

# EFFECT OF BIMANUVAL DRESSING SKILLS TRAINING IN STROKE SURVIVOUR

**Dr. R. V Benielraja Gnanadurai<sup>1</sup>, Dr.M. Arunkumar<sup>2</sup>, Mr.S. Muthu <sup>3</sup>**

<sup>1</sup>Assistant professor, Saveetha College of Occupational therapy, Saveetha Institute of Medical and Technical Science (SIMATS), Saveetha Nagar Thandalam, Chennai, Tamil Nadu, India

<sup>2</sup>Principal of Saveetha College of Occupational Therapy, Saveetha Institute of Medical and Technical Science (SIMATS), Saveetha Nagar Thandalam, Chennai, Tamil Nadu, India

<sup>3</sup>Final Year Student of Saveetha College of Occupational Therapy, Saveetha Institute of Medical and Technical Science (SIMATS), Saveetha Nagar Thandalam, Chennai, Tamil Nadu, India

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## **ABSTRACT**

*Stroke is rapidly developing in cerebral function and lasting more than 24 hours leading to death, with no apparent cause other than of vascular origin. Stroke or cerebrovascular accident describes a variety of disorders characterized by the sudden injury to the brain. Vascular damage in the brain disrupts blood flow, limits oxygen supply to surrounding cells and lead to brain tissues death or infarction. The study design was a Quasi-experimental type of study. A total of 30 patients were selected with the help of the Montreal cognitive assessment scale and they were evaluated with the help of Nottingham stroke dressing assessment scale. They were conveniently distributed into 2 groups: the experimental group (15 patients) and the control group (15 patients). The Control group underwent conventional occupational therapy whereas the experimental group underwent game-based intervention along with conventional occupational therapy for 24 sessions of 45 minutes. The statistical analysis showed a highly significant improvement in post-test scores of both the control and experimental group.*

## **INTRODUCTION**

Stroke is defined as a clinical syndrome, of presumed Vascular origin, typified by rapidly developing signs of focal or global disturbance of cerebral functions lasting more than 24 hours or leading to death” (WHO in1978).

A stroke is caused by an interruption of the blood supply to the brain, usually due to a ruptured blood vessel or a blockage caused by a clot, this causes an inadequate supply of oxygen and nutrients to reach vital parts and results in damage to the brain tissue” (WHO 2008).

Ischemic stroke results from a blockage of a cerebral vessel and can further be categorised as caused by thrombosis or embolism. Thrombosis is the stenosis or occlusion of a vessel, usually as a result of atherosclerosis. This occlusion Is typically a gradual process, often with preceding warning signs, such as transient ischemic attack. Embolism is dislodged platelets, cholesterol, or other Material the travels in the blood stream and blocks of vessel. Ischemic strokes are the most common type, representing roughly 80 percentage of strokes. (Roth&Harvey,1996).

Haemorrhagic strokes result from a rupture of a cerebral blood vessel. In such strokes, blood is released outside of the vascular space, cutting off pathways and leading to pressure injuries to brain tissue (Caplan&Stein,1986). Haemorrhages which are either intra cerebral or subarachnoid, maybe caused by Hypertension, arteriovenous malformation, or aneurysm. CVAs Account for only an estimated 20% of strokes but they can be the most catastrophic accounting for an estimated 3<sup>rd</sup> of stroke deaths.

### **AIM**

Effects of bimanual dressing training to improve dressing skills for stroke survivors

### **OBJECTIVE**

- To find out the patients with stroke who have dressing skills problem by using Nottingham stroke dressing assessment scale.
- To find out the effective intervention to improve dressing skills by providing bimanual dressing skill intervention.
- To implement the bimanual dressing skills on stroke patients and to improve voluntary motor control in upper extremity.

### **Research Hypothesis**

There is a significant improvement in dressing skills by using bimanual dressing skills training in stroke survivor

### **Research design**

Quasi-experimental type with a quantitative method was adopted

### **Sample technique**

Convenient sampling technique was used.

**The sample sizes**

30 patients participated.

- 15 in the experimental group
- 15 in the control group

**Sample setting**

The research was conducted in:

- Pain & Stroke rehab center at T Nagar
- Brain & spinal hospital at CIT Nagar
- Saveetha hospital at Thandalam

**SELECTION CRITERIA:****Inclusion criteria**

- Patients with stroke (hemiplegic).
- Male patients
- Both sides affected
- Patients with sitting tolerance
- Patients at Brunnstrom stage 4-5  
(Brunnstrom stage 4- voluntary movements outside of synergy patterns, decreasing spasticity)

**Exclusion criteria**

- Patients with psychiatric disorders, all neurotic and psychotic patients.
- Patients with other neurological problems, ex. Multiple Sclerosis.
- Patients with perceptual deficits.

**INSTRUMENTS USED:****SCREENING TOOL**

MONTREAL COGNITIVE ASSESSMENT SCALE

**OUTCOME MEASURE**

NOTTINGHAM STROKE DRESSING ASSESSMENT

**PROCEDURE OF DATA COLLECTION:**

Totally thirty subjects are selected according to the inclusion criteria. The subject's cognitive level was measured using the Montreal cognitive assessment scale. The samples are equally

divided into two groups, 15 samples in the control group and 15 samples in the experimental group. After the baseline data is obtained, the sessions are based upon bimanual dressing skill training. The pre and posttest values are used to find out the result of the study using the Nottingham Stroke dressing assessment scale.

## **REVIEW OF LITERATURE:**

### **POST STROKE EFFECT**

Sapna et al., in the year (2008) conducted a study to identify the prevalence, the factors that can cause stroke and consequence of disorders such as stroke in countries that are developing, mainly focusing urban and rural dwellers of a South Indian community. The study determined that all the participants were facing the first ever stroke episode. Results were that during a 6-month period, 541 strokes were registered, 431 in the urban and 110 in the rural communities. Stroke occurred at a mean age of 67 years; only 3.8% of patients were aged less than 40 years. Adjusted annual incidence rates per 100 000 were 135 for total, 135 (122–148) for urban, and 138 (112–164) for rural populations, and 74.8 (ischemic), 10.1 (intracerebral haemorrhage), and 4.2 (subarachnoid haemorrhage). Undetermined type of stroke was identified as the most common type among the stroke population. Ninety percent of the stroke patients were identified to have one or more modifiable risk factors. The study concluded that there were more similarities than differences between developing and developed countries in the epidemiology of stroke. The author also concluded that stroke patients within the city and urban areas received treatment when compared to the rural stroke patients, who were less likely to be investigated and treated.

Barker- Collo et al., (2013) conducted a study to identify sex differences in stroke incidence, prevalence and mortality. Grossly men have a higher prevalence rate than women around the world for ischemic type of stroke, whereas there was not much of a difference between males and females' incidences for the haemorrhagic type of stroke. Disability- adjusted life- years (DALYs) was a tool to measure the total health loss due to stroke. The study was able to identify that there was a clear difference in the number of males affected with stroke and the females suffering from the same neurological disorder. The study also discovered that there was an increase among both men and women in the DALYs since 1990.

### **Nottingham stroke dressing assessment scale**

Joanna Fletcher-Smith et al., (2010) was conducted a study on Nottingham Stroke Dressing Assessment. The study setting was an Inter-rater reliability study. Dressing problems after stroke are common. There is therefore a need to establish the psychometric properties of appropriate dressing outcome measures for use in clinical practice and research. The Nottingham Stroke Dressing Assessment (NSDA) is a validated assessment of post-stroke dressing ability. This study investigated the interrater reliability of the NSDA and the accompanying dressing error analysis form. Twenty patients with persistent dressing difficulties at 2 weeks post-stroke were recruited to the study. Two research occupational

therapists and one clinical occupational therapist acted as raters. They observed all 20 patients during dressing and independently completed the NSDA and error analysis form without discussion. Of the 44 items tested, there was excellent agreement ( $\kappa > 0.75$ ) on 29 items, good agreement ( $\kappa > 0.6$ ) on 8 items, fair agreement ( $\kappa > 0.4$ ) on 5 items and poor agreement ( $\kappa < 0.4$ ) on 2 items. The intraclass correlation coefficient between the three raters' final percentage score was 0.988, representing excellent agreement.

### **Bimanual technical:**

MANAL ABD EL WAHAB et al., (2014) This study focus on Children with hemiplegic cerebral palsy have impairments in bimanual coordination above and beyond their unilateral impairments. This study was conducted to examine the effect of hand-arm bimanual intensive therapy (HABIT) on the affected upper extremity use in children with hemiplegic cerebral palsy. Thirty hemiparetic children ranged in age from 3 to 7 years with mild to moderate hand involvement had participated in this study and they were divided equally into two groups (control and study). Children in the study group were engaged in play and functional activities that provided structured bimanual practice 3 h per day for 12 weeks, while children in the control group received traditional physical therapy program directed toward improving upper extremity use. Each child in the two groups was evaluated before and after the suggested treatment duration for detecting the level of hand performance using the Peabody Developmental Test of Motor Proficiency and hand grip strength by a hand-held dynamometer. The result of the study was children in both groups demonstrated improved scores on the Hand grip strength while only children in the study group showed significant improvement in fine-motor performance scores ( $p < 0.05$ ). The study concluded that the hand-arm bimanual intensive therapy appears to have a positive impact on hand function in children with hemiparetic cerebral palsy.

### **INTERVENTION PROTOCOL:**

**Session duration:** 45 minutes

**Session frequency:** 3 days per week

**Intervention session:** 36 sessions

**Intervention duration:** 12 weeks

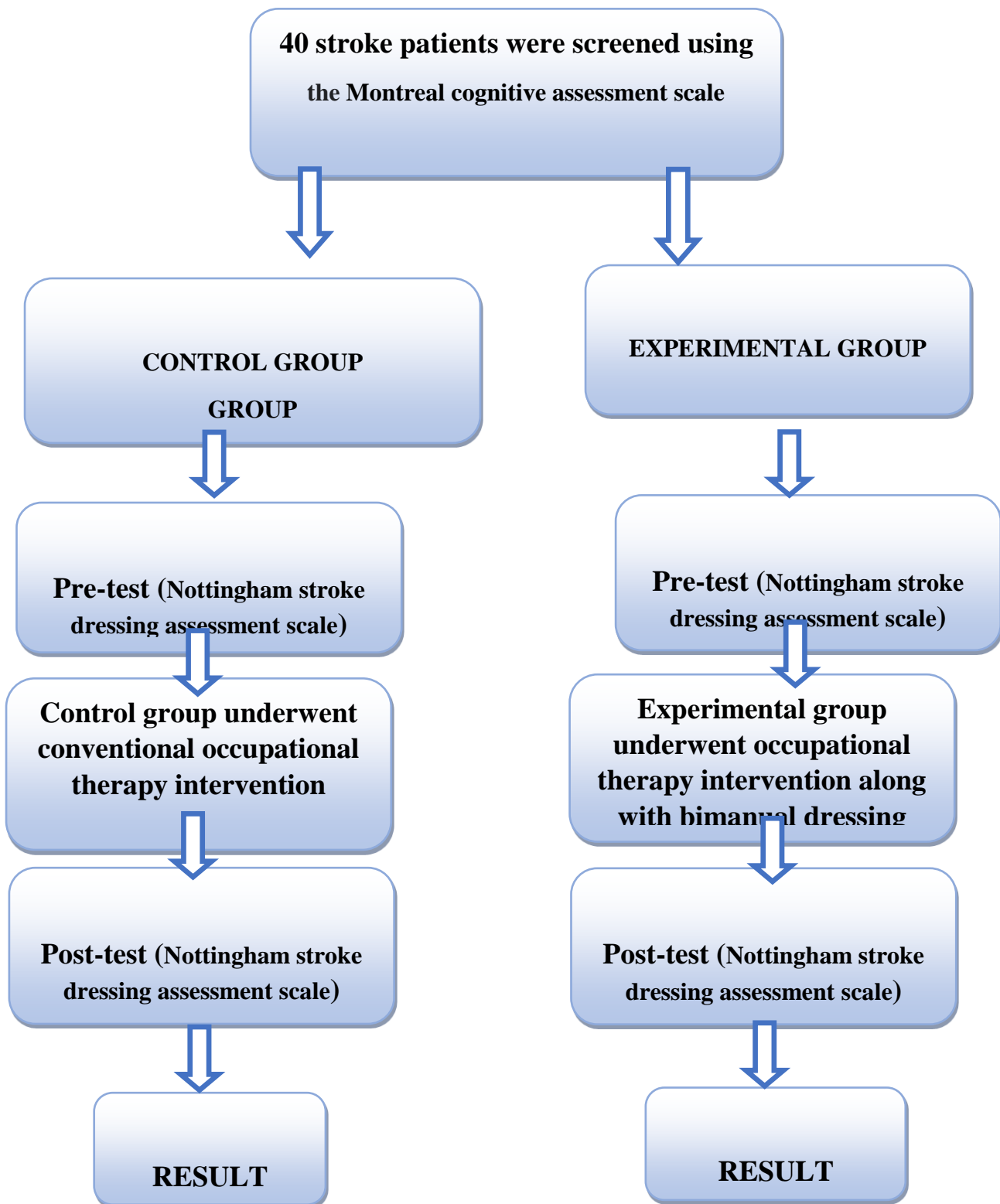
Hand function training

Diadochokinetic

Standing unsupported practice

Hands over head

Dressing techniques



### DATA ANALYSIS AND RESULT

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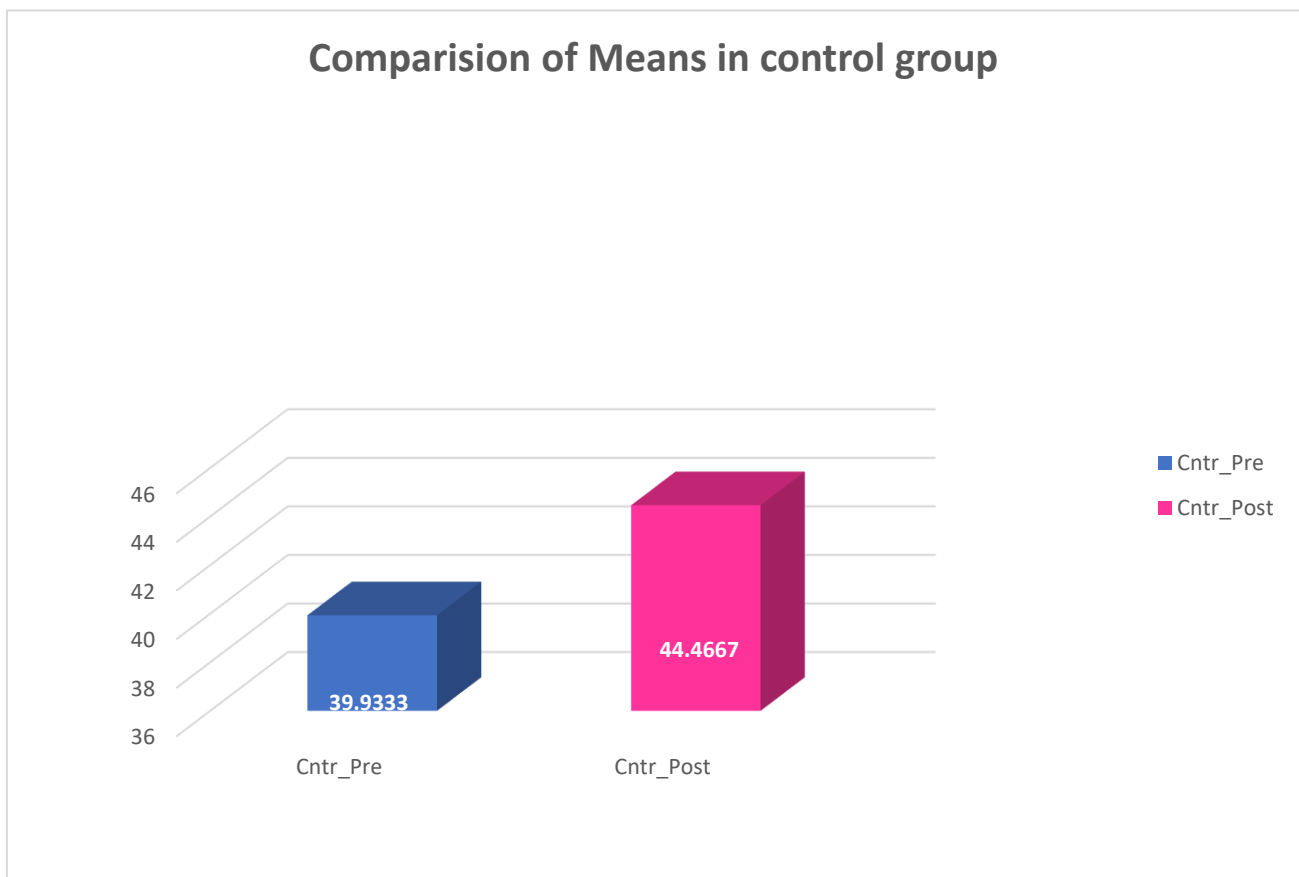
**Table 4.1 Statistical analysis of pre- test and post- test in control group**

	Mean	N	Z value	p value
<b>Cntr_Pre</b>	39.9333	15	-3.443	0.001*
<b>Cntr_Post</b>	44.4667	15		

**\* Significant at 5% alpha level**

Since the p value of 0.001 is lesser than 0.05, alternate hypothesis **1** is accepted. Hence, there is statistically significant difference between pre- test and post test scores in the Control Group of the NSDA scale. This suggests that the intervention received by the control group had significant improvement.

**Figure 4.1 Statistical analysis of pre- test and post- test in control group**



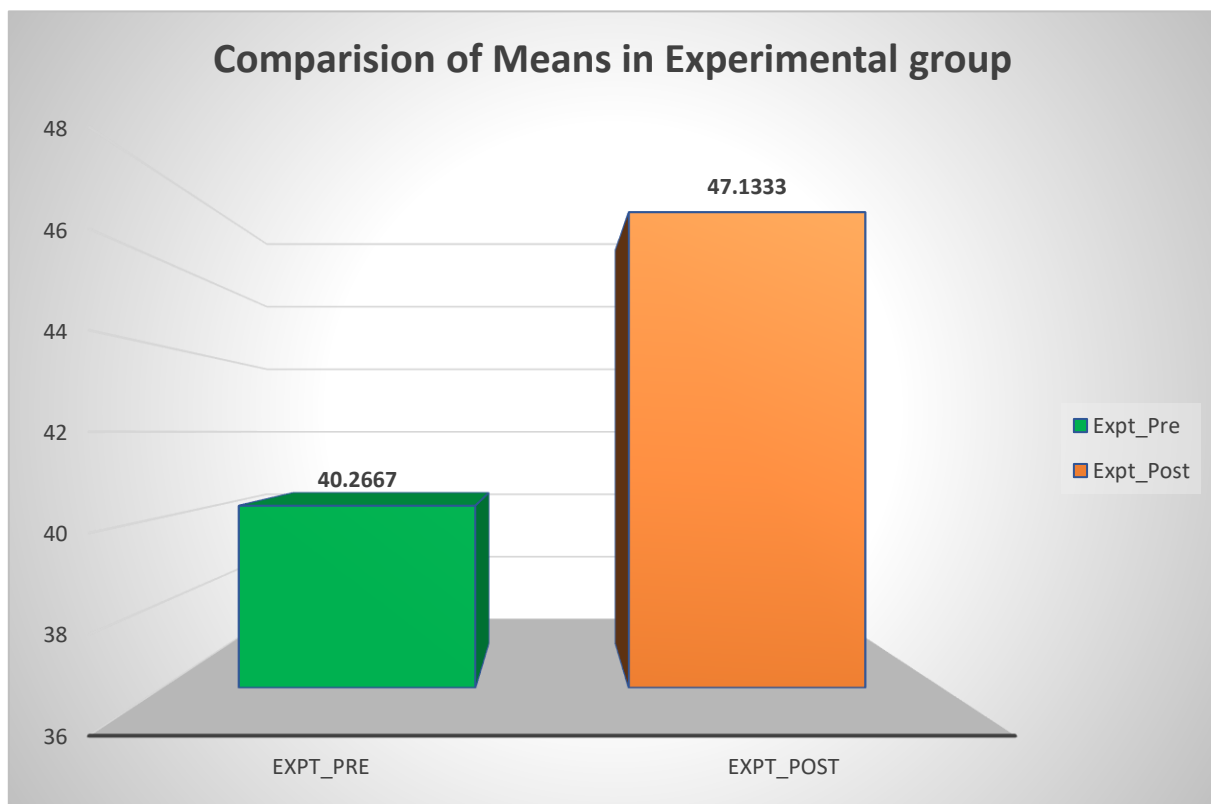
### 4.2 Statistical analysis of pre- test and post- test in experimental group

	Mean	N	Z value	p value
Expt_Pre	40.2667	15	-3.421	0.001*
Expt_Post	47.1333	15		

\* Significant at 5% alpha level

In the Experimental group, since the p value of 0.001 is less than 0.05, alternate hypothesis 2 is accepted. Hence, there is statistically significant difference in Experimental Group between pre-test and post test scores of NSDA scale. This suggests that the intervention received by the experimental group had significant improvement.

Figure 4.2 Statistical analysis of pre- test and post- test in experimental group





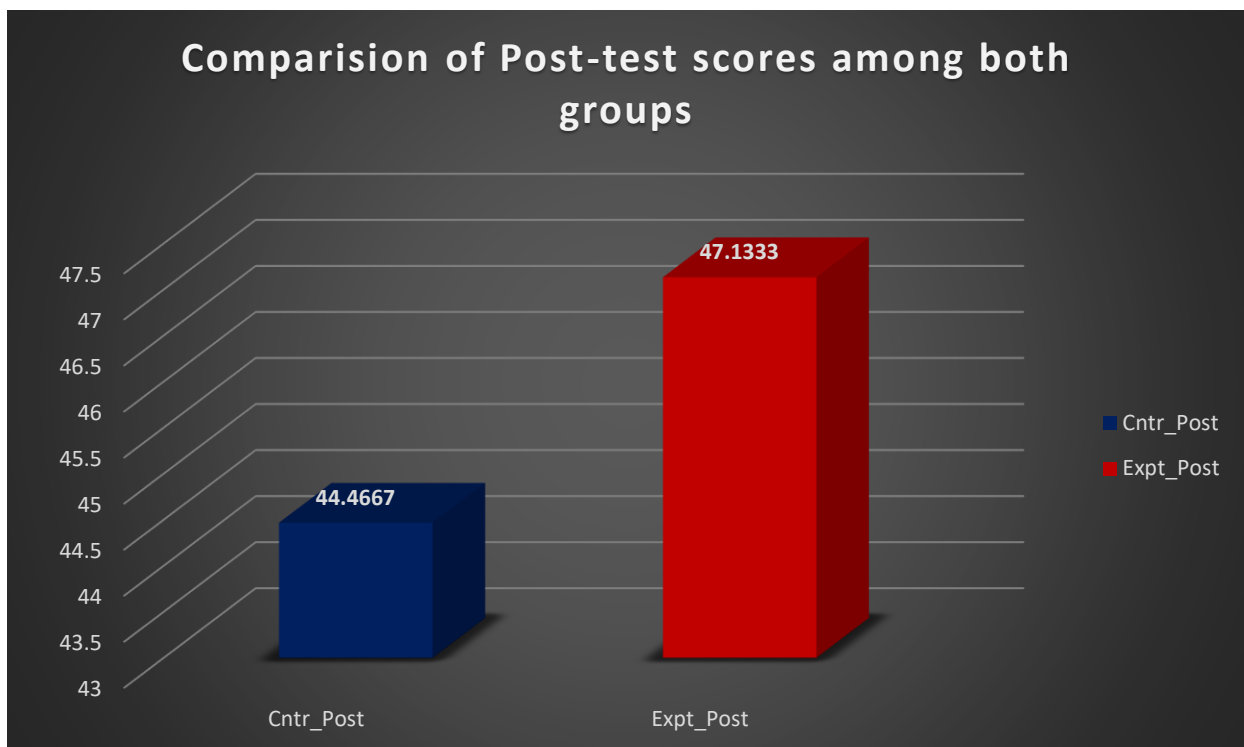
### 4.3 Statistical analysis between the post- test scores of the control and experimental group

	Mean	N	Z value	p value
<b>Cntr_Post</b>	44.4667	15	-3.15233	0.00164*
<b>Expt_Post</b>	47.1333	15		

**\*Significant at 5% alpha level**

Since the p value of 0.00164 is lesser than 0.05, alternate hypothesis is accepted. Hence, there is statistically significant difference in post test scores between Experimental and Control Group of the NSDA scale. This suggests that the intervention received by the experimental group had more improvement when compared to the control group.

**Figure 4.3 Statistical analysis between the post- test scores of the control and experimental group**



## DISCUSSION

The aim of the study was to find out the effect of bimanual dressing skills training to improve in stroke survivor

A total number of 30 patients with stroke were selected for the study. 15 patients were allocated for control group and 15 patients were allocated for experimental group.

Both control and experimental group were measured by Nottingham stroke dressing skill assessment scale to measure the dressing skills of the affected patients with stroke. The experimental group were assigned with intervention to improve the dressing skills, interventions such as sitting unsupported practice, standing unsupported practice, hand over the head, dressing techniques. whereas the control group received only the conventional occupational therapy. After the intervention was done, the post-test evaluation was done for both control and experimental group, finally the scores were calculated and the results were analysed.

The table 4.1 and figure 4.1 shows that the comparison between the dressing skills among patients with stroke in the controlled group. The mean value of the pre- test is 39.9333 and the mean value of the post- test is 44.4667 and the p value is less than 0.05. Hence there is a statistically significant difference in control group. These findings were accordance with the previous study done and supported by the author **R14 JAGDISH SHARMA (2022)** In these studies they have evaluated the processes and factors that influenced implementation and impact of a home-based bimanual training program in children with unilateral cerebral palsy aged 2 through 7 years.

The program consisted of bimanual task-specific training (3.5 hours/week for 12 weeks) adopting either implicit or explicit motor learning skills. A therapist and remedial educationalist coached parents. This mixed methods study included course attendance monitoring, questionnaires, registration form, video analysis, interviews, focus group discussion, and drop-out monitoring.

Fourteen families participated. The program was not fully implemented as intended. Parents positively experienced the training and were well able to provide it. The program was demanding for the children and time-consuming for parents. Several components positively contributed to the program: task-analysis, instructional videos, and coaching by a therapist and remedial educationalist. Several modifications to the program were proposed.

In Conclusion home-based bimanual training forms a demanding but promising therapeutic approach with potential for optimization and improvement.

Joanna Fletcher-Smith et al (2012) The influence of hand use on dressing outcome in cognitively impaired stroke survivors.

Table 4.2 and figure 4.2 showed the results of the difference between the pre and post-test of experimental group in Nottingham stroke dressing assessment scale . . The mean value of the pre- test is 40.2667 and the mean value of the post- test is 47.1333 and the p value is less than 0.05. There was statistically high significant difference in experimental group. The result of the study supported with the previous study done by the motivational researcher **R18 Joanna Fletcher-Smith et al., (2010)** was conducted a study on Nottingham Stroke Dressing Assessment. The study setting was an Inter-rater reliability study. Dressing problems after

stroke are common. There is therefore a need to establish the psychometric properties of appropriate dressing outcome measures for use in clinical practice and research. The Nottingham Stroke Dressing Assessment (NSDA) is a validated assessment of post-stroke dressing ability. This study investigated the interrater reliability of the NSDA and the accompanying dressing error analysis form. Twenty patients with persistent dressing difficulties at 2 weeks post-stroke were recruited to the study. Two research occupational therapists and one clinical occupational therapist acted as ratters. They observed all 20 patients during dressing and independently completed the NSDA and error analysis form without discussion. Of the 44 items tested, there was excellent agreement ( $\kappa > 0.75$ ) on 29 items, good agreement ( $\kappa > 0.6$ ) on 8 items, fair agreement ( $\kappa > 0.4$ ) on 5 items and poor agreement ( $\kappa < 0.4$ ) on 2 items. The intraclass correlation coefficient between the three ratters' final percentage score was 0.988, representing excellent agreement.

Table 4.3 and figure 4.3 showed the results of comparison of post test scores of control and experimental group. The mean value of the control group is The 'P' values are **function (0.00\*) and total (0.00\*)** there was a statistically high significant difference in the experimental group than the control group of Nottingham stroke dressing assessment score.

This suggested that the intervention provided for the experimental group were highly effective when compared to control group. **R14 JAGDISH SHARMA (2022)**In these studies they have evaluated the processes and factors that influenced implementation and impact of a home-based bimanual training program in children with unilateral cerebral palsy aged 2 through 7 years.

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In Conclusion home-based bimanual training forms a demanding but promising therapeutic approach with potential for optimization and improvement.

Joanna Fletcher-Smith et al (2012) The influence of hand use on dressing outcome in cognitively impaired stroke survivors.

## Conclusion

This study aims to find out the effectiveness of Bimanual dressing skills in stroke survivors, the study was done in hospital and clinics in and around Chennai.

30 patients were available and ready to involve in the study, out of which the whole study was completed by 30 patients.

These patients were previously screened using Montreal Cognitive Assessment. Those 30 patients were then divided into two groups, control and experimental groups.

Using the Nottingham Stroke Dressing Assessment scale, pre test scores were recorded. The 15 patients in the control group were given conventional occupational therapy.

The patients in the experimental group were trained Bimanual dressing skills using different techniques mentioned in the intervention protocol. Finally, NSDA outcome measures was taken as an indication of post-test and results were concluded.

The results showed that bimanual dressing skill training was an effective intervention for stroke survivors.

### **limitations**

- study was done on a small sample size.
- Study was done by confined age group.
- Study was not compared with gender differences.

### **Recommendations**

- Study can be done with larger sample size.
- Study can be done with gender differences.
- Study can be done with different age groups.
- This type of intervention can also use for other neurological condition.

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