

COMPARATIVE EFFECTS OF MULLIGAN AND MAITLAND MOBILIZATION TECHNIQUES IN CHRONIC NON-SPECIFIC LOW BACK PAIN PATIENTS

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ABSTRACT

Background: Approximately 23% of individuals experience non-specific low back pain, with a prevalence rate ranging between 11-22% in the general population.

Purpose: To compare the effects of mulligan and maitland mobilization to decrease pain and improve range of motion among patients having chronic non-specific low back pain. To find out either mulligan or maitland mobilization is effective to eliminate kinesiophobia among patients due to chronic non-specific low back pain.

Methodology: This study was randomized clinical trial. Data was collected through simple random sampling procedure. The sample size for this study was 40 allocated into 2 groups. Group A basically a mulligan group and Group B was a maitland group. Data was collected from Alkarim Hospital Nankana Sahib and District Headquarter Nankana Sahib. Data was analyzed through SPSSversion 20.

Results: Outcomes of interest were pain, range of motion and kinesiophobia that were estimated through numeric pain rating scale, measuring tape and tampa scale respectively. Comparison of the effects of mulligan and maitland mobilization to diminish pain and improve range of motion and eliminate kinesiophobia among patients with ongoing chronic nonspecific low back pain patients.

Conclusion: It is concluded that hydrocollatral pack, mulligan mobilizations and strengthening exercises have positive influence on Low Back Pain patients with Chronic Nonspecific pain (Group 1). In control group (Group 2) the hydrocollatral pack, maitland mobilization and strengthening exercises has no shown marked improvement.

Keywords: Lumbago, Back pain, Lower-Back, Backache, Lumbago, Lumbar Rheumatism, Mulligan, Maitland, Kinesiophobia, CNSLB

INTRODUCTION

One out of three individuals overall experience the effects of Low Back Pain. A long period of low back torment is assessed to be at least sixty. Ongoing low back issues are the most widely recognized objection of working 44 age individuals. It influences each grown-up adult like once in their lifetime. Low back pain is an umbrella term for conditions (1). It is estimated that more than seventy adults experience low back discomfort at some time in their lives. Less than half of consultations in private physiotherapy clinics are due to back pain (2). LBP is an incapacitating physical ailment that is considered the foremost burden in global musculoskeletal diseases (3). A suggested explanation for the cause of chronic non-specific lower back pain revolves around alterations in the perception of body position in the lower back and the muscular pattern used to stabilize the core, as a consequence of the degeneration of the muscles responsible for supporting the lumbar region and the gluteus maximus (4). Low back pain (LBP), which is defined as discomfort between the lower rib cage and hip crease, can be caused by a variety of underlying issues (5). Back pain is prevalent among individuals globally and is a significant health concern (6). But two broad types of back pain are experienced in physical therapy clinics. If the cause of back pain is identified as a particular pathology, such as a tumor or a fracture, it is categorized as specific and necessitates suitable medical interventions like certain drugs or surgical procedures (7). Chronic Low Back Dysfunction can result from various factors, including overloading

on regular spinal structures or applying normal stress on abnormal structures of the spine (8). Mulligan mobilization with movement (MWM) is a commonly utilized approach in physical therapy and orthopedic manual therapy that can be effective for both peripheral and spinal joints (9). The Mulligan approach to kinesiology is widely utilized in physical therapy and osteopathy, and is adaptable to both peripheral and vertebral joints (10). Mulligan introduced the concept of Mobilization with Movement (MWM) which is a modern therapy technique that involves applying an accessory gliding force by the therapist without causing any pain to the patient, along with an active movement (11). The IMTA international Maitland Teachers Association describes Maitland concept as a technique used to evaluate, diagnose and treat musculoskeletal conditions through manipulative therapy. This concept entails using oscillations within the normal range of joint mobility. The primary goal of Maitland mobilisation grades I and II is to relieve pain by providing continuous stimulation to the mechanoreceptors (12). The Maitland and Mulligan mobilization techniques are popular methods of manual therapy for addressing stiffness and joint pain (13). Shabana and Shamsi did a research study to see if Mulligan's technique and Maitland's method helped people with a lot of pain in their lower back (14). Kinesiophobia means being afraid to move your body because you think you might get hurt. It's a condition where a person feels too scared to do physical activities because they think they might experience pain or get injured again (15). The Tampa Scale for Kinesiophobia (TSK) is a tool that doctors use to measure how

scared patients are of hurting themselves again or feeling pain when they move, especially when they have back pain (16). Chronic Non Specific Low Back Pain is the leading cause of back pain in adults, there are many methods to treat back Pain Syndrome, many types of mobilization are there to manage symptoms of back pain, mulligan (MWM) and maitland lumbar spine mobilization proved to be beneficial for treatment but there was a lack of comparison between the most better one, So there were need to compare both techniques to find out best possible treatment, mobilization are given alone in most cases of treatment so there was a need of awareness of importance of exercise therapy with lumbar spine mobilization and also check the effect of both kind of mobilization along with exercise therapy protocols. Many of the patients not move due to figure of pain. Therefore, there is a need to access or to compare kinesiophobia between the two treatments. Was it has some difference between groups or not.

METHODOLOGY

This study was conducted at District Head Quarter Hospital and Ali Hospital in Nankana. This was a single blinded randomized clinical trial study design employed to compare the results of the study with a purposive sampling technique was utilized to select the participants. The study included participants of both genders. A total of 40 participants were included in this study.

The following inclusion criteria were applied:

- Both gender (Male /Female) with the age 20-50

- Patient having low back pain with duration of at least 4 months
- At least moderate pain according to NPRS
- Minimum flexion of lumbar was $37\pm 12^\circ$
- Minimum extension of lumbar was $14\pm 4^\circ$
- Minimum kinesiophobia was 40 ± 4

The following exclusion criteria were considered:

- Vascular disease
- Diagnosed with systematic disease i.e. TB of spine
- Diagnosed with specific disease of LBP (arthritis, SIJ pain, and osteoporosis)
- Recent fracture or history of fracture
- Osteoporosis
- Pregnancy or C-section 6 months ago
- Previous hip or back surgery or fracture less than half year prior
- Abdominal surgery inside the past 90 days
- Treatment of existing back pain by another health care professional within oneweek
- Red flags i.e. tumor, infection, open wound (clinical signs of conceivable serious spinal or foundational messes)
- Diagnosed with neurological disease or radiculopathy
- Patient who do not receive any PT/ exercise plan from previous 3 months

Data Collection Tool

On a numeric pain rating scale, patients were approached to check the number somewhere in the range of 0 and 10, 0 and 100 that best matches their aggravation power. Zero as a rule addresses no aggravation and as far as possible addresses most exceedingly terrible conceivable torment. One of the most common tape measurement procedures used to measure lumbar flexion involves a technique pioneered by Schubert, who described the original two-point method for measuring spinal flexion and later modified it to measure spinal flexion. This makes one mark at the lumbosacral Junction and the second mark are made 10 cm above the first mark, with the subject in a neutral position with the spine. After the stationary subject bends forward as far as possible, the amount of flexion in the spine is estimated by increasing the distance between the first and second points. Because the tape measure method relies on the stretching or distraction of the skin over the spine, this technique (and modifications of the technique) is sometimes called the skin distraction method. Bone landmarks for tape measure indicate ROM of lumbar extension, midline of spine consistent with PSIS, cm above baseline marker

Ethical Consideration

- A data collection letter was obtained from the university
- Consent was obtained from the head of physical therapy department
- Consent was obtained from the patients, through the assurance that their data will only

be used for research purpose, description of study was given before taking consent.

- Provision of all information to the patients provided regarding this study ineffective way like what was the benefit of treatment, no harm to them regarding this treatment.

RESULTS

After initial report writing and seeking permission to start our research on our selected topic we moved toward data collection through questionnaire based on TAMPA SCALE, RANGE OF MOTION, NPRS scale which has been previously used in the researches regarding Low Back Pain. After the generation of self-made questionnaire. Data collection covered almost 3 months, 50 patients responded to the questionnaire out of which only 40 fulfilled the inclusion criteria. Collected Data has been analyzed for those 40 patients (n=40) who fulfilled the inclusion criteria, through SPSS-20.

Data analysis has been carried out for variables mention in the questionnaire, frequency distribution of each variable along with its tabular and graphical distribution has been deduced from the results of self-made questionnaire. Furthermore, comparison of certain variables has also been calculated in the form of numerical values. Relevant tables and graphical representations have been added with their due explanation for better understanding and conceptualization. Mann-Whitney U test has been used to test the comparison of the two key variables in current analysis.

Table 1: Age Distribution

Groups	Age	Frequency	Percentage	Mean±SD
Group A	20-24	3	15	3.15 ± 1.66
	25-29	5	25	
	30-34	6	30	
	35-39	1	5	
	40-44	2	10	
	45-49	3	15	
Group B	20-24	4	20	3.50 ± 1.73
	25-29	1	5	
	30-34	6	30	
	35-39	2	10	
	40-44	4	20	
	45-49	3	15	

Frequency distribution of this table showed the age distribution of participants in study groups. Age Distribution for Group A interpret that 3 participants were lies in category 1 (20-24), 5 participants were lies in category 2 (25-29yeras), 6 were lies in category 3 (30- 34), 1 lies in category 4 (35-39), 2 were lies in category 5 (40-44) and 3 participants were fall in category 6 (45-49). Age Distribution for Group B interpret that 4 participants were including in category 1 (20-24), 1 participant were including in category 2 (25-29yeras), 6 were adding in category 3 (30-34), 2 lies in category 4 (35-39), 4 were including in category 5 (40-44) and 3 participants were fall in category 6 (45-49).

Table 2: Gender Distribution

Groups	Gender	Frequency	Percentage	Mean±SD
Group A	Male	9	45	0.40±0.50
	Female	11	55	
Group B	Male	9	45	0.55±0.51
	Female	11	55	

Gender distribution for group A interpret that 9(45%) were male and 11(55%) were female participants in group A.

Gender distribution for group B interpret that there were 11(55%) females and 9(45%) were male participants in group B.

Table 3: Normality Test

Variables	Shapiro-Wilk Test
Kinesiophobia Baseline	0.066
NPRS Baseline	0.066
Flexion ROM	0.049
Extension ROM	0.000

This table showed the normality of data. As the p value for kinesiophobia and NPRS was >0.005 so parametric tests were applied for the analysis of within and between group comparison. For the flexion and extension ROM the p value was <0.001 so non parametric was applied.

Table 4: Within Group Comparison of NPRS: Paired Sample T-Test

Study Groups		N	Mean±SD	P Value
Group A	Pre-treatment NPRS	18	7.00±1.34	.000
	Post treatment NPRS	18	2.75±1.35	.000
Group B	Pre-treatment NPRS	18	6.91±1.24	.000
	Post treatment NPRS	18	5.08±1.16	.000

Frequency distribution of this table showed within group comparison with paired t test of NPRS. The mean value of pre-treatment NPRS in group A was 7.00 ± 1.34 and post-treatment value was 2.75 ± 1.35 with p value <0.0001 . On contrary, Group B showed mean pre-treatment value of 6.91 ± 1.24 and post-treatment as 5.08 ± 1.16 with p value <0.000 . Group A showed considerable more significant improvement than group B.

4.1: Between Group Comparison of NPRS: Independent Sample Test

The data showed independent t-test for between group comparisons of NPRS. Pre-treatment NPRS of group A has mean and standard deviation of 7.00 ± 1.34 as compared to pre-treatment NPRS of group B that is 6.91 ± 1.24 with p value 0.876. Post-treatment of NPRS group A has mean of 2.75 ± 1.35 as compared to 5.08 ± 1.16 of group B with p value of 0.000.

4.2: Between group comparison of Both ROM groups: Mann-Whitney Test

Frequency distribution of this group showed the comparison of lumber extension and flexion range of motion by Mann Whitney test. In groups A and B the mean rank for lumber flexion was 23.78 and 14.47 respectively with Mann Whitney U value 85.00 and Z value -2.65. The P value was 0.008 In groups A and B the mean rank for lumber extension was 21.25 and 16.87 respectively with mann whitney U value 130.50 and Z value -1.23. The P value was 0.215

4.3: Within group comparison of Both ROM groups: Wilcoxon Test

This group showed the comparison of lumber extension and flexion ROM by Wilcoxon test. In groups A and B the mean rank for lumber flexion was 23.78 and 14.47 respectively with wilcoxon value 275.00 and Z value -2.65. The P value was 0.008 in groups A and B the mean rank for lumber. Extension was 21.25 and 16.87 respectively with Wilcoxon value 320.50 and Z value -1.23. The P value was 0.215.

4.4: Within Group Comparison of both Kinesiophobia groups: Paired Sample T-Test

This data showed the within group comparison of kinesiophobia values on tampa scale. For the within group analysis paired t test was used. In group A mean value 46.11 at pretreatment reading of kinesiophobia. Tampa scale and after treatment mean 16.33 for group A with p value .000 which means that the result was significance of this treatment. While in Group B the mean value was 48.95 at pretreatment reading of kinesiophobia. Tampa scale and after

treatment means 24.95 with significance value .000 which means that the result outcome was effective.

4.5: Between Group comparison of Both Kinesiophobia Groups: Independent Sample Test

This data showed the between group comparison of kinesiophobia by Tampa scale by independent sample t test. It is interpreted that mean value 16.33 at post treatment for group A, and group B post treatment mean value was 24.95. Mean value with p value 0.006 of kinesiophobia. Tampa scale shows that both groups were effective but group A mean value show better results than group B

DISCUSSION

The present study purposes Comparison of the effects of Mulligan and Maitland mobilization to diminish pain and improve range of motion among patients with ongoing chronic nonspecific low back pain patients. Mulligan or Maitland spinal mobilization may be effective in eliminating kinesiophobia in patients with chronic nonspecific low back torment. This study was a preliminary randomized clinical trial. Data was collected through simple random sampling procedure. The sample size for this study was 40 allocated into 2 groups. Group a (Mulligan group); apply Hot Pack first for 10 minutes to warm while the patient lies in a comfortable position. After the warm-up, the patient received a Mulligan mobilization during which the exercisers performed half crunches, knee-to-chest, and hamstring stretches for 15 minutes. In Group B (PA Mobilization group), apply the Hot Pack first for 10 minutes to warm up while the patient lies in a comfortable position. After a warm - up, the patient performs PA mobilization and these exercisers

perform half crunches, knee- to -chest and hamstring stretches for 15 minutes. The outcome measurement schedule is first at baseline, then 1 week later, and 2 weeks into treatment. A total of 4 sessions was done, 2 sessions per week. The duration of this study was 2 weeks after abstract approval. Data was collected using the NPRS scale, tape measures, and the Tampa scale. Chi-Square, frequency distribution and Mann-Whitney Test were used for analysis through SPSS 20 version.

Yet, current study varied in the approach utilized to evaluate the ROM of the back in comparison to that employed in the Hidalgo study. The trunk's range of motion was evaluated in a seated position using a sophisticated method; however, extension was not assessed by the researchers. Konstantinou and colleagues. According to another study that used a placebo control, the SNAGS technique was found to result in a notable increase in trunk flexion range of motion for individuals with non-specific chronic low back pain. The lumbar extension range of motion (ROM) was not measured by these researchers as well (17).

CONCLUSION

It is determined that mulligan mobilizations, hydrocollatral packs, and strengthening exercises benefit people with chronic nonspecific low back pain (Group 1). The hydrocollatral pack, maitland mobilisation, and strengthening exercises have not significantly improved in the control group (Group 2). As a result, the treatment and control groups of treatments varied. It was therefore determined that our alternate

hypothesis. "There is a statistically significant difference between the effects of mulligan versus maitland mobilisation techniques in chronic non-specific low back pain patients in the treatment and control group." has been acknowledged and the null hypothesis disproven. Both groups improved, but mulligan SNAG group outperformed maitland group in terms of pain, lumbar range of motion, and kinesiophobia.

LIMITATIONS

Although current research has been successful in achieving its maximum targets but there were some limitations for our study.

- One limitation was different experiences of therapist and assessor.
- The time duration of intervention was short.
- The sample size was small.
- The time duration of intervention was short.
- Patient ratio was another limitation which was average 20-40.
- Another limitation which was found in our study is chronic patient of non-specific low back pain
- Different timing, different hospitals, twice a week burdened the situation.

RECOMMENDATIONS

Grounded on the results of the current study, following recommendations are suggested:

Present research project included the patients with the ages between 20 years to 40 years. It was also defined in the inclusion criteria of the study. But if the students less than the age of 20 years or above

the 40 years were included then the study outcomes would have been varied. Or, if some other different defined age group was selected then in that case, the results could also be different. We recommend you that there should no limitation age moreover many people with any age should have the diseases that were treated in our study. We took criteria of age limitation that was not good because many educated people were excluded from our study because of age limitation

One major thing that has more impact in our study is the stress and anxiety. In our study at sometimes we have to go through this phase but the fact is that the more we took worry more we drew back. So we recommend you people to manage stress level and perform your tasks at daily basics so no worries can disturb you during and at end of study.

Present study conducted in Pakistan's university. If this study conducted in other countries, then result should be different. Every country's educational processes are different from others. Foreign countries have different and advance education system. Their infrastructure is different. They have well maintained university's furniture that provides more comfort in the situations of pain. Ergonomically they are well organized. Foreign countries have screening system by which student is screened about any type of health issue, any medical condition and any other problem. Our country should have these types of norms in our education system.

Present study was time consuming and this study was given a time frame of 3 to 4 months approximately. In this time period, data was

collected. If time period was extended, then 3 months, then result will be different.

Universities must start health education programs regarding Low Back Pain. Both the students and teachers should actively participate in these programs. It would increase one's knowledge about health issues and their needed solutions

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