



Behavior of falls and associated factors in older adults

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ABSTRACT

Introduction: population aging increases the prevalence of falls in older adults, constituting a multifactorial geriatric syndrome with serious physical, psychological, and social repercussions.

Objective: to describe the behavior of falls and associated factors in older adults treated at the Dr. León Cuervo Rubio Teaching Clinical Surgical Hospital, Pinar del Río, between 2024 and 2025.

Methods: observational, descriptive, cross-sectional study conducted on a sample of 128 older adults selected through simple random probability sampling, after verifying compliance with the selection criteria. A data collection form was applied, and statistical analysis was performed, respecting medical ethics.

Results: female sex (60,9 %) and the 60-65 age group (50,0 %) predominated. The most frequent intrinsic factors were the use of psychotropic drugs or central nervous system depressants (68,0 %) and the presence of osteomyoarticular conditions (64,8 %). Among extrinsic factors, structural housing problems stood out (61,7 %), with 41,4 % presenting a high risk of accidents. A total of 50,8 % of participants suffered falls; fractures (56,9 %), fear of falling again (58,5 %), and voluntary reduction of physical activity (58,5 %) were the main consequences.

Conclusions: a high exposure to intrinsic and extrinsic fall risk factors was observed, with female predominance and high risk of accidents at home. The physical, psychological, and social consequences demonstrate the need to strengthen preventive actions to promote safe and healthy aging.

Keywords: Accidental Falls; Aged; Aging; Risk Factors.

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INTRODUCTION

Population aging constitutes one of the most relevant demographic phenomena of the 21st century, with profound social, economic, and health repercussions. According to the World Health Organization (WHO), by 2030 one in six people in the world will be 60 years or older, while by 2050 the population of this age group will reach 2,100 million individuals, doubling the figure recorded in 2020.⁽¹⁾ This process occurs especially rapidly in low- and middle-income countries, where health systems face the challenge of adapting to the increase in chronic diseases, disabilities, and long-term care needs. Likewise, the sustained increase in life expectancy has turned aging into a priority for global public health, driving strategies aimed at guaranteeing an active, healthy, and functional old age.⁽²⁾

Cuba constitutes one of the most aged countries in Latin America and the Caribbean. Recent data from the National Office of Statistics and Information (ONEI) show that at the close of 2024, people aged 60 and over represented 25,7 % of the Cuban population, a figure that widely exceeds the 20,4 % reported in 2018.⁽³⁾ This behavior responds to the combination of sustained low fertility, increased life expectancy, and migratory processes that have reduced the population in productive ages. Demographic projections indicate that aging will continue to intensify over the coming decades, which will increase the demand for health, rehabilitation, and social support services aimed at older adults (OA).⁽⁴⁾

The increase in the long-lived population is associated with a higher prevalence of chronic non-communicable diseases, frailty, functional deterioration, and geriatric syndromes, among which falls occupy a prominent place due to their frequency and severity.⁽⁵⁾ The WHO recognizes falls as the second leading cause of death from unintentional injuries worldwide and estimates that around 684,000 people die annually from this cause, while more than 37 million suffer falls severe enough to require medical attention.⁽⁶⁾ The consequences especially affect people over 60 years of age, who present the highest rates of mortality and disability related to this event.

Falls in OA constitute a complex and multifactorial geriatric syndrome, the result of the interaction between biological, functional, environmental, and social factors. Various international studies collected in the systematic review developed by Li et al.,⁽⁷⁾ indicate that between 30 % and 40 % of older people living in the community experience at least one fall each year, a proportion that increases significantly in those over 80 years of age and in those residing in long-term care institutions. Additionally, the history of a fall increases the risk of new episodes, favoring the appearance of functional dependence, loss of autonomy, and deterioration of quality of life.

The repercussions of falls transcend immediate physical damage. Fractures, especially hip fractures, represent one of the most serious complications due to their association with permanent disability, institutionalization, and increased mortality during the first year after the traumatic event. To this are added psychological consequences such as fear of falling again, anxiety, depression, and voluntary restriction of daily activities. From the social perspective, falls generate a significant burden for families, caregivers, and health systems due to the increase in hospitalizations, prolonged rehabilitation, and demand for permanent care.⁽⁸⁾

Recent scientific evidence identifies numerous risk factors associated with falls, among them balance and gait disorders, muscle weakness, sarcopenia, visual alterations, cognitive deterioration, polypharmacy, and a history of previous falls. Likewise, environmental factors play a determining role, highlighting the presence of architectural barriers, insufficient lighting, slippery surfaces, and homes not adapted to the needs of older people. The multifactorial nature of this problem demands comprehensive interventions aimed at both individual conditions and the environment in which the OA develops.⁽⁹⁾

In line with the Decade of Healthy Aging 2021-2030 promoted by the WHO and PAHO, fall prevention is currently considered one of the priority strategies to preserve the functional capacity and independence of OA. In a context such as the Cuban one, characterized by accelerated population aging and a growing demand for geriatric care, it is essential to deepen the study of risk factors associated with falls and develop effective preventive actions that contribute to reducing their incidence and consequences.⁽¹⁰⁾ Taking into account the above, the present study was conducted, which aimed to describe the behavior of falls and associated factors in OA treated at the Dr. León Cuervo Rubio Teaching Clinical Surgical Hospital, Pinar del Río, between 2024 and 2025.

METHODS

An observational, descriptive, cross-sectional study was conducted in OA treated at the Dr. León Cuervo Rubio Teaching Clinical Surgical Hospital, in Pinar del Río province, between 2024 and 2025.

The study population consisted of 331 OA treated at said institution. The sample consisted of 128 participants selected through simple random probability sampling, who met the inclusion criteria (OA, physically and mentally fit to respond to the instruments applied and who expressed their willingness to participate in the research) and exclusion criteria (OA with terminal illness).

The information was obtained through the application of a data collection form prepared by the researchers. Information collection was carried out through direct interview with patients and companions, being complemented with data collected in the clinical history. The variables studied included:

- Age (60-65, 66-70, 71-75, 76-80, > 80)
- Sex (male, female)
- Intrinsic risk factors (visual deficit, auditory deficit, balance and gait disorders, osteomyoarticular conditions, use of psychotropic drugs or other central nervous system depressants)
- Extrinsic risk factors (insufficient lighting, structural housing problems, poorly protected electrical sources, objects on the floor, poor condition of public roads, inappropriate footwear and clothing)
- Risk of accidents (low risk, medium risk, high risk)
- Presence of falls
- Consequences of the fall (physical [fractures, cranioencephalic trauma, soft tissue injury, loss of functional capacity], psychological [fear of falling again, loss of confidence and self-esteem, anxiety and/or depression, voluntary reduction of physical activity], social [decreased participation in family and community activities, social isolation, greater dependence on family members or caregivers, loss of autonomy and independence])

The degree of accident risk was classified as low risk when three or fewer risk factors were identified, medium risk when between four and six factors were detected, and high risk when seven or more factors were identified. This categorization allowed stratifying the vulnerability of the OA.

Statistical processing

The information collected was incorporated into a database designed for the study. Statistical processing was performed using the Statistical Package for the Social Sciences (SPSS) program, version 21.0, complemented with Microsoft Excel 2013 for data organization and preparation of tables and graphs. Descriptive statistics were used through absolute and relative frequency distributions, percentages, and summary measures for the characterization of the studied variables.

Ethical considerations

The Scientific Council and the Ethics Committee of the institution were consulted for the execution of the study, receiving approval from both. Each participant was informed of the confidentiality to which the data and results obtained during the stages in which it was developed would be subjected. Each patient was also informed of the objectives and characteristics of the study, and their written informed consent was requested to participate in it.

RESULTS

Table 1 shows the distribution of the OA participating in the study, with a predominance of the female sex (60,9 %). The most representative age group was 60-65 years (50,0 %), followed by 66-70 years (25,0 %).

Table 1. Distribution of older adults with accidents according to age and sex.

Age	SEX				Total	
	Male		Female			
	No.	%	No.	%	No.	%
60-65	22	44,0	42	53,8	64	50,0
66-70	15	30,0	17	21,8	32	25,0
71-75	8	16,0	10	12,8	18	14,1
76-80	3	6,0	5	6,4	8	6,3
> 80	2	4,0	4	5,1	6	4,6
Total	50	39,1	78	60,9	128	100

In the studied sample (Table 2), several intrinsic factors predominated: the use of psychotropic drugs or other central nervous system depressants (68,0 %), osteomyoarticular conditions (64,8 %), and balance and gait disorders (39,1 %), with greater presence in the female sex. Regarding extrinsic factors, structural housing problems stood out (61,7 %), the presence of objects on the floor (51,5 %), and the use of inappropriate footwear or clothing (48,4 %).

Table 2. Distribution of the sample according to presence of intrinsic and extrinsic risk factors.

Risk factors		SEX				Total	
		Male		Female			
		No.	%	No.	%	No.	%
Intrinsic	Visual deficit	17	34,0	34	43,6	51	39,8
	Auditory deficit	6	12,0	12	15,4	18	14,1
	Balance and gait disorders	18	36,0	40	51,3	58	39,1
	Osteomyoarticular conditions	31	62,0	52	66,7	83	64,8
	Use of psychotropic drugs or other central nervous system depressants	33	66,0	54	69,2	87	68,0
Extrinsic	Insufficient lighting	20	40,0	32	41,0	52	40,6
	Structural housing problems	35	70,0	44	56,4	79	61,7
	Poorly protected electrical sources	9	18,0	18	23,1	27	21,1
	Objects on the floor	27	54,0	39	50	66	51,5
	Poor condition of public roads	17	34,0	25	32,0	42	32,8
	Inappropriate footwear and clothing	38	76,0	24	30,7	62	48,4

The classification of the degree of accident risk at home showed a predominance of OA with high risk (41,4 %), followed by medium risk (32,0 %). High risk was more frequent in the female sex (44,1 %) than in the male sex (37,3 %), while medium risk presented similar percentages between both sexes.

A total of 50,8 % of the OA suffered falls; Table 3 shows their consequences. The results suggest that the main consequences of falls were fractures (56,9 %), fear of falling again (58,5 %), and voluntary reduction of physical activity (58,5 %). Among the social repercussions, loss of autonomy and independence stood out (47,7 %) and dependence on family members or caregivers (44,6 %).

Table 3. Consequences of falls.

Consequences		Sex				Total	
		Male		Female			
		No.	%	No.	%	No.	%
Physical	Fractures	12	48,0	25	62,5	37	56,9
	Cranioencephalic trauma	3	12,0	4	10,0	7	10,8
	Soft tissue injury	9	36,0	8	20,0	17	26,2
	Loss of functional capacity	8	32,0	18	45,0	26	40,0
Psychologic al	Fear of falling again	11	44,0	27	67,5	38	58,5
	Loss of confidence and self-esteem	8	32,0	19	47,5	27	41,5
	Anxiety and/or depression	6	24,0	15	37,5	21	32,3
	Voluntary reduction of physical activity	13	52,0	25	62,5	38	58,5
Social	Decreased participation in family and community activities	7	28,0	16	40,0	23	35,4
	Social isolation	5	20,0	11	27,5	16	24,6
	Greater dependence on family members or caregivers	8	32,0	21	52,5	29	44,6
	Loss of autonomy and independence	9	36,0	22	55,0	31	47,7

DISCUSSION

A female predominance is observed among the OA, a finding consistent with multiple population and institutional studies that describe a higher frequency of falls and fall-related injuries in older women.^(11,12) This greater female representation has also been documented in broad reviews, although the literature warns that sex differences are not uniform in all contexts and that part of the variability depends on the type of event analyzed, the setting, and the operational definition of fall or accident.⁽¹³⁾

Regarding age, although in this series the 60-65 age group predominated, international evidence shows that the risk of falls and of hospitalization or death related to them tends to increase as age advances, especially from 80 years of age.⁽¹⁴⁾ This suggests that the greater concentration of cases in the younger groups of the OA in this study probably reflects the age structure of the sample or the catchment area, rather than a lesser relevance of risk in the oldest.

In the studied sample, the use of psychotropic drugs or central nervous system depressants, osteomyoarticular conditions, and balance and gait disorders predominated as intrinsic factors, with greater presence in women. This pattern is consistent with reviews that identify polypharmacy, the use of benzodiazepines, antidepressants, and antipsychotics, as well as gait and balance disorders, among the most solid predictors of falls in old age; Ambrose et al.,⁽¹⁵⁾ highlight these results.

The high frequency of osteomyoarticular conditions also constitutes a key element in this age group. Yang et al.,⁽¹⁶⁾ describe that musculoskeletal disorders and osteoporosis deteriorate stability, which translates into worse physical performance and increases the risk of falls in both sexes.

The female predominance observed in several intrinsic factors is congruent with international evidence, which shows a higher frequency of falls in older women, although some specific factors may vary by sex. Kakara et al.,⁽¹¹⁾ reported a higher proportion of non-fatal falls in women, and studies in Australia and Europe also describe higher female incidence or prevalence.^(17,18)

Regarding extrinsic factors, the predominance of structural housing problems, objects on the floor, and inappropriate clothing or footwear coincides with studies that recognize environmental risks in the home as relevant determinants of falls. Alabdullgader and Rabbani,⁽¹⁹⁾ point out that insufficient lighting, unevenness, and unsafe interior design increase the risk.

The predominance of OA with high risk of accidents at home is consistent with the literature that describes the home as the main setting for falls and injuries in old age, with concentration of events in interior spaces and sustained exposure to domestic hazards.^(20,21) This result is plausible because home risks accumulate through the interaction between functional limitations, need for help in instrumental activities, and environmental barriers, factors that raise the probability of injury even when the analysis by sex does not reach statistical significance, as specified by Muneera et al.⁽²²⁾

Although high risk was more frequent in women, the absence of statistical association between sex and risk in this sample is compatible with more nuanced evidence. In this regard, López-Soto et al.,⁽²³⁾ show that these differences depend on the context, the type of injury, and the predominant hazards.

The results show a profile of physical and functional consequences coherent with the literature on falls in OA, especially due to the high frequency of fractures. Global guidelines indicate that falls are associated with morbidity, disability, hospitalization, institutionalization, and mortality.⁽⁵⁾ Concordantly, a recent clinical review summarizes that one in five falls in older adults causes a fracture or cranial trauma, confirming that serious injury is one of the main sequelae of the event. In older women who had suffered falls, bone fractures were reported in 23,3 %, which reinforces that fracture is a frequent consequence, although its magnitude depends on the care context and the frailty profile of the sample.⁽²⁴⁾

The fear of falling again and the voluntary reduction of physical activity observed in this series also coincide with consistent findings. Fear of falling has been reported by Miri and Norasteh,⁽⁸⁾ who detail how women present higher percentages of occurrence. At a longitudinal level, this fear acts independently on functional limitation: it increased the risk of limitations in mobility, self-care, and domestic activities, with magnitudes comparable to those of multiple previous falls. Taken together, the evidence suggests that the fall not only injures, but triggers a circle of avoidance, inactivity, and functional deterioration.⁽²⁵⁾

The social repercussions described, such as loss of autonomy and dependence on family members or caregivers, are also well supported. A longitudinal analysis showed that the onset of falls was associated with lower perceived autonomy, regardless of sex, age, and education.⁽²⁶⁾ Another study found that falls were associated with a 42 % higher risk of deterioration in activities of daily living, and that in a relevant part of the older adults that deterioration persisted for years.⁽²⁷⁾

CONCLUSION

The results allowed concluding that the studied OA presented a high exposure to risk factors associated with falls, with a predominance of the female sex. Multiple intrinsic and extrinsic factors related to their occurrence were identified, among which the consumption of psychotropic drugs, osteoarticular conditions, and unfavorable conditions of the home environment stood out. Likewise, an important proportion of OA with high risk of accidentality was confirmed, which increases their vulnerability to suffering injuries and functional limitations. Its consequences evidence the need to strengthen prevention actions, health education, and adaptation of environments to favor safer and healthier aging.

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