

# Comparative Study of Dynamic Movement Skill, Task oriented training, Active exercise with Falls awareness and prevention guide on Balance in Community Dwelling Elderly – An Experimental Study

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## ABSTRACT

**Background and Purpose:** Falls in the elderly are a major cause of morbidity and mortality. There is growing evidence that Jixian Wang et al 2025<sup>1</sup> balance disturbance is the main symptom of aging in older adults. Therefore, understanding the mechanisms of balance disorders and developing effective early detection and intervention becomes crucial<sup>1</sup>. Exercise intervention in form of novel dynamic movement skill-based training is now recognized as a new strategy to improve verbal memory, working memory and processing speed in mild cognitive impairment<sup>2,3,4</sup>. So, the purpose of this study was to see the effect of dynamic movement skill, task-oriented training, active exercise with falls awareness prevention guide on balance in community dwelling elderly.

**Aim:** This study is to compare dynamic movement skill, task - oriented training and active exercise with falls awareness prevention guide on balance in community dwelling elderly.

**Study Design:** Experimental study design.

**Method:** The study participants are randomly assigned into Group A (n=20) dynamic movement skill, Group B (n=20) task-oriented training, Group C (n=20) active exercise with falls awareness prevention guide. All three groups underwent their session 5 days/week for 12 weeks.

**Outcome Measure:** Berg Balance Scale used to evaluate balance performance.

**Result:** The subject in all the groups were benefitted from the exercise intervention with a significant improvement in post-intervention balance scores as compared to their pre-intervention scores. Percentage increase between the group shows that Group A and Group B produced highly significant improvements over the Group C (control group).

**Conclusion:** This study concluded that dynamic movement skill showed greater balance performance than task-oriented training

**Keywords:** Balance, Dynamic Movement Skill, Task-oriented training, Community dwelling elderly, Fall

**How to cite this article:** Rajeswari C, Senthilselvam P, Kumari P and T M VP, Comparative Study of Dynamic Movement Skill, Task oriented training, Active exercise with Falls awareness and prevention guide on Balance in Community Dwelling Elderly – An Experimental Study. Int J Drug Deliv Technol. 2026;16(12s): 397-407. DOI: 10.25258/ijddt.16.12s.45

**Source of support:** Nil.

**Conflict of interest:** None

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## INTRODUCTION

Balance disorder are one of the common causes for falls in older adults. It leads to injury and disability. Recent studies (Shivani sathe et al 2021 and Anne Barnett et al 2003)<sup>5,6</sup> have found that intensity exercise, information brochure, balance training exercise is an effective intervention to prevent falls in older people<sup>6</sup>. India has witnessed a rise in population from 942 million in 1994 to 1360 million in 2019, with an average life expectancy of 70 years at present. Individuals aged 60 and above constitute 8.6% of the overall population. The longitudinal aging study of India predicts that this ratio is further expected to be 12 % by 2030 and 20 % by 2050. According to World Health Organization (WHO) world report on aging and health (2015), the percentage of

people worldwide who are 60 or older is expected to nearly double between 2015 and 2050, from 12 % to 22 % with significant ramifications for socio economic structures and health care systems<sup>1</sup>. Growing evidence proved that balance disturbance is the main symptom of aging in older adults. About 30 % of adults aged 65 and over will experience balance problems<sup>1</sup>. The most common balance disorder in elderly population include age-related decreased balance and postural instability<sup>1</sup>. Balance disorder is influenced by multiple factors, including age-related changes in sensory system such as vision, vestibular, somatosensory, musculoskeletal loss, changes in joint mobility, bone density, cognitive dysfunction and underlying medical conditions<sup>1</sup>.

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Research done on the field of medicine, biomechanics, neuroscience, psychology and physical therapy. Interventions such as exercise programs, balance training, rehabilitation techniques using sophisticated equipment enhance balance and reduce risk of falls in older adults<sup>1</sup>. In previous studies (Shivani sathe et al 2021, Anne Barnett et al 2003, Tracey E Howe et al 2008)<sup>5,6,7</sup> different interventions which include balance and coordination exercise, low resistance exercise, tai chi, aerobic dance, yoga, strengthening exercise were given to improve balance<sup>7</sup>.

There are numerous scales to assess balance in older adults. The scales are Functional reach test (FRT), Timed up and Go test (TU and GT), Berg Balance Scale etc. Functional reach test measures one can reach forward beyond arm's while keeping feet fixed in a standing position (Duncan et al 1990)<sup>8</sup>. It measures the single angle forward reach. Mathias et al 1986<sup>9</sup> and Podsiadlo P & Richardson S 1991<sup>10</sup> concluded that timed up and go test measures the dynamic equalization and further more validity is needed. Berg balance scale was generally utilized in numerous fields of rehabilitation. It has highest quality levels of balance execution. It measures both static and dynamic balance. The test-retest reliability for the berg balance scale was excellent. It is a reliable and valid scale to be utilized in balance assessment of elderly adult.<sup>11,12,13,14,15</sup>

Exercise aimed at improving balance and stability. In older adult exercise enhances their overall mobility and reduce the risk of falls. Exercise focus on strengthening key muscle groups, it enhances proprioception and sensory integration<sup>1</sup>. Dynamic movement skill (DMS) was introduced by Mike Antoniadis in 2014<sup>16</sup>. The DMS rehabilitation module has been developed through a series of movement patterns designed to correct the transmission time and firing sequence within the CNS to correct movement pattern and to improve functional movement and balance. It progresses from basic movement re-education to functional neuromotor stimulation to dynamic movement development. Through a series of functional exercise the movement patterns are re-educated and the proprioception system is retrained. The movement combinations are endless and deliver important and lasting beneficial changes that will make the neuromuscular system more efficient.<sup>16,17,18,19</sup> Task-oriented training is based on the motor learning theory<sup>20</sup>. Motor learning is a set of internal process associated with practice or experience leading to relatively permanent changes in the capability of skilled behavior<sup>21</sup>. Improvements in performance result from practice or experience and are a frequently used measure of learning. Motor learning involves significant amount of practice and feedback, with a high level of information processing related to control, error detection and correction. Through repeated practice of task specific exercise helps to regain balance and control of movements. By doing repetitive motor task it produce an improvement in performance called adaptation.<sup>21</sup>

## METHODOLOGY

Sixty community dwelling older adults participated in this study. The Group A receiving Dynamic Movement Skill consisted of 12 males and 8 females with a mean age of  $69.25 \pm 2.15$  Years. Group B receiving Task-oriented training consist of 13 males and 7 females with a mean age of  $69.65 \pm 2.72$  years. Group C (Control) receiving active exercise with falls awareness and prevention guide consisted of 10 males and 10 females with a mean age of  $69.05 \pm 2.87$  Years. The study was a randomised, evaluator blinded trial. Subjects were recruited from May 2025 to July 2025 in Kirubai old age home, Chennai. A physiotherapist who did not assess, randomise or rehabilitate subjects was in-charge of their enrolment. Inclusion criteria were i) Community dwelling elderly and not institutionalized or hospitalized ii) Age 65 to 75 years (Male and female) iii) Subjects having Mini mental state exam score of 24 iv) Subjects who were able to ambulate independently without assistive device. The subjects were excluded on the following criteria were i) Subjects with musculoskeletal disease and deformities of lower limbs ii) Subjects with neurological disorders like stroke, traumatic brain injury, parkinson's disease iii) History of unstable cardiac disease and cardiac surgery iv) uncorrected hearing and visual impairments v) Receiving any other exercise programme at the same time vi) Subjects who has an unstable medical condition and illness that may interfere with the exercise program.

### Blinding and allocation concealment:

The physiotherapist used computer software (Microsoft excel) to generate random numbers. The allocation sequence for the groups was strictly concealed by the physiotherapist and placed in sealed envelopes. This physiotherapist remained uninvolved in the recruitment of subjects and the intervention procedures. Randomisation was performed and stored by a physiotherapist who did not evaluate or rehabilitate subjects. The physiotherapist assessed the pre-test and post-test scores were unaware about the study procedures and interventions.

### Procedure:

The subjects were randomly assigned to one of the three groups. A detailed explanation of the procedure was given after which subjects signed the informed consent. The pre-test scores of berg balance scale was taken. All participants receive counselling at baseline from a physician in Vels Mission Hospital, Thalambur, Chennai regarding the importance of exercise in balance. In Group A 20 participants in dynamic movement skill. Group B 20 participants in task – oriented training and in Group C 20 participants in active exercise with falls awareness prevention guide. The exercise was carried out by supervision of physiotherapist in exercise therapy room. For all three groups exercise conducted 5 times in a week for 12 weeks.

### Dynamic Movement Skill:

The dynamic movement skill mat consists of A,B,C,D and 1,2,3,4. Based on the number and alphabet in the mat the exercise is scheduled. The dynamic movement skill routine includes 5 mins warm up, 24 mins dynamic movement skill exercise and 5 mins cool down. Dynamic

movement skill exercise displayed in the screen. Progression is done by increase the no of repetition completed in 2 mins.

**Warm up** – Side bending, stepping and breathing, head movement and turning

**Dynamic Movement Skill:**

- i) Wood chop with exercise ball (2 mins)
- ii) Split Good morning (2 mins)
- iii) Diagonal step and rotate with stick (2 mins)
- iv) Posterior diagonal step and rotate with stick (2 mins)
- v) Diagonal step and rotate with swiss ball (2 mins)

- vi) Posterior diagonal step and rotate with swiss ball (2 mins)
- vii) Posterior step with double arm reach (2 mins)
- viii) Standing diagonal reach (2 mins)
- ix) Posterior diagonal step and rotational reach (2 mins)
- x) Diagonal step and rotate with ‘V’ arms (2 mins)
- xi) Anterior step and reach with stick (2 mins)
- xii) Diagonal step and rotational reach with stick (2 mins)

**Cool down-** Shoulder movements, stepping and breathing, low speed stepping.



**Figure 1:** Dynamic Movement Skill Mat

**Task-Oriented Training:**

The task-oriented training routine includes 5 mins warm up, 24 mins task-oriented training exercise and 5 mins cool down. Task oriented training exercise displayed in the screen. Progression is done by increase the no of repetition completed in 2 mins.

**Warm up** – Side bending, stepping and breathing, head movement and turning

**Task-Oriented Training**

- i) Overground walking (2 mins)
- ii) Sit to stand (2 mins)
- iii) Rising from a chair then walking a short distance (2 mins)
- iv) Step ups/step downs (2 mins)
- v) Walking through an obstacle (2 mins)
- vi) Walking while carrying an object (2 mins)

- vii) Walking at maximal speed (2 mins)
- viii) Walking backwards and sideways (2 mins)
- ix) Tandem stance (2 mins)
- x) Single leg stance (2 mins)
- xi) Forward, backward and lateral weight shifting (2 mins)
- xii) Tandem walk with support (2 mins)

**Cool down:** Shoulder movements, stepping and breathing, low speed stepping.

**Control:**

The control group training routine includes 5 mins warm up, 20 mins active exercise and 5 mins cool down. Falls awareness and prevention guide were explained to the study participants.

**Table 1:** Demographic characteristics of study participants in Group A, Group B and Group C

Variable	Group-A (Dynamic Movement Skill) n=20	Group-B (Task Oriented Training) n=20	Group-C (Falls Awareness and Prevention Guide) n=20
Age (years)	Mean: 69.25 SD: 2.15	Mean: 69.65 SD: 2.72	Mean: 69.05 SD: 2.87
BMI	Mean: 23.70 SD: 0.87	Mean: 23.68 SD: 1.05	Mean: 22.31 SD: 1.59
Fall in last year (Percentage "Yes")	50.0%	45.0%	35.0%
Afraid of falling (Percentage "Yes")	80.0%	55.0%	60.0%

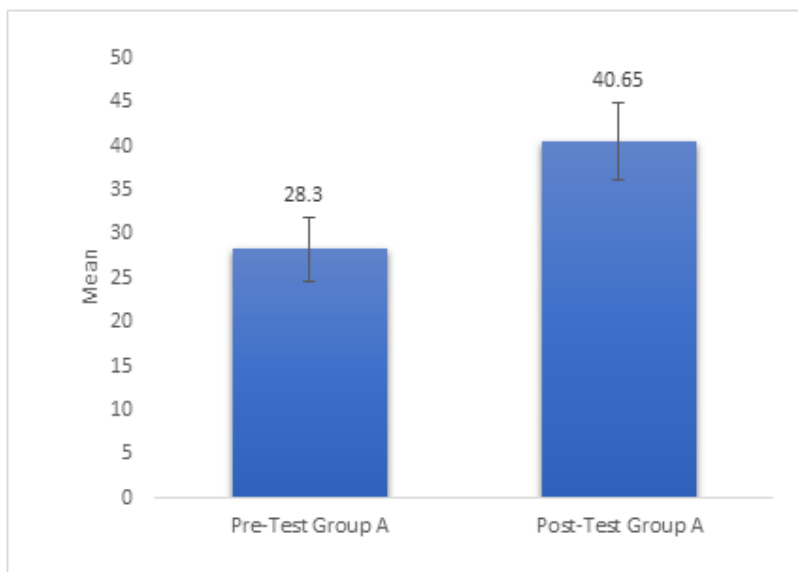
**Table 2** -Comparing Pre and Post-test scores of Berg balance scale in Group A

**Descriptive Statistics**

Variable	Mean	Standard Deviation (SD)	Standard Error (SE)
Pre-Test	28.30	3.713	0.830
Post-Test	40.65	4.371	0.977
Difference (Post – Pre)	<b>+12.35</b>	<b>3.272</b>	<b>0.731</b>

**Paired t-test**

H <sub>0</sub> Difference	Mean Difference	SE of Difference	t-value	df	p-value
0.000	+12.35	0.731	16.89	19	p < 0.0001



**Figure 2:** Bar diagram shows pre and post-test scores of BBS in Group A

**Inference:** This table interprets that the Berg balance scale post-test value 40.65 is significantly greater than the pre-test value 28.30 in Group A and ‘t’ value 16.89 is significant ‘p’ <0.0001. The test revealed that dynamic movement skill intervention is effective in Group A.

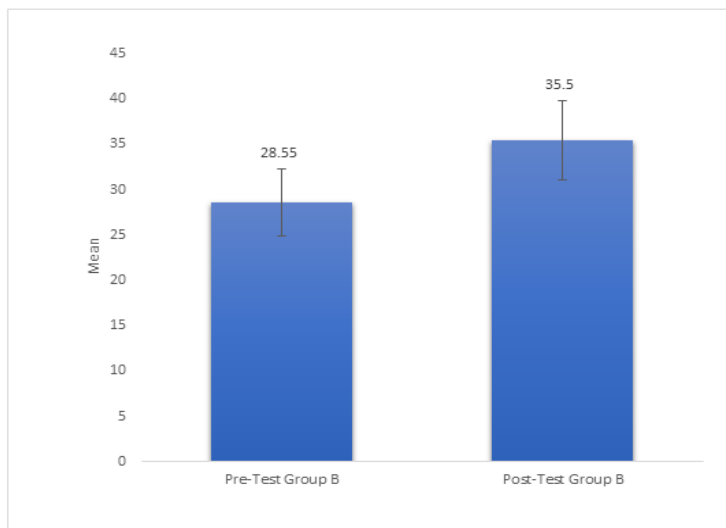
**Table 3** -Comparing Pre and Post-test scores of Berg balance scale in Group B

**Descriptive Statistics**

Variable	Mean	Standard Deviation (SD)	Standard Error (SE)
Pre-Test	28.55	4.789	1.071
Post-Test	35.50	5.338	1.193
Difference (Post–Pre)	<b>+6.95</b>	<b>2.683</b>	<b>0.600</b>

**Paired t-test**

H <sub>0</sub> Difference	Mean Difference	SE of Difference	t-value	df	p-value
0.000	+6.95	0.600	11.58	19	< 0.0001



**Figure 3:** Bar diagram shows pre and post-test scores of BBS in Group B

**Inference:** This table interprets that the Berg balance scale post-test value 35.50 is significantly greater than the pre-test value 28.55 in Group B and ‘t’ value 11.58 is significant ‘p’ < 0.0001. The test revealed that task-oriented training intervention is effective in Group B.

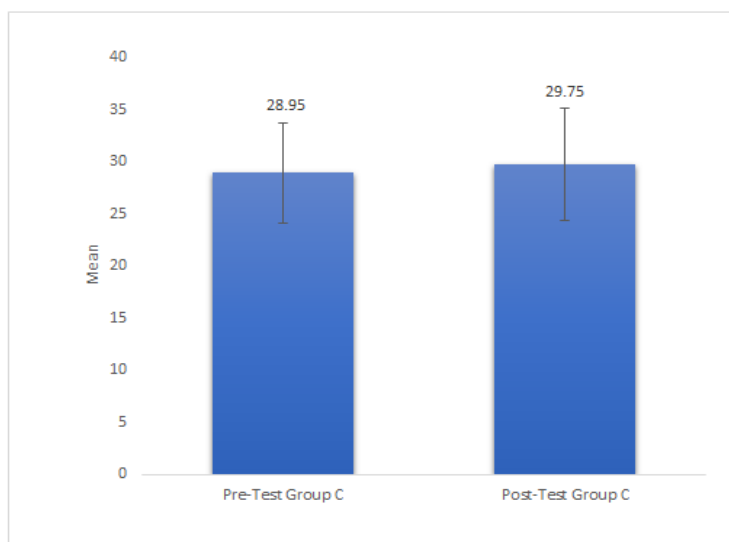
**Table 4 -** Comparing Pre and Post-test scores of Berg balance scale in Group C

**Descriptive Statistics**

Variable	Mean	Standard Deviation (SD)	Standard Error (SE)
Pre-Test	28.95	2.760	0.617
Post-Test	29.75	2.750	0.615
Difference (Post–Pre)	<b>+0.80</b>	<b>0.894</b>	<b>0.200</b>

**Paired t-test**

H <sub>0</sub> Difference	Mean Difference	SE of Difference	t-value	df	p-value
0.000	+0.80	0.200	4.00	19	0.001



**Figure 4:** Bar diagram shows pre and post-test scores of BBS in Group C

**Inference:** This table interprets that the Berg balance scale post-test value 29.75 is significantly greater than the pre-test value 28.95 in Group C and ‘t’ value 4.00 is significant ‘p’ < 0.001. The test revealed that although statistically significant, the improvement is very small and likely of no practical or clinical importance.

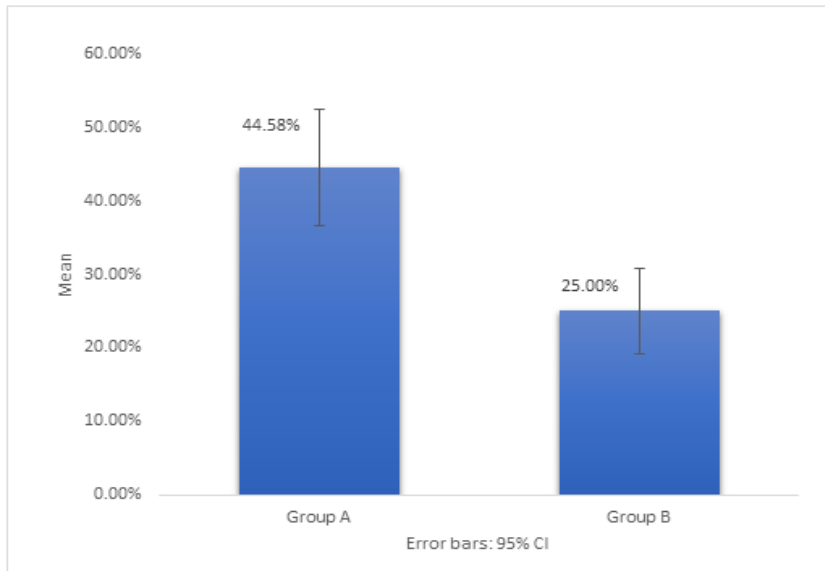
**Table 5** - Comparison of Berg balance scale % increase between Group A & Group B

**Descriptive Statistics**

Group	Mean % Increase	SD	SE	Lower 95% CL	Upper 95% CL	N
Group A	44.58%	16.87%	3.77%	36.68%	52.48%	20
Group B	25.00%	12.24%	2.74%	19.27%	30.73%	20

**Independent Samples One-tailed t-test**

H <sub>0</sub> Difference	Mean Difference (A – B)	SE of Difference	t-value	df	p-value (one-tailed)
0.000	+19.58%	4.65%	4.21	38	< 0.0001



**Figure 5:** Bar diagram shows % increase of Berg balance scale between Group A and Group B

**Inference:** This table interprets that mean % increase in berg balance scale value is 44.58 in Group A is significantly greater than mean % increase in berg balance scale value is 25.00 in Group B and ‘t’ value 4.21 is

significant and ‘p’ < 0.0001. Hence, the test revealed that dynamic movement skill (Group A) intervention is effective than task-oriented training (Group B)

**Table 6** - Comparison of Berg balance scale % increase between Group A & Group C

**Descriptive Statistics**

Group	Mean % Increase	SD	SE	Lower 95% CL	Upper 95% CL	N
Group A	44.58%	16.87%	3.77%	36.68%	52.48%	20
Group C (Control)	2.82%	3.37%	0.75%	1.24%	4.40%	20

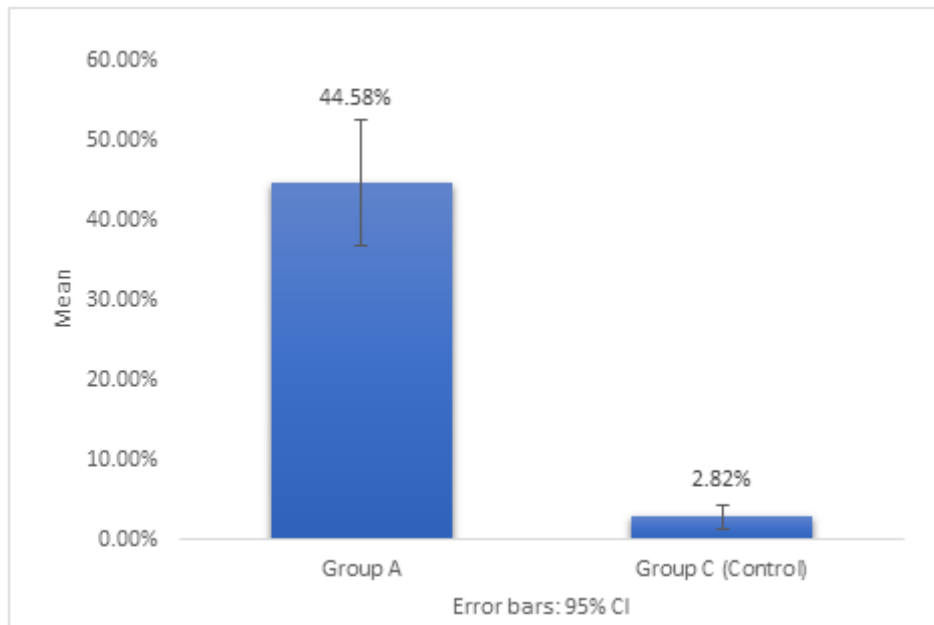
**Independent Samples One-Tailed t-test**

H <sub>0</sub> Difference	Mean Difference (A – C)	SE of Difference	t-value	df	p-value
0.000	+41.76%	3.85%	10.85	38	< 0.0001

**Inference:**

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**Figure 6:** Bar diagram shows % increase of Berg balance scale between Group A and Group C

**Inference:** This table interprets that mean % increase in berg balance scale value is 44.58 in Group A is significantly greater than mean % increase in berg balance scale value is 2.82 in Group B and ‘t’ value 10.85 is significant and ‘p’ < 0.0001. Hence, the test revealed that dynamic movement skill (Group A) intervention is effective than active exercise and falls awareness and prevention guide (Group C).

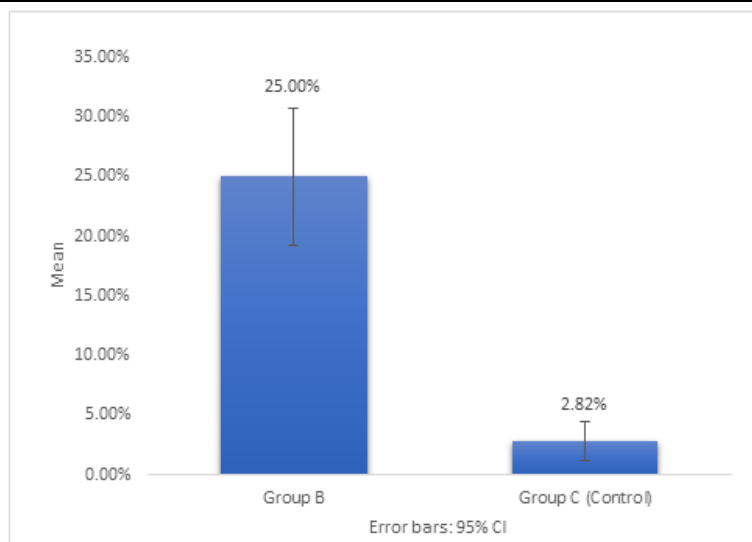
**Table 7 - Comparison of Berg balance scale % increase between Group B & Group C**

**Descriptive Statistics**

Group	Mean % Increase	SD	SE	Lower 95% CL	Upper 95% CL	N
Group B	25.00%	12.24%	2.74%	19.27%	30.73%	20
Group C (Control)	2.82%	3.37%	0.75%	1.24%	4.40%	20

**I One-Tailed t-test**

Ho. Difference	Mean Difference (B – C)	SE of Difference	t-value	Df	p-value (one-tailed)
0.000	+22.18%	2.85%	7.78	38	< 0.0001



**Figure 7:** Bar diagram shows % increase of Berg balance scale between Group B and Group C

**RESEARCH PAPER**

**Inference:** This table interprets that mean % increase in berg balance scale value is 25.00 in Group B is significantly greater than mean % increase in berg balance scale value is 2.82 in Group C and 't' value 7.78 is

significant and 'p' < 0.0001. Hence, the test revealed that task-oriented training (Group B) intervention is effective than active exercise and falls awareness and prevention guide (Group C).

**Table 8** - One-Way ANOVA with Post-Hoc (Tukey HSD) comparison across the three groups using Percentage Increase (%) as the dependent variable.

**One-Way ANOVA**

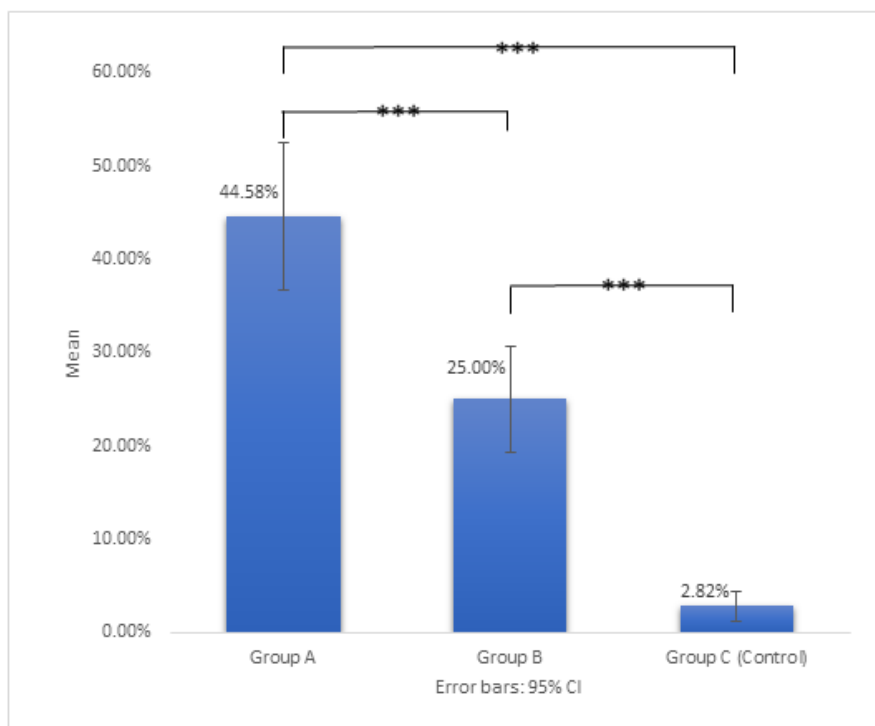
Source	df	Sum of Squares	Mean Square	F-value	p-value
Between Groups	2	24,259.47	12,129.74	66.42	< 0.0001
Within Groups	57	10,409.79	182.63		
Total	59	34,669.26			

**Descriptive Statistics (Percentage Increase)**

Group	N	Mean % Increase	SD	SE
Group A	20	44.58%	16.87%	3.77%
Group B	20	25.00%	12.24%	2.74%
Group C (Control)	20	2.82%	3.37%	0.75%
Total	60	24.13%	24.24%	3.13%

**Tukey HSD Post-Hoc Test Table (Pairwise Comparisons)**

Comparison	Mean Difference	SE	t-value	p-value (Tukey)	Significance	95% CI of Difference
Group A vs Group B	+19.58%	4.27%	4.58	< 0.001	***	+8.92% to +30.24%
Group A vs Group C	+41.76%	4.27%	9.77	< 0.001	***	+31.10% to +52.42%
Group B vs Group C	+22.18%	4.27%	5.19	< 0.001	***	+11.52% to +32.84%



**Figure 8:** Bar diagram shows one-way ANOVA with post-Hoc test to compare % increase in the three groups

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**Inference:** All three groups differ significantly from each other in percentage improvement  $p < 0.001$  for all pairwise comparison. Both interventions dynamic movement skill and task-oriented training produced highly significant improvements over the control group. Dynamic movement skill was significantly more effective than task-oriented training. The one-way ANOVA followed by Tukey HSD confirms a clear, statistically robust hierarchy in treatment efficacy.

## RESULTS

A total of 60 sessions of dynamic movement skill, task-oriented training, active and general mobility exercise with falls awareness and prevention guide are given to the participants. No adverse events were reported or observed in the 12 weeks of study period.

### Within Group Analysis

#### Dynamic Movement Skill:

When comparing pre and post-test scores of (Table 2) berg balance scale revealed that post-test scores are significantly greater than pre-test scores ' $p < 0.0001$ '

#### Task-oriented Training:

When comparing pre and post-test scores of (Table 3) berg balance scale revealed that post-test scores are significantly greater than pre-test scores ' $p < 0.0001$ '

#### Active Exercise with Falls Awareness and Prevention Guide:

When comparing pre and post-test scores of (Table 4) berg balance scale revealed that post-test scores are significantly greater than pre-test scores ' $p < 0.0001$ '. Although statistically significant, the improvement is very small and likely of no practical or clinical importance.

### Between Group Analysis:

When comparing % increase between Group A and Group B (Table 5) revealed that % increase mean in Group A is significantly greater than Group B with ' $p$ ' value  $p < 0.0001$ .

When comparing % increase between Group A and Group C (Table 6) revealed that % increase mean in Group A is significantly greater than Group C with ' $p$ ' value  $p < 0.0001$ .

When comparing % increase between Group B and Group C (Table 7) revealed that % increase mean in Group B is significantly greater than Group C with ' $p$ ' value  $p < 0.0001$ .

### Comparing across three groups using percentage increase as the dependent variable:

All three groups show highly significant difference among the three groups in percentage improvement  $p < 0.0001$ . Dynamic movement skill and Task-oriented training produced highly significant improvements over the control group. Dynamic movement skill was significantly more effective than Task-oriented training.

## DISCUSSION

This experimental study revealed the positive effect of dynamic movement skill and task-oriented training on balance in community dwelling elderly population. The significant improvement observed in dynamic movement skill and task-oriented training after the 12 weeks of study period.

### Discussion on result of balance within group and between the group:

#### Dynamic Movement Skill:

Balance is an essential component of functional independence, activity of daily living and mobility in elderly individuals. It refers to the ability to maintain body stability while in motion or when the centre of gravity shifts during walking or transition between different positions (Shumway – cook & Woolacott, 2017)<sup>1</sup>. Maintaining balance requires complex coordination between multiple systems including the visual, vestibular, musculoskeletal and proprioceptive sensory systems. Age related degeneration in these systems often leads to a decline in balance, increase the risk of falls and injury (Lord et al.,2021)<sup>1</sup>. Therefore, interventions targeting balance improvement are critical for reducing risk of falls and maintain quality of life among elderly<sup>1</sup>.

The findings of this study confirm that dynamic movement skill and task-oriented training has a significant positive effect on balance in study participants. The increase in average post-test scores compared to pre-test scores demonstrates the effectiveness of dynamic movement skill and task-oriented training in enhancing balance performance. This result support with the previous research that highlights the role of dynamic movement skill in improving balance (Riri segita et al 2025)<sup>22</sup>. The repeated practising of dynamic movements activated the multiple sensory system and promote neuromuscular adaptation, which enhances postural control and reduces risk of fall (Mike Antoniadis)<sup>16</sup>. Meghan Ambrens et al 2022<sup>20</sup> found that eHealth – delivered exercise programmes improved balance in elderly participants<sup>12</sup>. These findings are suggestive that balance can be improved by dynamic movement skill. Balance improvement directly correlates with better performance in activities such as walking, climbing stairs and standing from a seated position. These activities are essential for maintaining independence and preventing disability in aging population (Khushboo C Valodwala et al 2019)<sup>21</sup>. By improving balance dynamic movement skill contributes to reducing the likelihood of falls – a leading cause of injury related hospitalizations among the elderly (Mike Antoniadis)<sup>16</sup>. To perform dynamic movement skill it requires the participants to memorize and follow specific step patterns further enhances its impact by improving attention, memory and reaction time critical factors in fall prevention (Pereira et al 2014)<sup>22</sup>.

#### Task-Oriented Training:

In task-oriented training the post-test scores are significantly greater than pre-test scores with a corresponding p value  $p < 0.0001$ . The possible reason for improvement could be composition of task they had practised. Evidence (Mike Antoniadis)<sup>16</sup> suggests that skill training is closely related to increased corticospinal excitability. Neural adaptation caused by training seem to be maintained for long periods of time, it further implicating the importance of task specificity. The task specific training reflects the concept of neuroplasticity and motor learning. The findings of this study are in line with (Pandita sandeep 2021)<sup>23</sup> which supports that task-oriented training had positive effect on balance. (Kirsti Skavberg Roaldsen et al 2014)<sup>24</sup> which supports the present study that balance training improves balance in community dwelling older adults. (Rinku Roshan et al 2022)<sup>25</sup>, Mona Patel 2020<sup>26</sup> and Sachin M V et al 2024<sup>27</sup>) which supports the current study that task-oriented balance training program with altered sensory input improves balance and functional performance in older adults.

#### **Factors contributing to enhanced balance performance in dynamic movement skill:**

The possible reason for the increase in balance performance in dynamic movement skill (Group A) are goal directed practice. The new neuro scientific research is the effect that exercise and movement has on cognitive learning. By combining unusual or new movement that require us to concentrate as by using many of the body driver's as possible. The challenge and provocation of the learning process is more in dynamic movement skill than task-oriented training and active exercise. This type of skilled movement directly linked to improvement of cognitive process like concentration, memory, attention and processing speed. The movements in dynamic movement skill used in this study participant are challenge the body and brain simultaneously. The study participants require more visual awareness, kinaesthetic awareness and concentration to complete the movement successfully<sup>8</sup>.

The movement which stimulate the central nervous system and peripheral nervous system facilitate the neuroprotection. Actively participated in skill-based training improve balance performance. Cortical re-mapping is the special characteristics of central nervous system to change its existing cortical structures and functions through learning a new skill, experience and training. Motor learning process stimulates the cortical changes in the brain. Through practising a new skill movement, it induced an activity-dependent neural plasticity. Structural functional changes in the neural network will happen throughout the life period<sup>28</sup>.

#### **HIERARCHY IN TREATMENT EFFICACY:**

Using one-way ANOVA with post-Hoc (Tukey HSD) comparison across the three groups using percentage increase as the dependent variable which shows that all three groups differs significantly from each other in percentage improvement  $p < 0.001$ . Dynamic movement skill and task-oriented training produced highly significant improvement over the control group. Dynamic movement

skill was significantly more effective than task-oriented training.

#### **CONCLUSION**

This study shows that 12 weeks of dynamic movement, task-oriented training and active exercise with falls awareness prevention guide training significantly improve the balance performance in community dwelling elderly population. Dynamic movement skill has a greater potential for enhancing balance performance than the other interventions. This helps us in identifying a more appropriate training program for improving balance in community dwelling elderly and finally help in reducing the risk of future falls promoting healthier and more independent aging.

#### **LIMITATIONS:**

- i) Sample size was relatively small, limiting the generalizability of the findings. A larger sample size would provide greater statistical power and a more comprehensive understanding of the intervention's effect
- ii) This study only measured the short-term effects. Long term follow-up is necessary to determine whether the benefits of dynamic movement skill and task-oriented training are sustained over time and how they impact overall quality of life.

#### **FUTURE RECOMMENDATIONS:**

Future research should also investigate its cognitive benefits, particularly its effects on cognitive functions such as memory, executive control and reaction time. This area of study is especially relevant for elderly individuals with mild cognitive impairment (MCI). Researches can determine whether dynamic movement skill can serve as a dual-purpose intervention for both physical and cognitive health.

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