The Dissertation entitled

"A COMPARATIVE STUDY ON EFFECTIVENESS OF MOVEMENT BASED TREATMENT AND BOBATH TECHNIQUE AND IN MCA STROKE PATIENTS"

Submitted by

Reg no: 27102314

Under the guidance of

Associate Prof. N.UMA. M.P.T (NEURO), MIAP

Dissertation submitted to

THE TAMILNADU DR. M. G. R. MEDICAL UNIVERSITY,

CHENNAI-32.

Dissertation evaluated on ----------

Internal Examiner **External Examiner**

CERTIFICATE I

This is to certify that the dissertation entitled **"A COMPARATIVE STUDY ON EFFECTIVENESS OF MOVEMENT BASED TREATMENT AND BOBATH TECHNIQUE ON MCA STROKE PATIENTS"** was carried out by **Reg.No.27102314**, P.P.G College of physiotherapy, Coimbatore-35, affiliated to the Tamilnadu Dr. M.G.R medical university, Chennai-32, under the guidance of **Assoc. Prof. N.UMA. M.P.T (NEURO)., MIAP.**

Prof. K. RAJA SENTHIL M.P.T (Cardio-Resp).,MIAP.,Ph.d

Principal

CERTIFICATE II

This is to certify that the dissertation entitled **"A COMPARATIVE STUDY ON EFFECTIVENESS OF MOVEMENT BASED TREATMENT AND BOBATH TECHNIQUE ON MCA STROKE PATIENTS"** was carried out by **Reg.No.27102314** P.P.G College of physiotherapy, Coimbatore-35, affiliated to the Tamilnadu Dr. M.G.R medical university, Chennai-32, under my guidance and direct supervision.

Asso. Prof.N.UMA. M.P.T (NEURO), MIAP,

ACKNOWLEDGEMENT

I give my thanks to **GOD ALMIGHTY** for providing me the wisdom and knowledge to complete my study successfully.

It is my bounded duty to express at the outset heartiest gratitude to my parents and family for their strong support and encouragement that enabled me to turn this idea into a reality. I am very grateful to her throughout my life.

I express my sincere gratefulness to **Dr.L.P.THANGA VELU, M.S**., **F.R.C.S.,** Chairman and **Mrs. SHANTHI THANGAVELU, M.A.,** correspondent, P.P.G group of institutions, Coimbatore, for their encouragement and providing the source for the successful of the study.

I express my sincere thanks to my principal **Prof. K.RAJA SENTHIL M.P.T (Cardio-Resp).,MIAP**.,**Phd** Principal of P.P.G.College of physiotherapy who extend his guidance and encouragement throughout this project.

I express my special thanks to my Guide **Assoc. Prof. N.UMA. M.P.T (Neuro)., MIAP.,** for offering me perceptive inputs and guiding me entirely through the course of my work and without her tiredless guidance, support, and constant encouragement this project would not have come through.

My heartful thanks to class co ordinator **Asst. PROF K.RAJESH KANNAN MPT (Ortho); MIAP,** and **PHYSIOTHERAPY FACULTY** members for their guidance and encouragement for my studies.

I express my thanks to each and every **PATIENTS** who co-operated to fulfill this dissertation work possible.

Last but not least I thank my **FRIENDS AND FAMILY MEMBERS** who provided support and encouragement throughout this work.

CONTENTS

LIST OF GRAPHS

LIST OF TABLES

ABSTRACT

STUDY OBJECTIVES: A Comparative Study On Effectiveness Of Movement Based Treatment And Bobath Technique on MCA Stroke Patients

DESIGN: Pre-test, post-test two group experimental study design

PARTICIPANTS: Thirty subjects aged 40-55 years with middle cerebral artery stroke patients were selected under purposive sampling technique and assigned in two groups with 15 subjects each,one group received bobath based technique and other group received movement based treatment for a period of 4weeks

INTERVENTION: Bobath based and movement based treatment is given to middle cerebral artery stroke patients for 30 minutes per day

OUTCOME MEASURES: Functional independence measure scale is used to measure functional outcome before and after treatment

RESULT: There is significant difference in functional independence between patients receiving bobath technique and movement based treatment.

CONCLUSION: It can concluded that there is significant difference in functional independence of both groups in middle cerebral artery stroke patients.

CHAPTER I

1.1 INTRODUCTION

Stroke is a disease of developed nations. Worldwide it is increasing along with modernization. In India stroke is one of the leading cause of serious, long term disability. It is the acute severe manifestation of cerebro-vascular disease. WHO defined stroke as “rapidly developed clinical signs of focal disturbance of cerebral function, lasting more than 24 hrs or leading to death, with no apparent cause other than vascular origin”.

The disturbance of cerebral function is caused by 3 morphological abnormalities, i.e. stenosis, occlusion or rupture of the arteries. Dysfunction of the brain (neurological deficit) manifests itself by various neurological signs and symptoms that are related to the extent and site of the area involved and to the underlying causes.

Warning signs of stroke can be numbness, weakness or paralysis of face, arm, and leg especially on one side of the body sudden severe head ache, loss of balance and many factor contribute to delay in seeking medical treatment for stroke.

It has been noted that stroke incidence may vary considerably from country to country. The prevalence of stroke in India was estimated as 203 per 100,000 population above 20 years, amounting to a total of about 1 million cases (Sethi .K). 78 per cent of strokes in 40 - 65 age group (M.Dinesh Varma)

If there is recovery from stroke it takes place in the first 3-6 months after the injury (Umphred, 1995). However, research has shown there can be recovery of useful motor function year’s later (Wall & Ashburn, 1979; Thaut et al, 1997, 1999). It is anticipated that by 2020, stroke will have moved from the sixth leading cause of lost disability adjusted life years to fourth (Murray J L).

The expected increase in stroke survivors potentially living with disabilities will place a burden on the survivors family, community and the health care system. Because of the substantial costs and their impact on society, much attention is paid to the prevention of stroke. Major preventable risk factors include hypertension , diabetes, and tobacco consumption. Moreover a metaanalysis has demonstrated that moderate to high levels of physical activity are associated with reduced risk of ischemic stroke.Forty percent of stroke patients are left with moderate

functional impairments and 15% to 30% with severe disability. Effective rehabilitation interventions initiated early after stroke can enhance the recovery process and minimize functional disability.

New developments in stroke treatment included changes in stroke care and the necessity to concentrate this care in specialized and well organized manner. In terms of rehabilitation different approaches focus on the modification of impairment and improvement in function within everyday activities. A number of different physiotherapy approaches e.g. Bobath approach, Motor Re-learning approach, Brunnstrom, Rood approach, Proprioceptive Neuromuscular Facilitation have been developed based on different ideas about how people recover after a stroke.

The movement based treatment is used by 90% of the physiotherapists (sign, 2004), which is “a problem-solving approach to the assessment and treatment of individuals with disturbances of function, movement and tone” (Panturin 2001).

Bobath technique treatment is to normalize tone, to inhibit primitive patterns of movement, and to facilitate automatic, voluntary reactions and subsequent normal movement patterns.

These approaches improve the functional activities in post.Stroke
patients but we need more evidence to find out the most effective technique.

1.2 NEED FOR THE STUDY

The primary goal of stroke rehabilitation is functional enhancement by maximizing the independence, life style, and dignity of the patient.

A functional involvement in stroke patients affects activities of daily living and minimizes independence.

Stroke treatment in improving ADL and functional activities is inevitable. A new development in stroke treatment in specialized and well organized manner generated by different neurological treatment approaches includes Bobath technique and Movement based treatment.

There has been less research explaining about the importance of Bobath technique and movement based treatment for improvement in functional activities.

Hence, there is need to compare the efficacy of Movement based treatment and Bobath technique in improving functional activities in hemiplegic patients.

1.3 0PERATIONAL DEFINITION

Stroke

"Rapidly developed clinical sign of focal (or) global disturbance of cerebral function lasting more than 24 hours or leading to death with apparent cause other than vascular origin".

-WHO (1996)

Functional Independence Measure Scale

It is the most widely accepted functional assessment measure in use in the rehabilitation community. The FIM is an 18-item ordinal scale, used with all diagnoses within a rehabilitation population. It is viewed as most useful for assessment of progress during stroke rehabilitation.

-MAUTHE (1996)

Bobath Technique

NDT is to normalize tone, to inhibit primitive patterns of movement, and to facilitate automatic, voluntary reactions and subsequent normal movement patterns.

-BOBATH (1978)

Movement based treatment

Bilateral movement training , uses the intact limb to promote functionalrecovery of the impaired limb through the facilitative coupling effect between the upper limbs identified in studies of inter limb coordination in healthy adults.

JRFFRY.J.SUMMERS

1.4 AIMS AND OBJECTIVES

AIM OF STUDY

The aim of the study is to find out the comparision of movement based treatment and bobath technique treatment to improve functional activity in middle cerebral artery stroke subjects.

OBJECTIVES OF THE STUDY

To study the effectiveness of bobath technique on improving functional activity in middle cerebral artery subjects.

To study the effectiveness of movement based treatment on improving functional activity in middle cerebral artery subjects..

To compare the effectiveness of bobath technique and movement based treatment on improving functional activity in middle cerebral artery subjects..

1.5. HYPOTHESIS

Null hypothesis:

There is no significant difference existing between Movements based treatment and Bobath technique on improving MCA stroke patients.

Alternate hypothesis:

There is a significant difference existing between Movement based treatment and Bobath technique on functional activities in rehabilitation of stroke patients.

CHAPTER II

REVIEW OF LITERATURE

1. NATIONAL INSTITUTE OF NEUROLOGICAL DISORDES; 2010

Suggested that Stroke often strikes after age 40, involved more than 38000 veterans aged 40 and older.

2. BOUDEWIJIN J KOLLEN ; 2009

Suggested that based on best evidence synthesis, no evidence is available for the superiority of any approach. This review has highlighted many methodological shortcomings in the studies reviewed; further high-quality trials need to be published.

3. KLAUS KAAE ANDERSON ; 2009

Suggested that stroke most often occurs within the age range 40 to 55 years and about 85% of strokes are caused by ischemia.

4. JERROLD SCOTT PETROFSKY ; 2009

Suggested that middle and anterior cerebral artery involvement are most seen in the patients affected by stroke.

5. P M VAN VLIET ; 2005

Concluded that comparision of bobath based treatment and movement based treatment shows less significant difference in functional improvement

6..**NA BAYONA ; 2005**

Postulated that improvement in functional activities in post stroke patients were found when combination of repetitive Bobath were given.

7. KRUTULYTE G , 2003

Proposed that physiotherapy with task-oriented rehabilitation of stroke patients represented by MRP is preferable to physiotherapy with facilitation/inhibition strategies, such as bobath programme in the rehabilitation of stroke.

8. KENNETH W. LINDSAY ET AL ; 2003

Postulated that site and size of Cerebrovascular lesion and the amount of initial collateral blood flow determines the degree of motor deficits of upper and lower limbs and face.

9. MATTEO PACI ;2003

Described Bobath concept also known as Neuro Developmental Treatment is a widely used approach in the rehabilitation of hemiplegic patients. Results show no evidence proving the effectiveness of NDT as the optimal type of treatment but requirement for further research or combinations are suggested.

10. JANET.H.CARR ;2003

FIM is widely used a standard measurement of functional activities. It has been reported as reliable and valid in its current state.

11. US NATIONAL ADVSORY COMMITTEE ; 1999

Described the functional independence Measure scale is used to measure the patient's progress and assess rehabilitation outcomes. This scale is useful in clinical settings of rehabilitation of stroke.

12. UMPHRED ; 1995

Suggested if there is recovery from stroke it takes place in the first 3-6 months after the injury. However, research has shown there can be recovery of useful motor function years later

13. WALTER G BRADLEY ET AL ; 1993

Concluded that Ischemic stroke account for approximately 85% of all strokes and common cause of death or disability in adult living in industrialized nation

14. KEITH RA ET AL ;1987

Suggested that information on functional disability following stroke is typically gained through performance based measures. FIM have been extensively tested and demonstrate excellent reliability, validity and sensitivity.

15. GRANGER CV ET AL ;1986

Concluded that functional independence Measures what the individual does. The interrater reliability of the FIM has been established at an acceptable level of psychometric performance (intra class correlation coefficients ranging from 0.86 to 0.88) for post-stroke patients

CHAPTER III

MATERIALS AND METHODOLOGY

3.1 MATERIALS

- Couch
- Pillows
- Chair
- Towel
- Stick

3.2 METHODOLOGY

3.2.1. STUDY DESIGN

Controle group and experimental group designed with pre-test and post-test.

3.2.2. SAMPLING TECHNIQUE

Purposive Sampling Technique.

3.2.3. SAMPLE SIZE

30 subjects

3.2.4. STUDY METHOD

Subjects were divided into controle group and Experimental group .

Controle group :

15 subjects were treated with Movement based treatment.

Experimental group :

15 subjects were treated with Bobath based treatment.

3.2.5 SELECTION CRITERIA

Inclusion criteria

- Ischemic stroke.
- Territories-Anterior cerebral artery and middle cerebral artery.
- Above one month post-stroke and within one year (Brunnstrom stage 2).
- Age group between 40 and 55 years.
- Both Male and female.
- Either right or left hemiplegic side.

Exclusion criteria

- Patient with deformities.
- Bilateral involvement.
- Shoulder hand syndrome.
- Pathologies including both upper and lower limb.
- Recent surgery of both upper limb and lower limb.
- Post traumatic injury.
- Unbearable pain.
- Medical instability.
- Territory-Posterior cerebral artery.
- Unreliable patients.

3.2.6. STUDY SETTING

Study was conducted at ashwin hospital , Coimbatore

3.2.7. STUDY DURATION

Study was conducted for a period of 6months.

3.2.8. PARAMETER

Functional Independence Measure Scale. Items included self care and transfer only.

3.2.9. STATISTICAL TOOLS

Intra group analysis:

Statistical analysis is done by using Paired‘t’ test

$$t = \frac{\bar{d}\sqrt{n}}{s}$$

$$s = \sqrt{\frac{\sum d^2 - \frac{(\sum d)^2}{n}}{n-1}}$$

$\bar{d}$ = difference between the pre-test Vs post test values

d = mean difference

n= number of observations

s = standard deviation

To compare controle Group and Experimental Group :

Statistical analysis is done by using Independent ‘t’ test

$$t = \frac{\overline{X_1} - \overline{X_2}}{S}\sqrt{\frac{n_1 n_2}{(n_2 + n_2)}}$$

$$S = \sqrt{\frac{\sum (x_1 - \overline{x_2})^2 + \sum (x_2 - \overline{x_2})^2}{n_1 + n_2 - 2}}$$

$\overline{x_1}$ = mean value of group I

$\overline{x_2}$ = mean value of group II

n_1= number of observations in controle group

n_2= number of observations in experimental group

S = combined standard deviation group.

3.2.10. TREATMENT TECHNIQUES

BILATERAL MOVEMENT BASED TECHNIQUE

Computer typing :-

Make the patient to sit with the computer and give a topic and ask the patient to do typing with both hands a paragraph about that topic

Computer games

Ask the patient to play the games in computer by using their both hands

Wand exercises

Ask the patient to take a wand in both hands tell them to do shoulder flexion and extension movements actively

BOBATH TECHNIQUE:

IN SITTING:

Sitting on a firm flat surface, hands rests over bed, feet flat on floor, while therapist place one hand over elbow and other over wrist.

(i) Weight shifting to both sides.

(ii) Clasping both hands forward, turning to sound side. While lifting the affected leg and crossing it over the sound side.

(iii)Clasping both hands forward, turning to affected side. While lifting the sound leg and crossing it over the affected side.

(iv) Sitting with crossed legs. The affected leg over the sound one. While both hand clasps and places over knee.

(v) Flexion and extension of knee. Therapist places one hand over foot other hand over knee.

FROM SITTING TO STANDING:

(i) Clasping both hands forward. Affected foot parallel with sound one. Therapist place one hand over sacrum and other hand over knee.

(ii) Patient stands up weight bearing over affected leg.

Stage 1:Therapists assists in holding patient and help them to raise up.

Stage 2: Assist by clasping hands forward and without therapist support.

Stage 3: With one hand support.

Stage 4: Without hand support.

IN STANDING:

(i) Clasping both hands forward. Turning to both sides.

(i) Sitting and standing up.

FOR MOVEMENTS OF ARM:

(i) Elevation of arms with clasped hands.

(ii) Moving clasped hands to face, while therapists hand prevents retraction of shoulder.

(iii) Moving clasped hands above head, while therapists hand prevents retraction of shoulder.

(iv) Mobilizing shoulder girdle with extended arm.

(v) Bilateral shoulder flexion exercises.

(vi) Sitting push-ups to full elbow extension.

3.2.11. Procedure

The subjects of both controle group and experimental group were involved for pre test assessment by Functional independence measure scale, only self care and transfer activities are taken.

The subjects of controle group were given movement based therapy and experimental group were given Bobath technique .

Clinical applications to be assessed are upper limb function, sitting up over the side of bed, balanced sitting, standing up and down and balanced standing.

For upper limb function analyze lack of shoulder forward flexion, excessive elbow flexion, internal rotation of shoulder and pronation of forearm, grasp - wrist extension, Metacarpophalangeal joint extension, thumb abduction and rotation,

For Sitting up over the side of the bed analyze the poor lateral trunk movement, pulls with intact hand, hooks intact leg under affected leg, difficulty in flexion of hip and knee.

For Standing up and Sitting down analyze weight through intact side, inability to shift centre of gravity sufficiently forward.

For Balanced standing analyze ability to stand relatively still without using undue muscular activity, to move about in standing to perform a variety of tasks, Difficulty in hip and knee extension and wide base of support.

After analyzing the above activities perform the techniques. At the end of fourth week, both groups were involved for post test assessment by Functional independence measure scale, only self care and transfer activities are taken.

The treatment was designed as one hour therapy sessions daily on week days.

CHAPTER IV

DATA PRESENTATION

Table I

PRE TEST AND POST TEST VALUES OF CONTROLE GROUP USING FUNCTIONAL INDEPENDENCE MEASURE SCALE

Control group		
S.NO	**PRE-TEST**	**POST-TEST**
1	15	37
2	10	24
3	11	26
4	15	38
5	13	29
6	17	40
7	12	28
8	10	25
9	16	39
10	14	36
11	12	28
12	13	33
13	9	22
14	10	24
15	9	22

Table II

PRE TEST AND POST TEST VALUES OF EXPERIMENTAL GROUP

USING FUNCTIONAL INDEPENDENCE MEASURE SCALE

Experimental group		
S.NO	**PRE-TEST**	**POST-TEST**
1	11	32
2	15	42
3	10	31
4	17	50
5	12	33
6	13	34
7	15	42
8	9	28
9	11	32
10	13	38
11	16	45
12	13	36
13	9	28
14	10	30
15	14	39

CHAPTER V

DATA ANALYSIS AND INTERPRETATION

TABLE III

ANALYSIS OF PRE TEST DATA OF CONTROLE GROUP AND EXPERIMENTAL GROUP

TESTS	**CONTROLE GROUP**	**EXPERIMENTAL GROUP**
Pre test mean value	12.4	12.53
Independent ‘t’ test	0.139	
P value and its significance	P value > 0.05 and is insignificant	

For 28 degrees of freedom at 5% level of significance, the calculated Independent ‘t’ test for pre test values between controle group and Experimental group was 0.139 and the critical value was 2.048, which states that there is no significant difference between two groups.

GRAPH 1

PRE-TEST VALUES OF CONTROL GROUP AND EXPERIMENTAL GROUP

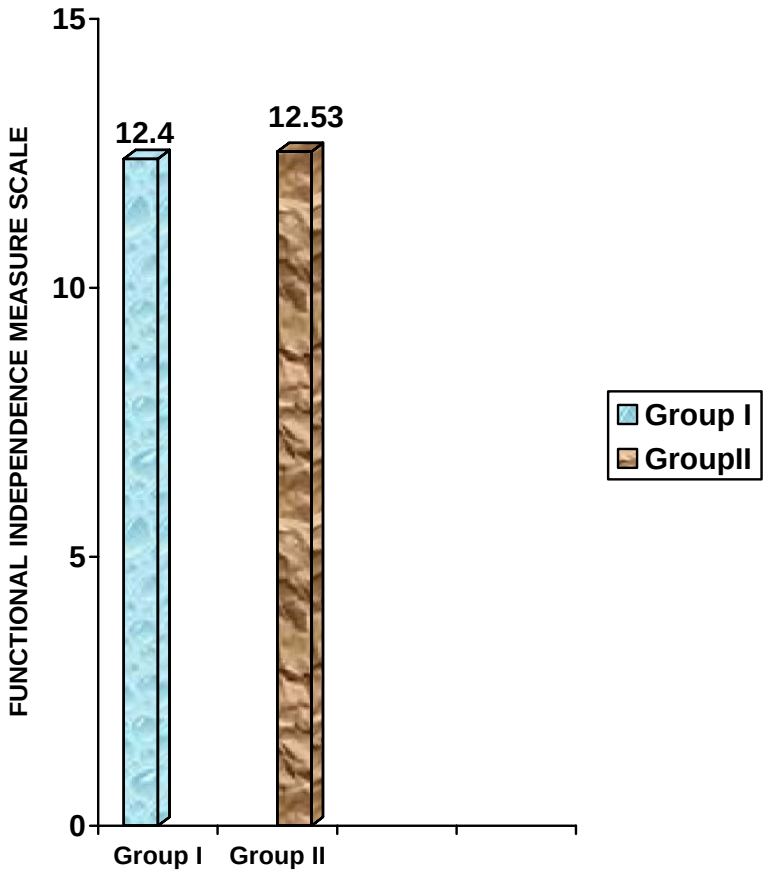


TABLE IV

ANALYSIS OF POST TEST DATA OF CONTROL GROUP AND EXPERIMENTAL GROUP

TESTS	CONTROLE GROUP	EXPERIMENTAL GROUP
Post test mean value	30.06	36
Independent ‘t’ test	2.701	
P value and its significance	P value < 0.05 and is significant	

For 28 degrees of freedom at 5% level of significance, the calculated Independent ‘t’ test for post test values between controle group and Experimental group was 2.701 and the critical value was 2.048, which states that there is significant difference between two groups.

GRAPH-2

POST-TEST VALUES OF CONTROL GROUP AND EXPERIMENTAL GROUP

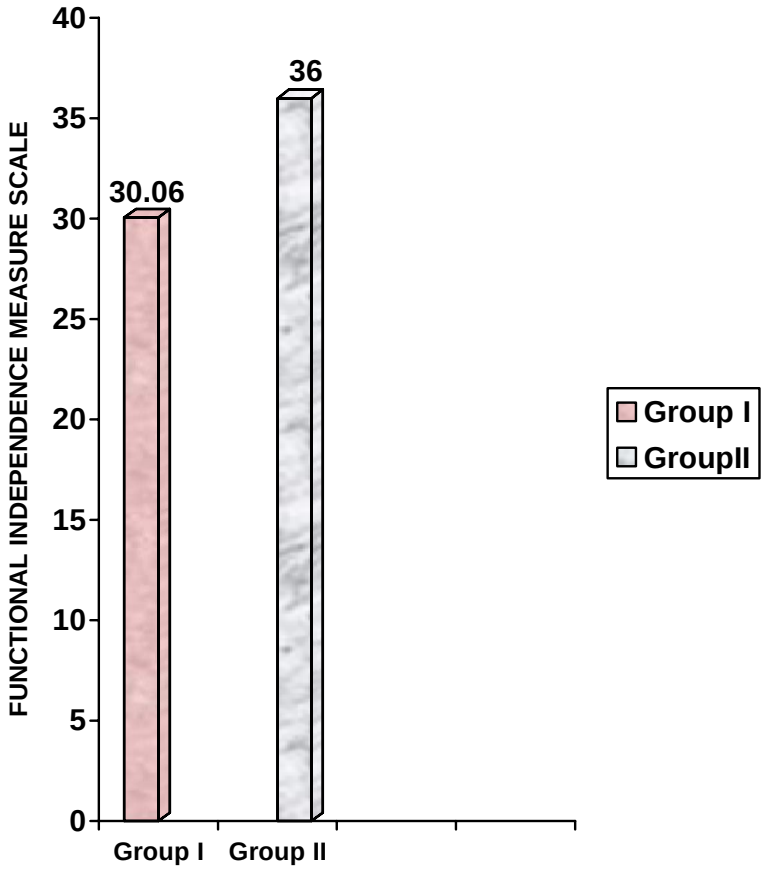


TABLE V

ANALYSIS OF PRETEST AND POSTTEST DATA OF CONTROLE GROUP

TESTS	MOVEMENT BASED TREATMENT	
Controle group	Pre test mean value	Post test mean value
	12.4	30.06
Paired 't' test	13.96	
P value and its significance	P value < 0.05 and is significant	

For 14 degrees of freedom at 5% level of significance, the student 't' test value for controle group (movement based treatment) was 13.96 and the critical value was 2.145, which states that there exists significant difference between the pre test and post test values of Experimental group .

GRAPH 3

POST-TEST VALUES OF CONTROL GROUP AND EXPERIMENTAL GROUP

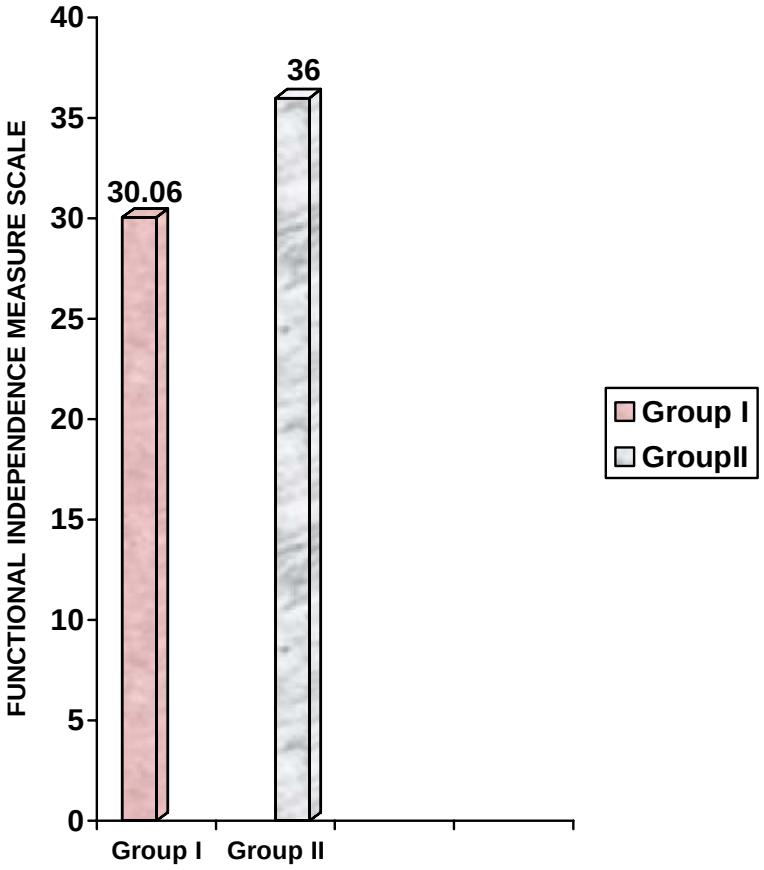


TABLE VI

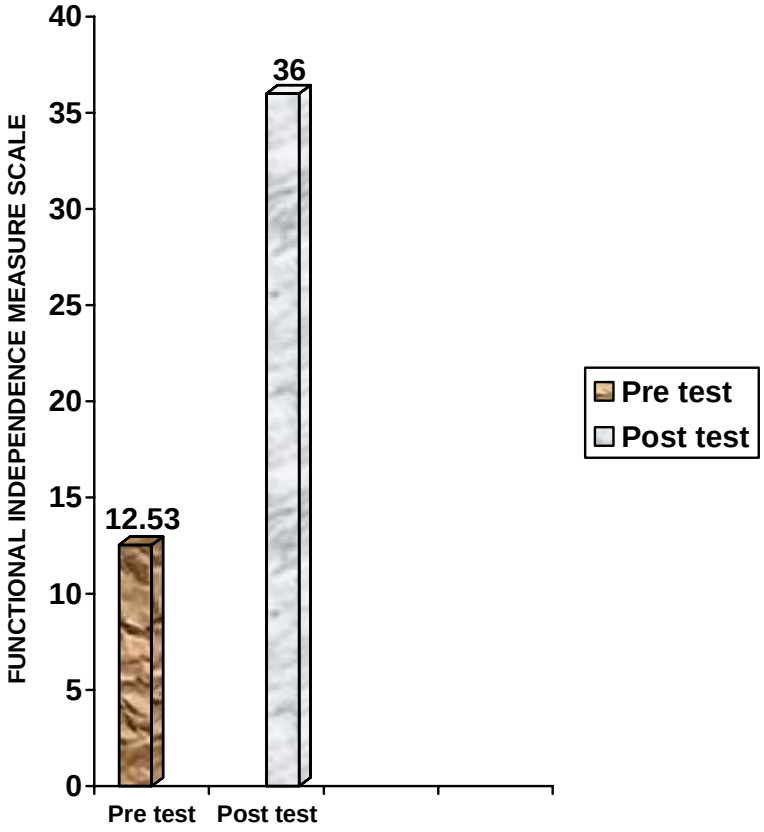
ANALYSIS OF PRETEST AND POSTTEST DATA OF EXPERIMENTAL GROUP

TESTS	**BOBATH TECHNIQUE**	
Experimental group	Pre test mean value	Post test mean value
	12.53	36
Paired 't' test	15.91	
P value and its significance	P value < 0.05 and is significant	

For 14 degrees of freedom at 5% level of significance, the student 't' test value for Experimental group (Bobath technique) was 15.91 and critical value was 2.145, which states that there exists significant difference between the pre test and post test values of experimental group

GRAPH 4

PRE-TEST AND POST-TEST VALUES OF EXPERIMENTAL GROUP [BOBATH TECHNIQUE]



CHAPTER VI

RESULTS

Effectiveness of control Group (Movement based therapy) is elicited by comparing the pre test and post test values of experimental group using paired 't' test; the calculated value is 13.96 , whereas the critical value is 2.145. Since the calculated value is greater than the critical value, there exists a significant difference between the pretest and post test values of Experimental group. When comparing the mean values of both, the post test mean value 30.06 is greater than the pre test mean value 12.4 which confirms that there is a significant improvement in functional activities.

Effectiveness of Experimental group (Bobath based therapy) is elicited by comparing the pretest and post test values of controle group using paired 't' test, the calculated value is 13.96 , whereas the critical value is 2.145. Since the calculated value is greater than the critical value, there exists a significant difference between the pretest and post test values of controle group. When comparing the mean values of both, the post test mean value 36 is greater than the pre test mean value 12.53, which confirms that there is a significant improvement in functional activities.

While comparing the post test values of control group and Experimental group using independent 't' test, the calculated value is 2.701, whereas the critical value is 2.048. Since the alternate hypothesis is accepted, which shows that there exists a significant difference between the post test values of two groups

When comparing the mean values of both, the post test mean value of controle group 30.06 is lesser than the post test mean value of Experimental group 36 which confirms that experimental group shows a significant improvement in functional activities than controle group .

CHAPTER VII

DISCUSSION

Timothy L. Kauffman described stroke is a global problem which results in a multitude of impairments and functional limitations.Stroke also affects patient's normal activities of daily living and make them dependent to others.

Recently Jerrold Scott Petrofsky in 2009 also suggested that middle and anterior cerebral artery involvement are most seen in the patients affected by stroke.

As stated in literature the challenges are wide for physiotherapist which is to be the best are more critical. So there are many older and recent neurodevelopmental techniques available to face these challenges.

Bobath technique and movement based therapy will be more beneficial in different aspects but we need the best outcome measure for stroke patients. Recently a study by Stanghelle et al in 2009 concluded that Bobath therapy showed significant improvements at 3 days, 2 weeks, and 3 months and so on.

A study by Derrick.k.s in 2006 suggested that Movement based therapy was found to be more effective for enhancing functional recovery of stroke patients.

The past studies and literatures shows a comprehensive therapy will be more beneficial for post-stroke patients. In that way this study is a supporting evidence of Bobath technique in post-stroke patients.

The results of this study reveal that patients in experimental group , which includes Bobath technique showed better functional recovery in terms of self care and transfer than those who were in controle group , which includes Movement based therapy alone.

The FIM, a new tool for rehabilitation of post stroke patients as postulated by Grzesiak in 1987. The FIM measurements, self-care and transfer capacity in the before and after treatment, improving the quality of life of patients and to continue to lay the Foundation for rehabilitation like this.

The results of present experimental study shows more effectiveness of Bobath which is comprehensive and more beneficial to stroke patients than movement based therapy .

CHAPTER VIII

SUMMARY AND CONCLUSION

In an effort to find out the efficacy of and Bobath technique and movement based therapy in improving functional activities in hemiplegic patients, 30 subjects were selected using purposive sampling technique and assigned in to two experimental groups with 15 subjects each.

Controle group was treated with Movement based therapy and Experimental group was treated with Bobath technique , each patient for a period of 4 weeks.

Pre-test and Post-test scores are noted and analysis was done using independent ‘t’ test where the post test scores favored the alternate hypothesis.

The intra group analysis was done and results were analyzed using paired ‘t’ test, which favored the alternate hypothesis.

Statistical analysis shows there is significant improvement in ADL in hemiplegic patients in experimental group (Bobath technique) than in controle group (movement based therapy).

It can be concluded that Bobath technique therapy were found to have fast recovery in improving functional activities of stroke patients than giving movement based therapy .

CHAPTER IX

LIMITATIONS AND SUGGESTIONS

- This study has been done with small sample size so further study can be done with large samples.
- This study was very short term and therefore to make it more valid long term is necessary.
- Though the functional independence measure scale administered objectively bias is possible, further study can be done with other reliable assessment tools.
- Variation in calamite, drugs, diet, personal habit, side of involvement, gender, age could not be controlled.
- Either right or left side involvement is considered due to the lack of subjects, the variation in dominant side involvement could not be controlled.

CHAPTER X

BIBLIOGRAPHY

1. A.B.Taby, *Neurorehabilitation, Principles and practice*, 2/e, 2001, Ahuja Publications.
2. Berta Bobath, *Adult hemiplegia, Evaluation and treatment*, 3/e, 1990, Butterworth- Heinemann page89-182.
3. Carole.B.Lewis, *Geriatric Physical Therapy and clinical approach*, page 379-396.
4. Catherine.A.Trombly, *Neurophysical and development of treatment approaches*, page 91-103.
5. Darcy Ann Umphred, *Neurological Rehabilitation*, 2/e, 1990, Mosby, page 772-776.
6. Glady Samuel Raj, *Physical Therapy in Neuro conditions*, 1/e, 2006, Jaypee Brothers, page 28-30.
7. Janet H. Carr, *Neurological Rehabilitation*, 1998, Elsevier, page 220-260.
8. Janet H. Carr, *Stroke Rehabilitation optimizing motor performance*, 1/e , 2003, Butterworth- Heinemann. Page129-205.
9. Janet M. Howle *Neuro-developmental treatment approach: theoretical foundations* , Page 319
10. Joel A Delisa – Editor, *Physical Medicine and Rehabilitation Principles and Practice*,4 /e, 1998, Lippincott , page 986-990.
11. John Gilroy, *Basic neurology*, 3 /e, 2000, McGraw- Hill, page 225-227.
12. John Walton- Editor, *Briain's disease of Nervous system*, Oxford.
    Kenneth W. Lindsay, *Neurology and Neuro surgery illustrated*, 4/e, 2004, Elsevier. page 239-269.
13. Mary Kessler, *Neurologic intervention for physiotherapists*, 2000, Saunders publications, page 89-129
14. Patrica.A.Downie, *Cash's Text book of Neurology for physiotherapists*, 4 /e, 2007, Jaypee, page 194,213-254.

15. Raine S. *The current theoretical assumptions of the Bobath Concept as determined by the members of BBTA. Physio Therapeutical Practice.* 2007; 23: page137–152.
16. Raymond D.Adams, *Principles of Neurology*, 6 /e, 1997, McGraw hill.
17. Sethi P.K. *Stroke: incidence in India and management of ischaemic stroke. Neurosciences Today*, 2002 6 (3). page. 139-143
18. Stuart.B.Porter, *Tidy's physiotherapy*, 13/e, 2003, Butterworth and Heinemann, page446.
19 .Susan B.O' Sullivan, *Physical Rehabilitation*, 5/e, 2006, JaypeeBrothers, page 388-755.
20. Susan Edwards- Editor, *Neuro physiotherapy*, 2 /e, 2002, Livingstone.

CHAPTER XI

REFERENCESS

1. *Darcy Ann Umphred, Neurological Rehabilitation, 2/e, 1990, Mosby, page*

2. *Glady Samuel Raj, Physical Therapy in Neuro conditions, 1/e, 2006, Jaypee Brothers, page 28-30.*

3.Janet H. Carr, Neurological Rehabilitation, 1998, Elsevier, page 220-

Janet H. Carr, Stroke Rehabilitation optimizing motor performance, 1/e , 2003,

4.Butterworth- Heinemann. Page129-205.

Janet M. Howle Neuro-developmental treatment approach: theoretical foundations , Page 319

5.Joel A Delisa – Editor, Physical Medicine and Rehabilitation Principles and Practice,4 /e, 1998, Lippincott , page 986-990.

6.John Gilroy, Basic neurology, 3 /e, 2000, McGraw- Hill, page 225-227.

7.John Walton- Editor, Briain's disease of Nervous system, Oxford.s

8.Kenneth W. Lindsay, Neurology and Neuro surgery illustrated, 4/e, 2004, Elsevier. page 239-269.

9.Mary Kessler, Neurologic intervention for physiotherapists, 2000, Saunders publications, page 89-129.

10.A.B.Taby, Neurorehabilitation, Principles and practice, 2/e, 2001, Ahuja Publications.

11.Berta Bobath, Adult hemiplegia, Evaluation and treatment, 3/e, 1990, Butterworth- Heinemann page89-182.

12.Carole.B.Lewis, Geriatric Physical Therapy and clinical approach, page 379-396.

13.Catherine.A.Trombly, Neurophysical and development of treatment approaches, page 91-103.

14..Patrica.A.Downie, Cash's Text book of Neurology for physiotherapists, 4 /e, 2007, Jaypee, page 194,213-254.

15.Raine S. The current theoretical assumptions of the Bobath Concept as determined by the members of BBTA. Physio Therapeutical Practice. 2007; : page137–152.

16.Raymond D.Adams, Principles of Neurology, 6 /e, 1997, McGraw hill.

.Sethi P.K. Stroke: incidence in India and management of ischaemic stroke. Neurosciences Today, 2002 6 (3). page. 139-143

17.Stuart.B.Porter, Tidy's physiotherapy, 13/e, 2003, Butterworth and Heinemann, page446.

18.Susan B.O' Sullivan, Physical Rehabilitation, 5/e, 2006, JaypeeBrothers, page 388-755.

19.Susan Edwards- Editor, Neuro physiotherapy, 2 /e, 2002, Livingstone.

CHAPTER XI

APPENDIX

CASE ASSESSMENT PROFORMA

CASE NO :

NAME :

SEX :

ADDRESS :

DATE OF ADMISSION :

DATE OF EVALUATION :

HISTORY :

ON OBSERVATION :

ON EXAMINATION :

TREATMENT :

MEASUREMENT TOOL :Functional Independence Measure scale

S.NO.	PRE TEST	POST TEST

Signature of physical therapy student

APPENDIX

PATIENT CONSENT FORM

TITLE: -"A COMPARATIVE STUDY ON EFFECTIVENESS OF MOVEMENT BASED TREATMENT AND BOBATH TECHNIQUE ON MCA STROKE PATIENTS"

INVESTIGATOR: _ _ _ _ _ _ _ _ _ _ _

PURPOSE OF THE STUDY:

I_ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ ,have been informed that this study will work towards achieving on the functional activities of daily living in post-stroke conditions for me and other patients.

PROCEDURE:

Each term of the study protocol has been explained to me in detail. I understand that during the procedure, I will be receiving the treatment for one time a day. I understand that I will have to take this treatment for four weeks.

I understand that this will be done under investigator, _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ supervision. I am aware also that I have to follow therapist's instructions as has been told to me.

CONFIDENTIALITY:

I understand that medical information provided by this study will be confidential. If the data are used for publication in the medical literature or for teaching purposes, no names will be used and other literature such as audio or video tapes will be used only with permission.

RISK AND DISCOMFORT:

I understand that there are no potential risks associated with this procedure, and understand that investigator will accompany me during this procedure. There are no known hazards associated with this procedure.

REFUSAL OR WITHDRAWL OF PARICIPATION:

I understand that the decision my participation is wholly voluntary and I may refuse participate, may withdraw consent at any time during the study.
I also understand that the investigator may terminate my participation in the study at anytime after researcher has explained me the reasons to do so.

I _ _ _ _ _ _ _ _ _ _ _ _ _ _ _ have explained to ……. the purpose of the research, the procedures required and the possible risks and benefits,to the best of my ability**.**

…… **……**

investigator Date

I ……. Confirm that researcher has explained me the purpose of the research, the study procedure and the possible risks and benefits that I may experience. I have read and I have understood this consent to participate as a subject in this research project.

…….. ……

Subject Date

…….. …….

Signature of the Witness Date

FUNCTIONAL INDEPENDENCE MEASURE (FIM):

FIM scale used to determine the impact of impairments and the plan of care, monitor progress, ascertain efficacy of stroke rehabilitation efforts.

Instruments include items to examine are as follows:

- SELF CARE:
  A. Eating
  B. Grooming
  C. Bathing
  D. Dressing-upper body
  E. Dressing-lower body
  F. Toileting
- TRANSFERS:
  A. Bed, Chair, Wheel chair
  B. Toilet
  C. Tub, Shower

Functional Independence Measure (FIM) performance items

Degree of Dependency	**Level of functioning**
No helper	7.Complete independence 6.Modified independence
Modified dependence on a helper	5.Supervision 4.Minimal assist(at least 75% independence) 3.Moderate assist(at least 50% independence)
Complete dependence on a helper	2.Maximal assist(at least 25% independence) 1.Total assist(less than 25% independence)