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# COMPARING THE EFFECTS OF DRY NEEDLING AND CENTRAL STABILITY EXERCISES ON QUADRATUS LUMBORUM TRIGGER POINTS (RANDOMIZED CLINICAL TRIAL)

**Nida Ilahi[*1], Sania Naz[2], Roshan Qamar[3], Ashbeela Kifayat[4], Attia Ur Rehman[5], Mahek Fatima[6], Muqadas Tanveer[7]**

*[*1]Head of Department DPT, GCUF Layyah Campus*
*[2]Senior Lecturer DPT, GCUF Layyah Campus*
*[3, 4,5,6,7]GCUF Layyah Campus*

[*1]nidailahi78@gmail.com, [2]saaniaanaz@gmail.com, [3]roshanqamar55@gmail.com, [4]ashbeelakifayat213@gmail.com, [5]attiarehman192@gmail.com, [6]mahekf45@gmail.com, [7]tanveermuqads305@gmail.com

**Corresponding Author: ***
**Nida Ilahi**
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## ABSTRACT

***Background:*** *Lower backache is often caused by myofascial pain points in the quadratus lumborum muscle. The lower back's muscles may develop trigger points–hyperirritable foci within tight bands of hypertonic musculature–as a result of acute or chronic stressors, changes in muscular demands, or both. There are a number of tried-and-true manual therapy methods for addressing muscle imbalances and trigger points, including central stability exercises and dry needling.*

***Objective:*** *Comparing the Effects of Dry Needling and Central Stability exercises on Quadratus lumborum Trigger Points.*

***Methods:*** *The inclusion and exclusion criteria were satisfied by fourteen participants in a randomized clinical study. The subjects were split into two categories: Central stability exercises were administered to Group B, whereas dry needling was administered to Group A. Disposable stainless-steel needles measuring 0.3*60 mm were used for DN. There were thirty to thirty-five minutes in each session. Exercises for Core Stability that include the following: Bridging, Toe Tapping, prone plank, side plank with extended arm and Bird Dog (Quadruped Position with Alternating Arms and Legs). Each session lasted three weeks. The workout regimen consisted of two sessions per week, with each session lasting 6-9 minutes and consisting of three sets of five repetitions with a 5-10 second hold between sets. The NPRS was used to assess pain, while the MODI was used to quantify disability.*

***Results:*** *Reductions in both pain and disability were significantly affected by therapy in both groups ($p>0.05$). When it came to alleviating pain and incapacity caused by Quadratus lumborum trigger points, Dry Needling proved to be more helpful than Central Stability Exercises.*

***Conclusion:*** *Dry needling and central stability exercises both reduced pain and impairment similarly, according to the research. On the other hand, the results for pain and impairment were much better with the Dry Needling Technique.*

## INTRODUCTION

A myofascial trigger point (MTrP) is typically described as a highly sensitive area located within a taut band of skeletal muscle or its fascia. This area becomes painful when pressure is applied and can result in distinctive referred pain as well as motor impairments. [1] These trigger points often consist of several hyperirritable nodules found within a specific muscle zone. Research indicates that approximately

44 million individuals in the United States suffering from back pain are also affected by myofascial trigger points. Another study found that nearly 30% of those with lower back pain exhibited symptoms related to myofascial trigger points. Overall, myofascial-related disorders are believed to account for up to 55% of all musculoskeletal pain complaints. [2] These trigger points can lead to discomfort, muscle fatigue, increased stiffness, a heightened sensitivity to pressure, a decline in joint range of motion (ROM), and various limitations in physical functionality. [3]

There is no single, universally accepted set of diagnostic criteria for identifying myofascial trigger points; however, multiple guidelines have been proposed. According to Simons, diagnosing a trigger point involves satisfying five primary and at least one secondary criterion. The primary indicators include ongoing localized pain without obvious external stimuli, altered sensation in the affected region, a taut muscle band at the trigger site, focal tenderness, and a notable decrease in the muscle's range of motion. The additional or secondary signs include pain relief following muscle stretching and the observation of a twitch response or pain upon manual compression of the point. [2]

Low back pain (LBP) is frequently triggered by repetitive strain, such as lifting heavy objects, prolonged bending, or maintaining poor posture. These activities contribute to muscle tightness and further reduce flexibility and range of motion in the lumbar region. [4]

Among the muscles involved in LBP, the quadratus lumborum (QL) plays a pivotal role. It is a deep-seated muscle situated near the spinal segment's axis of rotation, making it ideal for regulating spinal motion. The QL is bilaterally positioned in the posterior abdominal wall, originating at the posterior section of the iliac crest and inserting along the lower border of the twelfth rib and the transverse processes of the first to fourth lumbar vertebrae (L1–L4). Functionally, the QL acts both as a stabilizing muscle (deep segmental fibers) and a global mover (superficial fibers). When contracting on one side (unilaterally), it contributes to lateral flexion of the spine, while bilateral contraction results in lumbar extension. [5]

The QL is also among the most common sites for myofascial trigger points in patients experiencing lower back pain. It typically has four recognized trigger points—two superficial and two deep. [6] The superficial trigger points can produce pain that extends from the iliac crest down to the greater trochanter, along the lateral aspect of the femur, and may even radiate to the groin. Meanwhile, the deep trigger points are more likely to refer pain from the lower back toward the sacroiliac joint and down to the lower buttock. [7] Pain associated with the QL is often described as a deep, dull ache that intensifies during movement and can spread to the outer upper groin region. [6]

A variety of treatment methods exist for addressing myofascial pain associated with trigger points. Pharmacological interventions often include the use of painkillers such as analgesics, muscle relaxants, nonsteroidal anti-inflammatory drugs (NSAIDs), antidepressants, and corticosteroids. Non-pharmacological options encompass a broad spectrum of therapies, including massage, therapeutic ultrasound, application of heat (hot packs), transcutaneous electrical nerve stimulation (TENS), and rehabilitative exercise protocols such as McKenzie therapy. [8]

One increasingly popular non-pharmacological intervention is dry needling (DN), a method derived from acupuncture principles. Dry needling involves inserting a fine needle into the skin and muscle, targeting the myofascial trigger point directly. When performed by a qualified practitioner, DN can effectively deactivate trigger points and alleviate associated pain. [3] Research supports the use of DN as a beneficial treatment for pain relief across various body regions. It has also shown promise in improving ROM, spinal mobility, and functional outcomes in patients. However, the evidence base supporting DN's effectiveness ranges from low to moderate in quality. [9]

In clinical practice, DN targeting the QL muscle typically involves using a sterile 0.3 x 60 mm stainless steel needle. To precisely locate the lateral border of the QL muscle, practitioners use deep palpation with fingers placed slightly posterior to the midline. The needle is then inserted directly downward toward its anatomical attachment at the transverse process of the L4 vertebra. [10]

In cases of chronic, non-specific lower back pain, central stability exercises that engage the QL muscle have been found to significantly reduce pain and enhance functional performance. These exercises promote core muscle engagement, which aids in maintaining spinal alignment, improving posture, and supporting better ergonomics during daily activities such as lifting, bending, and sleeping. [11]

Common central stability exercises include the prone plank, side plank with extended arm, toe taps,

bridging, and quadruped position exercises like the "bird dog," which involves alternating arm and leg extensions. [12]

Given the widespread prevalence of myofascial trigger points in the QL and their significant impact on everyday movement, a combined treatment strategy involving both dry needling and central stability exercises may offer a comprehensive approach. While both methods have shown individual effectiveness, there is limited existing literature that directly compares their outcomes for treating QL-related myofascial trigger points. This presents a research gap that warrants further exploration.

Therefore, the rationale for this study is to evaluate and compare the relative effectiveness of dry needling and central stability exercises in the management of myofascial trigger points in the quadratus lumborum muscle. The goal is to determine whether one method offers superior benefits over the other in reducing pain, improving ROM, and enhancing functional performance. As the QL is a key postural and stabilizing muscle used frequently in daily tasks such as sitting, standing, and stair climbing, selecting the most effective treatment is critical for optimal patient recovery and quality of life.

## LITERATURE REVIEW

A study of dry needling acupuncture's immediate effects on those with chronic mechanical low back pain participants was performed by Alrawaili et al. (2024). Consequently, the study was a randomized controlled trial of 30 consecutive adult participants diagnosed with nonspecific low back pain. The subjects were divided into 2 sets of two parallel groups. Therefore, 15 participants were assigned to Group A in which they received dry needling acupuncture at certain places on their backs. In another group of 15 people, Group B, a stretching and muscle-strengthening exercise regimen was given. It was found that chronic mechanical low back pain could be effectively managed by the use of dry needling in regards to pain intensity, disability and pain pressure sensitivity. [13]

According to Zahid et al. (2023), they wanted to study and contrast the effectiveness of Dry Needling (DN) rather than the Muscle Energy Technique (MET) to heal active trigger points located in the quadratus lumborum muscle. This randomized controlled study enrolled 24 patients equally to two groups, who were intervened twice a week for 3 weeks. Improved functional disability was assessed using the Modified Oswestry Disability Index (MODI). Regarding the results, it was found that Dry Needling was more efficient at reducing functional limitations attributed to active trigger points in the quadratus lumborum in patients affected by low back pain. [4]

In 2023, Pour Ahmadi et al. the study about the comparative study of the functional disability, the pain perception, muscle performance of the quadratus lumborum and lumbar multifidus, the spinal range of motion, and the pain pressure threshold to the dry needling and the lumbar spine mobilization was conducted in individuals who suffered from nonspecific chronic low back pain. A double blind two arm randomized clinical trial involving 56 participants was this study. Dry needling plus a placebo mobilization was performed on the experimental group, while control group received Maitland's posterior-anterior mobilization and sham dry needling. In both groups, therapeutic exercises as well as low level laser therapy was also given. With regards to function disability, the dry needling group made significant relative improvement compared to the mobilization group, which was an outperformance for the study. [3]

In their work to study the influence of combining reciprocal inhibition with ischemic pressure versus just the ischemic pressure on trigger points in the quadratus lumborum muscle of persons with low back pain, Sanaullah et al. (2022) aimed to evaluate which would be the best method for the treatment of trigger points due to ischemic pressure in the quadratus lumborum muscle of people with low back pain. This randomized controlled trial ran for six months and assigned participants using a lottery, and was performed in collaboration with the Department of Canadian Heritage. Convenience sampling was used to recruit fifty people and divided them into two groups. Group 1 received standard therapy, while the patients of Group 2 were subjected to standard treatment and ischemic pressure therapy. Pain intensity and lumbar mobility were assessed by goniometer and quantitative numerical pain rating scale respectively. Secondly, results showed that including reciprocal inhibition in the treatment protocol produced highly positive results. [2]

In a study aimed at comparing the comparative efficacy of electrical dry needling to conventional physiotherapy on the active and latent myofascial trigger points of subjects with nonspecific chronic low back pain, Lara-Palomo et al (2022). This randomized, double blind group trial was carried out on 92 participants, randomly divided into two groups

(40 in each). The first group received electrical dry needling, the second subject group underwent conventional physiotherapy, which was ischemic compression, analytical stretching, and postural education. Pain intensity, functional disability, fear of movement, sleep quality, quality of life, anxiety, depression, pressure pain threshold, abdominal strength and lumbar mobility were the assessed variables. Electrical dry needling was determined to significantly reduce disability and work absenteeism as a result of chronic low back pain. [14]

As mentioned earlier, Bhosale et al. in their 2021 study assessed the efficacy of combining myofascial release, muscle energy technique and quadratus lumborum stretch with treating patients with nonspecific low back pain. An experimental design was conducted; two groups were included, the control group and experimental group, which were measured on a pretest and post-test structure. Inclusion and exclusion criteria were used to randomly pick up thirty-five participants, whom we then divided between the two groups. For outcome measures, these were Numerical Pain Rating Scale (NPRS), Oswestry Disability Index (ODI) and Modified Schober's Test was used to measure lumbar range of motion. These results supported the conclusion that manual therapy techniques were beneficial to integrate in managing nonspecific low back pain. [5]

TUBASSAM et al. (2021) carried out a quasi-experimental study comparing the effectiveness of the Muscle Energy Technique (MET) and the Strain Counter strain Technique (SCS) on trigger points located in the quadratus lumborum muscle among patients with low back pain. The study included 40 participants divided into two treatment groups. Group A received MET combined with moist heat therapy, while Group B was treated using the SCS method along with moist heat. Both interventions were administered over a two-week period. Pain and functional disability were evaluated using the Numerical Pain Rating Scale (NPRS) and the Modified Oswestry Disability Questionnaire. The findings showed that both techniques significantly reduced pain and functional impairments. However, MET demonstrated a greater mean improvement compared to the SCS method. [15]

### 2.2 OBJECTIVE:

Comparing the Effects of Dry Needling and Central Stability Exercises on Quadratus lumborum Trigger Points.

### 2.3 HYPOTHESIS

#### 2.3.1 NULL HYPOTHESIS

There was no significant difference in Comparing the Effects of Dry Needling and Central Stability Exercises on Quadratus Lumborum Trigger Points.

#### 2.3.2 ALTERNATE HYPOTHESIS

There was significant difference in Comparing the Effects of Dry Needling and Central Stability Exercises on Quadratus Lumborum Trigger Points.

## MATERIAL & METHODS

### 3.1 STUDY DESIGN

The Study Design was Randomized Clinical Trial.

### 3.2 SETTING

The Study Setting was Rehab max Physiotherapy and Sports Injury Clinic, Layyah

### 3.3 DURATION OF THE STUDY

The study was completed within 3 months after the approval of synopsis.

### 3.4 SAMPLE SIZE

The calculated sample size considering pain and disability as an outcome measure was seven in each group by using Open Epi online software. [6]

**Sample Size For Comparing Two Means**

**Input Data**

| | |
|---|---|
| Confidence Interval (2-sided) | 95% |
| Power | 80% |
| Ratio of sample size (Group 2/Group 1) | 1 |

| | Group 1 | Group 2 | Difference* |
|---|---|---|---|
| Mean | 1.34 | 3.09 | -1.75 |
| Standard deviation | 0.98 | 1.25 | |
| Variance | 0.9604 | 1.5625 | |

| | |
|---|---|
| Sample size of Group 1 | 7 |
| Sample size of Group 2 | 7 |
| Total sample size | 14 |

### 3.5 STUDY GROUPS

#### 3.5.1 Group A:

Group A Received Dry Needling Technique

#### 3.5.2 Group B:

Group B Received Central Stability exercises

### 3.6 SAMPLING TECHNIQUE

Non-Probability purposive Sampling Technique was used.

### 3.7 SAMPLE SELECTION

#### 3.7.1 INCLUSION CRITERIA

- 18-45 years of age. [6]
- Both Male and Female Gender. [16]
- An activated activation spot in the quadratus lumborum muscular as per the diagnostic criteria set by Travell and Simons. [6]
- Mechanical lower back pain must have persisted for a minimum of two months in order to participate. [6]
- Experience discomfort when engaging in two or more of the following activities: sitting for lengthy periods of time, ascending stairs, crouching, jogging, leaping, or hopping. [10]
- There is at least one active trigger point in the quadratus lumborum that can be felt by palpation. [17]

#### 3.7.2 EXCLUSION CRITERIA

- Spinal abnormalities. [6]
- Disc Herniation. [6]
- History of spinal Surgery. [6]
- Current Pregnancy. [10]
- Presence of Lumbar Stenosis. [14]
- A fear of needles. [10]

### 3.8 DATA COLLECTION TOOL:

- NPRS Scale
- Modified Oswestry Disability Index

#### 3.8.1 NPRS Scale:

Individuals experiencing pain, whether acute or chronic, were assessed using the NPRS. An 11-point scale, with 0 representing no pain and 10 representing the greatest suffering possible, is used by the NPRS.

0= No pain
1-3=Mild pain
4-6=Moderate pain
7-10=Severe pain [18]

#### 3.8.2 Modified Oswestry Disability Index:

One disability measure that takes into account the particular effects of back pain on a patient's everyday life is the MODI, or Modified Oswestry Low Back Pain Disability Questionnaire. Each statement is rated on a scale from 0 (no disability at all) to 5 (extreme disability), with 0 being the least level of handicap and 5 the most severe.

0-20= Minimal disability.
21-40= Moderate disability.
41-60= Severe disability.
61-80= Cripple, pain impinges on all aspects of patient's life.
81-100= Patients are bed-bound or exaggerating their symptoms. [19]

### 3.9 DATA COLLECTION PROCEDURE:

Participants were selected for this research based on their eligibility.

For randomization, sealed opaque envelopes were used. Each participant in this study received a sealed opaque envelope with their specific treatment plan. An envelope with the assigned treatment regimen was presented to a patient after they had agreed to participate in a study. [10]

#### 3.9.1 ASSESMENT:

Data was collected at baseline, at 3rd week and at 6th week.

### 3.10 INTERVENTIONS:

#### MANUAL THERAPY:

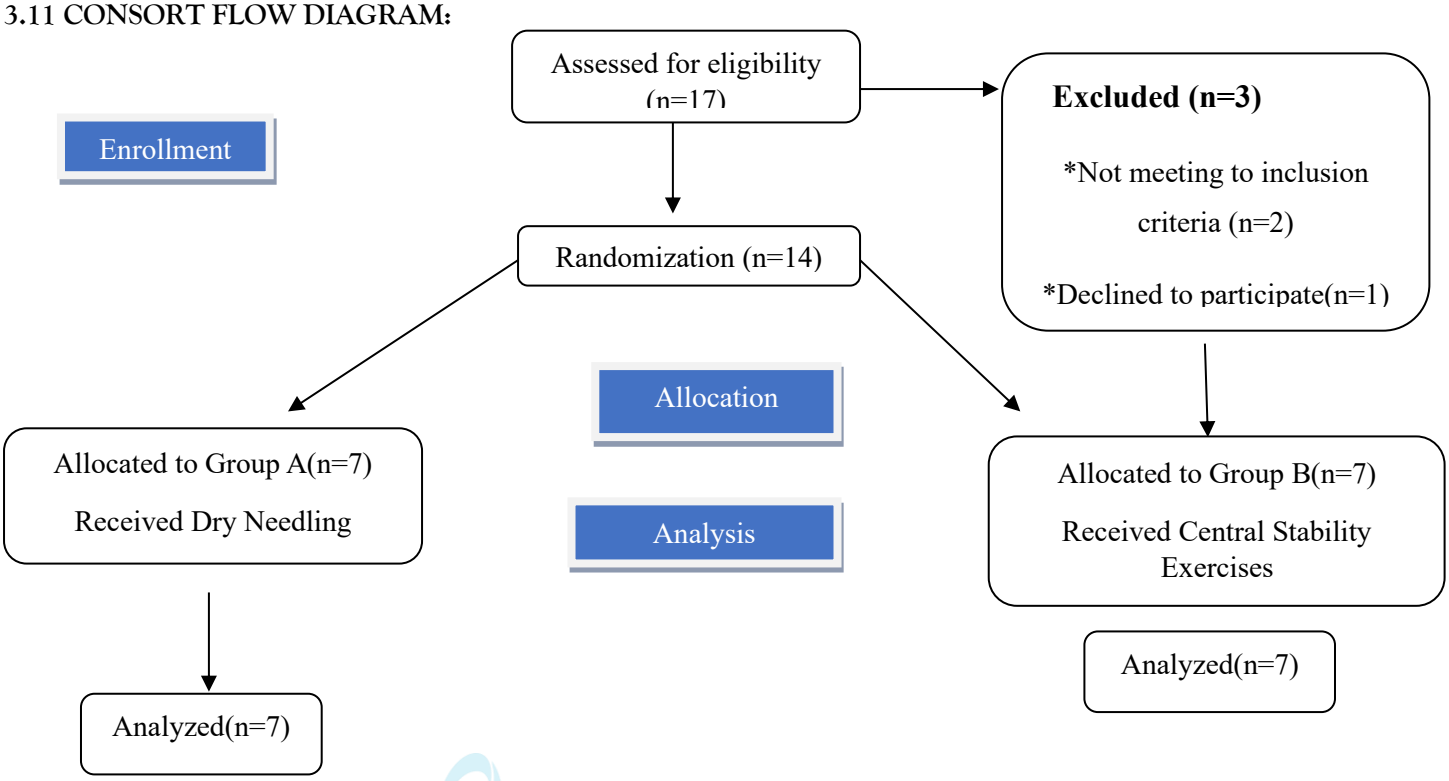
**Dry Needling Technique:**

Dry needling was administered to Group A using disposable stainless-steel needles measuring 0.3*60 mm for DN. In order to locate the lateral border of the QL muscle, the fingers were positioned slightly behind and pushed deeply using flat palpation. The needle was then pointed downwards, making its way to its fasteners on the transverse process of L4. There were thirty to thirty-five minutes in each session.[10]

**Central Stability Exercises:**

The members of Group B were given Central Stability Exercises, which included positions such as the Prone Plank, Side Plank with extended arm, Toe Tap, Bridging, and quadruped posture with alternating arm/leg lifts ("bird dog"). [12] Each session lasted three weeks. Each exercise was performed for 6-9 minutes twice weekly with a 5-10 second hold in between sets of three repetitions.[20]

### 3.11 CONSORT FLOW DIAGRAM:




### 3.13 ETHICAL CONSIDERATIONS:

The rules and regulations set by Ethical committee of GC University Faisalabad Layyah Campus was followed by conducted the research and the rights of the research participant was respected.

- Written informed consent (attach) was taken from all the participants.
- All information and Data collection was kept confidential.
- Participants remained anonymous throughout the study.
- The subject was informed that there are no disadvantage or risk in the procedure of the study.
- We did everything we can to protect your privacy. Your identity was not revealed in any publication resulting from this study.
- Your Participation in this research study was voluntary. You may choose not to participate and you may withdraw your consent to participate any time. You were not penalized in any way should you decide not to participate or to withdraw from this study

## RESULTS

**Table 1: Age of Participants**

| Groups | Mean ±SD |
|---|---|
| Group A (Dry Needling) | 28.43±7.42 |
| Group B (Central Stability Exercises) | 30.14±8.49 |

The mean age of participants of Dry Needling group was 28.43±7.42 while Central Stability Exercises group was 30.14±8.49

**Table2: Age Distribution among Groups**

| Groups | Age | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Group A (Dry Needling) | 18 | 1 | 14.3 | 14.3 | 14.3 |
| | 23 | 1 | 14.3 | 14.3 | 28.6 |
| | 25 | 1 | 14.3 | 14.3 | 42.9 |

| | | | | | |
|---|---|---|---|---|---|
| | 28 | 1 | 14.3 | 14.3 | 57.1 |
| | 30 | 1 | 14.3 | 14.3 | 71.4 |
| | 35 | 1 | 14.3 | 14.3 | 85.7 |
| | 40 | 1 | 14.3 | 14.3 | 100.0 |
| | Total | 7 | 100.0 | 100.0 | |
| Group B (Central Stability Exercises) | 21 | 1 | 14.3 | 14.3 | 14.3 |
| | 23 | 1 | 14.3 | 14.3 | 28.6 |
| | 25 | 1 | 14.3 | 14.3 | 42.9 |
| | 27 | 1 | 14.3 | 14.3 | 57.1 |
| | 33 | 1 | 14.3 | 14.3 | 71.4 |
| | 38 | 1 | 14.3 | 14.3 | 85.7 |
| | 44 | 1 | 14.3 | 14.3 | 100.0 |
| | Total | 7 | 100.0 | 100.0 | |

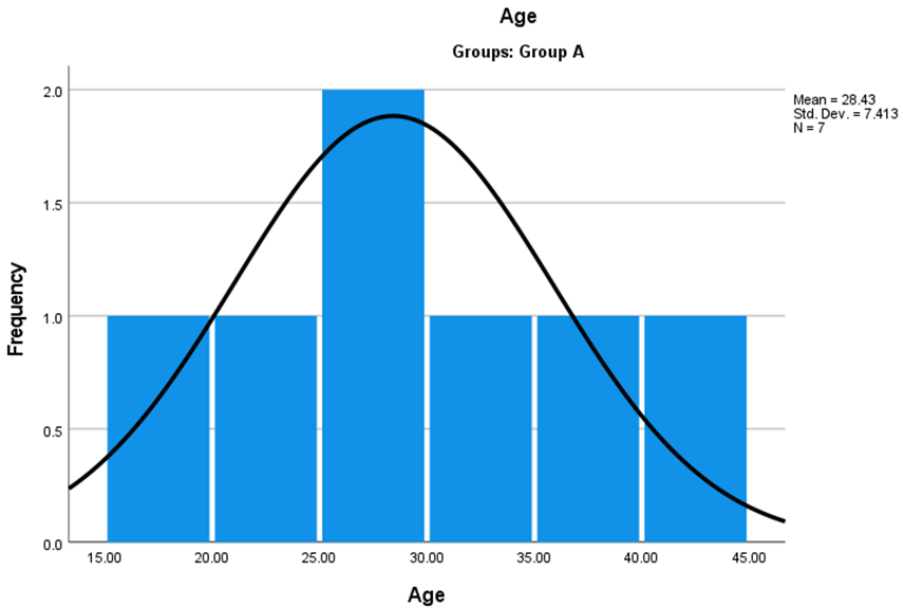



Figure 1: Frequency of Age of Participants in Dry Needling

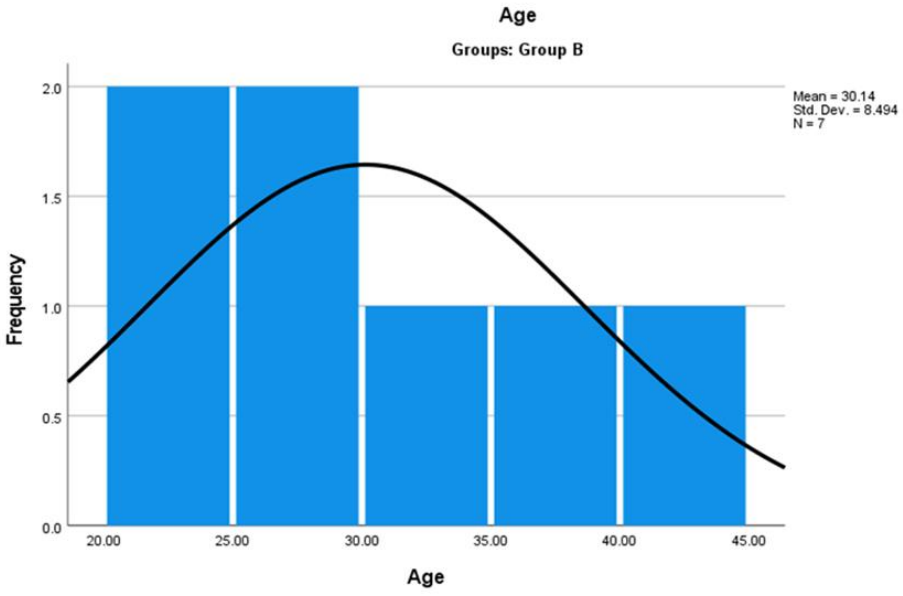



Figure 2: Frequency of Age of Participants in Central Stability Exercises

Table 3: Gender Statistics

| Group | Mean± SD |
|---|---|
| Dry Needling | 1.57±0.53 |
| Central Stability Exercises | 1.43±0.53 |

Table 4: Gender Distribution among Groups

| Groups | Gender | Frequency | Percentage |
|---|---|---|---|
| Dry Needling | Male | 3 | 43% |
| | Female | 4 | 57% |
| Central Stability Exercises | Male | 4 | 57% |
| | Female | 3 | 43% |

Out of 14 Participants, 3 were Males and 4 were Females in Dry Needling Group and in Central Stability Exercises Group there were 4 Males and 3 Females.

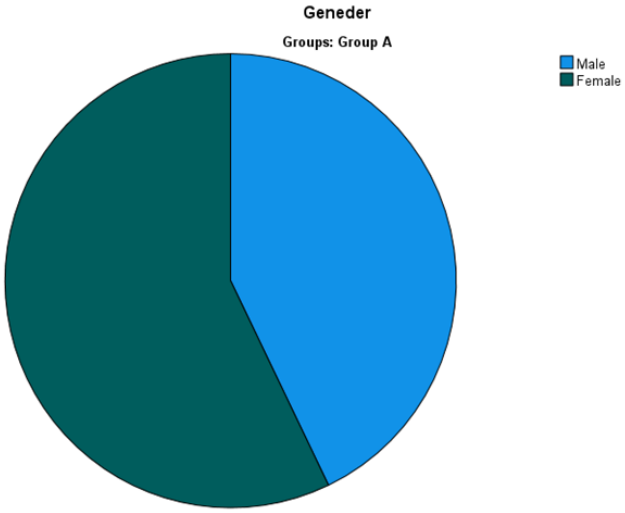



Figure 3: Pie Chart showing Gender Distribution in Dry Needling Group

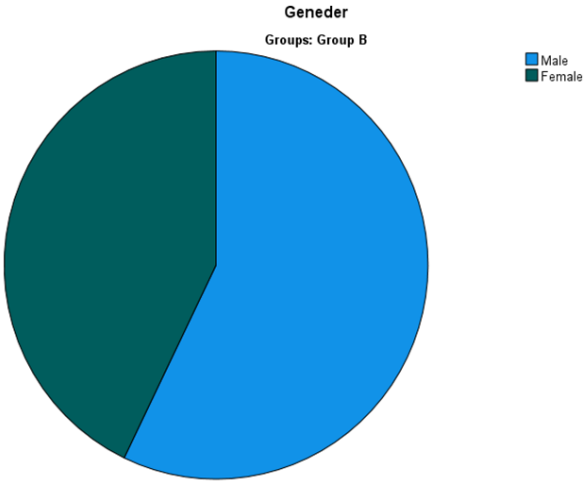



Figure 4: Pie Chart showing Gender Distribution in Central Stability Exercises

Table 5: Normality Test

| | Kolmogorov-Smirnov | | | Shapiro-Wilk | | |
|---|---|---|---|---|---|---|
| Variables | Statistic | df | Sig. | Statistic | df | Sig. |
| NPRS at baseline | .211 | 14 | .092 | .925 | 14 | .261 |
| NPRS at 3rd Week | .293 | 14 | .002 | .869 | 14 | .040 |

| | | | | | | |
|---|---|---|---|---|---|---|
| NPRS at 6thWeek | .213 | 14 | .085 | .893 | 14 | .090 |
| MODI at baseline | .148 | 14 | .200 | .953 | 14 | .612 |
| MODI at 3rdWeek | .114 | 14 | .200 | .972 | 14 | .903 |
| MODI at 6thWeek | .176 | 14 | .200 | .886 | 14 | .071 |

The Normality test was applied to check if our data was normally distributed. Since the p-value is greater than 0.05, so the data was normally distributed then parametric tests were applied for statistical analysis.

**Table 6: Intra Group Comparison using ANOVA Repeated Measure for Dry Needling Group**

| Variable | Assessment | Mean ±SD | Mean Difference | P-value |
|---|---|---|---|---|
| NPRS (Numeric Pain Rating Scale) | At Baseline | 8.14±1.21 | 0.57 | 0.001 |
| | At 3rd Week | 4.86±.69 | -1 | |
| | At 6th Week | 3.00±1.00 | -1.14 | |
| MODI (Modified Oswestry Disability Index) | At Baseline | 71.71±3.25 | 0.43 | 0.001 |
| | At 3rd Week | 53.28±4.78 | -2.58 | |
| | At 6th Week | 33.57±3.15 | -3.86 | |

Parametric ANOVA Repeated measure test was used for comparison within the Dry Needling group based on NPRS and MODI. The p-value was 0.001 when NPRS compared within group for baseline, 3rd week and 6th week. The p-value was 0.001 when MODI compared within group for baseline, 3rd week and 6th week.

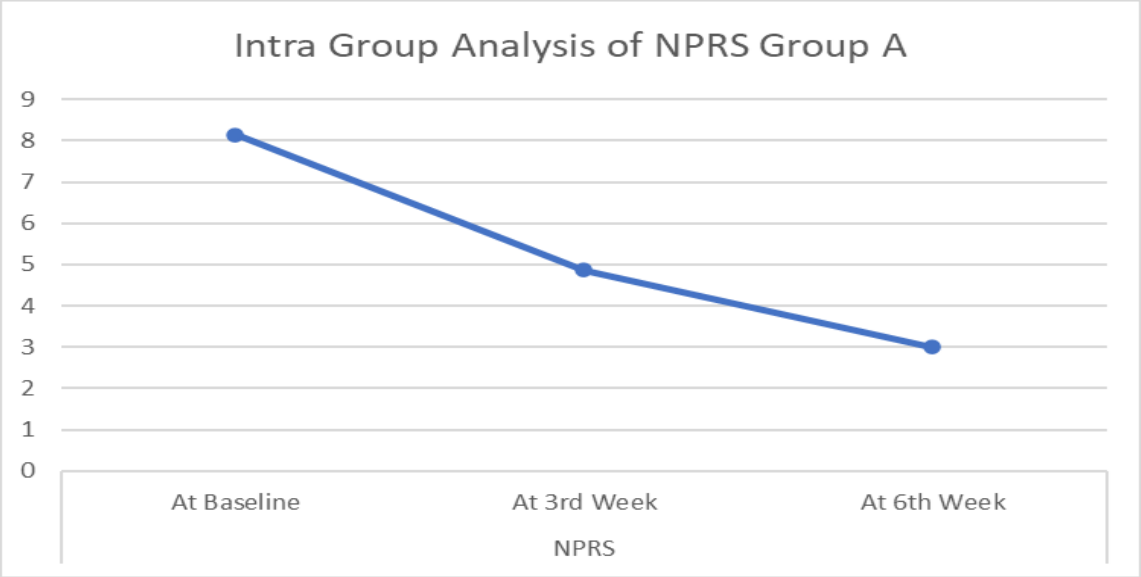



**Figure 5:** Representing a line chart of intra group comparison of NPRS in Dry Needling Group, showing mean 8.14 at baseline, 4.86 at 3rd week and 3 at 6th week.

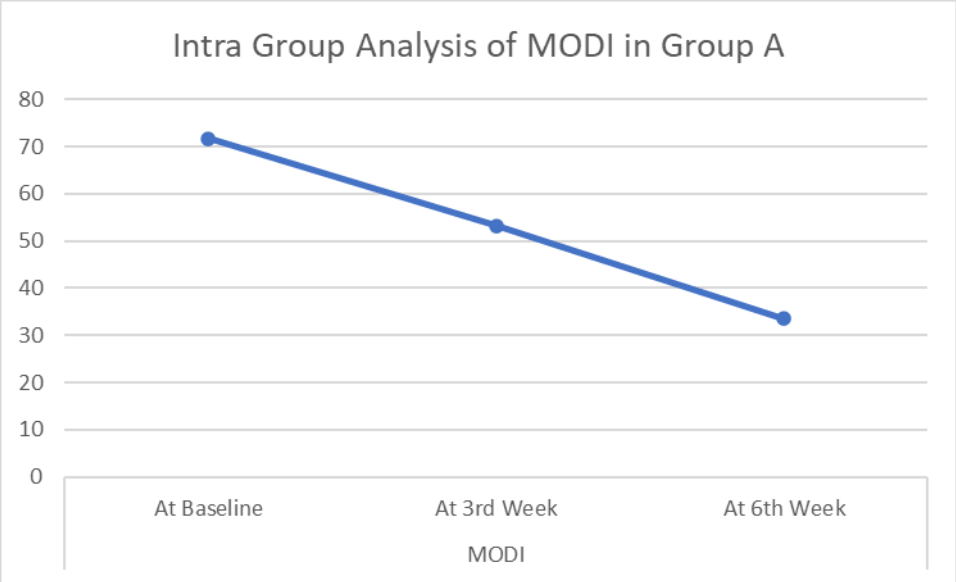



**Figure 6:** Representing a line chart of Intra group analysis of MODI in group A, showing mean 71.71 at baseline, 53.28 at 3rd week and 33.57 at 6th week

**Table 7: Intra Group Comparison using ANOVA Repeated Measure for Central Stability Exercises Group**

| Variable | Assessment | Mean ±SD | Mean Difference | p-value |
|---|---|---|---|---|
| NPRS (Numeric Pain Rating Scale) | At Baseline | 7.57±.97 | -0.57 | 0.001 |
| | At 3rd Week | 5.86±.89 | 1 | |
| | At 6th Week | 4.14±.69 | 1.14 | |
| MODI (Modified Oswestry Disability Index) | At Baseline | 71.28±4.82 | -0.43 | 0.001 |
| | At 3rd Week | 55.86±4.88 | 2.58 | |
| | At 6th Week | 37.43±3.46 | 3.86 | |

Parametric ANOVA Repeated Measure Test was used for comparison within the Central Stability Exercises Group based on NPRS and MODI. The p-value was 0.001 when NPRS compared within group for baseline, 3rd week and 6th week. The p-value was 0.001 when MODI compared within group for baseline, 3rd week and 6th week.

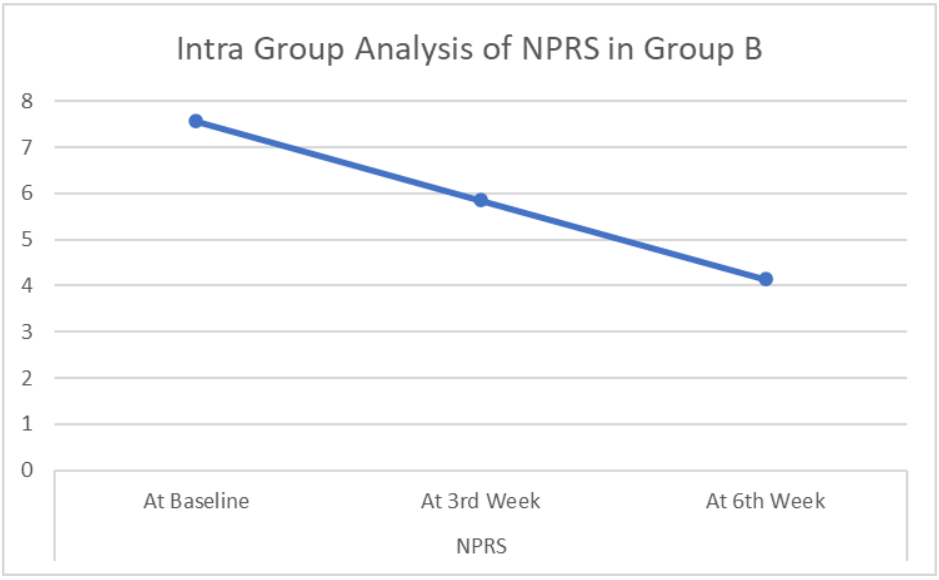



**Figure 7:** Representing a line chart of Intra group analysis of NPRS in group B, showing mean 7.57 at baseline, 5.86 at 3rd week and 4.14 at 6th week.

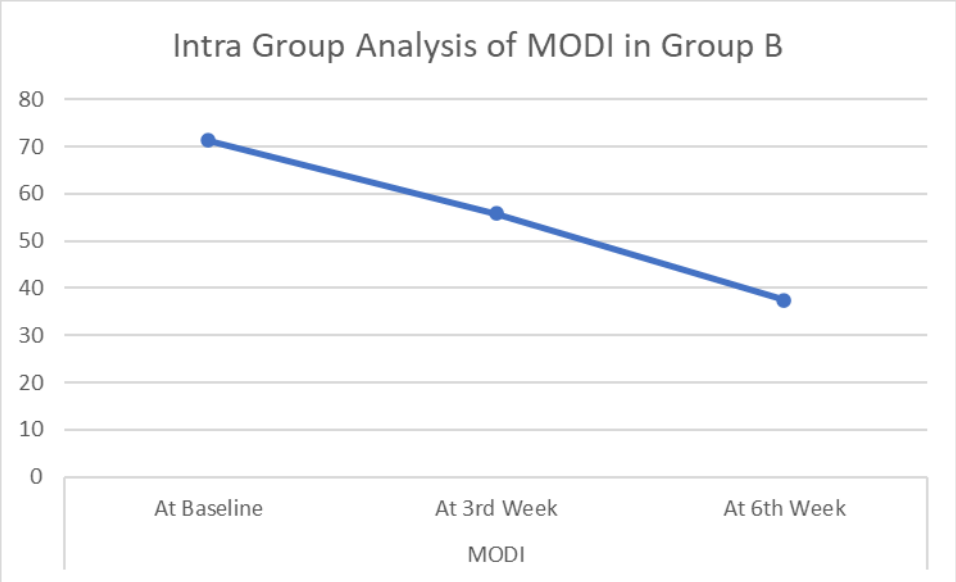



**Figure 8:** Representing a line chart of Intra group analysis of MODI in group B, showing mean 71.28 at baseline, 55.86 at 3rd week and 37.43 at 6th week.

**Table 8: Inter Group comparison using Independent Sample t-Test**

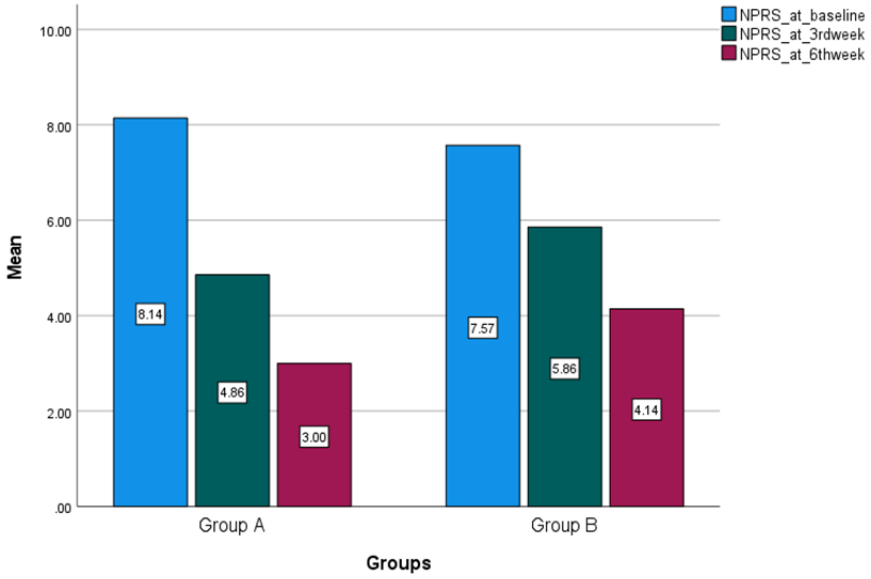
| Variables | Groups | Mean ±SD | t-statistics | Mean Diff. | df | p-value |
|---|---|---|---|---|---|---|
| NPRS at Baseline | Dry Needling | 8.14±1.21 | .97 | .57 | 11.47 | .352 |
| | Central Stability Exercises | 7.57±.97 | | | | |
| NPRS at 3rd Week | Dry Needling | 4.86±.69 | -2.33 | -1.00 | 11.24 | .039 |
| | Central Stability Exercises | 5.86±.89 | | | | |
| NPRS at 6th Week | Dry Needling | 3.00±1.0 | -2.49 | -1.14 | 10.66 | .031 |
| | Central Stability Exercises | 4.14±.69 | | | | |
| MODI at Baseline | Dry Needling | 71.71±3.25 | .195 | .43 | 10.52 | .849 |
| | Central Stability Exercises | 71.28±4.82 | | | | |
| MODI at 3rd Week | Dry Needling | 53.29±4.79 | -.99 | -2.57 | 11.99 | .339 |
| | Central Stability Exercises | 55.86±4.88 | | | | |
| MODI at 6th Week | Dry Needling | 33.57±3.15 | -2.18 | -3.86 | 11.90 | .050 |
| | Central Stability Exercises | 37.42±3.46 | | | | |

Parametric independent sample t-test was applied for comparison between Dry Needling (Group A) and Central Stability Exercises(Group B), based on NPRS and MODI .The mean value of NPRS at baseline for Dry Needling group is 8.14, for Central Stability Exercises group is 7.57 and the p value is .352.The mean value of NPRS for dry Needling at 3rd week is 4.86, for Central Stability Exercises is 5.86 and the p value is .039.The mean value of NPRS at 6th week for Dry Needling group is 3.00, for Central Stability Exercises is 4.14 and the p value is .031.The mean value of MODI at baseline for Dry Needling group is 71.71 and the p value is .849, for Central Stability Exercises group is 71.29 and the p value is .849.The mean value of MODI at 3rd week for Dry Needling group is 53.29, for Central Stability Exercises is 55.86 and the p value is .339. The mean value of MODI at 6th week for Dry Needling group is 33.57, for Central Stability Exercises group is 37.42 and the p value is.050. The result shows a significant difference as the p value is <0.05 at 6th week. According to the results, both Dry Needling and Central Stability Exercises are

effective for Quadratus Lumborum Trigger Points, but Dry Needling shows slightly statistically significant results. Thus, Dry Needling is more effective in Quadratus Lumborum Trigger Points.

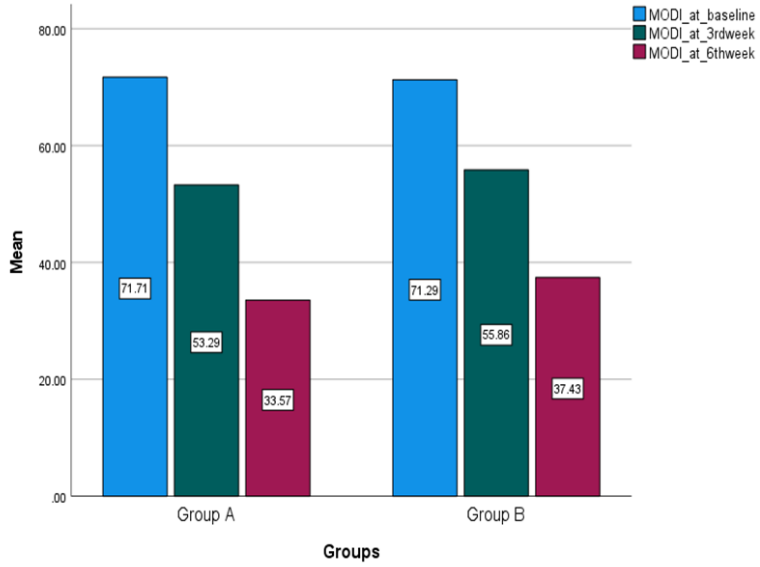
Mentioned bar chart represents the comparison of pain intensity with respect to two groups, Dry Needling and Central stability Exercises. The blue bar represents mean NPRS scoring at baseline, green bar represents mean NPRS scoring at 3rd week and pink bar represents mean NPRS scoring at 6th week. The decreasing mean value of NPRS scoring at 6th week represents that both interventions have effects in relieving pain intensity but Dry Needling Technique have significant effects with mean value 8.14 at baseline, 4.86 at 3rd week and 3.00 at 6th week.

**Figure 9**




Bar chart represents the comparison of functional disability with respect to two groups, Dry Needling and Central Stability Exercises. The blue bar represents mean MODI scoring at baseline, green bar represents mean MODI scoring at 3rd week and pink bar represents mean MODI scoring at 6th week. The decreasing mean value of MODI scoring at 6th week represents that both interventions have effects in improving functional disability but Dry Needling have significant effects with mean value of 71.71 at baseline, 53.29 at 3rd week and 33.57 at 6th week.

**Figure 10**



## DISCUSSION

In this present study we explored the effect of Dry Needling (DN) and Central Stability Exercises (CSE) in decreasing pain and disability on Quadratus Lumborum Trigger points. NPRS was used to determine level of pain, and MODI to measure functional disability, which were used to assess the outcome. This included having directed assessments performed initially on the baseline, at the third week, and finally at the intervention end point at the sixth week. Results of the statistical analysis showed a significant difference from time to time, as $p < 0.05$, attempting to find that both methods of intervention reduced pain and enhance functional status. The improvements were however found to be more with those who had received Dry Needling, implying that of the two therapy modalities, DN had a more pronounced therapeutic effect.

Methodology of the research was a randomized clinical trial using a sample size of 14 individuals who met the inclusion and exclusion criteria predefined. The Dry Needling treatment was given to Group A, and the Central Stability Exercise to Group B. Six treatment sessions were carried out on each group. For Group A, DN was performed using 0.3×60 mm sterile stainless-steel needles. Each treatment session lasted approximately 30 to 35 minutes. Group B followed a structured CSE protocol that included exercises such as prone plank, side plank, bridging, and the bird-dog exercise (performed in a quadruped position with alternate arm and leg raises). The exercise regimen was carried out twice a week for three weeks, consisting of three sets of five repetitions per session, with each type of exercise held for 5 to 10 seconds and lasting a total of 6 to 9 minutes.

Findings showed a statistically and clinically significant difference though less favorable results from Central Stability Exercises compared to Dry Needling in reducing pain and disability.

These results are supported by several previous studies. For example, in Alrawaili et al. (2024) the short-term effects of acupuncture style dry needing on patients with chronic mechanical low back pain was studied. In the randomized controlled trial conducted in 30 subjects, they separated the subjects into two groups and took one group and administered dry needling. They were able to show a significant reduction in pain, improvement in functional disability and increase in range of motion. The outcomes of the Alrawaili' s study are so similar to that of the current research, that it confirms the efficacy of DN in controlling the chronic mechanical low back pain. [13]

Zahid et al. (2023) also compared Dry Needling to Muscle Energy Technique (MET) for the treatment of active trigger points on the Quadratus Lumborum. The study was conducted over three weeks including 24 participants divided into two groups, which concluded that DN was more effective than MET in decreasing functional disability. These results correspond to the current literature, as CSE showed a less pain reduction and disability than DN. [6]

Other appropriate study (Akhtar et al., 2022) was conducted to assess dry needling versus dry cupping in management of positional faults of pelvis due to myofascial trigger points in Quadratus Lumborum. The trial involved 26 people and showed that DN was significantly more effective at reducing pain and getting the pelvic alignment back in order than dry cupping. The findings of this study also align with these current findings that discern the therapeutic value of DN in treating lower back dysfunctions. [17]

On the contrary, Samir et al. (2024) compared the Passive Stretching Exercises and the Post Isometric Relaxation (PIR) technique for type of the patients' treatment of the pain caused by the Quadratus Lumborum trigger points in the patients with Myofascial Pain Syndrome. There were 32 people involved, cut in half equally into two groups for their study. Both interventions resulted in a decrease in pain intensity but PIR had a slightly more pronounced effect than passive stretching. While this study does support the efficacy of manual therapy techniques as has been shown in the current study, DN in this study showed a greater effect than exercise-based interventions. This difference could be due to differences in sample size, methodology of the treatment, and characteristics of the population. [21]

In conclusion, the current study adds to the growing body of evidence that supports Dry Needling as a highly effective method for managing Quadratus Lumborum Trigger Points and associated functional impairments. While Central Stability Exercises also yielded positive outcomes, the superior results observed in the Dry Needling group suggest it may be a more potent intervention for pain relief and functional recovery in similar clinical populations. These findings are largely consistent with existing literature, though variations in methodology across studies highlight the need for further research with larger sample sizes and long-term follow-up to confirm and expand upon these results.

## CONCLUSION

In the current study we found that both Dry Needling Technique and Central Stability Exercises have statistically significant results to alleviate pain and disability in the subjects with Quadratus Lumborum Trigger Points but Dry Needling Technique found to be more effective than Central Stability Exercises. However, Dry Needling Technique demonstrated more significant improvement in terms of pain reduction and disability.

## LIMITATIONS

1. The study sample size is relatively small with only 7 subjects in each group, which may limit the generalizability of the findings.
2. The study only evaluated short term effects over a 3week period, and the long-term sustainability of the observed improvement is unknown.
3. Limitations of the study include the inability to document immediate effects and the lack of categorization based on chronicity.
4. Limited clinical area for conduction of study involve.

## RECOMMENDATIONS

1. Long-term follow up sessions.
2. Larger sample size would help to improve results.
3. Exploring optimal treatment protocols.
4. Considering post-needling discomfort reduction techniques and allowing longer rest intervals between dry needling treatments are recommended.
5. Other outcome measures should be used in future study.
6. More research into the use of various screening techniques and devices to evaluate pain and impairment is required.

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**6.1 ANNEXURE:**

**PERFORMA**

Serial Number ---------- Age ----------
Gender ---------- Adress ----------

**OUTCOME VARIABLES:**

- Pain
- Disability

**TREATMENT GROUPS:**

**Group (A):** Dry Needling
**Group (B):** Central Stability Exercises

## 6.2 ENGLISH CONSENT FORM

The study you are about to participate is a randomized control trial survey titled as;

**"Comparing the Effects of Dry Needling and Central Stability Exercises on Quadratus Lumborum Trigger Points"**

The study has no potential harm to participants. All data collected from you will be coded in order to protect your identity, and should not be disclosed to anyone. Following the study there will be no way to connect your name with your data. Your answers to the questions will not affect the quality of education given to you. Any additional information about the study results will be provided to you at its conclusion, upon your request.

You are free to withdraw from the study at any time. You agree to participate, indicating that you have read and understood the nature of the study, and that all your inquiries concerning the activities have been answered to your satisfaction.

NAME ..... SIGNATURE .....
DATE .....

## 6.3 URDU CONSENT FORM

میں _____ تصدیق کرتا/ کرتی ہوں کہ
محترم
نے
**اپنی تحقیق**
**کواڈریٹس لمبورم کے ٹرگر پوائنٹس پر ڈرائی نیڈلنگ اور سینٹرل اسٹیبلیٹی ایگزیرسز کی ورزشوں کے اثرات کا موازنہ**
زیرنگرانی **ڈاکٹرندا اِلٰھی**
کے متعلق بتا دیا ہے۔ مجھے اس تحقیق کی نوعیت، مقاصد، احداف، توقعات، فوائد اور خطرات کے متعلق ساری معلومات فراہم کر دی گئی ہیں۔ اس تحقیق کے دوران ساری معلومات صیغۃ راز میں رہیں گی اور مریض کا نام اور دیگر معلومات صرف تحقیق کے لیے استعمال ہوں گی۔مجھے یہ بھی بتا دیا گیا ہے کہ میں اس تحقیق سے متعلقہ ہر قسم کے سوال پوچھنے کا مجاز ہوں اور یہ تحقیق صرف ایک شخص ک مفاد میں نہیں ہے بلکہ بحسثیت مجموعی انسانیت کا مفاد اس سے وابسطہ ہے۔ تمام تفصیلات جاننے کے بعد یس تحقیق میں شامل ہونے یا نہ ہونے پر کسی کا قائل نہیں ہوں۔ اس تحقیق سے کسی بھی وقت علیحدہ ہونے پر مجھ پر کوئی پابندی نہیں ہو گی۔ میں بذاتِ خود بقائمی حوش و حواس اور رضا مندی سے اس تحقیقاتی عمل میں شامل ہوتی/ ہوتا ہوں۔

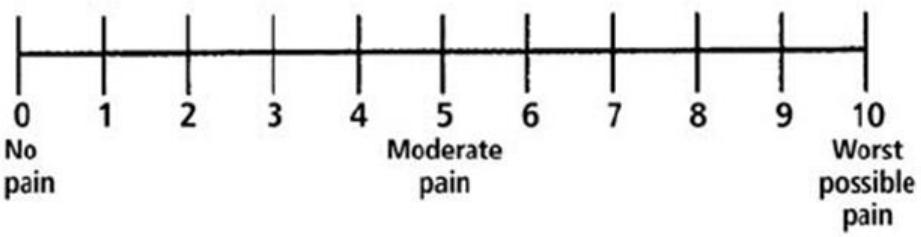
---------- دستخط محقق
---------- دستخط شرکت کار
---------- تاریخ

## TOOL/QUESTIONNAIRE

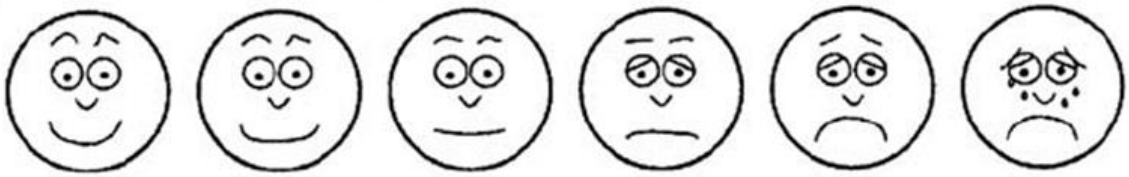
**Numeric Pain Rating Scale** [22]

| Outcome Variables | Baseline | 3rd week | 6th Week |
|---|---|---|---|
| Pain (NPRS) | | | |
| Disability (MODI) | | | |

Numeric Pain Rating Scale




Wong-Baker FACES Pain Rating Scale



## Modified Oswestry Disability Index [23]

Patient Name: _____ Date: _____/_____/_____

**Please read instructions carefully.**
This questionnaire has been designed to give the doctor information as to how your low back pain has affected your ability to manage everyday life.
Please read all statements in each section and mark the box which most closely describes your problem.

### SECTION 1 - PAIN INTENSITY

- ☐ The pain comes and goes and is very mild.
- ☐ The pain is mild and does not vary much.
- ☐ The pain comes and goes and is moderate.
- ☐ The pain is moderate and does not vary much.
- ☐ The pain comes and goes and is very severe.
- ☐ The pain is severe and does not vary much.

### SECTION 2 - PERSONAL CARE

- ☐ I do not have to change my way of washing or dressing to avoid pain.
- ☐ I do not normally change my way of washing or dressing even though it causes some pain.
- ☐ Washing and dressing increases the pain but I manage not to change my way of doing it.
- ☐ Washing and dressing increases the pain and I find it necessary to change my way of doing it.
- ☐ Because of the pain, I am unable to do some washing and dressing without help.
- ☐ Because of the pain, I am unable to do any washing or dressing without help.

### SECTION 3 - LIFTING

- ☐ I can lift heavy objects without any extra pain.
- ☐ I can lift heavy objects, but it gives extra pain.
- ☐ Pain prevents me from lifting heavy objects off the floor.
- ☐ Pain prevents me from lifting heavy objects off the floor but I can manage if they are conveniently positioned on a table.
- ☐ Pain prevents me from lifting heavy objects but I can manage light to medium objects.
- ☐ I can only lift very light objects at the most.

### SECTION 4 - WALKING

- ☐ I have no pain on walking.
- ☐ I have some pain but it does not increase with distance.
- ☐ I cannot walk more than one mile without increasing pain.
- ☐ I cannot walk more than 1/2 mile without increasing pain.
- ☐ I cannot walk more than 1/4 mile without increasing pain.
- ☐ I cannot walk at all without increasing pain.

### SECTION 5 - SITTING

- ☐ I can sit in any chair as long as I like.
- ☐ I can only sit in my favorite chair as long as I like.
- ☐ Pain prevents me from sitting more than one hour.
- ☐ Pain prevents me from sitting more than half an hour.
- ☐ Pain prevents me from sitting more than 10 minutes.
- ☐ I avoid sitting because it increases pain.

### SECTION 6 - STANDING

- ☐ I can stand as long as I want without pain.
- ☐ I have some pain on standing but it does not increase with time.
- ☐ I cannot stand for longer than one hour without increasing pain.
- ☐ I cannot stand for longer than 1/2 hour without increasing pain.
- ☐ I cannot stand longer than 10 minutes without increasing pain.
- ☐ I avoid standing because it increases the pain.

### SECTION 7 - SLEEPING

- ☐ I get no pain in bed.
- ☐ I get pain in bed but it does not prevent me from sleeping well.
- ☐ Pain reduces my normal sleep by 1/4 each night.
- ☐ Pain reduces my normal sleep by 1/2 each night.
- ☐ Pain reduces my normal sleep by 3/4 each night.
- ☐ Pain prevents me from sleeping at all.

### SECTION 8 - SOCIAL LIFE

- ☐ My social life is normal and gives me no pain.
- ☐ My social life is normal but increases the degree of pain.
- ☐ My social life is unaffected by pain apart form limiting more energetic interests.
- ☐ Pain has restricted my social life and I do not go out very often.
- ☐ Pain has restricted my social life to my home.
- ☐ I have hardly any social life because of the pain.

### SECTION 9 - DRIVING / RIDING IN CAR, ETC.

- ☐ I get no pain while traveling.
- ☐ I get some pain while traveling but none of my usual forms of travel make it any worse.
- ☐ I get extra pain while traveling but it does not compel me to seek alternate forms of travel.
- ☐ I get extra pain while traveling which compels me to seek alternate forms of travel.
- ☐ Pain restricts all forms of travel.
- ☐ Pain prevents all forms of travel except that done lying down.

### SECTION 10 - CHANGING DEGREE OF PAIN

- ☐ My pain is rapidly getting better.
- ☐ My pain fluctuates but overall is definitely getting better.
- ☐ My pain seems to be getting better but improvement is slow at present.
- ☐ My pain is neither getting better or worse.
- ☐ My pain is gradually worsening.
- ☐ My pain is rapidly worsening.