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A Review on Treatment Approaches for Chronic Low Back Pain via Mulligans Movement with Mobilization and Physical Therapy

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Abstract
One of the main causes of functional impairment is low back pain. Every one of all ages can have low back discomfort, and there are several ways to treat this condition. Physiotherapy's manual therapy is a specialist field that treats neuromuscular discomfort. The Mulligan technique, Maitland mobilisation technique, Active release technique, and many more are examples of manual therapy procedures. The primary focus of manual therapy is on the joint's osteokinematics and arthrokinematics. It is one of the primary methods for treating low back pain. Any ligamentous strain, muscular pathology, spinal dysfunction, or sacroiliac dysfunction can all produce low back discomfort.
It is important to determine the reason of the low back discomfort and treat it appropriately. This review leads us to the conclusion that mobility combined with Mulligan mobilisation is a useful strategy for lowering low back pain. Checking the efficacy of manual therapy techniques in treating chronic low back pain requires more research.

Keywords: Chronic lower back, spinal dysfunction, Mulligan mobilization, Maitland mobilization technique, osteokinematics, sagittal plane

Introduction and Background

Chronic lower back pain is defined as back discomfort lasting longer than three months. In all age groups, lower back pain (LBP) is prevalent. Roughly three-quarters of the population report having low back pain at some point in their lives, and half of individuals experience back discomfort annually [1]. According to a 2015 study, the prevalence of LBP was 7.3% worldwide. LBP interferes with activities necessary for day-to-day existence. LBP is the cause of the significance of disability. The primary regions of LBP are the lumbar, sacroiliac, and lumbosacral regions [2]. LBP may result from a specific reason, such as a chronic fracture, or it may result from an unidentified nociceptive source, known as non-specific LBP. [3-5]. Due to its significant incidence, LBP requires particular consideration during therapy. There is evidence supporting the usefulness of exercise therapy for low back pain (LBP), but there is scant information regarding the impact of manual therapy. Physiotherapy's manual therapy is a specialist field that treats neuromuscular discomfort. The Maitland mobilization technique, Mulligan technique [6], active release technique, and many more are examples of manual therapy techniques. The

primary focus of manual therapy is on the joint's osteokinematics and arthrokinematics. It is a primary approach to managing long-term disability.

Mulligan is a manual therapy approach that states that mobilisation in a moving posture can restore the joint's osteokinematics and arthrokinematics to normal since occasionally mobilisation alone is insufficient to resolve the problem. According to Mulligan, there are certain positional defects in the joint that result from extended use or injury, and these faults induce discomfort and limited range of motion. Mulligan's idea uses movement and mobilisation to assist address postural errors [7].

Everyone, regardless of age, can have lower back pain (LBP), and there are several ways to treat it. Among the many techniques used in manual treatment are mulligan mobilisation and active release technique. LBP may result from any type of ligamentous tension, muscular pathology, sacroiliac dysfunction, or spinal dysfunction [8]. It is important to determine the source of the LBP and address it appropriately.

LBP's pathophysiology

The spine is moved by the combined action of the spinal and trunk muscles. Flexion, extension, lateralization, and rotation are examples of primary movements [9]. Rotations in the sagittal plane are referred to as flexion/extension, while rotations in the frontal plane are referred to as lateral bending. The spine rotates along its vertical axis when it undergoes axial rotation. For the lumbar spine to remain stable during forward flexion, facet joints are essential. During axial rotation, the facets support heavy loads, which cause the applied force to fall close to the posterior edge of the articulating surface. LBP is caused by any pathology affecting the facet joint or intervertebral disc. In LBP, the spine's ability to maintain intervertebral neutral zones is compromised, which can cause pain, severe deformity, and neurological dysfunction. This makes the spine more unstable and can also result in excessive movements, which can cause inflammation, nerve compression, and muscle stretch, all of which can exacerbate LBP.

Numerous conditions, such as mechanical, structural, functional, psychological, and neuromuscular dysfunctions, can result in spinal pain. The quadratus lumborum and iliocostalis lumborum muscles are where MTrPs are most prevalent, and research has shown a correlation between increased pain intensity and a higher number of active MTrPs [10]. They are typified by pain that radiates to other areas, referred pain, and stiffness and sensitivity in the muscles [11]. Events related to trauma, ergonomic factors, structural factors, and system variables constitute the general dangers [12]. They could also be brought on by muscular tension from athletic training or an underlying medical issue. Usually, they are found by feeling a muscle for knots or little areas of spasm inside a tight, painful band of muscle that causes referred pain. There are two types of trigger points: latent and active.

Avoidance of Low Back pain

LBP can affect people of any age. Inappropriate long-term sitting posture, extended standing, and inappropriate lifting practices are risk factors. In light of this, LBP can be avoided by utilizing mirror feedback to correct posture, strengthening the core muscles, employing safe lifting techniques, and engaging in flexibility training [4].

The benefits of motion in the healing process of various connective tissues can be applied also for the back pain sufferer; in addition, the nutrition of the intervertebral disc is improved by moderate motion. Biomechanical factors with epidemiologically proven negative effects for the back pain sufferer have

been measured and delineated. Thus, guided activation of large muscle groups is a benefit for the structures of the back as well as the bodies own pain-reducing enkephalins. Present knowledge includes a detrimental effect of prolonged inactivation, including long-term bed rest and inactivity, which should be avoided. Better treatment methods, particularly in the surgical field, will evolve from technical advances in the diagnostic field. For the majority of the low-back pain patients who do not need surgical treatment, help will come in the next decade from a collaborative effort from politicians, industrial leaders and engineers, physicians, psychologists, and biomechanics.

Review

Non-specific LBP (NSLBP)

NSLBP is the name for the kind of LBP in which the aetiology is unknown. Although there isn't a specific illness causing anatomical or biomechanical changes in the back, the discomfort is nonetheless present. It has long been believed that mechanical factors contribute to LBP. According to the Bradford-Hill causality criterion, awkward posture, extended walking or standing, handling, tugging or twisting, or how things are carried do not independently correlate with any of these behaviors. Mechanical low back pain (LBP) is defined as back pain that arises from heightened stress and strain in the muscles and spinal column, typically brought on by unhealthy habits like bad posture, incorrect sitting positions, and incorrect bending and lifting techniques. The mechanical manifestation of low back pain (LBP) is discomfort that both improves rest and aggravates movement. [13]

The main causes of non-specific LBP include sacroiliac displacement, poor postural control, and weakening of the back and core muscles. In these situations, there is a decrease in muscle activation, which results in pain and a restricted range of motion (ROM). Because of the ROM restriction, performing daily tasks becomes more difficult, which can lead to impairment. Reviewed LBP and noted that pain and stiffness in the gluteal and lower back regions are often the hallmarks of LBP. The quadratus lumborum, glutei, piriformis, iliopsoas, and other SI joint stabilizers are secondary to the SI joint dislocation and tendinitis.

Most persons who suffer from back pain don't have a specific type of pain and don't have any nociceptive or detectable root pathology. The quality of life is severely impacted for those who experience back discomfort. The likelihood of becoming disabled is increased by back pain, and the more the pain gets, the lower life quality gets. It is worsened when pain persists longer than expected and is associated with anxiety and worry, particularly with relation to one's (feeling of) self and social interactions [14]. Pain, muscle tension, or stiffness localized in the gluteal region, leg region, and sacroiliac region was defined as LBP in a research conducted by "Specific LBP, which is caused by a recognized known particular disease, and non-specific LBP, which is defined as a condition caused by no recognized specific pathology, are the two categories of LBP that are frequently identified by clinical advice [15]. Moreover, LBP is also divided into three categories: acute, sub-acute, and chronic. Acute pain lasts less than six weeks, sub-acute pain lasts between six and twelve weeks, and chronic pain lasts more than twelve weeks, despite the fact that pain and impairment can often persist for longer periods of time. For epidemiological study, determining the kind of LBP acute, sub acute, chronic, specific, or nonspecific—and its specificity are crucial.

As well as a therapeutic approach, indicating that the role of muscle elements, particularly myofascial pain syndrome (MPS), was mentioned. Since MPS appears to be a highly treatable cause of LBP, it should be acknowledged as a significant factor in all cases of LBP. In both the sub-acute and chronic

stages of MLBP, exercises are beneficial. Physical modalities are helpful, as are stretching and strength training methods. By boosting bone mineral density and addressing specific ageing factors in the muscles, resistance training reduced pain while maintaining optimal bone health. Biofeedback provides them with feedback and motivation during training, pushing them to improve their performance to the desired level. [16].

Mulligan mobilization with movement

According to Mulligan's view, pain results from a small joint positioning error that causes restriction. A postural error causes a biomechanical change those results in pain [17]. Mulligan mobilisation provides a sustained natural apophyseal glide for the spine and mobilizes the extremities. The patient is requested to do flexion and extension as well as passive accessory movement for the transverse and spinous processes. Mulligan mobilisation is based on the idea that movement should not cause pain [18]. Impact of Chronic NSLBP on the Mulligan notion of lumbar sustained natural apophyseal glide (SNAG) 42 individuals with NSLBP were chosen, and they were split into two groups at random. Both groups received standard physiotherapy treatment, which involved muscle stretching and strengthening, whereas the experimental group received Mulligan's concept SNAG at the level of the spine where the greatest amount of affection was present. Three sessions per week of the treatment were administered for a month. An isokinetic dynamometer was used to record the outcome, with functional impairment and pain serving as the outcome measures. All three of the results were noted both before and after the treatment. Both groups showed improvement after the statistical analysis. When used in conjunction with traditional programmes, SNAG provided superior pain relief and functional improvement for patients with persistent nonspecific LBP [7, 19]. The study comprised five trials. The main result was both discomfort and incapacity.

They came to the conclusion that McKenzie is a more effective short-term pain management strategy [20]. The McKenzie therapy technique is based on an individual pre-treatment evaluation and operates on the peripheralization and centralization principle [21]. In a systematic review, McCaskey et al. included eighteen papers on the effects of proprioceptive exercises on long-term neck pain and lower back pain.

As outcome measures, they took functional independence and pain into consideration. They came to the conclusion that proprioceptive exercises had no consistent positive effects on LBP or chronic neck pain [22]. Examined how spinal manipulation therapy affected lower back pain. The study comprised 110 people in total. The Oswestry Disability Index was used to measure functional disability and the Numeric Pain Rating Scale (NPRS) was used to measure pain. According to the study's findings, spinal manipulation therapy works [23]. Carried out a pilot research comparison to see how electrotherapy affected CLBP. Treatment modalities used in the study included high voltage electrical stimulation, acupuncture TENS, diadynamic current, interferential current, and standard transcutaneous electrical nerve stimulation (TENS).

The methods of central and peripheral stimulation are non-invasive. Transcranial direct current stimulation is another name for central stimulation. The effects of stimulation, both cerebral and peripheral, are analgesic. Hence has the potential to lessen CLBP. [24, 25]Carried out a comprehensive analysis to determine how kinesiotaping affected CLBP. They evaluated pain and functional disability and included ten articles in all. Kinesio taping did not show any better results than placebo taping [26]. Examined how hydrotherapy affected lower back pain. Water's ability to stretch and strengthen muscles is aided by its viscosity, surface tension, hydrostatic pressure, and buoyancy. Since water lowers the

chance of harm, it can be utilized as a substitute for land workouts.[27] Treatment options for CLBP include various exercise regimens. Teaching patients about pain and cognitive misalignment is known as pain neurophysiology education, and it has been shown to help reduce CLBP [28].

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The methods of central and peripheral stimulation are non-invasive. Transcranial direct current stimulation is another name for central stimulation. The effects of stimulation, both cerebral and peripheral, are analgesic. Therefore, it may be useful in lessening low back pain [25]. Given that managers have a common obligation to handle large structures, it is not surprising that handling and manual lifting of materials are frequently employed interchangeably. However, treating large structures can lead to spinal overload, particularly when done in an atypical posture or involving the bending and twisting of the trunk. Spinal overload may result from moving and lifting large objects [26]. As a debilitating disorder, LBP is linked to significant declines in health and quality of life.

Therefore, using accurate and legitimate HRQoL indicators is essential for evaluating LBP therapy or programmes and choosing which resources to allocate. HRQoL is usually measured with the use of generic or disease-based questionnaires. In turn, preference rather than preference can be used to categories generic instruments. The fundamental advantage of generic preferred measurements is their

wide coverage of health-related factors, which makes it possible to compare different illnesses, therapies, and health initiatives.

In conclusion

LBP is a prevalent ailment that affects people of all ages. There are several reasons why someone experiences pain, and the best course of action for that reason varies. Exercises for general strengthening have been shown to be beneficial in lowering LBP.

Numerous researches have been carried out to evaluate the effectiveness of several treatment techniques for low back pain (LBP), such as aquatic therapy, mulligan mobilisation, and the McKenzie technique. We learned from this review that everyone is affected by LBP. To lessen chronic low back pain, Mulligan mobilisation is a more effective treatment strategy than other manual therapy procedures. When drawing a conclusion, pain, stiffness, and impairment were taken into account. Exercises for strengthening the back and core, in addition to Mulligan mobilisation, also aid in decreasing pain and stiffness, improving range of motion, and lowering low back pain. LBP has an impact on life quality, and building stronger muscles is crucial to preserving or enhancing life quality. An overview of the therapeutic approaches available for treating LBP clinically is provided by this review.

References

1. Franke H, Fryer G, Ostelo RW, Ka mper SJ: Muscle energy technique for non-specific low-back pain . Cochrane Database Syst Rev. 2015, CD009852. 10.1002/14651858.CD009852.pub2
2. Jothi S, Ram PS, Vpr S: The efficacy of core muscle release technique in mechanical low back pain a quasi experimental study. Int J Clin Ski. 2017, 11: 10.4172/Clinical-Skills.100124
3. Seo UH, Kim JH, Lee BH: Effects of Mulligan mobilization and low-level laser therapy on physical disability, pain, and range of motion in patients with chronic low back pain: a pilot randomized controlled trial. Healthcare (Basel). 2020, 8:10.3390/healthcare8030237
4. Balagué F, Mannion AF, Pellisé F, Cedraschi C: Non-specific low back pain. Lancet. 2012, 379:482-91. 10.1016/S0140-6736(11)60610-7
5. Maher C, Underwood M, Buchbinder R: Non-specific low back pain. Lancet. 2017, 389:736-47. 10.1016/S0140-6736(16)30970-9
6. Bhat P V, Patel VD, Eapen C, Shenoy M, Milanese S: Myofascial release versus Mulligan sustained natural apophyseal glides' immediate and short-term effects on pain, function, and mobility in non-specific low back pain. PeerJ. 2021, 9:e10706. 10.7717/peerj.10706
7. Hussien HM, Abdel-Raoof NA, Kattabei OM, Ahmed HH: Effect of Mulligan concept lumbar SNAG on chronic nonspecific low back pain. J Chiropr Med. 2017, 16:94-102. 10.1016/j.jcm.2017.01.003
8. Roi GS, Creta D, Nanni G, Marcacci M, Zaffagnini S, Snyder-Mackler L: Return to official Italian first division soccer games within 90 days after anterior cruciate ligament reconstruction: a case report. J Orthop Sports Phys Ther. 2005, 35:52-61; discussion 61-6. 10.2519/jospt.2005.35.2.52
9. Lomelí-Rivas A, Larrinúa-Betancourt JE: Biomechanics of the lumbar spine: a clinical approach . Acta Ortop Mex. 2019, 33:185-91.

10. Dayanır IO, Birinci T, Kaya Mutlu E, Akcetin MA, Akdemir AO: Comparison of three manual therapy techniques as trigger point therapy for chronic nonspecific low back pain: a randomized controlled pilot trial. J Altern Complement Med. 2020, 26:291-9. 10.1089/acm.2019.0435
11. 11. Money S: Pathophysiology of trigger points in myofascial pain syndrome . J Pain Palliat Care Pharmacother. 2017, 31:158-9. 10.1080/15360288.2017.1298688
12. Tantanatip A, Chang K-V: Myofascial Pain Syndrome. StatPearls Publishing, Treasure Island, FL; 2020.
13. Mitra M, Mande M: Effectiveness of core stabilization training with pressure biofeedback in the management of mechanical low back pain in subjects between age group of 20-25 years. Indian J Physiother Occup Ther - Int J. 2019, 13:82. 10.5958/0973-5674.2019.00016.9
14. Vlaeyen JW, Maher CG, Wiech K, et al.: Low back pain. Nat Rev Dis Primers. 2018, 4:52. 10.1038/s41572- 018-0052-1 2022 Chitale et al. Cureus 14(8): e28127. DOI 10.7759/cureus.28127 6 of 7
15. Violante FS, Mattioli S, Bonfiglioli R: Low-back pain. Handb Clin Neurol. 2015, 131:397-410. 10.1016/B978- 0-444-62627-1.00020-2
16. Sharan D, Rajkumar JS, Mohandoss M, Ranganathan R: Myofascial low back pain treatment. Curr Pain Headache Rep. 2014, 18:449. 10.1007/s11916-014-0449-9
17. Wilson E, Payton O, Donegan-Shoaf L, Dec K: Muscle energy technique in patients with acute low back pain: a pilot clinical trial. J Orthop Sports Phys Ther. 2003, 33:502-12. 10.2519/jospt.2003.33.9.502
18. Do Moon G, Lim JY, Kim DY, Kim TH: Comparison of Maitland and Kaltenborn mobilization techniques for improving shoulder pain and range of motion in frozen shoulders. J Phys Ther Sci. 2015, 27:1391-5.10.1589/jpts.27.1391
19. Beurskens AJ, de Vet HC, van der Heijden GJ, Knipschild PG, Köke AJ, Lindeman E, Regtop W: Efficacy of traction for non-specific low back pain: a randomised clinical trial. Lancet. 1995, 346:1596-600. 10.1016/S0140-6736(95)91930-9
20. Namnaqani FI, Mashabi AS, Yaseen KM, Alshehri MA: The effectiveness of McKenzie method compared to manual therapy for treating chronic low back pain: a systematic review. J Musculoskelet Neuronal Interact. 2019, 19:492-9.
21. Petersen T, Larsen K, Nordsteen J, Olsen S, Fournier G, Jacobsen S: The McKenzie method compared with manipulation when used adjunctive to information and advice in low back pain patients presenting with centralization or peripheralization: a randomized controlled trial. Spine (Phila Pa 1976). 2011, 36:1999- 2010. 10.1097/BRS.0b013e318201ee8e
22. McCaskey MA, Schuster-Amft C, Wirth B, Suica Z, de Bruin ED: Effects of proprioceptive exercises on pain and function in chronic neck- and low back pain rehabilitation: a systematic literature review. BMC Musculoskelet Disord. 2014, 15:382. 10.1186/1471-2474-15-382
23. Bialosky JE, George SZ, Horn ME, Price DD, Staud R, Robinson ME: Spinal manipulative therapy-specific changes in pain sensitivity in individuals with low back pain (NCT01168999). J Pain. 2014, 15:136-48. 10.1016/j.jpain.2013.10.005
24. Rajfur J, Pasternok M, Rajfur K, et al.: Efficacy of selected electrical therapies on chronic low back pain: a comparative clinical pilot study. Med Sci Monit. 2017, 23:85-100. 10.12659/msm.899461
25. Hazime FA, de Freitas DG, Monteiro RL, Maretto RL, Carvalho NA, Hasue RH, João SM: Analgesic efficacy of cerebral and peripheral electrical stimulation in chronic nonspecific low back

pain: a randomized, doubleblind, factorial clinical trial. BMC Musculoskelet Disord. 2015, 16:7. 10.1186/s12891-015-0461-1

26. Li Y, Yin Y, Jia G, Chen H, Yu L, Wu D: Effects of kinesiotape on pain and disability in individuals with chronic low back pain: a systematic review and meta analysis of randomized controlled trials. Clin Rehabil. 2019, 33:596-606. 10.1177/0269215518817804
27. Sawant R, Shinde S: Effect of hydrotherapy based exercises for chronic nonspecific low back pain . Indian J Physiother Occup Ther - Int J. 2019, 13:133. 10.5958/0973-5674.2019.00027.3
28. Pires D, Cruz EB, Caeiro C: Aquatic exercise and pain neurophysiology education versus aquatic exercise alone for patients with chronic low back pain: a randomized controlled trial. Clin Rehabil. 2015, 29:538-47. 10.1177/0269215514549033
29. Bontrup C, Taylor WR, Fliesser M, Visscher R, Green T, Wippert PM, Zemp R: Low back pain and its relationship with sitting behaviour among sedentary office workers. Appl Ergon. 2019, 81:102894. 10.1016/j.apergo.2019.102894
30. Kothawale S, Rao K: Effectiveness of positional release technique versus active release technique on hamstrings tightness. Int J Physiother Res. 2018, 6:2619-22. 10.16965/ijpr.2017.265