COMPARISON OF EFFECT OF MCKEINZE APPROACH AND MOTOR CONTROL EXERCISE IN PATIENTS WITH SUB ACUTE LOW BACK ACHE

Dissertation submitted to
The Tamil Nadu Dr. M. G. R. Medical University
Chennai

In partial fulfillment of the requirements for the degree of
MASTER OF PHYSIO THERAPY
(ADVANCED PHYSIO THERAPY IN ORTHOPAEDICS)

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COLLEGE OF PHYSIOTHERAPY
SRI RAMAKRISHNA INSTITUTE OF PARAMEDICAL SCIENCES
COIMBATORE - 641 044.
I. INTRODUCTION

Low back pain is a common disorder. Nearly everyone is affected by it at some time. For most people affected by low back pain substantial pain or disability is short lived and they soon return to normal activities regardless of any advice or treatment they receive. A small proportion, however, develop chronic

Back pain can be acute, sub acute, or chronic. Acute back pain develops suddenly and lasts up to several weeks. Acute pain is the most common type of back pain. Sub acute back pain is pain that lasts up to 3 months. Chronic back pain can begin abruptly or gradually, but it lasts longer than 3 months.

Most of the patients with acute or sub acute lower back pain recover completely over a few weeks without of any treatments. 60% of patients recover after seven weeks, without any treatments they receive. A recent study found that almost 30% of patients did not recover from the presenting episode of back pain within a year. For those patients whose low back pain become to chronicity, it is rarely a self limiting, as 10% of those patients whose low back pain becomes chronic had reports no pain five years later.
Back pain can occur in any area of the back, but it is more common in the lower back, which supports most of the body's weight. Etiology of lower back pain is varied. Most commonly due to a sprain or strain in the muscles and soft tissues of the back. Over activity of back can lead to an injury to ligament which in leads to pain. Other causes like an injury occur to one of the inter vertebral discs prolapsed (disc tear, disc herniation), spondylitis. Due to aging, discs begin to diminish and shrink in size or dehydration of disc occur which resulting the vertebrae and facet joints rubbing against one another. Spondylolisthesis, which causes slipping of the vertebrae, Pain is also occurs due to lumbar spinal canal stenosis, sciatica and scoliosis. At the lower end of the spine, some patients experience tailbone pain (coccydynia). Others may have pain from their sacroiliac joint, where the spinal column attaches to the pelvis, called sacroiliac joint dysfunction. Physical causes may include osteoarthritis, rheumatoid arthritis, degeneration of the discs between the vertebrae or a spinal disc herniation, a vertebral fracture (such as from osteoporosis), or rarely, an infection or tumor.
Recent research has reported that in most low back pain cases, after any injury to back certain muscles of the back that stabilize the spine are reflexively inhibited (shutdown). These muscles suddenly will not recover even after the patients recover from back pain and return to normal activity levels, so muscular dysfunction occurs. These specific core muscles that work together to support and stabilize the spine to help for preventing low back pain. The main muscles that include are lumbar multifidus and the transversus abdominis.

**Lumbar Multifidus and Transversus Abdominis**

The deeper layer muscles of the back are lumbar multifidus and transversus. Their attachments are from the vertebral arches to the spinous processes. Multifidi connects one to three vertebrae of spine.
and were controlling movement between the vertebrae. The transversus abdominus muscle is a deep abdominal muscles group which stabilizes the spine. Transverse abdominus is the most important abdominal muscle. In patients with sub acute or chronic back pain, these muscles found to be in a weakened state. Transverse abdominus muscle and lumbar multifidus acts together to make a deep internal corset, which acts to stabilize the spine during movement and activity. This pattern of spinal protection is disrupted low back pain patients.

The reason for dysfunction of these muscles after low back injury is uncertain. Specific exercises for the contraction of these two core muscles together will help in improve the protective stabilizing function of the spinal muscles. This helps in the reduction of pain intensity, and improves overall activities of daily living as well as the posture and body awareness during activities.

**MCKENZIE EXERCISE**

McKenzie approach is by the identification of movement which reduces the Pain or brings about its centralization from the basis of exercise therapy (movement therapy).
The McKenzie Method is not just extension exercises. It is a comprehensive approach to the spine based on good principles. They must be understood and followed correctly to be successful. McKenzie treatment prescribes a series of individualized exercises. In the end, most patients can successfully treat themselves when provided with the necessary knowledge and tools. The McKenzie Method is based on finding a cause and effect relationship between the positions the patient usually has while sitting, standing or moving, and the generation of pain as a result of those positions or activities. The therapy requires a patient to move through a series of activities and test movements to gauge the patient’s pain response. The approach then uses that information to develop an exercise program designed to centralize or alleviate the pain.

The McKenzie Assessment is a comprehensive and logical step-by-step process to evaluate the patient's problem quickly. This mechanical examination classifies most patient conditions by the level of pain or limitation that results from certain movements or positions. Patients doing McKenzie exercises may minimize or abolish their localized pain which is often acute or chronic. Patients can achieve centralization over the course of daily prescribed exercises.
**MOTOR CONTROL EXERCISES**

Motor control exercise was developed based on the principle that individuals with LBP have a lack of control of the trunk muscles. The idea is to use a motor learning approach to retrain the optimal control and coordination of the spine. The intervention involves the training of pre activation of the deep trunk muscles, with progression toward more complex static, dynamic, and functional tasks integrating the activation of deep and global trunk muscles.

Motor control exercise, also known as *specific stabilization exercise*, is a new form of exercise for back pain. The exercise focuses on regaining control of the trunk muscles mainly *transversus abdominis and multifidus*, which support and control the spine, patients with low back pain have shown they are unable to properly control these muscles. Through motor control exercise, patients are taught how to isolate and "switch on" these muscles and then incorporate these movements into their normal activities.

Motor control exercise is different from going to the gym or going for a walk," explained Macedo." The program relies upon a skilled clinician, such as a physical therapist, identifying the specific trunk muscles that are a problem and then working closely with patients to teach them how to get the muscles working properly again. The patient first learns to control these muscles in simple postures,
then later in more challenging activities. The ultimate goal is for the patient to get the muscles to work to control and support the spine in those activities that previously caused pain.

**Risk factors of low back ache:**

- Job requiring heavy and repetitive weight lifting
- Use of machine tools
- Operation of motor vehicles (especially two wheelers)
- Cigarette smokers and tobacco consumers
- Anxiety and depression
- Stressful occupations
- Women with greater number of pregnancy
- Obesity and other cardio vascular risk factor
- Improper postural habit
- Accident and sports injuries

**Aggravating factor:**

- Walking
- Sneezing
- Coughing
- Strain toilet
- Weight lifting
- Long sitting
- Stooping
1.1 NEED FOR THE STUDY

Low back pain leads to significant morbidity placing strict activity limitations to the patients. The purpose of study is to find out the effectiveness of McKenzie approach and motor control exercise in sub acute low back ache.

1.2 STATEMENT OF THE PROBLEM

To compare the effectiveness of McKenzie approach and motor control exercise in the treatment of patients with subacute low back ache.

1.3 OBJECTIVE OF THE STUDY

This study aim is to quantify the reduction in low back ache brought about by McKenzie approach and motor control exercise.

1.4 HYPOTHESIS

The null hypothesis of this study can be stated as ‘There is no significant difference in effects of mckenzie approach and motor control exercise’ in the treatment of patients with sub acute low back ache.
II. REVIEW OF LITERATURE

➢ Petersen, Tom PT BSc, Kryger, Peter MD, PhD, Ekdahl, C. PT, PhD, Steen PT, MDT, Jacobsen, Soren MD, PhD (AUGUST 2002) stated that Intention-to-treat analysis showed a tendency toward a difference in reduction of disability in favor of the McKenzie group than intensive strength training (motor control training) group at the 2-month follow-up assessment.

➢ David A Browder, John D Childs, Joshua A Cleland, Julie M Fritz (December 2007) States that an Extension oriented treatment approach (mckenzie approach) was more effective than trunk strengthening exercise in a subgroup of subjects hypothesized to benefit from this treatment approach.

➢ Daniel C. Cherkin, Ph.D., Richard A. Deyo, Michele Bettie, Ph.D., R.P.T., Janet Street and William Barlow, Ph.D. (October 1998) States that for patients with low back pain, the McKenzie method of physical therapy and chiropractic manipulation had similar effects and costs.

➢ Machado, Luciana Andrade Carneiro BScPT, de Souza, Marcelo von Sperling BScPT, Paulo Henrique PhD, Manuela Loureiro PhD. (April 2001) States McKenzie method is more effective than strength training or passive therapy for acute LBP.
Francesca Cecchi, Raffaello Molino-Lova, Massimiliano Chiti, Guido Pasquini (January 2010) Concluded that spinal manipulation provided better short and long-term functional improvement, and more pain relief in the follow-up than either back school or individual physiotherapy.

Latimer, Paul W. Hodges, Robert D. Herbert, Kathryn M. (November 5, 2009) It summarized that motor control exercise formed short-term improvements in global feeling of recovery and activity, for people with chronic low back ache. Most of the effects observed in the short term were maintained at the 6- and 12-month follow-ups.

Chris G Maher, Jane Latimer Paul W Hodges Kathryn M Refshauge (2006 Feb) States the effect of motor control exercise produce better effect than placebo in patient with chronic low back ache.


Hicks GE, Fritz JM, Delitto A, S.M. MG (2005) Preliminary development of a clinical prediction rule for determining which
patients with low back pain will respond to a stabilization exercise program.

- Luciana G Macedo, Christopher G Maher, Jane Latimer and James H McAuley (2009) suggest that motor control exercise is more effective than minimal intervention and adds benefit to another form of intervention in reducing pain and disability for people with persistent LBP.

- Aure of jh, vasselien (March 2003) conclude that manual therapy showed significantly greater improvement than exercise therapy in patients with chronic low back pain.

- Brian M Busanich and Susan D verscheure (2006) states that McKenzie therapy results in a decrease in short-term (<3 months) pain and disability for low back pain patients compared with other standard treatments.

- Dlmaggio A, Mooney V (1987) states that McKenzie approach exercise is effective against low back pain.

- O'Sullivan, Peter B.; Phyty, Dip Manip Grad; Twomey, Lance T. PhD; Allison, Garry T. PhD A "specific exercise" treatment approach appears more effective than other commonly prescribed conservative treatment programs in patients with chronically symptomatic back pain.


III. MATERIALS AND METHODOLOGY

3.1 MATERIALS (TOOLS)

- Treatment Couch
- Pillows
- Small stool
- Exercise mat

3.2 METHODOLOGY

Study Design

This study is carried out by two groups, each group having 15 patients for both groups pre test and post test will be taken.

Group A - Patient treated with McKenzie approach.

Group B - Patients treated with motor control exercise.

Both groups have been given back stretching and hamstring stretching after the session.

Study Setting

This study is proposed to conduct in outpatient department of orthopedics and various other departments, Sri Ramakrishna Hospital, Coimbatore.

Study Duration

The study extended for a period of 6 months.
Treatment Duration

Each patient received the treatment for 30min, single session and for 5 days per week, total of 15 sessions.

Sampling

The sample included in this study is simple random sampling. Each group assigned with 15 patients.

A sample of 30 patients were randomly selected and divided into Group A and Group B

**Group A** - Patient received McKenzie approach.

**Group B** - Patients received motor control exercise.

- Groups were evaluated using Visual Analogue Scale and Oswenrthy low back pain scale.
- First day pre test measurement was taken and the outcome was assessed at the end of the 3rd week of intervention based Oswenrthy low back pain scale and visual analogue scale.

3.3 CRITERIA FOR SAMPLE SELECTION.

Inclusion Criteria

- Mean age of 25 – 50 years.
- Both male and female groups were included.
- All low back pain with or without sciatica, who volunteered to participate in the study were included.
Exclusion Criteria

- Recent fracture of vertebrae
- Spinal canal stenosis
- Tuberculosis of spine
- Osteomyelities of spine
- Severe spinal deformities
- Severe osteoporosis
- Patient who require surgical management
- Cardiac patients
- Spondylolisthesis
- Cauda equina syndrome

3.4 PARAMETERS OF THE STUDY

- Visual Analogue Scale (VAS) in cms.
- Oshwrthy low back pain scale

3.5 STATISTICAL TOOLS

Pre and post test values are collected and asses for variation in improvement and their results are analyzed using Independent ‘t’ test.
\[
    t = \frac{\bar{x}_1 - \bar{x}_2}{S \sqrt{\frac{n_1n_2}{(n_1 + n_2)}}}
\]

\[
    S = \sqrt{\frac{\sum (x_i - \bar{x}_1)^2 + \sum (x_i - \bar{x}_2)^2}{n_1 + n_2 - 2}}
\]

Where,

\( S \) = Combined Standard deviation.

\( X_1 \) = Difference between pre test and post test in Group A

\( \bar{x}_1 \) = Mean difference of the Group A.

\( X_2 \) = Difference between pre test and post test in Group B

\( \bar{x}_2 \) = Mean difference of the Group B.

\( n_1 \) = Number of patients in Group A

\( n_2 \) = Number of patients in Group B
IV. TREATMENT TECHNIQUE

MOTOR CONTROL EXERCISE

Plank

Procedure:

a) Lie face down on mat resting on the forearms, palms flat on the floor.

b) Push off the floor, raising up onto toes and resting on the elbows.

c) Keep back flat, in a straight line from head to heels.

d) Tilt the pelvis and contract abdominals to prevent rear end from sticking up in the air or sagging in the middle.

e) Hold for 10 to 15 seconds, lower and repeat for 5-10 reps.
Oblique Plank

Procedure:

a) Patient on her side balances on the right fore-arm with shoulder above to the elbow.

b) With her legs out straight to the left, ask her to lift the pelvis so that the patient is balanced on her fore-arm and feet. The body should form a straight line and she should feel the oblique muscles down the side of her trunk working to maintain the position.

c) Hold for 10 to 15 seconds, lower and repeat for 5-10 reps
Drawing-In Maneuver

Procedure:

a) Lie on back with patient’s knees bent and feet flat.

b) Ask patient simply pull the belly button in and towards spine. Try to get belly button all the way to back.

c) Hold for 10 to 15 seconds, release and repeat for 5-10 reps
Hundreds

Procedure

a) Lie on patient’s back. Raise the legs and bend them so that you form a right angle at your hips and knees

b) Keeping the arms straight and ask her to lift her hands no more than a few inches, gently tap the floor 100 times
Superman

Procedure:

a) Ask patient to balance on the floor on her hands and knees. The back should be flat and hips parallel to the floor.

b) Instruct patient to raise right arm out in front of her and raise her left leg out behind, keeping it straight.

c) Hold for 10 seconds and then repeat on the other side.

d) 5 to 10 repetition for each side
MCKENZIE EXERCISE

Exercise I:

Lying Down:

Patient lying down with arms beside the patient’s body and the turn his head to one side and maintain this position, then ask him to take deep breaths and relax for four to five minutes.

Ask the patient to relax muscles in his lower back otherwise there is no chance to eliminate distortion present in his joint.
Exercise II

Prone on elbow

Ask the patient to lie on prone position, Place the elbows under his shoulders so that he can lean on his forearms. During in this exercise ask the patient to take deep breaths for relaxing his back muscles.

Stay this position for five minutes and ask the patient to relax muscles in the lower back;

This is used as a first aid exercise and should perform once per sessions.
Exercise III

Prone on hand:

Ask the patient to face down, place elbows under the shoulders in the press-up position. Straighten the elbows and push the upper half of the body up as far as the pain permits.

Keep the hip pelvis, and both legs hanging limb and allow the back to sag. After two or three second patient should lower himself to the starting position. Every time repeat this movement cycle and must try to raise the upper trunk higher, so that in the end the spine is extended as much as possible with the arms as straight.

After straighten the arm hold the sag position for a second or two up to the patient feel pain reducing or centralizing.
Exercise IV

Standing with bending backwards:

Stand with patient’s feet slightly apart. Place hands in the small of his back with the fingers pointing backwards and thumbs pointing forwards. Bend backwards at the waist as far as the patient can, using the hands as a fulcrum. During the exercise keep the knees straight.

After maintaining this position for a second patient should return to starting position. Each time repeat this movement cycle, every time the patient should bend backwards a little further then only in the end he has reached the maximum possible degree of extension.
Exercise V

Knee to chest on Lying

Supine lying with the knees bent and feet flat on the floor or bed. Bring both knees up towards chest. Place both hands around knees and gently bent the knees as towards the chest as the pain permits.

After maintain this position patient should lower the legs and return to the starting position, while performing the exercise doesn’t raise the head, or STRAIGHTEN YOUR LEGS AS YOU LOWER THEM. Repeat the exercise and try to pull the knees a little further so that in the end the patient has reached the maximum flexion and knees will touch the chest.
Exercise VI

Spine flexion in sitting

Sit on a chair and bend trunk forwards and touch the floor with hands. Return immediately to the starting position.

Every time the patient repeats this movement cycle and must bend down a little further to reach the maximum flexion. At this reached the maximum possible degree of flexion as the head close as possible to floor.

This exercise will be made more effective by holding the ankles with hands and pulling himself down further. Exercise six must done after the completion of exercise five. In the beginning only five or six repetitions will do in each session and the sessions are to be repeated four or five times per day. FLEXION EXERCISES ONLY FOLLOWED BY A SESSION OF EXERCISE 3 – PRONE ON HAND.
STRETCHING EXERCISES

Hamstring stretching

Procedure:

a) Place one leg on the stool, knee straight (remember that foot of non-stretching leg should be pointed straight), Hips and shoulders square to surface.

b) Point toes of the stretching leg straight up in the left/right plane. You don’t have to pull your toes back toward during the hamstring stretch by contracting THE shin muscles, though doing so during the hamstring stretch will stretch your calf simultaneously.
c) Lean forward from the hips until there a gentle hamstring stretch is felt on the underside of the thigh.

d) Once a gentle hamstring stretch is felt, hold this position for 30 seconds for a bilateral hamstring stretch

**Back stretching**

Slowly pull the legs into your chest, bending your knees. Hold your hands against the backs of your thighs. Hold for 30 to 60 seconds, then release.
V. DATA ANALYSIS AND INTERPRETATION

The calculation was tabulated for easier statistical calculations and better comprehension. The pre test values and post test values obtained by using visual analogue scale and Oswestry as follows:

**VISUAL ANALOGUE SCALE (Group A)**

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**Mean: 3.8**
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Mean : 2.4
MEAN DIFFERENCE BETWEEN GROUP A AND GROUP B

(VAS)

VISUAL ANALOGUE SCALE

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MEAN DIFFERENCE BETWEEN GROUP A AND GROUP B

(VAS)
OSHWRTHY SCALE (Group A)

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Mean: 23
## OSHWRTHY SCALE (Group B)

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**Mean: 17.6**
OSHWRTHY SCALE (Group A)

OSHWRTHY SCALE (Group B)
MEAN DIFFERENCE BETWEEN GROUP A AND GROUP B

(OSHWARTHY)

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MEAN DIFFERENCE BETWEEN GROUP A AND GROUP B

(VAS)
VI DISCUSSION

This was comparative study conducted to evaluate and to compare the effectiveness of McKenzie exercise and motor control exercise for sub acute low back ache.

Pain was found to decrease effectively in group A when compared to group B. The independent ‘t’ test the ‘t’ value is 3.9. This ‘t’ value greater than the one tail table value 2.763 with 28 degrees of freedom at p=0.05 respectively. Hence we can reject the null hypothesis and accept the alternative hypothesis. Therefore treatment given in group A reduces pain effectively than treatment given in group B.

The disability also reduces effectively in group A when compared to group B. In functional improvement the independent ‘t’ test the ‘t’ value is 2.75. This ‘t’ value greater than the one tail table value 2.763 with 28 degrees of freedom at p=0.05 respectively. Therefore treatment given in group A increases functional improvement in back pain effectively than treatment given in group B.

Hence we can reject the null hypothesis and accept the alternate hypothesis.
LIMITATIONS AND RECOMMENDATION

✓ The study was a short term study; large sample size and long term follow up need to get the good result.

✓ Only two parameters are used in this study, in further study parameters like range of motion of lumbar spine, trunk muscle strength and endurance can also include.

✓ The study has a small sample size.

✓ Included patients may not have been equally suitable for both Interventions.

✓ Multiple groups can be included for the study.

✓ Whole Core stability exercise compared with McKenzie approach instead of motor control exercise can do as further study.
VII. CONCLUSION

The literature review and statistical analysis done from the data collected from the study have shown that the McKenzie approach helps in early pain relief and improves functional activities effectively in sub acute low back pain when compared to the motor control exercise.

Hence the alternate hypothesis of this study is accepted and stated as “There is a significant difference between McKenzie approach and motor control exercise in reducing pain and improves functional activities in patients with sub acute low back ache.”
REFERENCES


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5. Lancet.twomey, James r.taylor, Physical therapy of the low back.


APPENDIX -I

ASSESSMENT CHART

SUBJECTIVE ASSESSMENT

Name:

Age:

Sex:

Occupation:

Address:

IP/ OP Number:

Date of evaluation:

Chief complaints:

HISTORY

Past medical history:

Present medical history:

Surgical history:

Drug history:

Personal history:
VITAL SIGNS

Temperature:

Pulse rate:

Respiratory rate:

Blood pressure:

OBJECTIVE ASSESSMENT

ON OBSERVATION

Built:

Posture:

Postural changes:

Tropical changes:

Oedema:

ON PALPATION

Tenderness:

Warmth:

Swelling:

ON EXAMINATION

Range of Motion

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<td>Lumbar extension</td>
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Sensation

Deep:

Superficial:

PAIN ASSESSMENT

VAS SCALE:

Side:

Site:

Type of pain:

Duration of pain:

Aggravating factors:

Relieving factors:

Grading of pain:

MOTOR EVALUATION

Muscle power:

Lumbar extension:

Abdominals:

REFLEX

Deep tendon reflex: right…… Left:……

Knee jerk:

Ankle jerk:
SPECIAL TESTS

Straight leg raise:

Fabers test:

Slump test:

INVESTIGATION

DIAGNOSIS

PROBLEM LIST

AIMS

MANAGEMENT

HOME PROGRAM
APPENDIX II

FOLLOW UP CHART

Name:

Age:

Sex:

Occupation:

Address:

Op Number:

<table>
<thead>
<tr>
<th>Parameters</th>
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<th>Post treatment</th>
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APPENDIX III

VISUAL ANALOGUE SCALE

The visual analogue scale used to determine the severity of pain experienced by the patients.

It is used to quantify the nature of pain. It attempts to represent measurement quantities in terms of straight line placed horizontally or vertically on a paper. The end points on the line are labeled descriptive terms of anchor the extremities of the scale commonly the line are 10cm in length.
APPENDIX IV

OSHWRTHY DISABILITY INDEX FOR LOW BACK PAIN

Name:                                                Date of birth:

Address:  Age:

Occupation:

How long you had back pain?

................Years..........Months.........Weeks

How long you had leg pain?

.............Years.........Months.........Weeks

Pain Intensity

1. Can tolerate the pain I have without having to use pain medication.
2. The pain is bad but I can manage without having to take pain Medication.
3. Pain medication provides me complete relief from pain.
4. Pain medication provides me with moderate relief from pain.
5. Pain medication provides me with little relief from pain.
6. Pain medication has no affect on my pain.
**Personal Care (Washing, Dressing etc.)**

1. I can take care of myself normally without causing increased pain.
2. I can take care of myself normally but it increases my pain.
3. It is painful to take care of myself and I am slow and careful.
4. I need help but I am able to manage most of my personal care.
5. I need help daily in most aspects of my care.
6. I cannot dress myself, wash and stay in bed.

**Lifting**

1. I can lift heavy weights without increased pain.
2. I can lift heavy weight but causing increased pain.
3. Pain restricts me from lifting severe heavy weights from the floor, but can manage if weights are conveniently positioned (ex. on a table).
4. Pain restrict me while lifting heavy weights, but can manage Moderate weight lifting if they are conveniently positioned.
5. I can lift only very light weights.
6. I can not lift or carry anything at all.
Walking

1. Pain does not prevent me for walking any distance.
2. Pain restricts me from walking for more than 1 mile.
3. Pain restricts me from walking more than ½ mile
4. Pain prevent me from walking for more than ¼ mile.
5. I can walk only with use of crutch or a cane.
6. I am in bed for most time and need to crawl to the toilet.

Sitting

1. I can sit in any chair for a long time.
2. I can only sit in my favorite chair as long as I like.
3. Pain prevent me from sitting more than 1 hour.
4. Pain prevents me from sitting more than ½ hour.
5. Pain prevents me from sitting more than 10 minutes.
6. Pain prevents me from sitting at all.

Standing

1. I can stand as long as I want without any increase pain.
2. I can stand as long as I want duration but it increases my pain.
3. Pain prevents me from standing more than 1 hour.
4. Pain prevents me from standing more than ½ hour.
5. Pain prevents me from stand more than 10 minutes.
6. Pain prevents me from standing at all.
Sleeping

1. Pain does not make me in preventing from sleeping well.
2. I can sleep well only by using pain medication.
3. Even when I take pain medication, I sleep less than 6 hours.
4. Even when I take pain medication, I sleep less than 4 hours.
5. Evens when I take pain medication, I sleep less than 2 hours.
6. Pain prevents me from sleeping at all.

Social Life

1. My social life is normal and does not increase my pain.
2. My social life is normal, but it increases my level of pain.
3. Pain prevents me from participating in more energetic activities (ex. sports, dancing etc.)
4. Pain prevents me from going out very often.
5. Pain restricted my social life to my home.
6. I hardly have any social life because of the pain.

Traveling

1. I can travel anywhere without increased pain.
2. I can travel anywhere but it increases my pain.
3. My pain restricts travel over 2 hours.
4. My pain restricts my travel over 1 hour.
5. My pain restricts my travel to short necessary journeys under ½ hour.

6. My pain prevents all travel except for visits to the doctor/therapist or hospital.

**Employment/Homemaking**

1. My normal homemaking/job activities do not cause pain.

2. My normal homemaking/job activities increase my pain, but I can still perform all that is required of me.

3. I can perform most of my homemaking/job duties, but pain prevents me from performing more physically stressful activities (ex. lifting, vacuuming)

4. Pain prevents me from doing anything but light duties.

5. Pain prevents me from doing even light duties.

6. Pain prevents from performing any job or homemaking chores.
APPENDIX V

SPECIAL TEST

*Straight leg raise*

It is a positive test and each leg is tested individually. The patient is in supine position the examiner raises the leg straight in hip flexion and knee extended position, if the pain arises at about 45 degree of hip flexion it indicate positive SLR.

*Reverse laeseque test*

Patient to lie in prone, maintaining the hip in neutral Extension. The knee is passively flexed. Pain in the distribution of femoral nerve indicates irritation of the third lumbar nerve root. The test is positive if the symptoms are aggravated on passively extending the hip.

*Faber’s test*

The patient is placed supine with the hip held in flexion and slight abducted position. A full range of passive external and internal rotation is attempted with slight over pressure at the end of the range. If there is pain in the hip the test is positive.
**Slump test**

The patient is made to sit in slouch, sitting with knee in relaxed flexion at the edge of the table. The therapist passively bends the hand and the trunk forward as much as possible, bringing the head down in between the knees. The patient is then asked to extend the knee to the maximum maintaining the foot in dorsiflexion. If pain is responses on attempting knee extension the test is positive.
CERTIFICATE

This is to certify that the dissertation work entitled

Comparison of Effect of Mckenzie Approach And Motor Control Exercise in Patients With Sub Acute Low Back Ache

was carried out by the candidate bearing the Register No. 27101105 (April 2012) in College of Physiotherapy, SRIPMS, Coimbatore, affiliated to The Tamilnadu Dr. M.G.R Medical University, Chennai towards partial fulfillment of the Master of Physiotherapy (Advanced Physiotherapy in Orthopaedics).

Prof. N. PARAMESHWARRI, M.P.T.,
Principal
College of Physiotherapy,
SRIPMS,
Place : Coimbatore
Coimbatore - 641 044.

Date : 
CERTIFICATE

This is to certify that the dissertation work entitled

**Comparison of Effect of Mckenzie Approach And Motor Control Exercise in Patients With Sub Acute Low Back Ache** was carried out in College of Physiotherapy, SRIPMS, Coimbatore, affiliated to The Tamilnadu Dr. M.G.R Medical University, Chennai towards partial fulfillment of the **Master of Physiotherapy** (Advanced Physiotherapy in Orthopaedics) under my direct supervision and guidance.

Mr.K. SARAVANAN, MPT (Ortho),
Professor,
College of Physiotherapy,
SRIPMS,
Place:Coimbatore Coimbatore - 641 044.

Date :
CERTIFICATE

This is to certify that the dissertation work entitled

Comparison of Effect of McKenzie Approach And Motor Control Exercise in Patients With Sub Acute Low Back Ache. Submitted By

Reg. No. 27101105
April-2012

To The Tamil Nadu Dr. M.G.R. Medical University, Chennai in Partial fulfillment of the requirement for the award of degree of MASTER OF PHYSIOTHERAPY was evaluated

---------------------------------------------
INTERNAL EXAMINER

EXTERNAL EXAMINER

Place : Coimbatore
Date:


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