

Falls and Fall Prevention in the Elderly

The Jamaican Perspective

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ABSTRACT

Falls in the elderly may precipitate adverse physical, medical, psychological, social and economic consequences and are an issue of concern in both developed and developing countries. In Jamaica, there are no epidemiological studies on falls in the elderly though there is evidence to suggest that it is an issue that warrants some attention. This paper, through the use of quantitative and qualitative methods, provides insights on falls in the elderly in Jamaica. Through literature reviews, review of medical records, and conducting focus group interviews, perspectives were gleaned on falls in elderly persons in Jamaica. Contributory risk factors and perceptions, and costs were explored, as were any existing fall prevention policies or policy thrusts. The emerging picture is that falls are not a rare occurrence among older persons in Jamaica and extrinsic factors such as poor road surfaces, poorly constructed steps and poor design of public transportation vehicles are factors that contribute to falls. Similarly, intrinsic factors related to co-morbid conditions such as hypertension, diabetes mellitus and sensory impairment appear to also contribute to increased risk of falling.

Caídas y Prevención de las Caídas de los Ancianos

Una Perspectiva Jamaicana

K James, D Eldemire-Shearer, J Gouldbourne, C Morris

RESUMEN

Las caídas de los ancianos pueden tener consecuencias físicas, médicas, psicológicas, sociales y económicas adversas, y constituyen un asunto de preocupación tanto en los países desarrollados como en los países en vías de desarrollo. En Jamaica no existen estudios epidemiológicos sobre las caídas de los ancianos, aunque hay evidencias que sugieren que es un problema que merece atención. El presente trabajo, a través del uso de métodos cuantitativos y cualitativos, ofrece percepciones que se adentran en el problema de las caídas de ancianos en Jamaica. Mediante revisiones de la literatura, escrutinio de las historias clínicas, y entrevistas de grupos de foco, se derivaron perspectivas sobre las caídas de ancianos en Jamaica. Se exploraron los factores de riesgo, las percepciones y los costos, así como la impulsión de políticas y las directrices existentes en relación con la prevención de caídas. El cuadro emergente indica que las caídas no son una ocurrencia rara entre las personas mayores en Jamaica, y que factores extrínsecos tales como superficies pobres de las carreteras, escalones mal construidos, y pobre diseño de los vehículos de transporte público, contribuyen a las caídas. De modo similar, factores intrínsecos relacionados con las condiciones co-mórbidas – tales como la hipertensión, la diabetes mellitus y los trastornos sensoriales – parecen contribuir también al aumento del riesgo de caídas.

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INTRODUCTION

Falls and their consequences are one of the four “giants” of geriatric medicine recommended for screening and management by healthcare professionals in the older population (1). A fall can be defined as “unintentionally coming to rest on the ground or other lower level with or without loss of consciousness” (2). Age-related changes and disease both

have an impact on an older person's ability to balance. Similarly, cognitive impairment, various medications and changes in a person's environment all contribute to increased risk of falling (3). Falls in the elderly are a public health and community problem with adverse physical, medical, psychological, social and economic consequences. These include disability and deformity, fear of repeated falls, curtailment of routine social activities, direct costs of medical care associated with injuries and loss of potential income. Yet little attention has been paid to the problem and falls are not routinely screened for in the geriatric population (over 60 years) (4). Fall prevention is an assessment category specific to the elderly.

Current literature suggests that the problem is of concern in both the developed and the developing world. In Australia and the United States of America (USA), it is estimated that about a third of the elderly living in the community experience at least one fall annually (3, 5). Gillespie (2004) citing studies from the USA corroboratively asserts that more than 30% of people aged 65 years or older living in the community fall each year and that the risk of falling increases with age (6). Statistics from Ontario, Canada, indicate that one-third to one-half of persons over 65 years old are prone to falling, with falls being more common in older females (7).

From the developing world, data are emerging which suggest that falls in the elderly are an increasing problem and of significant public health concern. Falls in the elderly in China have been described as a common complication in social life (8). Based on a prospective cohort study in Hong Kong among older adults, the prevalence and incidence of falls were determined to be 19.3% per year and 270 per 1000 person-years respectively; with recurrent falls happening in 4.75% of Chinese older adults every year (9). In Africa, one population-based survey from Tanzania that examined the injury morbidity in an urban and a rural setting indicated that in persons over 60 years old, falls accounted for about 35% of reported injuries in both settings (10). In Latin America and the Caribbean, analysis of data from the SABE (*Salud, Bienestar y Envejecimiento en América Latina y el Caribe*) study on Ageing, Health and Well-being conducted in seven cities across the region reported the prevalence of falls as varying from 21.6% in Bridgetown (Barbados), 29% in Havana (Cuba), 33% in Mexico City (Mexico) and 34% in Santiago (Chile) (11). Several studies have documented the morbidity associated with falls especially with regards to hip fractures and subdural haematoma. About 90 per cent of hip fractures are associated with a fall, with the vast majority of such falls being from a standing height or less including in the bath or from a chair (12).

Background and Rationale

The Caribbean has been identified as the most rapidly ageing region of the developing world. Between 1960 and 1995,

there was a 76.8% increase in the elderly population (13). Among its regional island states, the average growth rate in the elderly population was approximately 5.3% for the 1995–2000 period. The elderly as a percentage of total population was 4.3% in 1950 and is estimated to reach about 15% by 2020 (13) (Fig. 1). In Jamaica, a similar pattern has been

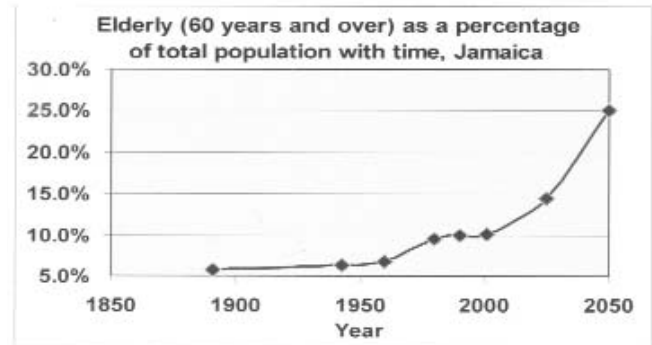


Fig. 1: Constructed using data from <http://www.un.org/esa/socdev/ageing/workshops/vn/jamaica.pdf>.

observed with a clear and rapidly rising trend in the elderly as a proportion of the total population (14).

Also occurring is the epidemiological transition where the leading causes of morbidity and mortality have shifted from being infectious to chronic diseases such as hypertension, diabetes mellitus and osteoarthritis (13). These conditions, as well as polypharmacy, gait and sensory disorders and the use of sedatives and hypnotics (1) are commonly known to increase the risk of falling, providing further rationale for the assessment of the situation regarding falls and fall prevention in the elderly in Jamaica.

Aims and Objectives

This review paper describes falls and fall prevention in Jamaica from data available. The primary objectives were to describe and review

- * the epidemiology of falls
- * health service impacts and costs and
- * interventions and policies regarding fall prevention.

METHODS

A number of methods and strategies were used to collect evidence and insights into falls. These included a search of the existing literature for articles and papers from the Caribbean. Trauma and fractures were included in the search and only those in English reviewed. The records of persons attending the Hermitage August Town Clinic for the period January 2004 – September 2006 were reviewed (15 450 visits) and 27 dockets for persons 60 years and over who had had a fall identified.

The daily register was also reviewed and the case notes with a diagnosis related to trauma, vertigo and all chronic diseases were reviewed for persons over 60 years with a history of fall.

A physiotherapist attached to the University Hospital of the West Indies (UHWI) identified all fall-related physiotherapy visits between October 2005 and September 2006.

Four focus groups of eight persons, 60 years and over, were held to obtain information, opinions and perceptions of the characteristics of falls, intervention approaches, risk factors, outcomes and prevention implications. The National Policies for the Disabled and for Senior Citizens were reviewed for relevant legislation (15–16).

RESULTS

Two seminal papers pertinent to falls in the elderly in Jamaica were identified. These were *Patterns of trauma injuries in rural versus urban Jamaica* (17) and *Falls: a modifiable risk factor for the occurrence of hip fractures in the elderly* (18). The former study was conducted between March 1, 1998, and April 30, 1998, at the UHWI (urban area) and at the St. Ann's Bay Hospital (rural area) among 974 patients and 458 persons admitted to the surgical services of these hospitals respectively. At these institutions, 22% (185) and 19% (101) respectively of admissions were due to trauma, with elderly persons (60 years and over) accounting for 10.5% of such admissions. The data indicated that falls were the second leading cause of unintentional injury accounting overall for 31.5% of such injuries seen (26% at UHWI and 41% at the St Ann's Bay Hospital). The authors highlighted the fact that "falls were confined to two groups, the elderly who usually fall at home in urban as well as rural areas and young children who fall from trees in rural areas". Williams-Johnson *et al* reported that of the 152 patients with hip fractures presenting to the UHWI in Jamaica, between January 1, 1998 and December 31, 2001, 90% (137) were due to falls and the overwhelming majority of these persons were aged 65 years and over and most of these falls took place at home (Fig. 2) (17).

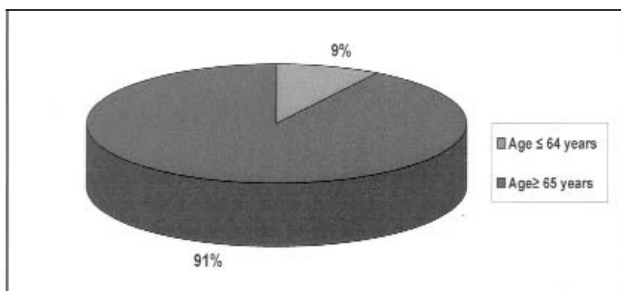


Fig. 2: Age distribution of persons presenting with hip fractures subsequent to falls at the University Hospital of the West Indies, Jamaica (1998–2001). Constructed using data from Williams-Johnson JA, Wilks RJ, McDonald AH. *West Indian Med J.* 2004 ; **53**: 238–41.

A number of extrinsic factors were notably associated with hip fractures; 16% fell from a bed or a chair/stool while about 8% tripped over objects such as boards, garden hose, slippers, loose carpet and electrical wires. In about 58% of

cases, the location/activity associated with the fall was not stated. However, 14% were associated with slips in the bathroom (18).

Co-morbid conditions included hypertension (37%) diabetes mellitus (21.7%), heart disease (76%) and dementia (7.6%).

Review of Health Centre records

Twenty-seven cases of falls among persons 60 years and over were identified and the age range was 61– 82 years with a mean age of 71.3 years (SD = 6.1, median = 70 years) (Fig. 3). Females comprised 66.7% of cases (male to female ratio 2:1). Nationally, 6% of users of health clinics are females.

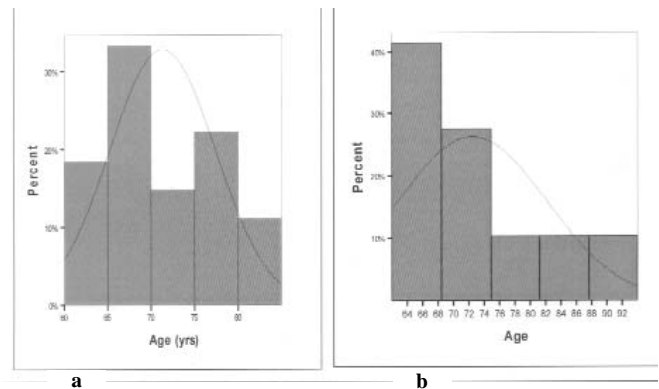


Fig. 3a: Age distribution of persons 60 years and over attending Hermitage/August Town Clinic for falls (Jan. 2004 – Sept. 2006)
 b: Age distribution of elderly patients seen at hospital outpatient physiotherapy department for falls (Oct. 2005 – Sept. 2006).

Five had as primary diagnoses vertigo/dizziness of unknown cause, with two having fractures, one was epileptic and two were just recorded as "falling". The remaining 17 (63%) were listed as various cases of trauma or injury to the body parts.

Impairment of sight was noted in 11.1% of cases and a similar proportion had hearing impairment. Mobility problems were documented for 22.2% of elderly persons who fell. No disability or other physical impairment was reported for 51.9% of those elderly who fell (Fig. 4).

Injury to body parts

The lower limb was the most frequently injured area of the body during falls (52%). There were two head injuries and one eye injury secondary to falling. The common comorbid illnesses were as found by Williams Johnson *et al*(18): hypertension, diabetes mellitus, dementia and 14.8% had no chronic disease.

Consequences (medical) of fall

Consequences from the falls were lacerations needing cleaning and dressing (85%) accompanied by pain from tissue damage. For some patients, the wounds resulted in chronic leg ulcers requiring frequent cleaning and dressing.

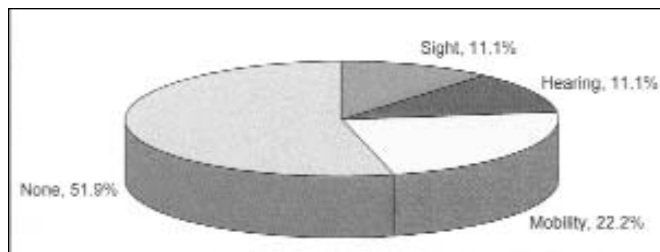


Fig. 4: Physical disability/impairment among elderly persons presenting to the Hermitage/August Town Health Centre (Jan 2004 – Sept 2006).

Physiotherapy Services

A similar picture was seen for the 29 cases identified from the outpatient physiotherapy department of UHWI. Nine (31%) were males and 20 (69%) were females. Ages ranged from 62 to 94 years; the mean age being 72 years (SD = 9.7). The median age was also 70 years (inter-quartile range: 63–76 years). The co-morbid pattern was again dominated by diabetes mellitus and hypertension.

Injury following fall

The majority of patients (79.3%) seen sustained at least a fracture supporting the findings of the previous studies. Fractures of the lower limb were noted in 48.2% of the cases and fractures involving the upper limb occurred in 27.5% of the cases. In approximately one in six cases, muscular pain and other damage was the main cause of referral for physiotherapy.

Place of fall

As in the health centre review, the house was the most frequently documented site of falls accounting for 52% of the location of falls for those persons for whom site was recorded and at least 38% overall of the falls among the clients studied. Twenty-eight per cent of persons stated that they fell outside within the yard or home environs while only 3.4% of falls occurred at work. In 28% of cases, the site of the fall was not recorded (Fig. 5).

Health Impact

Persons who fell and sought attention at the hospital underwent a variety of medical treatments and procedures. All

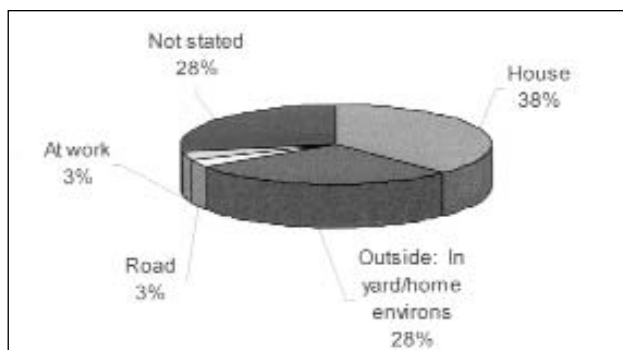


Fig. 5: Distribution of place of fall among elderly patients experiencing falls seen at outpatient physiotherapy department (Oct 2005 – Sept 2006) [n =29].

cases had radiological investigations of the injured areas. Sixty-two per cent (18) of the cases had surgical operations done. In a minority of instances (10.3%), computed tomography scans or ultrasound investigations were required. All cases subsequently attended the orthopaedic and physiotherapy clinics. The number of visits made by the clients reviewed ranged from 1 to 24; the median number of visits being 4 (inter-quartile range: 2.75 – 8).

Falls in the elderly incur direct cost clearly associated with the falls, but also indirect and intangible costs. Direct costs include those associated with the cost of medical care. Indirect costs include: the loss of income and productivity associated with the fall, those of absenteeism from work and losses from disability. Additional indirect costs include increased insurance premiums and increased payments to beneficiaries when an insured person is injured. Intangible costs occur due to pain and suffering or due to fear of falling again.

The Table highlights some major costs borne by patients as a result of the fall they sustained. It is a rough estimate of some of the costs incurred. It is important to note that room and board were not included and other incidentals that were inevitable with hospitalization were not included (as these were not readily available). Health centre visits, outpatient and orthopaedic clinic visits were calculated based on a minimum of one visit only. As such, these summary costs are minimum preliminary out of pocket expenditure estimates and will under-estimate true costs. Additionally, a substantial portion of the true costs is borne by government under its current cost-sharing schemes.

Based on the above figures with regard to falls, the mean minimum out of pocket expenditure for those presenting to the community clinic was \$2448 J and that of those seen as patients at the UHWI outpatient physiotherapy clinic was \$21 600 J.

Focus Groups Results

The focus groups yielded information on places of fall, impact of fall and fall prevention strategies and supported the previous findings.

Most participants had experienced directly or indirectly a fall in the last few months. This was for example expressed as “I fall down frequently and they call me ‘Miss Fall Down’” and “I have friends who fall down very regular”. Some participants noted physical injuries resulting from falls as exemplified by the statements “I fell down and broke my leg” and “Fell at home and hit my shoulder”

Causes of falls

Participants identified a number of contributory factors including poor lighting on the street, holes and puddles in the roads and sidewalks, uneven pavements, and sidewalks cluttered with roadside vendors and their merchandise. Stumps remaining from incompletely removed road and sidewalk

Table: Minimum estimates of economic cost of falling in clients studied

Procedure	Minimum costs	# of Health centre cases utilizing procedure or service	Total	# of Physiotherapy cases utilizing procedure or service	Total
X-ray	\$1 500.00		22 500.00	29	43 500.00
CT scan	\$12 000.00			1	12 000.00
Ultrasound	\$4 000.00			2	8 000.00
MRI	\$50 000.00			1	50 000.00
Surgery	\$20 000.00			18	360 000.00
Dressings	\$ 200.00	27	5 400.00	18	3 600.00
Health centre visits	\$ 100.00	27	2 700.00		
Physiotherapy	\$950.00 [^]			114*	108 300.00
Out patient clinic	\$500.00			7	3 500.00
Accident &	\$500.00			29	14 500.00
Emergency	\$500.00	27	13 500.00	29	14 500.00
Pain medication	\$1 000.00	27	22 000.00	23	23 000.00
Antibiotics					
Total			\$66 100		\$626 400.00

[^]Represents the weighted average of a first visit of \$2000 and 3 follow-up visits of \$600 (recall typical number of visits = 4)

* represents number of *person-visits* for physiotherapy services

N.B. To convert costs into US\$ divide by 66 (\$1US = 66 Jamaican dollars at time of study)

signs were mentioned as causing persons to trip, stumble and fall.

Participants demonstrated an awareness of contributing medical conditions – “*High blood pressure threw me down one time*” and Vertigo, “*the head started to spin and then I fell down*”.

The poor design of buses used for public transportation was mentioned as a worrisome issue. “*There are not enough seats on the buses and so we fall down because we have to stand and cannot hold on properly*”. “*The steps on the public buses are too high and sometimes we fall trying to get into the bus*”. Additionally, the rails on buses were thought to be too high and persons had difficulty in holding on to these for support. Other factors mentioned included violent attacks from robbers and problems of adjustment to new spectacles.

Fall prevention

Participants had a plethora of suggestions to help prevent falls among older persons. Improved lighting on the roads, improved road surfaces and the use of rough-cast cobblestones for sidewalks were all proposed. There was expressed a need for ‘*buses for seniors*’ which would eliminate falls associated with the mad rush and chaos while trying to run after route taxis.

The notion was expressed that little or nothing is being done by public authorities to prevent seniors or anybody from falling.

DISCUSSION

This review of falls is not based on population-based or community-wide household surveys but on clinic-based or hospital-based records. As such, falls which occur without major consequences and/or falls which occur and are treated at home have not been identified. Although there is an underestimation of the problem, it still highlights the importance and cost of falls in the elderly population.

This review indicates that falls in the elderly are issues of significant concern. The suggestion is that falls are relatively frequent occurrences with resultant morbidity ranging from soft tissue injury through to fractures and possibly death. Hypertension, diabetes mellitus, cardiovascular disease, mobility disorders and sensory impairment were the most prevalent co-morbid conditions associated with falls and are known to be factors that predispose to an increased incidence of falls.

The role that environmental or extrinsic factors have in the genesis of falls has been highlighted. Outside the home, road conditions, public transport, the presence and state of sidewalks and impediments such as pools of water and holes contribute to a large number of falls. Fall prevention tips need to be routinely included in health promotion messages.

Within the house and its immediate surroundings, contributing factors to falls range from slippery floors, to uneven walking surfaces, to household clutter, to stairs without rails,

to poorly constructed steps, to defective weight-bearing furniture and fixtures. In the yard, the uneven terrain, loose gravel and soil, haphazardly distributed objects as well as open drains and poor drainage increase the risk of falling.

Consequently, awareness and responsibility for fall prevention begins at the individual and household level. There are relatively inexpensive steps which can be taken to reduce the risks of falling. The use of rails and the maintenance of stools, chairs, rails and stairs can decrease the likelihood of falls and their attendant morbid sequelae. The latter statement has implications important in environmental assessments and design of health facilities.

Research has identified intervention that can reduce falls (19). Health practitioners and caregivers need to be acutely aware of both 'normal physiological' and 'pathological' changes with age. Distinguishing and discerning these can pre-emptively alter risks of falls among elderly persons if appropriate actions are taken and relevant information and advice are offered. Muscle strength especially in the limbs is important in maintaining balance and preventing falls. The elderly should be encouraged to walk regularly and to engage in resistance exercise (use of light weight to strengthen the muscles in the upper and lower limbs). Additionally, more astute management of drug therapy for multiple co-morbid conditions can reduce the risk of falling. Indeed, avoiding unnecessary polypharmacy and titration of medication doses to fit clients changing needs, changing physiology and changing activities, can markedly lessen the occurrence of falls from iatrogenic causes. Routine systematic assessments of areas of potential risk in the elderly during medical examinations and identification of specific risk are an effective tool to reduce morbidity from falls.

In promoting fall prevention activities, overcoming cultural practices and preferences such as the practice of shining floors and steps until they achieve mirror-like properties may be challenging. There is need to change the cultural perception that falls among the elderly is an inevitable natural part of ageing.

Policies currently remain broad and overarching. The existence of general policies which indirectly embrace fall prevention provides an avenue forward. However, there is need to develop definite and clear policies and programmes to prevent falls. These would give focus to fall prevention activities and provide catalytic thrust to fall prevention efforts. On a practical level, government and authorities need to be vigilant and must enforce the regulations that address issues such as the illegal use of and cluttering of sidewalks.

The preliminary findings of this review indicate that greater sensitivity is needed on the issue of falls and fall prevention; more research and understanding of the epidemiology of falls, its associated costs and impact on the

individual, family, community and state; and the best practices to reduce falls within the Jamaican setting, are needed. Special surveillance or serial surveys may need to be established to monitor the situation regarding falls. The majority of falls are preventable; the time for action is now.

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