ORIGINAL ARTICLE

Association between falls in older adults and prevention group

Associação entre quedas em idosos e grupo de prevenção

Asociación entre caídas en ancianos y grupo de prevención

Elenir Pereira de Paiva[I]
ORCID: 0000-0001-6893-1221

Maira Amorim da Costa[I]
ORCID: 0000-0001-5685-3828

Tamara Costa Souza[I]
ORCID: 0000-0003-3805-5704

Meire Cavalieri de Almeida[II]
ORCID: 0000-0002-1309-1728

Monalisa Claúdia Maria Novaes da Silva[I]
ORCID: 0000-0002-6185-5171

Fabiano Bolpato Loures[I]
ORCID: 0000-0003-2669-2052

[I]*Universidade Federal de Juiz de Fora. Juiz de Fora, Minas Gerais, Brazil.*
[II]*Faculdade de Ciências Médicas e da Saúde de Juiz de Fora – Suprema. Juiz de Fora, Minas Gerais, Brazil.*

Corresponding author:
Elenir Pereira de Paiva
E-mail: elenirufjf@gmail.com

ABSTRACT
Objectives: to assess the effectiveness of guidelines on fall prevention in a group of older adults in Primary Health Care. **Methods:** a cross-sectional study, carried out with older adults selected by a simple random sample (274; N=1,234). Data covered sociodemographic and socioeconomic variables, marital status, health conditions, factors associated with falls and participation in the prevention group. Student's t test was used, and dichotomous variables were used by the chi-square test. The project met ethical requirements. **Results:** sample with female profile (61.7%), married, with low education, mean age of 71.69 years. The factors associated with falls identified were female sex, medicalization and participation in the prevention group. There was no protective association between participation in a fall prevention group in older adults and a decrease in the number of falls. **Conclusions**: based on evidence, a personalized intervention during the nursing visit is suggested as a strategy to prevent falls.
Descriptors: Aged; Accidental Falls; Community Health Nursing; Primary Health Care; Accident Prevention.

RESUMO
Objetivos: avaliar a efetividade das orientações sobre prevenção de quedas em um grupo de idosos na Atenção Básica à Saúde. **Métodos:** estudo transversal, realizado com idosos selecionados por amostra aleatória simples (274; N=1.234). Os dados abrangeram variáveis sociodemográficas, socioeconômicas, estado civil, condições de saúde, fatores associados a quedas e participação no grupo de prevenção. Utilizou-se a técnica estatística descritiva teste t de *Student*, e as variáveis dicotômicas, pelo Teste do Qui-Quadrado. O projeto atendeu às exigências éticas. **Resultados:** amostragem com perfil feminino (61,7%), casados, apresentando baixa escolaridade, idade média de 71,69 anos. Os fatores associados a quedas identificados foram sexo feminino, medicalização e participação no grupo de prevenção. Não houve associação protetora entre realização de grupo de prevenção de quedas em idosos e diminuição do número de quedas. **Conclus**ões: baseado nas evidencias, sugere-se uma intervenção personalizada durante a visita de enfermagem como estratégia para prevenção das quedas.
Descritores: Idoso; Acidentes por Quedas; Enfermagem em Saúde Comunitária; Atenção Primária à Saúde; Prevenção de Acidentes.

RESUMEN
Objetivos: evaluar la efectividad de las guías de prevención de caídas en un grupo de ancianos en la Atención Primaria de Salud. **Métodos:** estudio transversal, realizado con ancianos seleccionados por muestra aleatoria simple (274; N=1.234). Los datos abarcaron variables sociodemográficas y socioeconómicas, estado civil, condiciones de salud, factores asociados a caídas y participación en el grupo de prevención. Se utilizó la técnica estadística descriptiva de la Prueba t de *Student*, y las variables dicotómicas se utilizaron mediante la Prueba Chi-Cuadrado. El proyecto cumplió con los requisitos éticos. **Resultados:** una muestra con perfil femenino (61,7%), casada, con baja escolaridad, edad media de 71,69 años. Los factores asociados a las caídas identificados fueron sexo femenino, medicalización y participación en el grupo de prevención. No hubo asociación protectora entre la participación en un grupo de prevención de caídas en ancianos y una disminución en el número de caídas. **Conclusiones:** con base en la evidencia, se sugiere una intervención personalizada durante la visita de enfermería como estrategia para la prevención de caídas.
Descriptores: Anciano; Accidentes por Caídas; Enfermería en Salud Comunitaria; Atención Primaria de Salud; Prevención de Accidentes.

INTRODUCTION

The increase in life expectancy points to a change in the demographic and morbidity and mortality profile, promoting the aging of the population and, consequently, a proportional increase in chronic-degenerative diseases. This happens due to improvements in the population's health, such as a decrease in maternal and child deaths, a decrease in malnutrition, an expansion of free vaccines and medicines for treatment of chronic diseases, and an improvement in primary care and urgent and emergency services[1-2].

Brazil is in transition, in an accelerated aging process, exposing several challenges, making it essential to develop public policies for elder health care[2].

As a result of population aging, chronic degenerative diseases stand out. These are non-communicable diseases (cancer, cardiovascular disease, hypertension, diabetes, blindness, chronic obstructive pulmonary disease, mental illness, among others). The reality is that aging does not happen in the same way for everyone and is not limited to one age group, as it is a consequence of habits adopted throughout life. Biological changes make older adults frailer and physically disabled[3].

Loss of functional capacity is represented by several factors, such as episodes of falls, which can make older adults dependent on care[4]. It was evidenced that 88% of older adults who suffered falls are afraid of falling again, which restricts the performance of tasks, affecting their social life[3].

A study reports that, ten years ago, falls occurred on average at 32% between 65 and 74 years old, 35% between 75 and 84 years old, and 51%, over 84 years old. These data show that, with aging, the possibility of accidents increases. Falls among older adults are characterized as a public health problem in the country, due to the frequency with which they occur, causing an increase in morbidity and mortality and in health costs[5-6].

It should be noted that these are preventable events[7]. They represent one of the greatest reasons for hospitalization of older adults in Brazil, with 28 to 35% of people over 65 years old falling at least once a year, and these percentages increase considering people over 70 years old. A study found that 12.1% of older adults suffered fractures as a result of the fall, with 60% to 70% of falls occurring in their homes, and 12% reported fractures as a consequence[8].

This study is justified by the fact that falls are preventable events[7], representing one of the greatest reasons for hospitalization of older adults in Brazil, with 28% to 35% of people over 65 years old falling at least once a year and that these percentages increase when considering people over 70 years old. Previous research[8] showed evidence that 12.1% of older adults suffered a fracture as a result of a fall, with 60% to 70% of falls occurring in their homes. Moreover, falls and related injuries in older adults are associated with great burdens, both for individuals and for the health system and society. In view of this scenario, the following hypotheses emerged: H0: the fall prevention group does not reduce risk of falls; H1: The fall prevention group decreases risk of falls.

OBJECTIVES

To assess the effectiveness of guidelines on fall prevention in a group of older adults in Primary Health Care.

METHODS

Ethical aspects

This research was approved by the Research Ethics Committee of the *Universidade Federal de Juiz de Fora*, according to ethical aspects for research with human beings, according to the Resolution of the Brazilian National Health Council (*Conselho Nacional de Saúde*).

Study design, location and period

This is a cross-sectional study, carried out with older adults at a Basic Health Unit (BHU) enrolled in the Family Health Strategy (FHS) program in the urban area of Juiz de Fora, Minas Gerais, Brazil, from August to December 2016. The STROBE instrument was used to guide the study methodology.

After 1 year of meetings, a cross-sectional study was carried out with older adults at this BHU. Data collection took place between August and September 2016.

Sample, and inclusion and exclusion criteria

For the selection of participants, we used the simple random sampling technique (N=1234) by randomization of the list, with a force of 10%, formed by 274 residents. Older adults over 60 years of age, accepting to participate in the research and participating in the prevention group were included. Older adults who did not meet these criteria and who were not found in more than two visits, who had died or had changed their address during the research were excluded.

Study protocol

Data were collected using a semi-structured instrument, used in other studies[8-9], covering the variables: sex, age, color, education, socioeconomic status, marital status, health conditions, associated factors to falls (environmental and biological conditions) and participation in the fall prevention group held at the BHU. This study is the product of the researcher's extension project, which aims to guide older adults on fall prevention at home. One meeting per month was held, usually at the BHU, where intrinsic and extrinsic factors associated with falls were discussed, which were the main target of the meeting and also behavioral factors related to falls.

The interviews in this study took place in a private place, previously agreed between the team of researchers and the participants. The data collection team included students who were previously trained by the researcher.

Analysis of results, and statistics

The data obtained were organized in a Microsoft Excel spreadsheet, by means of double typing and subsequent validation, in order to control possible errors, and exported to Statistical Package for Social Science (SPSS), version 21.0. A level of evidence was established considering 5%. Continuous variables were analyzed using Student's t test, and dichotomous variables were analyzed using the chi-square test.

RESULTS

The mean age found among them was 71.69 years (SD: 8.53), ranging from 60 to 99 years, with the majority being women (61.7%). As for marital status, most were married (52.6%), followed by widowers (25.5%).

Regarding the level of education, complete elementary school predominated, with 56.9%, followed by incomplete education, with 17.7%, and only 3% of individuals in the sample reported having a college degree.

In the sample, 54.8% older adults reported not being smokers, and 35.8% said they were former smokers and 9.4% were smokers.

Regarding ethnicity, 62.8% of participants in the sample declared themselves to be white, totaling the majority.

Graph 1 demonstrates the behavior related to the use of medication, daily and continuously, reported by older adults. Mean consumption was 2.86 medications (SD: 1.43 medications) per individual, ranging from none to 6 medications used per day.
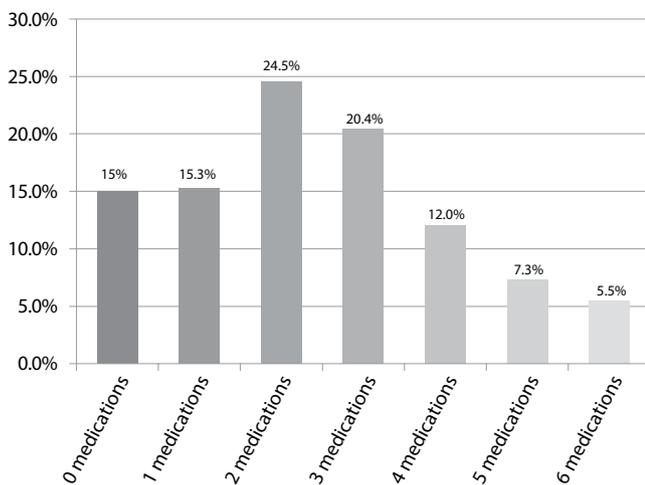

Figure 1 – Number of medications consumed by older adults, Juiz de Fora, Minas Gerais, Brazil, 2016

In the last year, a 22.63% incidence of falls was identified in the sample, resulting in 43.54% of fractures, requiring surgical intervention in 17.74% of cases. Of the patients who suffered a fall, 17.6% reported having received guidance on fall prevention in a group of older adults formed at the BHU.

There was a statistically significant association between falls and guidance on prevention, with females and chronic use of more than three medications per day; these results are presented in Table 1.

Table 1 – Multivariate association between studied variables and falls in older adults (N=62), Juiz de Fora, Minas Gerais, Brazil, 2016

Variable	Association	p value
Fall prevention guidance	Yes	p=0.02
Over 80 years	No	p=0.89
Female	Yes	p= 0.01
Non-white race	No	p=0.07
Not married marital status	No	p=0.59
Smoking	No	p=0.34
More than 3 medications per day	Yes	p < 0.01

DISCUSSION

Sample with a female profile, most of them married, with a mean age of 71.69 years, low education, low-income population, supporting other studies[10-14], which state that people with less education probably have greater difficulty in accessing services, among them: information, health services and better living conditions.

Regarding ethnicity, most of the sample declared themselves to be white; however, there are studies[10-11] that do not show inequality between blacks and whites in terms of understanding about health. In other studies, the white population has advantages in terms of professional qualification, when compared to the black population, as they have lower incomes. For the most part, they do not have access to quality education, health care, basic sanitation and live in areas without structure; therefore, they are more subject to risks that contribute to the decline of their health condition and functional autonomy, resulting in problems of public health[10-11].

Smoking did not show an association with falls, but it deserves to be highlighted due to the number of respondents who never smoked (54.8%) and of those who say they are former smokers (35.8%). Studies[12] report that Brazil has made great progress in reducing smoking and related diseases. This fact is due, for example, to the creation of groups, such as the Framework Convention on Tobacco Control (FCTC), with which many advances have been made, such as the photos on cigarette packages warning of the health risks caused by the cigarette. The issue to be highlighted is that people are more aware of the harmful effects of tobacco use. In the past, smoking provided status, today, it is seen as something negative, and it is observed that the number of people who smoke is decreasing.

Regarding the number of falls and the need for surgical intervention, we found in the literature[5,12] similar data in which 43% of older adults had fractures as a result, highlighting that the most frequent were those of the femur and radius. These findings are worrisome, as 70% of accidental deaths in older adults aged 75 and over are a result of fractures. It is known that older adults are more vulnerable, due to the decline in physiological reserves and changes in several systems, and it is worth noting that older adults who undergo surgery may need to use invasive devices, such as drains and probes, and/or have surgical wounds, which interferes with their frailty[5,12]. After hospitalization, complications such as pneumonia, myocardial infarction and pulmonary thromboembolism may arise, which can result in death[12].

Another result to be highlighted was the association between medication use and falls. Although the most used medication classes were not specified, it was found that these older adults consume a mean of 2.86 medications per day, ranging from none to six medications/day. Studies[13-14] had similar outcomes, noting that the use of some medications, in particular, polypharmacy, is related to an increased risk of falls. In this regard, health professionals should aim at patient safety before prescribing a medication, carrying out an assessment with the older adult and family members about medications' negative and positive effects[13].

It is noteworthy that there was an association between (61.7%) female older adults and falls. This result corroborates studies[14-15]

that reveal a higher life expectancy of women and growth of this population, while the male population had higher mortality rates. Considering that age is an aggravating factor for falls, it is expected that the representative percentage of the number of falls will increase, due to greater female longevity[13]. Previous research[16-18] identified the predominance of chronic diseases and female frailty as examples of incidence of falls, because men attend less doctors' offices and complain little and do not take care of their health as they should. They also point out that women, even retired, continue to develop more risky behaviors in their homes, such as household chores, which are not commonly performed by men. Furthermore, osteoporosis is a complicating factor for falls and affects mostly women. Its risk increases in post-menopausal women, since, due to drop in estrogen, bone mass is lost, which has a relevant result in fracture in the case of falls[16-19].

A result evidenced in the sample was that the educational group for fall prevention was not protective, in fact, it was associated with an increase in falls (p = 0.02). This result is explained, probably due to a memory bias. Older adults who attended the meetings gave more importance to falls and remembered them more when asked.

A study[20] considered the specific effect of fall prevention programs on quality of life in 12 randomized clinical trials, including older adults over 75 years, concluding that there is a lack of evidence on the potential benefits of fall prevention programs on quality of life in older adults and that more research is needed on the subject. It is widely accepted that falls and subsequent injuries are likely to result in a substantial reduction in the quality of life of those affected, as well as a substantial economic burden on the healthcare system.

In view of these findings, it is known that the pragmatic logic of the organizational structure of nursing services in Primary Health Care is based on nursing visit. Therefore, it is necessary to plan actions to face this situation, in which nurses, in their role as educators, can act to improve this profile. Regarding nursing visit, it can contribute significantly, aiming to reduce this problem, because, through it, risk factors for falls in the residence can be identified, make interventions through guidance for environmental changes according to the residents' possibilities[11]. It is important to highlight that, during the home visit, nurses perform assistance activities, health education, prevention and guidance regarding diseases, rehabilitation and health promotion of the older adult, so that they are able to take care of themselves, have independence and autonomy.

Study limitations

The main limitation of this study is based on the non-classification of medications used by the older adults surveyed, which could have better explained which classes are more associated with falls and, with this, would allow for better planning of actions.

Another limitation occurs, as it is an investigation carried out in a single Primary Health Care unit, not allowing generalization to socially distinct groups, despite bringing affirmative contributions to the context of guidelines in fall prevention groups. Further research on the topic is suggested.

Contributions to nursing and health

The results point to the need to create new strategies, in addition to educational groups, since, in the study in question, it was not effective.

We emphasize the importance of carrying out health education, encouraging positive attitudes towards care, and nursing interventions, focusing on home visit actions and seeking to identify internal/environmental factors at home that may put older adults at risk for falls. Personalized intervention may have the potential to promote evidence-based decision making and enable older adults to remain in charge of their own lives. This study may support further studies, in addition to providing support for nursing care practice.

CONCLUSIONS

There was no protective association between participation in a prevention group at the BHU for fall prevention in older adults and a decrease in the number of falls itself. It is suggested that other strategies should be planned and used in Primary Health Care, aiming at preventing falls in older adults.

It is suggested to investigate new alternatives to support more assertive preventive actions in fall prevention, since risk factors, in most cases, are modifiable, reinforcing the need to implement guidelines and preventive measures related to risk of falls.

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