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PREVALENCE AND CORRELATES OF FALL AMONG ELDERLY LIVING IN GANO WARD OF DAWAKIN KUDU LOCAL GOVERNMENT AREA KANO STATE

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ABSTRACT

Background: The elderly population is growing, both in size and proportion with the total population and fall is a major problem for elderly. The aim of this study was to determine the prevalence and correlates of falls among elderly.

Methods: A cross sectional survey with Snowball sampling technique was used to recruit 100 elderly persons, 52 male and 48 female, 65 years and above. A modified self administered closed ended questionnaire was used. The data obtained were summarized using descriptive statistics of mean and Standard Deviation. Inferential statistics of Chi square, phi and Cramer's V were used to analyze the data.

Result: The result showed that 49% of the elderly had one or more falls with 65.3%falls occurring once and 34.7% occurring two or more times. Women fall more than men, accounting for 61.2% and 38.8% of the population respectively. A significant association was found between fall, age, sex, and reduced balance.

Conclusion: The study concluded that there is high prevalence of falls in elderly with women experiencing more fall than men. It is recommended that modifications in the environment, counseling to the elderly and their families should be done to prevent further falls.

Keywords: Prevalence, correlates, fall, Elderly, Dawakinkudu, local government, Kano

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INTRODUCTION

Falls can be described as any involuntarily change from a position of bipedal support to a position of no longer being supported by both feet accompanied by (partial or full) contact with the ground or floor.[1] A fall is an event that anyone might experience, but for elderly it is a serious mishap that could result in a severe medical condition such as bone fracture and head injury.[2] Falls often cause deterioration of activities of daily living, institutionalization, loss of autonomy , limitation of movement for fear of further falls.[3] It causes morbidity and mortality among older people and pose a serious problem to the public health.[4]

Past findings showed an increase in falls incidence usually with advancing age, such that 30% of people over 65years and 50% of those over 80years fall each year; and that older adults who fall once are two to three times likely to fall within a year in community dwelling older people.[5] An estimate on the incidence of falls in community dwellers, giving the proportion of people sustaining at least one fall over a one year period, varying from 28-35%, in the people over or equal 65 years, to 32-42%, in those over or equal 75years.[6] Even, 'healthy' older people have an annual incidence of falls of up to 15%. In addition, approximately 50% of older people in residential care facilities fall at least once a year, and 20% of fall-related deaths in residential care setting occur among people of 85years and older.[5]A study showed that falls occur in 21-23% of men and 43-44% of women aged over 65 years living in urban community of China.[7]

The increased rate of fall-related injuries in elderly persons is caused by a high prevalence of clinical disease (such as osteoporosis) and age related physiologic changes (such as slowed protective reflexes) that make even a relatively mild fall, particularly dangerous. Although most falls produce no serious injury, community survey reported over half of falls resulting in minor injuries that usually do not require medical treatment; but between 5% and 10% of community dwelling older adults who fall each year do sustain a serious injury such as fracture, head injury or serious laceration.

Fall- related mortality increases dramatically with advancing age, and it constitute two-third of accidental falls.[7,8] Falls also account for about 40% of all injury-related death, with rate variation depending on the country and the studied population. For instance, fall fatality rate of people aged 65 and older in United states of America is 36.8 per 100,000 population, whereas in Canada mortality rate for the same age group is 9.4 per 10,000 population, mortality rate in fin land of people age 50years and older is 55.4 for men 43.1 for women per 100,000 population.[9]

It is generally agreed that most falls are caused by interacting factors that include host factors as well as situational circumstances. These host factors (cognitive, medical and physical factors that are related to the subject) and the situational circumstances of fall, such as, the type of activity in progress, acute disease at the time of fall and environmental circumstances, are not equally well defined, even though these factors contribute to the risk factors of fall and injury. Fall is symptomatic of several intrinsic factors ('normal' physiologic aging changes, pathological and psychological disease states and medications) and extrinsic (environmental hazard) factors.[10]

Several physiologic changes predispose the elderly to recurrent falls[11], and it is not their age that increases the risk of fall, but it is the co-morbidity of aging-related changes such as physical, cognitive, and affective changes that may contribute to the risk of falls, including sensory, musculoskeletal, neurological, and metabolic changes.[12] Fall from environmental hazards are also called accidents and comprises the largest fall cause category, accounting for about 25% to 45% of falls. Falls in this category stem from interactions between environmental hazards or hazardous activities and increased individual susceptibility to these hazards from accumulated effects of age and disease.

In Kano information on incidence of fall and factors relating fall to elderly is scarce. Therefore this study sets out to determine the incidence and correlates of fall in elderly living in Gano ward of Dawakin Kudu local government of Kano state.

METHODOLOGY

This study was aimed at investigating the prevalence and correlates of falls among elderly people living in Gano ward of Dawakin kudu local government.

Research Design

This is a cross-sectional survey.

Population

The population for this study comprised of both male and female elderly people within the age of

65 years and above living in Gano ward of Dawakin kudu local government area.

Sample and Sampling Technique

A total of 100(52 males and 48 females) elderly persons were recruited to participate in this study using snowball sampling technique.

Inclusion Criteria

1. Only apparently healthy males and females were involved.
2. Only those aged 65 years and above were studied.

Data Collection Instrument

1. Falls questionnaire adapted and modified from Lordet al.[13] The questionnaire was translated to Hausa Language by experts in Hausa Department, School of languages Sa'adatu Rimi College of Education, Kumbotso, Kano. It was translated back to English Language by experts in the same department.
2. Tape rule; was used to measure the participants height.
3. Weighing scale (SECA model 330LB made in china) was used to measure the weight of the participant.

Questionnaire Description and Scoring

The fall questionnaire used in this study comprised of 17 items divided into 3 sections. Section A consisted of 4 questions and sought information on the socio-demographic data, section B consisted of 3 questions and assessed falls prevalence and C consisted of 10 questions and assessed correlates of falls. The questionnaire consisted of closed ended questions. The prevalence of falls was determined by calculating the number of those who have had at least one fall from the total number of participants (Response rate = Number of complete survey/Number of participants contacted * 100). The correlates were determined by scoring a zero for a NO answer and 1 for a YES answer.

Anthropometric Measurement

Participant's physical characteristics (height and weight) were measured using standardized anthropometric protocol.[14]

Height Measurement

The height of the participants was measured using a tape rule. Each participant asked to stand against the wall or have someone assist by holding the participant for those that have no balance. A mark was drawn with a pencil behind the participant head, and the distance was measured from the floor to mark made on the wall. The number in inches was converted to meters by multiplying the number by 2.5 and dividing the number by 100.[15]

Weight Measurement

The weight of the participants was measured using a bathroom weighing scale. Each participant was asked to remove their foot wears and any heavy object on them before mounting on the scale. The reading was then recorded to the nearest kilograms.

Data Collection Procedure

Ethical approval was sought from the state ministry of health, and was taken to the traditional leader of Gano ward of Dawakin Kudu local government. Thereafter, the participants were recruited using snowball sampling technique. Their consent was also sought (via completion of a consent form) after the aims and objective of the study was explained to them. Anthropometric variables of height and weight were measured using standard procedures. Falls questionnaire was then administered to them and for those who couldn't read and write the researcher administered the questionnaires through interview.

Data Analysis Procedure

Descriptive statistics was used to determine the incidence of falls and to identify the associated risk factors. Analysis included frequency distribution, mean, standard deviation, percentages, and cross tabulations for association of the nominal categorical data. Chi square test was used to test the association between variables and symmetric measures of phi and Cramer's V were used to determine level of association between variables. The level of significance (probability) was $p < 0.05$ (1 tailed). All analysis was done using Statistical Package of Social Sciences (SPSS).

RESULTS

Table 1: Socio-demographic characteristics of the participants

Variables	Fallers	non fallers
X ± SD	X ± SD	
Age (years)	73.65 ± 7.80	70.98 ± 5.47
Height (m)	1.396 ± 0.12	1.414 ± 0.17
Weight (kg)	48.97 ± 6.94	51.74 ± 7.18

X = Mean, SD = Standard deviation

In table 1 above the fallers were found to be older (73.65 ± 7.80years) than the non-fallers (70.98 ± 5.47). The results also show that the fallers weighed lesser (48.97 ± 6.94kg) than the non fallers (51.74 ± 7.18kg). It was also observed that the fallers were shorter (1.396 ± 0.12m) than the non-fallers (1.41 ± 0.17m). The difference in mean value between the age of the fallers and non-fallers was found to be significantly different at Zcal > Zcritical (1.98 > 0.09761). Also, the difference in mean value between the weight of the fallers and non-fallers

was also found to be significantly different at Zcal > Zcritical (0.62 > 0.2676). Also, the difference in mean value between the height of the fallers and non-fallers was also found to be significantly different at Zcal > Zcritical (1.96 > 0.0250).

Table 2: Gender Distribution of the Participants

Gender	n	%
Fallers		
Male	19	38.8
Female	30	61.2
Total	49	100
Non fallers		
Male	33	64.7
Female	18	35.3
Total	51	100

n = frequency % = percentage

Table 2 above showed that of all the participants 52(52%) were males and 48(48%) were females. Also 49(49%) fell and 51(51%) did not fall. Of those that have fallen 30(61.2%) were females and 19(38.8%) were males, while 33(64.7%) of the non-fallers were males and 18(35.3%) were females.

Table 3: Distribution of fall by Age, Frequency of Fall, and Place of Fall

Variables	n	%
Age		
65-69	13	26.5
70-74	14	28.6
75-79	4	8.2
80-84	8	16.3
85-89	3	6.1
90-94	4	8.2
95and >	3	6.1
Total	49	100
Frequency of fall		
Once	32	65.3
Two or more times	17	34.7
Total	49	100
Place of Fall		
Indoor falls	32	65.3
Outdoor falls	10	20.4
Both	7	14.3
Total	49	100
Time of Fall		
Morning	13	26.5
Afternoon	8	16.3
Evening/ night	28	57.1
Total	49	100

% = percentage n = frequency

Table 3 above showed that falls is higher in those around the age 75-74years and 65-69years being about 28.6% and 26.5% respectively and lower in those around 85-89year and 95 and > being 6.1% for each. It also showed that the frequency of fall is 65.3% for the fallers that had only one fall, and 38.8% for those that had two or more falls.

Place and Time of fall

65.3% of falls occurred indoor, 20.4% occurred outdoor, and 14.3% occurred both indoor and outdoor. Of those that have fallen indoors, 52.6% occurred on the one level, 15.8% occurred on getting out of a chair, and 31.6% occurred on using the toilet, while for those that fell out door, 42.1% falls occurred on a footpath, 42.1% occurred on a gutter, and 15.8% getting out of a vehicle. The time of occurrence of most falls is usually in the evening or at night, accounting for up to about 57.1%, followed by morning, then afternoon being about 26.5% and 16.3% respectively.

Table 4: Variables Associated with fall

Variables	Yes n (%)	No n (%)
Unexpected falls	30(61.2)	19(38.8)
Vision problem	33(67.3)	16(32.7)
Medication use	12(24.5)	37(75.5)
Cognitive problem	30(61.2)	19(38.8)
Medical problem	12(24.5)	37(75.5)
Gait problem	27(55.1)	22(44.9)
Balance problem (dizziness)	45(91.8)	4(8.2)
Weakness (Endurance problem)	36(73.5)	13(26.5)
Pain	33(67.3)	16(32.7)
Lighting	41(83.2)	8(16.8)
Other hazards	39(79.6)	10(20.4)

% = percentage, n = frequency

Table 4 above showed that the variables associated with falls for those that have fallen are, unexpected falls which occurred at the rate of 30(61.2%), vision problem at the rate of 33(67.3%), medication use at 12(24.5%), cognitive problem at 30(61.2%), medical problem was 12(24.5%), gait problem at 27(55.1%), balance problem (dizziness) at the rate of (91.8%), leg weakness (endurance problem) at 36(73.5%), and pain at 33(67.3%). Only balance problem equally distributed both the fallers and non fallers being 45(91.8%) and 23(46.9%) respectively. as they majorly complained of it. Environmental lighting was found to be insufficient at about 41(83.7%), and other environmental hazards were found to be 39(79.6%).

Table 5: Chi Square Test for Level of Falls Across Sexes

X^2	Phi	Cramer's V	df	p-value
6.732	0.259	0.259	1	0.009

X2tab = 3.84; P < 0.05, df = degree of freedom, X^2 = Chi square

The association between tendency towards fall and the sex of the individual as shown in table 5 was significant. X^2 (1, N = 99) = 6.732, p = 0.009. The association was of weak strength: ϕ = 0.259 and thus, the type of sex accounted for 6.71% ($\phi \times \phi \times 100$) variance in the tendency to fall. (ϕ = phi)

Table 6: Chi Square Test for Level of fall and Reduced Balance

X^2	Phi	Cramer's V	df	p-value
25.088	0.501	0.501	1	0.000

X2tab = 3.84; P < 0.05, df = degree of freedom, X^2 = Chi square

The association between tendency to fall and reduced balance as shown in table 6 was significant. X^2(1, N = 99) = 25.088, p = 0.000. The association was of moderate strength: ϕ = 0.501 and thus reduced balance in the individuals accounted for 25.1% ($\phi \times \phi \times 100$) of variance in the tendency to fall. (ϕ = phi)

Table 7: Chi Square Test for Level of Fall Across Age Groups

X^2	Phi	Cramer's V	df	p-value
12.619	0.355	0.355	6	0.05

X2(6) = 12.592; P < 0.05, df = degree of freedom, X^2 = Chi square

The association between age groups and tendency to fall was as shown in table 7 significant. X^2(1, N = 99) = 12.619, p = 0.05. The association was of weak strength: ϕ = 0.355, and thus age groups accounted for 12.6% ($\phi \times \phi \times 100$) of variance in the tendency to fall among the elderly.

DISCUSSION

The aim of the study was to determine the prevalence and correlates of fall among the elderly living in Gano ward of Dawakin kudu local government Area. The result of the study reported a prevalence rate of falls of about 49% among the total participants (100), this was found to be higher than the values reported[16,17] that gave a incidence rate of 29.1-42.2% and 17.2- 29.3% respectively. The prevalence rate for women is higher than that of men being 61.2 and 38.8% respectively. This was found to be in line with the study[3] that showed the rate to be 21.5% for women and 12.8% for men.

Approximately 30% of elderly aged 65years and over fell at least once and 10-20% fell two or more times.[18,19] The present study showed 65.3% of the age group fell once and 34.7% fell two or more times in the past 4 months, but this is not in accordance with the study[16]that reported 12.3% of elderly falling once and 7.2% falling two or more times, but the pattern is the same since those that fell once were greater than those that fell more often in both studies. Of all the falls, the present study revealed more of indoor falls as compared with the outdoor falls sine most of the female fallers do their activities at home, and most falls occur in the toilet. And this was found to be in line with the study.[20,21] The study also showed an increased prevalence of falls in the evening or at night which could be attributed to visual deficit that compromised people's sight as most of the study participants has visual impairment, but this is not in accordance with the study that showed more falls during early morning and afternoon in the course of most activities.[21]

The study also reported that there was an increase in the frequency of fall at around 65-69years, It then rose higher at around 70-74years, declined at around 75-79 and rose a little more at around 80-84years. This higher frequency of falls in early ages could be due to the fact that the elderly during that age are not aware of their decline in independent activities, thinking they can do much, but those around 85years and over are afraid of all sort of activity due to fear of further falls. This is contrary to the study that showed increased incidence with advancing age. [22]

The study also reported that increased risk of falls is caused by factors such as feminity, reduced balance (dizziness), endurance problem, vision problem, pain, insufficient lighting and presence of other environmental hazards showing higher rate in balance problem, insufficient lighting, vision problem and other hazards. This was found to agree with the findings of a study that reported increased risk in relation to poor eye sight without the use of glasses and assistive device, depression, balance problem and environmental hazards. [23]

The study showed an inversely weak statistical association between falls and sex with higher falls in women than men. This collaborates the findings of the study by that showed a higher number of women than men among the fallers, and higher number of men than women among the non-fallers of the total participants. It also showed a weak statistical significant (p < 0.05) association between falls and age groups. This contrast with the findings of the study that reported higher number of elderly fallers around 80 years and above, and higher number of those around 65-79 in the non fallers among the total participants. The study also showed a moderately strong statistical association (p < 0.05) between falls and reduced balance and

hence was found to be in line with the study which showed that loss of balance is common among all elderly individuals both the fallers and non fallers but higher in the fallers. This could be due to physiological changes associated with aging which does results to muscle weakness, etc.

CONCLUSION

From the findings of this study, it was concluded that there is high prevalence of falls in the elderly, with reduced balance, vision problem, insufficient lighting and other hazards contributing more to falls.

Recommendations

The following recommendations are put forward based on the findings of the study:

1. Older people and their family members should be counseled on removing slipping (drying wet floor surfaces and water spills) and tripping hazards such as loose rugs, mats. Should also be able to identify irregular walking surfaces, proper footwear and a need for a supportive aid.
2. Specific environmental modification, such as adequate lighting, non-slip bath, mats, put stair rails next to the toilet and in the bathroom and raised toilet seats and appropriate bed and chair heights should be considered in homes of elderly people.
3. Family members staying with older people should restore their confidence in their ability to move about safely, and increase the safety of their surroundings. They should also help them to cope with any further falls by teaching them strategies for summoning help and preventing the consequences of long lie.
4. One of the goals for physiotherapists working with older people at risk of falling is to reduce that risk. As these are older people living independently, increasing their muscle strength, flexibility and bone density and improving balance and gait, through exercise have been shown to be associated with a reduction of falls or fall related injuries in people.
5. Physiotherapists working with older people should try to encourage them in their ability to move about safely and to increase the safety of their surroundings. They should also help them with education, advice on how to cope with any further falls and teach them strategies for summoning help and preventing the consequences of long lie.
6. Further studies should be conducted with larger sample size in a larger area to reassess the problems associated with falls among the elderly. Also further detailed analysis should be carried out to specify on the factors that mostly contribute to falls.

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