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Review Article

Effectiveness of Manipulation and Mobilization in Chronic Back Pain-A Systematic Review

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Abstract: Background: Low back pain is a condition that continues to place a great deal of stress on the healthcare system. Globally one out of three people suffer from low back pain. Lifetime prevalence of low back pain is estimated to be at least 60-70%. Low back pain is considered a multidimensional medical problem having multiple risk and causative factors. **Aim:** To determine the recent research evidences for the effectiveness of manual therapy in low back patients. **Method:** This review includes randomized controlled trails (RCTs). Searching done by Google Scholar, PubMed and Pedro from 2010 to 2019. We used terms like-back pain, mobilization, manipulation, exercise, and physiotherapy management. **Result**: Present outcomes shows that manual therapy treatment is effective technique in reducing pain and increasing Range of motion (ROM) in back pain patients without adverse effects. The search resulted in 50 articles but only 05 articles were selected for the study based on criteria. **Conclusion**: Manual therapy program designed for back pain treatment can be more effective at increasing lumber ROM and reducing pain.
Keywords: Manual therapy, Back pain, Exercise, Mobilization.

Introduction

Low back pain is a condition that continues to place a great deal of stress on the healthcare system. Globally one out of three people suffer from low back pain. Lifetime prevalence of low back pain is estimated to be at least 60-70%[1]. Low back pain (LBP) is a major health problem because of its high prevalence worldwide[2]. It affects almost every adult person at least once throughout his or her life span[3].

Low back pain is considered a multidimensional medical problem having multiple risk and causative factors[4,5]. Pain in region between bottom of ribs and buttock crease is referred as low back pain (LBP). Low back pain is umbrella of conditions. 80% of adults estimated to experience LBP at some point during their life[6]. More than 60% of consultation in private physiotherapy clinics is because of low back pain[7].

Male and female individuals are affected equally[8]. It is a major problem that causes activity restriction, work absence and financial burden on families, communities, industries and government. Diagnostic triage is use to differentiate between non spinal or serious spinal disorder and those with pain of musculoskeletal cause by means of history and examination with special emphasis on red flags[9]. Clinical presentation can differ but majority of patients will complain pain that either centralizes or radiates to lower extremities[10].

Mechanical low back pain is a general term used to refer pain that does not have any specific cause or that is not related to any serious spinal pathology[11]. 90% of patients presenting to primary care are sufferers of mechanical low back pain and these are the majority of the individuals that present to physiotherapy. Common symptom is the pain that gets worse with activity and relieved by rest[12].

A wide range of managements is available, with different treatments specifically targeted toward different causes. A balanced approach, which deals with patient psychosocial factors and includes multidisciplinary care, increases the probability of success from back pain interventions[13]. Medication, physical therapy, and surgery are most commonly used managements of mechanical low back pain.

Posture involvement is evident in back pain rule of thumb is that pain leads to bad postures and bad postures further aggravates pain[13]. When bad posture is fixed it decreases pain significantly.

Usually LBP treatment strategies focus on pain area and neglect proximal or distal areas to pain. But according to emerging concept of Regional Interdependence it is necessary to treat proximal and distal area too for better outcomes[14].

Involvement of thoracic spine posture in chronic low back pain is proved from literature but rare evidence is present on treatment of posture correction to low back pain. This study is conducted to add to literature the effects of posture correction on low back pain Effects of lumbar Mulligan sustained natural apophyseal glides on patients with nonspecific low back pain is evident in literature[15].

Methods

This review study is performed in accordance to PRISMA- Preferred Reporting Items for Systematic Reviews and Meta-Analyses[16].

Search Strategy

The searching was done in PubMed, Google Scholar and PEDro. Key words like- Back pain, mobilization, manipulation, exercise, and physiotherapy management. We included past 10 years articles (mainly RCTs-Randomized controlled trial) published in English language only from 2010-2019.

The title and abstracts of all articles in the searches were screened in accordance with the inclusion and exclusion criteria to identify potentially eligible articles. Full texts of potential articles were read and assessed independently by the two reviewers.

Inclusions criteria

In this review RCTs articles were used only

- ✓ If they posed low prejudice chances.
- ✓ Where instructions for random allocation is necessary and clearly specified.
- ✓ Where single-blind assessor or double-blinded assessor design was used.
- ✓ Both male and female patients between 18-60 years of age with chronic (>3 months) back Pain were utilized.

Exclusion criteria

- ✓ Any other languages than English.
- ✓ Any report conducted prior to 2010 was omitted from the survey.
- ✓ Articles left out they did not adhere to mobilization for back is.
- ✓ Spinal cord research, chiropractic, livestock, and other non-original medical findings have been excluded.

Quality assessment

Methodological quality of selected articles was assessed using PEDro Scale[17] consisting of 11 questions in two aspects. Criteria 2-9 assess internal validity and criteria 10-11 assess statistical information required to make a study interpretable. Scoring of each question is done in accordance to its existence or nonexistence in the assessed study.

The final scoring is done by the addition of all positive answers. Studies considered of high quality scoring ≥5 (5/10) as stated by Moseley et al[18]. In this review all included studies scoring ≥5 were found to be of high in methodological quality. The studies were analyzed in PEDro scale by two independent investigators.

Data Analysis

The screening of included articles was done by two independent investigators. The selected articles were analyzed in an organized manner including parameters given: author-year, study design, subjects-age, interventions, study duration, outcome measures, and results. Differences between the investigators were solved by conversation to reach agreement and settled by using Cohen's kappa statistics.

Intervention

Considered experiments are those which involve mobilization, Manipulation, different types of exercise irrespective of strength and durations. Exercises programs included, strengthening exercises, flexibility exercises, stretching exercises.

Results

Studies identified

After implementing the inclusion and exclusion criteria, 50 articles were retrieved using the keywords-Back pain, mobilization, manipulation, exercise and physiotherapy management. 30 articles were excluded as they were found in more than one database. For eligibility criteria 20 articles were screened. Further 15 articles excluded because either they were not available in full text, objective not available, they did not meet exclusion and inclusion criteria or no control group (Figure-1). Finally, 05 articles were selected by agreement for quality assessment phase.

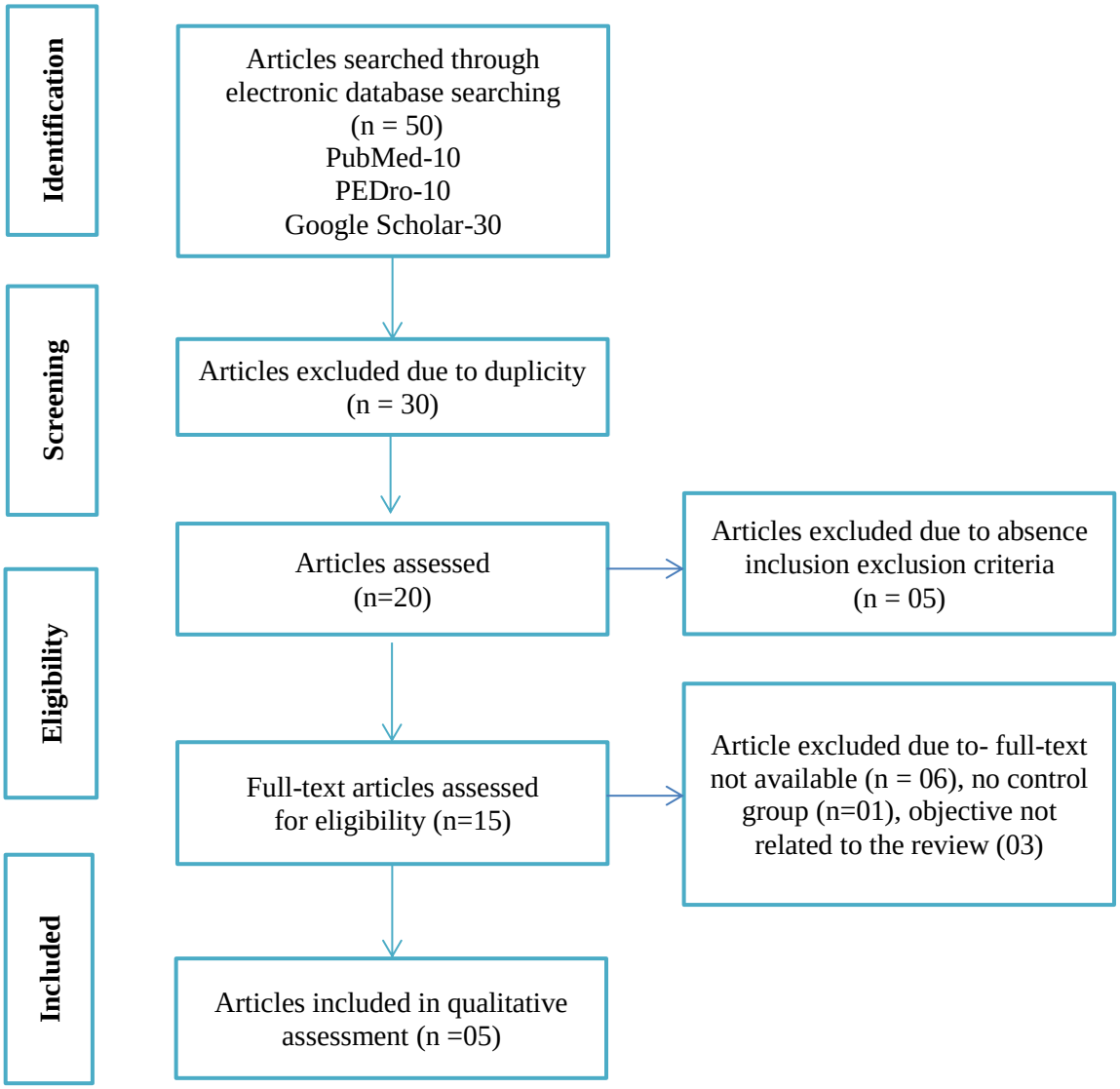

Figure 1. Flow diagram showing the screening and selection of articles

General data of the included studies

Selected articles in this review are summarized in Table 1 including given parameters: author-year, study design, subjects, interventions, study duration, outcome measures, and results. All 05 studies included in this study were RCTs[19-22]. All studies were conducted between 2010 and 2019.

Number of participants in the studies ranged from 18 to 60. All articles were experimental. Concerning the efficacy of results established in the most of the articles, both manipulation and mobilization were found to be significantly effective on pain and function between pre-and post-intervention assessments.

Outcome Measures

The key result tests are VAS, ODI, Lumbar Range of Motion, Lumbar flexion and extension ROM, Pain numeric scale, Catastrophic Thoughts Scale, Modified Shober test for ROM), Lumbar Range of Motion With Inclinometer (LROM), Oswestry Disability Index (ODI) Version 2.

Table 1. Description of the included studies

Author	Study design	Subject	Intervention	Study Duration	Outcome measure	Result
Shabana Khan, Nezar Al Torairi et al. 2018[19]	Randomized controlled trial	N=60	Group A: SNAG consisted of stretching strengthening and postural correction exercises Group B: Maitland's mobilization consisted of stretching strengthening and postural correction exercises	4 weeks, 3 sessions per week one session per day	VAS, ODI, Lumbar Range of Motion.	The result of his study suggests that both SNAG and Maitland's improves the symptoms of chronic low back pain. Better improvement was shown by SNAG group than Maitland's group. Based on these results SNAG and Exercise should be the treatment of choice for chronic Low back pain rather than Maitland's with Exercise.
Mohammad Javaherian, Siamak Bashardoust Tajali et al. 2017[20]	Randomized controlled trial	N=18	Group A: Postero-anterior (PA) mobilization Group B: SNAG Group C: Sham SNAG	One time study	Lumbar flexion and extension ROM	Within group analysis showed significant changes of flexion and extension in ROMs in SNAG and PA mobilization groups. Between groups analysis pointed out significant difference between the SNAG and placebo groups after interventions.
Fernando Augusto Gonçalves Tavares, Thais Cristina Chaves, et al. 2017[21]	Randomized controlled trial	N=60	Group A:Joint mobilization group Group B: Sham mobilization Group C: Control group	Ten Session	Pain numeric scale, Oswestry Disability Index, Catastrophic Thoughts Scale	Results suggest sham effect related to the application of mobilization in chronic low back pain patients.
Sara Mohamed Samir, Lilian Albert ZakY et al. 2016[22]	Randomized controlled trial	N=30	Group-A: Mulligan technique and conventional physical therapy program. Group-B: Maitland technique and conventional physical therapy program.	12 session (3sessions /week) over four weeks period	Visual analogue scale, Modified Shober test for ROM	Both Mulligan and Maitland techniques were shown to be effective in reducing pain level and improving ROM in patients with CLBD, no statistical significant difference was proven between both of them.
Pallavi Chopade[1]	Randomized controlled trial	N=60	Group-A: conventional therapy and Maitland mobilization Group-B: conventional and McKenzie	3 weeks (3 visits per week).	Visual analogue scale (VAS), Lumbar Range of Motion With Inclinometer (LROM),	McKenzie therapy with an adjunct to conventional therapy resulted in greater alleviation of Pain, improvement in Lumbar ROM & also more reduction of Disability

			therapy Group-C: conventional therapy		Oswestry Disability Index (ODI) Version 2	as compared to Maitland's mobilization & only conventional treatment in patients with non-specific low back pain.

Discussions

This review was conducted to determine the efficacy of manual therapy approaches in improving quality of life in patients with back pain. Evidences from RCTs are used to assess the efficacy of manual therapy approaches in back pain patients.

There is low to intermediate quality proof that different forms of manipulation and/or mobilization can alleviate pain and improving function for chronic back pain relative to other treatments. Several prior studies of chronic back pain show findings in favor of manipulation and mobilization for individuals with chronic back pain. However, most of these studies also report that methodological flaws render the evidence insufficient or inconclusive, making it inappropriate to conclude that manipulation and/or mobilization are more effective compared to usual care or other complementary and integrative medicine therapies.

In addition to above mentioned evidences, researchers mentioned below also proved manual therapy interventions to be equally effective in decreasing pain and improving ROM in patients with back pain. Study conducted to find out effects of thoracic manipulation and mobilization on function and mental state of patients of CLBP. Thirty-six subjects were randomly divided into mobilization group, manipulation group and control group. Outcome of study showed that mobilization or manipulation to thoracic lumbar vertebrae has a positive effect on function, mental state, and ROM in patients with lower back pain. Conclusion of this study also supports current study that ROM and functional level increases when thoracic intervention was given for LBP[23,24].

The results on RE agreed with previous a previous recommendations. This study investigated the effects of another manual technique (Gong's mobilization) on RE. The comparison between both studies was not accurate because the Gong study was performed on healthy participants, whereas the present study was conducted on chronic nonspecific LBP patients[25]. This study shows that both the Maitland protocols are effective in improving the PPT and ROM. They are equally effective in improving the PPT but 3 repetitions of 1 minute were more effective in improving the ROM than 1 repetition of 3 minutes. Mobilizations produce a multitude of beneficial effects through stimulation of peripheral mechanoreceptors, inhibition of nociceptors, and an increase in synovial nutrition, thus helping to reduce pain[26,27].

Conclusion

This systematic review was conducted to investigate the effectiveness of manual therapy methods designed to improve pain and ROM in back pain patients by summarizing the evidences from randomized controlled trials (RCTs). We conclude that manual therapy program designed for back pain treatment can be more effective at increasing back ROM and reducing pain. In addition, back pain patients can improve self-reported symptoms with isometric exercises including ROM exercises, either with or without electrotherapy.

Conflicts of interest

The authors declare that there are no conflicts of interest.

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