

A STUDY TO ASCERTAIN THE EFFECTIVENESS OF DUAL TASK OVER SINGLE TASK TRAINING IN REDUCING FEAR OF FALLING AMONG THE ELDERLY

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ABSTRACT

The objective was “To ascertain the effectiveness of dual task over single task training in reducing fear of falling in the elderly population.” It was a Pre & post experimental study design. The study was conducted in two different Old Age Homes located in Chennai. The elderly between the age groups of 60 and 90 staying at the Old Age Homes were taken. The tools used were Mini-Mental Status Examination, Berg Balance Scale and Falls Efficacy Scale. The result shows that dual task training is more effective in reducing fear of falling than single task training. It can be concluded that fear of falling is one of the causes of falls in the geriatric population and it also affects their functional independence, therefore, reducing fear of falling through dual task training should be one of the techniques used in occupational therapy intervention.

KEYWORDS: *Dual Task Training, Single Task Training, Fear of Falling, Elderly Person*

INTRODUCTION

Background

Falls are one of the major problems in the elderly and are considered one of the “Geriatric Giants”. Recurrent falls are an important cause of morbidity and mortality in the elderly and are a marker of poor physical and cognitive status. ^[1]

In India, the prevalence of falls among older adults aged 60 years and older is 14% to 53%. Several intrinsic and extrinsic fall risk factors have been identified, but there is less understanding of the impact of fear of falling on falls.

Although fall prevention interventions are within the occupational therapy scope of practice as identified in the Framework (AOTA, 2008), important gaps were evident in the literature documenting the occupational therapy practitioner’s role in fall-related interventions addressing, managing medications, managing postural hypotension recommending appropriate footwear and managing existing foot problems, and modifying behaviors such as fear of falling among community-dwelling older adults. ^[2]

Fear of falling (FOF) is an internal phenomenon or anxiety associated usually with falling that can impact significantly on purposeful activity and independence. ^[3]The prevalence of fear of falling is estimated in a range of “30-50%” for independent living older adults. Seventy percent of recent fallers and 40% percent of non-fallers report a fear of falling. ^[4]

It is believed that Occupational Therapy practitioners can reduce fear of falling in older adults by having them practice fear-provoking daily tasks to increase confidence, assisting them with cognitive restructuring^[5,6], and using guided imagery.^[7]

Several studies have pointed out the need for further research to examine the effectiveness of interventions that include dual-task challenges during therapeutic interventions to reduce fall risk among older adults.

Many studies have found a significant relationship between balance and fear of falling. A recent study concluded that dual task training was effective at improving balance and gait abilities of chronic stroke patients. A recent study also concluded that dual-task training improved cognitive and walking abilities, and dual-task training subjects' performance was better than single-task training subjects' performance.^[8] Hence, this study was carried out to determine the effectiveness of dual task training over single task training in reducing fear of falling in the elderly.

Aim

To ascertain the effectiveness of dual task challenge over single task challenge in reducing fear of falling in the elderly population

OBJECTIVES

- To translate the Falls Efficacy Scale to Tamil.
- To determine the level of fear of falling in each individual with FES
- To compare the pre test and posttest scores of FES in Single and Dual task group.

METHODOLOGY

Research Design

It is a quasi-experimental intervention study. A pre-test and post-test experimental design is used to compare the effectiveness of the interventions given.

Study Setting

This study was conducted among the elderly from two different Old Age Homes located in the city of Chennai.

Study Sample

Sampling Technique

Fourteen [N=14] were selected through convenient sampling procedure. Each of the participants was again divided into single and dual task training using convenient sampling procedure. Each group consists of seven subjects.

Sample Population

Elderly between the age groups of 60 and 90 were selected from two different Old Age Homes located in the city of Chennai.

SCREENING CRITERIA

Inclusion Criteria

- Age 60 years to 90 years
- Ability to walk 10m without the assistance of another person
- Score of 24 to 30 in the Mini Mental Status Examination

Exclusion Criteria

- Any neurologic or musculoskeletal diagnosis such as Cerebro Vascular Accident
- Significant visual and auditory impairments
- Amputee
- Any known case of psychiatric illness such as MDP, Schizophrenia, Hysteria, obsessive compulsive neurosis etc.

TOOLS USED

- The Falls Efficacy Scale(FES) is a short, easy to administer tool that measures the level of concern about falling during social and physical.(outcome measure)
- Berg Balance Scale (BBS) was used to measure balance among elderly people with impairment in balance function by assessing the performance of functional tasks(Screening)
- The Mini–Mental State Examination (MMSE) test is a 30-point questionnaire that is used to measure cognitive impairment (Screening)

DATA ANALYSIS PROCEDURE

Study Procedure

The purpose of this study was explained to the authorities of the Old Age Homes and a written consent form was taken from each of the participants participating in this study. Fourteen elderly were recruited for this study. Berg Balance Scale [BBS] and Mini-Mental Status Examination [MMSE] were administered as screening tools. Falls Efficacy Scale [FES] was used as a pre-test and posttest measurement tool. They were divided into Group A [Single Task Training] and Group B [Dual Task Training].

Single Task Training

The participants were given occupational Therapy intervention three times a week for four weeks. The intervention lasted thirty minutes for each participant. The various activities given were walking on a plane surface, marching on the same plane, walking backwards, etc. Each participant was asked to perform one of the above mentioned activities for thirty minutes each session.

Dual Task Training

The participants were given Occupational Therapy intervention three times a week for four weeks. The intervention lasted thirty minutes for each participant. In this case, the participant was asked to do a task such as walking

on a plane surface for thirty minutes while at the same time ten different smaller tasks such as buttoning and unbuttoning a shirt, naming twenty objects etc. lasting up to three minutes each were given.

RESULTS

Table 1: Frequency and Percentage Distribution of Demographic Variables of the Elderly Population N=14

Demographic Variables		(N=14)	
		n	%
Age	60 -69 yrs	1	7.1
	70 -79 yrs	11	78.6
	80 -90 yrs	2	14.3
Sex	Male	2	14.3
	Female	12	85.7
Duration of stay	< 1 yr	1	7.1
	1- 2 yrs	8	57.1
	> 2 yrs	5	35.8

With respect to age distribution, majority 11(78.6%) of elderly population were between the age group 70-79 years and only 1(7.1%) were between the age group 60-69 years and 2(14.3%) were between the age group 80-90 years. With regard to the distribution of gender, majority of the participants were female 12(85.7%) and rest were male 2(14.3%)

With respect to duration of Stay the percentage of people in the Old Age Home for less than 1 year is 1 (7.1%), between 1 year to 2 years is 8 (57.1%) and more than 2 years is 5 (35.8%).

Table 2: Comparison of Pre Test FES Scores with Posttest FES Scores in Single Task and Dual Task

Task	Pre test			Posttest			t	df	Sig
	Mean	SD	Std. Error Mean	Mean	SD	Std. Error Mean			
Single task (Group A)	52.8	9.0	3.4	51.8	9.3	3.5	2.29	6	0.062
Dual task (Group B)	53.57	5.85	2.21	44.71	10.38	3.92	3.59	6	0.011***

***Significant at <0.001 level

Table 1 shows the comparison of pre-test and post-test score in Single task (Group A) and in Dual task (Group B). The summary statistics of the difference are displayed (Mean, Standard Deviation & Standard Error Mean) along with their confidence limit. The minimum & maximum differences are also displayed. The t test in single task is (t=2.29, p value = 0.062) which is not statistically significant. The t-test of dual task is [t=3.59, sig. (2-tailed) =0.011], indicating that the dual task treatment significantly affected the FES score.

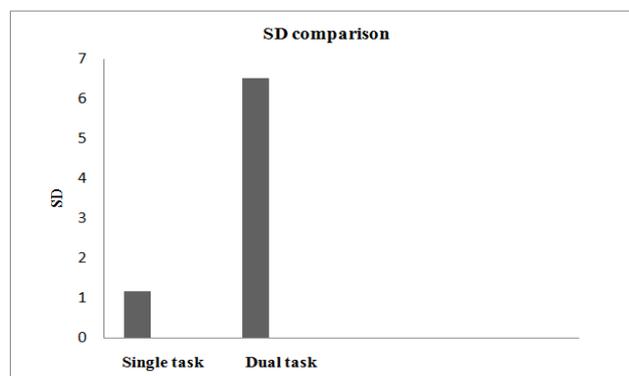


Figure 1: Comparison of SD between Single Task and Dual Task

Figure 1 shows the comparison of standard deviations (Levene's test) of the two groups and the resultant p-value was 0.05, which shows that the dual task training has a better outcome than single task training.

DISCUSSIONS

This study is focused on the effects of single and dual task training on fear of falling in the elderly and to compare the results to determine which has a better outcome.

The participants were subjected to Mini-Mental Status Examination (MMSE) and Berg Balance Scale (BBS) as screening tools, after which they were asked to fill Falls Efficacy Scale (FES) as a pre-test. Participants with fear of falling were then split into two groups, one group receiving single task treatment (Group A) and the other receiving dual task treatment (Group B).

In Group A the participants were asked to perform one of the following activities such as walking on a plane, climbing stairs, walking backwards, etc., for thirty minutes each session. In Group B, the participants were asked to do activities similar to that in Group A but they were also asked to do activities such as counting backwards, subtracting by seven, etc., while doing the other activity. After a treatment period of 4 weeks, a post-test with FES was taken.

Paired t-test was done to the pre and post test scores of Group A and Group B separately where the significance of Group A was 0.062 and that of Group B was 0.011. Levene's test was then done to compare the standard deviations of the two tests where it was found that the standard deviation of Group B was higher than that of Group A. The results show that dual task training has a better outcome than single task training in reducing fear of falling.

Previous studies which focused on comparing dual and single task training in improving gait [Anastasia Kyvelidou et al,2012]^[9], balance [Patima Silsupadol,et al,2009]^[10] and cognition [Gye Yeop Kim et al,2013]^[11] also found that dual task training had a better outcome than single task training in improving the same.

CONCLUSIONS

This study aimed to compare the effects of dual task training and single task training on fear of falling and to determine which of the two is more effective in reducing fear of falling in the elderly population from two different Old age Homes in Chennai, Tamil Nadu.

Comparison of the results showed that dual task training is more effective than single task training in reducing fear of falling. Fear of falling is one of the causes of falls in the geriatric population and it also affects their functional independence, therefore reducing fear of falling through dual task training should be one of the techniques used in occupational therapy intervention.

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