



FINDING THE EFFECTIVENESS OF TAI CHI EXERCISE IN ENHANCING BALANCE- IN GERIATRIC PATIENTS

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ABSTRACT **Background:** Falls are a leading cause of injury and functional decline among the elderly, significantly affecting their quality of life. Tai Chi, a traditional Chinese mind-body exercise, is known for enhancing balance, flexibility, and mental well-being. Its gentle, rhythmic movements have shown promise in improving postural stability and reducing fall risk in older adults. **Objective:** To evaluate the effectiveness of Tai Chi exercises in enhancing balance and reducing fall risk among geriatric individuals. **Methods:** A two-week survey-based intervention study was conducted on 199 elderly participants (≥ 65 years) from Moradabad, Uttar Pradesh. Participants were selected using random sampling and assessed pre- and post-intervention using the Activities-specific Balance Confidence (ABC) Scale. Tai Chi exercises included "Commencing Form," "Broadening One's Chest," "Dancing with Rainbows," and "Rowing the Boat" performed over three sessions per week. Data were analyzed using SPSS version 22.0. **Results:** Pre-intervention ABC mean score was 1057.24 (SD ± 113.37), which significantly increased to 1144.37 (SD ± 130.52) post-intervention. A paired t-test revealed this change to be statistically significant ($p < 0.001$), indicating improved balance confidence. Graphical analysis also supported the improvement in post-intervention scores. **Conclusion:** Tai Chi exercise significantly enhances balance and reduces the risk of falls in the geriatric population. In addition to physical benefits, it also contributes to improved mental health and overall quality of life. The findings suggest Tai Chi as a valuable therapeutic tool in geriatric rehabilitation for fall prevention and functional independence.

KEYWORDS : Tai Chi, Balance exercise, geriatric individuals, mental health, recent advancement in geriatric rehabilitation.

INTRODUCTION-

Tai Chi is a balance-focused exercise that blends traditional Chinese martial arts with meditative movements, designed to enhance both physical and mental well-being. The practice involves a series of slow, flowing, dance-like postures, seamlessly transitioning from one to the next. Tai Chi is increasingly recognized for its therapeutic benefits, offering both physical and psychological healing. It combines aerobic exercise, strengthening, relaxation, stretching, and proper posture to create a balance-enhancing workout that is particularly beneficial for older adults. Research has shown that Tai Chi can improve walking ability by enhancing muscular strength, flexibility, reaction time, balance, and posture control. It is a multi-modal mind-body exercise that induces relaxation and calmness through its slow, gentle, rhythmic movements.

Falls represent a significant risk to the health and well-being of older adults. Approximately 30% of adults aged 65 or older experience at least one fall annually, which can have serious consequences for their independence and participation in social activities. Among those who fall, 68% sustain fall-related injuries, and these incidents contribute significantly to the financial burden on individuals and society as a whole. Reducing the frequency of falls is crucial for improving the quality of life for older adults and alleviating the societal costs associated with fall-related injuries.

In previous studies, it was found that older adults who regularly practice Tai Chi exhibited superior balance control compared to non-practitioners of similar age, gender, and physical activity levels. This was especially evident when the participants were asked to stand in conditions that required heightened reliance on their visual and vestibular systems. Tai Chi's combination of meditation, breathing exercises, and fluid movements has been shown to effectively relieve pain, reduce fall risk, and improve mental health, including alleviating symptoms of anxiety and depression. Additionally, studies indicate that Tai Chi practitioners demonstrate better postural stability and balance control compared to their non-practicing peers, particularly among the elderly.

In a 2001 study by Wong et al., the postural stability of older Tai Chi practitioners who had experienced falls was compared to that of healthy, non-practicing older adults. The results revealed that Tai Chi practitioners had superior postural stability, likely due to the stabilization of back and pelvic muscles, which help maintain proper spinal alignment against gravity. This alignment provides the necessary support for limb movements, contributing to improved balance.

The aim of the current study is to find the effectiveness of Tai Chi exercise in enhancing dynamic balance and gait in older adults. By doing so, this research seeks to identify alternative therapeutic approaches to fall prevention and promote functional independence in older individuals. Tai Chi offer valuable benefits, to determine exercise method is more effective for improving balance and reducing fall risks in this vulnerable population. This could lead to more targeted, evidence-based recommendations for improving the quality of life and safety for older adults.

PROCEDURE AND MATERAIL-

Study Type: Survey research

Sample Size: 199

Sampling Method: Random sampling

Study Duration: 2 weeks

Study Settings: In or around Moradabad City, (Uttar Pradesh)

Inclusion Criteria-

- Subjects who are willing to participate.
- Subjects with more than 65 years age old people.
- Balance difficulty in walking
- Both gender

Exclusion Criteria-

- Any cognitive, hearing impairment and poor vision.
- Any underlying neurological / vestibular disorders affecting balance and gait.
- Limb length Discrepancy.
- Severe Musculoskeletal problem (e.g. Ankylosing Spondylitis, Severe Osteoporosis)

Instruments Used-

- Pen
- Patient evaluation Sheet
- Informed consent
- Laptop
- Activities-specific Balance Confidence (ABC) Scale
- Chair
- Exercise Mat

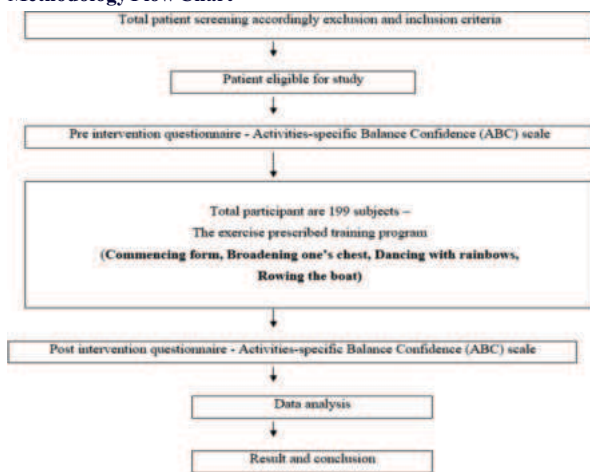
Procedure

- Informed consent was obtained from participants who were

willing to participate.

- Subjects were screened according to the inclusion and exclusion criteria. Those who meet inclusion criteria & fit for protocol were selected for the study.
- A written consent was obtained from selected participants.
- The purpose and procedure of the study was explained to participants.
- Total 199 subjects were included in the study.
- The participants those who meet on initial first day for the data collection filled the questionnaire - Activities-specific Balance Confidence (ABC) scale
- After the two week of intervention, 3 alternate sessions in a week were done and re-evaluate the same questionnaire - Activities-specific Balance Confidence (ABC) scale.
- After the compilation of the intervention post outcome measure were recorded.
- The Tai Chi exercises which we used for the study are –
 - o Commencing form (3 reps 5sec hold)
 - o Broadening one's chest (3 reps 5sec hold)
 - o Dancing with rainbows (3 reps 5sec hold)
 - o Rowing the boat (3 reps 5sec hold)

Methodology Flow Chart



RESULT-

Data analysis was performed by using SPSS (version 22.0). Quantitative variables were described by descriptive statistics using mean and SD. At 0.05, the levels of significance were established

Table-1-Descriptive statistics depict the Pre –ABC score mean is 1057.24 with SD of 113.377 and Post ABC score mean is 1144.37 with SD of 130.521.

| Descriptive Statistics | | | | | |
|--|-----|---------|---------|---------|----------------|
| | N | Minimum | Maximum | Mean | Std. Deviation |
| Gender | 199 | 1 | 2 | 1.72 | .451 |
| Age | 199 | 62 | 81 | 69.95 | 3.965 |
| Pre_intervention_ABC_Baseline_Scoring | 199 | 800 | 1360 | 1057.24 | 113.377 |
| Post_intervention_ABC_2nd_Week_Scoring | 199 | 880 | 1440 | 1144.37 | 130.521 |
| Valid N (list wise) | 199 | | | | |

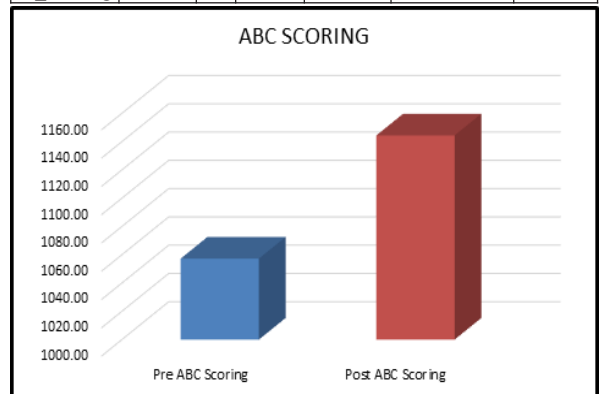
Table-2- One sample statistics, depict the Pre intervention SEM (8.037) and Post intervention SEM (9.252).

| One-Sample Statistics | | | | |
|--|-----|---------|----------------|-----------------|
| | N | Mean | Std. Deviation | Std. Error Mean |
| Pre_intervention_ABC_Baseline_Scoring | 199 | 1057.24 | 113.377 | 8.037 |
| Post_intervention_ABC_2nd_Week_Scoring | 199 | 1144.37 | 130.521 | 9.252 |

Table-3- Depicit That It Is Highly Significant Results With 95%

Confidence Interval With Pre And Post Abc Score.

| One-Sample Test | | | | | | |
|--|----------------|-----|-----------------|-----------------|---|---------|
| | Test Value = 0 | | | | | |
| | t | Df | Sig. (2-tailed) | Mean Difference | 95% Confidence Interval of the Difference | |
| | | | | | Lower | Upper |
| Pre_intervention_ABC_Baseline_Scoring | 131.544 | 198 | .000 | 1057.236 | 1041.39 | 1073.09 |
| Post_intervention_ABC_2nd_Week_Scoring | 123.684 | 198 | .000 | 1144.372 | 1126.13 | 1162.62 |



| | |
|------------------|---------|
| Pre ABC Scoring | 1057.24 |
| Post ABC Scoring | 1144.37 |

Graph-1-The bar graph shows that Post ABC score is better than Pre ABC score.

DISCUSSION-

In the present it is evaluated that the effect of Tai Chi exercise shows, positive result in geriatric people. In the present study it shows that after the two week intervention, the mean ABC score shows the highly significant it reduce the risk of fall and improve the mental and physical dysfunction in geriatric population. Tai Chi exercise shows both physical and mental enhancement in geriatric population it also focus on balance, strength and elasticity. There was research conducted by Alexandra Makai (2024) emphasized that the Tai Chi exercise yogic physical rehabilitation activity that improve the neuromuscular twitch, erect the posture, improve the proprioception and awake the peaceful QOL. The requirement of the study is to due to the sedative lifestyle in geriatric population, we have seen the path physiological changes occur in musculoskeletal it lead to increase the risk of fall ,injuries and chronic conditions. After the intervention we have seen that Tai Chi exercise improve the risk of fall and improve the functional dysfunction there was research done by Mahmoud Haji Ahmadi (2021) support this statement that Tai Chi exercise enhance the muscular group, improve elasticity, reduce the neuromuscular conduction, and improve the proprioception perturbations. Increase the attention and tasking ability and its response. Although it encourage the posture alignments help the individual to move with the confident, Tai chi exercise help to control and coordinate the proprioception perturbations. It enhances the sensory-motor integration by align the body movement.

Tai Chi exercise also help the geriatric people to reduce the anxiety and increase the moral towards the life ,it also improve the QOL, Tai Chi exercise relaxed the mind and increase the oxygenation and lung capacity in geriatric people. Intervention exercises impact in the current study shows that it help to low the hormones & neurochemical in the geriatric people. In a present study it shows the stress reduction, improve coordination and erect posture and several human body system are directly inter-linked.

Current study result shows that Tai Chi exercises contribute the effective efforts in reduction of fall risk and improve QOL.

CONCLUSIONS-

Through this study concludes that Tai Chi exercise contribute effective

efforts to reduce fall risk, improve mental health. Findings include positive and new clinical implementation in geriatric rehabilitation.

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