

**EFFECTIVENESS OF GATE TECHNIQUE IN
IMPROVING FUNCTIONAL ACTIVITIES IN
SUBJECT WITH ACUTE NON SPECIFIC LOW
BACK PAIN**



REG.NO : 271410223

**MADHA COLLEGE OF PHYSIOTHERAPY
(Affiliated to the Tamil Nadu Dr.M.G.R Medical University,
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APRIL 2016

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**A Dissertation Submitted To
THE TAMILNADU Dr. MGR MEDICAL UNIVERSITY.
CHENNAI-32
In Partial Fulfillment of Requirement for the Post Graduate Degree
of
Master of Physiotherapy (Advanced Orthopaedics)
April-2016**

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EXAMINERS:

1.

2.

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BONAFIDE CERTIFICATE

This is to certify that the dissertation titled **“EFFECTIVENESS OF GATE TECHNIQUE IN IMPROVING FUNCTIONAL ACTIVITIES IN SUBJECT WITH ACUTE NON SPECIFIC LOW BACK PAIN”** is a bonafide record of work done under my guidance and supervision in partial fulfillment for the Post Graduate Degree of Master of Physiotherapy (MPT II YEAR, APRIL - 2016) by **MR.A.ROBINSON ARUL ANAND** (Register No.271410223) Post Graduate (MPT) student of Madha College of Physiotherapy.

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ACKNOWLEDGEMENT

I owe my thankful prayers to the GOD who was gracious enough in providing me knowledge with the opportunity of doing this project and complete it successfully.

My special thanks to **MR.S.SARAVANAN MPT (Ortho), MIAP**, Prof, Madha College of Physiotherapy who is always readily available for discussions and comments on manuscripts. Sir, thanks you for your expertise, enthusiasm, and especially for your precious time and for the kind help and support, valuable suggestions and constant guidance throughout the study.

My profound gratitude and heartfelt thanks to my coordinator and co-guide **PROF.S.NAGARAJ MPT, MIAP, PGCDE**, Vice Principal, Madha College of Physiotherapy, an ideal supervisor. Never negative always looking ahead with new ideas, guiding with patience and support.

Also thank **Prof. V.VIJAI KRISHNA MPT(Cardio), MAIP**, Principal, Madha College of Physiotherapy for giving me a constant encouragement to do the project.

I also thank **Mrs.Mercy Clara, MPT, MIAP**, Professor, Madha College of Physiotherapy and **Mrs.Rathna Mala, MPT, MIAP**, Asst Professor, Madha College of Physiotherapy, who were very supportive in completing the project.

I also thank Mr.Porchelvan, Biostatistician, Saveetha College of Physiotherapy and Mr.R.Dasarathan, M.A, Librarian, Madha College of Physiotherapy who were helpful in completing the project.

I also wish to thank the patient and relative who were the subjects for this study. I owe my gratitude to all others who were very helpful in completing this project.

Last but not least, I would like to show my humble gratitude to all my Friends and my seniors who were the back bone for me to complete this study successfully.

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INTRODUCTION

1. INTRODUCTION

The term low back pain refers to pain in the lumbosacral area of spine encompassing the distance from first lumbar vertebra to the first sacral vertebra. This is a area of the spine where the lordotic curve forms²⁶. Low back pain (LBP) is a problem world wide with a lifetime prevalence reported to be as high as 84% by world health organization (WHO)⁸. Half of the population will have experienced a significant incident of low back pain by the age of 30 years.

Low back ache (LBA) occurrence at a frequency of at least once a week within the past 6 months was regarded as the primary outcome, similar to the classification used by **Mikhelson et-al and Brattbers**.

Low back ache occurs in people with a wide variety of professions, including those involving repetitive work activities and extended sedentary postures. Lesser amounts of hamstring tightness are reportedly associated with a posterior rotation of the pelvis in standing. It is thought that due to the attachments of hamstrings to the ischial tuberosity, hamstring tightness generates posterior pelvic tilt and decreases lumbar lordosis which results in low back ache⁴³.

“Hamstring postural muscle “postural muscles are used to hold your upright posture. They contain predominantly slow twitch muscle fibres and are designed to contract for long period without fatiguing. They can be therefore be prone to hypertonicity. These type of muscles tend to shorten overtime unless stretched or taken through their full range of motion on a regular basis³⁴.

The human body functions as a whole. The main reason people experience these problems are because certain muscles are pulling their body out of proper alignment. Muscles are connected to bones in two places. The insertion and origin. In order for movement to occur the muscles must contract or shorten which pulls on one end or attachment.

Two things can cause a muscle to pull too much when it is not being asked to contract. The most common cause is poor posture or positioning.

An example of this would be how the hip flexor muscles (the muscle in the top front of your thigh that bring your leg forward) shorten while sitting. The more time you spend sitting the hip flexor muscles will tighten due to poor positioning. What's worse is most of us spend a lot of time sitting whether it's while driving, while at work, at home watching television or at home on the computer. This sets you up for a big problem.

The other cause is a corresponding weakness or lack of use in the opposing muscle groups. For example the hamstring and gluteus muscles don't get worked nearly as often as the hip flexors and quadriceps, unless of course one walked backwards. The pull of these muscles directly affects the positioning the pelvis¹⁸.

Fahrni and Trueman have emphasized the common association of increased lumbar lordosis and low back pain. **Kendall** points out that the best index regard to painful low back is not the degree of lordosis or other mechanical defect visible in examination of alignment but the extent of muscle tightness that maintains a fixed antero posterior alignment and the extent of muscle weakness that allows the faulty position to occur and to persist.

Cailliet in his soft tissue pain and disability remarks that excessive lordosis or abnormal lumbosacral angle, has been advocates as the major cause of postural pain, whether it is discogenic, facetal or radicular. The sacral angle implies the concept of pelvic tilt, because the sacrum is firmly attached to the pelvis, which rotates around the hip joint.

If the hip extensors (muscles gluteus maximus and hamstring) are weak an anterior tilt is the result, especially in combination with hip flexors shortness or abdominal weakness, with extreme weakness the only stable position of the hip is obtained by displacing the pelvis forward whereas the upper trunk is displaced backwards ('sway back posture'). Stretched hamstrings appear to be the reason for lordosis and hyperextended knee with short hamstrings there will be a sway back position or flat back position. A position of hyper flexion of the lumbar spine may be more likely due to tight hamstrings than to weak back extensor muscles.

In the cross sectional study of kim –et al it was hypo sized that imbalance of trunk muscles due to weakness of abdominal muscles can increase the lordotic curvature of the lumbar spine which can be an important factor of LBP.

In the study of Goldby et-al. The efficiency of musculoskeletal physiotherapy on chronic low back disorder was investigated. The authors came to the conclusion that the spinal stabilization program is significantly more effective than manual therapy at **reducing pain, disability, dysfunction, medication intake and improving the quality of life**. It is suggested that manual therapy is appropriate to be used on patients with low back pain but should not be used as an isolated modality¹⁸.

Based on the theory by Jull and janda “pelvic cross syndrome” where they hypothesized that there is a combination of weak,long muscles and short ,strong muscles resulting in an imbalance pattern leading to low back pain.An imbalance in the lower cross will lead to postural changes such as excavated lumbar lordosis, forward tilting of the pelvis and flexion in the hips.

Cailliet illustrates in his 5th edition of low back pain syndrome-how tight hamstrings restrict pelvic rotation and there by cause excessive stretch of low back resulting in pain.

Hamstring flexibility is an important variable because reduced extensibility has been proposed as a predisposing factor for injuries (**Hartig and Herderson,1999**) nonspecific low back pain (**jones et-al,2005**) and changes in lumbopelvic rhythm (**Esola et-al 1996**).

Hamstring muscles attach proximally to the ischial tuberosity, except for the short head of biceps femoris. Because the hamstring muscles orginate at the ischial tuberosity of the pelvis, the tension in the hamstring muscles has an influence on pelvic posture(**congdon et-al 2005**).The pelvis is considered to be the base for the spine and its anteroposterior orientation affects the saggital curves of the spine (**Delisle et-al 1997**).For this reason a change in hamstring extensibility should have some influence in pelvic and spinal postures when the hamstring muscles are

subjected to moderate or high tension. The hamstring muscles the biceps femoris, semitendinosus and semimembranosus are very susceptible to injury in sports¹⁸.

Based on the etiology LBP is classified as

- ❖ Specific LBP
- ❖ Nonspecific LBP

All the LBP patients 90% are attributed to nonspecific causes.

Specific LBP causes are

- The nerve root compression
- Vertebral fracture
- Tumor
- Infection
- Inflammatory disease
- Spondylolisthesis (or) Spinal stenosis

Nonspecific LBP

Do not have a specific pathology

Nonspecific low back pain is defined as low back pain not attributable to a recognizable known specific pathology

Based on duration NS-LBP

- Acute (less than 6 weeks)
- Sub-acute (6 weeks to 3 months)
- Chronic (more than 3 months)

In deed lots of research have suggested that the people, with history of nonspecific low back pain have significantly less hamstring flexibility and functional activities compared with the people without low back pain, and are also very prone to the recurrence of hamstring troubles and functional activities.

Thus there has been considerable interest in the development of routine, which can upgrade hamstring flexibility and functional activities of the people having low back pain.

Gate technique

This is superb procedure for lumbar spine lesions that restrict straight leg raising. It is special because when useful it can be done successfully by the patients without assistance.

Mulligan's two leg rotation (TLR) is a new technique that has been developed by DR. Brain R mulligan and colleagues-2010 and is a pain less techniques and can be tried in any patients with hamstring tightness, LBP and who has limited and painful straight leg raise. Extremely use full in patients who have a gross bilateral limitation of straight leg raising.

Gate Technique: For the following reason when the patient attempts to take his knees to the side of the limited straight leg raise the movements may stop as it has encountered a barrier like a fence. By increasing or decreasing his hip flexion, further movement takes place as if he has found a gate in the fence and gone through it. He again may encounter a further barrier (fence) and with altered hip flexion finds the next "gate" to go through and so on⁵⁴.

1.1 STATEMENT OF STUDY

Effectiveness of gate technique in improving functional activities in subject with acute nonspecific low back pain.

1.2 NEED OF STUDY

- To achieve a faster and better response
- To reduce the number of physiotherapy sittings
- To find the effectiveness of Gate technique in improving functional activities in subjects with acute nonspecific Low back pain.
- To find out the effect of conventional treatment with Gate Technique throughout in functional activities in nonspecific low back pain.

1.3 OPERATIONAL DEFINITION

1. **In the guide lines by KNGF** The term “Low Back Pain” refers to non specific low back pain which is define in as low back pain that does not have a specified physical causes such as nerve root compression (The radicular syndrome) trauma infection or the presence of tumor. This is the case in about 90% of all low back pain patients as stated in the guide KNGF lines “low back pain”.
2. **Low back pain:** Pain in the lowerback area that can relate to problems with the lumbar spine, the discs between the vertebrae, the ligaments around spine and discs, the spinal cord and nerves, muscles of the low back, internal organs of the pelvis and abdomen or the skin covering the lumbar area.
3. **Flexibility is defined by Gummerson** as “the absolute range of movement in a joint series of joints that is attainable in a momentary effort with the help of a partner or a piece of equipment”. A person’s flexibility refers to the ability of your jonts to move through a full range of motion. Having flexibility in your muscles allows for more movements around the joints and can be achieved this with a basic stretching work out. stretching after work out When the muscles are warm and piable, is a great way to increase flexibility and keep the body protected from injury. Flexibility in some joints can be increased to a certain degree by stretching .

4. **Flexibility:** A person's flexibility refers to the ability of your joints to move through a full range of motion. Having flexibility in your muscle allows for more movements around the joints and that means
 - i. Better posture.
 - ii. Less muscle tension and soreness.
 - iii. Reduced risk of injury.
 - iv. More relaxations of the mind and body.

5. **Visual Analog Scale:** The visual analogue scale or visual analog scale (VAS) is a psychometric response scale which can be used in questionnaires. It is a measurement instrument for subjective characteristics or attitudes that cannot be directly measured. When responding to a VAS item, respondents specify their level of agreement to a statement by indicating a position along a continuous line between two end-points.

Ref: Wikipedia.org

6. **Oswestry Low back Pain Disability Questionnaire:** The Oswestry Disability Index (also known as Oswestry Low back Pain Disability Questionnaire) is an extremely important tool that researchers and disability evaluators use to measure a patient's permanent functional disability. The test is considered the "gold standard" of low back functional outcome tools.

Ref: Fairbank JCT & Pynsent, PB (2000) The Oswestry Disability Index, Spine, 25 (22):2940-2953

Davidson M & Keating J (2001) A comparison of five low back disability questionnaires: reliability and responsiveness. Physical Therapy 2002:82:8-24

1.6 AIM OF THE STUDY

To find out study on effectiveness of gate techniques in improving functional activities in subjects with acute nonspecific low back pain.

1.7 OBJECTIVE OF THE STUDY

- Effectiveness of Gate Technique in acute non specific low back pain.
- Effectiveness of conventional treatment in acute non specific low back pain
- Comparison of Gate technique and conventional treatment in acute non specific low back pain

1.8 HYPOTHESIS

Alternative hypothesis (or) Experimental hypothesis

There is a significant effect of conventional treatment with gate technique and conventional treatment in improving functional activities in acute nonspecific LBP.

Null hypothesis

There is no significant effect of conventional treatment with gate technique and conventional treatment in improving functional activities in acute nonspecific LBP.

**REVIEW OF
LITERATURE**

2. REVIEW OF LITERATURE

1. **PRATIK A.PHANSOPKAR (2014)** This study ruled out the improving hamstring flexibility and functional activities in the subject of acute nonspecific low back pain using gate techniques.
2. **VIJAY KAGE (2014)** This study finds out the effect of the Mulligan two leg rotation technique in improving hamstring flexibility and functional activities
3. **J.CORNWALL (2005)** This study find out effect of the Mulligan bend leg raise technique in improving hamstring flexibility and functional activities.
4. **HALL et-al- (2006b)** Mulligan bend leg raise technique has been described as a means of improving range of straight leg raise in subjects with LBP.
5. **HALL et-al-(2006a)** He has been suggested that improving the range of SLR has a beneficial effect in restoring normal movement and reducing the degree of impairment due to low back pain.
6. **Dr.BRAIN R. MULLIGAN AND COLLEAGUES (2010)** It is a pain less technique and can be tried in any patients with hamstring tightness. Low back Pain who has limited or painful SLR. Extremely useful in patients who have a gross bilateral limitation of SLR.
7. **DEBBIE EHRMANN** Carried out study between Low back pain subgroups and gender. Assessed differences in end range lumbar flexion. Results of the study support the proposal that people with low back pain display stereotypic patterns of posture and movement.
8. **SHABANA KHAN and SHARICK SHAMSI** This study find out effect of reduction in VAS score both at rest and activity in outcome post intervention as a combination of SWD and exercise.
9. **CHRIS G MAHER, JANE LATIMER** This study finding Reduction in VAS scores both at rest and activity where motor control exercise and SWD.

10. **DAVIDSON M,KEATING JL et-al** Stated MODQ as a tool which was most reliable and responsive means to obtain responses from the patients related to their pain and daily life events out of the five low back disability questionnaires.
11. **MOHAMMAD REZA NOUR BAKHSH et-al** The phenomenon was also justified in the present study, lumbar ROM for flexion and extension in both. The groups had improvements which were statistical significant. As a result to the improvement in hamstrings flexibility there was lengthening in the muscle length which relived the pelvis of its excess posterior rotation which improved the spine pelvis biomechanical function there by providing an efficient lumbo pelvic rhythm to the lumbar range of motion.
12. **A.HURLEY MAPPSC, M.WALSH.D.Phil. (Arch phys med Rehabil (2001)** This study find out effect of IFT electrode placement technique in LBP.
13. **PATRICK M.MINDER,Bsc, SUZANNE, M.MCDONOUGH Ph D (2001)** This study findings showed that IFT electrode placement technique affects LBP-specific functional disability. Providing preliminary implications for future clinical studies.
14. **ANN P.MOORE,Ph D,DAVID G.BAXTER, Dphil (2001)** This study find out IFT to be more effective for reducing pain Acute Non specific low back pain.
15. **JORGE P.FUENTES,SUSAN ARMIJO OLIVO (2010)** Interferential current as a supplement to another intervention seems to be more efficient for reducing pain a control treatment at discharge and more effective than a place treatment at the 3-month follow up.
16. **DAVID J.MAGEE, DOUGLAS P.GROSS(2010)** This study find out to another intervention seems to be more effective for reducing musculoskeletal painful conditions compared with no treatment or placebo.

17. **HAYDEN JA, VANTULDER MW, MALMIVAARA KOES B (2005)** The type, dose or intensity and mode of delivery of exercises as well as the provision of additional interventions have a significant effect on outcomes in patients with chronic low back pain.
18. **TUDLER VAN (1997)** From his study on “Exercise and the prevention of back pain” showed that exercise normally improved the functional status in patients with chronic low back pain.
19. **NORDIN M, CAMPELLO M (1999)** From their study on “physical exercise and low back pain” they proved that exercises are beneficial for reducing pain in patients with subacute and chronic low back pain.
20. **PORTEAU-CASSARD L, ZABRANIC KIL (1999)** In their study on “A back school program at the Toulouse–purpan teaching hospital” they proved that back school intervention was helpful in preventing disability and recurrences of low back pain.
21. **TAIN T, EFAL (2000)** From this study on “The effect of trunk muscle exercises in patients with chronic low back pain” they confirmed that trunk muscle strengthening exercises are useful for increasing muscle strength and improving symptoms in patients with low back pain.
22. **SHANNON et-al and Addison et-al** Reported the functional problems associated with tight hamstrings.
23. **CHRIS MAHER, JANE LATIMER et-al** The relationship between the lumbar lordosis and short hamstring muscle in subjects with low back pain and subjects without low back pain.
24. **TOBY HALL et-al** The study where they reported increase in straight leg raise in two leg rotation technique.
25. **ALONSO J et al (2009)** made a study to examine the relationship between hamstring flexibility and knee flexion angle torque relationship. Hamstring flexibility was assessed in 20 subjects (10 men and 10 women) using straight

leg raise (SLR) and active knee extension (AKE) tests. Isometric knee flexion strength was measured at five knee flexion angles while subjects were seated with the test thigh flexed 40 degrees and the trunk flexed 80 degrees. Lower extremities were classified as tight or normal based on the SLR and the AKE tests. They concluded the study stating that angle torque relationship was shifted to the left in less flexible hamstrings such that knee flexion torque was increased at short muscle lengths and decreases at long muscle lengths when compared with more flexible hamstrings.

26. **DAVIS DS et al (2005)** studies the effectiveness of three stretching techniques on hamstring flexibility using consistent stretching parameters among 19 young adults between the ages of 21 and 35 with criteria of inclusion was tight hamstring as defined by a knee extension angle greater than 20 degrees while supine with hip flexed 90 degrees. The participants were randomly assigned to one of four groups. Group – I was self stretching, Group-II was static stretching, Group 3 was PNF incorporating the theory of reciprocal inhibition and Group 4 was control. Each group program received the same stretching dose of a single 30 second stretch 3 days per week for 4 weeks. Knee extension angle was measured before the start of stretching program, at 2 weeks and at 4 weeks. Statistical analysis revealed that all 3 stretching techniques measuring hamstring length from the baseline value during a four week training program.
27. **SPERNOGA SG et al (2001)** made a study to measure the duration of maintained hamstring flexibility after a 1 time modified hold-relax stretching protocol. 30 male subjects with average age 18.8 years with limited hamstring flexibility in the right lower extremity were selected for the study. Hamstring flexibility was measured in degrees using active knee extension test (AKET) with hip flexed 90 degrees. All subjects performed 6 warm up active knee extensions, with the last repetition serving as the pre stretch measurement. The experimental group received 5 modified (no- rotation) hold relax stretches, whereas the control group rested quietly supine on a table for 5 min, post test measurements were recorded for both groups at 0,2,4,6,8,16 and 32 min. The

results suggested that a sequence of 5 modified hold-relax stretches produced significantly increased hamstring flexibility that lasted 6 minutes after the stretching protocol ended.

28. **DENIPO GM et al (2000)** studied to determine the duration of hamstring flexibility gains as measured by an active knee extension test, after cessation of an acute static stretching protocol among 30 males subjects with age group between 18 to 23 years with limited hamstring flexibility of the right lower extremity were randomly assigned to control and experimental group. All these subjects 6 active warm up active knee extensions with the last repetition serving as the baseline comparison measurement. After warm up the experimental group performed four 30 second static stretches. Post exercise active knee extension measurements for both groups were recorded at 1,3,6,9,15 and 13 minutes. The study results suggested that 4 consecutive 30 second static stretches enhanced hamstring flexibility (as determined by increased knee extension range of motion).
29. **BANDY WD, Irion JM (1994)** studied the effect of time on static stretch on the flexibility of time on static stretch on the flexibility of hamstring muscles among 57 subjects (40 men and 17 women) from age 21 to 37 years with limited hamstring flexibility were randomly assigned to one of four groups. Three groups stretched 5 as per week for 15,30 and 60 seconds respectively. The fourth group, which served as a control group did not stretch. Measurement was determined by 90-90 hamstring flexibility test. Before and after 6 weeks of stretching, flexibility of the hamstring muscle was determined by measuring knee extension ROM with the femur maintained in 90 degrees hip flexion and analysis revealed that duration of 30 and 60 seconds of stretching were an effective time for enhancing the flexibility of the hamstring.
30. **GAJDOSIK RL et al (1993)** made a study to examine four tests passive straight leg raise (SLR) with the pelvis and opposite thigh stabilized with straps (SLR-SS), passive SLR with the low back flat (SLR-LBF), active knee extension with 90 degree hip flexion (AKE) and passive knee extension with

90 degree hip flexion (PKE) to verify the results related to the testing procedures for assessing hamstring muscle length. A dependent t-test showed no significant differences between the angles of SLR-SS and SLR-LBF. The knee flexion angles for AKE and PKE tests have significant difference. Thus the study result suggested that using different testing procedures had a minimal influence on test result.

31. **SULLIVAN MK et al (1992)** studied the effect of pelvic positions and stretching method on hamstring flexibility among 20 subjects who were randomly divided in 2 testing positions, Anterior Pelvic Tilt (APT) and Posterior Pelvic Tilt (PPT). Each subject then performed 8 sessions using PNF on one leg and static stretch on the other leg while maintaining the pelvis in the assigned position. Hamstring flexibility was assessed with active knee extension test (AKET). A two way ANOVA results revealed that APT group significantly increased hamstring flexibility and results suggested that APT position was more important than stretching method for increasing hamstring flexibility.

DESIGN AND METHODOLOGY

3. DESIGN AND METHODOLOGY

3.1 STUDY DESIGN

The study design was pretest and posttest experimental study design

3.2 SAMPLING TECHNIQUE

Convenient sampling technique

3.3 SAMPLE SIZE

Thirty patient were selected

3.4 SAMPLING CRITERIA

Inclusion criteria

- Age group of 25-40, both male and female
- LBP with no specific pathology
- Limitation range of SLR
- Pain/Paresthesia in the lumbar spine with a distribution of symptoms that has extended distant to the gluteal fold on at least one lower extremity
- LBP less than 6 weeks
- Oswestry disability score at least 20%
- At least one of the following signs of nerve root compression
- Positive ipsilateral or contralateral SLR (reproduction of legs symptoms with SLR < 70%)
- Sensory deficit of pin prick on the ipsilateral lower extremity

- Diminished strength of a myotome (Hip flexion, knee Extension, Ankle dorsiflexion, Great toe extension or Angle eversion of the ipsilateral lower extremity).
- Diminished lower extremity reflex (quadriceps or Achilles of the symptomatic lower extremity)

Exclusion criteria

- Unstable medical conditions
- Un cooperative patients
- Patients suffering from psychological or psychiatric disorder
- Red flags such as tumor metabolic disease RA osteo porosis spinal compression fracture prolonged history of steroid use
- Central nervous system involvement such as cauda equine syndrome (ie) Loss of bowel/bladder control or saddle region paresthesia or the presence of pathological reflexes (ie) positive babinski
- Complete absence of low back and leg symptoms when seated
- Recent surgery (<6 months) to the lumbar spine
- Recent (<2 weeks) epidural steroid injection for LBP
- Current pregnancy
- In ability to complete with the treatment schedule

3.5 STUDY POPULATION

Patients who are having acute nonspecific low back pain and who fulfill the inclusion criteria were included in this study.

3.6 STUDY SETTING

1. Kumaran Multi Speciality Hospital (46 1st avenue, Ashok Nagar, Chennai-600083)
2. Madha Medical College (Kovur, Chennai - 600122)

3.7 STUDY DURATION

This study is conducted for a period of two weeks.

3.8 VARIABLES OF THE STUDY

INDEPENDENT VARIABLES

- IFT
- Exercise
- Gate technique

DEPENDENT VARIABLES

- Pain
- Functional ability

PARAMETERS

- VAS
- MODQ

3.9 MATERIALS

1. IFT
2. Couch
3. Pillows
4. Consent Forms

5. Data Collection Sheet

6. Cotton

7. Gel

3.10 METHODOLOGY

The subjects of both control group and experimental group were involved for pretest and posttest.

Participants

Subjects eligible for the study if they were aged between 25 and 40 years and must have reported LBP with or without the presence of associated lower extremity – pain that had an average intensity of greater than 4 on VAS. In addition all subjects had to have a score of greater than 20% on the MODI questionnaire.

Sampling procedure

After setting approval from ethical committee, the patients were selected depending upon the various inclusion and exclusion criteria. All the samples who were diagnosed as Acute Non Specific Low back pain were participated in this study. Then the procedures were explained to the selected patients and then informed consent was obtained from all the patients.

Based on eligibility criteria subjects were included by simple random method and these subjects were randomly divided into two groups. Prior informed consent forms were signed by every subject included. All the subjects were explained about need for the documentation, procedure for the measurements and the treatment procedure. Baseline measurements prior the treatment was conducted that is VAS for pain and MODQ for functional disability index, core muscle strength and these outcomes were again assessed on 15th day post treatment.

The subjects of control group were given conventional therapy and experimental group were given gate technique and conventional therapy.

Allocation of group

The total number of subjects in the study were N=30 in the age group of 25-40 years. The total number of subjects in each group is 15.

TREATMENT PROCEDURE

GROUP A

Subjects received IFT for the low back region for treatment time 15 min. Mulligans TLR technique, motor control exercises.

Motor control exercise

Subjects in both groups received motor control exercises.

Goal of the therapeutic exercise program is the achievement of an optimal level of symptom-free movement during basic to complex physical activities with 10 seconds hold and 15 repetitions each 1 session / day for 15 days.

1. **Patient position and procedure-** Hook lying. Have the patient first bring one knee and then the other toward the chest, clasp the hands around the thighs and pull them to the chest, elevating the sacrum of the mat.
2. **Patient position and procedure-**Supine lying abdominal draw in with leg lifts (one by one)
3. Abdominal draw in with bridging.
4. The curl up exercise to strengthen the abdominal muscles.

The thorax is flexed on the lumbar spine

The arms are shown in the position for least resistance.

Lift the head, progress by lifting the shoulders until the scapulae and thorax clear the mat, keeping the arms horizontal.

5. Patients position and procedure- Prone, with hands placed under the shoulders. Have the patient extend the elbows and lift the thorax up off the mat but keep the pelvis down on the mat.(prone using a press up)

6. Patient position and procedure-Prone with hands at the side. Lift the head and trunk.
7. Patient position and procedure-Prone with hands at the side. Lift the head and trunk with leg lifting(single leg alternatively)
8. Patient position and procedure
 - a. Quadruped (on hands and knees)

The patient performs a posterior pelvic tilt without rounding the thorax
9. Quadruped position and progress extending one lower extremity (LE) with leg slide.
10. Quadruped position and progress extending one lower extremity by lifting it off the mat.
11. Quadruped position and progress flexing one upper extremity while extending contra lateral lower extremity and then alternate to opposite extremities.
12. Patient position and procedure- Standing with the hands placed in the low back area. Instruct the patient to lean backward.

Mulligan's Two Leg Rotation: (Gate Technique)

Patients lies supine and grips the side of the plinth with his hand. Both legs are now flexed so that the feet are off the plinth. Keeping his shoulders on the bed he takes his leg slowly to the side of the limited straight leg raise. He must feel no pain. If painful he alters the degree of flexion at the hips(more or less) to see if this enables further pelvic rotation his limb. It usually will but he may again find further progress painful. If so, again alter the degree of flexion at the hips and see if further progress may be made with the rotation. When he reaches his limit the position is sustained for 30 seconds repeat for 5 repetitions and 1 minute rest between each stretch. And same procedure is done for the other side of limited hamstrings flexibility. Returning to a crook lying position he then places first one leg and then the other out straight on the bed.



**THE ABOVE PICTURE ILLUSTRATES THE IFT TREATMENT
FOR GROUP A AND GROUP B**



THE ABOVE PICTURE SHOWS THE GATE TECHNIQUE

GROUP B

Subjects received IFT for the Lower back region for the treatment time 15 minutes, motor control exercises

Motor control exercise

Subjects in both groups received motor control exercises.

Goal of the therapeutic exercise program is the achievement of an optimal level of symptom-free movement during basic to complex physical activities with 10 seconds hold and 15 repetitions each 1 session / day for 15 days.

1. Patient position and procedure- Hook lying. Have the patient first bring one knee and then the other toward the chest, clasp the hands around the thighs and pull them to the chest, elevating the sacrum of the mat.
2. Patient position and procedure-Supine lying abdominal draw in with leg lifts (one by one)
3. Abdominal draw in with bridging.
4. The curl up exercise to strengthen the abdominal muscles.

The thorax is flexed on the lumbar spine

The arms are shown in the position for least resistance.

Lift the head, progress by lifting the shoulders until the scapulae and thorax clear the mat, keeping the arms horizontal.

5. Patients position and procedure- Prone, with hands placed under the shoulders. Have the patient extend the elbows and lift the thorax up off the mat but keep the pelvis down on the mat.(prone using a press up)
6. Patient position and procedure-Prone with hands at the side. Lift the head and trunk.
7. Patient position and procedure-Prone with hands at the side. Lift the head and trunk with leg lifting(single leg alternatively)

8. Patient position and procedure

a. Quadruped (on hands and knees)

The patient performs a posterior pelvic tilt without rounding the thorax

9. Quadruped position and progress extending one lower extremity (LE) with leg slide.
10. Quadruped position and progress extending one lower extremity by lifting it off the mat.
11. Quadruped position and progress flexing one upper extremity while extending contra lateral lower extremity and then alternate to opposite extremities.
12. Patient position and procedure- Standing with the hands placed in the low back area. Instruct the patient to lean backward.



**THE ABOVE PICTURE ILLUSTRATE ONE OF THE CONVENTIONAL
EXERCISES FOLLOWED FOR LBA**

Outcome Measures

1. Pain intensity

Pain score of the subjects involved in this study were recorded by using the visual analogue scale (VAS). VAS is a 10 cm straight line drawn on a paper marked with numbers 0-10 where 0 symbolized no pain and 10 symbolized the worst tolerable pain and subjects were asked to mark a point on this line as per the severity to his/her pain which indicates present pain level.

2. Modified Oswestry Disability Scale (MODS)

Percentage of functional disability was calculated by Modified Oswestry Disability Scale (MODS).

The Oswestry Disability Index (also known as the oswestry low back pain disability questionnaire) is an extremely important tool that researchers and disability evaluators use to measure a patients permanent functional disability. The test is considered the 'gold standard' of low back functional outcome tools. A well validated self-report questionnaire designed for low back pain contains 10 sections. For each sections the possible score is 5.If the first statement is marked the section score is 0.If the last statement is marked the section score is 5.Total score is calculated in percentage, where better functions are indicated by lower scores.

PROTOCOL

Group 1

- IFT
- Gate technique
- Motor control exercise

Group 2

- IFT
- Motor control exercise

Group 1-15 subjects

- IFT- 15 min 2 weeks 1 session per day
- Gate Technique – sustain the position for 30 seconds - 5 repetitions - 1 minute rest between each stretch.
- Motor control exercise

Group 2- 15 subjects

- IFT -15 min 2 weeks 1 session per day
- Motor control exercise

DATA ANALYSIS

4. DATA ANALYSIS

STATISTICAL METHOD

The following statistical tools were employed to analyze the data and testing of hypothesis. Data analysis was done using SPSS Software version (16.0)

The scores were obtained by using VAS and MODQ. All the dependent variables between the groups A and B was analyzed using independent “t” test. Statistical significance was set at (p<0.05) level.

$$1. \quad \text{Mean } X = \frac{\sum x}{n}$$

$$2. \quad \text{Standard Deviation } SD = \sqrt{\frac{\sum (x - \bar{x})^2}{n - 1}}$$

$$3. \quad \text{Paired “t” test} = \frac{\bar{d} \sqrt{n}}{SD}$$

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

$$\bar{d} = \frac{\sum d}{n} \quad \text{Where,}$$

n = number of samples SD =Standard deviation D = Mean difference

$$4. \quad \text{Independent t -test } t_{\text{cal}} = \left| \frac{(x_1 - x_2)}{SE} \right|$$

$$SE = S \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}$$

$$\text{Where } S = SE \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}}$$

n₁, n₂ = Size of the samples of two groups

TABLE 4.1
COMPARISON OF PRETEST AND POSTTEST VALUES OF
VAS AND MODQ IN GROUP A

GROUP A						
VARIABLE	Pretest			Posttest		
	Mean	SD	Std. Error Mean	Mean	SD	Std. Error Mean
VAS	7.2	0.775	0.200	2.93	0.96	0.248
MODQ %	47.07	9.939	2.566	19.07	5.133	1.325

VAS

The VAS mean value of VAS in post test score 2.93 with Std.Deviation 0.96 Std.Error Mean 0.248 which is less than mean value of pretest score Mean 7.20 with SD = 0.775 and Std.Error Mean 0.200.

MODQ

The Mean value of MODQ in post test score 19.07 with SD 5.133 and Std.Error Mean 1.325 which is less than Mean value of pretest score 47.07 with SD 9.939 and Std.Error Mean 2.566

TABLE 4.2
COMPARISON OF PRETEST AND POSTTEST VALUES OF
VAS AND MODQ IN GROUP B

GROUP B						
VARIABLE	Pretest			Posttest		
	Mean	SD	Std. Error Mean	Mean	SD	Std. Error Mean
VAS	6.67	0.976	0.252	4.07	0.961	0.248
MODQ %	46.27	11.535	2.978	26.53	10.106	2.609

VAS

The VAS mean value of VAS in post test score 4.07 with Std.Deviation 0.961 Std.Error Mean 0.248 which is less than mean value of pretest score Mean 6.67 with SD = 0.976 and Std.Error Mean 0.252.

MODQ

The Mean value of MODQ in post test score 26.53 with SD 10.106 and Std.Error Mean 2.609 which is less than Mean value of pretest score 46.27 with SD 11.535 and Std.Error Mean 2.978

TABLE 4.3
COMPARISON OF PRETEST AND POSTTEST VAS SCORES
IN GROUP A AND GROUP B

VAS	Group A		Group B		t-Test	P- Value
	MEAN	SD	MEAN	SD		
PRE	7.20	0.775	6.67	0.976	1.511	0.131
POST	2.93	0.96	4.07	0.961	2.848	0.004

Note * denotes very significant if p value ≤ 0.05

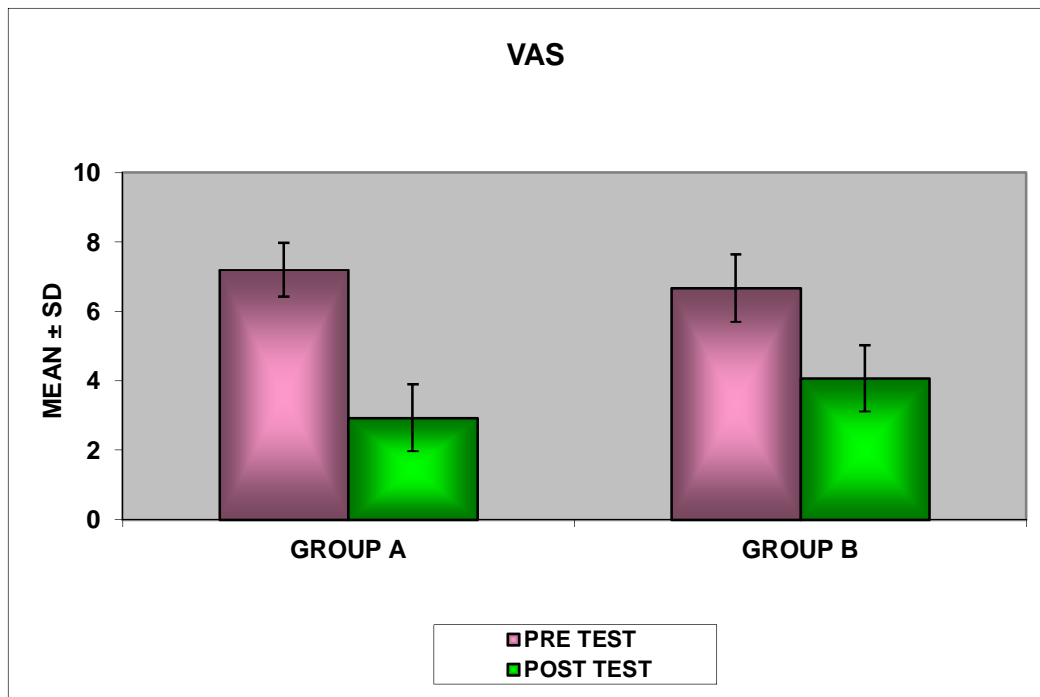
SD Standard Deviation

INTERPRETATION

Table 4.3 shows the comparison of pre and post intervention data of **Visual Analogue scale scores** between groups along with the results of statistical tests. Pre-test **VAS scores** of Group –A and Group – B were 7.2 (SD-.775) and 6.67 (SD-.976). Post Test **VAS scores** of Group – A and Group – B were 2.93(SD-0.96) and 4.07(SD-0.961).

GRAPH 4.1

GRAPHICAL REPRESENTATION OF PRE TEST AND POST TEST OF VISUAL ANALOG SCALE IN GROUP A AND GROUP B



The graph above shows that there is a marked decrement in the percentage of VAS scores. The mean total pain score has decreased from group A 7.2 to 2.93 group B 6.67 to 4.07.

TABLE 4.4
COMPARISON OF PRE AND POST TEST MODI SCORE (%)
IN GROUP A AND GROUP B

MODQ	Group A		Group B		t-Test	P- Value
	MEAN	SD	MEAN	SD		
PRE	47.07	9.939	46.27	11.535	0.203	0.840
POST	19.07	5.133	26.53	10.106	2.551	0.016

Note- * denotes very significant if p value= <0.05

SD Standard Deviation

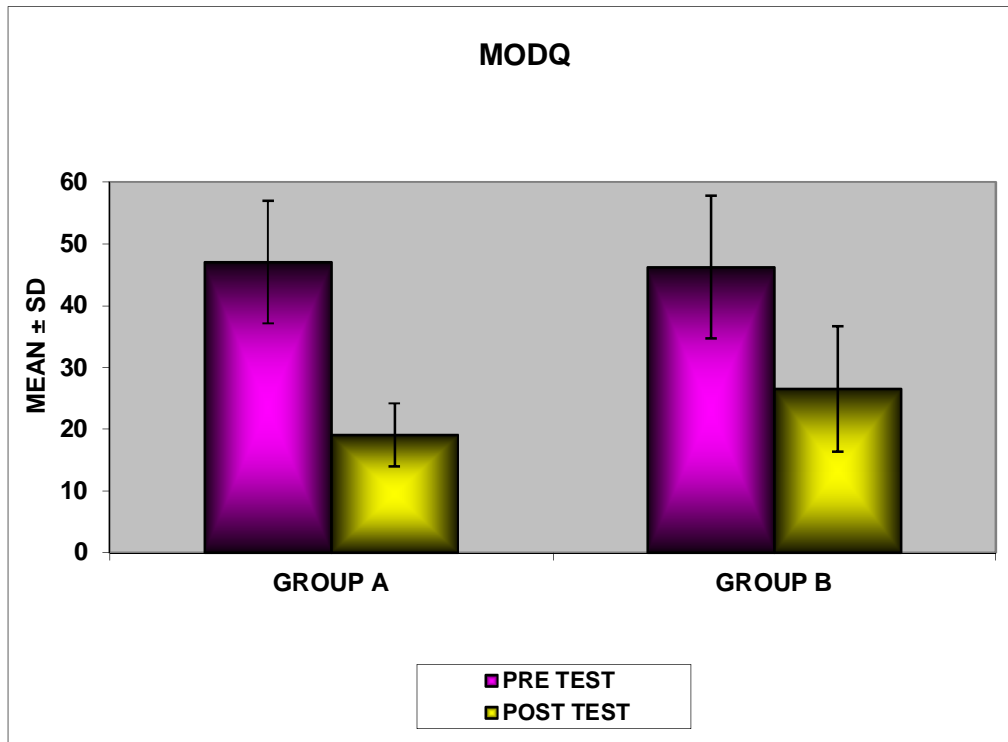
INTERPRETATION

Modified Oswestry Disability Questionnaire (MODQ)

Table 4.4 shows the comparison of pre and post intervention data of **MODQ scores** between groups along with the results of statistical tests. Pre-test **VAS scores** of Group –A and Group – B were 47.07 (SD-9.939) and 46.27 (SD-11.535). Post Test **VAS scores** of Group – A and Group – B were 19.07 (SD-5.133) and 26.53 (SD-10.106).

GRAPH 4.2

GRAPHICAL REPRESENTATION OF PRE TEST AND POST TEST OF MODIFIED OSWESTRY DISABILITY INDEX IN GROUP A AND GROUP B



The graph above shows that there is a marked decrement in the percentage of modified disability index scores. The mean total disability score has decreases from Group A 47.07 to 19.07, Group B 46.27 to 26.53.

RESULT AND DISCUSSION

5. RESULT AND DISCUSSION

5.1 RESULTS

While comparing the posttest values of control group and experimental group using independent “t” test the calculated value is by using VAS, MODQ scale. Since the alternate hypothesis is accepted, which shows there exists a significant difference between the posttest values of two groups.

Data was computed and analyzed using spss (statistical package for social science) software version 16. Mean and standard deviation were calculated for pre and 15th post treatment data for all the outcome measures in both the groups. Test of significance namely paired ‘t’ test, Mann whitney tests were used to compare the data level of significance was set up at $p < 0.005$. Inter and intra group differences were compared to evaluate the effectiveness of the treatment protocols given to the two groups.

Statistical Analysis it was clear that between group mean value of pain and MODQ. Total score sure for group A significant for group B were the intervention was gate technique very useful to improve the functional activities.

The independent T test perform between the groups clearly prove that there as significant difference between the group. T- value 2.84 ,p- value .004 for pain and MODQ score 2.55 p-value .016 shows as a correct value.

The result shows gate technique will be more effect Intervention in improving functional activities.

5.2 DISCUSSION

The study shows as effectiveness of gate technique for treating the Nonspecific low back pain subjects. The gate technique improves the muscle flexibility and endurance of back and thigh muscles.

The present study was conducted to compare the effectiveness of mulligans TLR technique with conventional therapy and conventional therapy for reducing pain and functional activities in acute nonspecific low back pain.

There are lot of researches made in the past, which are mentioned below, also discussed different techniques followed to reduce the pain and increase the functional activities as discussed in the present study.

Mulligans two leg rotation technique (TLR) is a new technique that has been developed by DR.BRAIN R MULLIGAN AND COLLEAGUES (2010) and is a painless technique and can be tried in any patients with hamstring tightness and functional limitation due to low back pain and who has limited and or painful straight leg raise (SLR).It can be extremely useful in patients who have a gross bilateral limitations of straight leg raising.

MOHAMMED REZANOURBAKSH ET AL, the relationship between lumbar lordosis and short hamstring muscle in subjects with low back pain and subjects without low back pain. In the present study lumbar ROM flexion and extension in both the groups had improvement which were statistically significant. As a result to the improvements in hamstring flexibility there was lengthening in the muscle length which relieved the pelvis of its excess posterior rotation which improved the spine pelvis biomechanical function there by providing a efficient lumbo pelvic rhythm to the lumbar range of motion.

Tight hamstrings usually start as early at the age of 5 or 6 years when children start their seated school careers intensity of tightness increases at adolescents and peaks at 25 years when an individual involves in profession or gets occupationally linked.

GRENIER SG: Defined the age group to be 21 to 37 years. When one sits in a standard chair, some important postural control muscles are inactivated, while others are being asked to work overtime. The findings of this study correlated with above references since maximum number of subjects were in the age group of 18 to 35 years.

DEBBIE EHRMANN carried out a study between low back pain subgroups and gender, assessed differences in end range lumbar flexion. Results of the study support the proposal that people with low back display stereotypic patterns of posture and movement.

As a person advances through life, the structure and composition of skeletal muscle changes. Improving connective tissue compliancy and increasing the number of serial sarcomeres are both major contributing factors in musculoskeletal flexibility and are influenced by slow, low intensity and long duration stretches.

TAYLOR ET AL studied the viscoelastic behavior of the muscle tendon unit in animal model and found that after four stretches there was a little alteration of the muscle tendon unit, implying that a minimum number of stretches will to most at elongation in repetitive stretching.

TOBY HALL ET AL While the AKE measurement reported for TLR technique group were also considerably moves as compares to those.

DAVIDSON M KEATING JL ET AL Stated MODQ as a tool which was most reliable and responsive means to obtain responses from the patients related to their pain and daily life events out of five low back disability questionnaires.

Visual Analogue Scale is a reliable tool for acute as well as chronic pain. In the present study intergroup VAS reduction group A reporting better improvements.

CHRIS GMANER, JANE LATIMER ET AL where motor control exercise and SWD were given in combination to one group and the group that only received SWD, better outcome post intervention.

SHABANA KHAN AND SHARICK SHAMI studied the reduction of VAS scores both at rest and activity are in study which had better outcome post intervention as a combination of SWD and exercise.

SHANNON ET AL AND ADDISON ET AL reported the functional problems associated with tight hamstrings and hence with the results obtained from the present study, suggest to have a beneficial role in restoring the normal functional body mechanics to provide a healthy lower back. The attachments of hamstrings to the ischial tuberosity, hamstring tightness generates posterior pelvic tilt and decreases lumbar lordosis, result LBA.

DEIRDRE A HURLEY Recent surveys of the physio therapeutic management of LBP in Britain, Ireland, the united states and Canada found that a range of mobilization, active exercise and electrical stimulation (Interferential therapy IFT).

JORGE P.FUENTES: Interferential current as a supplement to another intervention seems to be more effective for reducing pain.

SUMMARY AND CONCLUSION

6. SUMMARY AND CONCLUSION

6.1 SUMMARY

This study aims to find out the effectiveness of gate technique on acute nonspecific low back pain patients. Pretest and post test scores were recorded for both control and experimental group. Control group patients were treated conservatively and experimental group were treated with gate technique with treatment as like conservatively. MODQ and VAS scale is used to evaluate for pre and post test scores. Analysis of recorded scores was tabulated and by using paired “t” test and independent “t” test data were analyzed.

The results of this study show statistically that the experimental group is more significant than control group.

6.2 CONCLUSION

The present study results demonstrates that the treatment technique that are effective in reducing pain and increasing functional activities in subjects with acute nonspecific low back pain in terms of pain, range of motion and functional disability.

LIMITATIONS AND SUGGESTIONS

7. LIMITATIONS AND SUGGESTIONS

7.1 LIMITATIONS

- Only a small group could be used for this study.
- Patients were selected on basis of symptomology
- Subjects could not be followed up after the study.
- Study is conducted only for a short period of time
- Protocol includes gate technique, IFT, exercise so results are combination effects of techniques and exercise.
- Sample size is small.

7.2 SUGGESTIONS

The causes of unspecific low back pain and its link to hamstring shortening and muscular imbalance has been widely accepted by physical therapists, but there is lack of scientific evidence to support this view.

Changed stress level, other psychological and/or physiological changes could have influenced the outcome of the study. In order to receive a higher validation of the outcome. It would be useful to repeat the study with a larger amount of subjects to be tested for a longer period of time as well as with an improved method for the control of quality and quantity of the exercises.

Studies with longer follow up period are recommended so that long term benefits can be assessed.

A Larger sample size should be taken to conduct future studies.

Further studies are recommended to conduct on subjects having chronic low back pain due to hamstring muscle tightness and core muscle weakness.

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APPENDIX

APPENDIX-I

CASE ASSESSMENT PROFORMA

CASE NO :

NAME :

SEX :

ADDRESS :

DATE OF ADMISSION :

DATE OF EVALUATION :

HISTORY :

ON OBSERVATION :

ON PALPATION :

ON EXAMINATION :

TREATMENT :

MEASUREMENT TOOLS :VAS & MODQ

S.NO	PRE TEST	POST TEST

Signature of physical therapy student

APPENDIX-II

INFORMED CONSENT FORM

TITLE: “EFFECTIVENESS OF GATE TECHNIQUE IN IMPROVING FUNCTIONAL ACTIVITIES IN SUBJECT WITH ACUTE NON SPECIFIC LOW BACK PAIN”

INVENSTIGATOR

PURPOSE OF THE STUDY

I, have been informed that this study will work towards achieving the normal function 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 and I have to take this treatment for two weeks.

I understand that this will be done under therapist's 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 for teaching purpose 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 he will accompany me during this procedure. There are no known hazards associated with this procedure.

REFUSAL OR WITHDRAWL OF PARTICIPATION

I understand that the decision my participation is wholly voluntary and I may refuse participate, may withdraw consent at any time during this study.

I also understand that the investigator may terminate my participation in the study at any time after he has explained me the reasons to do so.

Ihave 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 has explained me the purpose of the research, the study procedure and the possible risk and benefits that I may experience and i have understood this consent to participate as a subject in this research dissertation.

.....

Subject

.....

Date

.....

Signature of the Witness

.....

Date

APPENDIX –III

MASTER CHART

Group A

GROUP	VAS - PRE TEST	VAS - POST TEST	MODQ - PRE TEST	MODQ - POST TEST	VAS - DIFFERENCE	MODQ - DIFFERENCE
GROUP A	7	3	42	20	4	22
GROUP A	7	4	42	20	3	22
GROUP A	8	3	44	19	5	25
GROUP A	6	2	34	12	4	22
GROUP A	8	5	42	18	3	24
GROUP A	8	4	54	20	4	34
GROUP A	6	2	46	15	4	31
GROUP A	8	3	68	19	5	49
GROUP A	7	3	38	17	4	21
GROUP A	6	2	56	28	4	28
GROUP A	7	2	34	10	5	24
GROUP A	7	4	40	15	3	25
GROUP A	8	3	56	25	5	31
GROUP A	7	2	60	28	5	32
GROUP A	8	2	50	20	6	30

Group B

GROUP	VAS - PRE TEST	VAS - POST TEST	MODQ - PRE TEST	MODQ - POST TEST	VAS - DIFFERENCE	MODQ - DIFFERENCE
GROUP B	8	6	54	31	2	23
GROUP B	7	4	46	30	3	16
GROUP B	8	5	58	35	3	23
GROUP B	7	5	42	25	2	17
GROUP B	6	4	60	43	2	17
GROUP B	5	3	40	20	2	20
GROUP B	8	4	74	50	4	24
GROUP B	7	4	42	20	3	22
GROUP B	7	5	52	30	2	22
GROUP B	7	4	42	19	3	23
GROUP B	6	3	32	12	3	20
GROUP B	7	4	46	20	3	26
GROUP B	5	2	38	20	3	18
GROUP B	6	4	36	22	2	14
GROUP B	6	4	32	21	2	11

APPENDIX –IV

OSWESTRY LOW BACK PAIN DISABILITY QUESTIONNAIRE

Scoring: Total score / Total possible score x 100 = Percentage of score %

Interpretation of Scores 0% to 20% Minimal disability:	The patient can cope with most living activities. Usually no treatment is indicated apart from advice on lifting sitting and exercise.
21% - 40% Moderate disability:	The patient experiences more pain and difficulty with sitting, lifting and standing. Travel and social life are more difficult and they may be disabled from work. Personal care, sexual activity and sleeping are not grossly affected and the patient can usually be managed by conservative means.
41%-60% Severe disability	Pain remains the main problem in this group but, activities of daily living are affected. These patients require a detailed investigation
61%-80%: Crippled	Back pain impinges on all aspects of the patient's l

Section 1 – Pain Intensity

- I have no pain at the moment
- The pain is very mild at the moment
- The pain is moderate at the moment
- The pain is fairly severe at the moment
- The pain is very severe at the moment
- The pain is the worst imaginable at the moment

Section 2- Persons care (washing, dressing etc.)

- I can look after myself normally without causing extra pain
- I can look after myself normally but it causes extra pain
- It is painful to look after myself and I am slow and careful
- I need some help but manage most of my personal care
- I need help every day in most aspects of self-care
- I do not get dressed, I wash with difficulty and stay in bed

Section 3 – Lifting

- I can lift heavy weights without extra pain
- I can lift heavy weights but it gives extra pain
- Pain prevents me from lifting heavy weights off the floor, but I can manage if they are conveniently place e.g. on a table
- Pain prevents me from lifting heavy weights, but I can manage light to medium weights if they are conveniently positioned.
- I can lift very light weights
- I cannot lift or carry anything at all

Section 4 – Walking

- Pain does not prevent me walking any distance
- Pain prevents me from walking more than 1 mile
- Pain prevents me from walking more than ½ mile
- Pain prevents me from waling more than 100 yards
- I can only walk using a stick or crutches
- I am in bed most of the time.

Section 5 – Sitting

- I can sit in any chair as long as I like
- I can only sit in my favourite chair as long as I like
- Pain prevents me sitting more than one hour
- Pain prevents me from sitting more than 30 minutes
- Pain prevents me from sitting more than 10 minutes
- Pain prevents me from sitting at all

Section 6 – Standing

- I can stand as long as I want without extra pain
- I can stand as long as I want but it gives me extra pain
- Pain prevents me from standing for more than 1 hour
- Pain prevents me from standing for more than 30 minutes
- Pain prevents me from standing for more than 10 minutes
- Pain prevents me from standing at all

Section 7 – Sleeping

- My sleep is never disturbed by pain
- My sleep is occasionally disturbed by pain
- Because of pain I have less than 6 hours sleep
- Because of pain I have less than 4 hours sleep
- Because of pain I have less than 2 hours sleep
- Pain prevents me from sleeping at all

Section 8 – Sex life (if applicable)

- My sex life is normal and causes no extra pain
- My sex life is normal but causes some extra pain
- My sex life is nearly normal but is very painful
- My sex life is severely restricted by pain
- My sex life is nearly absent because of pain
- Pain prevents any sex life at all

Section 9– Social life

- My social life is normal and gives me no extra pain
- My social life is normal but increases the degree of pain
- Pain has no significant effect on my social life apart from limiting my more energetic interests e.g. sport. Pain has restricted my social life and I do not go out as often
- Pain has restricted my social life to my home
- I have no social life because of pain

Section 10 – Travelling

- I can travel anywhere without pain
- I can travel anywhere but it gives me extra pain
- Pain is bad but I manage journeys over two hours
- Pain restricts me to journeys of less than one hour
- Pain restricts me to short necessary journeys under 30 minutes
- Pain prevents me from travelling except to receive treatment

*** Previous Treatment**

Over the past three months have you received treatment, tablets or medicines of any kind for

Your back or leg pain?

Please tick the appropriate box.

- No
- Yes (If yes please state the type of treatment you have received)

APPENDIX –V

VISUAL ANALOG SCALE

The visual analogue scale or visual analog scale (VAS) is a psychometric response scale which can be used in questionnaires. It is a measurement instrument for subjective characteristics or attitudes that cannot be directly measured. When responding to a VAS item, respondents specify their level of agreement to a statement by indicating a position along a continuous line between two end-points.

Ref: Wikipedia.org

Numerical Rating scale (NRS)

Instruct the patient to choose a number from 0 to 10 that best describes their current pain.

0- Would mean “No Pain” and 10- would Mean “Worst Possible pain”.

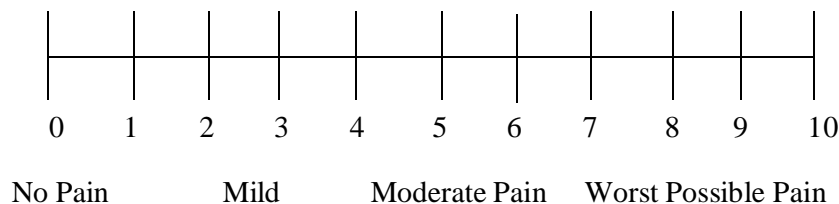
The Numeric Pain Rating Scale Instructions

General Information

The patient is asked to make three pain ratings, corresponding to current, best and worst pain experienced over the past 24 hours. The average of the 3 ratings was used to represent the patient’s level of pain over the previous 24 hours.

Patient Instructions (adopted from (McCaffery, Beebe et al. 1989):

“Please indicate the intensity of current, best, and worst pain levels over the past 24 hours on a scale of 0 (no pain) to 10 (worst pain imaginable)”



Reference: McCaffery, M., Beebe, A., et al. (1989). Pain: Clinical manual for nursing practice, Mosby St. Louis, MO