Mobility Related Confidence Level in Chronic Stroke Patients Through Task Oriented Walking Intervention
Aysha Khan¹, Malik Muhammad Atif², Amna Yaseen³, Tahir Mahmood⁴, Maria Nazir⁵, Sarosh Khan⁶

Introduction: Stroke is a neurological insufficiency caused by cerebrovascular injury resulting in major motor deficits in lower limbs. Different therapeutic interventions are being used for stroke rehabilitation. A unique approach used for stroke rehabilitation is task-oriented walking interventions. This research work was planned to study the effects of task-specific walking Interventions on improving the mobility-related confidence level in chronic stroke patients.

Method: This randomized control trial study was conducted on 48 stroke patients in hospital settings. Informed consent was taken from all the study participants before inclusion in the study population and the data from the study subjects was collected through a specially designed questionnaire, 06 minutes-walk test (6MWT), Timed "Up and Go" test (TUG), and Activity-specific Balance Confidence (ABC) Scale. The study population was randomly divided into two groups as interventional group and control group. Interventional group was trained for Task-Oriented Walking Interventions along with the conventional rehab treatment while the control group was trained only with conventional rehab interventions.

Results: On statistical analysis, performed after 6 weeks of interventions, significant improvement in mobility related confidence level for all the three scales TUG (P=0.000), ABC (P=0.000) and 6MWT (P=0.000) was observed in interventional group as compared to the control group where P>0.05 after six weeks of interventions.

Conclusion: The study concluded that task oriented walking interventions is an effective approach for improving mobility related confidence level in post stroke patients.

Keywords: Task oriented training, Mobility related confidence, Stroke, Activity-specific Balance Confidence Scale

**REFERENCES**


2. Introduction: Stroke or the cerebrovascular injury occurs because of the reduced flow of the blood to brain cells. It is deliberated as one of the leading causes of the death and/or disability in the affected population. It has been reported that stroke is most prevalent and severe health related condition that can lead to the disability and even death in all over the world. Stroke is actually a cardiovascular lesion of the neurological origin which can lead to multiple health issues including physical ailments including physical, social, cognitive and other behavioral abnormalities. All of these can lead to serious complications. The affected individuals may have pronounced physical symptoms including aphasia or difficulty in talking, disability ranging from monoparasis to quadriplegia, as in case of brain stem stroke. The common aftereffects of stroke include some sensory and some motor deficits for the affected areas or the limbs however, the everyday impacts or lesions include the motor abnormalities or dysfunctions. In short, it can be noted that the spectrum and pattern of the signs and symptoms of stroke may vary from person to person that may lead to damage in the affected area of the brain.

3. The pathology of stroke is complex and there are many different clinical presentations, each with distinctive impairments particularly motor insufficiencies and activity limitations. So, it is vital for the restoration and rehabilitation to enhance the functional status and functional capabilities of the affected individual as soon as possible by functional regain. The conservative stroke management includes rehab exercises, brainstorm methodology, PNF (Properceptive Neuromuscular Facilitations), NDT (Neuro Developmental Techniques) and multiple diverse exercises. Stroke patients whom lower extremity is effected and dysfunctional may have remarkable issues for ADLs performance and have compromised performance because of the motor deficits. It is utmost need to search for novel strategies for stroke rehabilitation in order to help the affected individuals for achieving high levels of independence functionally.

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**Citation:**
Received: 10-12-2022
Revised and Accepted: 16-02-2023
Published On-Line: 20-02-2023

**ABSTRACT**

Introduction: Stroke or the cerebrovascular injury occurs because of the reduced flow of the blood to brain cells. It is deliberated as one of the leading causes of the death and/or disability in the affected population. It has been reported that stroke is most prevalent and severe health related condition that can lead to the disability and even death in all over the world. Stroke is actually a cardiovascular lesion of the neurological origin which can lead to multiple health issues including physical ailments including physical, social, cognitive and other behavioral abnormalities. All of these can lead to serious complications. The affected individuals may have pronounced physical symptoms including aphasia or difficulty in talking, disability ranging from monoparasis to quadriplegia, as in case of brain stem stroke. The common aftereffects of stroke include some sensory and some motor deficits for the affected areas or the limbs however, the everyday impacts or lesions include the motor abnormalities or dysfunctions. In short, it can be noted that the spectrum and pattern of the signs and symptoms of stroke may vary from person to person that may lead to damage in the affected area of the brain.

The pathology of stroke is complex and there are many different clinical presentations, each with distinctive impairments particularly motor insufficiencies and activity limitations. So, it is vital for the restoration and rehabilitation to enhance the functional status and functional capabilities of the affected individual as soon as possible by functional regain. The conservative stroke management includes rehab exercises, brainstorm methodology, PNF (Properceptive Neuromuscular Facilitations), NDT (Neuro Developmental Techniques) and multiple diverse exercises. Stroke patients whom lower extremity is effected and dysfunctional may have remarkable issues for ADLs performance and have compromised performance because of the motor deficits. It is utmost need to search for novel strategies for stroke rehabilitation in order to help the affected individuals for achieving high levels of independence functionally.

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Original Research Article
A lot of work has been done in the field of rehabilitation in the past few years and it was found that the functional improvement can occur even in the chronic stages of the stroke. This discovery urged the researchers and clinicians to find out the new and modified interventions in order to make the rehabilitation process more effective and to transfer the attention towards the patients with chronic stroke. Task-oriented walking interventions is not a single method of treatment or management of stroke but it is a group of interventions specially designed for the patients to make them able to participate actively in rehabilitation process. Moreover, it also intends to develop the interest of the patient in the treatment procedure. Task-oriented walking interventions include ten different rehab exercises that are designed to foster the rehab process related to the mobility of the stroke affected patients. The present research work was planned to study the effects of Task specific or oriented walking Interventions on improving the mobility related confidence levels in chronic stroke patients. Although, multiples researches have shown the effects of particular interventions on stroke but still there is lack of multi-component interventional studies to show the effects on mobility related confidence of the patients with chronic stroke. Moreover, no such study has been conducted in Pakistan yet despite of its utmost significance and this is the uniqueness of this research study.

**Materials and Methods:**

This randomized control trial was conducted on 48 stroke patients. Sample size was calculated by G power Purposive sampling technique was used for sampling and the randomization was done by coin toss method and then study participants were randomly divided into two groups as the interventional group (n=24) and the control group (n=24) according to inclusion (Age 40-65 years, both genders, 1st stroke > 3 months, MOCA (Montreal Cognitive Assessment) scoring >26, Ability to comprehend the instructions for the testing procedures) and exclusion criteria (Individuals having other neurological deficits, Modified Ashworth scale > 2, BBS <20, Acute systemic illness, Comorbidity precluding participation in either intervention).

The tools used for the assessment were six minutes’ walk test, timed up and go tests and ABC (Activity-specific Balance Confidence) scale. The study settings were DHQ Hospital Chiniot, AI- Amin medical complex and Ali hospital Chiniot. The study plan was approved by the Research Ethical Committee (REC) of Riphah College of rehabilitation sciences (REC Letter no: 00546). The baseline data and the terminal readings of the treatment were recorded from both the groups, ‘interventional and control’. The Interventions received about 10 minutes warm up exercises and then were advised to perform the task-oriented walking interventions (for about 20-25 minutes) for 3 days in a week and the session was continued for 6 consecutive weeks on alternative days. The individuals in interventional groups have received task-oriented walking interventions along with the conventional rehab exercises. The session time was approximately 40-45 minutes. While, the control group received 10 minute warm up exercises and then were advised to perform the conventional rehab exercises which included the mild to moderate and pain free sustained stretching exercise, leg swinging exercises, the balance training including the side shuffles, the arm circles, the wobble board exercise and active and passive ROMs (performed by the individuals of control group who have difficulty in performing active ranges initially), balance beam exercises for independent walk training and some exercises to improve the component of balance during walking. This session time was approximately 40 to 45 minutes. Figure 1 mentioned below showing the consort diagram for this study.

The data was collected from the participants after their consent and the obtained data was analyzed using SPSS 24 by applying Kolmogorov test (to assess the normality of the data so that parametric or non-parametric tests can be applied further), Wilcoxon signed rank test (for within group analysis) and Mann-Whitney test (for analysis between the groups). Data was presented in the form of median inter-quartile range (IQR), and the p values less than 0.05 was considered significant.

![Consent diagram](image)

**Results:**

The results of this study depicted that most of the study participants were male (54%) between 29-57 years of age. Most of the participants ~60% belong to low socioeconomic status and ~60% participants were non-smokers. It has been found that almost 44% of the participants had stroke since a year or 2 while only 27% participants had stroke since more than 2 years and less than 3 years. It has been found that about 87.5% of the participants have other health issues along with stroke while only 12.5% claimed that they just have stroke.
The Kolmogorov test showed that the data was skewed (Table 1). Therefore, Wilcoxon signed rank test was used for within group analysis of interventional group and control group (Table 2) and Mann-Whitney test was used for intra group analysis of the data before and after session (Table 3).

The results of Wilcoxon signed rank test showed significant (p<0.05) variations among study participants between the sessions within the interventional group while no significant (p>0.05) variations were observed among study subjects within the control group. Intra group analysis through The Mann-Whitney test showed highly significant (p=0.00) i-e p<0.05 variations before and after the sessions between interventional and control groups.

### Table 1: Tests of Normality (Kolmogorov Smirnov)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Statistics:</th>
<th>DF</th>
<th>P value</th>
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</thead>
<tbody>
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<td>Difference TUG</td>
<td>0.349</td>
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<tr>
<td></td>
<td>0.346</td>
<td>31</td>
<td>0.000</td>
</tr>
<tr>
<td>Difference 6MWT</td>
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<td>0.000</td>
</tr>
<tr>
<td></td>
<td>0.379</td>
<td>31</td>
<td>0.000</td>
</tr>
<tr>
<td>Difference ABC</td>
<td>0.410</td>
<td>17</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>0.346</td>
<td>31</td>
<td>0.000</td>
</tr>
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</table>

### Table 2: Comparison within groups by Wilcoxon Signed rank test

<table>
<thead>
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<th>Variable</th>
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<th>Control Group</th>
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<tbody>
<tr>
<td></td>
<td>Pre-Median (IQR)</td>
<td>Post-Median (IQR)</td>
</tr>
<tr>
<td>----------</td>
<td>-----------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>6MWT</td>
<td>2.00 (1.00)</td>
<td>2.00 (1.00)</td>
</tr>
<tr>
<td>TUG</td>
<td>3.00 (1.75)</td>
<td>2.00 (2.00)</td>
</tr>
<tr>
<td>ABC</td>
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<td>2.00 (1.75)</td>
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</table>

### Table 3: Mann-Whitney Test showing intra group comparison

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group</th>
<th>Pre-Analysis</th>
<th>Post-Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Me</td>
<td>P Value</td>
<td>IQR</td>
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<tr>
<td>TUG</td>
<td>Control Intervention</td>
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<tr>
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<td>Intervental</td>
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<td>Control Intervention</td>
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<tr>
<td></td>
<td>Intervental</td>
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### Discussion:

Mobility is one of the prime goals of rehabilitation after stroke. Every patient wants to be independent in terms of the walking ability. However, sometimes the patients cannot cope with the situation and may sway or even fall off the ground. The patients thus need any rehabilitation exercise to regain their confidence. Task-oriented walking interventions fulfilled the purpose and it has been reported in published studies. In the past 20 years, a number of new and modified approaches have been added to the rehabilitation of patients with chronic stroke. Most of the studies, however favored the task oriented training regime as that of results of this study and this approach is regarded as the best possible rehab treatment after stroke.

A lot of people searched this area of stroke rehabilitation and the final conclusion of this study can be favored by the results of the other studies like a study reported that only concentrating on the performance was a lot simpler than focusing on the improvement in the participation and movement. It was concluded in the study that the clinicians should look for the approaches to improve mobility related confidence by implementation of the task oriented walking interventional training or the similar rehab mediations in the post stroke patients.

Another study was labelled as “The effects of task oriented walking interventions” was explored by Salbach. The results of the study showed a significant improvement in the interventional group (P<0.05) compared with the control group. Salbach led another multivariable interventional study for checking the impacts of task-oriented walking interventional training on mobility related confidence looking at the impacts of upper and lower extremities in the post stroke patients. The consequences of this multivariable research study concluded that the improvement to be decided and Mobility related confidence of post stroke patients was subject to numerous variables including the age, sex of the participants, time after stroke and the patient’s status of functional mobility.

Salbach did a lot of work in this area of research and in the recent years, Salbach and his partners led a systemic review to build up a standard protocol for stroke rehabilitation. They looked through 7 different data-bases and explored the researches as per their titles, the abstracts and their strength. The final conclusion affirmed the past outcomes and it was discovered that a standard protocol of six minute walk test is required and the task oriented walking rehab interventional training was increasingly productive and compelling strategy for treatment in post stroke patients.

A research study was conducted in Korea by Choi and Kang on post stroke patients. The results showed great variations in scores of all of these measurement scales and it was found that the interventional group has improved more (P<0.005) as compared with the control group and it was concluded that task specific walking exercises were real magic to improve the balance and the mobility related confidence of the patients after stroke as compared with the traditional rehabilitation interventions and methods.

Another study was conducted for aneurysms and it referred that task-oriented walking interventions can be helpful in early recovery of the patients. A similar study was conducted by Lee et.al in 2011 to evaluate the risk factors and treatment options for stroke and they also found that task-oriented walking interventions can be proved best for stroke rehabilitation. All of these studies favored the results of this study and the researchers found that the task oriented walking interventions can be used extensively to foster the rehabilitation process after the stroke.

### Conclusion:

The study concluded that the patients improved formerly if the rehabilitation session is concise and task specific. From
the study it was summed up that the task oriented or task specific walking interventions are one of the best therapeutic interventions to improve mobility related confidence of the patients after stroke.

**Key Finding:**
Task-oriented walking interventions are one of the best therapeutic interventions to improve mobility related confidence of the patients after stroke.

**References:**