



Outcome Of Functional Task Program With Gait Exercises On Activities Of Daily Living, Balance And Quality Of Life Among Gereatric Population: Randomized Control Trial.

Bhavya Shrivstava¹, Prof, (Dr.) R. K. Sharma², Dr.Chhavi Kalra³, Dr.Ankita Sharma⁴

MOT (Neurology) Student¹, Santosh Occupational therapy College, Dean, Paramedical, Principal Santosh Occupational Therapy College Ghaziabad²,
Assistant Professor (Neurology)³,
Assistant Professor (Neurology)⁴.

***Corresponding Author:-** Bhavya Shrivstava¹ Prof, (Dr.) R. K. Sharma²

MOT (Neurology) Student^{1*}, Santosh Occupational therapy College, Dean, Paramedical, Principal Santosh Occupational Therapy College Ghaziabad^{2*}

Abstract

ABSTRACT

Objective: Outcome Of Functional Task Exercises with Gait Exercises on Activities of Daily Living, Balance and Quality of Life Among Gereatric Population.

Design: A randomized trial study.

Set up: Geriatric health services facility in Bhopal Madhya Pradesh.

Results: 30 elderly subjects were allocated into two groups. Group A (experimental group) which were given functional task exercises, gait exercises along with conventional exercises which is compared to Group B (control group) which were given conventional exercises only. Functional activity measured by FIM Scale before and after the intervention in both the Groups were improved, but more in Group A (FTE)(94.92) compared to Group B (conventional exercises)(92.21). Group A showed mean of (92.533) before and (94.928) after the intervention. Group B showed the mean of (94.642) before and (92.214) after the intervention. Balance measured by POMA before and after the intervention in both the Groups were improved, but more in Group A (FTE) (22.933) compared to Group B (conventional exercises) (21.133). Balance which is measured by POMA scale is improved in both the Groups A and B but more in Group A (FTE). 4Before intervention the mean of Group A was (19.200) and after was (22.933). Group B had a mean of (19.000) before and (21.333) after intervention. Quality of Life is measured by OPQOL Brief 13 Scale before and after the intervention in both the Groups were improved, but more in Group A (FTE)(41.466) compared to Group B (39.63)(conventional exercises). Quality of life was improved more in Group A as compared to Group B with which is extremely significant as the level was set as $p < 0.05$. Group A showed mean of (38.333) before and (41.466) after the intervention and Group B showed mean of (37.8) before and (39.63) after the intervention.

Conclusions: The study concludes that functional task exercise Program along with gait and conventional exercises showed more improvement in elderly than conventional exercises.

<p>CC License CC-BY-NC-SA 4.0</p>	<p>Keywords: <i>Functional task exercise program, functional independence of measure, Performance Oriented Mobility Assessment, Older People's Quality of Life.</i></p>
--	--

INTRODUCTION

Elderly are defined as being 65 years of age or older¹. On the contrary, many times we come across the people who are healthy and active, even at the age of 70 years. It is because of these two contrasting representations of elderly in our society that this group of population should be defined in health terms: "What defines this group is the frequent presence of multiple pathology and the atypical way in which illness can present with confusion, falls and loss of mobility and day to day functioning". It is the common observation that with increasing age, the ability to carry out daily functions with vigour and alertness without undue fatigue is decreased i.e. there is decrease in muscular endurance. The ability of muscle to contract again and again against a load, create and sustain tension and resist fatigue over an extended period of duration is called as muscular endurance. Thus, factors like pain, reduced muscular strength, reduced muscular endurance, reduced muscle power, reduced balance control contribute in reduced functional activities in elderly.³

The world population is ageing rapidly. As society ages, the incidence of physical limitations is dramatically increasing, which reduces the quality of life and increases healthcare expenditures. In western society, 30% of the population over 55 years is confronted with moderate or severe physical limitations. These physical limitations increase the risk of falls, institutionalization, co-morbidity, and premature death. An important cause of physical limitations is the age-related loss of skeletal muscle mass, also referred to as sarcopenia. Emerging evidence, however, clearly shows that the decline in skeletal muscle mass is not the sole contributor to the decline in physical performance. For instance, the loss of muscle strength is also a strong contributor to reduced physical performance in the elderly. In addition, there is ample data to suggest that motor coordination, excitation-contraction coupling, skeletal integrity, and other factors related to the nervous, muscular, and skeletal systems are critically important for physical performance in the elderly. To better understand the loss of skeletal muscle performance with ageing, we aim to provide a broad overview on the underlying mechanisms associated with elderly skeletal muscle performance. We start with a system level discussion and continue with a discussion on the influence of lifestyle, biological, and psychosocial factors on elderly skeletal muscle performance. Developing a broad understanding of the many factors affecting elderly skeletal muscle performance has major implications for scientists, clinicians, and health professionals who are developing therapeutic interventions aiming to enhance muscle function and/or prevent mobility and physical limitations and, as such, support healthy ageing.⁴ Elderly adults show age related decline in sensory systems and reduced ability to adapt to changes in their environment to maintain balance.

Gait disturbances in the elderly population are prevalent and can significantly impact their balance and overall mobility. Muscle Weakness and Atrophy advances with advancing age, there is a natural decline in muscle mass and strength, leading to Decline in activities of daily living. This weakness compromises the ability to generate sufficient force during walking, resulting in instability and an altered gait pattern as well. Balance and Vestibular Dysfunction increases with advancing age. The vestibular system, responsible for maintaining balance and spatial orientation, undergoes age-related changes, leading to vestibular dysfunction. Vestibular impairment compromises the ability to detect changes in head position and movement, resulting in balance issues and an increased risk of falls. Gait disturbances directly contribute to balance issues in older people, predisposing them to an elevated risk of falls and associated injuries. A compromised gait increases the likelihood of missteps, loss of balance, and falls, leading functional decline. Furthermore, fear of falling may result in activity of daily living restriction and social isolation, further diminishing the individual's quality of life⁵.

Furthermore, gait disturbances in older people significantly impact balance and increase the risk of falls, necessitating proactive assessment and management strategies. By addressing underlying contributors and implementing targeted interventions, it is possible to improve gait stability, enhance mobility, and reduce the incidence of falls in the elderly population. The relationship between aging and activities of daily living, balance, and quality of life is complex and multifaceted. As individuals age, they may experience changes in physical and, which can impact their ability to perform basic activities of daily living independently. Age-related conditions can affect mobility, strength and coordination, making it more challenging to carry out tasks

like bathing, dressing, or cooking. Declines in Activities of daily living functioning can lead to a loss of independence resulting in affecting an older adult's overall quality of life⁶.

Aging is associated with changes in balance, increasing the risk of falls among older adults. Factors such as decreased muscle mass, changes in vestibular function, and alterations in gait and posture contribute to impaired balance. Falls can have serious consequences for older adults, including loss of independence, and decreased quality of life. Therefore, maintaining or improving balance is essential for promoting independence and well-being in older age⁷. Aging can bring about various physical, social, and emotional changes that influence an individual's quality of life. Chronic health conditions, functional limitations, loss of social connections, financial concerns, and existential questions about aging can all impact an older adult's sense of well-being. Maintaining a good quality of life in old age involves addressing these challenges through functional activities⁸.

In conclusion, the interplay between Activities of daily living, balance, and quality of life in aging is evident. Difficulties in Activities of daily living due to functional decline and balance disturbances can lead to a decline in quality of life, as individuals may experience frustration, loss of independence, and decreased satisfaction with daily life. Impaired balance further exacerbates the risk of falls, which can negatively impact both ADL functioning and quality of life. Therefore, this study aims to evaluate the outcome of functional task program with gait exercises on activities of daily living, balance and quality of life among geriatric population in which interventions aimed at improving ADLs, balance, and quality of life that results in overall well-being which can have positive synergistic effects, enhancing independence, safety, and satisfaction in older adults' lives⁹.

METHOD

An experimental study was conducted in institutional elderly's located in Bhopal, India. The aims and objectives of research were explained and willing participants were included in the study after the written consent was obtained. 30 elderly were included, neurological problems. Outcome Measures used were Functional Independence Measure Scale (FIM) . Performance Oriented Mobility Assessment Scale (POMA) and Older People's Quality of Life Questionnaire (OPQOL) . Sampling was done and 2 groups were formed Group A and Group B. after meeting the inclusion & exclusion criteria. Group A Experimental group were given Functional task exercise, gait exercise and conventional exercises for three sessions every week for six weeks. Each session included exercises of functional task and gait. Data was collected and statistical analysis is done. Group A were offered and provided with Functional Task Exercises, Gait Exercise along with Conventional exercises. Group B were provided with Conventional task exercise only.

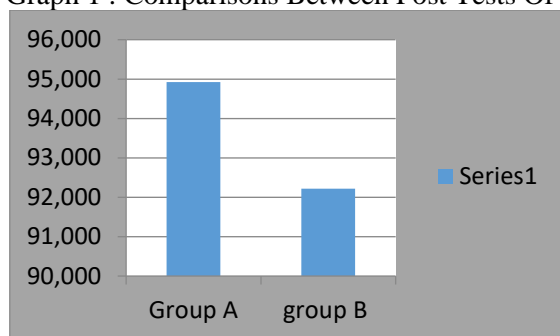
DATA ANALYSIS

Statistics used for analysing the data is Mean, Standard deviation, t test and P value using SPSS software.

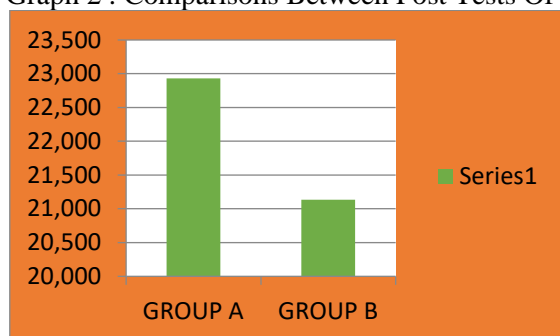
Table 1 : Mean score difference of FIM, POMA and OPQOL Pre and Post Intervention.
(SUMMARY TABLE)

S. NO	ITEMS	DATA ANALYSIS					
		A		B		AB	
		Pre	Post	Pre	Post	Post Test	
1	FIM	92.53	94.92	91.64	92.21	94.9	92.2
2	P Value	0.0003		0.014		0.00026	
3	POMA	19.20	22.933	19.00	21.13	22.9	21.1
4	P Value	0.0008		0.008		0.050	
5	OPQOL 13	38.33	41.46	37.8	39.63	41.4	39.6
6	P Value	0.0001		0.0035		0.0039	
7	Significance Level <0.05	Significant		Significant		Significant	

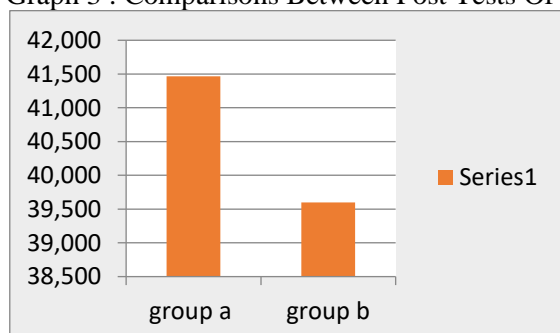
Graph 1 : Comparisons Between Post Tests Of Group A And Group B Of FIM



Graph 2 : Comparisons Between Post Tests Of Group A And Group B Of POMA



Graph 3 : Comparisons Between Post Tests Of Group A And Group B Of OPQOL



RESULT

Among 30 samples of Elderly, there were 7 males and 23 females. Of these, Group A (FTE) had 4 males and 11 females and Group B (conventional exercises) had 3 males and 12 females. Elderly Group A performing Functional task exercise Program, Gait Exercises and Group B performing conventional exercises showed mean (92.533) and (91.642) respectively before intervention. These scores of Group A and Group B improved to mean of (94.928) and (92.214) respectively after intervention. in Group A (FTE) as compared to Group B (conventional exercises). Functional activity measured by FIM Scale before and after the intervention in both the Groups were improved, but more in Group A (FTE)(94.92) as compared to Group B (conventional exercises)(92.21). activities of daily living was improved more in Group A as compared to Group B with $p < 0.0002$ which is extremely significant as the level was set as $p < 0.05$.

POMA scores (balance) were significantly improved in Group A (FTE) as compared to Group B (conventional exercise). These scores showed mean of (19.20) for Group A and mean of (19.00) for Group B before intervention and mean of (22.933) and (21.133) respectively after intervention. POMA Scores were significantly improved in Group A with a mean of 22.933 (FTE) as compared to Group B with a mean of 21.133 (conventional exercises) Balance was improved more in Group A as compared to Group B with $p < 0.050$ which is extremely significant as the level was set as $p < 0.05$ There is significant improvement in quality of life in Group A (FTE) as compared to Group B (Conventional exercises). These scores showed mean of (38.333) for Group A and mean of (37.8) for Group B before intervention and mean of

(41.466) and (39.63) respectively after intervention. OPQOL Scores were significantly improved in Group A with a mean of 41.466 (FTE) as compared to Group B with a mean of 39.63 (conventional exercises). Quality of life was improved more in Group A as compared to Group B with $p < 0.0039$ which is extremely significant as the level was set $p < 0.05$

DISCUSSION

The aim of research was to study the outcome of functional task exercises with gait exercises on activities of daily living, balance and quality of life among geriatric population.. 30 participants were selected according to the inclusion/exclusion criteria and all the exercises were explained in detail. The demographic details of subjects like age, gender, height, and weight were collected. The duration of this study was 6 weeks. The participants were elderly i.e. above the age of 65 years. They were divided in two groups of 15 Group A and Group B. Group A was given 6 weeks Functional task exercise program, gait exercises along with conventional exercises and Group B (control group) was given conventional exercises (strengthening and balance exercises). 3 sessions per week for 6 weeks were planned. A pilot study was conducted and errors were resolved with the approval of the guide. Before every session, warm up of 10 minutes (walking, moving arms and legs, stretching) and cool down of 10 minutes (static stretching in lying down) after the session was done by every participant. Every session had a 5 minutes hydration interval in between two circuits. Conventional exercises included strengthening and reactive balance exercises like : Ankle strategy (one leg stance with the trunk erect), Hip strategy(draw lines on floor perform tandem stance and single leg stance with trunk bending) and Steeping strategy (practice steeping on a stool) whereas Functional task exercise program included daily living activities as exercise which included locomotion activities – walking in zig-zag pattern in between cones, picking up clothes from the floor, hang out the washing clothes, talk while carrying objects, dial a number while walking, walk up and down on stairs, sit and stand for 5 repetitions etc. The participants were assessed for functional activity by using the Functional Independence Measure scale (FIM). The FIM Scale is a 18-item measurement tool that explores an individual's physical, psychological and social function which was filled before and after the treatment protocol. They were assessed for balance control by using Performance Oriented Mobility Assessment scale (POMA). POMA Scale is an easily administered task-oriented test measures an older adult's balance and gait abilities which interpret high, medium and low risk of fall assessed before and after the protocol. POMA Scale is a three-point ordinal scale, ranging from 0-2 in which '0' indicates the highest level of impairment and '2' the individual's independence. In POMA, the total Balance score is 16 and total Gait score is 12 so the total test score is 28 with the Interpretation: 25 – 28 = low fall risk, 19-24 = medium fall risk and < 19 = high fall risk. OPQOL Questionnaire, which includes 13 items with five answer options to assess quality of life checked before and after the protocol. Quality of life of the participants was measured by Older People's Quality of Life questionnaire (OPQOL) which has 13 questions with 5 options to mark from strongly disagree to strongly agree so higher the score, higher is the quality of life. The pre and post intervention values were recorded and data was collected. Data obtained was statistically analysed and a value of significance was set as $p < 0.05$. Functional activity measured by FIM Scale before and after the intervention in both the Groups were improved, but more in Group A (FTE) compared to Group B (conventional exercises).

CONCLUSION

The study concludes that functional task exercise program, gait exercises along with conventional exercises showed more improvement in elderly than conventional exercises only.

LIMITATIONS

1. Sample size is limited for each group
2. Study was done for confined age group
3. Sample are collected from the single center which affects the generalization of the treatment
4. No long term follow up was done due to the limitation of the duration of the study.

FUTURE RECOMMENDATIONS

1. Extending the duration of interventions represents a critical future recommendation for optimizing the effectiveness

2. Extended follow-up periods following the completion of interventions are essential for evaluating the durability and sustainability of intervention effects
3. Embracing Intensive Functional Task exercises and multimodal intervention strategies holds promise for enhancing the effectiveness of rehabilitation interventions in the geriatric population
4. Large sample size may be used for generalized results.

REFERENCES

1. Landefeld CS, Palmer RM, Johnson MA, Johnston CB and Lyons LW. Current geriatric diagnosis and treatment. 2004,
2. Colledge NR. Frail older people, In Davidson's Principles and Practice of Medicine, 2002,
3. Multani NK, Verma SK, . Principles of geriatric physiotherapy. 2008.
4. Tieland M, Trouwborst I, Clark BC. Skeletal muscle performance and ageing. Sarcopenia Muscle. 2018
5. Hiroyuki Shimada, Yasushi Uchiyama and Shuichi Kakurai, Specific effects of balance and gait exercises on physical function among the frail elderly.2003
6. Narinder Kaur Multani, Satish Kumar Verma. Principles of Geriatric Physiotherapy, First Edition, 2007.
7. Andrew A. Guccione, Rita A. Wong, Dale Avers. Geriatric physical therapy, third edition.
8. Donna J. Cech, Suzanne Tink Martin. Functional movement development across the life span, Third edition.
9. Mitali S Purandare, Dr. Shweta Kulkarni, Dr. Tushar Dhawale. Effect of functional task exercise program on functional activity, balance and quality of life in elderly population.