

Effectiveness of Task Oriented Physiotherapy Along with Conventional Physiotherapy for Patients with Stroke

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To cite this article:

Shahinoor Bente Khan, Mohammad Habibur Rahman, Md Obaidul Haque, Ehsanur Rahman. Effectiveness of Task Oriented Physiotherapy Along with Conventional Physiotherapy for Patients with Stroke. *International Journal of Neurologic Physical Therapy*.

Vol. 5, No. 2, 2019, pp. 37-41. doi: 10.11648/j.ijnpt.20190502.12

Received: June 24, 2019; Accepted: August 12, 2019; Published: September 16, 2019

Abstract: *Background:* Stroke is a disorder where brain is damaged either by blockage in the blood vessels or rupture of the blood vessels. It is the approximately number five leading cause of death. It is also the leading cause of longer period disability as well as preventable cause of disability. *Objectives:* To determine and compare balance, functional status and mobility before and after application of task oriented physiotherapy along with conventional physiotherapy among patients with Stroke. *Methodology:* Classic experimental study design was used in this study. 30 patients with stroke were randomly assigned into two groups among them 15 patients were assigned into experimental group received task oriented physiotherapy with conventional physiotherapy and another 15 into control group received only conventional physiotherapy. Total treatment sessions were twenty-four comprising of 3 sessions per week for 8 weeks. Single blinding procedure was used during data collection. *Outcome measurement tools:* Berg balance scale (BBS) was used to measure balance, functional independence measurement (FIM) was used to measure functional status and timed up and go test (TUG) to measure mobility. *Analysis of data:* Inferential statistics such as for between group analysis of BBS and FIM used Mann-Whitney U test, and within group analysis of BBS and FIM used Wilcoxon test. Besides Independent t test used for between group analysis and Paired t test was done for within group analysis of TUG by using SPSS version 22. *Results:* It was found that balance, functional status and mobility improved both between and within group results except standing unsupported one foot in front. *Conclusion:* This research showed that task oriented physiotherapy along with conventional physiotherapy was more effective than only conventional physiotherapy for patients with stroke.

Keywords: Task Oriented Physiotherapy, Conventional Physiotherapy, Stroke

1. Introduction

A common neurological insufficiency characterized by the sudden development of a clinical sign of focal disturbance secondary to a vascular event and persists more than 24 hours known as stroke [1]. Now a day's stroke is the major familiar cause of impairments in (ADLs) activities of daily livings and it is increasing worldwide [2]. American Stroke Association (2016) stated that it is the approximately number five-leading cause of death [3]. It is also the leading cause of longer period disability. Physiotherapy is such a major

component of medical science for rehabilitation of stroke patient [4]. One of the main purposes of the rehabilitative is to help patients achieve as high a level of functional independence as possible within the limits of their impairments. Task oriented physiotherapy is a treatment technique that involved the performance of repeated work; aim oriented, purposeful activities in a normal setting to facilitate individuals obtain most favorable manage strategies for alleviating association disorders and enhance the persons to lead a healthy life and improve the quality of life.

The aim of the study was to identify the effectiveness of task oriented physiotherapy along with conventional

physiotherapy for patients with stroke.

2. Null Hypothesis (H₀)

Task oriented physiotherapy along with conventional physiotherapy is no more effective than conventional therapy for the treatment of patients with stroke.

H₀: $\mu_1 - \mu_2 = 0$ or $\mu_1 = \mu_2$, where the experimental group and control group initial and final mean difference is same.

3. Alternative Hypothesis (H_a)

Task oriented physiotherapy along with conventional physiotherapy is more effective than only conventional therapy for the treatment of patients with stroke.

H_a: $\mu_1 - \mu_2 \neq 0$ or $\mu_1 \neq \mu_2$, where the experimental group and control group initial and final mean difference is not same.

4. Methods and Materials

The study was a quantitative evaluation of classic experimental research design. It was a single blinded study where the participants were blinded. In this study, 30 patients diagnosed with hemiplegia due to stroke were randomly assigned to balance exercise using task oriented physiotherapy group (experimental group) by 15 patient and conventional physiotherapy group (control group) of 15 patients. The present study was carried Department of physiotherapy at Centre for the Rehabilitation of the paralysed (CRP), Savar. Balance was measured using Berg balance scale, functional status was measured by FIM scale, and Mobility was measured by TUG test.

5. Data Collection and Analysis

Data was collected and recorded in MS excel spread sheet 2007 and data was analyzed by using SPSS version 22. Mann Whitney U test, Wilcoxon test and Independent t test and paired t test was admitted to find the significance between group analysis and within group analysis of BBS, FIM and TUG test.

6. Ethical Approval

Ethical clearance was obtained following the Bangladesh Medical Research Council (BMRC) guidelines and World Health Organization (WHO) Research guidelines. Thesis proposal was submitted for approval of the administrative bodies of ethical committee of CRP and permission was obtained from Institutional Review Board (IRB) of Bangladesh Health Profession Institute (BHPI). A pretest intervention and posttest 24 sessions of intervention was administered with each subject of both groups.

7. Intervention Regimen Received

Control group was given conventional physiotherapy including postural correction, maintain positioning, Bobath approach, Bobath mobilization, strengthening exercise, stretching exercise, weight bearing exercise, balance training, pelvic floor muscle strengthening exercise and also some home exercises according to patients response to treatment.

In experimental group task oriented physiotherapy was given along with conventional physiotherapy by physiotherapist who is expert in task oriented training program. The 10 tasks were (1) step-ups, (2) balance board exercise, (3) kicking a ball, (4) stand up and walk, (5) obstacle course, (6) treadmill, (7) walk and carry, (8) speed walk, (9) walk backwards, and (10) stairs. Before commencing training, the subjects warmed up for 5 minutes to improve their range of motion and flexibility. Each item was practiced for 5 minutes, and 1 minute of rest time was allowed between each item (Figure 1).



Figure 1. Description of different task oriented physiotherapy.

8. Result

Table 1. Comparison of baseline characteristics of the participants.

Variable	Control group	Experimental group	P
Age, mean (SD), years	58.53 ±15.491	49.60 ±8.903	0.06
Gender	Male=7 (46.7%) Female=8 (53.3%)	Male=6 (40%) Female=9 (60%)	0.52
Height (m), mean(SD)	157.82±7.366	158.50±5.581	0.50
Weight(kg), mean(SD)	63.07±9.231	62.73±7.401	0.43
BMI (kg/m ²), mean(SD)	25.35±3.608	24.90±1.927	0.13
TUG mean(SD), pretest	19.87±8.015	17.87±4.838	0.00

Table 1 compares the base line characteristics of participants between control and experimental group. In addition, two groups did not show significant differences at baseline regarding demographic characteristics instead of TUG test 0.00. In control group the mean age (\pm SD) of the participants was 58.53 (\pm 15.491) years and in experimental group 49.60 (\pm 8.903) years. In control and experimental group, male female ratio was (Male: Female=1:2). In

addition, mean height was in control group 5.19 (\pm .252) meters and 5.24 (\pm .220) meters in experimental group. Mean weight was 63.07 (\pm 9.231) kg in control group and 62.73(\pm 7.401) kg in experimental group. Mean BMI was 25.33 (\pm 3.586) in control group and 24.80 (\pm 1.905) in experimental group. Mean (\pm SD) pretest TUG score was in control group was 19.87 \pm 8.015 and in contrast mean (\pm SD) in experimental group was 17.87 \pm 4.838.

Table 2. Mann Whitney U test for between group analysis for total BBS and FIM.

	Category of participants	N	Mean of posttest	Mean rank	Mann Whitney U score	P
BBS	Experimental	15	42.40	20.10	43	.003
	Control	15	33.07	10.90		
FIM	Experimental	15	96.00	10.47	37	.002
	Control	15	109.47	20.53		
	Total	30				

The result showed that the calculated value of U is 43 for berg balance scale. From the calculated value (U=43), it was clear that U value between experimental and control groups had an associated probability. The level of significance is .003 which is less than 0.05. Therefore, the result is significant for one tailed hypothesis. Since the p value is less than 0.05, the result is significant and the null hypothesis (no relationship) is now rejected and the alternative hypothesis is accepted. So, it can conclude that task oriented physiotherapy

along with conventional physiotherapy is more effective than only conventional therapy between group analysis of individual variables to improve balance for the patients with stroke. Mann Whitney U test score for FIM is 37. And observed p value is .002 which is less than 0.05. So, we conclude that there is a significant difference between the distribution ranks in the FIM that is the exits significant difference in recalling the item between control post FIM and experimental post of FIM.

Table 3. Wilcoxon test for within group analysis for total BBS and FIM.

	Category of participants	N	Mann Whitney U score	P
BBS	Experimental	15	-3.409	.001
	Control	15		
FIM	Experimental	15	-3.415	.001
	Control	15		
	Total	30		

The study found that the observed wilcoxon result for BBS pre and BBS post in control group was -3.409 and p value was .001, significant at 5% level of significance. For FIM in control group wilcoxon result was -3.413 and p value was .001, in experimental group was -3.415 and p

value was .001 which is significant at 5% level of significance. For FIM in control group wilcoxon result was -3.413 and p value was .001, in experimental group was -3.415 and p value was .001 which is significant at 5% level of significance.

Table 4. Between group analysis by Independent t test for in control and experimental group for TUG test.

Variables	t value	df	P value	95% Confidence Interval	
				Lower	Upper
Difference between control and experimental group in TUG test	2.614	28	0.016	0.800	6.933

The result showed Independent t test in between group at 5% level of significant described that the calculated t value is 2.614 and for df= 28, the calculated t value is smaller that has

an associated probability level of .16%. This means that the probability of random error being responsible for the outcome of this experiment is in 0.16.

Table 5. Between group analysis by Independent t test for in control and experimental group for TUG test.

Variables	Mean	SD	Paired t	df	P value
TUG test Difference within control group	4.867	3.378	5.580	14	0.000
TUG test Difference within experimental group	6.933	2.434	11.033	14	0.000

This study found that in timed up and go test observed t value was 5.580 (4.867 ± 3.378) in the control group at two tailed paired t test while this same variable for experimental group observed value was 11.033 (6.93 ± 2.434). 5% level of significant at 14 (fourteen) degrees of freedom standard t value was 10.500. The observed t value in experimental was more than the standard t value, so null hypothesis was rejected and alternative hypothesis was accepted, that indicated that task oriented physiotherapy is effective for the patients with stroke. The observed t value in control group was less than standard t value that means null hypothesis was accepted and alternative hypothesis was rejected in the between group. Table showed that within group analysis of TUG test the improvement of Time up and go test was highly significant and in fact in control group ($p=0.000$) and trial group ($p=0.000$).

9. Discussion

The study showed significant difference in both group and following 8 weeks' task oriented physiotherapy. There was a significant improvement in balance and functional status. There are so many studies found for upper extremity and only few studies found for lower extremities. The lower extremity showed good prognosis instead of upper extremity. Some studies demonstrated that approximately 80% stroke patients survive the acute phase with walking ability and 30% to 66% facing arm disability.

In this study mobility was improved significantly. In comparison with another study proved that high intensity task oriented training can improve mobility early after stroke [5].

In this study intervention duration was 3 times per day for 45 minutes per sessions for total 8 weeks. In contrast another study conducted by Knox, Stewart and Richard (2018), showed six hour of task oriented training improve walking competency in post stroke patients [6].

Another study stated that task oriented training with cognitive behavior therapy decrease the fear of falling in chronic stroke patients [7]. It can support our study which is mobility improvement and decrease the risk of falling in stroke patients.

The present study determined the effects of task oriented physiotherapy along with conventional physiotherapy for improving balance, mobility and functional status of patients with stroke. Some studies have found that task oriented physiotherapy is effective for stroke patients. In comparison with one study conducted by Liu et al, 2019 stated that task oriented training and cognitive behavior therapy decreased fear of falling of the stroke survivors [8].

Ghazal & Amjad (2016) stated that task oriented training improves the balance as well as balance outcome of stroke patients with diabetes. It also played an important role to reducing fall risk in diabetic population [9].

Task oriented training or task oriented physiotherapy has the capacity in case of improve balance and mobility [10]. Another study showed that task training with group therapy is a safe treatment and it is better when compared with another task training including individual task training of equal based dose. It is safe training program for self-reported mobility for the unable to walk independently stroke patients [11].

10. Conclusion and Limitation

10.1. Conclusion

Based on the result of the study was demonstrated that there was significant difference with most of the domains and some showed not significant in experimental group and control group in case of between group analysis and within group analysis. Task oriented physiotherapy helped in improving balance, mobility and functional outcome of patients with stroke. The result of the study has shown that task oriented physiotherapy along with conventional physiotherapy is superior to the conventional physiotherapy alone after twenty-four sessions of treatment for patients with stroke. From this study concluded that task oriented physiotherapy helps to improve balance, mobility and functional outcome for the patients with stroke.

10.2. Limitation

The study has several limitations. The sample size was very small, so the result is difficult to generalize among whole population. Researcher has taken help from one assessor for data collection purpose, it may vary result. Data was collected one clinical setting CRP Savar, it can influence the result. Sometimes treatment sessions were interrupted due to public holiday 6% participants were illiterate; it may give data error way. Therefore, the duration of the effect after the experimental intervention is unknown.

Acknowledgements

First of all, I am grateful to almighty Allah for allowing me to complete this thesis and then thanks to my parents and my supervisor to support me. I would like to thanks all physiotherapy staff and interns for helping me during data collection and treating patient for this project. I am obliged to all Physiotherapists of Neurology Unit, CRP, Savar, for their cordial support. MPT students of BHPI have supported me. I would like to express my gratitude to men and women with stroke, who gave me their valuable time and provided the information, related to my study and helped me to make my work successful.

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