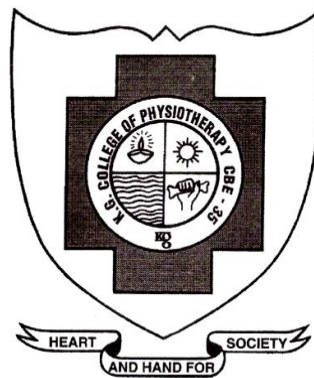


**AN EXPERIMENTAL STUDY TO COMPARE THE
EFFECT OF DYNAMIC MUSCULAR STABILIZATION
TECHNIQUE (DMST) AND YOGA THERAPY ALONG
WITH MOIST HEAT THERAPY ON HEALTH STATUS
AND PAIN IN POSTURAL LOW BACK PAIN
PATIENTS**



REGISTER NO: 271610305

ELECTIVE: PHYSIOTHERAPY IN ORTHOPAEDICS

**A DISSERTATION SUBMITTED TO THE TAMILNADU
Dr. M. G. R MEDICAL UNIVERSITY, CHENNAI.
AS PARTIAL FULFILLMENT OF THE MASTER OF
PHYSIOTHERAPY DEGREE**

MAY 2018

CERTIFICATE

Certified that this is the bonafide work of **Ms. SARANYA. R** of K.G.College of Physiotherapy, Coimbatore submitted in partial fulfillment for the requirements of Master of Physiotherapy Degree course from the Tamil Nadu Dr. M. G. R Medical University under the **Registration No: 271610305** for the May 2018 Examination.

Date:

Principal

Place: Coimbatore

Date:

**AN EXPERIMENTAL STUDY TO COMPARE THE
EFFECT OF DYNAMIC MUSCULAR STABILIZATION
TECHNIQUE (DMST) AND YOGA THERAPY ALONG
WITH MOIST HEAT THERAPY ON HEALTH STATUS
AND PAIN IN POSTURAL LOW BACK PAIN
PATIENTS**

Under the guidance of,

PRINCIPAL:

**Dr. B. Arun, MPT., Ph.D.,
KG College of Physiotherapy,
KG Hospital,
Coimbatore – 641035.**

GUIDE:

**Mr. M. Ramesh, MPT.,
Associate Professor,
KG College of Physiotherapy,
KG Hospital,
Coimbatore – 641035.**

**A DISSERTATION SUBMITTED TO THE TAMILNADU
Dr. M. G. R. MEDICAL UNIVERSITY, CHENNAI,
AS PARTIAL FULFILLMENT OF THE MASTER OF
PHYSIOTHERAPY DEGREE**

May 2018

A Dissertation on

**AN EXPERIMENTAL STUDY TO COMPARE THE
EFFECT OF DYNAMIC MUSCULAR STABILIZATION
TECHNIQUE (DMST) AND YOGA THERAPY ALONG
WITH MOIST HEAT THERAPY ON HEALTH STATUS
AND PAIN IN POSTURAL LOW BACK PAIN
PATIENTS**

**Has been submitted in partial fulfillment for the requirement of the
MASTER OF PHYSIOTHERAPY DEGREE**

May 2018

Internal examiner

External examiner



ACKNOWLEDGEMENT

First, I thank to the **GOD** almighty, merciful and passionate, for providing me this opportunity and granting me the capability to proceed successfully.

At the very outset, I express my deepest sense of gratitude to our respected Chairman **Padmashree Dr. G.Bakthavathsalam**, Chairman, K. G. Hospital, Coimbatore for allowing me to use facilities of the hospital and institution for this study.

I would like to express my deep thanks to our madam **Mrs.Vaijyanthi Mohandas**, CEO - Education, K. G. College of health sciences for her concern for the betterment of students.

I humbly express my sincere gratitude and special thanks to our Principal **Dr. B.Arun, MPT., Ph D.**, for his support, encouragement, valuable suggestions and guidance.

My special and sincere thanks to **Dr. Mohan Raj, MPT.,Ph D.**, Vice Principal, for rendering valuable suggestions, constant guidance and support for the progress of my work and fruitful outcome of this study.

I take this opportunity to express my profound gratitude and deep regards to my guide **Associate Prof. M.Ramesh, MPT.**, for his

exemplary guidance and constant encouragement throughout the course of this dissertation.

I express my sincere gratitude to **Prof. V.Mohan Gandhi, M.P.T.**, Chief Physiotherapist, K.G. Hospital, Coimbatore for his valuable support and guidance.

I extend my sense of gratitude to my coordinator **Prof. R.K.Punitha kumar, M.P.T.**, other **Faculty Members, Librarian** of K.G. College of Physiotherapy, and **Physiotherapists** in the Department of Physiotherapy, K.G.Hospital for their priceless contribution in cultivating education and specific skills in me which stands significantly for my career.

I am obliged to offer my sincere thanks to all **My subjects** for having consented to participate in this study forgoing all suffering.

My deep humble sense of gratitude to **My Father, Mother, Sister and Brother in law** for their unwarranted and conditional love and courage they have given me.

Finally, I submit my thanks to **My Friends** for their unwavering support, encouragement and love which helped me in doing my project and my studies as well.

CONTENTS

S.No	CHAPTER	Page No.
I	INTRODUCTION	1
	1.1. Need for the study	4
	1.2. Purpose of the study	5
	1.3. Objectives of the study	6
	1.4. Hypothesis	6
	1.5. Keywords	7
II	REVIEW OF LITERATURE	8
III	METHODOLOGY	14
	3.1. Study design	14
	3.2. Study setting	14
	3.3. Study duration	14
	3.4. Subjects	14
	3.5. Criteria for selection	15
	3.6. Variables	16
	3.7. Operational tools	16
	3.8. Outcome measure	16
	3.9. Procedure	17
	3.10. Statistical tools	18
IV	DATA ANALYSIS AND INTERPRETATION	21
V	RESULTS	35
VI	DISCUSSION	37
VII	SUMMARY AND CONCLUSION	42
VIII	LIMITATIONS AND RECOMMENDATIONS	44
IX	BIBLIOGRAPHY	45
X	APPENDIX	55

LIST OF TABLES

Table No.	Title	Page No.
1.	DEMOGRAPHIC DATA	21
2.	PAIRED 't' TEST - PRE-TEST AND POST-TEST VALUES OF GROUP A – SF 36 HEALTH SURVEY QUESTIONNAIRE	23
3.	PAIRED 't' TEST - PRE-TEST AND POST-TEST VALUES OF GROUP B - SF 36 HEALTH SURVEY QUESTIONNAIRE	25
4.	UNPAIRED 't' TEST - POST-TEST VALUES OF GROUP A AND GROUP B - SF 36 HEALTH SURVEY QUESTIONNAIRE	27
5.	PAIRED 't' TEST - PRE-TEST AND POST- TEST VALUES OF GROUP A – VISUAL ANALOGUE SCALE	29
6.	PAIRED 't' TEST - PRE-TEST AND POST TEST VALUES OF GROUP B – VISUAL ANALOGUE SCALE	31
7.	UNPAIRED 't' TEST - POST-TEST VALUES OF GROUP A AND GROUP B – VISUAL ANALOGUE SCALE	33

LIST OF GRAPHS

Table No.	Title	Page No.
1.	DEMOGRAPHIC DATA	22
2.	MEAN PRE-TEST AND POST-TEST VALUES OF GROUP A – SF 36 HEALTH SURVEY QUESTIONNAIRE	24
3.	MEAN PRE-TEST AND POST-TEST VALUES OF GROUP B - SF 36 HEALTH SURVEY QUESTIONNAIRE	26
4.	MEAN POST-TEST VALUES OF GROUP A AND GROUP B - SF 36 HEALTH SURVEY QUESTIONNAIRE	28
5.	MEAN PRE-TEST AND POST- TEST VALUES OF GROUP A – VISUAL ANALOGUE SCALE	30
6.	MEAN PRE-TEST AND POST TEST VALUES OF GROUP B – VISUAL ANALOGUE SCALE	32
7.	MEAN POST-TEST VALUES OF GROUP A AND GROUP B – VISUAL ANALOGUE SCALE	34

I INTRODUCTION

Chronic low back pain is sometimes defined as back pain that lasts for longer than 7-12 weeks. Chronic low back pain has also become a diagnosis of convenience for many people who are actually disabled for socio-economic, work -related, or psychological reasons. In fact, some people argue that chronic disability in back pain is primarily related to a psychological dysfunction, **Gunnar BJ, et al., 1999**. Low back pain is one of the most prevalent medical problems in society today. In addition to the profound affect low back pain can have a patient, it has an exceedingly high societal cost **Andrew k. Simpson, et al., 2006**.

Individuals suffering from chronic low back pain experience major physical, social, mental and occupational disruptions. It is argued that the impact of low back pain includes ;deterioration of general health and deconditioning (loss of muscle tone and weight gain; constant or episodic pain or increase in the level of pain ; loss of social functioning manifested as decreased participation in social and leisure activities, family stress or loss of group and community relatedness (often associated with decreased income and / or job loss) ;and disruption of psychological functioning manifested through insomnia, irritability, anxiety, depression and somatic complaints, **Sefigheh Sadat Tavafian, et al., 2007**.

A recent focus in the physiotherapy management of patients with chronic low back pain has been the specific training of muscles surrounding the lumbar spine

whose primary role is considered to be the provision of dynamic stability and segmental control to the spine, **Richardson CA, et al., 1992.**

These are the deep abdominal muscles (internal oblique and transverse abdominis and the lumbar multifidus). The importance of lumbar multifidus muscle regarding its potential to provide dynamic control to the motion segment in its neutral zone is now well acknowledged, **Kaigle A, et al., 1995.**

The deep abdominals, in particular, the transverse abdominis, are primarily involved in the maintenance of intraabdominal pressure, while imparting tension to the lumbar vertebrae through the thoracolumbar fascia, **Cresswell A, et al., 1996.**

In addition, there is increasing evidence that these muscles are preferentially affected in the presence of low back pain (LBP), CLBP, and lumbar instability, **Hodges P, et al., 1996).**

Richardson and Jull proposed that specific submaximal training of these “stability” muscles of the lumbar spine and the integration of this training into functional disability in these suffering from mechanical low back pain.

Research addressing the effects of yoga on chronic low back pain (CLBP) has shown promise. Two studies evaluating Hatha yoga showed decreases in pain as well as improvements in pain balance, hip flexibility, disability and depression, **Kimberly Williams, et al., 2015.**

In addition, **Sherman, et al.**, found that yoga classes resulted in both statistically and clinically significant improvements in functional status but when compared to conventional therapeutic exercises, were statistically significant but not clinically improvement.

Low back pain is the most common condition for which complementary therapies are used. In the united states, more than half of patients suffering from Low back pain use complementary therapies and yoga is among the most commonly used complementary treatments, **Wolsko PM, et al., 1998.**

An estimated 15 million American adults report having practiced yoga at least once in their lifetime, 20% of those using yoga explicitly for back pain relief, **Saper RB, et al., 2004.**

Deriving from ancient Indian Philosophy, yoga comprises physical exercise, relaxation and live style modification, **Iyengar, et al., 1996.**

In North America and Europe, yoga is most often associated with physical postures (asana), breathing techniques (pranayama) and Meditation (dyana), **Feurstein G., 1998.**

There is moderate evidence that heat wrap therapy reduces pain and disability for patients with back pain and disability for patients with back pain that lasts for less than three months. The relief has only been shown to occur for a short time and the effect is relatively small. The addition of exercise to heat wrap therapy

appears to provide additional benefit. Heat treatments include hot water bottles, soft heated packs filled with grain, poultices, hot towels, heat pads, electric heat pads and infrared heat lamps, **Simon D French, et al., 2010.**

1.1 NEED FOR THE STUDY

Management of low back pain ranges from nonsurgical management to surgical. Various researchers attempt to identify effective nonsurgical treatment approaches such as exercise for the management of Low back pain have been largely unsuccessful, resulting in an array of disparate treatment recommendations in low back pain practice guidelines, **Hayden et al., 2005, Arnau et al., 2006.**

However, there is a wide range of nonsurgical methods with little evidence or standardizations, **Atlas et al., 2005.**

A recent review suggests that many patients will be beneficial by physiotherapy measures when compared to a general practitioner alone, **Luijsterburg et al., 2008.**

Physiotherapists use a wide variety of treatment for patients with low back pain, **Jewell et al., 2005.** It is also unclear if there is meaningful heterogeneity in the response to different physical therapy treatment options.

Though the literature identifies patient with psychological related disability following low back pain was limited, **Fritz et al., 2001, Linton et al., 2000, Button et al., 1998.** Studies which deal with the fear of pain and the disability are very few.

There is a consensus that clinical trials designed to assess the efficacy and effectiveness of treatments for chronic pain should consider outcomes in six core domains: pain, physical functioning, emotional functioning, patient global ratings of satisfaction, negative health states, and adverse events, and patient disposition, **Turk DC, Dworkin RH et al., 2004.**

Literature supports that different interventions can reduce the burden of the disease. For example, the use of Dynamic Muscular Stabilization Technique, Yogasanas, and hot packs.

These techniques basically work on muscle strengthening and relaxation to bring about reduction in back pain, decrease the time lost from work and improves patient functioning leading to improved quality of life, **Suraj Kumar, Vijai P. Sharma et al., 2009, Karen J. Sherman et al., 2005, French SD, Cameron M et al., 2006.**

So, this study aims to find out the effect of two different interventions in the treatment of postural low back pain.

1.2 PURPOSE OF THE STUDY

The purpose of the study is to find out the effect of Dynamic Muscular Stabilization Techniques and Yoga therapy along with Moist heat therapy on health status and pain in patients with postural low back pain.

1.3 OBJECTIVE OF THE STUDY

- To find out the effect of Dynamic Muscular Stabilization Technique along with Moist heat therapy on health status and pain in postural low back pain patients.
- To find out the effect Yoga therapy along with Moist heat therapy on health status and pain in postural low back pain patients.
- To compare the effect of Dynamic Muscular Stabilization Technique and Yoga therapy along with Moist heat therapy on health status and pain in postural low back pain patients.

1.4 HYPOTHESIS

1.4.1 NULL HYPOTHESIS

There is no significant difference between Dynamic Muscular Stabilization Techniques and Yoga therapy along with Moist heat therapy on health status and pain in postural low back pain patients.

1.4.2 ALTERNATE HYPOTHESIS

There is a significant difference between Dynamic Muscular Stabilization Techniques and Yoga therapy along with Moist heat therapy on health status and pain in postural low back pain patients.

1.5 KEYWORDS

- Dynamic Muscular Stabilization Technique
- Yoga therapy
- Moist heat therapy
- Health status
- Pain
- SF – 36 Health Survey questionnaire
- Visual Analogue Scale
- Postural low back pain.

II REVIEW OF LITERATURE

DYNAMIC MUSCULAR STABILIZATION TECHNIQUES

Saal JA., 1990

Concluded that the Dynamic Muscular Stabilization Techniques are effective to treat the repetitive intervertebral disc or facet joint injury.

Koumantakis GA, et al., 2005

Concluded that the effectiveness of exercise program based on stabilizing the lower back. So, this study concerning both physiological and functional parameters.

Watson PJ, et al., 2005

Proposed that the general exercises and Stabilization exercises are involving in the improvement of disability of chronic low back pain. There are no additional benefits of this intervention by giving separately.

Cairs MC, et al., 2006

Proposed that there are improvements in both conventional physiotherapy and specific spinal stabilization exercises for recurrent low back pain.

Ras mussen – Barr E, et al., 2009

Researchers concluded that the graded exercises are concentrates on stabilization basis. So, it improves the disability and health parameters.

Kumar S, et al., 2009

Concluded that the conventional treatment, as well as Dynamic Muscular Stabilization Techniques, can be benefitted by the patients. But data shows that improvements are there in Dynamic Muscular Stabilization Technique group than conventional treatment.

Kriese M, et al., 2010

Concluded that the segment is stabilization exercises alone are useful in relieving pain than minimal interventions. But there is no improvement when compared with other physiotherapy interventions.

Sharma VP, et al., 2012

This study proposed that Dynamic Muscular Stabilization Technique is a very effective intervention for chronic low back pain.

YOGA THERAPY

Kimberly Anne Williams, et al., 2005

This study showed improvements in medical and functional pain-related outcomes from Iyengar Yoga therapy.

Chametcha Singphow, et al., 2008

After 7 days of yoga program reduced pain-related disability and improved spinal flexibility in patients with chronic low back pain when compared to other physical exercise program.

Posadzki P, et al., 2011

This research proposed that the significantly greater reduction in low back pain from yoga therapy.

P. Tekur, et al., 2012

Proposed that the residential yoga therapy improves pain, anxiety and depression in chronic low back pain patients more than exercises.

Cramer, et al., 2013

Found that yoga alleviates low back pain when recommended with additional therapy for a long-term effectiveness.

Robert B, et al., 2013

Proposed that there is no significant difference in improvements either once weekly or twice weekly in the duration of 12 weeks. Thus, the same level improvements were seen by doing yoga exercises for low back pain.

MOIST HEAT THERAPY

French SD, et al., 2006

Revealed conflicting evidence between heat and cold for low back pain. Because the moderate evidence is seen by giving heat therapy for low back pain. It had a short duration placebo effect. On the other hand, minimal evidence for a cold pack for low back pain and there is no evidence for reducing pain in patients with low back pain.

Gregory Garra DO, et al., 2010

Recommended that either heat or cold may be beneficial for patients with neck and back strain. It depends on the patient as well as practitioner preferences and availability of materials.

Morteza Dehghan, et al., 2014

Suggested that the thermotherapy along with pharmacological treatment to minimize the pain in patients with acute low back pain when compared to cryotherapy.

VISUAL ANALOGUE SCALE (VAS)

Huskisson EC, et al., 1974

Showed the visual analogue scale seems to be the most sensitive than other various methods for measuring pain.

Mc Cormack HM, et al., 1988

Visual Analogue Scale providing for measuring subjective experience and also this scale has been established as validity and reliability in a range of clinical and research applications.

Dauphin AP, et al., 1999

Concluded that the VAS is used in epidemiologic and clinical research. So, VAS scale should implement for cross-sectional studies, particularly when symptoms of low or high intensity are being measured.

D. Gould et al., 2001

Concluded that there is an instrument which measures the pain level. The range of pain level mentioned in the continuum. The subject should interpret their pain level on the scale.

SF-36 HEALTH SURVEY QUESTIONNAIRE

John E. Ware, et al., 1995

Concluded that the role of chance in testing hypotheses about health outcomes about measuring the summarizes of physical component and mental component.

Horng YS, et al., 2005

This type of questionnaire emphasis on functional status and psychological factors more than physical impairmentSs in patients with low back pain.

III METHODOLOGY

3.1 STUDY DESIGN

Pre-test vs Post-test experimental study -comparative in nature.

3.2 STUDY SETTING

KG Pain relief center, KG college of Physiotherapy, Coimbatore.

3.3 STUDY DURATION

Six months (4 weeks for individual subjects).

3.4 SUBJECTS

30 patients who fulfilled the predetermined inclusive and exclusive criteria were selected and divided into two groups by simple random sampling method. Each group consists of 15 patients.

16 males and 14 females are included in this study. Age group of the participants varies from 19 to 30 years and about 8 patients from 19 to 21 years, 9 patients from 22-24 years, 7 patients from 23 to 26 years, 6 patients from 27 to 30 years.

3.5 CRITERIA FOR SELECTIONS

3.5.1 INCLUSION CRITERIA

- Patients with postural low back pain.
- Age group between 19-30 years.
- Both the sexes are involved in this study.
- Low back pain with duration more than 6 weeks.
- Postural low backache without any history of injury, fall or disease.
- Patient with pain scale not more than 6 in Visual Analogue Scale.
- Patient with Short Form Health Survey -36 scores more than 40.

3.5.2 EXCLUSION CRITERIA

- If the patient is diagnosed as having a tumour, infection or inflammatory disease affecting the spine.
- Had spinal or lower limb surgery.
- Had spinal fracture or structural deformities such as spondylolisthesis and spondylosis.
- Had signs of nerve root compression, defined as decreased reflexes, sensory loss and motor deficits and hyperlaxity of muscles.
- Unwilling patients.

3.6 VARIABLES

3.6.1 INDEPENDENT VARIABLES

- Dynamic Muscular Stabilization Technique.
- Yoga therapy.
- Moist heat therapy.

3.6.2 DEPENDENT VARIABLES

- Health status.
- Pain.

3.7 ORIENTATION TOOL

- SF-36 Health Survey questionnaire.
- Visual Analogue Scale.

3.8 OUTCOME MEASURE

- Health status.
- Pain.

3.9 PROCEDURE

Subjects who are visiting the outpatient department of KG college of Physiotherapy, with chronic low back pain were assessed. A clear explanation of the study is given to all the patients. All the subjects were included in the study following suitable inclusion and exclusion criteria were allocated into two groups. Subjects were randomly allocated with a fixed sample size of 15 in each group.

An informed consent was obtained from all the participants, they were advised to withdraw from the study at any point of time. After obtaining consent form, all subjects the completed a thorough physical examination. Following the assessment patients, Pre-test values were assessed using Visual Analogue Scale, Short Form-36 Health Survey questionnaire.

30 subjects with chronic low back pain were selected and all the subjects were divided into 2 groups. The subjects randomly assigned to two equal groups, 15 subjects in each group.

Group – A

15 subjects in this group underwent Dynamic Muscular Stabilization Technique along with Moist heat therapy. The approaches are detailed in the Appendix.

Group – B

15 subjects in this group underwent Yoga therapy along with Moist heat therapy. These approaches are described in Appendix.

All exercises are demonstrated to the patients individually. Exercises explained in Appendix. Following the treatment, patients were advised to continue the home program.

3.10 STATISTICAL TOOLS

STUDENTS ‘t’ TEST

Paired ‘t’ test

Unpaired ‘t’ test

Paired ‘t’ test:

Paired ‘t’ test was conducted to compare the pre-test and post-test values of Visual analogue scale for pain and Short Form-36 Health Survey questionnaire for health status.

Formula of paired ‘t’ test:

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

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

d = difference between the pre-test versus post-test

\bar{d} = mean difference

n = total number of subjects

s = standard deviation

$\sum d^2$ = sum of the squared deviation

Unpaired ‘t’ test:

The Unpaired ‘t’ test was used to compare the post-test values of group A and group B for Visual analogue scale for pain and Short Form-36 Health Survey questionnaire for health status.

Formula of Unpaired 't' test:

$$S = \sqrt{\frac{\sum(x_1 - \bar{x}_1)^2 + \sum(x_2 - \bar{x}_2)^2}{n_1 + n_2 - 2}}$$

$$t = \frac{\bar{x}_1 - \bar{x}_2}{S} \sqrt{\frac{n_1 n_2}{n_1 + n_2}}$$

n_1 = total number of subjects in group A

n_2 = total number of subjects in group B

x_1 = difference between pre-test vs post-test of group A

\bar{x}_1 = mean difference between pre-test vs post-test of group A

x_2 = difference between pre-test vs post-test of group B

\bar{x}_2 = mean difference between pre-test vs post-test of group B

S = combined standard deviation

Level of significance = 5%

IV DATA ANALYSIS AND INTERPRETATION

TABLE - I

DEMOGRAPHIC DATA

S. NO	AGE GROUP	GENDER		TOTAL
		MALE	FEMALE	
1.	19-21	5	3	8
2.	22-24	5	4	9
3.	23-26	3	4	7
4.	27-30	3	3	6
	TOTAL	16	14	30

GRAPH – I
DEMOGRAPHIC DATA

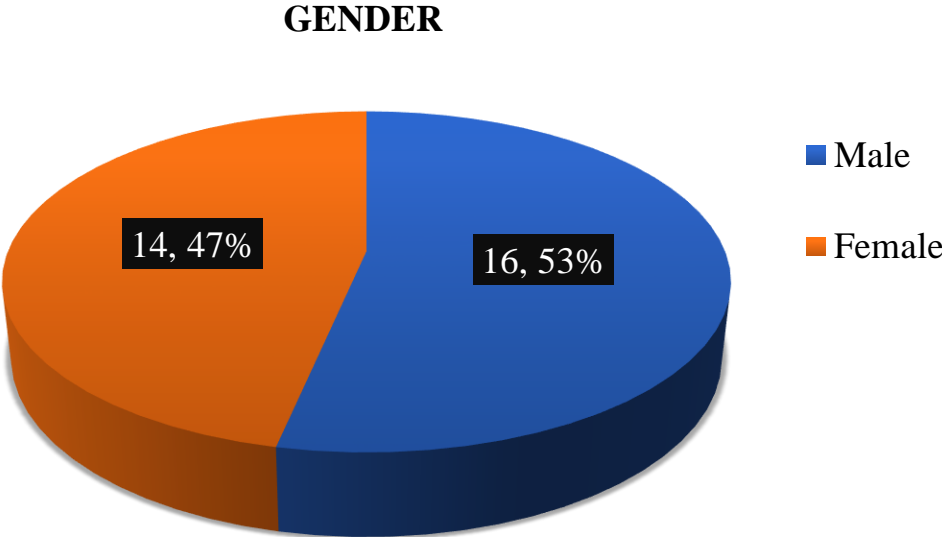
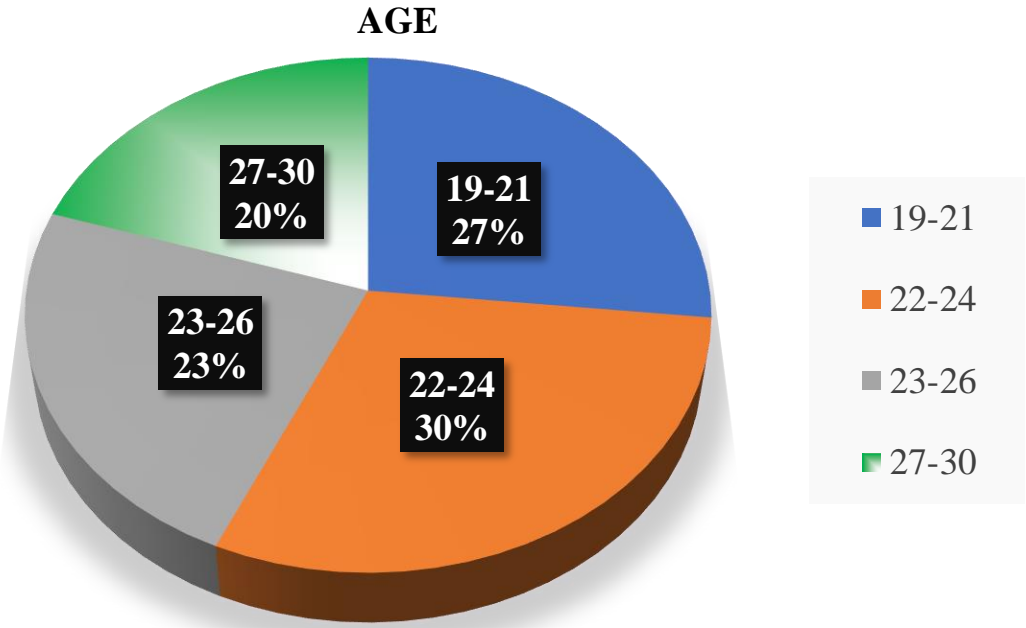


TABLE - II

SF -36 Health Survey questionnaire

PAIRED 't' TEST - GROUP A

S.NO	GROUP A	MEAN	STANDARD DEVIATION	't' VALUE
1.	PRE-TEST	44.07	2.91	74.67
2.	POST TEST	132.67	5.59	

The Table II shows analysis of SF-36 Health Survey questionnaire in Group A. Using paired 't' test with 14 degrees of freedom and 0.05% as a level of significance, the calculated 't' value is 74.67 which was greater than the table 't' value 2.145. The result shows that there was a marked difference between pre-test and post-test values.

GRAPH – II

SF-36 Health Survey questionnaire

PAIRED 't' TEST - GROUP A

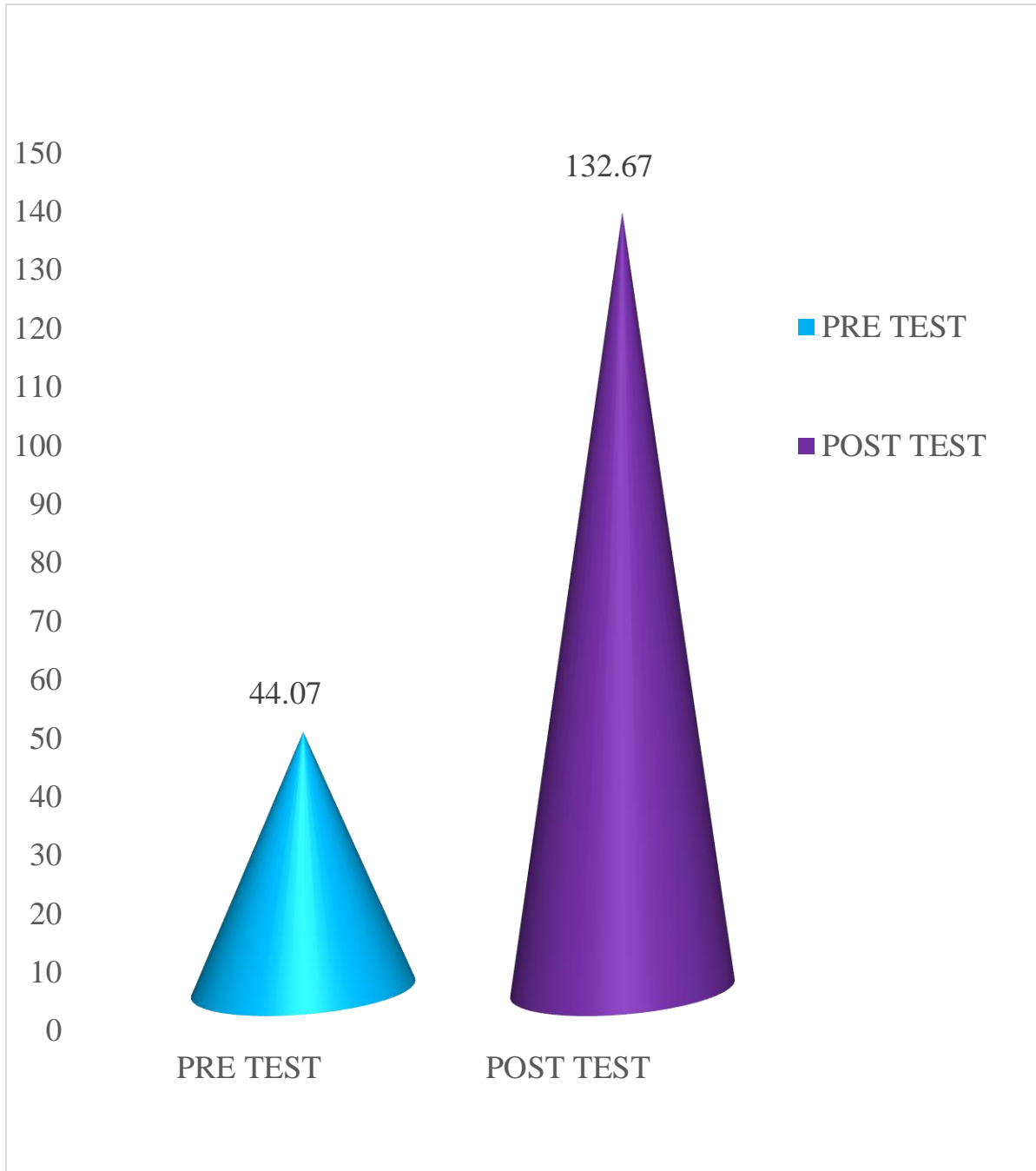


TABLE - III

SF -36 Health Survey questionnaire

PAIRED 't' TEST – GROUP B

S.NO	GROUP B	MEAN	STANDARD DEVIATION	't' VALUE
1.	PRE-TEST	47.87	4.03	22.58
2.	POST TEST	113.73	11.58	

The Table III shows analysis of SF-36 Health Survey questionnaire in Group B. Using paired 't' test with 14 degrees of freedom and 0.05% as a level of significance, the calculated 't' value is 22.58 which was greater than the table 't' value 2.145. The result shows that there was a marked difference between pre-test and post-test values.

GRAPH – III

SF-36 Health Survey questionnaire

PAIRED ‘t’ TEST - GROUP B

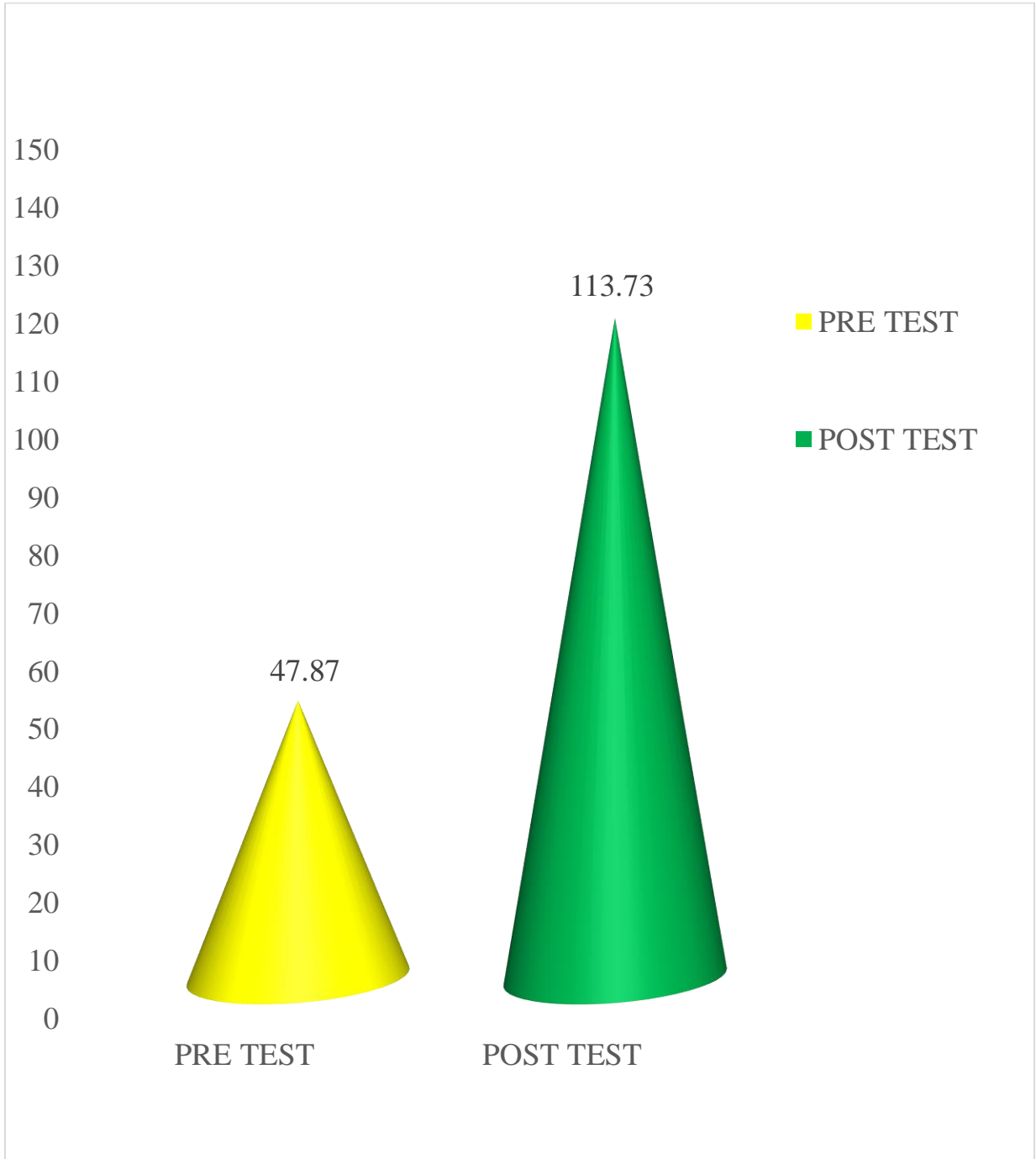


TABLE - IV

SF -36 Health Survey questionnaire

UNPAIRED 't' TEST – GROUP A & GROUP B

S.NO	GROUPS	MEAN	STANDARD DEVIATION	't' VALUE
1.	GROUP A	132.67	5.59	5.70
2.	GROUP B	113.73	11.58	

Table IV shows the analysis of SF-36 Health Survey questionnaire on unpaired 't' test. The calculated 't' value is 5.70 which is greater than the table 't' value is 2.048 at 5% level of significance and 28 degrees of freedom. This test showed that there was a significant difference between Group A and Group B.

GRAPH IV

SF -36 Health Survey questionnaire

UNPAIRED 't' TEST – GROUP A & GROUP B

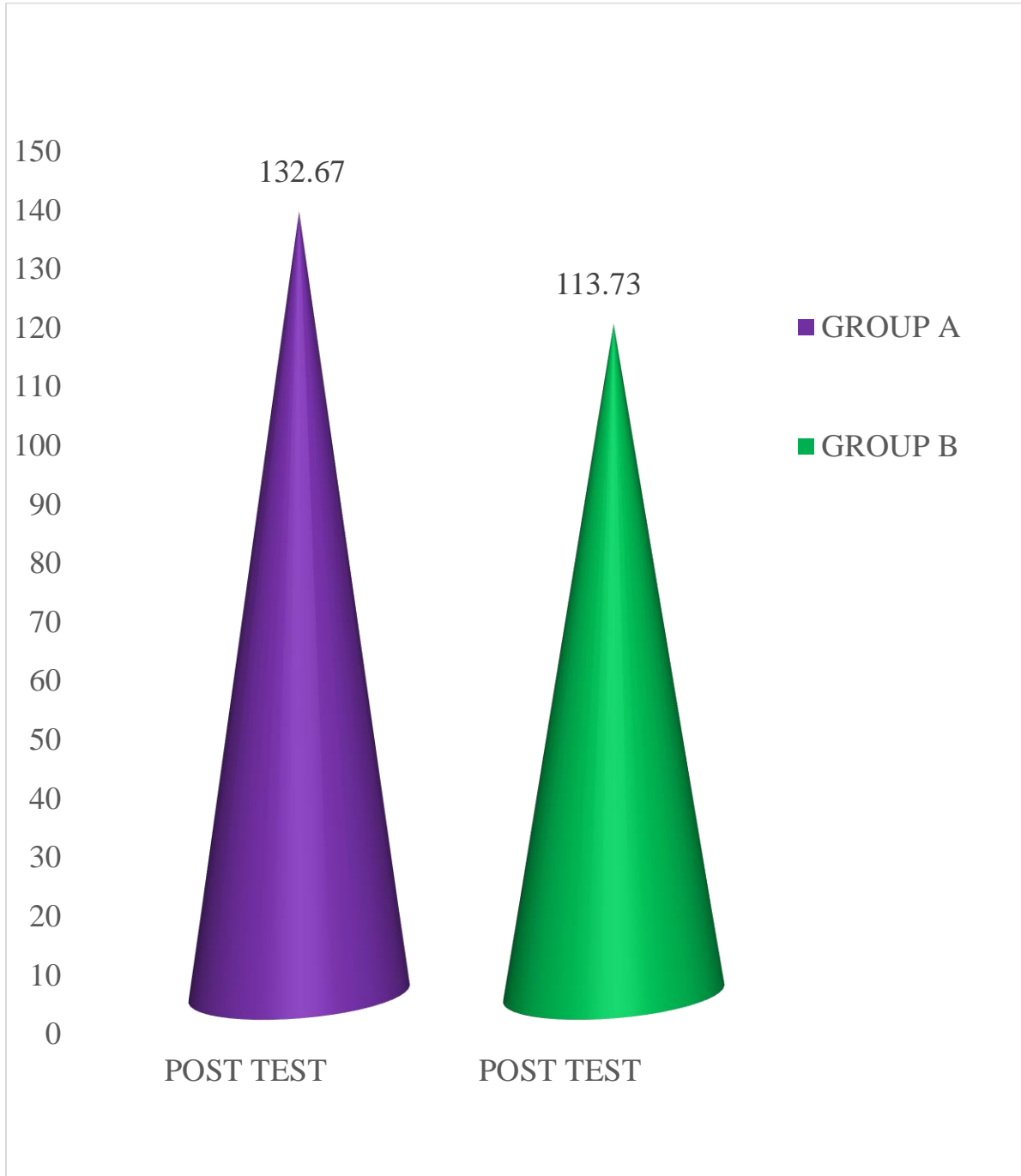


TABLE - V

Visual Analogue Scale

PAIRED 't' TEST - GROUP A

S.NO	GROUP A	MEAN	STANDARD DEVIATION	't' VALUE
1.	PRE-TEST	7.87	0.92	29.78
2.	POST TEST	2.67	0.82	

The Table V shows the analysis of Visual Analogue Scale in Group A. Using paired 't' test with 14 degrees of freedom and 0.05% as a level of significance, the calculated 't' value is 29.78 which was greater than the table 't' value 2.145. The result shows that there was a marked difference between pre-test and post-test values.

GRAPH - V

Visual Analogue Scale

PAIRED 't' TEST - GROUP A

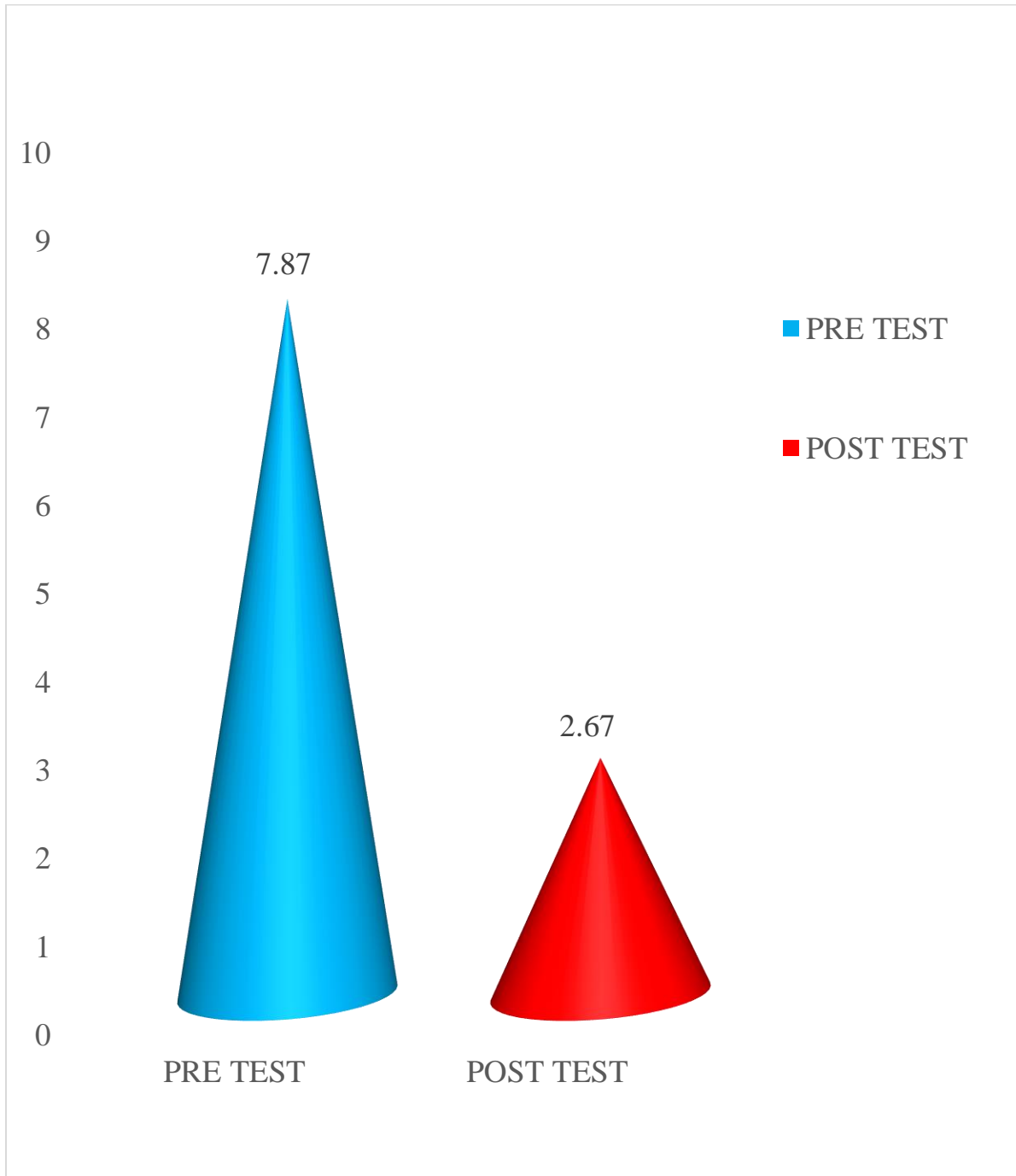


TABLE - VI

Visual Analogue Scale

PAIRED 't' TEST – GROUP B

S.NO	GROUP B	MEAN	STANDARD DEVIATION	't' VALUE
1.	PRE-TEST	6.60	1.24	17.34
2.	POST TEST	3.73	0.96	

The Table VI shows the analysis of Visual Analogue Scale in Group B. Using paired 't' test with 14 degrees of freedom and 0.05% as a level of significance, the calculated 't' value is 17.34 which was greater than the table 't' value 2.145. The result shows that there were marked differences between pre-test and post-test values.

GRAPH - VI

Visual Analogue Scale

PAIRED 't' TEST – GROUP B

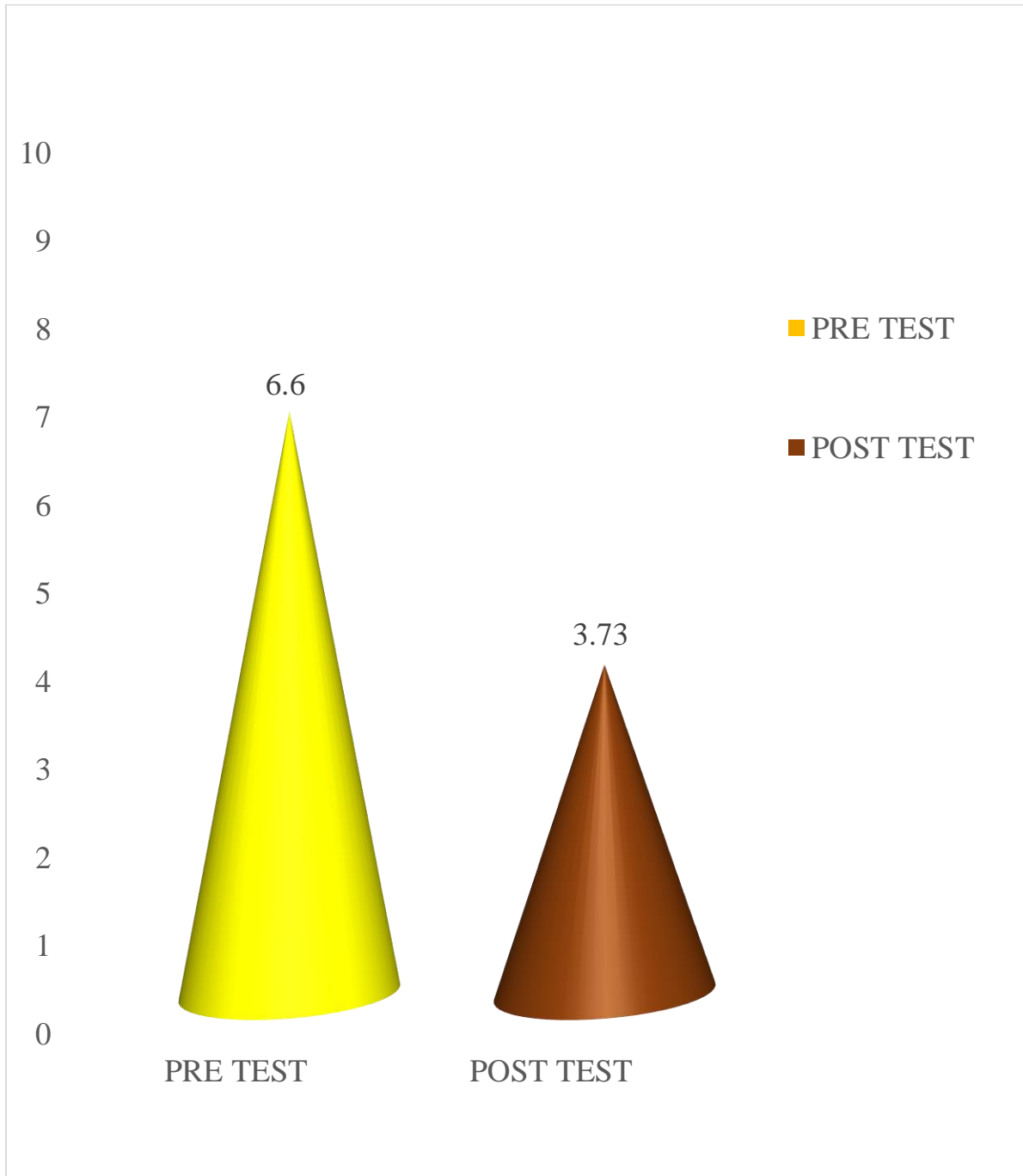


TABLE - VII

Visual Analogue Scale

UNPAIRED 't' TEST – GROUP A & GROUP B

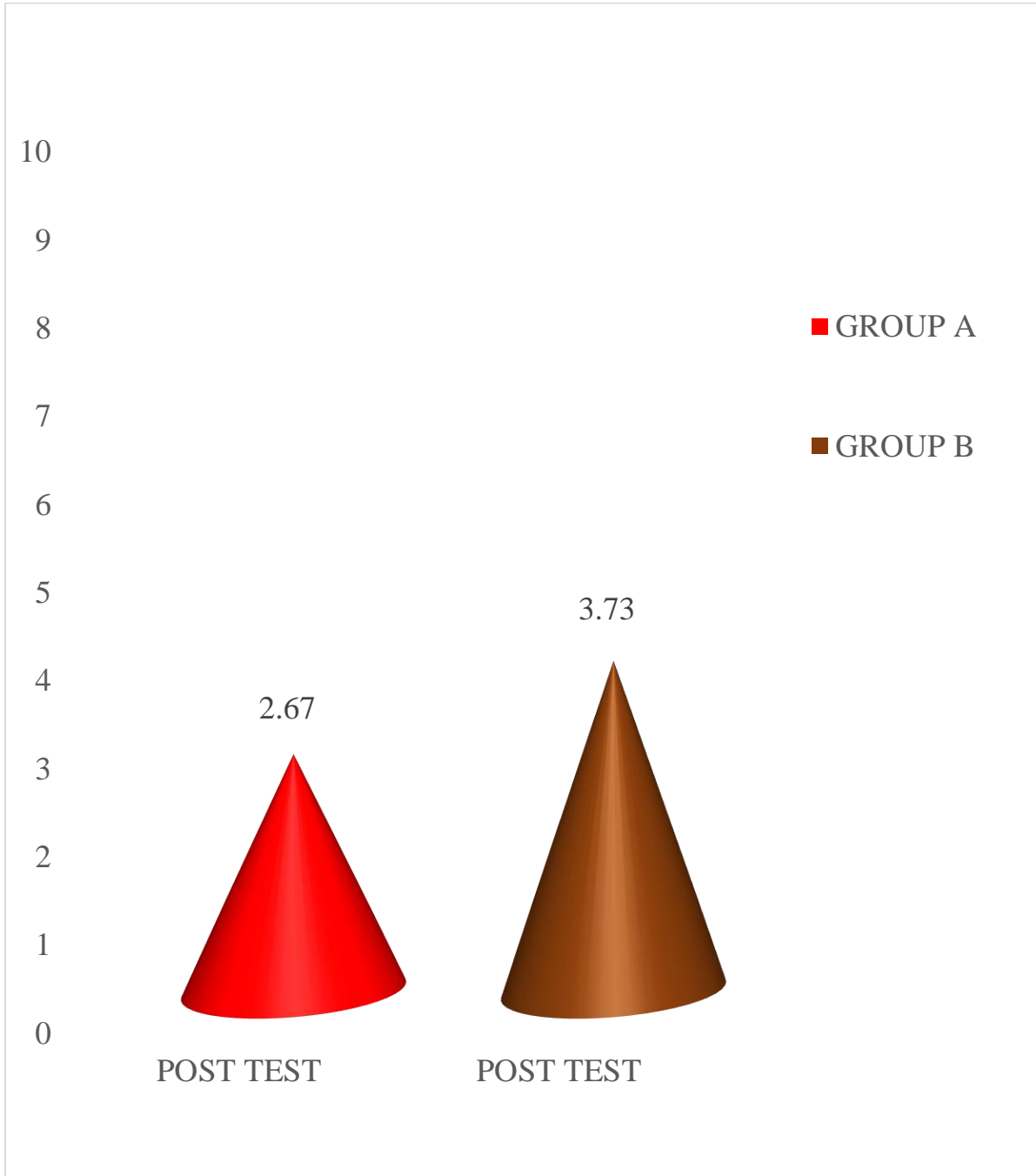
	GROUPS	MEAN	STANDARD DEVIATION	't' VALUE
1.	GROUP A	2.67	0.82	3.27
2.	GROUP B	3.73	0.96	

Table VII shows the analysis of Visual Analogue Scale on unpaired 't' test. The calculated 't' value is 3.27 which is greater than the table 't' value is 2.048 at 5% level of significance and 28 degrees of freedom. This test showed that there was a significant difference in Group A and Group B.

GRAPH - VII

Visual Analogue Scale

UNPAIRED 't' TEST – GROUP A & GROUP BSSS



V RESULTS

The demographic representations of the groups are given in Table I. Treatment duration was not analyzed since all underwent same duration. 16 males and 14 females are included in this study. Age group of the participants varies from 19-30 years and about 30% from 22-24 years, 27% from 19-21 years, 23% from 23-26 years, and 20% from 27-30 years.

The Paired 't' test analysis for the pre test and post-test variable for the SF 36 health survey questionnaire for measuring health status in patients with postural low back pain which was shown in table II and III. Both the groups show significant differences in the pre test and post-test values. The 't' value for the Group A is **74.67**, the 't' value for the Group B is **22.58**.

The Student 't' test analysis for the post-test variables between both the groups for the SF 36 health survey questionnaire for measuring health status in patients with postural low back pain which was shown in Table IV. Both the groups show significant differences between the groups. Subjects in Group A show superior mean difference than Group B. The 't' value for the post-test variables for both group is **5.70**.

The Paired 't' test analysis for the pre-test and post-test variable for the Visual Analog Scale for measuring pain in patients with postural low back pain which was shown in Table V and VI. Both the groups show significant differences in the pre test and post-test values. The 't' value for the Group A is **29.78**, the 't' value for the Group B is **17.34**.

The Student 't' test analysis for the post-test variable for both group for Visual Analog Scale for measuring pain in patients with postural low back pain which was shown in Table VII. Both the groups show significant differences between the groups. Subjects in Group A show superior mean difference than Group B. The 't' value for the post-test variables for both group is **3.27**.

So, the patients who underwent Dynamic Muscular Stabilization Technique along with Moist heat therapy shows significant improvement than patients who underwent Yoga therapy along with Moist heat therapy.

VI DISCUSSION

The purpose of this study is to compare the effect of Dynamic Muscular Stabilization Techniques and yoga therapy along with Moist heat therapy on health status and pain in postural low back pain patients.

30 subjects with postural low back pain are selected for the study and all were divided into two groups. The subjects are selected using simple random sampling method. Group A, 15 subjects underwent Dynamic Muscular Stabilization Techniques along with Moist heat therapy. Group B, 15 subjects underwent Yoga therapy along with Moist heat therapy. The study was conducted for 6 months of duration.

Back pain is very common condition and at least 80% of the human race experience low back pain. 60% of the population will have experienced some degree of back pain every year, **Waddell, 1987**. Fear avoidance was important in causing disability in low back pain suffers, about 23% have a disability and 26% has job loss, **Waddell et al., 1993**.

Back pain is a common in the second decade, disc disease and disc herniation in the third or fourth decade. The usual history of lumbar disc herniation is of repetitive low back pain, radiating to the buttocks and decreased by rest. Pain is increased by flexion, sitting, straining, sneezing, coughing etc. Pain is decreased by rest and in semi - Fowler's position, **Barr JS, et al., 1951**.

About 5-10% of disability rate in people with chronic low back pain in the western industrialized world, **O'Sullivan, 2000**. Disability due to chronic low back pain is increasing faster than any other form of incapacity, **Mannion, et al., 1999**. The three main consequences of low back pain are a pain, disability and limited function and decreased productivity, **Kendall, 1997**. There is a greater amount of reduction in physical functioning, **Chung – Wei Christine, et al., 2011**.

Low back pain is a common condition that is estimated to affect approximately 40% of the adult population within a 1-month time frame, **Deyo, et al., 2002**. Most of the cases are considered as 'nonspecific' with no clear evidence, **Abenhalm, et al., 1995**.

Chronic low back pain is detrimental because it lasts long after the injury has healed. Tonic self – sustaining neural loops are set up to perpetuate the pain. Decreases in sympathetic activity may cause depression and apathy. Chronic pain outlasts the normal time of healing and has no recognisable end – point, **Grinchink and Ferrante, 1991**.

Many subjects with chronic low back pain have been reported to have a psychological profile that predisposes them to develop chronic pain, **Burton, et al., 1995; Carrageen, 2001**. Additionally, people aged between 50 and 60 years are more likely to become disabled because of low back pain, **Burton, et al., 1995**.

The identification of the patients at risk of progression to chronicity (failure to respond treatment) is by means of a psychological questionnaire because clinical variables contribute practically nothing to our predictive ability, **Burton, et al., 1995.**

The psychological traits concerned (coping strategies, depressive tendencies, inappropriate beliefs about pain and activity) are present in the result of persistent symptoms, **Burton, et al., 1995.**

A recent study on the topic has found that the health-related quality of life of patients with low back pain depends on functional status and psychological factors more than simple physical impairment, **Lucy TG, Ann PM, 2006.**

In this study, the randomly assigned subjects underwent training through a set of protocols. Group A subjects underwent Dynamic Muscular Stabilization Techniques along with Moist heat therapy for 4 weeks of duration. Group B subjects underwent Yoga therapy along with Moist heat therapy for 4 weeks of duration.

Thus, in this respect, it seems that Dynamic Muscular Stabilization Techniques is a very relevant regimen to improve both patient's physical and psychological status. As we already seen that main cause of postural low back pain is the weakness and wasting of the postural muscles leading to impairments in physical and mental functions and thus affecting general health as a whole, **Fritz JM, et al., 2005.**

Dynamic Muscular Stabilization Techniques was more effective as it emphasizes specifically on muscle strengthening and spinal stabilization component which once gained leads to relief from physical and thus mental symptoms, **Sovik. R., 2000.**

Dynamic Muscular Stabilization Techniques shows more improvement may be due to the restoration of muscle strength in combination with balance, posture and coordination due to the presence of pain and functional disability, **Suraj Kumar, et al., 2009.**

Usually, postural low back pain is due to muscle weakness leading to hypermobility, **Fritz JM, et al., 2005.** Those who have hypermobility of spine are more benefitted from Dynamic Muscular Stabilization Techniques, **Whitman JM, et al., 2005.**

Hot packs have a temporary relaxing or placebo effect on back pain. Hot pack in conjunction with exercise is more effective than hot pack alone, **Mayer JM, et al., 2005.**

As we seen postural low back pain is relieved much by muscle strengthening and stabilization than muscle stretching and relaxation. Yoga therapy does not concentrate specifically on strengthening and moreover basically concentrates on breathing patterns and relaxation of muscles. So, it can be said that there are temporary benefits in mental functions by Yoga but the physical problems persist due to which psychological problems reappear, **Karen J. Sherman, et al., 2005.**

In this study Dynamic Muscular Stabilization Technique along with Moist heat therapy will improve health status and pain. Based on the statistical analysis the result of the study shows that there was a significant difference exist between both the groups and the group underwent the Dynamic Muscular Stabilization Techniques with Moist heat therapy is more benefitted than the group underwent Yoga therapy with Moist heat therapy in the management of postural low back pain.

VII SUMMARY AND CONCLUSION

SUMMARY

The purpose of the study is to compare the effect of Dynamic Muscular Stabilization Technique and yoga therapy along with Moist heat therapy on health status and pain in postural low back pain patients.

30 subjects with chronic low back pain are selected for this study. Age group varies between 19-30 years and they are assessed and selected following inclusion and exclusion criteria. A clear explanation is given to every individual subject and those who are willing are selected and randomly assigned to two equal groups. Proper consent is obtained from all the participants.

Group A subjects underwent Dynamic Muscular Stabilization Techniques along with Moist heat therapy. Group B subjects underwent yoga therapy along with Moist heat therapy. Following the 4 weeks of interventions, the outcomes of health status and pain is measured. Pain is measured by Visual Analogue Scale and Health status is measured by Short Form -36 Health Survey quality of life questionnaire.

Student 't' test was used to find the difference between the two groups. Based on this statistical analysis the Group A patients showed a marked improvement in health status and pain when compared to Group B patients.

CONCLUSION

- There is a significant improvement in health status in both the groups.
- There is a significant reduction of pain in both the groups.
- When compared with Group B, the Group A shows a marked improvement of health status when compared with group B, the Group A shows a marked reduction of pain.

So, this study concludes that the Dynamic Muscular Stabilization Techniques along with moist heat therapy is very helpful in reducing postural low back pain than the Yoga therapy with Moist heat therapy.

VIII LIMITATIONS AND RECOMMENDATIONS

LIMITATIONS

- The study is done for a short duration, long-term study needs for further explorations.
- Long-term effect of exercises was not found.
- Separate benefits of Dynamic Muscular Stabilization Techniques were not studied.
- Certain factors like climate conditions, nutrition, time of testing, psychological factors, regular activities of daily living could not be controlled during the testing period.

RECOMMENDATIONS

- The study recommends the use of manual therapy techniques in the management of low back pain.
- Long-term follow up of exercises have to be found.
- A similar study can be done with the use of application of various other modalities in the management of postural low back pain.

IX BIBLIOGRAPHY

- Andrew K Simpson, Jack Choleswicki, Jonathan Grauer (Current pain and head ache reports; chronic low back pain) 2006; Vol 10(6), 431-436.
- Arnau Josep. M, Antoni Vallano, Anna Lopez, Ferran Pellise, Maria J, Dielgado, Nuria Prat (A critical review of guidelines for low back pain treatments) May 2006; Vol 15(5), 543-553.
- Atlas, Steven J, Keller, Robert. B, Yen A, Deyo, Richard A, Singh, Daniel E (Long term outcomes of surgical and nonsurgical management of Lumbar spinal stenosis) 2005 April 15; Vol 30(8), 936-943.
- Barr JS (The journal of Bone and Joint Surgery) 1951 July; Vol 33(3), 633-649.
- Burton A. Kim, Piness, Tanar, Vogel, Stevel, Field, Andy P (A systematic review of psychological factors as predictors of chronicity/disability in prospective cohorts of low back pain) March 1995; Vol 27(5), 109-120.
- Button, Radebold, Andrea, Jacek, Panjabi, Manohar, Patel, Tushar C.H (Muscle response pattern to sudden trunk loading in healthy individuals and in patients with chronic low back pain) 2000 April 15; Vol 25(8), 947-954.

- Cairns MC, Foster NE, Wright C (Randomized controlled trial of specific spinal stabilization exercises and conventional physiotherapy for recurrent low back pain) *Spine (Phila Pa 1976)*. 2006 Sep 1;31(19): E670-81.
- Chametcha Singphow, Hongasandra Ramarao Nagendra, Nagarathna Raghuram (Effect of short term intensive Yoga Program on pain, functional disability and spinal flexibility in chronic low back pain: A randomized control study) *Division of Yoga and Life Sciences, Swami vivekananda Yoga research foundation (SVYASA), Bangalore, India, July 2008 Volume 14: Issue 6: Pages 637-644.*
- Chung-wei Christine, Marion Haos, Chris G. Maher, Luciana A.C, Machado (Cost effectiveness of guideline- endorsed treatments for low back pain; a systematic review) *July 2011; Vol 20(7), 1024-1038.*
- Cramer Holger MSc; Lauche, Romy PhD; Haller, Heidemarie MSc; Dobos, Gustaw MD (A systematic review and Meta – analysis of yoga for low back pain) *The Clinical Journal of pain; May 2013 volume 29- Issue 5- pages 450-460.*
- Cresswell AG, Gundstrom H, Thorstensson A (Observation on intra-abdominal pressure and patterns of abdominal intra-muscular activity in man) *1992 April 1; Vol 144(4), 409-18.*

- D. Gould et al. Visual Analogue Scale (VAS), Journal of clinical nursing 2001;10:697-706.
- Dauphin AP et al. Bias and Precision in Visual Analogue Scales; A Randomized controlled trial. American Journal of Epidemiology 1999;150(10):1117-1127.
- Deyo, Ricahard A, Mirza, Sohail K, Martin, Brook (Back pain prevalence and visit rates) 2006 Nov 1st; Vol 31(23), 2724-2727.
- Feurstein G, R. Lavey, T Sherman, KT Mueser (The effects of yoga on mood in psychiatric in patients) 2005; Vol 28(4), 399-402.
- French SD, Cameron M, Walker BF, Reggars JW, Esterman AJ (Superficial heat or cold for low back pain. Cochrane Database of Systematic Reviews) 2006; 25(1), CD004750.
- French SD, Cameron M, Walker BF, Reggers JW, Esterman AJ (Superficial heat or cold for low back pain) Cochrane Database Syst Rev. 2006 Jan 25;(1):CD 004750.
- Fritz JM, Steven Z. George, Anthony Delitto (The role of fear-avoidance beliefs in acute low back; relationships with current and future disability and work status) 2001 Oct; Vol 94(1), 7-15.
- Gregory Garra Do, Adam J. Singer MD, Richard Leno MD, Breena R. Taira MD, Neeraj Gupta MD, Beena Mathaikutty MD, Henry J. Thode PhD (Heat

or cold packs for Neck and Back strain: A Randomized controlled trial of Efficacy) Academic Emergency Medicine, volume 17, Issue 5, May 2010, page 484-489.

- Gunnar B.J, McNeill, Thomas W, (Lumbarw spine syndromes; Evaluation and treatment) 1989; ISBN 978-3-7091-8981-8.
- Hayden JA, Van Tulder MW, Tomlinson G (Systematic review; strategies for using exercise therapy to improve outcomes in chronic low back pain) 2005 May 3; Vol 142(9), 776-85.
- Helen Cox, Helen Tilbrook, John Aplin, Anna Semlyen, David Torgerson, Alison Trehwela, Ian Walt (A randomized controlled trail of yoga for the treatment of chronic low back pain; Result of a pilot study) Department of Health sciences, SRB Area 4, United Kingdom. Volume 16, Issue 4, November 2010, pages 187-193.
- Hodges PW, Richardson CA (Inefficient muscular stabilization of the lumbar spine associated with low back pain; A motor control evaluation of transversus abdominis) 1996, Nov 15, 21(22), 2640-50.
- Horng YS, Hwang YH, Wu HC, Liang HW, Jang Y, TWU FC, Sang JD (Predicting Health – Related Quality of life in patients with low back pain) Spin: March 1st, 2005-volume 30-Issue 5-p 551-555.
- Huskisson EC. Measurement of pain. Lancet 1974; 2:1127-31.

- Iyengar BKS (Evaluation of the effectiveness and Efficacy of Iyengar yoga therapy on chronic low back pain) 1996 Sep 1; Vol 34(19), 2066-2076.
- Jewell. A, Kim Burton (How to prevent low back pain) 2005; Vol 9(4), 541-555
- John E. Ware, Jr. Mark kosinski, Martha S. Bayliss, colleen A. McHorney, William H. Rogers and Anastasia Raczek (Comparison of Methods for the scoring and statistical Analysis of SF -36 Health profile and Summary Measures; Summary of Results from the Medical outcomes study) volume 33, No. 4, The proceedings of the conference on Measuring the Effects of Medical treatment, Apr, 1995, AS 264-AS 279.
- Kaigle A, Indahl A, Reikeras. O (Electromyographic response of the porcine multifidus musculature after nerve stimulation. Spine) 1995; Vol 20(24), 2652.
- Karen J. Sherman et al. (Comparing yoga exercise and self-care book for chronic low back pain. Annals of internal medicine. 2005; 143(12), 846-846.
- Kendall, Philip C, Susan M, Micheal, Henin (Therapy for youths with anxiety disorders; A second randomized clinical trial) 1997; Vol 65(3), 366-380.
- Kimberly Anne Williams, John Petronis, David Smith, David Goodwich, Juan WU, Neelima Ravi, Edward J. Doyle Jr, R. Gregory Juckett, Maria Munoz

Molar, Richard Goss, Lois stainberg (Effect of Iyengar yoga therapy for chronic low back pain), Volume 115, Issues 1-2, May 2005, Pages 107-117.

- Koumantakis GA, Watson PJ, Oldham JA (Physiological and functional outcomes of a randomized control trial of patients with recurrent low back pain) Clin Biomech (Bristol, Avon), 2005 June;20(5):474-82.
- Koumantakis GA, Watson PJ, Oldham JA (Trunk muscle stabilization training plus general exercise versus general exercise only: randomized controlled trail of patients with recurrent low back pain) Phys Ther. 2005 March ;85(3):209-25.
- Kriese M, Clijsen R, Taeymans J, Cabri J. (Segmental stabilization in low back pain: a systematic review) Sport verletz Sports Chaden. 2010 March ;24(1):17-25.
- Kumar S, Sharma VP, Negi MP (Efficacy of dynamic muscular stabilization techniques (DMST) over conventional techniques in rehabilitation of chronic low back pain) J strength cond Res. 2009 Dec;23(9);2651-9.
- Kumar. S, Sharma VP, Aggarwal A, Shukla R, Dev R (Effect of dynamic muscular stabilization techniques on low back pain of different durations) J Back Musculoskeletal Rehabilitation 2012; 25(2):73-9.
- Linton. J Stven, Johan WS. Vilagen (Fear-avoidance and its consequences in chronic musculoskeletal pain) April 2000; Vol 85(3), 317-332.

- Lucy JG, Ann PM (A randomized controlled trial investigating the efficacy of musculoskeletal physiotherapy on chronic low back pain. Spine) 2006; 3; 1083-1093.
- Luijsterburg. Pim A.J, Arianne P. Verhagen, Raymond W.J (Physical therapy plus, general practitioners care alone for sciatica) 2008 April; Vol 17(4), 509-517.
- Mannion, Richard J, Clifford J Woolf (Neuropathic pain, aetiology, symptoms, mechanisms, and management) 1999; Vol 353(9168), 1959-1964.
- Mayer JM, Ralph L, Look M, Erasala GN, Verna JL, Matheson LN, et al (Treating acute low-level heat wrap therapy and/or exercise; a randomized controlled trial. The Spine Journal) 2005; 5(4), 395-403.
- MC Cormack HM, Horne DJ, Sheather S. Clinical applications of visual analogue scales: a critical review. Psychology Med 1988; 18:1007-19.
- Morteza Dehghan and Farinaz Farahbod (The Efficiency of thermotherapy and cryotherapy on pain relief in patients with acute low back pain, A clinical Trial study) J Clin Diagn Red 2014 Sep ;8(9):LC01-LC04.
- O' Sullivan (Lumbar segmental instability; clinical presentation and specific stabilizing exercise management) 2000 Feb; Vol 5(1), 2-12.
- P. Tekur, R. Nagarathna, S. Chametcha, Alex Hankey, H.R. Nagendra (Comprehensive yoga programs improves pain, anxiety and depression in

chronic low back pain patients more than exercise: RCT) Division of yoga and life sciences, Swami Vivekananda Yoga Research Foundation (SVYASA), Volume 20, Issue 3, June 2012, Pages 107-118.

- Posadzki, P. and Ernst, E (Yoga for low back pain; a systematic review of randomized clinical trials) Clin Rheumatoid (2011)30:1257.
- Rasmussen – Barr E, Aug B, Arvidsson I, Nilsson -Wikmar L (Graded exercise for recurrent low back pain; a randomized, controlled trail with 6-12, and 36 months follow- ups) Spine (Phila Pa 1976). 2009 Feb L;34(3):221-8.
- Richardson CA, Hides. J (Multifidus muscle recovery is not automatic after resolution of acute, first episode low back pain. Spine) 1992, Vol 21, 2763-9.
- Richardson CA, Jull GA (Muscle control-pain control. What exercises would you prescribe?) Man. Ther 1995 Nov; Vol 1(1), 2-10.
- Robert B. Saper, Ama R. Boach, Julia Keosaian, Christian Cerrada, Janice Weinberge, Karen J. Sherman (Comparing once – versus Twice – weekly yoga classes for chronic low back pain in predominantly low-income minorities: A Randomized dosing trail) Evidence – Based complementary and Alternative Medicine. Volume 2013, Article ID 658030,13 pages
- Saal JA, (Dynamic Muscular Stabilization in the non-operative treatment of lumbar pain syndromes) 01 Aug 1990,19(8):691-700.

- Saper, Habert B, Eisenberg, David M, Davis Roger B, Larry, Phillips, Russell S (Prevalence and patterns of adult yoga use in the United States; Results of a National Survey) 2004 March, Vol 10(2), 44-49.
- Sefigh Sadat Tavafian, Ahmadreza Jamshidi, Kazem Mohammed and Ali Montazeri (Low back pain education and short-term quality of life; a randomized trial. BMC musculoskeletal disorders, 2007; 10, 1186/1471-2474/21.
- Sherman KJ, DC Cherkin, (Comparing yoga, exercise, and self-care book for chronic low back pain; A randomized, controlled trial) 2005 Dec 20; Vol 30(3), 700-10.
- Simo D French, Melainie Cameron, Bruce F Walker, John W Reggers, Adrian J Esternman (Superficial heat or cold for low back pain) 2006 Jan 25; 39(8), 523.
- Suraj Kumar, Vijai P. Sharma, H K Tripathi, Mahendra P.S Negi, G. Venu Vandhan, 2009 (Efficacy of Dynamic Muscular Stabilization Techniques over conventional techniques in patients with chronic low back pain. Indian journal of physiotherapy and occupational therapy) 2009; 3(2), 47-50.
- Turk DC, Dworkin RH; (What should be the core outcomes in chronic pain clinical trials? Arthritis Res Ther) 2004; 6; 151-154.

- Waddell (A new clinical model for the treatment of low back pain) 1987 Sep 1, 12(7), 632-644.
- Whitman JM, Fritz JM, Childs JD (Lumbar spine segmental mobility assessment; an examination of validity for determining interventions strategies in patients with low back pain. Arch Phys Med Rehabil) 2000; 122; 491-505.
- Wolsko PM, Eisenberg DM, Davis RB (Perceived benefit of Complementary and Alternative Medicine [CAM] for Back pain; A National survey) 1998 June 23; 283-284.

X APPENDIX

APPENDIX - I

DYNAMIC MUSCULAR STABILIZATION TECHNIQUE

Exercise program

This is more effective as it emphasizes specifically on muscle strengthening and spinal stabilization component which once gained leads to relief from physical and thus mental symptoms.

1. Isolation and facilitation of target muscles

a) Abdominal Bracing:



- Patient lying in crook lying position and is instructed to draw the navel up and in towards the spine or feeling the muscle tighten at the waist.

- From the beginning patient learns to breathe normally while activating or holding the muscular contraction.

b) Abdominal Hollowing:



- Patient is in supine crook lying position and is instructed to perform abdominal hollowing by making the lower abdomen cave in with both arms elevated.

2. Training of trunk stabilization under static conditions of increase load

- Maintaining the above position and concentration pattern the patient is instructed to hold the position while load is added via the weight of lower limbs being moved passively into loaded positions like

a) One leg with knee extended.



b) Both legs with knees flexed



3. Development of trunk stabilization during slow controlled movement of the lumbar spine

- Once the stability is trained through static procedure, the movement of the trunk with appropriate activation of the supporting muscles.
- The first step is to produce and explore lumbo-pelvic movements and learn abdominal hollowing or bracing in quadruped position and second step is controlled loading by

a) Movement of trunk with one lower limb elevation.



b) Movement of trunk with elevation of one upper limb with the diagonal lower limb.



- The above techniques were given with 3 repetitions and 10 second hold for each exercise.

APPENDIX – II

YOGA THERAPY

1. Pawnmukt Asan (knee to chest posture)



- Lie down on the mat. Breath out, while breathing in lift both the legs, bend them and bring them up to the abdomen.
- Let the knee touch the nose, with rest of the thigh touching the chest. Press down on the leg, so that abdomen and chest receive pressure.
- Then breathe out slowly and straighten your legs.

3. Setubandh Asan (Bridge posture)



- Lie flat on the back; bend the knees placing sole of the feet on the mat with heels touching the buttocks.
- While breathing in raise the buttocks and arch the back upwards, remain in this position as long as you can hold the breath, then breath out slowly and come to the starting position.

3. Bhujang Asan (Cobra posture)



- Lie on the abdomen with legs straight, knees and feet together and toes pointing backwards.
- Breathe in and slowly raise the head, neck, chest and upper abdomen till the level of the navel.
- Remain in this position as long as you can hold the breath then breath out slowly and come to the starting position.

4. Shalabh Asan (Locust pose)



- Lie on the abdomen with legs straight, knees and feet together and toes pointing backwards. Place the palm beneath the thighs.
- Breathe in and slowly raise the head, neck, chest and upper abdomen along with both lower limbs straight together and stretching them as far as possible without bending the knees.
- Remain in this position as long as you can hold the breath, then breathe out slowly and come to the starting position.

5. Tab Asan (Palm tree posture):



- Stand with feet apart and arms by the side.
- Breathe in and raise your arm over the head, interlock the fingers and turn the palm upwards, stretch the arm shoulders and chest upwards, raise the heel coming up on to the toes.
- Remain in this position as long as you can hold the breath then breathe out slowly and come to the starting position.

6. Makar Asan (Crocodile posture):



- Lie flat on the abdomen, spread your legs with toes facing inwards.
- Move the shoulders up and by bending the elbows keep the palm on dorsum of other hand place the forehead on the hands.
- Relax and breathe normally for 2-3 minutes and concentrate on the breathing pattern.
- Above asanas were performed with 3 repetitions of each asana.

APPENDIX – III

MOIST HEAT THERAPY



- Patient lying prone position, hot pack is placed under the lower back of the patient for 15 minutes.

Each technique given 5 times a week in a 4 weeks protocol. At 1st and 4th week the score of SF 36 QOL questionnaire and Visual Analog Scale was measured again.

APPENDIX – IV

Medical Outcomes Study Questionnaire Short Form 36 Health Survey

This survey asks for your views about your health. This information will help keep track of how you feel and how well you are able to do your usual activities. Thank you for completing this survey! For each of the following questions, please circle the number that best describes your answer.

1. In general, would you say your health is:	
Excellent	5
Very good	4
Good	3
Fair	2
Poor	1
2. Compared to one year ago,	
Much better now than one year ago	5
Somewhat better now than one year ago	4
About the same	3
Somewhat worse now than one year ago	2
Much worse now than one year ago	1

3. The following items are about activities you might do during a typical day. Does your health now limit you in these activities? If so, how much? (Circle One Number on Each Line)

	Yes, Limited a Lot (1)	Yes, Limited a Little (2)	No, Not limited at All (3)
a. Vigorous activities , such as running, lifting heavy objects, participating in strenuous sports	1	2	3
b. Moderate activities , such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	1	2	3
c. Lifting or carrying groceries	1	2	3
d. Climbing several flights of stairs	1	2	3
e. Climbing one flight of stairs	1	2	3
f. Bending, kneeling, or stooping	1	2	3
g. Walking more than a mile	1	2	3
h. Walking several blocks	1	2	3
i. Walking one block	1	2	3
j. Bathing or dressing yourself	1	2	3

4. During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities **as a result of your physical health**?

(Circle One Number on Each Line)

	Yes (1)	No (2)
a. Cut down the amount of time you spent on work or other activities	1	2
b. Accomplished less than you would like	1	2
c. Were limited in the kind of work or other activities	1	2
d. Had difficulty performing the work or other activities (for example, it took extra effort)	1	2

5. During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities **as a result of any emotional problems** (such as feeling depressed or anxious)?

(Circle One Number on Each Line)

	Yes	No
a. Cut down the amount of time you spent on work or other activities	1	2
b. Accomplished less than you would like	1	2
c. Didn't do work or other activities as carefully as usual	1	2

6. During the past 4 weeks, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?	
Not at all	5
Slightly	4
Moderately	3
Quite a bit	2
Extremely	1

7. How much bodily pain have you had during the past 4 weeks?	
None	6
Very mild	5
Mild	4
Moderate	3
Severe	2
Very severe	1

8. During the past 4 weeks, how much did pain interfere with your normal work (including both work outside the home and housework)?	
Not at all	5
A little bit	4
Moderately	3
Quite a bit	2
Extremely	1

These questions are about how you feel and how things have been with you **during the past 4 weeks**. For each question, please give the one answer that comes closest to the way you have been feeling. **(Circle One Number on Each Line)**

9. How much of the time during the **past 4 weeks . . .**

	All of the Time	Most of the Time	A Good Bit of the Time	Some of the Time	A Little of the Time	None of the Time
a. Did you feel full of pep?	1	2	3	4	5	6
b. Have you been a very nervous person?	1	2	3	4	5	6
c. Have you felt so down in the dumps that nothing could cheer you up?	1	2	3	4	5	6
d. Have you felt calm and peaceful?	1	2	3	4	5	6
e. Did you have a lot of energy?	1	2	3	4	5	6

	All of the Time	Most of the Time	A Good Bit of the Time	Some of the Time	A Little of the Time	None of the Time
f. Have you felt downhearted and blue?	1	2	3	4	5	6
g. Did you feel worn out?	1	2	3	4	5	6
h. Have you been a happy person?	1	2	3	4	5	6
i. Did you feel tired?	1	2	3	4	5	6

10. During the past 4 weeks, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)? (Circle One Number)	
All of the time	1

Most of the time	2
Some of the time	3
A little of the time	4
None of the time	5

11. How TRUE or FALSE is each of the following statements for you.

(Circle One Number on Each Line)

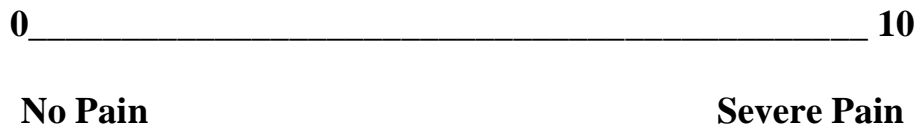
	Definitely True	Mostly True	Don't Know	Mostly False	Definitely False
a. I seem to get sick a little easier than other people	1	2	3	4	5
b. I am as healthy as anybody I know	1	2	3	4	5
c. I expect my health to get worse	1	2	3	4	5
d. My health is excellent	1	2	3	4	5

- The SF 36 reports the patient's preserved quality of life by scores ranging from 36 to 149, where 149 is the best and 36 is the worst score.

APPENDIX - V

VISUAL ANALOGUE SCALE

- To allow a continuous assessment of pain, visual analogue scale uses a 10 cm line labelled at '0' with no pain and '10' with worst pain.
- This line is marked at a point corresponding to the mark from zero is measured.
- This scale is used to assess the level of pain.



APPENDIX - VI

PATIENT CONSENT FORM

I Voluntarily consent to participate in the project name
**“An experimental study to compare the effect of Dynamic Muscular
Stabilization Technique and Yoga therapy along with Moist heat therapy on
health status and pain in postural low back pain patients”.**

The researcher has explained to the treatment approach in brief, risk of
participate and has answered the questions related to the study to my satisfactions.

Signature of the patient :

Signature of the candidate :

Signature of the witness :

Date :