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Research Paper

Occurrence of accident among inmates of old age homes of Uttarakhand, India

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ABSTRACT : The purpose of the study was to appraise occurrence of accidents among inmates of old age homes. Purposive sampling design was chosen to select the samples because not much research work has been carried out. Hitherto, ergonomics have attempted to upgrade the industrial situation by improving the condition of work. But bathrooms and flooring in residential building, particularly in old age homes have been neglected to a great extent. Two regions of Uttarakhand State *i.e.* Kumaon and Garhwal were selected for the study. To assess the base line characteristics of the elderly and occurrence of accidents, interview method was adopted to collect the data. The Chi-square test of independence and per cent ratios was used for data analysis. The findings showed that the elderly people were between 60-70 years of age. The mean age was 72.5 year; the female sex ratio was greater than male. Elderly (53.3 %) usually led fallen between the age group of 70-80 years, out of which 75 per cent were females. It was proved that the occurrence of accidents depends on the age and sex. Causes of accident were slip followed by fall. Tripping was not a cause of any single accident in the studied group. "Skid Resistance Polycemtiles" which was developed by Central Building Research Institute, Roorkee (India), had been recommended for the old age homes. The ageing of the population had not only brought at the emerging and with it new and serious issues, but had also become a cause of concern for the aged at national and international level.

KEY WORDS : Accidents, Fall/slip, Old age home, Home modification, Skid resistance tiles

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India, like many traditional societies, today faces a unique situation in providing care for its elderly as the existing old-age support structures in the form of family, kith and kin, are fast eroding and the elderly are ill-equipped to cope alone with their lives in the face of infirmity and disability. The onus of caring for the elderly is therefore now much more on the state than the family and will necessitate the creation of adequate institutional support. Elderly people living independently without any assistance and palliative measures should be considered for improving the safety within their homes, as elderly people are more prone to serious injuries and long-term disability if they fall. There is therefore an urgent need to examine the various aspects of this new and fast growing population to ensure the design of appropriate policy and programmes directed to meet the varied needs of this vulnerable and dependent group. Steel *et al.* (1995) noted that among the most fatal injuries amongst the elderly, a leading cause of death is due to falling, and the less percentage of falls (10-15%) resulted in fractures or serious injury. *Tinetti et al.* (1998) determined a group of risk factors for falls, which include the inability to safely maneuver the stairs, the overuse of sedatives, cognitive impairment, lower extremity disability, diminished vision and balance and gait abnormalities. Home injuries occur as a result of falls, poisonings and burns. Most of us regards home as a safe place, but accidents often occur in and around the home. Approximately 75 per cent of the domestic accidents to people aged 75 and above were due to falls (Wright, 1994). Accidents involving elderly people have been neglected in research for a number of years and there are insufficient data on the true prevalence of accidental injuries. Given that multiple falls have been found to be associated with negative outcomes, such as an increased risk of

institutionalization, more research in this area is warranted. Hazards are part of the offer challenges to the elderly people residing in old age homes to research and evaluate strategies to help mitigate the hazards. Realistically, the goal is not one of eliminating hazards, but one of reducing the risk of injury. The advantage to be derived from a local study of this nature is in the personal insights that can be gained from face-to-face interviews carried out with people who have recently experienced an accident. Interviewing people in the old age homes allows a unique understanding of their lives and the impact of any accident which may have occurred. Such information cannot be gleaned from national statistics or quantitative survey data. The main objective was to fill in the gap in information on base line characteristics and related health hazards on elderly people in the State of Uttarakhand, India.

■ RESEARCH METHODS

Purposive sampling design was adopted to select the study area and the samples on the basis that not much research work has been carried out in these areas. Until recently, ergonomics have been tried to improve the industrial situation by improving the conditions of work, but bathrooms and flooring in residential building, particularly, in old age homes have been neglected to a great extent. The present study was conducted in two regions of Uttarakhand State, India *i.e.* Kumaon Haldwani block of (Nainital district) and Garhwal (Haridwar and Dehradun districts). Fifteen elderly people from each of the selected old age homes namely Nirmala, (Haldwani block); Geeta Kutir and Vridh Sewa, (Haridwar), and Prem Dham (Dehradun) were selected randomly. The numbers of males were twenty six and females accounting to thirty four, thus making a total sample size of sixty**.** These selected elderly people, residing in the old age homes were the reliable representations of the total population of India as per their physical build up, functional status, health status (disease), longevity, income, educational status and gender. A placid and non-chalet atmosphere was created, so as to ensure the maintenance of the quality of the research protocol and to enable interviewees to confide their feelings freely. Voluntary revealing was essential, and they were assured that this study was conducted purely to better understand their needs and assist with better moral and psychological support and other comforts. To assess the base line characteristics of elderly people and occurrence of accidents, data interview method was adopted**.** The data were analyzed using both descriptive (frequency, percentage, average and standard deviation) and the relational statistics (Chi-square test of independence). Cement concrete and marble stone titles were found in habitat room and bath with water closet. These tiles were taken from the supplier and tested for water absorption level and strength by using compression testing machine in the laboratory of College of Technology, Govind Ballabh Patel University of Agriculture and Technology, Pantnagar Uttarakhand, India. The findings of the test were then compared with the recommended values prescribed in Indian standard codes.

■ RESEARCH FINDINGS AND DISCUSSION

The findings in Table 1 depict that the elderly people were in 60-70 years of age group. The mean age was 72.5 year; with 7.18 S.D. This finding is consistent with other study (Das, 2004) that about 61 per cent were above the age of 69 years, 32 per cent were between 60 and 69 years while the remaining 7 per cent were less than 60 years old. The female sex ratio was higher than male. Female widows dramatically outnumbered male widowers; the probable reason behind this might be that most were unmarried females widowhood forced them to live at the old age homes. The studies showed that it was the woman who suffered most as larger proportion survived longer than their spouses. Widows were with sizeable proportion than the elderly. Specifically, the Indian women married to men, who were 10-15 years older than their wives. Hence, they have to endure longer periods of widowhood. The educational characteristics indicated that the elderly people were literates and represented different castes/religions. In old age home Ist (Vridh Seva), IIIrd (Nirmala), and IVth (Prem Dham) majority of the elderly people were independent, respectively, and they are paid for maintenance, while in IInd (Geeta Kutir) majority of the elderly people had no income and were dependent on the authority. Recent Indian Council of Medical Research (ICMR) studies in Chennai, Lucknow, Delhi and Mumbai have revealed that out of the surveyed older population, 52 per cent did not have any income. Elderly (53.3 %) usually led fallen between the age group of 70-80 years. This finding is consistent with other studies (Donmez and Gokkoca, 2003) that majority of accidents involving older people, both fatal and non-fatal, are falls. Out of which 75 per cent were females and had restriction to daily activities. Falling is not only an important marker of frailty (Davis *et al.*, 1999, Walston and Fried, 1999, Nourhashemi *et al.*, 2001) but frequent falls can play a role in accelerating the downward spiral in a frail older person (Fried *et al.*, 2001). Women had a higher fall rate in all age groups and the severity of their injuries appeared as their age increased. The findings on gender differences match other research showing that elderly women report more accidents than elderly men (Mary, 2007). It was proved that the occurrence of accidents depend on the age and sex (Table 2) in (Nirmala and Premdham) old age homes. The findings of the study revealed that the many accidental injuries occurred in the bathroom followed by separate toilets and corridors. Causes of accident were slip followed by fall. Tripping was not a cause of any single accidents in the studied group (Table 3). Lord *et al.* (2001) have summarized and classified the risk factors for accidents as psychosocial and demographic factors,

Table 1 : General profile of elderly people of old age homes (n=15)

Personal characteristics	Old age homes				Total (n=60)
	I Vridh Seva	II Geeta Kutir	III Nirmala	IV Prem Dham	
Age (years)					
60-70	8 (53.3	9 (60)	1 (6.6)	2 (13.3)	20 (33.3)
70-80	4 (26.6)	2 (13.3)	12 (80)	10 (66.6)	28(46.6)
80+	3 (20)	4 (26.6)	2 (13.3)	3 (20)	12 (20.1)
Mean	68.73	72.26	73.73	75.46	72.5
S.D.	8.57	11.03	3.84	5.28	7.18
Sex					
Male	9(60)	8(53.3)	7(46.6)	2 (13.3)	26 (43.3)
Female	6(40)	7(46.6)	8 (53.3)	13 (86.6)	34 (56.6)
Educational status					
Illiterate	3 (20)	4 (26.6)	-	-	7 (11.6)
Primary	1 (6.6)	3 (20)	-	-	4 (6.6)
Secondary	4 (26.6)	4 (26.6)	3 (20)	-	11 (18.3)
High School	3 (20)	1 (6.6)	4 (26.6)	-	8 (13.3)
Intermediate	2 (13.3)	1 (6.6)	3 (20)	3 (20)	9 (15)
Graduate	2 (13.3)	2 (13.3)	5 (33)	12 (80)	21 (35)
Marital status					
Married with alive spouse	1(6.6)	2(13.3)	2(13.3)	1(6.6)	6(10)
Unmarried	3(20)	-	9(60)	7(46.6)	19(31.6)
Widow	2(13.3)	6(40)	1(6.6)	5(33.3)	14(23.3)
Widower	9(60)	7(46.6)	3(20)	2(13.3)	21(35.1)
Caste					
General	2 (13.3)	9 (60)	2 (13.3)	10 (66.6)	23 (38.3)
Other Backward caste	10 (66.6)	4 (26.6)	5 (33.5)	1(6.6)	20(33.3)
Schedule caste	1 (6.6)	1(6.6)	2 (13.3)	2 (13.3)	6 (10.0)
Schedule tribe	2 (13.3)	1(6.6)	6 (40)	2 (13.3)	11(18.3)
Religion					
Hindu	12 (80)	11(73.3)	2 (13.3)	2 (13.3)	27(45)
Muslim	-	-	-	-	-
Sikh / Punjabi	1 (6.6)	4 (26.6)	-	11(73.3)	16 (26.6)
Christian	2 (13.3)	-	13 (86.6)	2 (13.3)	17(28.3)
Financial status					
No income	-	12 (80)	2 (13.3)	4 (26.6)	18 (30)
Retirement pay	15 (100)	3 (20)	13(86.6)	11(73.3)	42 (70)

Figures in parentheses represent percentage

Table 2 : Age and sex-wise distribution of occurrences of accident

Old age homes	60-70 years		70-80 years		80+ years		Total		Chi-square value
	M	F	M	F	M	F	M	F	
Vridh Seva	-	1 (16.6)	2 (22.2)	-	-	1 (16.6)	2 (22)	2 (33)	0.0001 NS
Geeta Kutir	2 (25)	-	-	1 (14.2)	-	2 (28.5)	2 (25)	3 (42)	1.701389 NS
Nirmala	-	2 (25)	-	1 (12.5)	-	1 (12.5)	-	4 (50)	4.1201 *S
Prem Dham	-	-	-	3 (23.0)	-	-	-	3 (23)	3.9310 * S
Total							4	12	

* indicates significant of value at P=0.05 Figures in parentheses represent percentage, M = Male, F= Female

Table 3 : Place and type of occurrences of accidents **(n=15)**

Description	Old Age Homes				Total (n=60)
	I Vridh Seva	II Geeta Kutir	III Nirmala	IV Prem Dham	
Place					
Toilets(separate)	-	-	2 (13.3)	1 (6.6)	3 (5)
Bathroom with W.C.	3 (20)	2 (13.3)	2 (13.3)	1 (6.6)	8 (13.3)
Stairs	-	-	-	-	-
Corridors	-	2 (13.3)	-	-	2 (3.3)
Room	1(6.6)	1(6.6)	-	1(6.6)	3 (5)
Type					
Fall	2 (13.3)	1(6.6)	2 (13.3)	2 (13.3)	7 (11.6)
Slip	2 (13.3)	4 (26.6)	2 (13.3)	1(6.6)	9 (15)
Trip	-	-	-	-	-
Causes of fall					
Split flooring	-	-	-	-	-
Slippery flooring	1(6.6)	1(6.6)	2 (13.3)	-	4 (6.6)
Poor light	-	-	-	-	-
Poor health	1(6.6)	-	-	2 (3.3)	3 (5)
Causes of slip					
Slippery flooring	1(6.6)	1(6.6)	1(6.6)	-	3 (5)
Wet floor	1(6.6)	1(6.6)	-	1(6.6)	3 (5)
Poor light	-	1(6.6)	1(6.6)	-	2 (3.3)
Poor health	-	1(6.6)	-	-	1(1.6)
Causes of trip					
Split floor	-	-	-	-	-
Uneven surface	-	-	-	-	-

Figures in parentheses represent percentage

Table 4 : Testing of flooring material

Characteristics	Values obtained	Recommended values	Indian standard codes
Cement concrete tiles Size: 250x250x20 (mm)			
Average transverse strength (N/mm^2)	4.75 N/mm^2	0.3 N/mm^2	IS:1237-1980
Water absorption (%)	3.059	10	
Marble stone tiles (white) Size: 39 cm/ 24.5 cm			
Weight (kg.)	7.125	-	IS: 1124-1957
Water absorption (%)	0	Max. 0.4 by weight	
Marble stone tiles (black) Size: 30 cm / 18 cm			
Weight (kg.)	3.01	-	IS: 1124-1957
Water absorption (%)	0	Max. 0.4 by weight	

postural stability factors, sensory and neuromuscular factors, medical factors, medication factors and environmental factors. Many accidental injuries occurred in the bathroom and could have been avoided with common sense and inexpensive measures. Research has shown that many home accidents are preventable (Davison *et al.*, 2005). Studies that aim to determine the causes of home accidents in elderly are crucial for taking safety measures (Erkal, 2005). Cement concrete and marble stone titles were found suitable for the residential purposes for general populations with regards to the transverse strength (Table 4). But it required to be replaced with "Skid Resistance Polycemtiles" which was developed by Central Building Research Institute, Roorkee, (India), and this tile has been recommended for the old age homes.

Conclusion:

It can be concluded from the foregoing results that majority of falls/slips occurred in the habitat room and the

surrounding grounds, a review of hazards and modification to address those identified are an important component in prevention of occurrence of accidents. The results of the study are being used to design a bathing facility with non-slippery flooring, capable of providing adequate safety and access to elderly people. Eliminating accidental deaths and injuries among inmates of old age homes are to be given prime importance in creating a safe environment. Further, prospective research is needed into accidents involving elderly people living in old age homes. The ageing of the population has not only discovered with it new and serious issues, but has also become a national and international health matter to be seriously taken care of.

Recommendation:

Smooth floor surfaces should be as far as possible avoided. In potentially wet areas such as kitchens, baths, entries or laundries, unglazed "Skid Resistance Polycemtiles" developed by Central Building Research Institute, Roorkee (India) has been recommended for the old age homes. We recommend that funding be provided for an accident alarm system in old age homes for all people over the age 80 who are in relatively good health, and for all those over 65 years who are disabled or in poor health.

Implication:

The design of old age home and its environment will affect more elderly people and its implications nationwide. Policymakers should treat the elderly not as burden to the family and society but as rich repertoire of human resources in participatory development works. This paper is a deliberate attempt to add a new dimension to the present discourse which presupposes the persistence of ill health due to occurrence of accidents especially among female elderly people. The results, therefore, suggest that the state should be embarking to meet the need for good institutional living arrangements for the elderly as the demand for such care is likely to rise in the future too.

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