FALLS AND OUTCOMES AMONGST OLD PEOPLE IN RURAL DWELLINGS

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ABSTRACT

Background: **Falls are the leading cause of injury deaths among people 65 years and older. This study gives an insight into the prevalence of falls among older people and how they occur in a rural setting in Nigeria.**

Methods: **A community based survey of 210 consenting old people aged 65 years and above selected using a multi-stage sampling technique was done. Study instrument was a semi-structured interviewer administered questionnaire and visual acuity was tested using Snellens chart.**

Results: **Incidence of falls was 21.4%. Of those who had falls, 86.7% were walking while 11.1% were either sitting or running when it occurred. The nature of the fall was tripping in 44.4%, slipping in 35.6% and hitting an object in 17.8% of cases. Consequences of falls included pain 48.9%, bruises 22.2%, lacerations 13.3% and fractures 11.1%. Females had more falls than males; 23.8% vs 19.0%, p = 0.40. Major injuries resulting from falls also occurred more frequently amongst females than males; 30.7% vs. 15.0%, p = 0.3. History of diabetes and alcohol use increased the odds of falling (OR 4.1, 95% CI 1.0 – 16.0; OR 2.2, 95% CI 1.0 – 4.6 respectively). Being in a monogamous marriage and having normal sight were protective of having falls (OR 0.4, 95% CI 0.2 – 0.9; OR 0.4, 95% CI 0.2 – 0.9 respectively).**

Conclusion: **Falls often occur from tripping and slipping while females are more likely to have major injuries. Risk factors for falls were alcohol use and diabetes while having normal sight and being monogamous were protective. Prevention should aim at a life course approach to addressing these intrinsic and extrinsic factors.**

INTRODUCTION

A fall is a sudden, unintentional change in position causing an individual to land at a lower level, on an object, the floor, or the ground, other than as a consequence of sudden onset of paralysis, epileptic seizure or overwhelming external force[1]. Internationally, it is estimated that one in three people over 65 years living in the community will fall each year[2,3] and in half of these cases, falls are recurrent[3]. About 20-30% of those who fall suffer injuries that reduce mobility and independence and increase the risk of premature death[4,5]. In addition, falls are the leading cause of injury deaths among people 65years and older and half of these falls occur in their own home[6,7]. Thus falls and fall-related injuries among older people are now becoming major issues for health and care givers world wide[7].

The risk factors for falls have been described as internal and external or in more exact terms as intrinsic/ personal such as impaired strength, poor vision e.t.c and extrinsic/environmental like loose surfaces and poor lightning[8]. Often falls increases with age and are more commoner amongst females than males[9,10]. Other factors that have been documented to increase the risk of falling include: a previous history of fall, living alone, chronic disease burden, dizziness and use of one or more medications. Furthermore, some studies have reported that between 30% and 50% of falls among older people living in communities are due to environmental causes while 20% of falls are due to major external factors that can cause any healthy adult to fall[11,12]. Thus environmental hazards like poor lighting, slippery floors, and uneven surfaces would contribute substantially to the rising prevalence of falls.

The consequences of falls is the increased morbidity and mortality often associated with them[4,5]. Injuries amongst the elderly reduce length and quality of life

and take up a large proportion of the health spending especially in a rural setting, but its prevention is quite cheap and simple. This study documents the occurrence of falls and its associated risk factors among older people in a rural setting in Nigeria. This information which is largely unavailable in Nigerian studies would be crucial in prevention of falls amongst the elderly.

METHODS

A community based survey of 210 consenting old people aged 65 years and above residing in Oyo State, Nigeria was done using an interviewer administered questionnaire. Igboora is the headquarters of Ibarapa Central Local Government in Oyo State, southwestern Nigeria. It is a rural town slowly undergoing urbanization with a population of . The minimum sample size calculated at 5% precision using a prevalence of falls of 14% (13) among community elderly people was 184 and the sampling technique was multistage. Two blocks were selected out of the six blocks in Igboora by simple random sampling and all consenting households within the selected wards were enrolled for the study. One male and one female were selected as the final sampling unit from each consenting household. Where there was more than one female or male in the household, balloting was done to select the study participant. Informed consent was obtained from each participant before the interview. Questionnaire contained questions on socio-demographic characteristics, existing morbidities and related issues, occurrence of falls, outcomes of falls and social habits. Visual acuity was also checked using the Snellens chart. Research assistants were medical students who had earlier been trained on the use of the Snellens chart. However, a training test run was done to standardize its use by all research assistants. Low vision was defined as vision of 6/18 and below. At the end of each interview, health education was given and any interviewee with acute or chronic condition for which medical attention has not been sought was referred to the health centre within the community. Data was analysed using the SPSS version 11.0

RESULTS

About 40% of respondents were within the age group 65-69 years while those in the age group e" 85 years were the least. Males and females were of equal proportion. Majority 159 (74.3%) were married while 48 (22.9%) were widows. Majority 131 (62.4%) were also from a polygamous set-up. The predominant occupation of respondents was trading 99 (47.1%) followed by farming 67 (31.9%).

Altogether, 21.4% of respondents have experienced at least one fall within 1 year preceding the study.

Regarding the most recent fall, 39 (86.7%) were walking, 4 (8.9%) sitting and1 (2.2%) running when the fall occurred; 1 person (2.2%) couldn't say what he was doing before the fall. The nature of the fall was tripping in 20 (44.4%), slipping in 16 (35.6%) and hitting an object in 8 (17.8%) of cases; 1 person (2.2%) couldn't say what happened. Following the fall, 10 (22.2%) sustained bruises, 22 (48.9%) pain only, 6 (13.3%) lacerations, 5 (11.1%) fractures and amongst 2 (4.4%), nothing significant. All those who had fractures were females.

Characteristic N = 210	n	%
Age		
65-69	90	42.9
70-74	58	27.6
75-79	27	12.9
80-84	18	8.6
= 85	17	8.1
Sex		
Male	105	50.0
Female	105	50.0
Marital status		
Married	159	74.3
Cohabiting	3	1.4
Divorced	3	1.4
Widowed	48	22.9
Marital setting		
Monogamous	79	37.6
Polygamous	131	62.4
Occupation		
Housewife	4	1.9
Farmer	67	31.9
Trader	99	47.1
Artisan	26	12.4
Professional	14	6.7

Table 1: Socio-demographic characteristics of elderly respondents in Igbo-Ora

Characteristic N = 210	n	%
Activity when fall occurred		
Walking	39	86.7
Sitting	4	8.9
Running	1	2.2
Can't say	1	2.2
Nature of fall		8.1
Tripping	20	44.4
Slipping	16	35.6
Hitting an object	8	17.8
Can't say	1	2.2
Outcome of fall		
Swelling and pain	22	48.9
Bruises	10	22.2
Lacerations	6	13.3
Fractures	5	11.1
Nothing significant	2	4.4

Table 2. Characteristics of fall

A greater percentage of those ≥75years (25.8%) experienced falls compared to those aged 70-74years (24.1%) and 65-69 years (16.7%); p = 0.33. those within monogamous marriages were less likely to have experienced a fall compared to those in a polygamous marriages, 13.9% vs 26.0%; p = 0.04. More females (23.8%) experienced falls than the males (19.0%); p = 0.40. Females had more major injuries compared to males, 30.7% vs. 15.0%, p = 0.3. Also, more of those who use alcohol (34.4%) had falls compared with the non-users (15.8%); p = 0.002.

Logistic regression analysis revealed that being in a monogamous marriage was protective of having falls; OR 0.4, 95% CI 0.2 – 0.9. The odds of having falls was higher among diabetic than non-diabetic respondents; OR 4.1, 95% CI 1.0 – 16.0. In addition, the use of alcohol increased the odds of having falls; OR 2.2, 95% CI 1.0 – 4.6 and having a normal sight was protective of having falls; OR 0.4, 95% CI 0.2 – 0.9.

Characteristic	History of Fall		
	Yes n (%)	No n (%)	
Age			
65 – 69	15 (16.7)	75 (83.7)	
70 – 74	14 (24.1)	44 (75.9)	
≥ 75	16 (25.8)	46 (74.2)	p = 0.33
Sex			
Male	20 (19.0)	85 (81.0)	
Female	25 (23.8)	80 (76.2)	p = 0.40
Marital setting			
Monogamous	11 (13.9)	68 (86.1)	
Polygamous	34 (26.0)	97 (74.0)	p= 0.04
Well lit room during fall			
Yes	36 (21.4)	132 (78.6)	
No	9 (21.4)	33 (78.6)	p = 1.00
Alcohol use			
Yes	22 (34.4)	42 (65.6)	
No	23 (15.8)	123 (84.2)	p = 0.002
	Severity of injury		
	Major	Minor	
Male	17 (85.0)	3 (15.0)	
Female	18 (69.3)	8 (30.7)	*p = 0.30

∗ Fishers exact test

Table 3: Factors associated with falls

The association between pre-existing morbidities and falls are shown in table 4. More diabetic (54.5%) had falls compared to the non-diabetic (19.6%); p = 0.06. More hypertensive (25.9%) had falls than the non-hypertensive (19.9%); p = 0.35. A greater percentage of those who had experienced stroke previously (50.0%) had falls compared to those who had not (20.6%); p = 0.08. A greater proportion of those with chronic joint pain (28.9%) had falls compared to those without (15.0%); p = 0.02. A greater percentage of those with re-current history of dizziness (38.1%) had falls than those without such history (19.6%); p = 0.05. A lesser proportion of full sighted respondents (17.4%) experienced falls as compared to the partial sighted/blinded (30.3%); p = 0.03.

DISCUSSION
This study documented the incidence of falls amongst the respondents in Igboora to be 21.4%. This was lower than the 58.3% reported by Wojszel and Bien in their study among older people living in the community and this may be due to the fact that they studied a relatively older community aged 75 years and over[14]. In addition, the African rural communities are quite conducive to functionality of the older person. Our study highlighted that older persons were more likely to have experienced falls than the relatively younger people i.e., 16.7% amongst those in the age group 65-69 compared to 25.8% amongst those 75years and above. Tripping and slipping have been documented as extrinsic factors for falling especially in areas where

Disease	Had fall n (%)	No fall n (%)	P value
Diabetes			
Yes	6 (54.5)	5 (45.5)	
No	39 (19.6)	160 (80.4)	p= 0.06
Hypertension			
Yes	4 (25.9)	40 (74.1)	
No	31 (19.9)	125 (80.1)	p = 0.35
History of stroke			
Yes	3 (50.0)	3 (50.0)80	
No	42 (20.6)	162 (79.4)	p= 0.11
Chronic joint pain			
Yes	28 (28.9)	69 (71.1)	
No	17 (15.0)	96 (85.0)	p= 0.02
History of tremor at rest			
Yes	3 (60.0)	2 (40.0)	
No	42 (20.5)	163 (79.5)	p =0.07
History of dizziness			
Yes	8 (38.1)	13 (61.9)	
No	37 (19.6)	152 (80.4)	p = 0.05
Visual acuity			
Full sighted	25 (17.4)	119 (82.6)	
Partial sighted/blind	20 (30.3)	46 (69.7)	p = 0.03

Table 4: Morbidities and falls

objects are placed haphazardly, rugs that move across the floor easily are used and crooked or slippery floor and carpet skirting boards that protrude are common occurrences[15]. Our study supports this assertion by showing that tripping and slipping were responsible for 45.5% and 36.4% of falls respectively. However, the assertion that lighting is a strong extrinsic factor for falling was not supported by our study. This may be due to the fact that the typical structure of the rural dwelling place admits light quite easily. So only a small number of people (forty-two) reported their rooms as not being well lit when falls occurred.

Falls were reported more by those who were polygamous marriages probably because of the relatively less space availability per person within a polygamous setting with a high probability of being cluttered. The higher proportion of females having falls is not unusual as other studies have documented similar findings[16]. Females do a lot of household chores and this explains their susceptibility to falls. However, it has also been documented that this dissimilarity of gender related falls is a function of age as the older women fall more often than men[9,10]. Dizziness has been reported to be common in fallers as is diabetes[15,17] and this is similar to our own finding that those with history of recurrent dizziness as well as those with history of diabetes had a higher proportion of fallers. Tremor at rest indicating disease conditions like

Parkinsonism, chronic joint pain indicating conditions like arthritis and alcohol use were significantly associated with falls. Other studies have shown that the prevalence of falling actually rises with chronic disease burden[18] and this is demonstrable with arthritis and alcohol use[19,20]. This is related to the problem of balance and righting imperfection in the elderly. Being partially sighted or blinded was associated with a significantly increased risk of falling. Visual impairments have long been identified as a common health problem among the elderly and studies have demonstrated its association with an increased risk of falling in old age[14].

The predominantly injury sustained were swelling with pain followed by bruises, lacerations and fractures. The direct consequence of this is that these injuries reduce mobility and independence and increase the risk of premature death[4,5]. Though the reported outcome of these falls were not substantially major, the risk of poor outcomes especially when older people are left unattended to can be quite substantial. Falls may also result in a psychological trauma known as fear of falling[21,22]. Major injuries also occurred more amongst the females than the males with all the fractures occurring amongst the females. Postmenopausal, women have been known to be at increased risk of having fractures resulting from hormone related osteoporosis.

Variable	Odds Ratio	95% CI	p value
Family setting			
Polygamous	1		
Monogamous	0.4	0.2 – 0.9	0.02
Diabetes			
No	1		
Yes	4.1	1.0 – 16.0	0.04
Chronic joint pain			
No	1		
Yes	2.0	0.9 – 4.2	0.07
History of tremor			
No	1		
Yes	3.4	0.4 – 32	0.29
Recurrent history of dizziness			
No	1		
Yes	1.6	0.5 – 4.6	0.42
Alcohol use			
No	1		
Yes	2.2	1.0 – 4.6	0.04
Visual acuity			
Partial sighted/blinded	1		
Full sighted	0.4	0.2 – 0.9	0.03

Table 5: Predictors of fall

Overall, our study documented the predictors of falling in old age as diabetes which is associated with a 4 fold increased odds and alcohol use with a 2 fold increased odds. Suffice it to say that alcohol is present in many herbal preparations at the rural level. Being full sighted and coming from a monogamous setting was also significantly protective of experiencing falls amongst the elderly. These results further reinforce the fact that predictors of falls amongst old people are often multifactorial. However, a recent meta-analysis showed that evidence of benefit from multifactorial risk assessment and targeted intervention for falls in primary care, community, or emergency care settings was limited and reductions in the number of fallers may be smaller than thought[24].

We have documented that falls occur quite commonly amongst older people living within rural settings. Conversely, the public health measures for its prevention are quite cheap and simple. Based on this, we recommend a life course approach (a concept of life as a journey with different phases and transitions and an examination of experiences common to these transitions[25]) as a way of addressing the contributing intrinsic and extrinsic factors identified in this study.

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