A Study to Compare the Effectiveness of Neural Mobilization Technique Versus Positional Release Technique Among Piriformis Syndrome Patients

Mathiyarasi R
Lecturer (PT), Department of Therapeutics, College of physiotherapy, National Institute for Empowerment of Persons with Multiple Disabilities, Chennai, India

Abstract - Piriformis Syndrome is a neuromuscular disorder that irritates the sciatic nerve, resulting in pain, functional limitations, and limited hip motion. There is little comparison data on the utilization of conventional physiotherapy procedures like Positional Release Technique (PRT) and Neural Mobilization Technique (NMT). Comparing the relative merits of NMT and PRT in lowering pain, enhancing functional capacity, and expanding hip range of motion in Piriformis Syndrome patients. 30 patients with a Piriformis Syndrome diagnosis were divided into two groups at random: Group A (NMT, n = 15) and Group B (PRT, n = 15). For four weeks, both groups got interventions three times a week. A goniometer was used to evaluate hip range of motion (ROM), the Visual Analogue Scale (VAS) was used to quantify discomfort, and the Oswestry "Disability Index (ODI)" was used to measure functional disability. Pain, function, and range of motion all significantly improved in both groups ($p < 0.001$). However, NMT showed bigger improvements in hip range of motion and noticeably larger decreases in pain and functional impairment. Both approaches work well, however for treating Piriformis Syndrome, Neural Mobilization Technique is better than Positional Release Technique because it improves hip mobility, function, and pain more quickly and reliably.

Keywords: Piriformis Syndrome, Neural Mobilization technique, Positional Release technique, Hip range of motion, Physiotherapy, Nerve Flossing Technique

I. INTRODUCTION

The piriformis muscle, which is situated deep within the gluteal region, irritates or compresses the sciatic nerve in piriformis syndrome, a neuromuscular disorder. Buttock pain, radiating leg pain, tingling, or numbness that resembles sciatica are frequent symptoms [1]. Because its symptoms are like those of lumbar radiculopathy and other lumbopelvic illnesses, it frequently goes undiagnosed. Piriformis syndrome can develop because of a number of factors, including extended sitting, trauma, overuse injuries, muscular imbalance, anatomical abnormalities, and poor biomechanics [2]. The main course of treatment for piriformis syndrome is thought to be conservative physiotherapy care. Manual therapy techniques that focus on neural mobility and muscle tension are common among different approaches. Neural Mobilization Technique (NMT) and Positional Release Technique (PRT) are two frequently used therapies [3].

Because there is no imaging or laboratory sign for piriformis syndrome, the diagnosis is still mostly clinical. Clinical tests that aid in diagnosing the issue include the piriformis stretch test, the "FAIR test (Flexion, Adduction, Internal Rotation)", and probing of the sciatic notch [4]. The functional effect of the condition is highlighted by the fact that patients frequently present with discomfort that is made worse by sitting, ascending stairs, or turning the hip. To avoid chronicity and lessen the burden of impairment, early and accurate identification is crucial. The goal of the Neural Mobilization Technique, sometimes referred to as neurodynamics, is to lessen neural mechanosensitivity and restore normal nerve movement. By inflaming or compressing the sciatic nerve, piriformis syndrome can impair neural gliding and increase discomfort [5]. NMT increases neural excursion and overall neuro dynamic performance by nerve tensioning and sliding based on the fine, controlled motions. With the increased interest in evidence-based practice, it is essential to find out which approach would be more useful in the treatment of the patients with piriformis syndrome. In addition

to reducing rehabilitation time, increasing patient satisfaction, and improving functional recovery, a direct comparison assists physicians in choosing the best course of action [6].

➢ Cause and risk factor
- Prolonged.
- Trauma to the hip or bottom.
- Overuse or repetitive strain.
- Muscle imbalance.
- Anatomical variations.
- Poor posture [7].

1.1. Relationship between piriformis and sciatic nerve

Although there are anatomical variations where the sciatic nerve may pass above, through, or divide around the piriformis muscle, it usually goes beneath the muscle. Nerve entrapment is more likely because of these changes. Neuropathic symptoms including radiating pain, tingling, and numbness along the posterior leg might result from the piriformis compressing the sciatic nerve due to tightness, misuse, or inflammation [8].

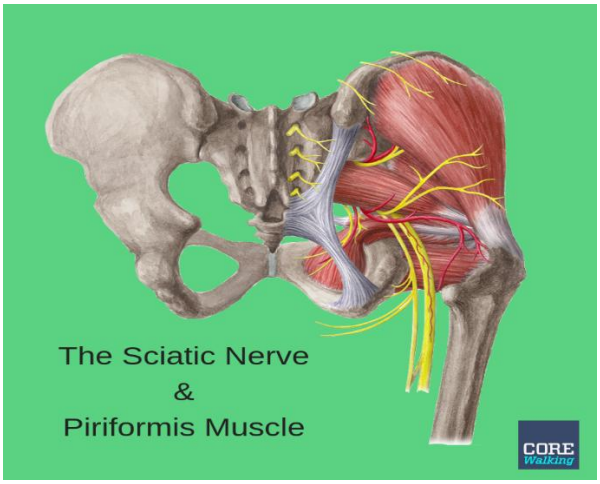

Fig 1: Anatomy of the Piriformis Muscle and Sciatic Nerve

Source: The sciatic nerve and piriformis muscle can be a pain in the butt.

1.2. Clinical presentation of piriformis syndrome

Patients frequently complain of buttock soreness that may radiate down the leg and back of the thigh. Activities like sitting, climbing stairs, and hip rotation exacerbate the symptoms.

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➢ Common symptoms
- Deep buttock pain
- Sciatica like radiation
- Tingling or numbness
- Pain aggravated by hip movement [10].

1.3. Physiotherapy management of piriformis syndrome

Since physiotherapy treats both the neurological and muscular aspects of the condition, it continues to be the principal treatment option. The goals of conservative treatment are to improve hip biomechanics, relieve sciatic nerve compression, ease stiffness in the muscles, and restore functional movement. A variety of methods are employed, such as myofascial release, neural mobilization, soft tissue mobilization, stretching, strengthening exercises, and positional release techniques [11].

➢ Common physiotherapy interventions
- Stretching exercise
- Strengthening exercise
- Myofascial release
- Neural mobilization [12].

1.4. Neural mobilization technique (NMT)

Restoring the normal movement and physiological function of brain tissues is the goal of the brain Mobilization Technique, sometimes referred to as neurodynamics. The sciatic nerve may have limited mobility as a result of inflammation or compression in piriformis syndrome. To enhance nerve excursion and lessen mechanosensitivity, NMT makes use of particular sliding or tensioning motions [13].

➢ Mechanism of action

1. Neural mobilization technique (MNT)

Restoring the peripheral nervous system's natural mobility, elasticity, and physiological function, particularly the sciatic nerve in piriformis syndrome is how the neural mobilization technique operates. This syndrome is characterized by increased piriformis

muscle rigidity or spasm, which irritates or compresses the sciatic nerve. Increased mechanosensitivity, discomfort throughout the nerve pathway, and poor nerve gliding result from this [14].

2. Positional release technique (PRT)

Placing the afflicted muscle in this example, the piriformis—in a posture that maximizes comfort is the foundation of the Positional Release Technique, an indirect manual therapy technique. By lowering gamma motor neuron firing and muscle spindle activity, this enables the muscle to relax [15].

1.5. Diagnosis of piriformis syndrome

Since there isn't a single, reliable test for Piriformis Syndrome (PS), the diagnosis is made clinically A physical examination, the patient's medical history, and the exclusion of other illnesses are all part of it, particularly lumbar radiculopathy or hip joint pathology [16].

1.6. Clinical assessment

1.6.1. Patient history

Patients frequently complain of buttock pain, which can occasionally spread to the posterior thigh or leg via the sciatic nerve pathway. Squats, climbing stairs, and extended sitting can all exacerbate pain. Tingling, numbness, or a feeling of tightness in the hip area is possible additional symptoms [17].

1.6.2. Palpation:

Replicating the patient's complaints, tenderness may be observed across the sciatic notch and the piriformis muscle [18].

1.6.3. Special test:

- ❖ Freiberg's test: Passive internal rotation of the extended hip causes pain.
- ❖ Pace's test: Resistance to hip abduction and external rotation results in pain or weakness.
- ❖ Straight leg raise: helps distinguish lumbar disc herniation from PS [19]

Aim

To evaluate how well the Positional Release Technique and Neural Mobilization work in Piriformis Syndrome patients.

Objective:

- To evaluate the Neural Mobilization Technique's (NMT) ability to alleviate pain in Piriformis Syndrome patients.
- To assess how well hip range of motion and functional abilities are enhanced by Positional Release Technique (PRT).
- To evaluate how well NMT and PRT work for treating pain and functional impairments in people with Piriformis Syndrome.

II. LITERATURE REVIEW

Zaghlol et al., (2025) reports that in females with "piriformis syndrome" and active trigger points, the effects of ischemia pressure technique (iPT) and active release technique (ART) be compared. The piriformis muscle's center has activated trigger sites in 45 females. The chit method of randomization was used to divide the participants into three equal groups. Three minutes of stretching, twenty minutes of TENS, and twenty minutes of hot packs comprised the traditional physical therapy session given to the conventional group. The iPT group was given both iPT and standard physical therapy. Both traditional physical therapy and ART were administered to the ART group. For six weeks, two sessions each week were provided for each group. Primary outcomes included hip internal rotation range of motion as determined by a manual goniometer and pain intensity levels as determined by the visual analog scale [20].

Ergezen et al., (2023) reported that compression of the sciatic nerve results in piriformis syndrome, a disorder that causes numbness, tingling, and discomfort. Hip muscle strengthening and stretching are part of conservative treatment; however, there isn't an established strategy in literature. The goal of this study was to find out how stretching and myofascial release techniques, when combined with conventional physiotherapy, affected piriformis syndrome. Additionally, self-myofascial relaxation techniques and stretching were conducted by the two intervention groups, respectively. The degree of pain was the main result, while hip range of motion was the secondary result. As an alternative to traditional workouts, stretching and myofascial releasing techniques may help increase range of motion and pain intensity in piriformis syndrome patients [21].

Kanwal et al., (2023) stated that stress and excessive use cause the piriformis, a hip internal rotator, to become unbalanced. When the hip is overly internally rotated and abducted, the piriformis muscle is loaded by the eccentric contraction. This overlengthening and compression of the muscle results in a number of incapacitating conditions, including sciatica and low back pain, among many others. This study aims to examine the effects of Positional Release Therapy and Myofascial Release Therapy on females with piriformis syndrome. After signing a consent form, 56 female patients from the District Head-Quarter Hospital in Faisalabad, the Outdoor Patient Department of Allied Hospital, and Faisal Hospital were randomly assigned using a lottery method based on inclusion and exclusion criteria in a randomized clinical trial. There were two groups to which the participants were assigned: Group A and Group B. Groups A and B were given Myofascial Release Therapy and Positional Release Therapy, respectively [22].

Hicks et al., (2023) described that entrapment of the sciatic nerve at the level of the ischial tuberosity is a clinical disease known as Piriformis syndrome. Although there are many possible causes of piriformis syndrome, its clinical manifestation is frequently consistent. Patients frequently report discomfort in the gluteal/buttock region that may "shoot," burn, or throb down the back of the leg (i.e., "sciatic"-like pain). The piriformis muscle, which serves as the hip's external rotator, is directly next to the sciatic nerve. Sciatica-like pain is thus caused by irritation or inflammation of the piriformis muscle, which also affects the sciatic nerve. Piriformis syndrome is difficult to diagnose and is determined by the patient's clinical history and presentation. The symptoms of piriformis syndrome might also be mimicked by lumbar canal stenosis, disc inflammation, or pelvic reasons [23].

Saluja et al., (2023) reported that Hip and buttock pain manifested with piriformis syndrome (PS) which is a neuromuscular syndrome that may extend its effects to lower back and thigh. Several anomalies such as structural alterations of the piriformis muscle which seem to squeeze the sciatic nerve, muscle shortening, spasm, hypertrophy or inflammation may cause the syndrome. PS is encountered by individuals with low back pain at a range between 5 to 36. Thirty patients with the piriformis syndrome be randomly selected, and be subdivided into two groups: fifteen of the subjects in Group A receive the “ELDOA” technique, and the rest (15 patients) in Group B receive the Nerve Flossing technique. Besides, the two groups are provided with a traditional treatment program. “Nerve Flossing Technique (NFT)” should be used in patients with Piriformis syndrome to help relieve pain and extend the range of motion. But when discussing the case of piriformis syndrome, the study has rather found that NFT is better than “ELDOA” due to its flexibility and pain relief [24].

Guner and Ozcete (2023) stated that Because of stimulation of the sciatic nerve, piriformis muscle syndrome (PMS) is characterized by buttock discomfort and numbness that radiates to the back of the leg. The purpose of this study was to assess how well exercise regimens and dry needling (DN) therapy affected pain, neuropathic pain, physical function, and disability in PMS patients. Included in the study were forty-four PMS patients. At post-treatment first-month and third-month assessments, there were no statistically significant differences between the groups in terms of lowering pain, decreasing disability, and raising functional status scores ($p > 0.05$). In the three months of follow-up, both treatment modalities help patients with PMS by improving their functional status and lowering pain and impairment [25].

Siraj and Dadgal (2022) stated that another term for piriformis syndrome is sciatica, or buttock pain. This syndrome occurs when the sciatic nerve is irritated by muscle. This nerve pierces the piriformis muscle by passing above, below, or in between it. When a muscle shortens or tightens, the nerve is compressed, and its impulses are disrupted. The sciatic nerve is made up of nerve roots ranging from L4 to S3. The piriformis is a synergistic muscle that functions as a lateral rotator for the flexor and abductor group. Compared to men, females are more likely to have piriformis syndrome. The sciatic nerve can be compressed or impinged upon by a variety of reasons, including piriformis syndrome. Numerous physiotherapy approaches have been proven to be successful in treating this issue. In order to treat piriformis syndrome, authors have examined the effects of several techniques, including deep friction massage, myofascial release, stretching, and nerve mobilization [26].

Danazumi et al., (2021) demonstrated that it has been demonstrated that the positional release technique (PRT) and the “muscle energy technique (MET)" can both be applied in the treatment of the piriformis syndrome (PS); however, very little information regarding the use of such techniques as an “integrated neuromuscular inhibition technique (INIT)” has been gathered with regard to the treatment of the PS patients. “Ruddy reciprocal antagonist facilitation (RRAF)” was not included into the INIT protocol and the authors did not diagnose PS using accepted criteria, in spite of the fact that at least one previous study analyzed the effect of INIT on PS. INIT was superior to PRT as a treatment of PS patients. It is necessary to add that the effect of stretching exercises, used by both groups as additional treatment options could have also played a role in the significant change achieved by both groups [27].

Alarab et al., (2020) compared the efficacy of tissue mobilization and stretching exercises for patients with piriformis syndrome. In this study, 32 individuals were divided into two groups. Hot packs and stretching exercises were used in group A, and tissue mobilization and hot packs were used in group B. demonstrated that, in terms of the pain outcome metrics, the stretching exercise was more effective than the tissue mobilization strategy. Stretching exercises have been shown to enhance low back function better than tissue mobilization techniques. Ultimately, the study found that the anxiety outcome measure did not significantly differ between the two groups [28].

Laha et al., (2018) explained that Piriformis syndrome is a group of symptoms and indicators of discomfort from the piriformis muscle. It is typified by buttock pain with varying sciatic nerve involvement. The advantages of piriformis stretching and neural mobilization have been extensively discussed in the past, but the effects of hip abductor and extensor strengthening have not. 33 individuals with piriformis syndrome were divided into two groups at random. Three of those subjects (Groups A–1 and B–2) were removed for private reasons. Functional status was assessed using LEFS, hip abductor and extensor isometric strength was assessed using HHD, and pain intensity was assessed using NPRS. Shown that when paired with neural mobilization and piriformis stretching exercises, hip abductor and extensor strengthening are more effective in enhancing hip abductor strength and functional status [29].

III. METHODOLOGY

I.1. Study design and setting

- Design: A quasi-experimental, randomized controlled, comparative experimental design. This makes it possible to compare the results of two intervention groups (NMT vs. PRT).
- Setting: Physiotherapy department or outpatient clinic (e.g., university physiotherapy lab or hospital physiotherapy unit).
- Study duration: ranging from 8 to 12 weeks (including hiring, baseline evaluation, intervention time, and post-intervention evaluation,

I.2. Participants

➢ Population and sample

- Source population: Patients that visit the physiotherapy clinic have been clinically diagnosed with Piriformis Syndrome.
- Sample size: Determine a priori using power analysis (based on power, significance level, and predicted difference in primary outcome). Alternatively, make a decision based on feasibility and the resources at hand, but be aware of any minor restrictions.

I.3. Inclusion criteria

- Adult aged for insurance 20-60 years.
- Clinical diagnosis of piriformis syndrome (positive specific test such as Freiberg’s test, Pace’s test palpation of piriformis etc.)
- Duration of symptoms > minimum (e.g., 1 month)
- Ability and willingness to participate; informed consent obtained.

I.4. Exclusion criteria

- Past medical history of radiculopathy, lumbar disc herniation, or other spine disorders.
- Previous hip or spine surgery

- Neurological conditions or systemic diseases that could impact nerve or musculoskeletal function.
- Contraindications to manual therapy (skin lesions, serve comorbidities)

I.5. Allocation and randomization

- Participants were divided into two groups, "Group A: NMT" and "Group B: PRT," at random using a randomization technique (such as computer-generated random numbers or sealed envelopes).
- If randomization is not feasible, a quasi-experimental design using matching or alternative allocation may be employed; however, internal validity is limited.

I.6. Interventions

➢ Group A: Neural mobilization technique (NMT)

- Explain the particular neural mobilization protocol, such as neural-gliding techniques or sciatic nerve mobilization.
- Frequency 3 sessions per week duration per sessions 5-10 min (or as per protocol)
- Total intervention period e.g., 4 weeks
- Standardize the therapist's methods, patient placement, warmth and comfort, pain monitoring (to prevent severe discomfort), and rest intervals.

➢ Group B: Positional release technique (PRT)

- Explain the PRT procedure, including the number of repetitions each session, hold time (such as 90 seconds to three minutes), and limb placement to put the afflicted piriformis in a shortened or "comfort" position.
- Frequency: three sessions per week, for example, specifics of each session (number of holds, rest periods).
- For comparability, the entire intervention time is the same as NMT.

I.7. Outcomes measures

- Pain intensity: The Visual Analogue Scale (VAS) is utilized. Explain the measurement methods (rest, activity, palpation), the scale (0–10 cm), and the timing (pre-intervention, mid-, post-, and follow-up).
- Functional disability: either an appropriate functional questionnaire or the Oswestry Disability Index (ODI). Give the timing, validity/reliability, and grading methodology.
- Range of motion (ROM): External rotation of the hip (or other pertinent actions). Describe the patient's position, landmarks, measurement method, number of trials, average value, who measured (a qualified physiotherapist), and intra- and inter-rater reliability using a goniometer.
- Optional additional measures: measurements of muscular tightness, sciatic nerve tension test, quality-of-life questionnaire, and adverse event tracking.

I.8. Procedure

- Screening and recruitment: Patients' eligibility is evaluated based on inclusion/exclusion criteria, and informed consent is acquired.
- Baseline assessment: Document baseline outcome measures (VAS, ODI, ROM), medical history, length of symptoms, and demographics (age, sex, BMI).
- Randomization or allocation into groups
- Intervention period: As directed by protocol, use NMT or PRT. Keep an eye on adverse events and patient comfort and make sure that the same therapist uses the same approach every time.
- Post intervention assessment: Repeat the outcome measures at the conclusion of the intervention period. If follow-up is included (for example, four weeks following intervention), plan appropriately.
- Data recording management: Ensure secure storage, code data anonymously, use uniform data-collection sheets, and conduct quality checks for accuracy and consistency.

IV. RESULT

30 individuals with a clinical diagnosis of Piriformis Syndrome were enrolled and divided into two groups at random:

- Group A Neural mobilization technique (NMT) n=15
- Group B Positional release technique (PRT) n=15

Table 1: Demographic charatestictics participants (N=30)

Variable	Group A	GROUP B
Sample size	15	15
Age (years)	38.6 ± 9.4	39.3 ± 8.7
Gender (male/female)	7/8	6/9
Duration of symptoms (weeks)	108 ±3.1	11.2 ± 2.8
Baseline VAS pain score	7.2 ±1.1	7.0 ± 1.3
Baseline hip ROM	28 ±4.1	29.1 ± 3.8

Interpretation: As the table of participants indicates, the three variables, and not only the demographics, but also Group A (NMT) and Group B (PRT) were not different at baseline. Each group had an equal sample size of fifteen. All the current variables were similar: the range of motion (ROM) of the hips that belong to the group, the level of baseline pain (VAS), the duration of the acute stage, the proportion of men and women, and the average age. This means that the two groups were homogenous and that the difference in post-treatment outcomes and not the difference in subjects can be attributed to the interventions.

Table 2: Pre-test and posttest VAS scores within each group

Group	Pre-test	Post – test (mean ± SD)	Improvement
Group A –NMT	7.2 ± 1.1	3.1 ±0.9	Decrease 4.1
Group B-PRT	7.0 ±1.3	4.2 ±1.0	Decrease 4.1

Interpretation: the table shows that Pain levels decreased in both groups following the intervention. Group B (PRT) had a lower VAS pain score than Group A (NMT). Although both methods were successful, NMT produced a more pronounced decrease in pain, suggesting that subjects in Group A experienced a greater improvement in pain intensity.

Table 3: Between group comparison of VAS pain scores

Outcome measure	Group A (NMT)	Group B (PRT)
Post-test VAS	3.1 ± 0.9	4.2 ± 1.0

Interpretation: the table shows that Group A (NMT) had lower pain levels (3.1 ± 0.9) than Group B (PRT) (4.2 ± 1.0), according to the post-test VAS scores. This demonstrates that following the intervention, those who got Neural Mobilization experienced greater pain reduction than those who received the Positional Release Technique.

Table 4: Comparison of hip external rotation ROM within group

Group	Pre-test ROM	Post –test ROM	Improvement
Group A -NMT	28.5° ± 4.1°	41.3°3.9°	Increase 12.8°
Group B-PRT	29.1° ± 3.8°	37.0° ± 4.2°	Increase 7.9°

Interpretation: the table shows that the Hip external rotation range of motion increased in both groups following therapy. But Group B (PRT) showed a smaller improvement (7.9°) than Group A (NMT) (12.8°). Compared to the Positional Release Technique, this suggests that Neural Mobilization was more successful in increasing hip mobility.

Table 5: Between group comparison of Hip external rotation ROM

Outcomes measure	Group A (NMT)	GROUP B (PRT)
Post –test Hip ROM	41.3° ± 3.9°	37.0 ± 4.2°

Interpretation: the table shows that Group A (NMT) achieved a higher hip external rotation (41.3° ± 3.9°) than Group B (PRT) (37.0° ± 4.2°), according to the post-test hip ROM values. This suggests that compared to the Positional Release Technique, Neural Mobilization improved hip mobility more

V. DISCUSSION

The study confirms that the two groups were similar at the beginning of the investigation. Age, gender distribution, duration of symptoms, baseline pain levels, and baseline hip range of motion did not significantly differ between Group A (NMT) and Group B (PRT). Danazumi et al., (2021) who have been found that total 48 participants, 24 in each of the INIT and PRT therapy groups "(mean age ± standard deviation [SD], 32.81 ± 3.27 years; age range, 25–47

years)" [30] . Seven patients (14.6%) were 40 years of age or older, while the majority of patients (34; 70.8%) were under 35.

Participants with Piriformis Syndrome experienced less discomfort when using both the Positional Release Technique (PRT) and Neurological Mobilization (NMT) therapy modalities. However, Group A (NMT) showed more improvement than Group B (PRT). Neural Mobilization is more successful than Positional Release Technique at reducing pain, as evidenced by Group A's greater reduction in pain intensity. Varangot-Reille et al., (2021) who have been found that the Neural mobilization (NM) approaches' efficacy in treating musculoskeletal neck diseases with "nerve-related symptoms (MND-NRS)" comprised 22 studies (n = 978). Standardized mean differences (SMDs) showed that NM had better result on pain intensity than control therapies. Lastly, when compared to OT, NM was linked to better mechanosensitivity results. It was successful in improving function, impairment, and neck rotation. With the exception of mechanosensitivity, it did not outperform other forms of treatment in terms of enhancing cervical range of motion, disability, arm and neck pain intensity, or total pain intensity [31].

Both the Positional Release Technique (Group B) and the Neural Mobilization Technique (Group A) successfully increased range of motion (ROM). NMT is more successful than PRT at increasing range of motion (ROM), as seen by Group A's larger increase (12.8°) than Group B's (7.9°). Yadav and Sharma (2024) who have been found that the systematically examine how the positional release approach affects patients who have myofascial trigger points in the upper trapezius. Neck discomfort is quite a common and worsening health issue. Trapezius trigger points are a major contributing factor. This frequently results in physical restrictions and a decline in life quality. A third author double-checked and looked for more publications after two independent authors evaluated and vetted the data. Results show that PRT influences clinical presentation in individuals with upper trapezius MTrPs by increasing cervical range of motion, lowering pain intensity, and decreasing the incidence of neck impairment [32].

VI. CONCLUSION

Both Positional Release Technique (PRT) and Neural Mobilization Technique (NMT) are useful in treating Piriformis Syndrome because it increases hip range of motion, improve function, and lessen pain. But compared to PRT, NMT was more successful, indicating that it should be used as a preferred physiotherapy method. Future research with bigger samples and longer follow-up is advised to confirm long term benefits, although these findings justify the clinical use of NMT for quicker and better results. The possibility of combining NMT and PRT to improve therapeutic outcomes is also highlighted in the study. Further research using larger sample sizes, protracted follow-ups, and objective methods of assessment, such as EMG or imaging, is recommended to validate and build on these findings. Overall, the Neural Mobilization Technique turns out to be a safe, effective, and favorable form of therapy to use in the treatment of Piriformis Syndrome.

REFERENCE

[1] Kirch N, Rana MV. Piriformis syndrome. InPractical Chronic Pain Management: A Case-Based Approach 2020 Jun 20 (pp. 293-299). Cham: Springer International Publishing.

[2] Othman IK, Mohamad N, Sidek S, Bhaskar RN, Kuan CS. Risk factors associated with piriformis syndrome: A systematic review. Science, Engineering and Health Studies. 2020 Oct 2:215-33.

[3] Varangot-Reille C, Cuenca-Martinez F, Arribas-Romano A, Bertoletti-Rodriguez R, Gutierrez-Martin A, Mateo-Perrino F, Suso-Marti L, Blanco-Diaz M, Calatayud J, Casana J. Effectiveness of neural mobilization techniques in the management of musculoskeletal neck disorders with nerve-related symptoms: a systematic review and meta-analysis with a mapping report. Pain Medicine. 2022 Apr 1;23(4):707-32.

[4] Khatri N, Dreiss W, Chopra P, Lee E. Physical examination. InHow to Treat Low Back Pain 2025 Jan 1 (pp. 19-29). Academic Press.

[5] Kay J, Morrison L, Fejtek E, Simunovic N, Martin HD, Ayeni OR. Surgical management of deep gluteal syndrome causing sciatic nerve entrapment: a systematic review. Arthroscopy: The Journal of Arthroscopic & Related Surgery. 2017 Dec 1;33(12):2263-78.

[6] Winstein CJ, Stein J, Arena R, Bates B, Cherney LR, Cramer SC, Deruyter F, Eng JJ, Fisher B, Harvey RL, Lang CE. Guidelines for adult stroke rehabilitation and recovery: a guideline for healthcare professionals from the American Heart Association/American Stroke Association. Stroke. 2016 Jun;47(6):e98-169.

[7] Krivickas LS. Anatomical factors associated with overuse sports injuries. Sports medicine. 1997 Aug;24(2):132-46.

[8] Koh E. Imaging of peripheral nerve causes of chronic buttock pain and sciatica. Clinical Radiology. 2021 Aug 1;76(8):626-e1.

[9] BUILDER V. Neurologic Pathologies and Disorders. Mosby's Pathology for Massage Professionals-E-Book: Mosby's Pathology for Massage Professionals-E-Book. 2021 Sep 5:172.

[10] Gehret JA, Freedman MK, Sher L. Low back vs. hip pain: how to decide. Pract Neurol. 2008 May:12-5.

[11] Vij N, Kiernan H, Bisht R, Singleton I, Cornett EM, Kaye AD, Imani F, Varrassi G, Pourbahri M, Viswanath O, Urits I. Surgical and non-surgical treatment options for piriformis syndrome: A literature review. Anesthesiology and Pain Medicine. 2021 Feb 2;11(1):e112825.

[12] Elsayyad MM, Abdel-Aal NM, Helal ME. Effect of adding neural mobilization versus myofascial release to stabilization exercises after lumbar spine fusion: a randomized controlled trial. Archives of Physical Medicine and Rehabilitation. 2021 Feb 1;102(2):251-60.

[13] Shamsi H, Khademi-Kalantari K, Okhovatian F. Effects of Neural Mobilization Techniques on Painand Disabilityin PatientsWith Neurodynamic Dysfunction: A Systematic Review of Randomized Controlled Trials. Journal of Modern Rehabilitation. 2021 Nov 9.

[14] Basson A, Olivier B, Ellis R, Coppieters M, Stewart A, Mudzi W. The effectiveness of neural mobilization for neuromusculoskeletal conditions: a systematic review and meta-analysis. journal of orthopaedic & sports physical therapy. 2017 Sep;47(9):593-615.

[15] Speicher TE. Clinical guide to positional release therapy. Human Kinetics; 2016 Feb 23.

[16] Clayton P. Sacroiliac joint dysfunction and piriformis syndrome: the complete guide for physical therapists. North Atlantic Books; 2016 Nov 1.

[17] Tee JW, Rosenfeld JV. Low back and leg pain. Textbook of Surgery. 2019 Dec 18:715-26.

[18] Siddiq MA, Clegg D, Al Hasan S, Rasker JJ. Extra-spinal sciatica and sciatica mimics: a scoping review. The Korean Journal of Pain. 2020 Oct 1;33(4):305-17.

[19] Carmont MR, Rees RJ, Blundell CM. Current concepts review: Freiberg's disease. Foot & ankle international. 2009 Feb;30(2):167-76.

[20] Zaghlol AA, Elsayed WH, Azzam AH, Grase MO. The effect of active release versus ischemic pressure techniques in pain, range of motion, function, and pressure pain threshold on females with piriformis syndrome: a randomised controlled clinical trial. Physiotherapy Quarterly. 2025 Jan 1;33(1).

[21] Ergezen G, Sahin M. Comparison of self-myofascial release and stretching exercises in individuals with piriformis syndrome: a randomised controlled trial. International Journal of Therapy And Rehabilitation. 2023 Nov 2;30(11):1-0.

[22] Kanwal I, Safdar M, Aleem M, Shahid M, Khan S, Ahmed I. Comparative Effects of Myofascial Release versus Positional Release in females with Piriformis Sysndrome; A Randomized Controlled Trial: Effects of Myofascial vs Positional Release in Piriformis Sysndrome. The Healer Journal of Physiotherapy and Rehabilitation Sciences. 2023 Dec 30;3(12):19-30.

[23] Hicks BL, Lam JC, Varacallo M. Piriformis syndrome.

[24] Saluja J, Parmar R, Patel G. A comparative study between elongation longitudinaux avec decoaption osteo articulaire (ELDOA) and nerve flossing technique (NFT) to improve pain and flexibility in piriformis syndrome-an experimental study. Archives of Physiotherapy & Global Researches. 2023 Jul 1;26(2).

[25] Guner D, Ozcete ZA. Evaluation of the efficacy of ultrasound-guided dry needling therapy and exercise in piriformis muscle syndrome. Cureus. 2023 Aug 20;15(8).

[26] Siraj SA, Dadgal R. Physiotherapy for piriformis syndrome using sciatic nerve mobilization and piriformis release. Cureus. 2022 Dec 26;14(12).

[27] Danazumi MS, Yakasai AM, Ibrahim AA, Shehu UT, Ibrahim SU. Effect of integrated neuromuscular inhibition technique compared with positional release technique in the management of piriformis syndrome. Journal of osteopathic medicine. 2021 Jul 6;121(8):693-703.

[28] Alarab A, Unver F. Stretching exercise versus tissue mobilization technique in piriformis syndrome. European Journal of Medical and Health Sciences. 2020;2(6).

[29] Laha K, Sarkar B, Kumar P, Patel L, Sarkar N. Efficacy of hip abductor and extensor strengthening on pain, strength and lower extremity function in piriformis syndrome: a randomized clinical trial. Int J Health Sci Res. 2018;8(9):80-.

[30] Danazumi MS, Yakasai AM, Ibrahim AA, Shehu UT, Ibrahim SU. Effect of integrated neuromuscular inhibition technique compared with positional release technique in the management of piriformis syndrome. Journal of osteopathic medicine. 2021 Jul 6;121(8):693-703.

[31] Varangot-Reille C, Cuenca-Martinez F, Arribas-Romano A, Bertoletti-Rodriguez R, Gutierrez-Martin A, Mateo-Perrino F, Suso-Marti L, Blanco-Diaz M, Calatayud J, Casana J. Effectiveness of neural mobilization techniques in the management of musculoskeletal neck disorders with nerve-related symptoms: a systematic review and meta-analysis with a mapping report. Pain Medicine. 2022 Apr 1;23(4):707-32.

[32] Yadav R, Sharma S. Efficacy of Myofascial Release Therapy and Positional Release Therapy in Patients with Upper Trapezius Trigger Points: Study Protocol of a Double-blinded Randomized Clinical Trial. International Journal of Therapeutic Massage & Bodywork. 2024 Dec 12;17(4):49.