REVISTA O MUNDO DA SAÚDE

Risk and fear of falls in the elderly of Campo Grande, Mato Grosso do Sul: sociodemographic and functional characteristics

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Abstract

The carrying out activities of daily life and falls are factors directly related to quality of life, which can influence the independence and autonomy of elderly people. The objective of the study was to evaluate activities of daily living, risk and fear of falling in elderly people in Campo Grande, MS. This was a cross-sectional study, carried out with 32 elderly men and women, age ≥60 years and were participants in the Open University for the Elderly program, from April to September 2018. A Mini-Mental State Examination score ≥19 points was considered as the inclusion criterion. Instruments used were: Sociodemographic questionnaire; Katz index; Lawton-Brody scale; Downton scale that assesses the risk of falling and the Falls Efficacy Scale – International (FES-I-BRASIL) which assesses the fear of falling. According to the Katz Index, most elderly people were independent (84.4%). The Lawton-Brody Scale classified the majority of the elderly participants as independent (53.1%) and partially dependent (46.9%). On the Downton scale, the age group from 70 to 82 years old reached a score of (3.6±1.5) demonstrating a high risk of falling, at FES-I-BRASIL female elderly reached (25.6±6.6) points, showing a greater fear of falling. There was a relationship between the FES-I-BRASIL and Lawton-Brody scales (r=-0.443/ p=0.011), that is, the more thy carrying out crucial activities of daily living, the lower their concern is with falling. Elderly people in a more advanced age group have a higher risk of falling and female participants were more concerned about falling than their male peers.

Keywords: Health of the Elderly, Cognition, Accidents due to Falls, Daily Activities.

INTRODUCTION

The aging process is a worldwide phenomenon characterized by several physical, psychological and social changes, affecting each individual in a particular way[1,2]. With aging, health care changes, the chances of chronic diseases appearing and the risk of falls increase, which significantly contribute to a rise in health costs among the elderly population[3].

According to the World Health Organization[3,4], well-being and functionality represent autonomy (individual ability to decide and command actions, establishing and following their own rules) and independence (ability to do something by their own means), allowing the individual to take care of themselves and their life. Likewise, according to the National Health Policy for the Elderly, the health of the elderly is related to autonomy and independence, which is due to the presence or absence of organic disease[5,6].

The daily tasks necessary for the individual to take care of themselves are called activities

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of daily living (ADL) and can be subclassified into basic (BADL) or instrumental (IADL). The greater the complexity of these activities is, the greater the demand placed on the subject is[7].

BADV are fundamental for the individual's self-preservation and survival. They include daily tasks such as bathing, dressing, transferring, having sphincter continence and eating alone, which configure necessary activities for bodily care. This hierarchical character of the tasks is extremely useful, capable of translating the severity of the individual's fragility process[8]. Thus, the functional decline starts with more complex tasks, such as bathing, and progresses hierarchically until reaching the level of complete dependence, when the patient needs help even to feed[9].

IADLs, according to Lawton and Brody[7], are more complex than basic activities, and are related to the elderly's ability to live alone in the community. They include activities related to home care, such as preparing food, the ability to shop alone, control money, use the phone, do housework, wash and iron clothes, make the correct use of medication and leave the house alone[10].

Cognition is the mental capacity to understand and solve everyday problems. It is constituted of a set of cortical functions, formed by memory, executive function, language, praxis, gnosis and visuospatial function, and in the literature there are several instruments available, adapted and validated in Brazilian[11].

Physiological changes are influenced by installed pathological conditions, which in turn also promote the deterioration of body systems. These systems start to respond slowly, and sometimes, inadequately, generating situations of instability, which may result in a fall. According to Dias and Ferreira[12], the fall is an unintentional displacement of the body to a level lower than the initial position with the inability to correct it in a timely manner, determined by multifactorial circumstances compromising stability. It has been considered a major social, economic and public health problem[13].

After the fall episode, the elderly are susceptible to developing a fear of falling, this condition can limit functional performance and restrict mobility[14]. Studies estimate that 25% of people who have already fallen down limit their activities due to fear of falling again and a lack of confidence in their balance[15].

It is believed that in 2020 the elderly population in Brazil will be 32 million, in view of this aging population, other demands for care are arising and requiring a different approach in relation to the health of the elderly[16]. Due to the heterogeneity of this population and the complexity of daily life activities added to the risk and fear of falls, identifying the socio-demographic and functional profile of this population can assist in the local planning of promoting and preventing actions for the health of the elderly in a broader way .

According to some systematic[17] and integrative[18] literature reviews, few studies on functionality and cognitive screening have been developed in the Midwest region of Brazil. Taking into account the size of the country and the socio-cultural and economic differences of each region, it is necessary to develop studies on the elderly in this region of Brazil. Thus, this study aims to assess activities of daily living, fear and risk of falling among the elderly in Campo Grande, Mato Grosso do Sul.

MATERIALS AND METHODS

This was an observational, quantitative and cross-sectional study, carried out from April to September 2018. It was developed at the Integrated School Clinic (CEI/INISA) of the Federal University of Mato Grosso do Sul (UFMS), after approval by the UFMS Research Ethics Committee (under opinion No. 2.519.617).

The volunteers were approached after their activities at UnAPI (Open University to the Elderly). UnAPI provides extension actions that involve the areas of teaching, culture, sports and leisure, enabling the inclusion of elderly people in the university environment. Then, the

interested parties were invited to participate in the study after presenting the objectives, the methodology, reading the Informed Consent Form (ICF) and signing the form, according to resolution 466/12 of the National Health Council.

Thirty-two elderly men and women, aged 60 years or over participated in the study. As an inclusion criterion, it was necessary to reach a score of 19 points or more, in the Mini-Mental State Examination (MMSE).

The instruments used were: a sociodemographic questionnaire; Katz index; Lawton-Brody scale; Mini-Mental State Examination (MMSE); Downton Scale and the International Fall Efficacy Scale (FES-I-BRASIL).

The sociodemographic questionnaire was used to characterize the sample: age, grouped into groups (60 to 70 years and 70 to 82 years); sex (male and female); marital status (married, widowed, divorced and single); education (highest degree achieved); individual monthly income (gross amount in minimum wages, in the amount of R$954.00 Brazilian Reais in 2018); if they lived alone; and the condition of the property (rented or paid off).

The Katz Index assesses BADL and consists of a list of six items that are hierarchically related and reflect the patterns of daily activities. 6 activities are presented, such as dressing, bathing, eating and others, where the subject must mark "yes" which is worth one point, or "no" which is worth no points. At the end, the classification is given based on the score, those being: Independent (6 points), Moderate dependence (≤ 5 to ≥ 3 points) and Very dependent (<3 points)[19].

The Lawton and Brody Scale[7] makes it possible to assess IADL, that is, the autonomy of the elderly in the eyes of the community. The scale has 9 instrumental activities, such as: using the phone, making purchases, preparing meals, using means of transport, handling medication and financial matters. Each activity has its own score which are: Without help (3 points), With partial help (2 points) and Unsuccessful (1 point). Finally, the classification was given by the sum of each point of the 9 activities, which are: Independent (27 points), Partially dependent (≤26 to ≥18 points), Dependent (<18 points)[6,7,20].

In addition to being used as an inclusion criterion, the MMSE was used to assess cognition. This is a screening instrument in several domains, its use is widespread, validated and adapted for the Brazilian population. It consists of questions about memory, orientation and attention, then there is the requirement of reading, writing, drawing, obeying verbal commands and naming. In total, it is possible to score up to 30 points[21]. The cut-off point for cognitive decline in illiterate elderly people is 19/20 points, while for literate elderly people it is 23/24 points[22]. Thus, the closer to 30 the result is, the better the cognitive performance.

The Downton Fall Risk Scale was used, a validated instrument in Portuguese, in which the questions are grouped into 5 factors that influence the risk of falling in the elderly, they are: previous falls, medication administration, sensory deficit, mental state and ambulation. The score ranges from 0 to 11 and is divided into: yes (1 point) and no (0 points). The final classification is given by the sum of the answers, where the result is given in: High risk of falling (≥3 points) and Low risk of falling (<3 points)[23,24].

The Fall Efficacy Scale (FES-I-BRASIL) was used to assess fear of falling. It was originally developed by Tinetti, Richman and Powell[25] under the name of the Falls Efficacy Scale, and was later adapted and translated into Portuguese, by Camargos *et al.*[26] It consists of 16 activities, categorized and scored on a continuous scale with 4 answer options being: I am not worried (1 point), A little worried (2 points), Moderately worried (3 points) and Very worried (4 points). The scores are inverted, that is, the lowest score refers to greater self-confidence and less concern about falling. Thus, the final score ranges from 16 points to 64 points[26,27].

Data analysis

The data are presented in a descriptive format,

by means of proportionality measurements for categorical variables [n(%)]. Continuous numerical variables are expressed as mean, standard deviation and 95% confidence interval [mean ± SD (95%CI)]. For statistical analysis of the data, the SPSS version 20.0 program for Windows (SPSS Inc., Chicago IL, USA) was used. The data were submitted to the Kolmogorov-Smirnov test to verify the normality of the distribution. After non-verification of normality (non-parametric data), for comparison between genders and age groups, a Mann-Whitney U test was applied for the independent groups. In addition, Spearman's linear correlation test was applied to correlate the risk of falling and the fear of falling with the scales of daily living activities. In all cases, a significance level of 5% was considered.

RESULTS

32 elderly people participated in the study, with a mean age of 67.9±6.8 years, 43.8% men and 56.3% women, distributed into groups, by age and sex. In the MMSE, the sample reached a score of 26.8±2.2 points, demonstrating that no participant was excluded, as can be seen in Table I.

Table II presents the scores of the Katz Index (BADV), the Lawton-Brody Scale (IADV) and the AADL questionnaire, in relation to sex and age group. It is possible to observe that there was no statistically significant difference in any of the variables.

Table III shows the comparison between sex and age group on the Downton Scale and the Fall Efficacy Scale (FES-I-BRASIL). It is possible to observe that more than half of the sample (53.1%) had a score equal to or higher than three on the Downton Scale, demonstrating a higher risk for falls. It is also observed that the score between the age groups on the Downton Scale presented a statistically significant value. On the FES-I-BRASIL scale, there was a significant difference in the score of the variable for sex, and among the two sexes, the females were the ones who presented a greater fear of falling than the males.

Table IV shows the Spearman correlation between the Downton Scale and the Fall Efficacy Scale (FES-I-BRASIL), with the Katz Index and the Lawton-Brody Scale. A statistically significant negative correlation between the FES-I-BRASIL scale and the Lawton-Brody scale was observed. This demonstrates that the greater their independence is in IADL (Lawton-Brody), the less their fear of falling is.

Table 1– Sample characterization. Campo Grande - MS, 2019.

Variables	n(%)
Age (in years) *	67.9 ± 6.8
MMSE *	26.8 ± 2.2
Age range	
60 to 70 years	17 (53.1)
70 to 82 years	15 (46.9)
Sex	
Male	14 (43.8)
Female	18 (56.2)
Marital status	
Married	16 (50.0)
Widowed	8 (25.0)
Divorced	4 (12.5)
Not married	4 (12.5)
Education	
Incomplete elementary School	13 (40.6)
Complete primary education	6 (18.8)
Incomplete high school	1 (3.1)
Complete high school	12 (37.5)
Individual Monthly Income	
No income	2 (6.3)
From 1 to 2 minimum wages	25 (78.1)
From 2 to 3 minimum wages	3 (9.4)
From 3 to 4 minimum wages	2 (6.3)
Live alone?	
Yes	8 (25.0)
No	24 (75.0)

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Variables	n(%)
Home	
Own	25 (78.1)
Rented	7 (21.9)

Data presented in absolute frequency and relative frequency.
*Data presented as mean±standard deviation.
MMSE: Mini-Mental State Examination.

Table 2– Results of the Katz Index, Lawton-Brody Scale and the AADL Questionnaire, in relation to sex and age group. Campo Grande - MS, 2019.

Variables	n(%)	P-value
Katz Index		
Classification		
Independent	27 (84.4)	
Moderate dependency	4 (12.5)	
Very dependent	1 (3.1)	
Overall score *	5.7 ± 0.9	
Gender Score *		
Male	5.9 ± 0.3	0.218
Female	5.5 ± 1.1	
Score according to age group *		
60 to 70 years	5.6 ± 1.1	0.698
70 to 82 years	6.0 ± 0.0	
Lawton-Brody scale		
Classification		
Independent	17 (53.1)	
Partially dependent	15 (46.9)	
Dependent	0 (0.0)	
Overall score*	25.3 ± 2.5	
Gender Score*		
Male	25.1 ± 2.8	0.984
Female	25.4 ± 2.3	
Score according to age group *		
60 to 70 years	24.9 ± 2.7	0.400
70 to 82 years	26.4 ± 1.0	

Data presented in absolute frequency and relative frequency.
* Data presented as mean±standard deviation.

Table 3– Results of the Downton Scale and the Fall Efficay Scale. Campo Grande - MS, 2019.

Variables	n(%)	P-value
Downton scale		
Overall score *	2.6 ± 1.8	
Classification		
High risk of falling	17 (53.1)	
Low risk of falling	15 (46.9)	
Gender Score *		
Male	2.4 ± 1.7	0.671
Female	2.7 ± 1.9	
Score according to age group *		
60 to 70 years	1.8 ± 1.6	0.009
70 to 82 years	3.6 ± 1.5	
FES-I-BRASIL scale		
Overall score *	23.9 ± 7.8	
Gender Score *		
Male	21.9 ± 9.0	0.029
Female	25.6 ± 6.6	
Score according to age group *		
60 to 70 years	24.7 ± 8.9	0.834
70 to 82 years	22.9 ± 7.0	

Data presented in absolute frequency and relative frequency.
* Data presented as mean±standard deviation.
FES-I-BRASIL: Fall Efficacy Scale.

Table 4– Values of the Spearman correlation and p-value of the Downton and FES-I-BRASIL scales with the Katz index and the Lawton-Brody scale. Campo Grande - MS, 2019.

	Katz Index	Lawton-Brody Scale
Downton scale	r = -0.136 (p = 0.457)	r = -0.208 (p = 0.254)
FES-I-BRASIL scale	r = -0.176 (p = 0.336)	r = -0.443 (p = 0.011)

FES-I-BRASIL: Fall Efficacy Scale.

DISCUSSION

The sociodemographic profile of the elderly in this study is similar to that of other national studies, characterized by more female, married and literate individuals[13,14,15,23,27]. The predominance of females in studies exemplifies the feminization process of old age in Brazil. This process is characterized by a higher life expectancy in females[28].

It was observed that all the elderly in this study reached a score above 24 on the MMSE (26.8±2.2). According to the systematic review by Melo and Barbosa[29], other studies carried out in Brazil used the cutoff point of cognitive decline of 18/19 points for illiterate elderly people and 23/24 points for those with more than one year of schooling.

Corroborating the findings of this study, Sposito et al.[30] used the MMSE in 2549 elderly people, with ages ranging from 65 to over 80 years old, divided into 7 cities in different states of Brazil (PA, PB, PI, MG and SP); they observed that, all reached a score above 24. Another point in common is the similarity of the profile of the elderly, where the majority were female, literate and had a family income of 1 to 3 minimum wages.

In two other large studies of the FIBRA Network, one conducted in Rio de Janeiro (RJ) with 737 elderly people[31] and another in Campinas (SP) with 900[32], it was also found that approximately 70% and 76.5% of elderly, respectively, exceeded the MMSE cutoff point. Thus, it is clear that there is a certain similarity in the profile of elderly people in different regions of Brazil (North, Northeast, Midwest and Southeast), considering the MMSE score and other characteristics.

The results show that the majority of the elderly are independent, at about 84.4% and 53.1%, both in the Katz Index (BADL) and in the Lawton-Brody Scale (IADL), respectively. This implies that they have a good functional capacity and confidence to perform their daily activities in the domestic and community scope, with autonomy and independence, reflecting significantly on maintaining their quality of life. It is believed that these results are due to the fact that these elderly people were not institutionalized or hospitalized, and, in a way, participate more actively in their daily lives because they participated in UnAPI. Additionally, Pereira and collaborators[6] observed that hospitalized elderly people have a functional decline and increased dependence in both IADL and BADL, especially since the IADL is more affected.

In this sample, the general classification of the risk of falling was split between high and low risk, and the same occurred in the score regarding sex, both of which did not characterize any statistical difference. However, in the analysis regarding the age group, elderly people with a more advanced age had a higher risk of falling using the Downton Scale. This fact is understandable and may be related to events arising from aging, such as: sarcopenia, osteopenia, decreased balance, mobility, speed and quality of gait, appearance of chronic-degenerative diseases, polypharmacy, decreased functional capacity and the decline of the body's systems[27,30].

Contrary to expectations, in this study those of the older age group (70 to 82 years old) obtained a FES-I-BRASIL score less than the general score and of those in the younger age group, however it was not statistically relevant. Also, it was observed that elderly women are more concerned with falling than men, which is in line with other studies. A literature review on the consequences of falls in the elderly found that the fear of falling is prevalent in women; moreover, it highlighted that the fear of falling has been associated with the reduction of daily living activities[33]. Another study correlated advanced age, a diagnosis of osteoporosis and falls in the elderly, and found that females were more susceptible to falls[34].

Studies indicate that the fear of falling has been reported even though no episode of falling has occurred, and among the elderly people who have already experienced falls, they feel less able to prevent another episode and are, therefore, more susceptible to recurrences. Another

considerable factor is the fear of falling again, which leads to decreased functional capacity and inactivity[4,27,35,36].

In general, some reasons that may contribute to the occurrence of falls in women, may be related to their physical constitution, lesser amount of lean mass, lesser muscle strength when compared to men, hormonal losses, prevalence of chronic-degenerative diseases, involvement in domestic activities and their longer life expectancy[33,37].

In the present study, a significant association was found between the values of the FES-I-BRASIL and the Lawton-Brody Scale, suggesting that the greater their performance is in instrumental activities of daily living, the lower their concern is with falling. In a way, it is something expected because, taking into account the questions of the two instruments, it was observed that there is a similarity between them. Both instruments analyze activities such as: cleaning the house, going shopping, walking down the street, making food and using the phone. This topic is widely discussed in the scientific community and several recent reviews correlate the level of physical activity and falls in the elderly both in foreign studies from different regions (Europe[38], Sweden[39], Australia[40], China[41], United States[42] and Canada[43]), as well as in national studies[35,42,43,44,45]. Everyone has come to the conclusion that the higher the level of physical activity performed by the elderly, the lower the occurrence of falls, improving their functional independence.

CONCLUSION

Based on the results of this study, it was concluded that elderly people with a more advanced age group have a higher risk of falling compared to younger people. Elderly females were more concerned about falling compared to males. Finally, it was observed that the greater their performance was of instrumental activities of daily living, the less worried they were about falling.

Regarding the limitations, we believe that the objective assessment of the participants' functionality, through functional tests, would further enrich the findings of this work. It is expected that more studies assessing the functionality and cognition of the elderly will be developed in different states and regions of Brazil, in order to contribute to the grouping of information of the elderly population; especially since especially since Brazil is beginning to experience the epidemiological changes that other countries are experiencing with regards to the longevity of the elderly population increasing every year.

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