





Environmental risks for falls of elderly attended by the Family Health Strategy team*

Riscos ambientais de quedas em idosos atendidos pela equipe de Estratégia Saúde da Família

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-  Iara Sescon Nogueira¹
-  Nayana Flor Ulbinski¹
-  André Estevam Jaques¹
-  Vanessa Denardi Antoniassi Baldissera¹

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¹Universidade Estadual de Maringá.
Maringá, PR, Brazil.

Corresponding author:

Iara Sescon Nogueira
Rua Estácio de Sá, 889, Zona 02,
CEP: 87010-360. Maringá, PR, Brazil.
E-mail: iara_nogueira@hotmail.com

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ASSOCIATE EDITOR: Renan Alves Silva

ABSTRACT

Objective: to analyze the environmental risk for falls among the elderly living in the area covered by a Family Health Strategy team. **Methods:** cross-sectional research, using, as a data source, 80 forms of environmental risk evaluation of elderly falls. The collected data were transcribed and organized in a computerized spreadsheet, using the Microsoft Excel® program, and analyzed using descriptive statistics. **Results:** most elderly's households were classified as low risk for falls (56.3%) and showed at least one environmental risk (94.0%), being the most frequently found in the bathroom (47.5%), in stairs (46.2%), and associated to light (41.2%). **Conclusion:** environmental risks were observed in different places of the households, highlighting the bathroom, stairs, and little light in the room, most of them being classified as a low environmental risk for falls.

Descriptors: Outcome and Process Assessment, Health Care; Risk Factors; Aged; Accident Prevention; Primary Health Care.

RESUMO

Objetivo: analisar o risco ambiental de quedas de idosos residentes em área de abrangência de uma equipe de Estratégia Saúde da Família. **Métodos:** pesquisa transversal, utilizando, como fonte de dados, 80 fichas de avaliação de risco ambiental de quedas em idosos. Os dados colhidos foram transcritos e organizados em uma planilha eletrônica, utilizando o programa *Microsoft Excel®* e analisados por meio de estatística descritiva. **Resultados:** a maioria dos domicílios dos idosos foi classificada como baixo risco para quedas (56,3%) e apresentou, pelo menos, um risco ambiental (94,0%), sendo os mais frequentes encontrados no banheiro (47,5%), na escada (46,2%), e relacionados à iluminação (41,2%). **Conclusão:** observaram-se riscos ambientais em diferentes locais dos domicílios, com destaque para o banheiro, escada e falta de iluminação no quarto, sendo a maioria classificada como baixo risco ambiental para quedas.

Descritores: Avaliação de Processos e Resultados em Cuidados de Saúde; Fatores de Risco; Idoso; Prevenção de Acidentes; Atenção Primária à Saúde.

Introduction

Falls are among the most common public health challenges that affect the elderly population. They negatively impact the quality of life and result in a decline in the functional capacity, debilitating self-care, and participation in physical and social activities, also decreasing autonomy and independence. They are associated with early institutionalization, increased hospitalizations, and elderly mortality⁽¹⁾.

In Brazil, a total of 941,923 hospitalizations due to falls and 66,876 deaths in the elderly were recorded by the Unified Health System only in the period from 1996 to 2012. Each year, there is an increase in the number of falls and the expenses related to the care of the elderly who experienced falls and had injuries, requiring some sort of clinical intervention or even hospitalization⁽¹⁾. Some falls may not cause physical injury but can cause anxiety or fear after having a fall and, consequently, make the elderly even more dependent⁽²⁾.

Falls are considered a multifactorial event, involving intrinsic and extrinsic factors. The intrinsic ones relate to the individual, with physiological and also pathological processes of aging, such as a history of falls, advanced age, female sex, use of several continuous use medications, cognitive and visual deterioration, changes in balance and pace, besides to the presence of chronic morbidities and diseases⁽³⁾. The extrinsic factors, on the other hand, are related to the environment in which the elderly moves, especially their household, due to inadequate conditions caused by poor light, slippery surfaces, uneven ground, the stairs, obstacles, the absence of support bars in the bathrooms and inappropriate placement of furniture⁽⁴⁾.

It is in the household environment and its surroundings that most elderly falls happen⁽⁵⁾, thus, the strategies for safety and prevention of falls in

the household environment are appropriate and can reduce the elderly's falls living in the community, being consistent with the assumptions of the Primary Health Care and with the actions carried out by the professionals who are part of the Family Health Strategy teams, which is essential for improving the quality of life of this population⁽⁶⁾.

Current knowledge about evaluating the risk of elderly falls points that the identification of risk factors is the key to detecting those at risk of falling⁽⁷⁾, once the health team, the elderly, and also their family members are aware of these factors, enabling the development of preventive practices. In this regard, the evaluation of environmental risk factors becomes relevant and necessary to guide health practices in Primary Health Care in the context of elderly falls⁽⁸⁾.

Therefore, allied with a Family Health Strategy team of Primary Health Care, researchers attempted to develop actions aimed at the elderly population living in the area covered by the health team, cooperating with the preventive practices of falls, collaboratively and in a participatory way, along with health professionals. This research was developed through these actions since this cooperation did not require a previous survey of the environmental risks of elderly falls, an event still persistent in this population and the aim of the present study.

Considering the above and, due to the thematic immersion that allowed to reveal the scarcity of publishing on household risks for falls^(2-3,5-6), this study was designed under the following research question: What are the environmental threats of elderly falls of people living in an area covered by a Family Health Strategy team?

Thus, aiming to contribute to the knowledge of environmental risk factors facing elderly management, the objective was to analyze the environmental risk for falls among the elderly living in the area covered by a Family Health Strategy team.

Methods

This is a cross-sectional research, carried out from July 2020 to August 2020, using as data source the existing records on the environmental risk evaluation forms of elderly falls who are residents in an area covered by a Basic Health Unit located in a municipality in the state of Paraná, Brazil.

This unit has only one linked Family Health Strategy team and provides services to 3,467 people, being 635 elderly (considered, in Brazil, people 60 years old and over). The sample was non-probabilistic, by convenience, and for that reason, all 80 elderlies were systematically evaluated in multidimensional aspects by members of an extension project of a public higher education institution, of which the authors of this study took part, in cooperation with the mentioned health team.

The environmental risk evaluation forms are private documents and belong to the health team of the mentioned unit. Such documents are primary sources of data and have not yet been discussed scientifically or analytically and, therefore, served for analysis and interpretation⁽⁹⁾. The documents comprised the documentary source of this research and were personally requested to the health team of the respective unit, being stored in physical folders after the acquisition of the material. Eighty evaluation sheets were collected and used for analysis, whose data collected concerned the period from August of 2018 to November 2018 and were initially acquired through nursing consultations carried out by home visits to the elderly, made by members of the extension project in Nursing in cooperation with health professionals.

The respective environmental risk evaluation of falls was carried out on a health institution's form, exclusively printed, with elderly's sociodemographic (age, sex, marital status); educational (years of schooling) and; professional data (current occupation), besides issues related to falls, whether they have already experienced a fall, the place of occurrence (home,

street, hospital or workplace) and the *Escala de Risco Ambiental de Quedas* (Environmental Risk for Falls Scale)⁽¹⁰⁾ filled out.

This mentioned scale evaluates the presence of environmental factors of protection for falls at home, such as areas of mobility, furniture layout, light, availability, and access to objects, consisting of 21 items divided into six topics: areas of mobility, light, bedroom, bathroom, kitchen, and stairs. The answers are of yes or no type, and the instrument was scored as follows: zero points for each positive answer and one point for each negative answer; the higher the final score, the greater the risk for falls⁽¹⁰⁾. It is noteworthy that households were classified into three groups according to the score achieved on that scale: less than seven points were considered low risk for falls, from 7 to 14 points medium risk and greater than 14 points, high environmental risk for falls.

The Document Analysis technique was used, composed of the stages of document systematization and the synthesis of information⁽⁹⁾, and consisted of identifying, verifying, and investigating the environmental risk evaluation documents of the elderly living in the area covered by the cited health unit, so that they could identify and characterize the environmental risks present in the household of these elderlies, collaborating with future health interventions.

In the first stage, the collected material was fully read, and the data systematized, which were transcribed and organized in a computer spreadsheet, using the Microsoft Excel[®] program. The second stage consisted of this information synthesis and, to identify and characterize the environmental risk of elderly falls, the data were analyzed using descriptive statistics, using the calculation of absolute, relative, and mean frequency, being discussed in the light of current and relevant literature.

The criteria established in the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) were used in this study, as a support tool concerning observational study methods. This research

ch is part of a more comprehensive study and has the approval of the Ethics Committee on Research with Human Beings, under decision No. 3,593,037/2019 (Certificate of Presentation of Ethical Appreciation: 16810419.0.0000.0104).

Results

In the analyzed material, the household risk for falls of 80 elderly was evaluated, among which, 52 (65.0%) were female. The mean age was 73.15 years old, with a minimum age of 60 years old and a maximum age of 95 years old, and a standard deviation of 8.91. Regarding marital status, 54 (67.5%) were married, 18 (22.5%) widowed and eight (10.0%) divorced. Concerning education, 22 (27.5%) never went to school, 21 (26.2%) elderly had from one to four years of education, and 37 (46.3%) studied for five years or more. Regarding occupation, 44 (55.0%) elderly were retired, 18 (22.5%) worked at home, 10 (12.5%) were self-employed, and only eight (10.0%) were employed.

The previous event of at least one fall episode was mentioned by 54 (67.5%) elderly, with 39 (72.2%) of those who fell were women. Of the total elderly men, 15 (53.6%) had already experienced a previous fall and, concerning females, from the total, 39 (75.0%) had already experienced a previous fall. The place of occurrence of falls most often referred was at home, 38 (70.4%), on the street, 14 (26%), and only one fall in the hospital (1.8%) and another in the workplace (1, 8%).

It was found that 75 (94%) of the elderly people had at least one environmental risk for falls in their household, and the houses evaluated had an average of 6.1 risks, with a range from 1 to 15 risks. It was found that 45 (56.3%) households had scored lower than seven points, showing low environmental risk for falls, followed by 30 (37.5%) with medium risk, and only five (6.2%) were classified as high risk.

In 40 (50.0%) households, the presence of the item stairs were not mentioned. Among the items analyzed, it was observed that all locations presented considerable risks (Table 1).

Table 1 – Distribution of environmental risk factors by places identified in the household of the elderly in the area covered by the Basic Health Unit surveyed. Maringá, PR, Brazil, 2018 (n=80)

Places	Environmental Risk Factors	Total n (%)
Mobility areas	Mobility areas obstructed or lack of support bars;	31 (38.7)
	Wall textures: non-uniform and non-fixed carpets.	30 (37.5)
Light	Lack of indirect light in bed;	33 (41.2)
	Lack of spotlight in the room, hallway, and bathroom;	27 (33.7)
	Switches with difficult access;	16 (20.0)
	Insufficient to brighten the complete walking area inside each room, including steps;	5 (6.2)
	Insufficient outdoor illumination to brighten the entire exterior entrance.	2 (2.5)
Bedroom	Lack of a chair to sit down to while getting dressed;	30 (37.5)
	Bed with irregular height;	19 (23.7)
	Wardrobe with hangers that are difficult to reach;	5 (6.2)
Bathroom	Shower: lack of non-slippery mat;	38 (47.5)
	Shower cabin: difficult to open or loose curtain;	22 (27.5)
	Toilet: difficult access or hard to reach.	7 (8.7)
Kitchen	Leaking sink or that impairs wheelchair passage if necessary;	22 (27.5)
	Cabinets: tall with the need for steps.	13 (16.2)
Stairs	Lack of closed riser stairs and non-slippery stickers;	37 (46.2)
	Lack of handrail from the first to the last step;	34 (42.5)
	Uniformity of steps: irregular height and depth of risers of steps;	33 (41.2)
	Lack of a steady handrail;	32 (40.0)
	Lack of handrails on both sides;	31 (38.7)
	Lack of non-slippery coating, and a sign with a yellow stripe on the first and last step.	28 (35.0)

Discussion

The environmental risks for falls were not compared and associated with sociodemographic and he-

alth variables, considered a study limitation, and with the type of non-probabilistic sample, which reduces the possibility for generalization of the study. There is a need for new and other types of studies to evaluate the cause-and-effect relationship and should be carried out to complement the findings, also in different scenarios and regions, to improve and expand knowledge about the environmental risks experienced by the Brazilian elderly population.

The present analysis enabled to identify the environmental risks for falls among the elderly living in the community and proved the value of this evaluation and the correct identification of risk factors that involve the household environment. This contributed to the risk mapping and future joint planning of health actions in this context. Thus, the Environmental Risk for Falls Scale is an essential tool for the qualification of care for the elderly in Primary Health Care, reinforcing the need and the importance for health professionals, especially nurses, to recognize this tool and be able to take action in the prevention of elderly falls.

The sociodemographic characteristics of the elderly attended by the health team were similar to those found in correlated research carried out in the Distrito Federal with 156 elderly people in the community with chronic diseases, whose percentage of prevalence of falls was 71.2%⁽¹¹⁾, being the elderly women also the most affected⁽¹¹⁻¹⁴⁾. Women are at a higher risk for falls due to pathophysiological processes related to decreased bone and muscle mass, besides greater exposure to environmental risks during the performance of household chores in the home environment⁽¹⁵⁾.

Episodes of falls among the elderly are not frequently identified due to underreporting of cases, due to their forgetfulness, or the lack of critical outcomes, or even due to the event of hospitalization⁽¹⁴⁾. Most of the elderly still do not identify themselves as a vulnerable group for falls, nor do they recognize the multiple risks found at home and that can benefit the event of this condition⁽⁷⁾. The identification of falls, their causes, and the knowledge of their consequences are

of great importance for the implementation of prevention strategies⁽¹⁴⁾.

Elderly's falls are associated with sociodemographic and economic factors, also self-perceived health, health problems, and frequencies of falls⁽¹²⁻¹³⁾, that is, it is a health problem of multifactorial causes, which increases according to the number of present risk factors and with the increasing of age⁽¹¹⁾. The preventive practices of falls are established by experiences of previous falls among older elderly, being the variable age a determinant and influencing the presence or not of home risk factors⁽⁷⁾.

The high prevalence of a history of falls is also associated with chronic non-communicable diseases that, when associated with the functional decline resulting from the aging process, can increase the vulnerability or propensity to falls, especially with recurrent episodes⁽¹¹⁾. However, we did not find in the documentary data those related to the health conditions of these mentioned elderly, making it impossible to make such inference. Issues of the physical environment for the healthy elderly are complex and, for the frail elderly, the inadequate environment becomes even more dangerous. For this reason, elderly people require awareness and care, especially those who are fragile, and it is essential to evaluate the environment in which the elderly population lives⁽¹⁶⁾.

It is worth noting that the household environment is the place of the elderly's longest stay and, therefore, it is the place with the highest incidence of falls, a cause that is related to environmental risk factors⁽⁵⁾. Most home environments ignore issues of ergonomics, usability, and accessibility, turning the household into a risk to the health of the elderly^(5,12-13,15). It is extremely necessary to propose a health intervention plan that seeks to prevent this condition through educational practices that guide changes in the inadequate environments in which these elderly people live, considering that many preventive actions depend much more on the transformation of knowledge, behaviors, and attitudes than other factors, such as socioeconomic⁽⁵⁾.

A safe environment against falls has adequate ergonomic aspects that facilitate moving around, besides maximizing the independence of individuals, enabling the interaction of the elderly with the environment, and encouraging their autonomy and independence⁽⁵⁾. Therefore, it is important to consider the careful planning of the elderly's household environment, to preserve their dignity and grant the deserved quality of life, preventing health problems⁽¹¹⁾.

The environmental risk factors found in this study are in line with other scientific research evidenced in the literature^(5,8). The most common extrinsic risk factor of falls in the household scenario is the slippery floor⁽⁸⁾, besides irregular surfaces and steps, unevenness in the floor, wet surfaces, as well as loose objects and carpets, lack of handrails in the bathroom, and inadequate light. These factors are often considered irrelevant or undetected by the elderly, so that they do not propose to change them, to prevent episodes of falls⁽⁴⁾. Nevertheless, elderly people with greater knowledge on the subject choose to modify household risks⁽⁷⁾.

Among the items of the environmental risk analyzed, it was observed that the bathroom showed the most frequent risk, whose data was similar to that revealed in another study, with 30% of the bathrooms lacking non-slippery floors⁽⁵⁾. In a survey carried out with older elderly, the slippery floor was present in 97.7% of the households surveyed⁽¹⁷⁾. The use of a non-slippery floor is necessary, as it lessens possible falls caused by slips on very slippery floors or wet surfaces, usually found in the bathroom, which is the most critical and mentioned place for falls at home^(5,7,11).

Regarding the bathroom area, some rules suggest that, besides the use of non-slippery floors, in the shower and front of the sink, the use of support bars and sills of contrasting colors should be adopted⁽⁵⁾. A study carried out identified this area of environmental risk as synergistic for the fall outcome among the elderly, with the lack of all times night light and health conditions common to aging, as is the case of nocturia, in which there is nighttime waking for urination⁽⁷⁾. It is

in a bedroom-bathroom way, when most falls take place, precisely due to the low or lack of light, humidity in the room, lack of support items, and risk obstacles in the way^(5,7).

In the second position of the highest risk event, the stairs was observed, one of the least suitable structures, found in the elderly household⁽⁵⁾. It is recommended to use ramps instead of stairs, when possible, to ensure the safety of the elderly. Anyway, it must be steady and also have a handrail to balance the body more easily⁽⁵⁾, avoiding falls.

Regarding light – the third in the rank with one of the highest percentages of environmental risks - the literature points out that among the elderly, the lack of light and the habit of leaving lights off at night at home is a frequent extrinsic risk factor for falls⁽⁷⁾. Adequate light is an important environmental factor to prevent falls⁽⁵⁾.

With aging, the elderly have a decrease in vision and, therefore, need increased brightness in the environment to compensate for such loss⁽¹⁶⁾. However, in 6.2% of the households evaluated, the light was not enough to brighten the entire walking surface. Thus, it is important to consider that the elderly's vision is also slower in adapting to changes in light, so gradual changes in brightness levels must take place, especially in transition areas, to reduce the possibility of an accident^(5,16).

Concerning the furniture in a household environment, these need to be appropriate for the elderly, avoiding the use of tall cabinets that need steps or stools, thus preventing risky behaviors⁽¹⁶⁾. On the other hand, in a study carried out in the municipality of *Foz do Iguaçu*, the variable kitchen cabinets lost relevance when analyzed in the multiple models⁽¹⁷⁾.

In general, furniture should, as much as possible, be fixed to the floor or walls, preventing movement and unsteadiness in case the elderly lean on them⁽¹⁶⁾. The same for carpets. The use of loose carpets by the elderly increases the risk for falls, and those who use loose carpets at home have a higher prevalence of falls compared to those who do not use them⁽¹¹⁾.

The environmental risk for falls was identified in most of the elderly households in the coverage area of the Basic Health Unit surveyed, that is, at least one risk within the home environment favors the fall, and these factors can increase the prevalence of falls by 50.0%⁽⁴⁾. Mistakenly, the home appears to be the safest place possible against falls, due to the resident's familiarity with the environment. Nevertheless, it becomes a risk when attention is reduced, due to overconfidence and underestimation of risks⁽⁸⁾.

A great part of accidents involving elderly falls takes place in the elderly's home or its surroundings, usually while doing routine tasks such as walking, moving from one room to another, and using the bathroom. In such a way, the influence of risk factors for falls found in the household of the elderly is directly related to functional capacity. Thus, elderly people considered fragile are more susceptible to falls, also those with changes in balance and pace⁽⁸⁾.

All environmental areas investigated (mobility area, light, bedroom, bathroom, kitchen, and stairs) showed risks, suggesting that prevention strategies to avoid falls in the household environment should be implemented. It is important to make changes in the household environment, aiming at reducing risks, besides promoting health, preventing diseases and health problems in the elderly, aiming to minimize the risks that may lead to falls⁽¹⁴⁾.

Thus, health professionals, members of the Family Health Strategy teams, especially nurses, who often work in the coordination of these teams, must evaluate the needs of the elderly and, through intersectoriality, increase their actions. Therefore, planning and implementing prevention strategies for falls are necessary and suitable, since they enable the promotion of a safe home environment for the elderly under their care⁽⁸⁾.

Investments must be made aimed at the prevention of elderly falls, emphasizing nursing interventions in the household environment, which focus on educational practices carried out on the risk factors of falls, including environmental risks, contributing to

the acknowledgment of the elderly population about the prevention of falls, thus promoting a safe home environment^(6,8). Nevertheless, it is crucial to share information with the elderly from different sources and encompassing the several risk factors involved⁽⁴⁾.

Conclusion

This study proved that most elderly households were classified as low risk for falls and showed at least one environmental risk for falls, the most frequent being those found in the bathroom followed by the stairs. They are related to low light and the lack of non-slippery floor in the shower area; closed risers and non-slippery stripes on the stairs; and indirect bedside light, which allowed, therefore, to be highlighted the modifiable environmental risk factors.

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Collaborations

Nogueira IS, Ulbinski NF, Jaques AE and Baldissera VDA contributed to the project design, data analysis and interpretation, article writing, relevant critical review of the intellectual content and final approval of the version to be published.

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