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Effect of low grade exercise program on functional status and incidence of fall among elders in selected rural area

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Abstract

Background: Falls and fall related injuries among older people are considered as major issues for health care providers. Falls is not only a problem for the patient but to the nursing staff. In hospital set up, the percentage of patients falling during the stay ranges from 2-15%. So aim of the present study was conducted to assess the effect of low grade exercise program on functional status and incidence of fall among the elders in selected rural areas.

Methodology: A quantitative approach with pre experimental one group pre-test post-test design was adopted for the study. The samples from the selected rural areas of Belagavi district were selected using convenient sampling technique. The sample consisted of 30 elderly people. The tools used for data collection was structured functional status assessment scale.

Results: The mean difference of functional status between the pre-test and post-test it is 0.76. and paired 't' test value was ' t' (28) = 4.67 is proved to be significant at 0.05 level of significance and the mean difference of incidence of falls between the pre-test and post-test it was 0.33 and paired 't' test value was ' t' (28) = 10.72 is proved to be significant at 0.05 level of significance indicating that the low grade exercise program has made it impact by improving functional status and reducing incidence of falls among elderly. There was significant correlation found between pre-test functional status and incidence of falls ('ϒ' (28) =-0.53) among the participants.

Conclusion: There is a need for the low grade exercise program for the elderly people for the improvement of their functional status and reduction of incidence of falls.

Keywords: Low grade exercise, incidence of falls, functional status, elderly people, rural areas

Introduction

Every being on the earth inevitably follows the cycle, determined by nature that takes him / her through variegated phases of childhood, adolescence, adulthood and maturity. Each stage has its own vigour, its set of responsibilities and its particular problems [1]. Generally, with the advancement of age, the entire scenario undergoes a drastic change. Responsibilities are passed on to the next generation and the vigor slowly fades out- giving rise to a monotony and dullness, leading gradually to a complicated set of problems that hinder effectiveness [2].

The number of persons above the age of 60 years is increasing very rapidly especially in India. India is the second most country in the world with 76.6 million people at or above the age of 60, constituting 7.7% of total population. This population is facing numerous problems, owing to the social and cultural changes that are taking place within the Indian society. Falls are one of the major problems in the elderly and pose a serious problem to health and wellbeing of older adults. While considerable research is available on the determinants of health in developed countries there is limited research on aging in India [3].

Elderly people utilize the largest proportion of health care resources. although patients above the age group of 65 years and older constitutes about 11% of the American population they account for 345 of all beds used in acute care hospitals

and 295 of all expenditure for personal health care. Since the population aged above 65 is expected to be the double of existing number by 2020, the health care need of the elderly is having great concern [4].

Seventy two percent of the people above 60 years are living in the rural areas. The Dependency ratio in 1991 was 12.6 and it will rise to 14.12 by 2016. National survey in India in 1986-87 revealed that 45% of old population is suffering from chronic illnesses, in that 35-50% are having joint problems. Half of the individuals above 60 have one or other ailment at any point of time. In rural setting 66% of the aged person manifested one or other ailment [5].

Falls and fall related injuries among older people are considered as major issues for health care providers. Falls is not only a problem for the patient but to the nursing staff. In hospital set up, the percentage of patients falling during the stay ranges from 2-15%. Up to one quarter of the falls result in physical injuries such as bruises, lacerations or fractures. Between 40% and 56% of the nursing home residents fall at least once a year [6].

Hence, the researcher felt that it is significant to study the effect of low intensity exercise program on functional status and incidence of falls among elderly and develop appropriate interventional health strategies which can be recommended to the old age groups.

Objectives
1. To determine the incidence of fall among elders before and after the administration of low intensity exercise program.
2. To find out the functional status among elders before and after the administration of low intensity exercise program.
3. To determine the effect of low grade exercise program in terms of improved functional status and decrease in the incidence of fall among elders.
4. To find out the relationship between incidence of falls and functional status among the elder people

Hypothesis
H_1: The mean post-test incidence of falls among elderly will be significantly lower than their mean pre-test incidence of falls at 0.05 levels of significance

H_2: The mean post-test functional status scores of the elderly will be significantly higher than their mean pre-test scores at 0.05 levels of significance

H_3: There will be significant relationship between the level functional status and incidence of falls among elders and their selected personal variables

Methodology
Research Approach: Quantitative Research Approach
Research Design: Pre experimental one group pre-test post-test design
Sampling technique: Non-Probability; convenient Sampling Technique
Sample size: 30
Setting of study: Selected rural areas of Belagavi district
Method of data collection: Self report technique

Tools Used
Section I: Socio-demographic variables of Participants
Section II: Structured functional status assessment scale
For assessing the functional status a standardized functional status assessment scale was used. It consists of 6 items, and the range of score is 0-6. It uses Katz Index of Independence in Activities of Daily Living for grading the independence level, which grade score 5- 6 as Highly Independent 2- 4 as partially dependent 0- 1 as Highly dependent.

Procedure of data collection
Data was collected after obtaining administrative permission from selected primary health centres of Belagavi district. The investigator personally explained the participants the need and assured them of the confidentiality of their responses. On day one pre-test was conducted to assess Functional status and incidence of fall among elders. Personal variables were collected using an interview technique. Low grade exercise program was conducted from second day to fifteenth day and post-tests were conducted on fifteenth day by using same tools.

Results
a. The findings related to socio-demographic variables of participants
Study comprised of 30 participants. The socio demographic variables are presented in following table.

Table 1: Frequency & Percentage Distribution of participants according to socio demographic variables N=30

Sl. No	Demographic variables	Frequency (f)	Percentage (%)
	Age (in yrs)		
1	a) 60-70	12	40
	b) 71-80	15	50
	c) 81-90	03	10
	Gender		
2	a) Male	21	70
	b) Female	09	30
	Work		
3	a) Not engaged in work	12	40
	b) Engaged in work	18	60
	Presence of morbidity		
4.	a) Yes	19	63.30
	b) No	11	36.70
	Type of Morbidity		
5.	a) Hypertension	12	63.15
	b) Diabetes	02	10.52
	c) Both	05	26.31
	Meals taken per day		
6.	a) One	01	3.30
	b) Two	17	56.70
	c) Three and more	12	40

b. Findings related to falls among the participants
I: Incidence of falls

Table 2: Frequency and percentage distribution of elder's according to their incidence of falls during fifteen days prior to pre-test and post-test N=30

Area	Frequency	Percentage
Pretest	12	40%
Post-test	06	20%

In pre-test 12 (40%) of participants were had incidence of fall during the fifteen days prior to pre-test and it was reduced to 6(20%) in post-test.

II: Frequency of falls

Table 3: Frequency and percentage distribution of elder's according to their frequency of falls during fifteen days prior to pre-test and post-test N=30

Area	No. of times	Frequency	Percentage
Pretest	One time	9	75%
	Two times	2	16.7%
	Three times	1	8.33%
	More than 3 times	0	0
Post-test	One time	05	91.67%
	Two times	01	8.33%
	Three times	0	0
	More than 3 times	0	0

In pre-test majority 9(75%) were had history of fall one time, 2(16.7%) were had history of fall two times and 1(8.33%) of was had history of fall three time. In post-test majority 5(91.67%) of participants were had frequency of falls one time and remaining 1(8.33%) were had frequency of falls two times.

III: Effectiveness of low-grade exercise program

Table 4: Mean, median, mode, standard deviation and range scores of falls during pretest and post-test N = 30

Area	Mean	SD	Median	Range
Pre test	1.33	0.62	1	0-3
Post-test	1	0	1	0-1

The data presented in Table 4 shows that the pre-test incidence of falls ranged from 0-3. The mean pre-test score is 1.33 with standard deviation ±0.62 and median score was 1. The post-test incidence o falls ranged from 0-1. The mean of Post-test incidence of fall is 1 with standard deviation 0 and median of 1.

In order to find out the significance of difference between means of pre-test and post-test incidence of falls, paired 't' value was computed. The data are presented in Table 5. To test statistical significance following hypothesis was stated:

H₁: The mean post-test incidence of falls among elderly will be significantly lower than their mean pre-test incidence of falls at 0.05 levels of significance

Table 5: Mean, mean difference, SD difference, Standard error of mean difference, and paired 't' test of pre-test and post-test incidence of falls of elders who have received low grade exercises N= 30

Area	Mean	Mean difference	SD$_{MD}$	SEMD	Paired 't' test	Level of significance
Pre test	1.33	0.33	0.383	0.0699	10.72	*S
Post-test	1					

t' (28) = 2.04 p<0.05

The data presented in Table 5 shows that the mean difference between the pre-test and post-test it is 0.33. This indicates a reduction in incidence of falls among elders after undergoing two weeks of low grade exercise program. To find significance of the reduction in incidence of falls paired 't' test value was computed and the obtained value of ' t' (28) = 10.72 is proved to be significant at 0.05 level of significance indicating that the low grade exercise program has made it impact on the incidence of fall by reducing its incidence.

c. Findings related to functional status among the participants

Table 6: Mean, median, mode, standard deviation and range scores of falls during pretest and post-test N = 30

Area	Mean	SD	Median	Range
Pre test	4.87	1.28	5	2-6
Post-test	5.63	0.60	6	4-6

The data presented in Table 6 shows that the pre-test functional status scores ranged from 2-6 in as against possible range of 0-6. The mean pre-test functional status score was 4.87 with standard deviation ±1.28 and the median score is 5. It was changed in post-test as mean functional status score was 5.63 with standard deviation ±0.60, median was 6 and scores ranged between 4-6.

In order to find out the significance of difference between means of pre-test and post-test functional status, paired 't' value was computed. The data are presented in Table 7. To test statistical significance following hypothesis was stated:

H₁: The mean post-test functional status among elderly will be significantly higher than their mean pre-test functional at 0.05 levels of significance

Table 7: Mean, mean difference, SD difference, Standard error of mean difference, and paired 't' test of pre-test and post-test functional status of elders who have received low grade exercises N= 30

Area	Mean	Mean difference	SD$_{MD}$	SEMD	Paired 't' test	Level of significance
Pre test	4.87	0.76	0.689	0.087	4.678	S
Post-test	5.63					

t' (28) = 2.04 p<0.05

The data presented in Table 7 shows that the mean difference between the pre-test and post-test it is 0.76. This indicates a improvement in the functional status among elders after undergoing two weeks of low grade exercise program. To find significance of the improvement in functional status paired 't' test value was computed and the obtained value of ' t' (28) = 4.67 is proved to be significant at 0.05 level of significance indicating that the low grade exercise program has made it impact on the improvement of functional status among the participants.

d. Findings related to relationship between incidence of falls and functional status among the participants

In order to, find out the correlation of functional status scores and incidence of falls of elders a correlation coefficient was computed by using Karl Pearson's Co efficient of correlation. To test statistical significance following hypothesis is stated-

H₃: There will be significant relationship between the level functional status and incidence of falls among elders and their selected personal variables

Table 8: Correlation coefficient of pre-test functional status and incidence of fall scores of participants n =30

Variables	Mean Score	Correlation Coefficient	Level of significance
Functional status Vs incidence of falls	4.87 1.33	-0.53	S

The data presented in Table 8 shows that there is significant correlation between pre-test functional status and incidence of falls ('ϒ' (28) =-0.53), of elders. Thus the research hypothesis H₃ is supported. It indicates that good functional status will reduce the incidence of falls.

Conclusion

The findings revealed that before the administration of low grade exercise program functional status were assessed and it was found poor. The incidence of fall was assessed and many elders were presented with history of falls. The low grade exercise program was planned and administered to the elders and it was found effective in improving the functional and in reducing the incidence of fall. As the result the result was computed and 't' value was found highly significant. The low grade exercise program was very much effective and the elders had great interest to learn and to do the exercises to improve their functional and to reduce the

incidence of fall.

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