

Study to Prevent Falls in Elderly People by Adhering to the Modifications Done in the Old Age Home

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Abstract: ***Aim:** To prevent falls in elderly people by adhering to the modifications done in the old age home. **Objectives:** To evaluate the needed modifications in old age home and to assess or evaluate the effectiveness of modifications in preventing falls in elderly people. **Procedure:** A sample size of 25 elder persons was included in this study. And evaluate the needed modification in the old age home by identifying which components are more concerned about falls. Then intervention given by adhering to the modifications has done in the old age home. Pre-test and post-test was conducted using "the falls efficacy scale – international". **Result:** The statistical analysis after putting to test with the paired 't' tests showed significant change over the fear of falls in elder people by doing home modifications in all 25 subjects. **Conclusion:** Adhering to home modifications makes effective reduction in fear of falls and preventing falls among elderly people.*

Keywords: Elderly Persons, Home Modification, Fear of Falls, Fall, and Occupational therapy

1. Introduction

Fall is defined as the unintentionally dropping onto the ground or another lower level; sometimes a body part strikes against an object that breaks the fall. Typically, events caused by acute disorders (e.g., stroke, seizure) or overwhelming environmental hazards (e.g., being struck by a moving object) are not considered falls.

Particularly falling repeatedly, increases risk of injury, hospitalization, and death, particularly in elderly people who are frail and have preexisting disease co morbidities (e.g., osteoporosis) and deficits in activities of daily living (e.g., incontinence). Longer-term complications can include decreased physical function, fear of falling, and institutionalization; falls reportedly contribute to > 40% of nursing home admissions.^[20]

Many population-based studies have described the epidemiology of falls for older people in different settings, and rates vary considerably. Lowest rates (0.3–1.6 per person annually, weighted mean 0.65) occur among community-living, generally healthy elderly people (age≥60). Although most of these falls result in no serious injury, about 5% do induce a fracture or require hospitalization.^[9]

In general, fall prevention interventions can be categorized in to several broad categories; multidimensional fall risk assessment coupled with risk reduction, exercise programs, various types environmental assessment and modification multi factorial interventions, and institutional interventions .although the goal of preventing falls is common to each type of interventions, the approach taken by each is different.

The objectives of the multidimensional fall risk assessment are to identify risk factors for future falls and to implement

appropriate interventions to reduce fall risk. Comprehensive multidimensional fall risk assessment is most appropriate for high risk individuals. (e.g., those who have just fallen or have multiple risk factors for falls), whereas a focused assessment generally is more appropriate individuals of average risk. Numerous studies have shown that exercise can improve important fall risk factors, such as muscle weakness, poor balance, and gait impairment in healthy and impaired older adults. Tai chi is another type of exercise that has been studied as a means of improving balance and reducing the risk for falling. Tai chi consists of a series of slow, rhythmic movements that require trunk rotation, dynamic weight shifting, and coordination between upper and lower extremity movements. Tai chi has been studied as group and home programs.

Environmental assessment and modification is another promising fall prevention strategy, which is used as a means of identifying and removing potential hazards (e.g., clutter, poor lighting, throw rugs) and for modifying the environment to improve mobility and safety (e.g., installation of grab bars, raised toilet seats, lowered bed height). Multifactorial interventions are those that combine several fall prevention strategies into a coordinated program. Generally, multifactorial interventions include some degree of fall risk assessment, followed by one or more risk factor modification strategies, such as exercise, education, or environmental modification.

2. Literature Survey

Old age comprises "the later part of life; the period of life after youth and middle age, usually with reference to deterioration". When old age begins cannot be universally defined because it shifts according to the context. The United Nations has agreed that 60+ years may be usually denoted as old age.

The 1st October is observed every year as the International Day of Older Persons internationally. Being the nodal Ministry for the welfare of senior citizens, Ministry of Social Justice & Empowerment has been celebrating the occasion every year by organizing a series of programs and felicitating the distinguished senior citizens with VayoshresthaSamman.

A report released by the United Nations Population Fund and Help Age India suggests that India had 90 million According to the law, a "senior citizen" means any person being a citizen of India, elderly persons in 2011, with the number expected to grow to 173 million by 2026. Of the 90 million seniors, 30 million are living alone, and 90 per cent work for livelihood. According to census (2011) in India, Tamil Nadu is in the second place, were the percentage of population in the age group 60 and above were found to be high, next to Kerala.

There are 728 Old Age Homes in India today. Detailed information of 547 homes is available. Out of these, 325 homes are free of cost while 95 old age homes are on pay & stay basis, 116 homes have both free as well as pay & stay facilities and 11 homes have no information. A total of 278 old age homes all over the country are available for the sick and 101 homes are exclusively for women. Kerala has 124 old age homes which is maximum in any state in India.

3. Methods

The study setting of the research is AMBALAYA OLD HOME in TamilNadu. All old age people in this old age home were included within one group. Modification was done in entire old age home with convenient sampling of 25 subjects. Total duration of the study was 6 months

3.1 Materials

The Falls Efficacy Scale-International (FES-I)

The Falls Efficacy Scale-International (FES-I) is a short, easy to administer tool that measures the level of concern about falling during social and physical activities inside and outside the home whether or not the person actually does the activity. The level of concern is measured on a four point Likert scale (1=not at all concerned to 4=very concerned) (Yardley et al., 2005). Assessment of fear of falling, followed by appropriate interventions, is crucial to promote independence, function, wellness, and safety of older adults. Targeted population of this tool is all older adults with or without a history of fear of falling. The FES-I had excellent internal validity (Cronbach's alpha=0.96) as well as test-retest reliability (ICC=0.96) (Yardley, Beyer et al, 2005). This tool was developed to expand on the initial Falls Efficacy Scale (FES) (Tinetti et al., 1990) to include social activities that may be considered more challenging by more active people, thereby potentially causing more concerns about falling than the basic activities presented in the initial FES. These additional activities correspond to items 11-16 on the FES-I.

3.2 Procedure

A sample size of 25 elderly persons was included in this study. Then some details such as name, age, sex, co-morbidity, and any previous history of falls was taken. Pre-test was conducted by using assessment of fear of falling in older adults: "The falls efficacy scale- international (FES-I). It is the questionnaire form including 16 questions. Then evaluation for the needed modification in the old age home from "The falls efficacy scale-international" by identifying which components are more concerned about falls. Then subjects were given 3 months' time to adhere with the modifications done in the old age home. After 3 month, post-test was conducted using same "The falls efficacy scale - international" (FES-I).

3.3 Intervention

Some modifications were giving in various areas of the old age home

Such as, Putting non-skid rubber mat, Bath mat, Putting projection in the sloping surface and steps, Non-skid foot wears and small chairs in the bath room, Making extra step in the place of big obstacle, Sticking rubber piece behind the chairs for slip resistant, Putting bleaching powder for foot gripping in the cloth washing area, Putting bright light in pathways, Sticking projection in the hand rails for hand gripping

4. Data Analysis and Results

Table 1: Comparison between pre and post test scores of all 25 subjects

TEST	MEAN	SD	't' value	P value
Pre	50.72	6.52	18.2123	<0.0001
post	41.88	7.03		

Table 1 shows that comparison between FES-I in pre and post test scores of all 25 subjects, mean values are 50.72 and 41.88; and 't' value is 18.2123, 'p' value is less than 0.0001. This difference is considered to be statistically significant.

Table 2: Comparison between pre and post test scores of all 80 and above aged subjects

Test	Mean	SD	't' Value	'p' Value
PRE	54.88	4.14	12.8349	<0.0001
POST	47.44	3.84		

Table 2 shows that comparison between FES-I in pre and post test scores of all 80 years and above subjects, mean values are 54.88 and 47.44; and 't' value is 12.8349, 'p' value is less than 0.0001. This difference is considered to be statistically significant.

Table 3: Comparison between pre and post test scores for subjects between 70 to 79 years

Test	Mean	SD	't' VALUE	'p' Value
PRE	50.58	5.82	15.3817	<0.0001
POST	40.42	6.43		

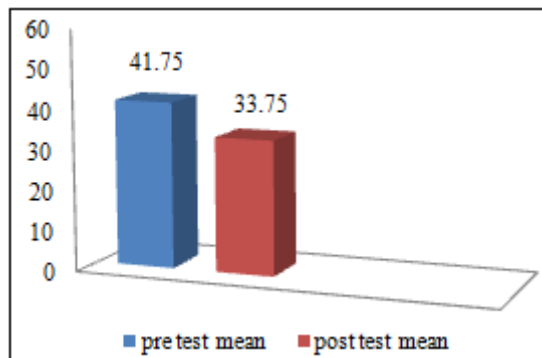
Table 3: shows that comparison between FES-I in pre and post test scores for all subjects between 70 to 79 years, mean

values are 50.58 and 40.42; and 't' value is 15.3817, 'p' value is less than 0.0001. This difference is considered to be statistically significant.

Table 4: Comparison between pre and post test scores for subjects between 60 to 69 years

Test	Mean	SD	't' Value	'p' value
PRE	41.75	3.20	6.5320	0.0073
POST	33.75	3.77		

Table 4: shows that comparison between FES-I in pre and post test scores for all subjects between 60 to 69 years, mean values are 41.75 and 33.75; and 't' value is 6.5320, 'p' value is 0.0073. Difference is considered to be statistically significant.



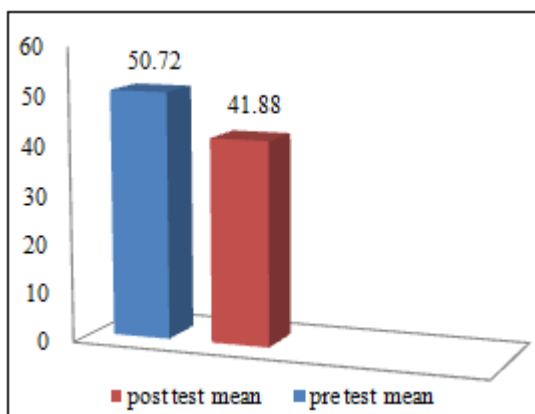
Graph 4: Comparison between pre and post test scores for subjects between 60 to 69 years

5. Discussion

This particular study was aimed to prevent falls in elderly people by adhering to the modifications done in the old age home by the process of evaluating the needed modifications in old age home and assess or evaluate the effectiveness of modifications in preventing falls in elderly people.

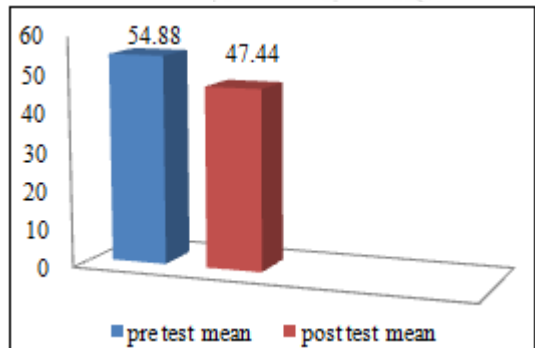
The post test score on Falls Efficacy Scale-International (FES-I) expressed that there it is a significant change over the fear of falls in elder people by doing home modifications.

Table 1: Graph 1: shows the comparison between FES-I in pre and post test scores of all 25 subjects, were mean values are 50.72 and 41.88 respectively; and 't' value is 18.2123; 'p' value is less than 0.0001. This difference is statistically significant when put through paired 't' test and it denotes there is a significant change over the fear of falls in elder people by doing home modifications in all 25 subjects.



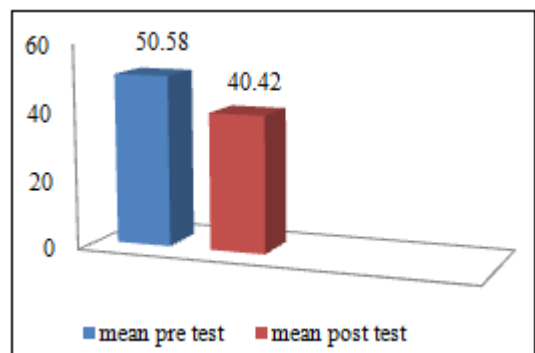
Graph 1: Comparison between pre and post test scores of all 25 subjects

Table 2: Graph 2: shows the comparison between FES-I in pre and post test scores of all 80 and above aged subjects, were mean values are 54.88 and 47.44 respectively; and 't' value is 12.8349, 'p' value is less than 0.0001. The difference between pre and post test scores is considered to be statistically significant and there are only mild changes over the fear of falls after modifications in this age group. As the subjects with 80 and above age have other co-morbid issues, the compliance with adjustments done in their old age home did not show an achievable difference in fear of falls.



Graph 2: Comparison between pre and post test scores of all 80 and above aged subjects

Table 3: Graph 3: denotes the comparison between FES-I in pre and post test scores for age group between 70 to 79 years, were mean values are 50.58 and 40.42 respectively; and 't' value is 15.3817, 'p' value is less than 0.0001.



Graph 3: Comparison between pre and post test scores for subjects between 70 to 79 years

Table 4: Graph 4: denotes the comparison between FES-I in pre and post test scores for age group between 60 to 69 years, mean values are 41.75 and 33.75 respectively; and 't' value is 6.5320, 'p' value is 0.0073.

The difference in pre and post-test values in Table 3 and Table 4 is considered to be statistically significant and moderate changes occur over the fear of falls in these age groups.

As the subject with 60 to 69 age groups doesn't have major co-morbid issues. They also had fewer score in fear of falls compared to others in the pre-test (41.75). After providing modifications, there was decrease in the fear of falls score in post test (33.75).

Subject with 70 to 79 age groups may have some associated conditions such as diabetics, hyper tension, body pain, swelling and pain in joints. So the subjects show higher scores in fear of falls in pre-test (50.58). After providing modifications, these groups too got benefit in level of fear for falls (40.42).

The present study is focusing on parameters in the remote and basic old age home where hardly any focus or measures to prevent the falls are looked upon.

Old age home visits are must, to identify the home environment and home hazards. And, modifications can be given in the old age home for preventing falls. So, Occupational Therapist must visit the old age home periodically and check out the hazards, and then should try to alter these hazards for falls prevention. Home visits by occupational therapist may also lead to change in behavior that enables older people to live more safely in both the home and the external environment.

Robert G. Cumming et al., (2009) conducted home visits by an occupational therapist for assessment and modification of environmental hazards: He concluded that home visits by occupational therapists can prevent falls among older people who are at increased risk of falling.^[12]

These modifications are done after the evaluation of Falls Efficacy Scale-International, by identifying more concerned area in the old age home. Occupational Therapist must provide adjustments after evaluation and find out what are the modifications are needed in the home.

Home modification is one of the financially expensive works. So, the Occupational Therapist must seek some assistance from sponsors for donating funds and material. Such as, trusts, social clubs, government schemes and non-governmental organizations. Fortunately there are many sources of assistance for making modifications to one's home to accommodate elderly persons.

6. Result

The statistical analysis after putting to test with the paired 't' tests showed significant change over the fear of falls in elder people by doing home modifications in all 25 subjects.

7. Conclusion

Adhering to home modifications makes effective reduction in fear of falls and preventing falls among elderly people.

8. Limitation and Recommendation

Limitations such as study is done with a small sample size, only one old age home was included, no other treatment methods were considered, various co-morbid issues were

not taken under consideration, and study was carried out for a short period of time.

Recommendations such as study can be done on a large sample size, the study can be suitable, if compared among both the sexes, other treatment techniques can be included, more adjustments can be applicable, various setups can be considered for research of falls, the study can be carried out for a longer duration with more number of follow-ups and screening.

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