



Perception of elderly related to the risk of falls and their associated factors

Percepção de idosos relacionada ao risco de quedas e seus fatores associados

Percepción de adultos mayores relacionada con el riesgo de caídas y sus factores asociados

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ABSTRACT

Objective: To analyze the association of the perception of the elderly on the risk factors for falls. **Methods:** An Analytical cross-sectional study with 190 elderly from the Healthy Longevity Program of a public university in Mato Grosso, from May to August 2016. The collection was done through a structured interview and vignettes. Performed descriptive and bivariate analyzes - Pearson chi-square test (χ^2) significance level of 5%. The crude and adjusted prevalence ratios (PR), with confidence intervals (95%), were also estimated, followed by Poisson multiple regression. **Results:** Of the participants, 64.2% had a satisfactory perception about the risk factors for falls. The prevalence of unsatisfactory risk perception was 105% higher in those with income from 1 to 3 minimum wages, 75% higher in those with low risk of falls and 46% higher in those who did not attend another social group. **Conclusion and implications for the practice:** A significant proportion of the elderly have an unsatisfactory risk perception for the risk factors for falls associated with low income, not attending another social group and the low risk of falls. Knowledge about the risk perception of falls in the elderly helps nurses to plan and implement fall prevention programs for this population.

Keywords: Risk factors; Falls; Aged.

RESUMO

Objetivo: Analisar a associação da percepção de idosos sobre os fatores de risco de ocorrência de quedas. **Método:** Estudo transversal analítico com 190 idosos do Programa Longevidade Saudável, de uma universidade pública de Mato Grosso, no período de maio a agosto de 2016. A coleta ocorreu por entrevista estruturada e vinhetas. Realizaram-se análises descritiva e bivariada – teste de *qui-quadrado de Pearson* (χ^2) nível de significância de 5%. Também foram estimadas as razões de prevalências (RP) brutas e ajustadas, com intervalos de confiança (95%), seguidas pela regressão múltipla de *Poisson*. **Resultados:** Dentre os participantes, 64,2% apresentaram percepção satisfatória sobre os fatores de risco referentes a quedas. A prevalência de percepção de risco insatisfatória foi 105% maior naqueles com renda de 1 a 3 salários mínimos, 75% maior nos de baixo risco de quedas e 46% maior naqueles que não frequentam outro grupo social. **Conclusão e Implicações para a prática:** Parcela significativa de idosos possui percepção de risco insatisfatória para os fatores de risco de quedas associada a baixa renda, não frequentar outro grupo social e ao baixo risco de queda. O conhecimento sobre a percepção de risco de quedas dos idosos auxilia os enfermeiros no planejamento e implementação de programas de prevenção de quedas dessa população.

Palavras-chave: Fatores de risco; Quedas; Idoso.

RESUMEN

Objetivo: Analizar la asociación de la percepción de adultos mayores sobre los factores de riesgo para caídas. **Métodos:** Estudio analítico transversal con 190 participantes del Programa de Longevidad Saludable de una universidad pública en Mato Grosso, realizado entre mayo y agosto de 2016. Recolección realizada por entrevista estructurada y viñetas. Análisis descriptivo y bivariado – prueba *chi-cuadrado de Pearson* (χ^2) con nivel de significancia del 5%. También fueron estimadas razones de prevalencias (RP) brutas y ajustadas, con intervalos de confianza (95%), seguidas por la regresión múltiple de *Poisson*. **Resultados:** El 64,2% presentaron percepción satisfactoria sobre los factores de riesgo para caídas. La prevalencia de percepción de riesgo insatisfactoria fue un 105% mayor en aquellos con ingresos de 1 a 3 salarios mínimos, un 75% mayor en los de bajo riesgo y un 46% mayor en aquellos que no frecuentan otro grupo social. **Conclusión e Implicaciones para la práctica:** Proporción significativa de personas mayores tiene percepción insatisfactoria para los factores asociados a los bajos ingresos, no frecuentar otro grupo social y el bajo riesgo de caída. Tener conocimiento sobre la percepción de los mayores auxilia a los enfermeros en la planificación e implementación de programas de prevención de caídas de esa población.

Palabras claves: Factores de riesgo; Caídas; Anciano.

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INTRODUCTION

Approximately 28% to 35% of people around the world older than 65 years old fall every year and figures are even higher among those older than 70 years of age, from 32% to 42%¹. One study conducted in 70 cities located in different regions of Brazil reports a prevalence of falls of 25.1%. Of these, 1.8% resulted in hip or femur fractures and, among them, 31.8% required surgery with prosthetic replacement².

The factors contributing to falls among these individuals are well known and are related to the aging process (intrinsic factors), along with domestic and public physical environments (extrinsic factors) and the elderly individuals' behaviors¹. Behaviors result from decisions people make when facing a risk situation¹, which depend on the individual's perception of risk factors for falls.

Risk perception (RP) is how an individual interprets risks based on a set of beliefs, values, and life experiences, which gives meaning to each harmful event, as well as understanding of specific threats. Risk perception works as an organizing axis that guides decisions and behaviors before, during and after a risk situation³, though it may be altered among individuals with cognitive deficit³.

Studies show that falls among elderly individuals can be prevented if individuals, as well as health workers, family members and caregivers adopt certain measures, such as improving lighting, removing rugs around the home, using appropriate shoes, among other actions³⁻⁵. These measures, however, may not be effective if elderly individuals lack an appropriate perception of the presence of risk factors for falls in their daily activities.

Studies addressing RP have been conducted, especially in the fields of psychology, the agrarian sciences, economics, education, nutrition, and architecture, among others⁶⁻⁹. Studies in the health field have focused on communicable diseases such as HIV and hepatitis, occupational risks, cancer (breast, ovarian, lung), osteoporosis, and public health¹⁰⁻¹².

Thus, little is known about the perceptions of elderly individuals regarding risks. Studies¹³⁻¹⁶ show that these individuals are able to perceive risk factors. Despite available evidence, however, authors conclude that further studies addressing RP are needed to confirm results among other groups of elderly individuals and acquire new information regarding associated factors. This study's objective was to analyze associations of the perceptions of elderly individuals regarding risk factors for falls.

METHOD

Cross-sectional and analytical study conducted with individuals 60 years old or older, participating in the Healthy Longevity Program of a public university located in the state of Mato Grosso, Brazil. The program provides physical, cultural and educational activities to promote the health of elderly individuals.

All 306 elderly individuals enrolled in the program in 2016 were invited to participate. Of these, 20 refused, 83 left the program, and 13 did not meet the inclusion criteria – presenting

cognitive capacity according to the Mini Mental State Exam (MMSE)¹⁷ and establishing communication with the researcher in order to check understanding of questions. The final sample was 190 elderly individuals.

Data were collected from May to August 2016 after free and informed consent forms were signed. Sociodemographic data and the health conditions of the elderly individuals were obtained through an interview based on a questionnaire, conducted by the researcher and other previously trained assistants.

The perceptions of the elderly individuals regarding risk factors for falls were verified using vignettes, a technique that consists of a brief description of an event, fictitious or real, using narrations, images or videos¹⁸. The vignettes were developed according to three stages: (1) format and content were selected; (2) an instrument was developed to collect data based on the vignettes; and (3) the content of the vignettes was validated by judges.

Twelve vignettes portraying images of situations elderly individuals experience in their routines were used. Each situation presented various environmental and behavioral risk factors for falls (1 to 5 risk factors) (Chart 1). The vignettes were presented using a 10" portable computer.

This study's dependent variable was the perception of elderly individuals concerning risk factors for falls (elderly individuals RP), which was verified with the question: Is there a possibility for an elderly individual to fall in this situation/environment? In the absence of a reference to classify of RP of the elderly, we opted for an arbitrary classification. Since the vignettes presented various risk factors, we considered the individual had a satisfactory RP if s/he identified at least one risk factor in each vignette (totalizing 12) and unsatisfactory RP if s/he identified none or up to 11 risk factors for falls.

The independent variables include sociodemographic data and health conditions. The following sociodemographic information was addressed: sex (male/female); age (60 to 69 years old/70 to 79 years old/80 years old or older); marital status (single/married or in a consensual union/separated or divorced/widowed); years of schooling (illiterate/1 to 4 years/5 to 8 years/9 to 10 years/>11 years); occupational situation (employed/retired/retired but still working/unemployed); income (none/up to one times the minimum wage (MW)/from 2 to 3 times the MW/more than 3 times the MW); family arrangement (living alone/with spouse or partner/family member/spouse and a family member/non-family caregiver/other people); participate in a social group other than the HLP (yes/no); visits friends or relatives (yes/no); and receives visits (yes/no).

The variables related to health conditions include self-perceived health (very poor, poor, regular, good, very good); smoker (yes/no/former smoker); alcohol consumption (yes/no/sometimes); health problems (yes/no, if yes, how many? Which one(s); medications (yes/no); self-reported change of balance (yes/no); self-reported mobility difficulties (yes/no); exercises (yes/no). Degree of dependence for daily living activities (DLA)

Chart 1. Description of risk factors included in each vignette presented to the elderly individuals attending the Healthy Longevity Program. Cuiabá, MT, Brazil – 2016.

Vignettes	Risk factors for falls	Number of RF per vignette	Minimum number of perceived risk factors
01	Sofa foot, rug, slick floor.	03	02
02	Steps, not using handrail, carrying weight when climbing a stair	03	02
03	Uneven sidewalk	01	01
04	Inappropriate slippers, slick floor	02	01
05	Objects scattered on the floor, rug	02	01
06	Climbing a stair without a safety device	02	01
07	Slick floor, climbing on a bench, using inappropriate slippers	03	02
08	Toys scattered on the floor, children around, rug	03	02
09	Wet and uneven floor, a hose, washing the sidewalk wearing inappropriate slippers.	05	03
10	Vases on stairs, inappropriate lighting, misuse of cane, rug on stairs, steps	05	03
11	Climbing the steps of a bus, uneven sidewalk, carrying weight when climbing steps	03	02
12	Drinking alcohol	01	01
Total		33	21

Source: Developed by the researcher, 2016.

was also assessed using the Katz Index¹⁷ and Lawton and Brody's Lawton Instrumental Activities of Daily Living Scale.¹⁷

Risk for falls was assessed using the Falls Risk Score¹⁹ and history of falls was verified through the following questions: any fall in the last 12 months? (yes/no, if yes, how many?); consequences of falls(s)? (abrasions/bruises/fractures/sprains). Fear of falling was assessed using Falls Efficacy Scale International-FES-I²⁰

Data were coded and double-entered into spreadsheets in Epi-Info, version 3.2.5. Descriptive analysis was performed using relative and absolute frequency. Pearson's Chi-square test was used in the bivariate analysis with significance level set at 5% to identify associations between the dependent variable and independent variables. Prevalence, raw and adjusted prevalence ratios (PR) were estimated, as were the respective confidence intervals (95%) regarding the perceptions of elderly individuals of environmental and behavioral risk factors for falls. Afterwards, Poisson's multiple regression was performed with robust variance using the stepwise forward method. Only the variables presenting $p < 0.20$ in the bivariate analysis were considered in the final multiple model, adjusted for sex, age and sensorial problems.

The study was approved by the Institutional Review Board at the Júlio Muller University Hospital (Opinion report 1.375.300/2015).

RESULTS

Most elderly individuals were women (90.5%), aged between 60 and 69 years old (67.3%), had more than 11 years of schooling (58.9%) and a large share of the individuals were married (36.2%).

In terms of occupational situation, most (51.5%) were retired and 36.9% had a monthly income from 2 to 3 times the minimum wage. More than half (57.4%) take part in a social group other than the HLP; 91.1% have the habit of visiting friends and relatives and also receive visits (93.7%).

Table 1 presents the health conditions of the elderly participants.

In regard to the prevalence of the perception of the elderly individuals regarding environmental and behavioral risk factors for falls, most (64.2%) presented satisfactory RP.

Considering the prevalence of unsatisfactory RP of the elderly in relation to the risk factors for falls in this study, the bivariate analysis between unsatisfactory RP and sociodemographic variables revealed a significant association with the variables: years of schooling ($p < 0.001$), occupational situation ($p = 0.048$) and monthly income ($p = 0.004$) (Table 3). Notes:

A significant association between unsatisfactory RP of the elderly and risk for falls ($p = 0.022$) was found, while no statistically significant association was found between unsatisfactory RP and health conditions.

Regardless of the risk for falls, whether the individual participates in another social group or not, his/her sex or age, or whether the individual reports sensorial problems or not, the final multiple model shows that the prevalence of RP unsatisfactory was 105% greater among those with an income from 1 to 3 times the minimum wage than among those with higher incomes (3 or more times the MW) (Table 3).

The prevalence of RP unsatisfactory was 75% greater among individuals with a low risk for falls, compared to those at a high

Table 1. Distribution of elderly individuals participating in the Healthy Longevity Program at the UFMT, according to health conditions. Cuiabá, MT, Brazil – 2016.

Variables	Frequency (n)	Percentage (%)
Health self-assessment*		
Poor	5	2.6
Regular	60	31.6
Good	93	49.0
Very good	32	16.8
Smoker		
Yes	3	1.6
No	150	78.9
Former smoker	37	19.5
Consumes alcohol		
Yes	6	3.2
Sometimes	59	31.1
No	125	65.8
Health Problems		
Yes	187	98.4
No	3	1.6
Number of health problems**		
One health problem	20	10.7
Two health problems	46	24.6
More than two health problems	121	64.7
Self-reported health problems***		
Sensorial ¹	166	88.8
Hypertension	118	63.1
Osteoarticular ²	68	36.4
Back problems	41	21.9
Degenerative diseases ³	2	1.1
Dyslipidemia	51	27.3
Diabetes	25	27.3
CHF	2	1.1
Urinary incontinence	41	21.6
Others	84	44.2
Uses medication		
Yes	171	90.0
No	19	10.0
Self-reported balance status		
Yes	45	23.7
No	145	76.3
Self-reported difficult mobility		
Yes	22	11.6
No	168	88.4
Exercises		
Yes	182	95.8
No	8	4.2
Level of dependence for DLA and IDLA****		
Independent	190	100.0
Dependent	0	0.0

Notes: *Classification according to VIGITEL (2014). ** n=187 (refers to individuals with health problems). ***Multiple choice questions 1 Sensorial: eyesight, hearing, tactile or smell; 2 Osteoarticular conditions: arthritis, arthrosis, osteoporosis or rheumatism; 3 Degenerative diseases: Alzheimer or Parkinson. ****Among all the elderly individuals, n= 41 (presented urinary incontinence) and, in regard to DLA, were considered independent for all activities but one (had occasional “accidents” – urine or feces loss) but were considered totally independent regardless.

Table 2. Distribution of elderly individuals participating in the Healthy Longevity Program at the UFMT according to history of falls, risk for falls, and fear of falling. Cuiabá, MT, Brazil – 2016.

Variables	Frequency (n)	Percentage (%)
Self-reported falls in the last 12 months		
Yes	41	21.6
No	149	78.4
Numbers of self-reported falls		
One fall	21	51.3
Two falls	14	34.1
More than two falls	6	14.6
Self-reported consequences from fall**		
	16	38.9
Bruise	14	34.1
Fracture	5	12.2
Sprains	4	9.8
Risk for falls (Fall Risk Score)		
Low risk for falls	99	52.1
High risk for falls	91	47.9
Fear of falling (FES-I-BRAZIL)		
Little worried about falling	113	59.5
Very worried about falling	54	28.4
Extremely worried about falling	23	12.1

Notes: *n=41 (refer to individuals who have fallen). **n=35 (refer to individuals who experienced consequences after falls. Multiple choice question).

risk for falls and 46% greater among those who do not participate in a social group other than the HLP, regardless of the remaining associated variables, such as sex, age, or whether the individual reported sensorial problems. A goodness-of-fit test was performed and showed the model is appropriate ($p=0.1972$) (Table 4).

DISCUSSION

Because this study addressed elderly individuals composing a specific group, and considering that RP is a subjective variable, susceptible to different conceptions of risk for falls, these results cannot be generalized. The findings, however, expand knowledge about one of the aspects that influence the frequency of falls among elderly individuals and how to prevent them.

The higher frequency of satisfactory RP identified in this study reinforce results reported by other studies¹³⁻¹⁶ showing that elderly individuals are generally aware of risks for falls. It may be considered a good result because it suggests there is greater possibility of preventing falls among elderly individuals.

The frequency of unsatisfactory RP, however, is of concern and has important implications. The lower the level of an individual's risk perception, the more likely s/he is to come to harm²¹, that is, these individuals are more likely to expose themselves to risks as they fail to perceive them.

The participants' unsatisfactory RP is possibly explained by the way they assessed the risks presented in the vignettes. Some authors argue that the conception of risk is inherently subjective; that is, risk's interpretation depends on how each individual, in his/her judgment process, analyzes and considers various

elements, such as one's experience, knowledge, potential harm, meanings, and values, among others²²⁻²³. RP is directly linked to the way people think, represent, classify or analyze the various forms of threats (risks) to which they are exposed or of which they are aware²².

In this sense, it may be that the RP of the individuals addressed in this study in regard to the risk factors presented in the vignettes was influenced by individual characteristics. That is, these individuals were young, independent, self-assessed their health as good, had a history of few falls, and were not very concerned over falls. Elderly individuals with these characteristics are less likely to perceive risk factors for falls as being a risk for them, as they do not identify themselves as being at a greater risk to fall. One study conducted in Australia reports that the individuals identified themselves as "someone who does not fall", a strategy to protect themselves from being viewed as physical incompetents²⁴.

The association found in this study between unsatisfactory RP and low income seems to be coherent, as income is a determinant factor in peoples' living and health conditions. One study shows that low income hinders one's access to health services and influences one's level of information²⁵.

Inadequate knowledge or the lack of knowledge coupled with an unfavorable financial situation generally leads people to expose themselves more frequently to risk situations²⁶. One study conducted in Rio Grande do Sul, Brazil shows that people with lower income less frequently perceived risks compared to

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Table 3. Prevalence of the perceptions of elderly individuals participating in the Healthy Longevity Program at the UFMT regarding environmental and behavioral risk factors for falls, according to sociodemographic variables Cuiabá, MT, Brazil – 2016

Variables	n*	Prevalence (%)	p-value**
Female	63	36.6	0.456
Male	5	27.8	
Age group			
60 – 69 years old	47	36.7	0.196
70 – 79 years old	17	30.4	0.196
80 years old or older	4	66.7	
Marital status			
Single	5	23.8	0.060
Married or stable union	21	30.4	
Separated or divorced	14	31.8	
Widowed	28	50.0	
Years of schooling			
1 to 4 years	22	64.7	<0.001
5 to 8 years	14	41.2	
9 to 10 years	7	70.0	
>11 years	25	22.3	
Occupational situation			
Retired	31	31.6	0.048
Working	6	42.9	
Retired but still working	1	6.7	
Pensioner	14	56.0	
Retired and pensioner	8	50.0	
Pensioner and working	2	28.6	
Unemployed	6	40.0	
Monthly income			
One to 3 times the minimum wage	55	42.4	0.004
More than 3 times the minimum wage	13	21.3	
Family arrangement			
Living alone	16	32.7	0.489
Spouse or partner	9	29.0	
Family (Spouse + family member)	12	32.4	
Family (Only family members, no spouse/partner)	31	42.5	
Visits friends/relatives			
Yes	33	30.3	0.066
No	35	43.2	
Visits friends/relatives			
Yes	61	35.3	0.627
No	7	41.2	
Receives visits from friends/relatives			
Yes	63	35.4	0.661
No	5	41.7	

Notes: n=68 – refer to all elderly individuals with unsatisfactory RP of risk factor for falls; **Chi-square test.

Table 4. Poisson's Multiple Regression Model: variables associated with unsatisfactory perception of environmental and behavioral risk factors for falls among individuals in the Healthy Longevity Program at UFMT. Cuiabá, MT, Brazil – 2016.

Variables	Prevalence (%)	Raw PR (IC95%)	Adjusted PR* (IC95%)	p-value
Income				
One to 3 times the minimum wage	42.4	2.00 (1.19-3.38)	2.05 (1.23-3.41)	0.006
More than three times the minimum wage	21.3	1.00	1.00	
Risk for falls				
Low risk for falls	43.4	1.58 (1.06-2.37)	1.75 (1.16-2.66)	0.008
High risk for falls	27.5	1.00	1.00	
Participates in other social group(s)				
Yes	30.3	1.00	1.00	0.042
No	43.2	1.43 (0.98-2.09)	1.46 (1.01-2.11)	

Notes: *Adjusted for sex, age and sensorial problems; PR: prevalence ratio; CI 95%: confidence interval of 95%.

those with higher incomes, and also tended to get involved with risk behavior more frequently²⁷.

Another association with unsatisfactory RP was found with the variable of not participating in a social group other than the HLP. A potential explanation is that those individuals with unsatisfactory RP less frequently attend extra-home activities. One study shows that participation in social groups may influence the RP of people; that is, an individual who is socially and culturally diverse is strongly influenced by more varied individual and emotional factors, as they have contact with more varied experiences and information transmitted in the milieu where they are inserted²⁸. Taking part in social groups may lead individuals to either underestimate or overestimate the risks to which they are exposed.

This study's elderly individuals with unsatisfactory RP tend to remain at home, less regularly interact with their peers and health workers who organize groups or programs directed to this specific population. Therefore, they are less likely to obtain information that is relevant to their health through an exchange of experiences and observations with other elderly individuals and health workers.

The items assessed in the *Fall Risk Score* (history of falls, use of medications, sensorial deficit, cognitive and gait changes) may explain the association between low risk for falls and unsatisfactory RP. These individuals presented a history of few falls and this fact may influence RP. One study addressing elderly individuals with a low perception of risk for falls were less likely to fall because they had not fallen before²⁹.

Additionally, we can infer that elderly individuals who do not use medications that contribute to the occurrence of falls, do not present sensorial deficits, or significant gait or cognitive problems, do not consider the risk factors present in their environments or their behaviors as being risky.

A similar result is reported by a study conducted with elderly individuals in Australia. The group presenting a low perception of risks did not consider themselves to be at risk of falling. These

individuals had a more active lifestyle, presented a lower rate of falls, and used a smaller amount of psychotropic medications²⁹.

CONCLUSIONS

A higher prevalence of satisfactory RP was found in this study and it may be considered a good result, as it increases the probability of these individuals adopting preventive measures. There is, however, a large portion of these elderly individuals who present unsatisfactory RP of risk factors for falls. This result is significantly associated with low income, not being part of a social group other than the HLP, and low risk for falls.

These findings contribute to knowledge of falls among elderly individuals and indicate the need for health workers, especially nurses, to assess the RP of elderly individuals regarding risk factors to which they are daily exposed to implement preventive measures.

Additionally, future studies are needed to investigate other aspects influencing the perception of risk factors for falls among elderly individuals using the technique of vignettes as an innovative methodological resource. This resource facilitates the collection of subjective data such as one's own and others' perceptions, which can favor proposing preventive strategies that are meaningful within the context experienced by these individuals, thus encouraging greater adherence on the part of these individuals to preventive measures.

To complement these findings, studies addressing the RP of risk factors for falls among groups of elderly individuals with different characteristics (e.g., 80 years old or older) are also suggested.

This study's limitation lies on the fact that the individuals addressed here belong to a specific group attending a program, which hinders the possibility of generalizations. The results, however, do reveal aspects concerning this population's risk perceptions that enable improved knowledge of what these individuals understand about falls.

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