence and prevalence of these falls; epidemiology of these falls in community-dwelling elderly; and epidemiology of these falls in the institutionalized elderly.

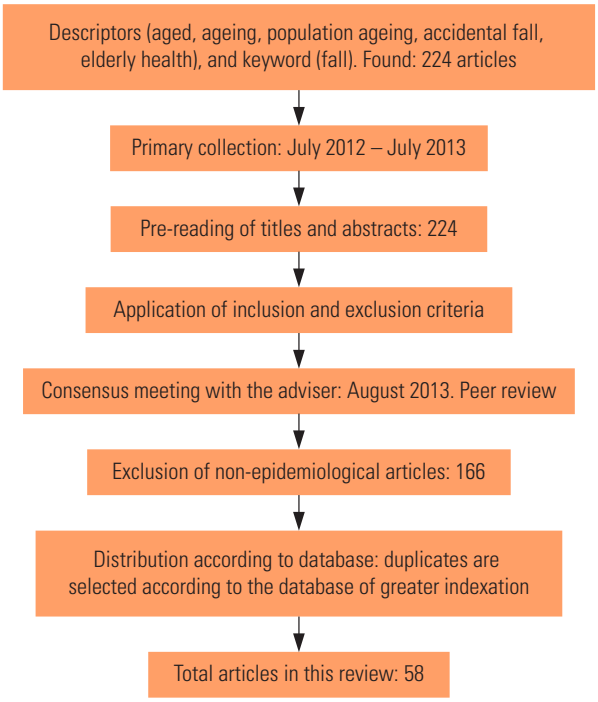

Figure 1 - Flow chart of the stages of the intergrative review- Florianópolis, 2014. Source: Paula Júnior NFP, Santos SMA. Data collection.

RESULTS

Ultimately, we selected 58 articles. To better identify each article, we organized the findings on a table with the following data: alphanumeric sequence, from A1 to A58, title, year of publication, database, journal, and country of origin (Table 1).

The majority of articles were found in the SciELO virtual library (46.55%, 27). PubMed and LILACS follow, with 22.41% (13) and 20.69% (12), respectively. There were three articles (5.17%) from the Scopus database, two from CINAHL (3.45%), and one from BDENF (1.73%).

2010 was the year with the most publications, (14, 24.17%), followed by 2009 and 2012, both with 13.80% (eight) articles, 2011 with seven (12.07%) and 2007 with six (10.34%). From year of 2005, five (8.62%) articles were selected, and from 2008, four (6.90%). The remaining years added up to six articles (10.34%).

Most of the articles 53.45% (31) were written in Portuguese, followed by 37.93% (22) in English and only 8.62% (five) in Spanish.

Table 1 - Selected articles for analysis, 2003-2012. Florianópolis, 2014

Code	Title	Year	Database/Virtual Library	Journal	Country
A1	Prevalência de quedas e fatores associados em idosos	2007	SciELO	Rev Saúde Pública	Brazil
A2	Quedas de idosos em uma clínica-escola: prevalência e fatores associados	2010	LILACS	ConScientiae Saude	Brazil
A3	Consequências das quedas em idosos vivendo na comunidade: revisão sistemática.	2011	SciELO	Rev Bras Geriatr. Gerontol	Brazil
A4	Falls in old age: a threat to identity	2012	PubMed	J Clin Nurs	Australia
A5	Perfil de mulheres idosas segundo a ocorrência de quedas: estudo de demanda no Núcleo de Atenção ao Idoso da UnATI/UERJ	2009	SciELO	Rev Bras Geriatr Gerontol	Brazil
A6	Prevalencia de dependencia funcional y su asociación con caídas en una muestra de adultos mayores pobres en Mexico	2011	SciELO	Salud Pública México	Mexico
A7	Characteristics and circumstances of falls leading to severe fractures in elderly people in Rio de Janeiro, Brazil	2009	SciELO	Cad Saúde Pública	Brazil
A8	Causas e consequências de quedas de idosos atendidos em hospital público	2004	SciELO	Rev Saúde Pública	Brazil
A9	An evaluation of footwear worn at the time of fall-related hip fracture	2003	PubMed	Age Ageing	England
A10	Falls and the elderly: Is there any difference in the developing world? A cross-sectional study from Turkey	2006	SCOPUS	Arch Gerontol Geriatr	Turkey
A11	Caracterização de quedas em idosos	2011	BDENF	Rev Pesq Cuid Fundam	Brazil
A12	One-year mortality among elderly people after hospitalization due to fall-related fractures: comparison with a control group of matched elderly	2012	PubMed	Cad Saúde Pública	Brazil
A13	Management of fall-related injuries in the elderly: a retrospective chart review of patients presenting to the emergency department of a community-based	2009	CINAHL	Physiother Can	Canada
A14	Balance confidence was associated with mobility and balance performance in older people with fall-related hip fracture: a cross-sectional study	2012	SCOPUS	Arch Phys Med Rehabil	Finland
A15	Episodes of falling among elderly people: a systematic review and meta-analysis of social and demographic pre-disposing characteristics	2010	PubMed	Clinics	França
A16	Ethnic differences in the frequency and circumstances of falling in older community-dwelling women	2005	PubMed	J Am Geriatr Soc	USA
A17	Análise da incidência de quedas e fraturas nos idosos etilistas	2008	CINAHL	Ter man	Brazil
A18	Lesiones por caídas y factores asociados en personas mayores de Cataluña, España	2010	SciELO	Rev Panam Salud Publica	Spain
A19	Quedas em idoso: um problema de saúde pública desconhecido pela comunidade e negligenciado por muitos profissionais da saúde e por autoridades sanitárias Brazileiras	2010	LILACS	Rev. Med Minas Gerais	Brazil
A20	Fall incidence in a population of elderly persons in Nigeria	2010	PubMed	Gerontology	Nigeria
A21	Prevalência de quedas em idosos e fatores associados	2007	LILACS	Rev. Saúde Pública	Brazil
A22	Increased prevalence of falls among elderly individuals with mental health and substance abuse conditions	2007	SCOPUS	Am J Geriatr Psychiatry	USA
A23	Diferenças socioeconômicas entre autoclassificação e heteroclassificação de cor/raça	2008	SciELO	Rev Saúde Pública	Brazil
A24	Epidemiología de caídas de ancianos en España: una revision sistemática	2007	SciELO	Rev Esp Salud Pública	Spain
A25	Prevalência do medo de cair em uma população de idosos da comunidade e sua correlação com mobilidade, equilíbrio dinâmico, risco e histórico de quedas	2009	SciELO	Rev. Bras. Fisioter	Brazil
A26	Prevalência e fatores associados a quedas em idosos em um município do Rio de Janeiro	2010	LILACS	Rev Bras. Geriatr Gerontol	Brazil

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Table 1 - Selected articles for analysis, 2003-2012. Florianópolis, 2014

Code	Title	Year	Database/Virtual Library	Journal	Country
A27	Prevalence of falls in elderly in Brazil: a countrywide analysis	2011	LILACS	Cad Saúde Pública	Brazil
A28	Prevalência de quedas e de fatores associados em idosos segundo etnia	2012	SciELO	Ciênc saúde coletiva	Brazil
A29	Evolution of Brazilian elderly with hip fracture secondary to a fall	2006	SciELO	Clinics	Brazil
A30	Recurrent falls in the elderly	2009	LILACS	Acta Med. Colomb	Colombia
A31	Mortalidade por causas externas em idosos em Minas Gerais, Brasil	2010	SciELO	Rev Anna Nery	Brazil
A32	O custo direto da fratura de fêmur por quedas em pessoas idosas: análise no setor privado de saúde na cidade de Brasília, 2009	2011	SciELO	Rev Bras. Geriatr Gerontol	Brazil
A33	Prevalence of falls in the elderly living in the community	2003	PubMed	Aten Primaria	Spain
A34	Characteristics of early fallers on elderly patient rehabilitation wards	2003	PubMed	Age Ageing	England
A35	Why the elderly fall in residential care facilities, and suggested remedies	2004	PubMed	J Fam Pract	USA
A36	Lesiones accidentales en adultos mayores: un reto para los sistemas de salud	2008	LILACS	Salud Pública Méx	Mexico
A37	Fatores associados a quedas em mulheres idosas residentes na comunidade	2010	LILACS	Rev Assoc Med Bras	Brazil
A38	Fatores associados ao histórico de quedas de idosos assistidos pelo Programa de Saúde da Família	2010	SciELO	Saude soc	Brazil
A39	Evaluation of balance in fallers and non-fallers elderly	2012	SciELO	Braz J Otorhinolaryngol	Turkey
A40	Fatores associados a quedas em pacientes idosos ambulatoriais menos ativos e mais ativos	2012	SciELO	Rev Bras Fisioter	Brazil
A41	A prospective study of the costs of falls in older adults living in the community	2003	PubMed	Aust N Z J Public Health	Australia
A42	Long-term survival after falls among the elderly in institutional care	2004	PubMed	Arch Gerontol Geriatr	Netherlands
A43	Prevalence and characteristics of traumatic intracranial hemorrhage in elderly fallers presenting to the emergency department without focal findings	2009	PubMed	J Am Geriatr Soc	USA
A44	Perfil de idosos com internação por quedas nos hospitais públicos de Niterói (RJ)	2010	LILACS	Rev Bras Epidemiol	Brazil
A45	Perfil do idoso vítima de trauma atendido em uma Unidade de Urgência e Emergência	2011	LILACS	Rev Esc Enferm USP	Brazil
A46	Older people presenting to the emergency department after a fall: a population with substantial recurrent healthcare use	2012	PubMed	Emerg Med J	Australia
A47	Quedas em meio hospitalar: um estudo longitudinal	2012	SciELO	Rev Latino-Am Enferm	Brazil
A48	Caídas en adultos mayores institucionalizados: descripción y evaluación geriátrica	2003	LILACS	Rev Méd Chile	Chile
A49	Prevalência de quedas em idosos asilados do município de Rio Grande, RS	2008	LILACS	Rev Saúde Pública	Brazil
A50	Prevalência de quedas em idosos institucionalizados no Lar das Vovozinhas e Lar dos Vovozinhos da cidade de Londrina	2009	SciELO	Rev Kairós	Brazil
A51	Quedas de idosos institucionalizados: ocorrência e fatores associados	2010	SciELO	Rev Bras Geriatr Gerontol	Brazil
A52	Ocorrência de quedas em idosos residentes em instituições de longa permanência em Pelotas, Rio Grande do Sul, Brasil	2010	SciELO	Cad Saúde Pública	Brazil
A53	Prevalência e características das quedas de idosos institucionalizados	2010	SciELO	Rev Bras Enferm	Brazil
A54	Quedas e fatores associados em idosos institucionalizados no município de Pelotas (RS, Brasil)	2011	SciELO	Ciênc saúde coletiva	Brazil
A55	Variáveis associadas à ocorrência de quedas a partir dos diagnósticos de enfermagem nos idosos atendidos ambulatorialmente	2007	SciELO	Rev Latino-Am Enferm	Brazil
A56	Comparação do risco de queda em idosos sedentários e ativos por meio da escala de equilíbrio de Berg	2009	SciELO	Rev Fisioter Pesqui	Brazil

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Table 1 - Selected articles for analysis, 2003-2012. Florianópolis, 2014

Code	Title	Year	Database/Virtual Library	Journal	Country
A57	Condições de saúde, incidência de quedas e nível de atividade física dos idosos	2007	SciELO	Rev Bras Fisioter	Brazil
A58	A importância das quedas no mesmo nível entre idosos no estado de São Paulo	2010	SciELO	Rev Assoc Med Bras	Brazil

South America had the most number of articles (63.79%, 37), with 34 from Brazil alone; Europe followed with eight (13.80%), and North America with seven (12.07%), Oceania with three (5.17%), Australia being the leading country; and Asia, with two (3.45%) articles and Africa with only one (1.73%).

From the analysis, the following categories emerged: characteristics, circumstances, and consequences of accidental falls, incidence and prevalence of accidental falls, epidemiology of accidental falls in the community-dwelling elderly, and epidemiology of accidental falls in the institutionalized elderly.

DISCUSSION

There has been an increase in the scientific production on the epidemiology of accidental falls in the elderly population in the years 2007-2012. In Brazil, this can be attributed to the publication in 2006 of Ordinance 399/GM, referring to the Pact for Health Guidelines (Diretrizes do Pacto pela Saúde), which includes the Pact for Life. In this document, elderly health is one of the priorities among the different governmental spheres. Another ordinance from October 19 2006, Ordinance 2.528, approved National Policy for the Health of the Elderly Person, which seeks to recuperate, maintain, and promote autonomy and independence of the elderly, with measures within the principles and capacities of the Unified Health System (SUS).[10] These legal arrangements were met by health professionals' preoccupation to consider the issue of accidental falls in the elderly population.

The predominance of South American articles can be verified in the São Paulo Research Foundation (FAPESP) citations. According to FAPESP, between 2008 and 2010, Brazilian researchers accounted for 56% of the scientific articles in Latin America, and in the state of São Paulo alone, 43,535 articles were published in Web of Science, a number that far surpasses other countries in Latin America. Brazil leads the publication of scientific studies, with 94,622 articles in international journals indexed by Web of Science in the years 2008-2010. The number of Brazilian publications was 25% higher than the sum from Mexico, Argentina, Chile, Colombia, and Venezuela, which together published 75,665 articles in the same time frame.[11]

Among the 58 articles analyzed, 14 had the theme of characteristics and circumstances of accidental falls in the elderly and sought to characterize and contextualize that event in the lives of the elderly and its outcomes. Twenty articles reported the incidence and prevalence of the event; 10 referred to the epidemiology in community-dwelling elderly; and 14 to the epidemiology in institutionalized elderly. Results of this analysis were grouped in the four categories below.

Under characteristics, circumstances, and consequences of accidental falls, 14 articles were analyzed. Out of these, seven (A5, A7, A8, A9, A10, A11, A12) sought to characterize falls in terms of place and time of day they occurred. Three (A6, A13, A14) profiled the elderly and proposed suggestions for assistance after the event. Four (A3, A4, A15, A55) discussed the consequences of the falls and its repercussions on the elderly's lives and health.

Falls are more frequent in elderly women, possibly related to genetic and physiological factors specific to females. Home is where most falls take place in this population.[12]

Approximately 17% of cases of falls recorded are from elderly living alone and nearly half of them have a low schooling level (incomplete primary school).[12] Elderly women with nutritional dysfunctions and presenting four or more comorbidities and symptoms that suggest depression are more prone to falls. Among the elderly, the most common comorbidities that can lead to falls are: cardiovascular disease, osteoarthritis, and osteoporosis.[12]

It must be understood that falls do not occur by chance, and the elderly's tendency to suffer lesions and fractures from falls are because of the high prevalence of comorbidities. This is in addition to the functional decline from the natural process of ageing, which makes any kind of fall a potential hazard.[12] Among the elderly who suffer falls, 30.9% have functional deficiencies.[7] Elderly people usually suffer one to two falls each year, especially when there is a history of falls, and are more prevalent on sidewalks.[13]

Falls cause myriad problems, and fractures are the most feared. A study carried out with 250 elderly hospitalized following a fall found that the most common fractures are hip (72%) and arm/forearm (19%).14 The high rate of hip fracture is possibly related to the fact that the hip is the bone structure that joins the inferior members to the rest of the body, a particularly unstable area during a fall. The arm/forearm fracture is possibly related to the fact that when they fall, the elderly use their arms and forearms to maintain balance and even protect other parts of the body.[15]

One third of the elderly has at least one yearly fall. Even with this high incidence, many do not take part in any programs of fall prevention, as they do not see themselves as being particularly vulnerable.[6]

The main consequences of accidental falls in the elderly population are: fractures; immobilization; soft tissue lesions; contusions; sprains; wounds and abrasions; muscle and neurological lesions; onset of other diseases; pain; functional decline of physical activity; need for medical assistance; hospitalization; rehabilitation; fear of falling; giving up of certain activities; sadness; lifestyle/behavior changes; feelings of impotence; decline in social activity; loss of autonomy; changes of environment/household; family rearrangements; and death. The knowledge of the physical, psychological, and social consequences of falls is extremely important, because elements taken in at this point will help to devise preventive and rehabilitation strategies.[16]

The above-mentioned consequences are strongly felt in the life of the elderly, because they limit and compromise their daily life activities (DLA) and their instrumental daily life activities (IDLA). We should note that the elderly with difficulties with their DLA or IDLA tend to have twice as much risk of falling. Thus, health services for the elderly should consider a multidisciplinary approach in order to promote a more effective outcome.[6]

In the categories incidence and prevalence of the event, 20 articles on the incidence and prevalence of accidental falls in this population and their outcomes were analyzed. Prevalence measures how many elderly fall, whereas incidence measures how many elderly have become fallers. Fallers are those who have suffered more than two falls in the past semester and are, therefore, more prone to further episodes. For this reason, they must be prioritized to minimize exposure to possible risk factors.[17] We must note that both concepts involve time and space, that is, the elderly that falls or has fallen in a given place at a given time.

Out of the assessed articles, five (A17, A18, A19, A20, A57) refer to the incidence of falls and 15 (A1, A2, A16, A21, A22, A23, A24, A25, A26, A27, A28, A29, A30, A31, A32) to prevalence. Among these, six (A17, A18, A29, A30, A31, A32) report accidental lesions caused by falls; one (A19) to factors related to the increase in incidence among the elderly; one (A20) refers to elderly women and specific interventions to reduce falls.

Out of the articles that meet the discussion of prevalence, four (A1, A2, A21, A27) characterized the factors contributing to increase prevalence and made suggestions to control this number. One (A26) article reported the association between extrinsic and intrinsic factors with prevalence of falls. Three (A17, A23, A28) discussed factors associated to the increase of prevalence according to sex, socioeconomic aspects, and ethnicities. Two (A22, A25) associated prevalence to cognitive factors, one (A22) discussed the prevalence of falls with compromise in mental health, and yet another (A25) indicated the prevalence of fear among the elderly who have suffered falls. As for outcomes, four (A29, A30, A31, A32) articles investigating the biopsicossocial results of falls were analyzed.

In a study with 3,247 non-institutionalized elderly, 14.9% of them had wounds caused by falls, which were, in turn, related to a number of factors, such as: sex, age, social life (living alone, social isolation), use of five or more drugs, mobility problems, diabetes, and bone and muscle disorders. There is also an increase in the risk of wounds provoked by falls. The use of alcohol is an aggravating factor, as it can also increase the chances of a fall.[18]

Accidental lesions are the sixth leading cause of death for the elderly, and falls are responsible for over half of the accidental deaths for the elderly of 75 years of age or more.[19] A Nigerian study reported the incidence of falls as approximately 23% in their country. The elderly with chronic pain—especially associated with arthritis—and insomnia have an increased risk of suffering falls.[20] Approximately 72% of the falls are accidental and occur during the daytime, possibly because it is during that time they are more active and more exposed to triggering factors.[21]

After the analysis of the incidence of falls, the next step is to investigate its prevalence. There was a prevalence of 34.8% in a study of 4,003 elderly from seven Brazilian states.[22] Another study reported a prevalence of 27.1% among 118 elderly.[21] A study of 6,616 elderly living in urban areas of 100 towns of 23 Brazilian states reported a prevalence of 27.6%.[23] On the following year, there was a prevalence of 32.1% among 420 elderly.[4] These numbers range from 27.1 to 34.8%, a difference that could be linked to factors such as cutoff age of the participants, methodology, as well as cultural and socioeconomic differences between the areas. In all studies, fractures are reported as the main consequence of falls, and there is an estimate that 50% of falls lead to some kind of lesion.[24]

Regarding race, black elderly fall more frequently than whites and pardos, with an average of 2.3 falls for blacks, 1.3 for whites, and 1.53 for pardos. Here we have the reflection of a cultural aspect. Black elderly have socioeconomic, demographic, clinical, functional, and psychosocial disadvantages, affecting their social autonomy and functional independence. The decline in functional dependence caused by age and the variables associated to ethnicity can contribute to disabling events, such as falls.[25]

The outcomes of falls are directly linked to health and quality of life, as they lead to impaired walking and functional capacities to perform DLA and IDLA.[25]

Among the elderly, 32.5% had recurring falls. Out of these, approximately 41% showed lesions and 19% showed impaired DLA, with compromised physical activity, conviviality and social interaction.[26] Fractures from falls affects elderly women and most injuries results in proximal femur fracture. The average hospital stay is 2.7 to 7.1 days. Femur fractures are among the most common traumatic injuries in this population. An el-

derly woman with proximal femoral fracture is 1.5 times more likely to die in a period of two years. In males, this probability increases sevenfold.[27]

In the category epidemiology of falls in community-dwelling elderly, 10 articles (A33, A34, A35, A36, A37, A38, A39, A40, A56, A58) were assessed, who sought to quantitatively study the distribution of falls and their conditioning and determining factors. The articles addressed the behavior of falls in community-dwelling elderly, taking into consideration several characteristics related to the person, physical space and also time, making it possible to devise prevention and control measures.

Falls are a health problem in the elderly population, and they are related to some balance disorders. About a third of the community-dwelling elderly will likely face one or more falls per year. Falls occurring in the community may also be related to the convalescence process of the elderly. A study found that 1,025 elderly who were in rehabilitation, 201 suffered falls, and of these, 38.3% fell in the first week. This incidence decreased steadily in subsequent weeks. Mental confusion and unsteady gait are independent risk factors that can lead to falls.[28]

Not all community-dwelling elderly are healthy, as they can have diseases, metabolic and physiological dysfunctions often controlled with medication. Thirty-seven percent of the causes of falls in community-dwelling elderly can be linked to the use of benzodiazepines or neuroleptics to control acute or chronic diseases or their symptoms.[28] The elderly who do not have a history of falls complain less of pain and dizziness, have better mobility, functional capacity and report less loss of balance.[29]

It is important to encourage the elderly to participate in specialized physical activity groups, to stimulate them to become more physically active, because the prevalence of falls is lower in active (47.4%), compared to less active (71.4%) elderly. Falls among the most active elderly were associated with depressive symptoms, concern about falling again and self-selected gait speeds; for the less active seniors, falls were related to older age and functional disability.[30]

For the community-dwelling elderly, the risk factors associated with falls are: old age; heavy workload; more diseases; chronic diseases; use and abuse of illicit drugs; medication and alcohol; perception of poor health; inadequate family support; among others.[28]

The category epidemiology of falls in the institutionalized elderly, refers to the elderly who suffered falls while hospitalized or residing in long-term care facilities (LTCF). We assessed 14 articles and seven (A41, A42, A43, A44, A45, A46, A47) referred to falls in hospitals and seven (A48, A49, A50, A51, A52, A53, A54) the in LTCFs.

The incidence of falls is three times higher among the institutionalized elderly than among those living at home.[31] Patients' safety is a major concern for health care facilities (HCF). Falls are one of the most serious events that can compromise patients' safety, and they are often responsible for prolonged stays worse recovering conditions.[32]

Falls occurring in hospitals are mostly mild or not serious, taking place in patients' rooms as they try to get up. The same authors have shown that falls occur more frequently in the morning shift (45.31%), followed by the night shift (31.25%) and, finally, the afternoon shift (23.43%).[32]

The elderly experiencing falls in hospital settings have comorbidities and make continuous use of medication. Among these, high blood pressure, heart disease and diabetes mellitus stand out. Among the injuries resulting from falls, the most frequent are external surface lesions, light cranioencephalic injuries and lower limb trauma, usually femoral fractures.[33]

In this same scenario, functional capacity appears to be important to maintain the quality of life of the elderly. People with better physical conditions are those without history of femur fracture, remain hospitalized for shorter periods, those who leave home more often. Improving functional ability and mobility may be relevant to prevent falls. On the other hand, falls from height are the main responsible, something close to 79.6%, which compromises functional ability.[33]

As for the reviewed articles that reference falls in LTCFs, we found that falls are more common in the institutionalized elderly and have multiple causes.[34] Falls are common, even within LTCFs, but with significant consequences for the physical, psychological and social health of the elderly.[34] Thus, a constant assessment of the health of the elderly is important to identify risk factors intrinsic and extrinsic to falls. It is also important to implement prevention strategies to rehabilitate muscle strength, balance and functional capacity. In the process, also reduce polypharmacy, promote better understanding of self-care, and increased nursing supervision in times and places of greatest incidence of falls, thereby improving the quality of life of its residents.

In a study conducted in the capital of Chile with 453 seniors, we found an incidence of 24% of falls among the elderly in LTCFs. Most falls occur during the day and when they are walking; among those who have suffered falls, about 70% have no history of falling. Those who fall, in this context, are those with compromised mental state and that consume more benzodiazepines and neuroleptics.[35]

A study conducted in Brazil with 105 elderly from four LTCFs found an incidence of 38.09% of falls. The risk factors identified were: female gender; use of medications; poor vision; lack of physical activity; osteoarthritis; depression; loss of grip strength; and disturbances in balance and gait.[34]

Another study conducted in southern Brazil with 243 elderly from 19 LTCFs found an incidence of 32.5% of falls. The occurrence of falls was twice as high in women, the elderly with rheumatism or column disease and those who used psychotropics.[36]

As for the prevalence of falls among seniors in LTCFs, the prevalence ranged from 38.3%[37]; 60%[38]; 37.2%[39]; and 33.5%[40]. In all studies on prevalence, the patients' room was most common site of falls. The variations can be attributed to the different regions where the studies were conducted, methodological design, as well as health conditions and diseases of the studied group, among others.

The studies indicate that the prevalence of falls among the elderly in LTCFs is high. Even knowing that some factors associated with falls are preventable, they still occur in theoretically safe environments, such as the patients' room. It would be prudent to implement intervention measures to minimize these numbers and to provide better quality of life for the institutionalized elderly.[40]

The categories reveal how research about accidental falls in the elderly population are being carried out. Studies like these are relevant insofar they contribute to the knowledge on the topic, in line with prevention measures as well as care those who have suffered. They also make clear how the health professional must be prepared for the development of care skills and practices to assist the elderly who have fallen and those who might yet fall. As the elderly population in Brazil continues to increase, we realize the importance of building knowledge about accidental falls and translating it into clinical practice.

FINAL CONSIDERATIONS

As the articles show, the high incidence and prevalence of NCDs and degenerative diseases among the elderly, in addition to manifestations arising from the process of aging itself, not only increases the likelihood of falls, but also the severity of the injuries resulting from this event.

The analysis of the reviewed articles showed how falls occur in both the institutionalized and the community-dwelling elderly, and its high prevalence and incidence among the institutionalized elderly.

The fact that falls in this population are multifactorial events, recurring and often downplayed by the elderly themselves and those who assist them is rather worrying, since the literature shows how this event can be impactful in their daily lives and how they represent a significant risk of death, be it imminent or from complications. It is known that there are several strategies that can prevent or minimize the occurrence of falls, but it is undeniable that they often happen because of oversights by the elderly themselves, who have difficulty realistically assessing their mobility conditions, postural stability and judgment.

The articles assessed revealed that, despite technological advances and modern medicine, increasing life expectancy and the implementation of laws aimed at public health and the elderly, prevention of injuries such as falls is still incipient. In this sense, we realize that there is much to be done in order to reach active ageing and with quality of life.

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