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A study to evaluate the effectiveness of balance exercises on body balance among elderly in selected old age homes, Visakhapatnam district

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Abstract
Balance problems are common among the elderly and are a leading cause of institutionalization in this group that result in over five million patient outpatient visits per year. It is estimated that between 28% and 35% of individuals over age 60 fall each year due to inadequate body balance, with a fifth of those requiring medical attention. The number of people with balance disorder increases to over 40% for those 60 and older. A history of balance disorder is also a robust predictor of morbidity among the elderly. Inadequate balance problems are prevalent, dangerous, and costly. Even falls that do not result in injury can have serious consequences. Psychological trauma and fear-of-falling produce a downward spiral of self-imposed activity reduction which leads to loss of strength, flexibility and mobility, thereby increasing the risk of future falls. Exercise is beneficial even in those aged more than 80 years. Balance exercises are a common technique for balance recovery. Previous studies have shown that elderly adults are less able than young adults to recover balance by balance exercises. The present study was done to find out the effectiveness of balance exercises on body balance.

Keywords: balance exercises, body balance, elderly, old age homes

Introduction
Balance refers to the ability to maintain the centre of gravity over the base of support, usually in an upright position. Balance is a dynamic phenomenon that involves a combination of stability and mobility. It is necessary to hold a position in space or move in a controlled and coordinated manner. Balance disorders in the elderly population are often a multi-factorial condition. While there is not a single solution to postural control problems, there is evidence that the most effective treatment strategies for balance disorders consists of a multimodal approach including a re-evaluation of medications, manual therapy, exercise, and behavioral modification programs**.**

Objectives of the Study
- To assess the body balance among elderly people in both experimental and control groups before balance exercises.

Research approach
The selection of research approach is the basic procedure for conducting research enquiry. The approach for this study is Quantitative approach.

Research Design
The research design selected for the present study was "Two groups Pre-test and Post-test design".

Research Design for the study is represented as
Quasi-Experimental study (control group and experimental group).

01 X02
O_1 : Pre-test assessment of level of body balance by Standardized Berg balance scale.
O_2 : Post-test assessment of level of body balance by Standardized Berg balance scale.
X : Balance exercise intervention.

Variables
Dependent variable
- Body balance.

Independent Variable
- Balance exercise.

Demographic variables
- In the study, it refers to Age, Sex, income status, marital status and religion, education, occupation, number of children.

Setting of the Study
The study was conducted among elderly people in selected old age homes in Visakhapatnam, Andhra Pradesh.

Population
In the present study, the population consists of elderly people in selected old age homes.

Sample: In the present study, the sample consists of 60 elderly people of selected old age homes in Visakhapatnam district

Sampling Technique: In this study purposive sampling technique is found to be apt in which every member of the population has an equal chance of selection into the sample, and lottery method was adopted to select the sample.

Description of tool: The tool consists of two sections.
Part A: It consists of demographic variables such as age, gender, body weight, exercise pattern, dietary pattern, use of any regular drugs and previous exposure to information.

Part B: It consisted of Standardized Berg Balance Scale which has 14 items to assess the balance and different positional changes. It is a 5 point scale ranging from 0 - 4. '0' indicated the lowest level of function and "4" indicated the highest level of function.
Maximum possible score was 56 and minimum possible score was 0.

Scoring Procedure
The body balance is classified as follows
0 – 20 (< 35%) – Inadequate body balance
21 – 40 (35% - 70%) – Moderate body balance
41 – 56 (> 70%) – Adequate body balance.

Data collection method
The Data collections were done in prema samajam old home Visakhapatnam. permissions were obtained from the ethical committee members and the head of the institutions. The formal written permission was obtained from the respected manager of prema samajam old age home, prior to data collection after informing the purpose of the study.
An informed written consent was obtained from the elderly people after explaining the purpose of the study and confidentiality of the study the total sample 60 elderly was included in the study. In that of samples 30 were experimental and 30 were control group. Informed consent was taken from the subjects prior to the procedures. The subjects were administered base line demographic Performa and standardized questionnaire.
Pre test was conducted on the first day, the average time taken for self administered questionnaire was 45-50 minutes.The demonstration of balance exercises was administered on the second day and the samples were divided into two groups :group-A=15members and group-B=15members and the demonstration of exercises for group-A in the morning section and group-B in the evening section observed and practicing of balance exercises every day for 30minutes by the samples and the post test body balance scores was collected on the 30th day.

Plan for data analysis
The data obtained will be analyzed in terms of objectives of the study using descriptive and inferential statistics.

1. **Descriptive statistics**
   - Frequency and percentage distribution will be used to analyze the demographic variables.
2. **Inferential statistics**
   - Paired 't'test will be used to evaluate the effectiveness of balance exercises on body balance among elderly.
   - A chi-square analysis will be used to find out association between the knowledge levels and socio demographic variables.

Results
1. Frequency and percentage distribution of on balance exercises on body balance among elderly people to their demographic variables.

Percentage Distribution of Samples According To Age Group

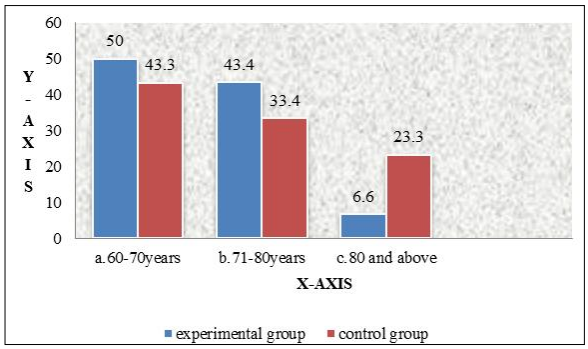

Fig 1: Age

With regards to age, in the experimental group the majority 15 (50%) of the participants were in the age group between 61-70 years, 13 (43.4%) of the participants were in the age group between 71-80 years, 2 (6.6%) of the participants were in the age group between 81 and above.
Where as in the control the majority 13 (43.3%) of the participants were in the age group between 61-70 years, 10 (33.4%) Of the participants were in the age group between 71-80 years, 7 (23.3%) of the participants were in the age group between 81 and above.

Frequency and Percentage Distribution According To Gender

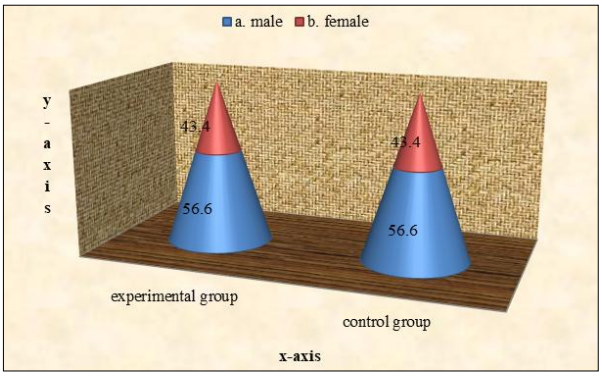

Fig 2: Gender

Regarding the gender of the elderly in the experimental group the majority 17 (56.6%) of the participants were male 13 (43.4%) of the participants were female. In the control group the majority 17(56.6%) of the participants were male and 13 (43.4%) of the respondents were female elderly.

Frequency and Percentage Distribution According To Body Weight

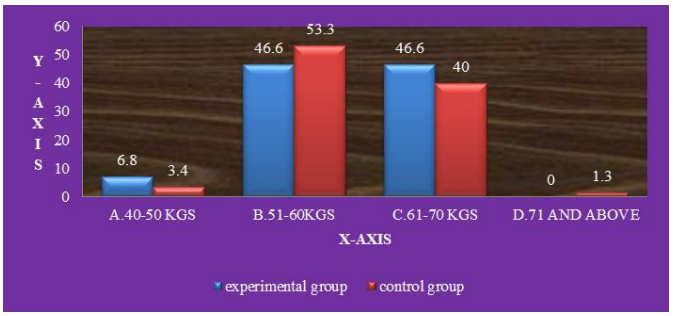

Fig 3: Body Weight

With regards to order of the elderly, in the experimental group the majority 14 (46.6%) of the participants were in the body weight between 51-60kgs and 61-70kgs, 2 (6.8%) of the participants were in the body weight of 40-50kgs, 0(0%) of the participants were in the body weight of 71 and above. In the control group the majority 16 (53.3%) of the participants were in the body weight between 51-60kgs, 12(40%) of the participants were in the body weight between 61-70kgs, 1 (3.4%) of the participants were in the body weight of 40-50kgs and 71 and above.

Frequency and percentage distribution according to exercise pattern

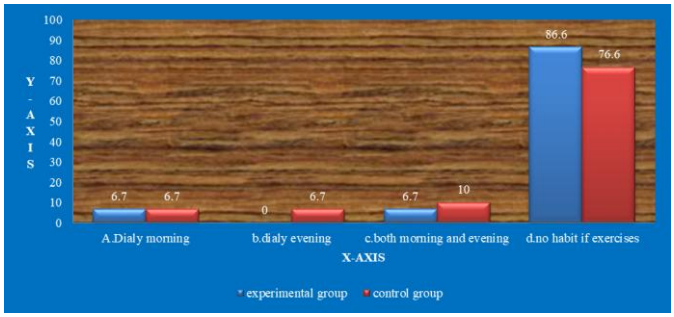

Fig 4: Exercise Pattern

Regarding exercise pattern of the elderly, in the experimental group the majority 26 (86.6%) of the participants were having no habit of doing exercise, 2(6.7%) of the participants were having a habit of doing exercise daily morning, 2(6.7%) of the participants were having a habit of doing daily both morning and evening, 0(0%) of the participants were having a habit of doing exercise daily evening.

In the control group the majority 23 (76.6%) of the participants were having no habit of doing exercise, 3(10%) of the participants were having a habit of doing daily both morning and evening 2(6.7%) of the participants were having a habit of doing exercise daily morning, 2(6.7%) of the participants were having a habit of doing exercise daily evening.

Frequency and Percentage Distribution According To Dietary Pattern

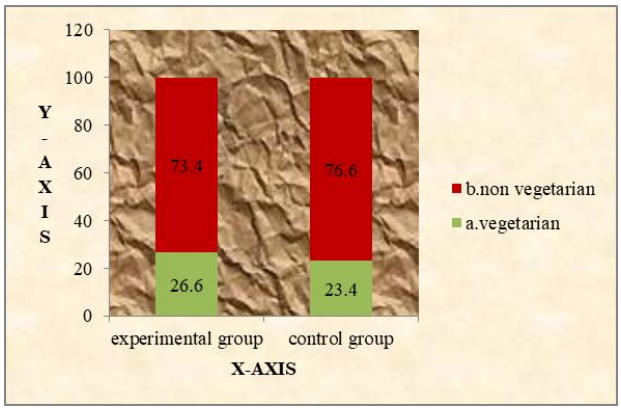

Fig 5: Dietary Pattern

Regarding dietary pattern in the elderly, in the experimental group, the majority 22 (73.4%) of the participants were non-vegetarian, 8 (26.6%) of the participant were vegetarian.

In the control group regarding, the majority 23(76.6%) of the participants were non-vegetarian, 7 (23.4%) of the participant were vegetarian.

Frequency and percentage distribution of Use of any medicines

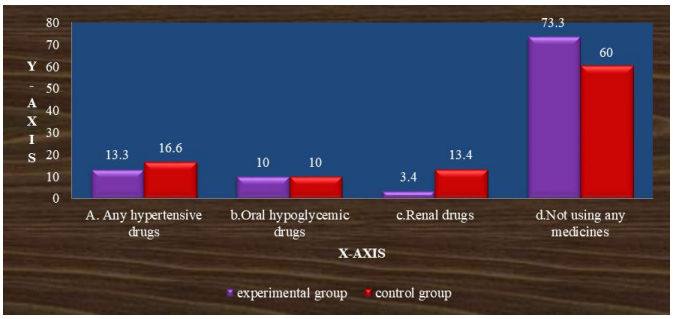

Fig 6: Use of any medicines

Regarding use of any medicines, in the experimental, the majority 22 (73.3%) of the participants were not using any medicines, 4 (13.3%) of the participants were using anti hypertensive drugs, 3 (10%) of the participants were using oral hypoglycemic drugs, and 1(3.4%) of the participants were using renal drugs. In the control group majority 18 (60%) of the participants were not using any medicines, 5 (16.6%) of the participants were using anti hypertensive drugs, 4(13.4%) of the participants were using renal drugs, and 3 (10%) of the participants were using oral hypoglycemic drugs.

Frequency and Percentage Distribution According To Previous Exposure to Information

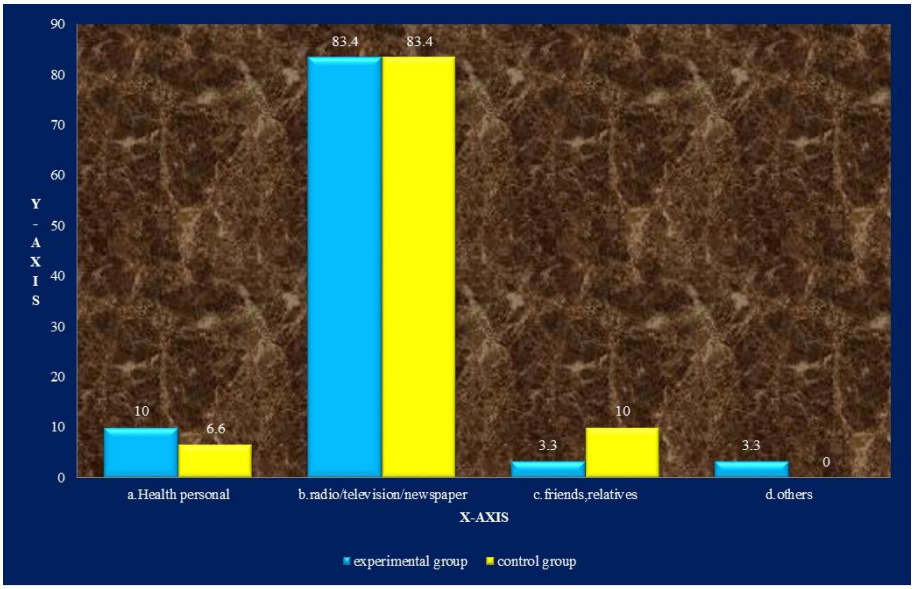

Fig 7: Previous exposure to information

Regarding previous exposure to information, in the experimental group, majority 25(83.4%) of the participants were through radio/television/news paper, 3(10%) of participants were through health personnel, 1(3.3%) of the participant were through friends/relatives, 1(3.3%) of the participants through others. In the control group, majority 25(83.4%) of the participants were through radio /television/ news paper, 3(10%) of the participant were through friends/relatives, 2(6.6%) of participants were through health personnel, 0(0%) of the participants through others.

Section-B

Frequency and percentage Distribution of elderly pre test score of experimental group according to their body balance

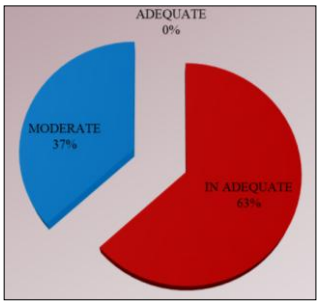

Fig 8

Table 1

S.no	Activity levels	Scoring category	Frequency	Percentage
1	Inadequate	0-20	19	63.3%
2	Moderate.	21-40	11	36.6%
3	Adequate	41-56	0	0%

N=30.

Table 2 Depicts that 63.3% of elderly people had inadequate body balance Pre-test score, 36.6% had Moderate body balance Pre-test score regarding activity before balance exercises.

Frequency and percentage Distribution of elderly people experimental group of post test score according to their body balance level

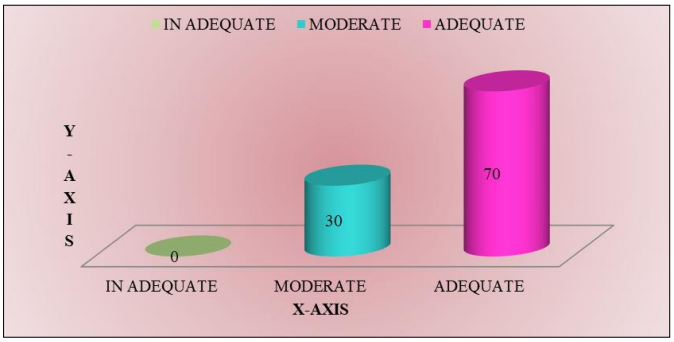

Fig 9

Table 2

S.No.	Activity levels	Scoring category	Frequency	Percentage
1	Inadequate	0-20	21	0%
2	Moderate	21-40	9	30%
3	Adequate.	41-56	21	70%

N=30.

Table 2: Depicts that 70 % elderly people had adequate body balance Post test score and 30% had moderate body balance post test-test score regarding Improvement in body balance level after providing balance exercises

Section-C

This section deals with the pre-test and post –test body balance of elderly as assessed in response to the berg balance scale.

Table 3: Comparison of pre- test and post- test body balance scores regarding elderly.

	Activity levels	Pretest		Post test	
		F	%	F	%
Experimental Group	Inadequate	19	63.3%	0	0%
	Moderate	11	36.6%	9	30%
	Adequate	0	0%	21	70%
Control Group	Inadequate	19	63.3%	19	63.3%
	Moderate	11	36.6%	11	36.6%
	Adequate	0	0%	0	0%

N=60.

Table 4 Depicts that (63.3%) of elderly people had inadequate body balance Pre-test score, (36.6%) had Moderate body balance Pre-test score regarding activity before balance exercises.

Depicts that (70 %) elderly people had adequate body balance Post test score and (30%) had moderate body balance post test-test score regarding Improvement in body balance level after providing balance exercises.

Fig: 9 shows the comparison of percentage of Improvement in the body balance in elderly that (70 %) elderly people had adequate body balance Post test score and (30%) had moderate body balance level.

Table 5: Comparison of Mean and standard Deviation of pre test and Post test body balance levels of elderly.

Group	Mean	S.D	"t" value	Table value
Experimental group				
Pre test	23.26	6.15	9.71	1.658
Post test	45.93	5.69		

Shows the comparison of the mean and standard deviation of the pre test and post test activities scores, where the mean is 23.26 in pre test and 45.93 in post test, standard deviation 6.15 in pre test and 5.69 in post test.

Mean standard deviation and "t" value of pre-test and post-test score on body balance among elderly in prema samajam old age home

Table 6

Group	Mean	S.D	"t" value	Table value
Experimental group (n=30)				
Pre test	23.26	6.15	9.71	1.658
Post test	45.93	5.69		
Control group (n=30)				
Pre test	23.26	5.72	0.170 NS	1.658
Post test	23.26	5.72		

Note * denotes significance at 0.05%level

Shows the mean, standard deviation and "t" value of pre-test and post test scores of body balance among elderly.

Interpretations: There will be a significant difference in the level of body balance among elderly before and after balance exercises among experimental group.

Illustrated that the mean post test score of experimental (45.93) and was greater than the mean pre test score (23.26), showed that there was a significant difference between the pre test and post test body balance scores.

The standard deviation of pre test is 6.15 and the standard deviation of post test is 5.69, showed that there was a significant difference between the pre test and post test body balance level among elderl

The overall computed t value is 9.71 greater than table value, which is statistically significant at $p < 0.01$ level.

The above results revealed that there is a significant difference between the pre test and the post test scores of body balance among elderly after providing balance exercises.

Comparison of Mean and standard Deviation of Post test Scores of body balance levels of elderly among experimental and control group

Paired 't' test showing the significance difference between the mean and standard deviation of post test body balance level scores of post experimental and control group.

Table 7

Aspects	Mean	Standard Deviation	Tabulated value	Calculated Value
Experimental group (Post test)	45.93	5.69	2.00	9.71
Control group (Post test)	23.26	5.72		

The obtained 't' value 9.71 is greater than table value 2.00 at df 29 at 0.05 level of significance. Therefore the obtained 't' value is found to be statistically significant. Therefore we have sufficient evidence to conclude that experimental group had effectiveness of balance exercises than control group after balance exercises.

It can be concluded that the intervention of balance exercises an important role in improving the level of body balance among elderly.

Section-D

Association between the post test scores of body balance levels with Selected Demographic Variables among elderly in experimental group.

Statement of Chi Square test result of Post Test Score with reference to body balance with the selected demographic variables among the elderly in Experimental Group

Table 8

Items	Variables	Adequate	Moderate	Adequate	Chi-Square	Df	Critical Table	Significance Result Y/N
Age	61-70 Years	0	7	8	3.33	6	5.35	Ns
	71-80 Years	0	2	11				
	80 and Above	0	1	1				
Gender	Male	0	4	13	1.69	2		5.8s
	Female	0	6	7				
Body Weight	40-50 kgs	0	0	2	1.07	4	3.36	Ns
	51 -60 kgs	0	5	9				
	61-70kgs	0	5	9				
	71 & above	0	0	0				
Exercise Pattern	Morning	0	2	0	6.92	6	5.35	S
	Evening	0	0	0				
	Both Morning and Evening	0	2	0				
	No habit of doing exercise	0	8	18				
Dietary Pattern	Vegetarian	0	4	4	1.36	6	5.35	Ns
	Non-Vegetarian	0	6	16				
Use of any Medicines	Anti hypertensive Drugs	0	0	4	4.09	6	5.35	Ns
	Oral Hypoglycemic Drugs	0	2	1				
	Renal Drugs	0	0	1				
	Not using any medicines	0	7	15				
Previous exposure to information	Health Personal	0	1	2	1.08	6	5.35	Ns
	Radio/Television /News Paper	0	9	16				
	Friends, Relatives	0	0	1				
	Others	0	0	1				

Significant at 5% level, *the result is not significant at p < 0.05.*

Interpretations

It can be seen from the above Table. 8 showed that the selected demographic variables, it is found that the computed value is less than the critical value of the all selected demographic variables of the study. Null hypothesis is accepted, where given second alternative hypothesis is significant at all demographic variables. i.e. Age, gender, body weight, exercise pattern, dietary pattern, use of medicines and previous exposure to information are the variables significant at 5% level (all variables p value > 0.05) with chi square test result for post test score of balance exercises on body balance among elderly at the present study. Further it is conclude that balance exercises are an important and useful treatment of body balance among elderly.

Table-8 shows the association of demographic variables with body balance is determined by using chi square test (X2) test.

With regard to the age chi square value is (3.33) and table value is (5.35), which shows that chi square calculated value is Less than the table value, which is not significant at 0.05 level. Hence the null hypothesis is accepted and inference that there is no significant association between the body balance and age group of elderly by providing balance exercises.

With respect to the Gender chi square value is (1.69) and table value is (1.39), which shows that chi square calculated value is more than the table value, which is significant at 0.05 level. Hence the null hypothesis is accepted and inference that there is significant association between the body balance and Gender group of elderly by providing balance exercises

In relation to the body weight chi square value is (1.07) and table value is (3.36), which shows that chi square calculated value is less than the table value, which is not significant at 0.05 level. Hence the null hypothesis is accepted and inference that there is no significant association between the body balance and body weight of elderly by providing balance exercises

With regard to the exercise pattern chi square value is (6.92) and table value is (0.5), which shows that chi square calculated value is more than the table value, which is not significant at 0.05 level. Hence the null hypothesis is accepted and inference that there is significant association between the body balance and exercise pattern of elderly by providing balance exercises

Regarding the dietary pattern chi square value is (1.36) and table value is (5.35), which shows that chi square calculated value is less than the table value, which is not significant at 0.05 level. Hence the null hypothesis is accepted and inference that there is no significant association between the body balance and dietary pattern of elderly by providing balance exercises.

In relation to the use of any medicines chi square value is (4.09) and table value is (5.35), which shows that chi square calculated value is less than the table value, which is not significant at 0.05 level. Hence the null hypothesis is accepted and inference that there is no significant association between the body balance and use of any medicines among elderly by providing balance exercises

In relation to the previous exposure to information chi square value is (1.08) and table value is (5.35), which shows that chi square calculated value is less than the table value, which is not significant at 0.05 level. Hence the null hypothesis is accepted and inference that there is no significant association between the body balance and previous exposure to information among elderly by providing balance exercise

Discussion

This chapter deals with the discussion of major findings in

accordance with the objectives of the study and hypothesis. The research findings are discussed in relation to similar studies conducted by other researchers. The present study has been conducted to evaluate the effectiveness of balance exercises on body balance among elderly in selected old age homes. In order to achieve the objective the data was collected from 60 respondents.

The findings of the study have organized and discussed under the following sections. The data is organized, analyzed and presented under the following headings.

Section-I: Formulating Frequency and percentage distribution of balance exercises on body balance according to their demographic variables.

Section –II: Providing balance exercises to improve their body balance level.

Section-III: evaluation of effectiveness of balance exercises on body balance between experimental group and control group.

Section-IV: This section deals with the associate the post test scores of body balance among elderly in selected demographic variables in both experimental and control groups.

Recommendations

On the basis of the study findings, the following recommendations have been made for the further studies.

1. A similar study can be conducted on a larger sample for wider generalizations.
2. A study can be done to assess the effectiveness of balance exercises on body balance among old age people in community.

Conclusion

Findings of the present study revealed that the pre test scores of body balance among elderly people in prema samajam old age home was assessed with the help of berg balance scale modified by the investigator. Findings revealed that the pre test scores more than half were 63.4% of elderly people had inadequate body balance, 36.6% had Moderate body balance in both experimental and control groups before demonstrating the balance exercises and in the post test revealed that more than (70 %) elderly people had adequate body balance Post test score and (30%) had moderate body balance post-test score.

Reference

1. Park-preventive K, social medicine, 21st edition, New delhi, M/S. banarsidas bhanot publishers, 2008, p. 408.
2. The Lippincott Manual of Nursing Practice, copy right by Lippincott Williams & Wilkins, 7th edition, 2001, 131-161.
3. Clinical management for positive Outcome, Medical Surgical Nursing, Joyce M. Black, volume -1, Elsevier Publications, 2005, 351-395.
4. Medical Surgical Nursing, BT Basavanthappa, Jaypee Brothers Medical Publications, first Edition, 2003, 111-134.
5. Davidson's Principles & Practices of Medicine, Christopher Hoslett, Edwin R Chilvers, Churchill Livingstone Publiahers, 11th Edition, p. 214-225.
6. Watson's Medical Surgical Nursing & related physiology, Joan A Royle, Milky Walsh, Butter & Tanner Ltd Printers, 19th Edition, 1993, 141-195.
7. Hausdorff JM, Rios DA, Edelber HK. Gait variability and fall risk in community-living older adults-1 year of prospective study-archives of physical medicine and rehabilitation. 2001; 82(8):1050(6).
8. Katherine berg. balance and it's measurement in the elderly, A Review university of Torento press. ISSN 0300-0508 (print) 1708-8313 (online), p. 240-246.
9. Jacobson BH, Thompson B, Wallace T, Brown L, Rail C. Independent static balance training contributes to increased stability and functional capacity in community dwelling elderly people: a randomized controlled trial. clin rehabilitation. 2011; 25(6):549-556.Epup 2011.
10. Vilai kuptniratsaikul, rungnirand P, Prasert A. Effectiveness of simple balancing training program in elderly patient with history of frequent falls, clin interventions ageing.
11. Shimada Hiroyuki, Uchiyama Yasushi, Kakurai Shuichi. Specific effects of balance and gait exercises on physical function among the frail elderly, Academic Journal. 2003; 17(5):472.
12. Yaser Alikhajeh,' Seyyed Reza, Attarzadeh Hosseini Amir Moghaddam, Effects of Hydrotherapy in Static and Dynamic Balance Among Elderly Men. 2012; 46:2220-2224.
13. Jerrold Petrofsky S, Maria cuneo, Russell dial, Ashley K Pawley, Jennifer hill, core strengthening and balance in the geriatric population, the journal of applied research, 2005, 5(3).
14. Susan W. kathrine berg –use of the berg balance scale for predicting multiple falls in the community dwelling elderly people, physical therapy. 2008; 88:449-459, DOI:10.2522/ptj.20070251.
15. Nutt JG, Marsden CD, Thompson PD. Human walking and higher-level gait disorders, particularly in the elderly. Neurology, 43, 268-279.
16. Robert Baloh W, Ying Kathleen MD. Petrography and balance problems in older people. J Am Geriatr Soc. 1995; 43:638-644.
17. Paul Chek, HHP, NMT, balance training for the elderly, april09, 2005, articles.mercola.com.
18. Marlo Sollitto, exercise for the elderly, ageing care.com.www.ageing care.com.
19. www.nihseniorhealth.com
20. www.pubmed.com.