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Effects of Qi gong exercises verses balance training exercises in geriatric patients with balance impairments

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Abstract
Background: Falls among the elderly is a major public health concern. Interventions to reduce such risk of fall are to be planned. Qi gong exercises are Chinese traditional technique, considering various forms of movement with breathing techniques. Balance training exercises involve forms with shift of COG, thus challenging balance.
Aim and Objectives: To study the effect of qigong and balance training exercises in geriatric patients with balance impairments.
Methodology: From 60 participants, 30 were selected according to criteria, medium risk of fall on berg balance scale score in 60-74 yrs. old age with no any known cause for balance disorder. They were randomly divided into two groups, each including 15 participants, as Balance training exercises (Group A), (mean age= 66.46±3.091) and Qi gong exercises (Group B), (mean age= 64±2.591) respectively as, 45min/session, thrice weekly for 4 weeks. They were evaluated pre and post with berg balance scale and timed-up and go test.
Results: For group A, TUG was reduced from 26.95±6.423 to 25.51±6.137 and BBS was reduced from 30.53±5.963 to 27.93±5.99. Group B showed TUG to be reduced from 27.74±6.084 to 25.75±5.897, and BBS was reduced from 31.33±5.233 to 29.33±5.690. Both the outcome measures showed significant changes post training in Qi gong and balance training exercises group. However, Qi gong was found to be more effective in improving balance training. Comparison of both groups showed significant difference with p value=<0.0001.
Conclusion: Balance training exercises and Qi Gong exercises are effective in geriatrics to improve balance.

Keywords: balance, Qi gong, balance training exercises, BBS, TUG

Introduction

Elderly population is increasing very rapidly and with aging process there are various health related changes taking in place with systemic changes. Balance is a control on person's ability to move and work independently, which leads to decline with age due to multiple factors and so increasing the chances of fall. Balance changes are the most important concern in geriatrics as it can lead to various problems like falls and that leading to fracture, any brain injury eventually leading to bed ridden or physical inactivity, immobility, and it can lead to various systemic, psychological illnesses, and lifestyle-related illness [1].

Qi Gong is an ancient traditional Chinese technique. It is series of various forms with movements linked in continuous sequence in which body shifts from foot to foot with low center of gravity. It includes deep breathing and mental concentration to achieve harmony between body and brain. It keeps mind to be calm and concentration on breathing and the movement forms done [2].

Qi Gong forms has its own advantages that, it doesn't require any specific instruments and it is low impact exercise which can be practiced by wide range of patients and are easy to be learned [3].

Balance training exercises were included as intervention which included challenging patients center of mass while feet are remains fixed and exercises that includes narrow base of support, which are static exercises. It included tandem standing, single-leg stance, squatting, and trunk rotations. Later also the dynamic movements which challenges center of mass while feet are moving and they are functional which includes, tandem standing, turning in circles, reaching activities, standing, stair-climbing. Gait training with feet moving like walking through and around the obstacles, commanding to increase or reduce in walking speeds, head turns to vertical up and down, and horizontal head turns while maintaining the walking speed and limit, commands to change directions while walking to left or right maintaining the walk, while walking commanding to suddenly stop and then walk.[4]

Dual-task training exercises that includes performing tasks while maintaining postural control and walking speed and so challenging cognitive function [4].

It has the effects of Qigong on different aspects of health, including mental health, cardiovascular parameters, quality of life, sleep quality, osteoarthritis, cardiorespiratory fitness, physical performance, balance, and flexibility [5].

The form movements were chosen to focus on basic mobility skills: weight shifting to both sides (stepping and pivoting forward, backward, sideways, and diagonally), range of

motion (emphasis on spinal rotation to both sides, bilateral upper extremity elevation and reaching forward, backward, and sideways), and coordination [6].

According to the American Physical Therapy Association's Guide to Physical Therapy Practice (Guide), physical therapists should strive to "restore, maintain, and promote not only optimal physical function but optimal wellness and fitness and optimal quality of life as it relates to movement and health." Prescribing and promoting exercise and educating patients on the importance and value of exercise are key responsibilities of the physical therapist [7].

Outcome measures used for balance assessment were (1) berg balance scale and (2) timed-up and go test. Berg balance scale was used to assess balance with impairment of balance function by assessing performance of functional tasks and also used for evaluation of the effectiveness of interventions and for quantitative descriptions of function in clinical practice and research. BBS includes 14 components which includes various functional activities performed in daily life and are scored from 0 to 4, 0 requiring maximum support to perform that specific task and 4 being performed independently. Total score is interpreted out of 56 and are later consider as, scores between 0-20 indicating high risk of fall, 21-40 indicating medium risk of fall and 41-56 as low risk of fall respectively.

Timed-up and go test was used to assess mobility and also the reaction time (time to complete the task) it includes the patient to sit in chair, and ask to get up from chair and walk around 3m or 10 feet distance and turn around the cone at that point and come back to sit in chair, and eventually the stopwatch will calculate the duration taken for the same. An older adult who takes ≥12 seconds to complete the TUG is at risk for falling.

It has been seen that proper balance trainings exercises have reduced the risk of some injuries like ankle sprain and after both static and dynamic balance trainings; it has been observed that training groups have lower risk of injury [8].

Studies have shown that elderly subjects who fall, demonstrate impaired functioning in sensory accountable for balance or postural stability [9].

Numerous studies have investigated TC and QG as an intervention for a wide variety of health problems, especially balance and musculoskeletal disease Since this technique is gaining more importance day by day, the need of study was to find out the effectiveness of same on balance in elderly [10].

Aim and Objectives

- **Aim**

To study the effect of qigong and balance, gait, coordination training in geriatric patients with balance impairments.

- **Objectives**

1. Effect of Qi gong on balance impairments in geriatric population.
2. Effect of balance training on balance impairment in geriatric population.
3. Comparison of Qi gong exercises and balance training in geriatric population with balance impairments.

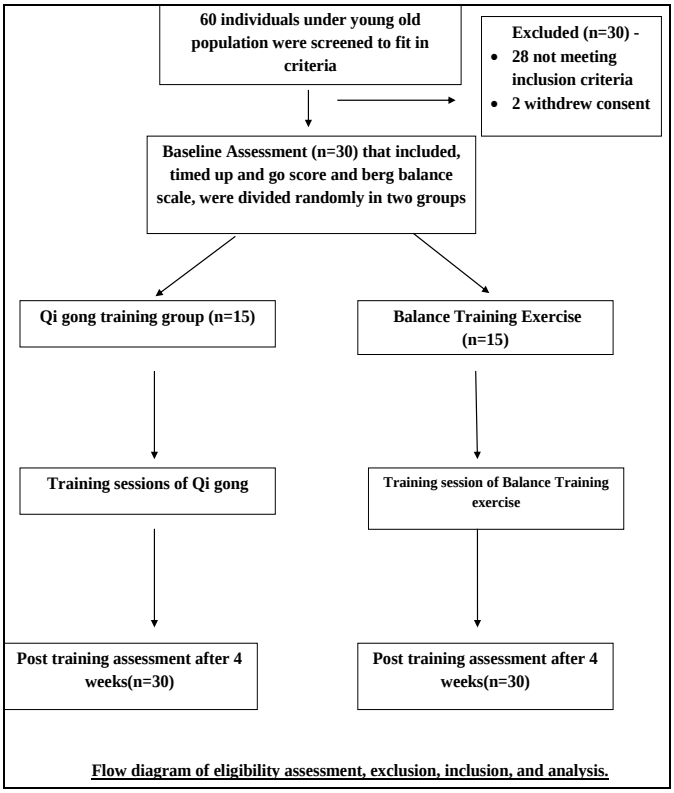
Materials and Methods

- **Study design:** Comparative.
- **Study setting:** Geriatric clubs in Pune.
- **Sample population:** Geriatric with risk of fall.
- **Sampling method:** Random.
- **Sampling size:** 30.
- **Inclusion criteria:** Balance impairment, berg balance scale interpreting risk of fall, young old age (65-74) group, both male and female.
- **Exclusion criteria:** Any diseases included balance disorders.
- **Materials required:** Pen, paper, BBS.
- **Outcome measures:** Berg balance scale, Timed up and go test.

Procedure

Initially, Synopsis was presented and approval from ethical committee was obtained. Geriatric clubs were approached and permission for data collection was taken. The study design was a pre-post intervention study. The assured and responsibility is taken that the identity of participants is preserved. They were explained about the aim and objectives of the study. Prior to participation, a written informed consent was taken from all subjects and subjects were informed about study protocol.

This study was randomized, comparative and the participants were divided into two groups: Balance training exercises (Group A, n=15) and Qi gong (group B, n=15). Total duration of intervention was 4 weeks. Outcome measures were measured, one at baseline assessment and other after intervention (after 4 weeks).



Flow diagram of eligibility assessment, exclusion, inclusion, and analysis.

Testing Protocol

- **Time up and go test**

The patient sits in the chair with his/her back against the chair. On the command "go", the patient rises from the chair, walks 3 meters at a comfortable and safe pace, turns, walks back to the chair and sits down. Timing begins at the instruction "go" and stops when the patient is seated. Duration for completion of this task is scored.

- **Berg balance scale**

The scale score interprets the components and measures balance among older people with impairments in balance function by assessing performance of functional tasks. It has 14-item scale designed to measure balance of older adult in a clinical setting. It is a functional assessment tool or tasks about daily activities. Every item has scoring from 0-4, 0 indicating complete dependence and 4 indicating independent.

4. Intervention

- **The Qi gong Intervention**

Subjects participated in 45min Qi gong sessions thrice weekly for 4 weeks. In the first session, we explained Qi gong theory and procedures and provided subjects with printed teaching materials, including QI GONG principles, practicing techniques, and safety precautions for the elderly. For the remaining sessions, each subject practiced QI GONG under the instruction.

Each session included (1) 5min of warm-up and a review of QI GONG principles, (2) 30min of QI GONG movement, (3) 5min of breathing techniques, and (4) 5min of cool down. The program consisted of 18 forms, with minor medications that were suitable for older adults. We encouraged subjects to participate in their usual sports activities, but to not engage in extra strength training.

- **The Balance Training Exercise Intervention**

Balance Training exercise classes were led by a physical therapist for 45min, thrice per week, over 4 weeks. The exercise protocol emphasized static and dynamic balance exercises. Each lesson incorporated a similar general plan as follows: (1) 5min warm-up; (2) 20min of static balance exercises such as squats (two-leg stance), sit to stand, standing with feet's together, then with eyes closed, squatting to 60 degree, tandem standing, trunk rotations to extreme right and then to left, and one-leg stance; (3) 15min of dynamic balance exercises such as dual tasking that is walking with less and more increase of speed with horizontal and vertical head turns to right left and up and down, sideways walking or running, forward walking; (4) 5min of cool-down. Exercises gradually increased in difficulty and training load over the 4-week training period.

Results

Statistical analysis was done using paired t-test. Both the groups showed to be significant improvement in p value, being <0.0001 which was extremely significant. We found that both the interventions were effective in improving balance.

Total population included in study was 30 out of which 16 were males and 14 were females.

Table 1: Gender Distribution

Gender	
M	16
F	14

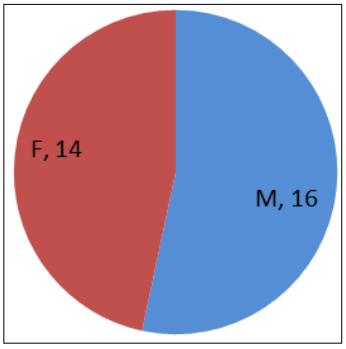


Fig 1: graph showing gender distribution.

Table 2: Pre and Post intervention measures

		Group A (balance training exercises) (n=15)	Group B (Qi Gong exercises) (n=15)	P value
Age (Mean ± S.D)		**66.46±3.091**	**64±2.591**	
Gender				
Timed-up and go test (Mean ± S.D)	Pre	26.95±6.423	27.74±6.084	<0.0001
	Post	25.52±6.137	25.75±5.897	
	Difference	1.439	1.985	
Berg Balance Scale (Mean ± S.D)	Pre	30.53±5.963	31.33±5.233	<0.0001
	Post	27.93±5.99	29.33±5.690	
	Difference	2.6	2	

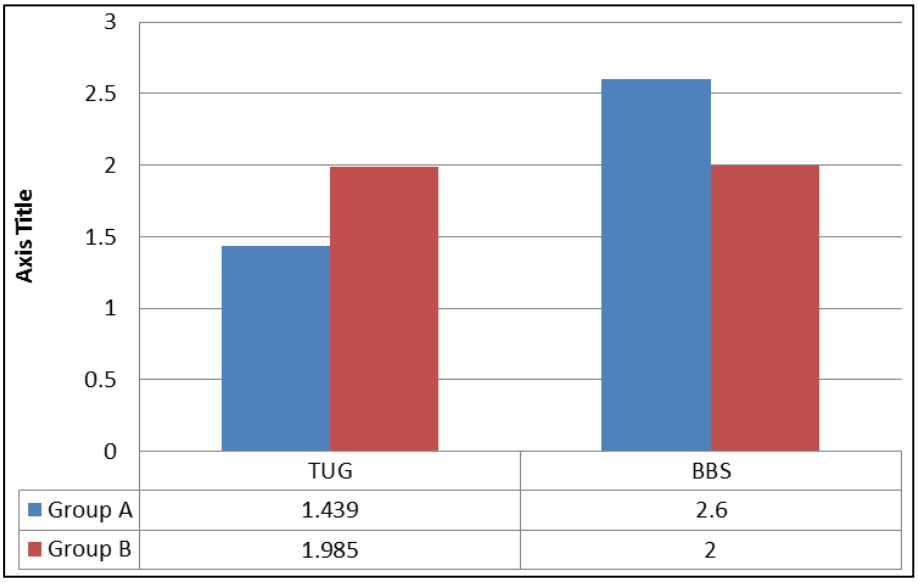


Fig 2: Comparative graph between both the intervention groups for post treatment scores on outcome measures.

Discussion

The study was completed and results were interpreted on basis of outcome measures used. The study showed that there is significant improvement in balance in geriatrics receiving the interventions and are helpful in reducing chances of fall.

The study done by Alexandar, taking balance training for older adults one step further: the rationale for and a description of a proven balance training programme The intervention was performed as group exercises for 45-minutes/group sessions, three times a week for 12 weeks. The study concluded that the mentioned training programme was effective in increasing walking speed and improves physical function, improved fall-related self-efficacy.

The study showed improvement in balance for both intervention groups, and it states that qi gong exercises which includes combination of breathing, body movement and meditation proved to be useful for other various reasons like emotional stress, physical functioning, and quality of life. The similar study done by Foram Dhebar stated, interventions for increasing balance & confidence in older adults: a review, have included combination of exercises like Strengthening exercise, Balance & co-ordination exercise, Hydrotherapy and allied therapeutics such as tai chi and yoga, proved to be effective in prevention of fall, increases balance and confidence in older adults.

Other similar study done by carol rogers, included various RCTs in which the Qi Gong exercises were included as the treatment protocol, Interventions that reported improved components of balance were designed to screen for sedentary or transitionally frail older adults and compared the TC or QG intervention to a wait list control group. Many of the multiple outcomes reported significant improvements.

Conclusion

The study concludes that, both techniques of balance training and qi gong exercises were significantly effective in improving balance in geriatrics which was assessed through outcome measures like Berg balance scale and Timed-up and go test.

The comparison of both the groups of intervention was done post treatment, which showed that qi gong exercises was statistically more significant than balance training exercise in improving balance among geriatrics.

Limitation and Future scope of study

The sample size was too small to draw any firm conclusions.

Duration of intervention was short.

Further progression of Qi gong exercise can be given in order to expand the study.

The study can be done using advanced equipment's.

Various progression levels can be included in Qi gong and balance training exercises to avoid monotonicity and avoid disinterest in the participant.

Duration of the study can be extended.

References

1. Alexandra Halverson, Ingo-Mari Dohrn and Agneta Ståhle. Taking balance training for older adults one step further: the rationale for and a description of a proven balance training programme. Clinical Rehabilitation. 2015; 29(5):417-425.
2. Carol Rogers. A Review of Clinical Trials of Tai Chi and Qigong in Older Adults. West J Nurs Res. 2009: 31(2):245-279.
3. Elena Mejías Gil. Systematic Review about the Effects of Qigong Therapeutic Exercise on Balance. Altern Integr. 2017, 6:1.
4. Foram Dhebar. Interventions for increasing balance & confidence in older adults: a review. Int J Physiotherapy Res. 2014; 2(4):631-36. ISSN 2321-1822.
5. Liye Zou. A Systematic Review and Meta-Analysis Baduanjin Qigong for Health Benefits: Randomized Controlled Trials. Hindawi Evidence-Based Complementary and Alternative Medicine, 2017, Article ID 4548706, 17 pages

6. Yang Yang Jay, Verkuilen Karl V, Rosengren S. Scott A. Grubisich, Michael R. Reed, Elizabeth T. Hsiao-Wecksler. Effect of combined Taiji and Qigong training on balance mechanisms: A randomized controlled trial of older adults. Med Sci Monit. 2007; 13(8):CR339-348.
7. Rebecca Forkan, Breeanna Pumper, Nicole Smyth, Hilary Wirkkala, Marcia A Ciol, Anne Shumway-Cook. Exercise Adherence Following Physical Therapy Intervention in Older Adults with Impaired Balance. Physical Therapy. 2006; 86(3).
8. Rasika panse1, Priyanka Piwal, Ujwal Geole, Gaurai gharote, Shweta Kulkarni, Pournima Pawar *et al.* Effect of Standing Pilates on Balance in Basketball Players. IOSR Journal of Sports and Physical Education (IOSR-JSPE) e-ISSN: 2347-6737, p-ISSN: 2347-6745. 2017; 4(1):35-38
9. Ujwal Yeole, Bhagyashree Gurav, Gaurai Gharote, Rasika Panse, Pournima Pawar and Shweta Kulkarni, effectiveness of progressive resistance training for improving balance amongst elderly. International Journal of Current Research. 2017; 9(1):45788-45791.
10. Ujwal Dr, Yeole L, Sharka J, Bardgujar Dr Gaurai M. Gharote, Dr *et al*. Effectiveness of Tai-Chi on Balance in Elderly. JMSCR. 2016; 4(12):14848-14854