

ADHERENCE AND BARRIERS TO DRUG THERAPY: RELATIONSHIP WITH THE RISK OF FALLS IN OLDER ADULTS

Cristiane Regina Soares¹ 
Marcia Maiumi Fukujima² 
Paula Cristina Pereira da Costa¹ 
Vanessa Ribeiro Neves¹ 
Anderson da Silva Rosa¹ 
Meiry Fernanda Pinto Okuno¹ 

¹Universidade Federal de São Paulo, Escola Paulista de Enfermagem, Programa de Pós-Graduação em Enfermagem. São Paulo, São Paulo, Brasil.

²Associação Paulista para o Desenvolvimento da Medicina, Ambulatório Médico de Especialidades Médicas do Idoso Sudeste. São Paulo, São Paulo, Brasil.

ABSTRACT

Objective: to verify the association of adherence and barriers to drug therapy with the risk of falls and the sociodemographic, clinical and economic variables.

Method: a cross-sectional study, carried out with 117 aged individuals in a Medical Clinic of Specialties for Older Adults in the Southeast region of the city of São Paulo (SP), from March to November 2019. The following scales were applied: Downton Fall Risk, Morisky-Green Test and Brief Medication Questionnaire. Logistic regression was used to verify the association between adherence to the treatment and types of barriers to adherence and the risk of falls. A 5% significance level was used.

Results: the older adults with low adherence to the drug treatment presented 5.57 times more chances of having a high risk of falling when compared to those with greater adherence, and those with a barrier in the recall domain had 22.75 times more chances of having a high risk of falling, in relation to the aged individuals without barriers in the recall domain.

Conclusion: low and average adherence to drug therapy and the barrier related to the recall domain were associated with high risk of falls in the older adults.

DESCRIPTORS: Accident due to falls. Adherence to medications. Older adult. Barriers to accessing health care. Cooperation and adherence to the treatment.

HOW CITED: Soares CR, Fukujima MM, Costa PCP, Neves VR, Rosa AS, Okuno MFP. Adherence and barriers to drug therapy: relationship with the risk of falls in older adults. *Texto Contexto Enferm* [Internet]. 2022 [cited YEAR MONTH DAY]; 31:e20200552. Available from: <https://doi.org/10.1590/1980-265X-TCE-2020-0552>.

ADESÃO E BARREIRAS À TERAPÊUTICA MEDICAMENTOSA: RELAÇÃO COM O RISCO DE QUEDA EM IDOSOS

RESUMO

Objetivo: verificar a associação da adesão e das barreiras à terapêutica medicamentosa com o risco de quedas e as variáveis sociodemográficas, clínicas e econômicas.

Método: estudo transversal, realizado com 117 idosos em um Ambulatório Médico de Especialidades do Idoso na Região Sudeste de cidade de São Paulo (SP), no período de março a novembro de 2019. Foram aplicadas as escalas: Risco de Queda de Downton, teste de Morisky-Green e *Brief Medication Questionnaire*. Para verificar a associação entre a adesão ao tratamento e tipos de barreiras a essa adesão e o risco de quedas, foi utilizada a regressão logística. Foi utilizado um nível de significância de 5%.

Resultados: os idosos com baixa adesão ao tratamento medicamentoso apresentaram chance de 5,57 vezes de ter alto risco de queda em relação aos idosos com maior adesão, e aqueles com barreira no domínio recordação apresentaram chance de 22,75 vezes de ter alto risco de queda, em relação aos idosos sem barreira no domínio recordação.

Conclusão: a baixa e média adesão à terapêutica medicamentosa e a barreira relacionada ao domínio recordação se associaram a alto risco de queda nos idosos.

DESCRITORES: Acidentes por quedas. Adesão à medicação. Idoso. Barreiras ao acesso aos cuidados de saúde. Cooperação e adesão ao tratamento.

ADHESIÓN Y OBSTÁCULOS CON RESPECTO A LA TERAPIA MEDICAMENTOSA: RELACIÓN CON EL RIESGO DE CAÍDAS EN ADULTOS MAYORES

RESUMEN

Objetivo: verificar la asociación de la adhesión y los obstáculos con respecto a la terapia con el riesgo de caídas y las variables sociodemográficas, clínicas y económicas.

Método: estudio transversal, realizado con 117 adultos mayores en una Clínica Médica Ambulatoria de Especialidades Geriátricas en la región sudeste de la ciudad de San Pablo (SP) entre marzo y noviembre de 2019. Se aplicaron las siguientes escalas: Riesgo de Caídas de Downton, prueba de Morisky-Green y *Brief Medication Questionnaire*. Se utilizó regresión logística para verificar la asociación entre la adhesión al tratamiento y los tipos de obstáculos con respecto a dicha adhesión y el riesgo de caídas. Se utilizó un nivel de significancia del 5%.

Resultados: los adultos mayores con bajo nivel de adhesión al tratamiento medicamentoso presentaron 5,57 más probabilidades de tener un riesgo de caídas elevado en relación con los que presentaron más adhesión, y quienes tuvieron obstáculos en el dominio Recordatorio presentaron 22,75 más probabilidades de tener un riesgo de caídas elevado, en relación con los adultos mayores sin obstáculos en dicho dominio.

Conclusión: los niveles bajo y medio de adhesión a la terapia medicamentosa y el obstáculo relacionado al dominio Recordatorio estuvieron asociados al riesgo de caída elevado en los adultos mayores.

DESCRIPTORES: Accidentes por caídas. Adhesión a los medicamentos. Adulto mayor. Obstáculos para acceder a la atención médica. Cooperación y adhesión al tratamiento.

INTRODUCTION

The Brazilian population is expected to continue growing, with estimated life expectancy at birth of 71.3 years for men and 78.5 years for women in 2013 and, in 2060, 78.0 years for men and 84.4 years for women. Along with these demographic changes, there are also changes in the health and disease patterns, with an increase in Chronic Non-Communicable Diseases (NCDs), that is, people are aging, and most of them tend to have some NCDs¹⁻⁴.

In these demographic and epidemiological changes, a percentage of the Brazilian population experiences morbidity and risk of falls, allowing for a decrease in functionality and the use of multiple drugs to treat the diseases, which provides an increase in life expectancy¹⁻⁴.

Unintentional displacement of the body to a level below its starting position and without timely correction is called a fall. This phenomenon is determined by multifactorial circumstances, which can impair postural stability. Among the factors related to the occurrence of falls are the biological, behavioral, environmental and socioeconomic aspects⁵⁻⁸.

Accidents caused by falls among older adults have been identified as the prevalent occurrence of morbidity and mortality from external causes among this population, resulting in prolonged hospitalization times due to fractures, with a consequent reduction in functionality due to immobilization. This makes it difficult for the older adults to reintegrate into society, making it necessary, in some cases, to re-adapt them to a new home care modality, leading to institutionalization and burdening health services⁵⁻⁷.

The intrinsic factors related to falls can be associated with physiological changes, due to the aging process, frailty, gender, age, effects of medications and comorbidities. In relation to the extrinsic factors, ambient lighting, sedentary behavior, use of walking aids, furniture in the bedroom or bathroom and building structures are present⁵⁻⁷.

The medications used by the older adults can increase the risk of falls, as many of them can cause arrhythmia or postural hypotension, muscle weakness and dizziness, in addition to reducing alertness and psychomotor function. Thus, the occurrence of accidents due to falls and their relationship with the use of medications can be due to unexpected adverse effects, lack of adherence to adequate treatment, inappropriate dosages, barriers to the use of medications or drug interactions⁸.

The prevalence of NCDs often requires the association of several drugs for their control. Additionally, in Brazil, health care for older adults is generally provided by several health professionals and in different specialties, which can explain polypharmacy in many situations⁹⁻¹⁰. Thus, the aged individuals identify barriers to adherence to their treatment, when receiving complex therapeutic regimens and needing to deal with drug interactions and adverse reactions⁹⁻¹⁰. Thus, proper use of the medications prescribed is necessary, in order to reduce the risks caused by drug non-adherence and barriers to the use of medications, enabling effectiveness of the treatment⁹.

Adherence to the drug treatment can be understood as the use of at least 80% of all the medications prescribed, considering factors such as timing of doses, duration of the treatment, complexity of the therapeutic regimen, storage of the medications, requirement that the medication be kept at low temperatures and difficulties ingesting large-sized tablets¹⁰.

Incorrect use of the medication, its non-use, its indiscriminate use or not using all the drugs prescribed are forms of non-adherence to the drug treatment. The following can be mentioned as examples of barriers to proper use of medications: side effects, financial reasons, advanced age, comorbidities, reduced physical and cognitive abilities, beliefs about the disease and medication, culture, history and family experiences¹¹⁻¹³.

Adherence to drug therapy depends on the involvement of the patient, their caregiver and their family. It is also related to understanding the therapeutic goals and well-being of the treatment proposed. Such adherence can be compromised in older adults, as they voluntarily decide to interrupt

or modify the therapy, or because they mistakenly believe that they are adhering properly, or because it is attributed to relevant socioeconomic factors, perceptions, motivations and physical impairment and cognitive, and even due to the complexity of the therapy¹³.

Adherence and barriers to the use of medications can be measured by self-reports, continuous monitoring by the health team and by using validated scales. Treatments for NCDs usually demand using medications for prolonged periods of time and, in the geriatric population, non-adherence contributes to adverse events, such as the occurrence of falls, causing an increase in the hospitalization times and readmissions in hospitals and a reduction in quality of life¹⁰.

This study hypothesizes the fact that low adherence and barriers to drug therapy are associated with a higher risk for falls in older adults. This study aimed at verifying the association between adherence and barriers to drug therapy and the risk of falls, as well as the sociodemographic, clinical and economic variables.

METHOD

This is a cross-sectional, descriptive and analytical study. The data were collected at the Specialties Medical Clinic for Older Adults (*Ambatório Médico de Especialidades, AME - Idoso*) in the Southeast region of the city of São Paulo (SP).

The mean number of appointments at the AME is 288 older adults per month. The sample was non-probabilistic and for convenience, using a formula of $N = [(z\alpha + z\beta) \div C]^2 + 3$, with R = correlation coefficient, $C = 0.5 \times \ln[(1+r)/(1-r)]$, with N = total sample, α = significance level (bilateral) and β = 1-power of the test. The values adopted were $Z\alpha = 95\%$, $Z\beta = 80\%$, and $R = -0.248$.

A pilot sample was carried out with 20 patients and calculated using a Pearson's correlation coefficient, which was included in the study. The sample was obtained by the correlation between the Morisky Green Test (MGT) test, the Brief Medication Questionnaire (BMQ) and the Downton Fall Risk Scale. Thus, when replacing the values in the formula, it would be necessary to include 117 aged individuals. The sample was representative in the research locus, but it is not representative of the Southeast region of the city of São Paulo.

The inclusion criteria were older adults aged 60 years old and over, assisted at the Southeastern AME for Older Adults, who were able to understand and answer the study questionnaires, with a Mini Mental State Examination (MMSE) score above 13 points for illiterates and of 18 points for the illiterate individuals with more than 1 year of schooling and with therapeutic regimens based on two medications. All the older adults included were retained until the end of the study.

The data collection period was from March to November 2019. The sociodemographic and clinical data were collected through individual interviews conducted between each older adult and the researcher, which were recorded in a structured form, with information on age, gender, schooling, marital status, occupation, individual and family income, morbidities and medications for continuous use.

The scales applied during the interview with the study participants were the Downton Fall Risk Scale, the MMSE, the MGT and the BMQ. All instruments used in this research were translated into Portuguese and validated. Authorization or request for an institutional license to use the instruments was also requested¹⁴⁻¹⁹.

The risk of falls was assessed using the Downton Fall Risk Scale, which is made up of five criteria: occurrence of previous falls, use of medications, presence of sensory deficits (visual and auditory disorders), mental status that must be assessed by the MMSE, and walking. The scale score varies between zero and 11 points, and a score equal to or greater than three indicates a high risk of falls¹⁴.

The MMSE was applied to assess the mental status criterion on the Downton Fall Risk Scale. The cutoff point for illiterate older adults is 13 points, for those with low and average schooling levels

(from 1 to 8 years of study), it is 18 points, and for aged individuals with high schooling levels (more than 8 years of study), it is 26 points¹⁵⁻¹⁶.

To assess the patients' adherence to the drug treatment, the MGT was used, an instrument consisting of four questions: "do you sometimes have problems remembering to take your medication?" "do you sometimes neglect to take your medication?" "when you are feeling better, do you sometimes stop taking your medication?", and "sometimes, if you feel worse while taking the medication, do you stop taking it?". The test has the following scores: high, average and low adherence to the drug treatment. Thus, giving negative answers to four questions means high adherence; when one or two answers are positive, the patient is classified as having average adherence and, if three or four answers are positive, the aged individual is in the low adherence group¹⁷⁻¹⁸.

The BMQ instrument was used to identify barriers to treatment adherence, from the patient's perspective. It is an instrument divided into three domains: the first verifies the patient's behavior in relation to adherence to the prescribed treatment; the second assesses the older adult's belief in the effectiveness of the therapy and reports of unwanted side effects; and the third domain is related to recall on the use of medications. The affirmative answers in each of the domains identify barriers to the prescribed treatment regimen, beliefs in the treatment and/or recall in relation to taking the medications¹⁹.

The gender, age, schooling, marital status, employment, individual and family income, number of medications used daily, medication classes and comorbidities variables were analyzed using descriptive statistics, presenting absolute and relative frequencies, mean values, standard deviations and medians, as well as variation (minimum and maximum). Logistic regression was used to verify the association of adherence to the treatment and the types of barriers to adherence in relation to the risk of falls in older adults. For the continuous variables, when compared with the Downton Falls Risk Scale and the BMQ, the Mann-Whitney test was used, and to compare the categorical variables with the Downton Falls Risk Scale and BMQ, the chi-square test was used. Fisher's Exact test was used when necessary. In all the comparative analyses, a 5% significance level was used (p -value < 0.05). The Statistical Package for the Social Sciences (SPSS), version 19, was used for the analysis.

The research was approved by the Research Ethics Committee of *Universidade Federal de São Paulo* (UNIFESP), pursuant to Resolution 466/12 of the National Health Council (*Conselho Nacional de Saúde*, CNS), which regulates research studies involving humans. The older adults were previously informed about the research and consented to participate, voluntarily, signing a Free and Informed Consent Term. Secrecy and confidentiality of the information collected were ensured.

RESULTS

The mean age of the older adults was 71.5 years old (standard deviation of 6.72). Most were women (92.3%); among them, 44 were widows (37.6%), 94 were retired or pensioners (80.3%), with a mean of 6.5 years of study (varying from zero to 15), and with a monthly family income of 1.85 minimum wages (varying from zero to six). The mean number of medications in daily use was 5.7 (varying from one to 17), and the most used were antihypertensives (72.6%), statins (56.4%), oral hypoglycemic agents (40.6%) and oral analgesics (45.3%). The most prevalent morbidity was Systemic Arterial Hypertension (SAH) (75.2%).

Classification of adherence to the medications as high, average and low was based on the MGT scores, and 104 (88.8%) participants presented low to average adherence to the use of the drugs. The research study also identified 107 (91.5%) respondents with barriers to drug therapy in the recall domain, and high risk of falls was reported by 93 (79.5%) older adults (Table 1).

Table 1 – Rates of adherence to the drug treatment, types of barriers to adherence and risk of falls in aged patients treated at a Specialty Medical Outpatient Clinic. São Paulo, SP, Brazil, 2019. (n=117).

Adherence rate / Types of barriers	n (%)
Morisky Test	
Low adherence	52 (44.4)
Average adherence	52 (44.4)
High adherence	13 (11.1)
<i>Brief Medication Questionnaire</i>	
Behavior	
Has no barrier	85 (72.6)
Has a barrier	32 (27.4)
Beliefs	
Has no barrier	76 (65.0)
Has a barrier	41 (35.0)
Recall	
Has no barrier	10 (8.5)
Has a barrier	107 (91.5)
Downton Scale	
No risk of falls	24 (20.5)
High risk of falls	93 (79.5)

Table 2 shows the analysis of the simple logistic regression model to verify the association of the independent variables (MGT and BMQ-behavior/beliefs/recall) in relation to the risk of falls. Older adults with low adherence to the drug treatment presented a 5.57-fold high risk of falls ratio when compared to those with high adherence. Those with average adherence to drug therapy presented an association of a 6.42-fold high risk of falls when compared to those with high adherence. Respondents with a barrier in the recall domain were 22.75 times more likely to have a higher risk of falling than patients without a barrier.

A multiple logistic regression analysis was performed to verify the set of significant independent variables with the high risk of falls. The selection method used was *forward*. The high risk of falls has a statistically significant association with average adherence to drug therapy ($p=0.0130$) and the barrier related to the recall domain of the BMQ ($p=0.0004$), that is, older adults at high risk for falls had average adherence and recall barriers in the continuous use of medications, as shown in Table 3.

The older adults without risk for falling had higher family incomes ($p=0.0031$) and used fewer medications ($p<0.0001$) when compared to those at high risk of falling.

The participants with SAH, cardiovascular disease and venous insufficiency of the lower limbs were those with the highest percentage of high risk of falls ($p<0.0001$).

The survey respondents who used diuretics ($p\leq 0.0001$), antidepressants and benzodiazepines ($p=0.0423$) presented a higher percentage of high risk for falling when compared to those who did not use these medications.

The respondents at high risk for falling presented greater use of medications, such as analgesics, anti-inflammatory drugs, muscle relaxants and medications to improve bloodstream in the lower limbs, when compared to those without risk of falls ($p=0.0076$).

In Table 4, it can be seen that the older adults' behavior, beliefs and recall for adherence to drug therapy had a significant relationship with family income, with the number of years of study and with the number of medications used.

Table 2 – Simple logistic regression model of adherence to the drug treatment and types of barriers to such adherence in relation to the risk of falls in older adults. São Paulo, SP, Brazil, 2019. (n=117).

	Estimate	p-value	OR [‡]	95% CI [§]
MGT* (low adherence <i>versus</i> high adherence)	1.72	0.0099	5.57	(1.5; 20.6)
GMT* (average adherence <i>versus</i> high adherence)	1.86	0.0060	6.42	(1.7; 24.1)
BMQ [†] -behavior (no adherence <i>versus</i> adherence)	0.84	0.0822	2.31	(0.9; 5.9)
BMQ [†] -beliefs (has a barrier <i>versus</i> has no barrier)	0.59	0.2516	1.81	(0.7; 5.0)
BMQ [†] -recall (has a barrier <i>versus</i> has no barrier)	3.12	0.0002	22.75	(4.4; 117.1)

*MGT = Morisky-Green Test; †BMQ = Brief Medication Questionnaire; ‡OR = Odds Ratio; §CI = Confidence Interval.

Table 3 – Multiple logistic regression model of adherence to the treatment and of the barrier related to the Recall domain regarding high risk of falls in older adults. São Paulo, SP, Brazil, 2019. (n=117).

	Estimate	p-value	OR [‡]	95% CI [§]
Constant	-2.83	0.0066		
MGT* (low adherence <i>versus</i> high adherence)	1.42	0.0535	4.12	(0.98; 17.3)
GMT* (average adherence <i>versus</i> high adherence)	1.92	0.0130	6.85	(1.5; 31.3)
BMQ [†] -recall (has a barrier <i>versus</i> has no barrier)	3.16	0.0004	23.67	(4.1; 135.2)

*MGT = Morisky-Green Test; †BMQ = Brief Medication Questionnaire; ‡OR = Odds Ratio; §CI = Confidence Interval.

Table 4 – Association of the schooling (years of study), income (in minimum wage) and number of medications variables with the domains of the Brief Medication Questionnaire in aged patients treated at a Specialty Medical Clinic. São Paulo, SP, Brazil, 2019. (n=117).

Variables	Brief Medication Questionnaire					
	Behavior		Beliefs		Recall	
	Has no barrier	Has a barrier	Has no barrier	Has a barrier	Has no barrier	Has a barrier
Schooling (years)						
Median	4	8	8	4	11	4
Quartile1-Quartile 3	(4-11)	(4-11)	(4-11)	(1-4)	(4-15)	(4-11)
p-value*	0.0593		0.0122		0.0877	
Individual income (MW [†])						
Median	1	1	2	1	2	1
Quartile1-Quartile 3	(1-2)	(1-2)	(1-2)	(1-1)	(1-2)	(1-2)
p-value*	0.6813		0.0054		0.0628	
Family income (MW [†])						
Median	2	2	2	2	2	2
Quartile1-Quartile 3	(1-2)	(1.5-3)	(1-2)	(1-2)	(2-3)	(1-2)
p-value*	0.0163		0.0380		0.0671	
Number of medications						
Median	5	4	5	6	1.5	5
Quartile1-Quartile 3	(4-7)	(2.5-7)	(3-7)	(4-7)	(1-2)	(4-7)
p-value*	<0.0001		<0.0001		<0.0001	

*Mann-Whitney test; †MW – Minimum Wage.

DISCUSSION

The findings of this study related to the sociodemographic and economic characteristics of the interviewees were similar to those of another study carried out with older adults assisted by the Family Health Strategy (FHS) in the state of Paraíba, in which the profile also points to a majority of women, widows, with a mean of age 73, retired, with a mean of 6 years of study and incomes of up to two minimum wages²⁰.

In this study, the older adults used a mean of 5.79 medications, the most frequent being antihypertensives; and the most prevalent morbidity was SAH. It was also verified that the aged individuals with SAH, cardiovascular disease and venous insufficiency of the lower limbs were those with the highest percentage of high risk of falls. As a result of the growing proportion of older adults in the general population and the prevalence of multiple chronic diseases, there are, among aged individuals, prescriptions for multiple medications that lead to drug interactions and polypharmacy²¹, defined as the regular use of five or more medications. Polypharmacy has the following consequences: greater demand for care in health services, greater number of hospitalization days and higher costs for the health system²².

Diverse evidence shows that, after initiating or intensifying the antihypertensive therapy, an increase in the risk of falls and in the occurrence of fractures can be identified, although orthostatic hypotension is more prevalent with aging and more common in individuals with hypertension²³⁻²⁴.

Therefore, it is reasonable to monitor the patients in the initial period after starting a new antihypertensive or dose escalation²³. Another research study, carried out with older adults in the municipality of João Pessoa in Paraíba, identified that SAH stood out among the morbidities associated with the risk of falls. When compared to non-hypertensive aged individuals, hypertensive older adults had approximately seven times more risk of falling²⁵.

Older adults usually have multiple NCDs and need several drugs to treat them. Thus, the use of three to five medications can be a barrier to the recall domain of the BMQ, that is, characteristics related to remembering to take all the continued-use medications daily and following the treatment regimen properly are evaluated as barriers among the older adults. Thus, adherence to the drug treatment can be more difficult for aged individuals when compared to other age groups²⁶.

Most of the interviewees in this research presented low and average adherence to the drug treatment and a barrier to drug therapy in the recall domain. In addition, older adults with low and average adherence present a higher percentage of risk of falls when compared to those with high adherence. It is known that there is a relationship between accidents due to falls and non-adherence to the pharmacological treatment⁸. In this study, most of the older adults presented high risk of falls.

The aged individuals in this study, with low and average adherence and presence of barriers in the recall domain for the use of medications, presented high risk of falls. It is important to emphasize that antihypertensive drugs were the most used in the sample studied. The literature points out that it is plausible that failure to consistently take antihypertensive medications could result in fluctuations in blood pressure, which could lead to an increased risk of falls. During gaps in the use of antihypertensive medications, the pharmacological effects on blood pressure gradually decrease and, upon resumption of the therapy, the patients may experience acute changes in blood pressure similar to the change from initial use²⁷.

Another study found a relationship between social and economic variables with the occurrence of falls among older adults, relating high schooling level, active life, income, better housing conditions and access to health services with lower risk of falls, that is, access to the health services can awaken the importance of self-care in the older adults, contributing to a reduction in the use of medications²⁸.

Accordingly, the patients in this study without risk of falls had higher family incomes and used fewer medications when compared to those at high risk for falling.

The use of diuretics, antidepressants and benzodiazepines presented a higher percentage of high risk of falls when compared to those who did not use these medications, that is, the use of diuretics, antidepressants and benzodiazepines can increase the risk of falls, when compared to the older adults who do not use such medications. Aged individuals at high risk for falling presented an increase in the use of analgesics, anti-inflammatory drugs and muscle relaxants, when compared to those without risk of falls.

The literature consistently points to the association between the occurrence of falls and the use of specific therapeutic groups of medications, which act on the central nervous system and on the cardiovascular system. These medications are called Fall Risk-Increasing Drugs (FRIDs)²⁹. A study carried out in Taiwan identified a significant relationship between the use of benzodiazepines and nonbenzodiazepines with the risk of injuries from falls requiring hospitalization in the older adults³⁰.

A study carried out at a hospital in Denmark identified that almost half of the patients who used FRIDs presented contributing factors for the occurrence of falls, such as dizziness, hypotension or symptoms of orthostatic hypotension³¹. In this regard, in the older adults interviewed, we identified the use of medications similar to FRIDs, such as psychotropics, antidepressants, antipsychotics, antiepileptics, opioids, antihypertensives and diuretics, which can contribute to the onset of contributing signs and symptoms to the occurrence of falls.

The older adults characterized in the group with presence of barriers to drug therapy had lower family and individual incomes, fewer years of study and used a greater number of drugs when compared to those without barriers to the drug treatment. In part, these findings are similar to those found in the study carried out at the medical specialties outpatient clinic of the *Santa Casa de Misericórdia* Hospital of Vitória in Espírito Santo, which showed a higher frequency of non-adherence to the drug treatment among illiterate, retired women with incomes of up to one minimum wage and presence of polypharmacy³².

Non-adherence to drug therapy has negative repercussions for the individual, the economy and society, becoming an important public health problem, as it increases the need for hospital admissions, impairs quality of life and leads to an increase in morbidity and mortality, bringing about clinical consequences, such as falls and exacerbation of diseases in the aged population³³.

The interventions suggested in the literature to improve adherence to the medications are drug review every 6 months, simplification of the medical prescriptions, provision of information to patients and their families about the indications for how to use the therapy, delivery of medications in a single point of care, reducing the number of prescribing physicians and monitoring the frequency for modification of the prescription³⁴.

Health literacy is defined as the individuals' ability to obtain, process and understand basic health information and services necessary to make appropriate health decisions³⁵. Literacy directly interferes with adherence or not to drug therapy. In this way, simplifying medical prescriptions, providing information to patients and their families about the indications on how to use the therapy, delivering medications in a single point of care, reducing the number of prescribing physicians and monitoring the frequency of modification of the medical prescription are strategies that can favor the older adults' adherence to the drug treatment³⁶.

Mobile technology has been used in some studies with indication for adherence to medications, but the results are still weak over use of the technology. The performance of group strategies among the older adults, for adapted and evidence-based guidance aimed at proper use of the medications, was an intervention presented in the literature¹²⁻¹³.

A research study carried out at a public hospital in the Brazilian Northeast region verified that there was greater attendance of participants at medical consultations when compared to nursing consultations, although adherence to medications assessed by the MGT was better in patients who attended the nursing consultations, frequently four to six times higher in the last year³⁷. Thus, in addition to monitoring by the nurse, education in health with the patient and the family enables greater adherence to medications among older adults. This monitoring allows for drug reconciliation and, consequently, to manage this factor associated with a higher risk of falls.

This study has as a limitation the fact that it was carried out in a single center, with assistance only provided to patients served by the public health system, which may not represent other realities. Thus, the results cannot be generalized. It was also a cross-sectional study, requiring longitudinal research studies with larger samples, to monitor the difficulties encountered by the older adults in adherence to medications and to suggest future interventions for the clinical practice.

However, the results of this research can contribute to preventing the occurrence of falls related to non-adherence to drug therapy. Nurses are the health professionals equipped to carry out educational and health actions. Thus, it is clear that it is important to institute a guiding protocol for the aged individuals assisted by the AME for Older Adults and their family members, about prevention of the risk of falls and the identification of barriers to drug therapy, in order to increase understanding of the importance of using medications, establishing joint strategies, avoiding forgetting medication use and, thus, possibly obtaining better adherence and effectiveness regarding the treatment.

CONCLUSION

This study verified that average adherence to drug therapy and the barrier related to the recall domain were associated with a high risk of falls in the older adults surveyed. The barriers to drug therapy were related to lower family incomes and higher number of medications used.

The results of this research contribute to targeting health promotion strategies carried out by nurses, aiming at adherence to the drug treatment and prevention of the risk of falls in specialized health services.

In addition to that, this study emphasizes the importance of assessing adherence and barriers to the use of medications, as well as evaluating the risk of falls among the older adults by the health care team, with scales validated during their clinical assessment at the Specialties Medical Clinic for Older Adults. This assessment will make it possible to implement the best intervention to obtain adherence to the treatment and fall prevention.

It is important to carry out longitudinal studies, so that it is possible to understand and intervene in the barriers to adherence to medications in the older adults' daily lives.

REFERENCES

1. Araújo Neto LA. Muito além da transição epidemiológica: doenças crônicas no século XX. *Hist Ciênc Saúde-Manguinhos* [Internet]. 2019 Jan-Mar [cited 2021 Jun 21];26(1):353-5. Available from: <https://doi.org/10.1590/S0104-59702019000100022>
2. Cortez ACL, Silva CRL, Silva RCL, Dantas EHM. Aspectos gerais sobre a transição demográfica e epidemiológica da população brasileira. *Enferm Bras* [Internet]. 2019 Nov 8 [cited 2021 Jun 21];18(5):700-9. Available from: <https://doi.org/10.33233/eb.v18i5.2785>
3. Souza MFM, Malta DC, França EB, Barreto ML. Transição da saúde e da doença no Brasil e nas Unidades Federadas durante os 30 anos do Sistema Único de Saúde. *Ciênc Saúde Colet* [Internet]. 2018 Jun [cited 2021 Jun 21];23(6):1737-50. Available from: <https://doi.org/10.1590/1413-81232018236.04822018>

4. Oliveira AS. Transição demográfica, transição epidemiológica e envelhecimento populacional no Brasil. *Hygeia* [Internet]. 2019 Nov 1 [cited 2021 Jun 21];15(32):69-79. Available from: <https://doi.org/10.14393/Hygeia153248614>
5. Khow KSF, Visvanathan R. Falls in the aging population. *Clin Geriatr Med* [Internet]. 2017 Aug [cited 2020 Jun 1];33(3):357-68. Available from: <https://doi.org/10.1016/j.cger.2017.03.002>
6. Bolding DJ, Corman E. Falls in the geriatric patient. *Clin Geriatr Med* [Internet]. 2019 Feb [cited 2020 Jun 1];35(1):115-26. Available from: <https://doi.org/10.1016/j.cger.2018.08.010>
7. Rosa BM, Abreu DPG, Santos SSC, Silva BT, Ilha S, Martins NFF. Association between fall risks and medication use in the elderly. *Rev Baiana Enferm* [Internet]. 2017 [cited 2020 Jun 1];31(4):e22410. Available from: <https://doi.org/10.18471/rbe.v31i4.22410>
8. Ribeiro IA, Lima LR, Volpe CRG, Funghetto SS, Rehem TCMSB, Stival MM. Frailty syndrome in the elderly in elderly with chronic diseases in Primary Care. *Rev Esc Enferm USP* [Internet]. 2019 Jun 3 [cited 2020 Jun 1];53:e03449. Available from: <https://doi.org/10.1590/S1980-220X2018002603449>
9. Garske CCD, Assis MP, Schneider APH, Machado EO, Morsch LM. Interações medicamentosas potenciais na farmacoterapia de idosos atendidos em farmácia básica do sul do Brasil. *Rev Saúde (Santa Maria)* [Internet]. 2016 Jul-Dec [cited 2020 Jun 1];42(2):97-105. Available from: <https://doi.org/10.5902/2236583421751>
10. Ministério da Saúde (BR). Secretaria de Ciência, Tecnologia e Insumos Estratégicos. Departamento de Ciência e Tecnologia. Síntese de evidências para políticas de saúde: adesão ao tratamento medicamentoso por pacientes portadores de doenças crônicas [Internet]. Brasília, DF(BR): Ministério da Saúde; 2016 [cited 2020 Jun 1]. Available from: https://bvsmms.saude.gov.br/bvs/publicacoes/sintese_evidencias_politicas_tratamento_medicamentoso.pdf
11. Jankowska-Polańska B, Dudek K, Szymanska-Chabowska A, Uchmanowicz I. The influence of frailty syndrome on medication adherence among elderly patients with hypertension. *Clin Interv Aging* [Internet]. 2016 Dec 7 [cited 2021 Jun 21];11:1781–90. Available from: <https://doi.org/10.2147/CIA.S113994>
12. McQuaid EL, Landier W. Cultural issues in medication adherence: disparities and directions. *J Gen Intern Med* [Internet]. 2018 Feb [cited 2021 Jun 21];33(2):200–6. Available from: <https://doi.org/10.1007/s11606-017-4199-3>
13. Stirratt MJ, Curtis JR, Danila MI, Hansen R, Miller MJ, AnnGakumo C. Advancing the science and practice of medication adherence. *J Gen Intern Med* [Internet]. 2018 Feb [cited 2021 Jun 21];33(2):216–22. Available from: <https://doi.org/10.1007/s11606-017-4198-4>
14. Downton JH. Falls in the elderly. London (UK): Editora British Library Cataloguing in Publication Data; 1993.
15. Folstein MF, Folstein SE, McHugh PR. “Mini-mental state”. A practical method for grading the cognitive state of patients for the clinician. *J Psychiatr Res* [Internet]. 1975 Nov [cited 2020 Jun 1];12(3):189-98. Available from: [https://doi.org/10.1016/0022-3956\(75\)90026-6](https://doi.org/10.1016/0022-3956(75)90026-6)
16. Bertolucci PHF, Brucki SMD, Campacci SR, Juliano Y. O miniexame do estado mental em uma população geral: impacto da escolaridade. *Arq Neuropsiquiatr* [Internet]. 1994 Mar [cited 2020 Jun 1];52(1):1-7. Available from: <https://doi.org/10.1590/S0004-282X1994000100001>
17. Morisky DE, Green LW, Levine DM. Concurrent and predictive validity of a self-reported measure of medication adherence. *Med Care* [Internet]. 1986 Jan [cited 2020 Jun 1]; 24(1):67-74. Available from: <https://doi.org/10.1097/00005650-198601000-00007>
18. Dewulf NLS, Monteiro RA, Passos ADC, Vieira EM, Troncon LEA. Compliance to drug therapy in university hospital outpatients with chronic digestive diseases. *Rev Bras Cienc Farm* [Internet]. 2006 Dec [cited 2020 Jun 1];42(4):575-84. Available from: <https://doi.org/10.1590/S1516-93322006000400013>

19. Ben AJ, Neumann CR, Mengue SS. The brief medication questionnaire and morisky green test to evaluate medication adherence. *Rev Saúde Pública* [Internet]. 2012 Apr [cited 2020 Jun 1];46(2):279-89. Available from: <https://doi.org/10.1590/S0034-89102012005000013>
20. Rodrigues ARGM, Assef JC, Lima CB. Assessment of risk factors associated with falls among the elderly in a municipality in the state of Paraíba, Brazil. A cross-sectional study. *São Paulo Med J* [Internet]. 2019 Sep-Oct [cited 2020 Jun 1];137(5):430-7. Available from: <https://doi.org/10.1590/1516-3180.2018.0198120619>
21. Reis KMC, Jesus CAIC. Relationship of polypharmacy and polypathology with falls among institutionalized elderly. *Texto Contexto Enferm* [Internet]. 2017 [cited 2020 Jun 1];26(2):e03040015. Available from: <https://doi.org/10.1590/0104-07072017003040015>
22. Özlek E, Çekiç EG, Özlek B, Çil C, Çelik O, Doğan V, et al. Rationale, design, and methodology of the EPIC (Epidemiology of Polypharmacy and Potential Drug-Drug Interactions in Elderly Cardiac Outpatients) study. *Turk Kardiyol Dern Ars* [Internet]. 2019 Jul [cited 2020 Jun 1];47(5):391-8. Available from: <https://doi.org/10.5543/tkda.2019.27724>
23. Bromfield SG, Ngameni C-A, Colantonio LD, Bowling CB, Shimbo D, Reynolds K, et al. Blood pressure, antihypertensive polypharmacy, frailty, and risk for serious fall injuries among older treated adults with hypertension. *Hypertension* [Internet]. 2017 Aug [cited 2020 Jun 1];70(2):259–66. Available from: <https://doi.org/10.1161/HYPERTENSIONAHA.116.09390>
24. Margolis KL, Buchner DM, LaMonte MJ, Zhang Y, Di C, Rillamas-Sun E, et al. Hypertension treatment and control and risk of falls in older women. *J Am Geriatr Soc* [Internet]. 2019 Apr [cited 2020 Jun 1];67(4):726-33. Available from: <https://doi.org/10.1111/jgs.15732>
25. Smith AA, Silva AO, Rodrigues RAP, Moreira MASP, Nogueira JA, Tura LFR. Assessment of risk of falls in elderly living at home. *Rev Lat Am Enfermagem* [Internet]. 2017 Apr 6 [cited 2020 Jun 1];25:e2754. Available from: <https://doi.org/10.1590/1518-8345.0671.2754>
26. Abreu DPG, Santos SSC, Ilha S, Silva BT, Martins NFF, Varela VS. Behavioral factors associated to medication adherence in elderly in outpatient care. *Rev Enferm Cent-Oeste Min* [Internet]. 2019 [cited 2020 Jun 1];9:e3025. Available from: <https://doi.org/10.19175/recom.v9i0.3025>
27. Dillon P, Smith SM, Gallagher PJ, Cousins G. Association between gaps in antihypertensive medication adherence and injurious falls in older community-dwelling adults: a prospective cohort study. *BMJ Open* [Internet]. 2019 Mar 4 [cited 2021 Jun 25];9(3):e022927. Available from: <https://doi.org/10.1136/bmjopen-2018-022927>
28. Silva EO, Rezende AAA, Calábria LK. Socioeconomic aspects and falls in older adults served by the public health system. *Rev Bras Promoç Saúde* [Internet]. 2019 [cited 2020 Jun 1];32:9532. Available from: <https://doi.org/10.5020/18061230.2019.9532>
29. Bell HT, Steinsbekk A, Granas AG. Factors influencing prescribing of fall-risk-increasing drugs to the elderly: a qualitative study. *Scand J Prim Health Care* [Internet]. 2015 Jun [cited 2020 Jun 1];33(2):107-14. Available from: <https://doi.org/10.3109/02813432.2015.1041829>
30. Yu N-W, Chen P-J, Tsai H-J, Huang C-W, Chiu Y-W, Tsay W-I, et al. Association of benzodiazepine and Z-drug use with the risk of hospitalisation for fall related injuries among older people: a nationwide nested case–control study in Taiwan. *BMC Geriatr* [Internet]. 2017 Jul 11 [cited 2020 Jun 1];17(1):140. Available from: <https://doi.org/10.1186/s12877-017-0530-4>
31. Andersen CU, Lassen PO, Usman HQ, Albertsen N, Nielsen LP, Andersen S. Prevalence of medication-related falls in 200 consecutive elderly patients with hip fractures: a cross-sectional study. *BMC Geriatr* [Internet]. 2020 Mar 30 [cited 2020 Jun 1];20(1):121. Available from: <https://doi.org/10.1186/s12877-020-01532-9>
32. Arruda DCJ, Eto FN, Velten APC, Morelato RL, Oliveira ERA. Pharmacological non-adherence therapy and associated factors among elderly from a philanthropic outpatient unit of Espírito Santo state, Brazil. *Rev Bras Geriatr Gerontol* [Internet]. 2015 Jun [cited 2020 Jun 1];18(2):327-37. Available from: <https://doi.org/10.1590/1809-9823.2015.14074>

33. Monterroso LEP, Sá LO, Joaquim NMT. Adherence to the therapeutic medication and biopsychosocial aspects of elderly integrated in the home-based long-term care. *Rev Gaúcha Enferm* [Internet]. 2017 [cited 2020 Jun 1];38(3):e56234. Available from: <https://doi.org/10.1590/1983-1447.2017.03.56234>
34. Smajel A, Weston-Clark M, Raj R, Orlu M, Davis D, Rawle M. Factors associated with medication adherence in older patients: a systematic review. *Aging Med (Milton)* [Internet]. 2018 Dec [cited 2020 Jun 1];1(3):254–66. Available from: <https://doi.org/10.1002/agm2.12045>
35. Saqlain M, Riaz A, Malik MN, Khan S, Ahmed A, Kamran S, et al. Medication adherence and its association with health literacy and performance in activities of daily livings among elderly hypertensive patients in Islamabad, Pakistan. *Medicina (Kaunas)* [Internet]. 2019 May 18 [cited 2021 Jun 25];55(5):163. Available from: <https://doi.org/10.3390/medicina5505016>
36. Scortegagna HM, Santos PCS, Santos MIPO, Portella MR. Letramento funcional em saúde de idosos hipertensos e diabéticos atendidos na Estratégia Saúde da Família. *Esc Anna Nery Rev Enferm* [Internet]. 2021 [cited 2020 Jun 21];25(4):e20200199. Available from: <https://doi.org/10.1590/2177-9465-EAN-2020-0199>
37. Albuquerque NLS, Oliveira ASS, Silva JM, Araújo TL. Association between follow-up in health services and antihypertensive medication adherence. *Rev Bras Enferm* [Internet]. 2018 Nov-Dec [cited 2020 Jun 1];71(6):3006-12. Available from: <https://doi.org/10.1590/0034-7167-2018-0087>

NOTES

ORIGIN OF THE ARTICLE

Extracted from the dissertation – Assessing the risk of falls in older adults: Association among barriers to adherence to medication use and social support, presented to the Stricto-Sensu Graduate Program in Nursing at *Escola Paulista de Enfermagem, Universidade Federal de São Paulo*, in 2021

CONTRIBUTION OF AUTHORITY

Study design: Soares CR, Fukujima MM, Costa PCP, Neves VR, Rosa AS, Okuno MFP.

Data collection: Soares CR, Fukujima MM, Costa PCP, Neves VR, Rosa AS, Okuno MFP.

Data analysis and interpretation: Soares CR, Fukujima MM, Costa PCP, Neves VR, Rosa AS, Okuno MFP.

Discussion of the results: Soares CR, Fukujima MM, Costa PCP, Neves VR, Rosa AS, Okuno MFP.

Writing and/or critical review of the content: Soares CR, Fukujima MM, Costa PCP, Neves VR, Rosa AS, Okuno MFP.

Review and final approval of the final version: Soares CR, Fukujima MM, Costa PCP, Neves VR, Rosa AS, Okuno MFP.

APPROVAL OF ETHICS COMMITTEE IN RESEARCH

Approved by the Ethics Committee in Research with Human Beings of the *Universidade Federal de São Paulo*, opinion No.3,165,580/2019, Certificate of Presentation for Ethical Appreciation 03691418.3.0000.5505.

CONFLICT OF INTEREST

There is no conflict of interests.

EDITORS

Associated Editors: Natália Gonçalves, Monica Motta Lino.

Editor-in-chief: Roberta Costa.

HISTORICAL

Received: November 15, 2020.

Approved: October 19, 2021.

CORRESPONDING AUTHOR

Cristiane Regina Soares

crissoares31@yahoo.com.br