# Original Research Article

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Immediate Effect Of Manual Trigger Point Release Versus Post Isometric Relaxation Technique Among College Students With Trapezitis: A Comparative Study

## ABSTRACT

**Background:** Trapezitis is an inflammation of trapezius muscle leading to pain, where it is present even during rest and will be aggravated by activity, inflammation in the muscle causes spasm and tightness of trapezius muscle. Trapezitis is one of the common inflammatory conditions seen among college students due to prolonged faulty posture, overuse, stressful neck movement, etc. Students with trapezitis usually complain of pain, decreased range of motion and difficulty in activities of daily living. Its prevalence is maximum in females with middle age and less common in males with is fluctuating with mean point prevalence of 13% and neck pain occurs usually in upper trapezius muscle.

**Aim:** To study the immediate effect of manual trigger point release versus post-isometric relaxation technique in college students with trapezitis .

**Study Design:** Experimental Comparative Study.

**Sample Size :** n=18 and the group allocation was done by using simple random sampling by chit method.

**Place and Duration of Study :** Dr. Ulhas Patil college of Physiotherapy, Jalgaon. 6 months duration.

**Methodology :** A comparative study was conducted on 18 college students. Subjects were selected according to inclusion & exclusion criteria of study. Prior to starting the study the procedure was explained and written Consent forms were taken from subjects. Trapezius trigger point assessed by using palpation method. The patient will be allocated into two groups using simple random sampling by chit method i.e., Group A subjects will receive manual trigger point release and Group B subjects will receive post isometric relaxation technique. The outcome measures NPRS & Cervical ROM by using goniometer will be measured at baseline and immediately after treatment. Statistical analysis was carried out using paired t test and unpaired t-test.

**Results:** The statistical analysis showed that there is a significant increase in the cervical range of motion and a significant reduction in the pain scores in both the groups (p<0.0001). However, intergroup analysis showed that group A is much more effective in improving cervical range of motion and reducing pain scores.

**Conclusion:** The present study concluded that manual trigger point release is more immediately effective than post-isometric relaxation technique in college students with trapezitis.

***Keywords****: Trapezitis , College students , Manual trigger point release , Post isometric relaxation, NPRS & cervical ROM (goniometer).*

## INTRODUCTION

* 1. **BACKGROUND**

“Trapezitis is an inflammation of trapezius muscle leading to pain, where it is present even during rest and will be aggravated by activity, inflammation in the muscle causes spasm and tightness of trapezius muscle”1. “So there is formation of descrit nodules within the band of skeletal muscle that are spontaneously painful”2 . “Trapezius muscle helps in actions like shrugging shoulders and neck movements like extension of a neck, which is produced by bilateral contraction of descending trapezius fibers, while lateral flexion of neck is produced by unilateral contraction of descending fiber”3 . “Trapezitis is one of the common inflammatory conditions seen among college students due to prolonged faulty posture, overuse, stressful neck movement, etc. Students with trapezitis usually complaints of pain, decreased range of motion and difficulty in activities of daily living”4.

“The pain generally arises due to overuse of the muscle in non-ergonomic posture, working in static position, stress and tension, repetitive movements, siting for prolong period of time without back support, too high keyboard on desks, long drives on bikes and cars, prolong head bending activities (reading/ looking through microscope/dentistry), tight pectoralis major and minor muscles, activities with sudden one sided movements, it may also be activated by stressful thoughts and feeling or abnormal breathing pattern”5 . “More recent studies have shown a relationship between trapezius muscle activation and pain , because the upper fibers of trapezius muscle fibers are often placed in a shortened position by poor ergonomics which creates shortness in their length”6 . “Its prevalence is maximum in females with middle age and less common in males with is fluctuating with mean point prevalence of 13% and neck pain occurs usually in upper trapezius muscle. Mechanical neck pain has a lifetime prevalence of 30-50% in general world population”7.

“The trigger points are hyperirritable and spontaneously2. It is a tender spot on the taut band, referred pain or altered sensation at least 2cm beyond the spot, elicited by pressure held for less than 10 seconds; and sometimes it may restrict cervical rom in the joint” 8. “Trigger points causing pain at rest are called active trigger points while trigger points causing pain on palpation are called latent trigger point”2 . “When such repetitive micro trauma occurs with predisposing factors like FHP (forward head posture) then muscle goes in spasm and tightness and there is formation of activated trigger points” 9.

“The pathogenesis of trapezitis could be explained as the areas of stressed soft tissue receiving less oxygen, glucose, and nutrient delivery, and subsequently accumulating high levels of metabolic waste products and ending up with the development of trigger points” 10. “Trapezitis leads to pain at the back of the neck, muscle spasm , shoulder pain , tingling or numbness in one or both arms and also decrease in the range of motion of shoulder and neck”3. “Once the trapezitis is diagnosed there are many treatment plans available including pharmacological interventions such as non-steroidal anti- inflammatory and pain-modulating therapies like electrotherapy modalities, stretching, met, positional release technique and trigger point release technique”4.

“Post isometric relaxation (PIR) is a technique performed by manual therapists to treat trapezitis patients who have tight muscles and poor joint function in order to achieve the best potential resistance , pir requires equal collaboration from both the patient and the therapist . Lewit and Simons noticed decreased myofascial soreness after using the pir method .pir’s success is attributed to a variety of actions , including lengthening short or tight muscles, strengthening weak muscles

,assisting the lymphatic or venous pump in improving fluid or blood drainage ,and increasing the range of motion (rom)of a restricted joint the pir approach involves the patient producing voluntary muscular contractions against a resistance applied by the therapist” 7.

“Post isometric relaxation is based on the active work of the patient and therapist who exerts an optimal resistance. Post isometric relaxation is a muscle energy technique used to relax and lengthen a hypertonic and shortened muscle. This gentle stretching technique is typically used on postural muscles. Due to gravity these muscles often become short and

Tight and can lead to muscle imbalances. This can lead to limitation of range of motion and cause joint restrictions. When trapezius muscle become shortened they can restrict rom in the head, neck and shoulder and often become painful. By using the pir technique the therapist can relax and lengthen the muscle to increase the passive and active rom and decrease the pain”11.

“Manual trigger point release (MTRP) involves using the hands (manual pressure) to apply sustained, focused pressure to a trigger point. This pressure helps to release the muscle’s contraction and reduce pain. The goal is to deactivate the trigger point, restore normal muscle function, and improve blood flow to the affected area. Manual trigger point release has been reported effective in relieving pain and improving cervical rom in the short term. The manual therapy (MT) techniques are known for their quick and safe application, with no side effects” 12.

There is lack of evidence about the effectiveness of post isometric relaxation and manual trigger point release among college students with trapezitis. So , the purpose of the study is to investigate the immediate effect of post isometric relaxation and manual trigger point release among college students with trapezitis.

## Aim

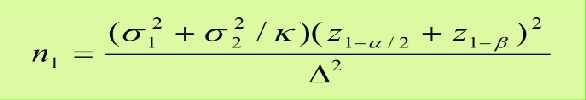
To study the immediate effect of manual trigger point release versus post-isometric relaxation technique in college students with trapezitis .

## Objective

* + 1. To find out the immediate effect of manual trigger point release technique in college students with trapezitis.
    2. To find out the immediate effect of post isometric relaxation technique in college students with trapezitis.
    3. To compare the immediate effect of post-isometric relaxation versus manual trigger point release technique in college students with trapezitis.

## METHODOLOGY

1. Study Design – Experimental Study
2. Study Type- Comparative study
3. Study Set up – Dr. Ulhas Patil college of Physiotherapy, Jalgaon
4. Study Duration – 06 months
5. Target Population – College students with trapezitis.
6. Sample Size - N=18 (calculated by using OpenEpi software, version 3 )



Minimum sample size= n1= 09

n2 = 09

1. Method of Sampling – simple random sampling by chit method.

### SELECTION CRITERIA FOR STUDY –

Age group between 18 to 25 years , Both genders , Subjects who diagnosed with bilateral trapezitis , Patients who willing to participate were included in the study. Any other cervical instability and other degenerative disorders , Recent surgery in and around shoulder and cervical region, Cervical radiculopathy , Any skin disease & infection , Fracture of cervical spine , Diagnosed case of disc prolapsed , Any neurological impairement , Tumor in the cervical region , Any deformity eg.,spasmodic torticollis, spremgel’s deformity were excluded from the study.

* 1. **MATERIALS** – Pen , Papers, Consent form ,Treatment couch ,Goniometer , NPRS ( numerical pain rating scale).

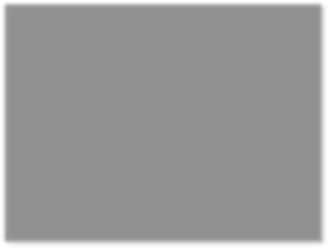
## PROCEDURE –

Ethical clearance will be obtained from institutional ethical committee & Principal of Dr. Ulhas Patil college of physiotherapy. A written informed consent form will be obtained from subjects who are willing to participate. Subject will be screened according to inclusion and exclusion criteria. The aim of the study and its objective will be explained to willing participants. selected participants demographics details outcome measures will be recorded.

**Patients Will Be Assessed For Trapezius Trigger Point By Palpation Method –**

**Positioning the Subject:**

* The person being assessed should be in a relaxed and comfortable position. A common position is sitting with their arms at their sides, shoulders relaxed.
* Pressure Algometer is a device designed to apply a consistent force. The device usually has a rubber-tipped probe that can be placed on the area of interest.
* Apply a gradual, steady pressure on the identified trigger point. Increase pressure slowly until the person indicates the sensation of pain or discomfort.
* Record the pain threshold (the amount of pressure at which pain is first felt).The pressure required to cause pain can be indicative of muscle sensitivity and trigger point activity.
* In people with active trigger points, the pressure pain threshold tends to be lower than in those without such points. normal PPT for the trapezius muscle is typically around 2-4 kg/cm². A lower PPT in the trapezius (e.g., < 2 kg/cm²) could be a sign of active trigger points.



# Fig

**Fig 1: Patients Assessed For Trapezius Trigger Point By Palpation Method**

**Patients Will Be Assessed For Quantity Of Pain Using Numeric Pain Rating Scale (NPRS) –**

* + The NPRS questionnaire is composed of an 11-point scale from 0-10.
  + The patient chooses a most compatible value with the force of pain they have experienced in the last 24 hours.
  + In which “0” means no pain, “10” means intense pain.
  + The NPRS has good sensitivity while producing data that can be statistically analyzed.
  + The patient has to mark the score on the questionnaire according to the pain intensity he/ she is suffering.
  + The reliability of the scale is 0.96.

# Fi2

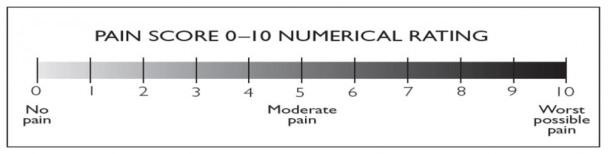
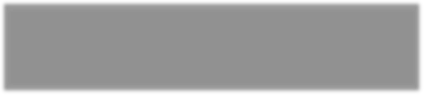


Fig 2: Numeric Pain Rating Scale indicating Patients Assessed For Quantity Of Pain

**Patient Will Be Assessed For Cervical Range Of Motion -**

The cervical range of motion for flexion, extension, lateral flexion and rotation with the individual.

### FLEXION AND EXTENSION:

* 1. Center fulcrum of the goniometer over the external auditory meatus.
  2. Align proximal arm so that it is either perpendicular or parallel to the ground.
  3. Align distal arm with the base of the nares.

# Fig 3-



**Patient Assessed For Cervical Range Of Motion**

### ROTATION (RIGHT/LEFT):

* 1. Center fulcrum of the goniometer over the spinous process of the C7 vertebra.
  2. Align proximal arm with the spinous processes of the thoracic vertebrae so that the arm is perpendicular to the ground.
  3. Align distal arm with the dorsal midline of the head, using the occipital protuberance for reference.



# Fig 4-

The Range Of Motion Was Assessed Before And After Therapy

The patient will be allocated into two groups , i.e., Group A will receive post isometric relaxation, and in Group B Patients will receive Manual trigger point release technique.

## INTERVENTION –

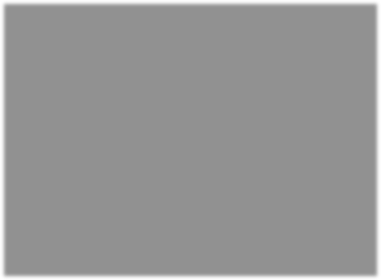
**Group A- Manual Trigger Point Release Technique-**

* At the beginning of the interventions, the therapist identified the trigger points in upper trapezius muscle by the pincer palpation method.
* The therapist applied a total of five slow and sufficient compressions to the MTrP until the subject reported a

“moderate but easily tolerable” pain.

* The duration of each compression was maintained until the therapist detected a softening of the trigger point nodule, loss of referred pain, or a maximum of 60 s. A 10-s rest was given between compressions.
* The total duration of the intervention was approximately 6 min 12.

# Fig 5-



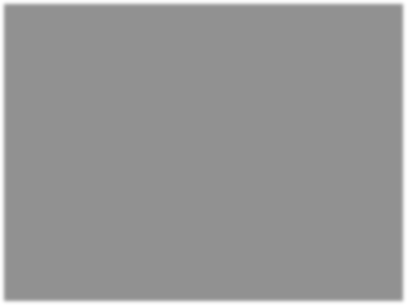
**Manual Trigger Point Release Technique**

**Group B- Post Isometric Relaxation For Trapezius –**

* PIR technique was applied from supine lying position and the patients with the head free position from the plinth

and it is held by the therapist’s hand and while the therapist is sitting on a stool at the treatment table head.

* The position of head was arranged so that the stretched muscle is in the lengthened position, and the therapist applied isometric resistance to the action of the tight muscle and held for 7 seconds with gentle muscle contraction to avoid the risk of increasing the muscle tone, while breathing in withhold this breath during contraction, then the patient is asked to breathe and relax for 3 seconds, then they applied static stretching in the opposite direction for 30 sec. for each muscle bilaterally, this procedure is repeated three times.
* Post isometric relaxation technique was applied on upper fibers of trapezius, while the head and neck of individual were flexed and the side bent away from the side which is being treated to just short of the restriction barrier with stabilization of the shoulder with one hand and the ipsilateral mastoid process with the other hand.
* Patient is asked to take the stabilized shoulder toward the ear, and the ear toward the shoulder against resistance from both sides and to breathe in and hold his breath for 7 seconds.
* Then the patient was asked to breathe out, relax for 3 seconds and the shoulder was stretched caudally for 30 seconds.
* This exercise was repeated 3 times for each time and the starting position is just short of new restriction barrier for both of the muscles 11 .



**Post Isometric Relaxation For Trapezius**

# Fig 6-

* 1. **STATISTICAL ANALYSIS –**

The data was collected, analyzed and was entered in excel sheet and statistical analysis was done using InStat 3.05 software. The statistical analysis was done using paired and unpaired t-test. Paired t-test was used for statistical analysis to compare pre and post intervention values within groups. The unpaired t-test was used for between groups statistical analysis to compare mean values of pre & post intervention values of both the groups. Statistical significance was set at p

≤0.05.

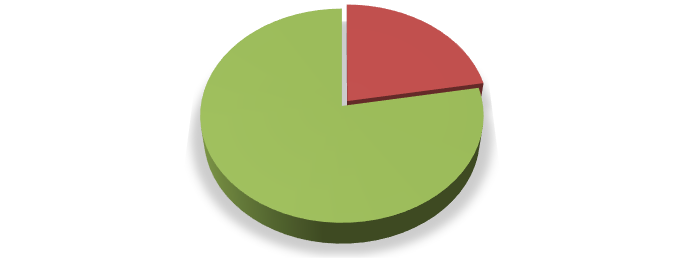
1. **RESULTS –**

The present study included 18 subjects with trapezitis who met the inclusion criteria. The subjects were equally divided into two groups by simple random sampling by chit method. Group A and Group B both consisted of 9 subjects. Group A received manual trigger point release and Group B received post isometric relaxation technique for trapezitis.

**Table 1 – Age wise distribution of Group A (MTPR)-**

|  |  |  |
| --- | --- | --- |
| **Age group** | **No. of subjects** | **Mean** |
| **18-21** | 2 | 23 |
| **22-25** | 7 |

# Fig 7



**AGE WISE DISTRIBUTION OF GROUP A**

**22%**

**78%**

Age 18-21

22-25

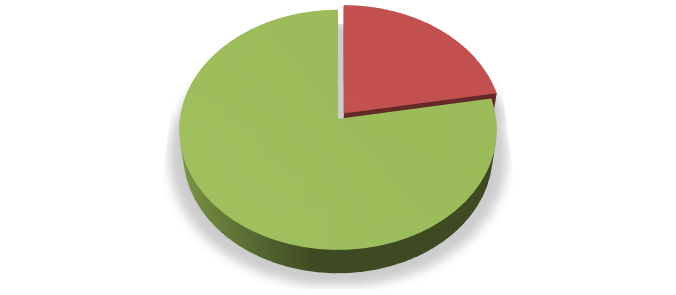
### AGE WISE DISTRIBUTION OF GROUP A

**COMMENT** – The pie diagram shows the age wise distribution of study subjects. There were 2 subjects between 18 to 21 years of age & 7 subjects from 22 to 25 years of age.

**Table 2 – Gender wise distribution of Group A (MTPR)-**

|  |  |  |
| --- | --- | --- |
| **Gender** | **No. of subjects** | **Percentage** |
| **Male** | 2 | 22% |
| **Female** | 7 | 78% |

# Fig 8-



**GENDER WISE DISTRIBUTION OF GROUP A**

**22%**

**78%**

Gender Male

Female

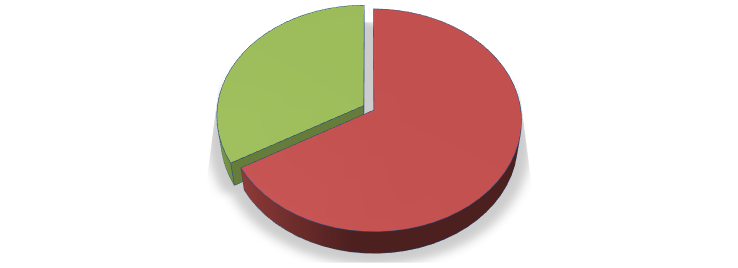
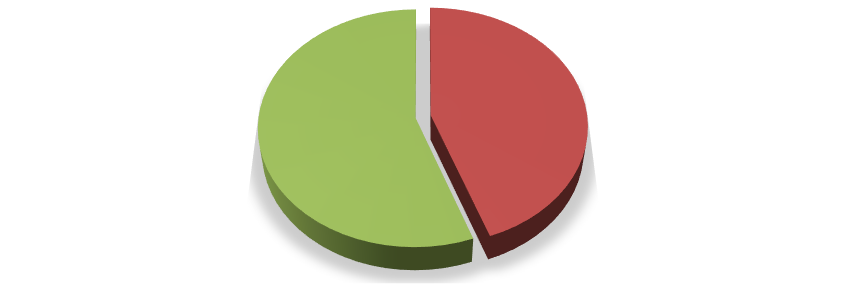
### GENDER WISE DISTRIBUTION OF GROUP A

**COMMENT** -The pie diagram shows the gender wise distribution of study subjects. There were 78% subjects are females & 22% subjects are males.

**Table 3 – Age wise distribution of Group B (PIR)-**

|  |  |  |
| --- | --- | --- |
| **Age group** | **No. of subjects** | **Mean** |
| **18-21** | 4 | 21.8 |
| **22-25** | 5 |

# Fig 9-



**AGE WISE DISTRIBUTION OF GROUP B**

**56%**

**44%**

Age 18-21

22-25

### AGE WISE DISTRIBUTION OF GROUP B

**COMMENT** – The pie diagram shows the age wise distribution of study subjects. There were 4 subjects between 18 to 21 years of age & 5 subjects from 22 to 25 years of age.

**Table 4 – Gender wise distribution of Group B (PIR)-**

|  |  |  |
| --- | --- | --- |
| **Gender** | **No. of subjects** | **Percentage** |
| **Male** | 6 | 67% |
| **Female** | 3 | 33% |

# Fig 10-

**GENDER WISE DISTRIBUTION OF GROUP B**

**33%**

**67%**

Gender Male

Female

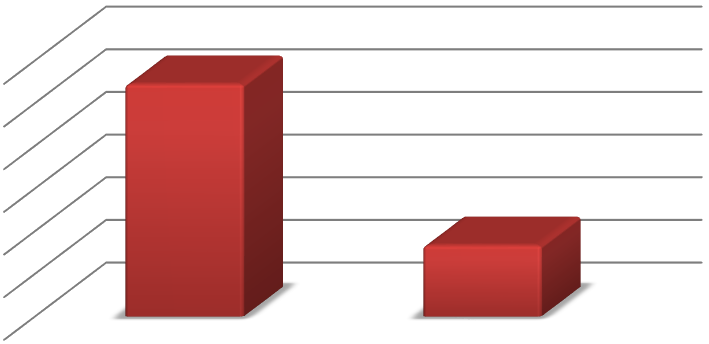
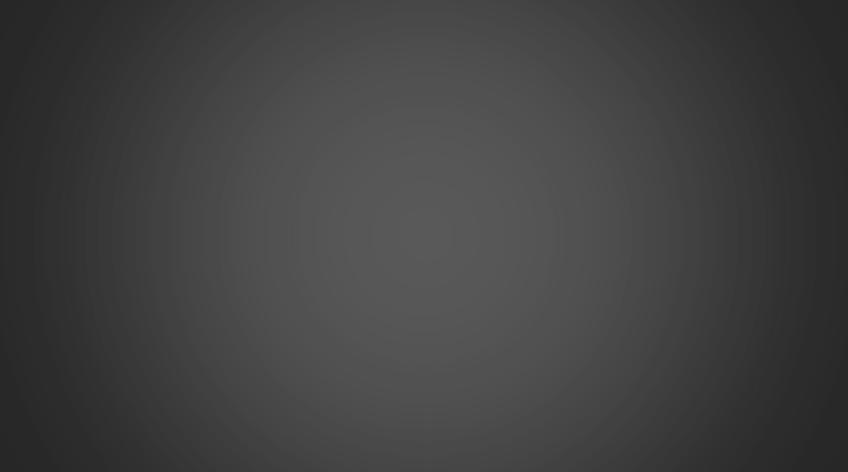
### GENDER WISE DISTRIBUTION OF GROUP B

**COMMENT** -The pie diagram shows the gender wise distribution of study subjects. There were 33% subjects are females & 67% subjects are males.

**Table 5- INTRA GROUP COMPARISON OF NPRS OF GROUP A(MTPR)-**

Intra group comparison of pre and post data value of NPRS in group A. The pre data of NPRS mean is 5.444 with SD 1.130; when it is compared with post mean 1.667 with SD 1.000, the obtained p value is <.0001 which represents there is significant improvement in pain intensity after intervention (table 5 and graph 1).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Test** | **n** | **Mean** | **Mean**  **Difference** | **SD** | **t Value** | **p Value** | **Level of**  **Significance** |
| **Pre** | 9 | 5.444 | 3.778 | 1.130±1.000 | 17.000 | <0.0001 | statistically significant |
| **Post** | 1.667 |



**NPRS GROUP A**

5.444

6

5

4

3

2

1

0

1.667

PRE POST

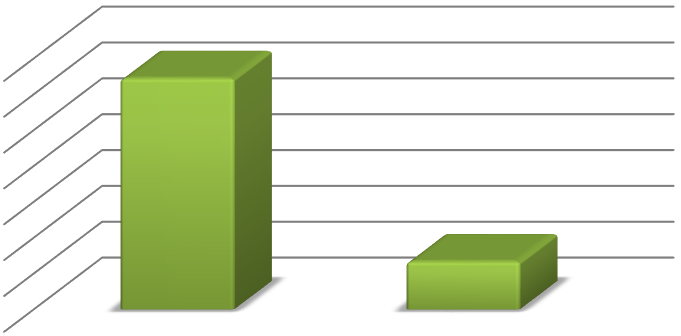
**Graph 1- Comparison of pre and post intervention NPRS of group A(MTPR)**

**Table 6 – INTRA GROUP COMPARISON OF NPRS OF GROUP B (PIR)-**

Within group comparison of pre and post data value of NPRS in group B. The pre data of NPRS mean is 6.444 with SD 0.7265; when it is compared with post mean 1.333 with SD 0.8660, the obtained p value is <.0001 and statistically significant difference found between in pain intensity after intervention (table 6 and graph 2).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Test** | **n** | **Mean** | **Mean**  **Difference** | **SD** | **t Value** | **p Value** | **Level of**  **Significance** |
| **Pre** | 9 | 6.444 | 5.111 | 0.7265±0.8660 | 13.143 | <0.0001 | statistically significant |
| **Post** | 1.333 |

**Graph 2- Comparison of pre and post intervention NPRS of group(PIR)**



**NPRS GROUP B**

7

6

5

4

3

2

1

0

6.444

1.333

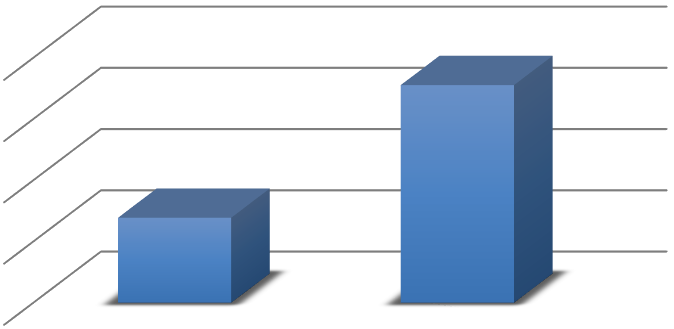
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### TABLE 7 – INTRA GROUP COMPARISON OF CERVICAL ROM ( FLEXION) OF GROUP A(MTPR)-

Intra group comparison of pre and post data value of cervical ROM (Flexion) in group B. The pre data of Cervical ROM (Flexion) mean is 27.778 with SD 7.546; when it is compared with post mean 71.111 with SD 6.972, the obtained p value is <0.0001 which represents there is statistically significant improvement in cervical ROM (flexion ) after intervention (table 7 and graph 3)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Test** | **n** | **Mean** | **Mean**  **Difference** | **SD** | **t Value** | **p Value** | **Level of**  **Significance** |
| Pre | 9 | 27.778 | -43.333 | 7.546±6.972 | 17.333 | <0.0001 | statistically significant |
| Post | 71.111 |

**CERVICAL FLEXION GROUP A**



80

60

40 27.778

20

0

71.111

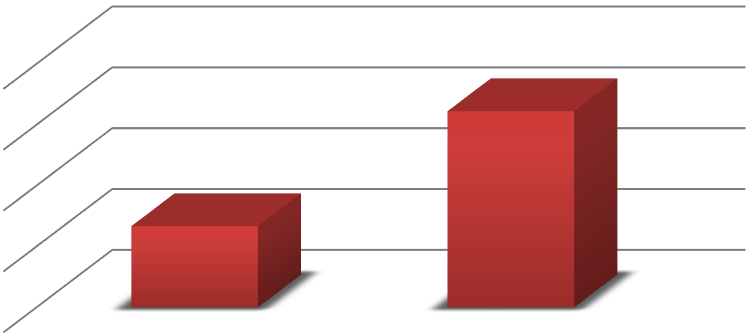
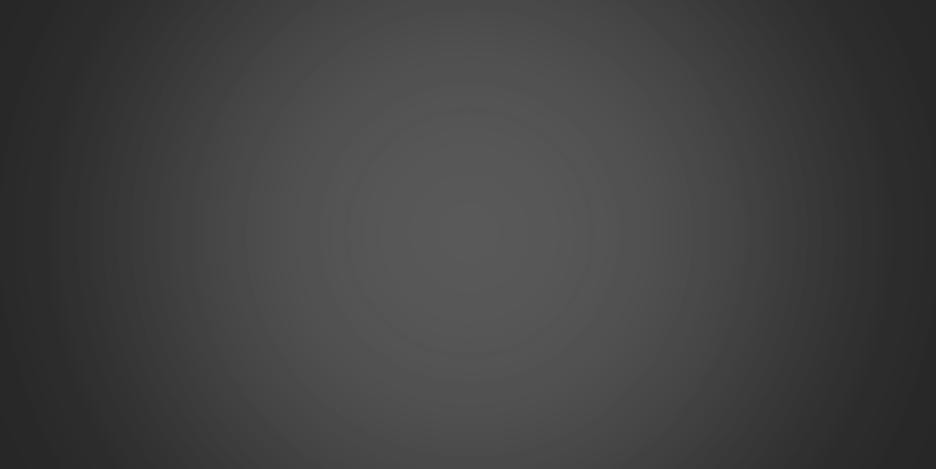
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**Graph 3- Comparison of pre and post intervention cervical flexion of group(MTPR)**

### TABLE 8 – INTRA GROUP COMPARISON OF CERVICAL ROM ( EXTENSION) OF GROUP A (MTPR)-

Intra group comparison of pre and post data value of cervical ROM (Extension) in group B. The pre data of Cervical ROM (Extension) mean is 26.667 with SD 5.590 ; when it is compared with post mean 64.444 with SD 4.640, the obtained p value is <0.0001 which represents there is statistically significant improvement in cervical ROM (Extension) after intervention (table 8 and graph 4).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Test** | **n** | **Mean** | **Mean**  **Difference** | **SD** | **t Value** | **p Value** | **Level of**  **Significance** |
| **Pre** | 9 | 26.667 | -37.778 | 5.590±4.640 | 12.520 | <0.0001 | statistically significant |
| **Post** | 64.444 |



**CERVICAL EXTENSION GROUP A**

80

64.444

60

40

26.667

20

0

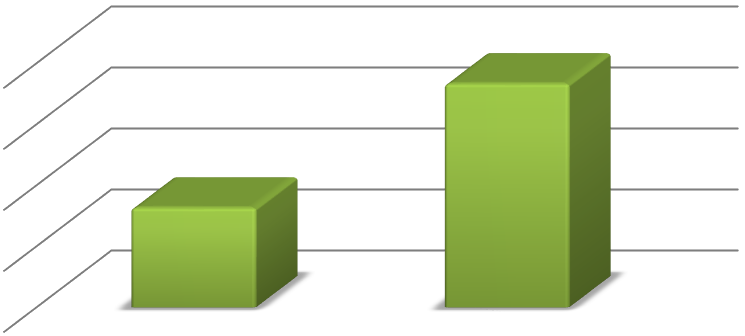
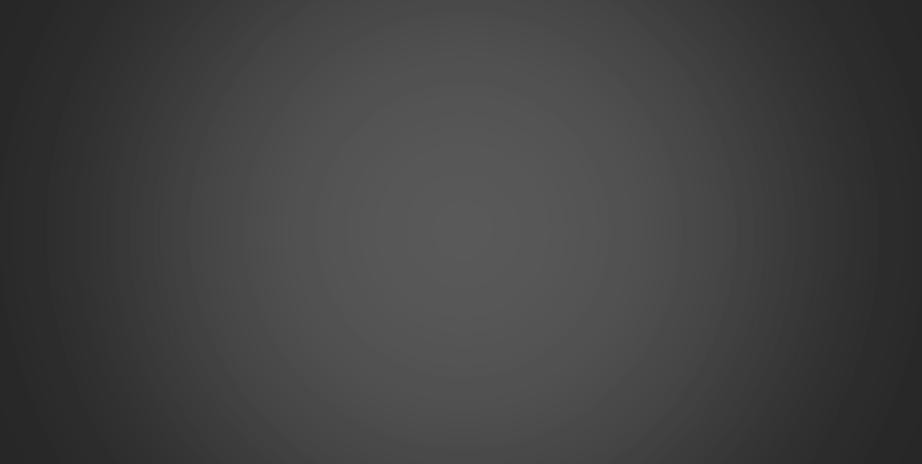
PRE

POST

**Graph 4- Comparison of pre and post intervention cervical extension of group(MTPR)**

### TABLE 9 – INTRA GROUP COMPARISON OF CERVICAL ROM ( SIDE-ROTATION) OF GROUP A(MTPR)-

Intra group comparison of pre and post data value of cervical ROM (Side-Rotation) in group B. The pre data of Cervical ROM (Side-Rotation) mean is 16.333 with SD 4.796 ; when it is compared with post mean 36.667 with SD 3.536 , the obtained p value is <0.0001 which represents there is statistically significant improvement in cervical ROM (Side-Rotation) after intervention (table 9 and graph 5).



**CERVICAL SIDE ROTATION GROUP A**

36.667

40

30

16.333

20

10

0

PRE

POST

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Test** | **n** | **Mean** | **Mean**  **Difference** | **SD** | **t Value** | **p Value** | **Level of**  **Significance** |
| **Pre** | 9 | 16.333 | -20.333 | 4.796±3.536 | 9.896 | <0.0001 | statistically significant |
| **Post** | 36.667 |

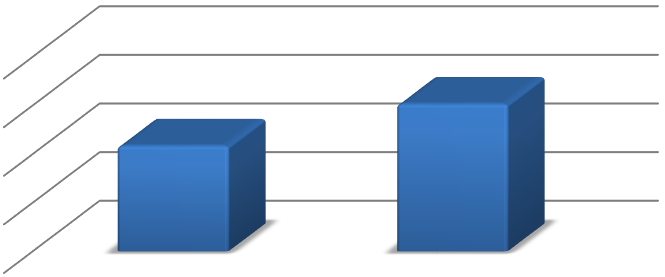
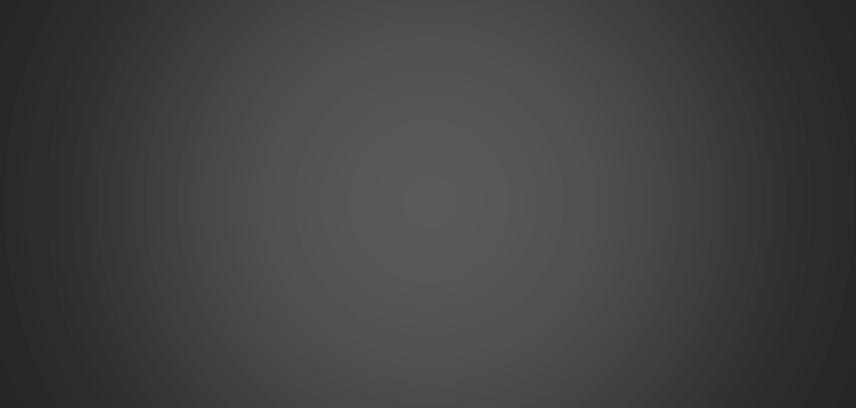
**Graph 5- Comparison of pre and post intervention cervical side rotation of group(MTPR)**

### TABLE 10 – INTRA GROUP COMPARISON OF CERVICAL ROM ( FLEXION) OF GROUP B (PIR)-

Intra group comparison of pre and post data value of cervical ROM (Flexion) in group A. The pre data of Cervical ROM (Flexion) mean is 43.333 with SD 10.000; when it is compared with post mean 60.556 with SD 9.825, the obtained p value

is <0.0001 which represents there is statistically significant improvement in cervical ROM (flexion ) after intervention (table 10 and graph 6).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Test** | **n** | **Mean** | **Mean**  **Difference** | **SD** | **t Value** | **p Value** | **Level of**  **Significance** |
| **Pre** | 9 | 43.333 | -17.222 | 10.000±9.825 | 8.360 | <0.0001 | statistically significant |
| **Post** | 60.556 |



**CERVICAL FLEXION GROUP B**

80

60

40

20

0

60.556

43.333

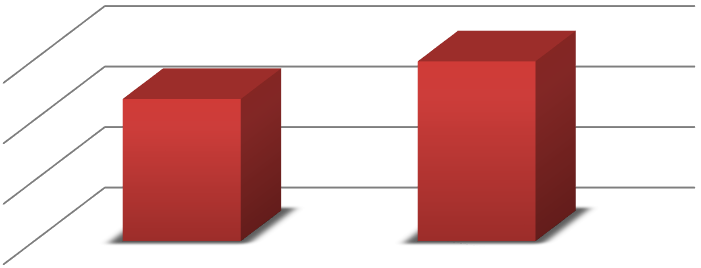
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**Graph 6- Comparison of pre and post intervention cervical flexion of group(PIR)**

### TABLE 11 – INTRA GROUP COMPARISON OF CERVICAL ROM ( EXTENSION) OF GROUP B(PIR)-

Intra group comparison of pre and post data value of cervical ROM (Extension) in group A. The pre data of Cervical ROM (Extension) mean is 47.000 with SD 5.292; when it is compared with post mean 59.444 with SD 5.270, the obtained p value is <0.0001 which represents there is statistically significant improvement in cervical ROM (Extension) after intervention (table 11 and graph 7).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Test** | **n** | **Mean** | **Mean**  **Difference** | **SD** | **t Value** | **p Value** | **Level of**  **Significance** |
| **Pre** | 9 | 47.000 | -12.444 | 5.292±5.270 | 8.190 | <0.0001 | statistically significant |
| **Post** | 59.444 |



**CERVICAL EXTENSION GROUP B**

59.444

60

47

40

20

0

PRE

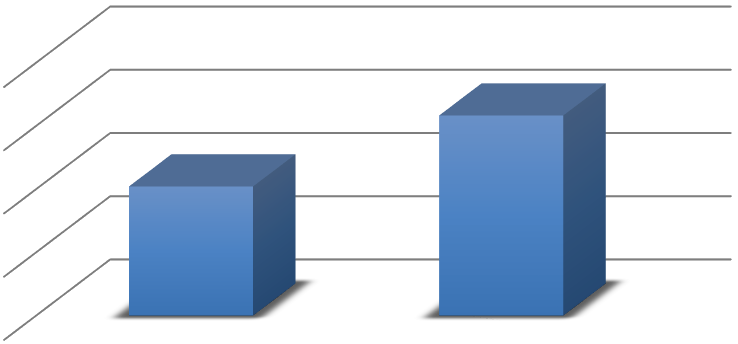
POST

**Graph 7- Comparison of pre and post intervention cervical extension of group(PIR)**

### TABLE 12 – INTRA GROUP COMPARISON OF CERVICAL ROM ( SIDE-ROTATION) OF GROUP B (PIR)-

Intra group comparison of pre and post data value of cervical ROM (Side-Rotation) in group A. The pre data of Cervical ROM (Side-Rotation) mean is 20.444 with SD 4.362 ; when it is compared with post mean 32.667 with SD 4.975, the obtained p value is <0.0001 which represents there is statistically significant improvement in cervical ROM (Side- Rotation) after intervention (table 12 and graph 8) .

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Test** | **n** | **Mean** | **Mean**  **Difference** | **SD** | **t Value** | **p Value** | **Level of**  **Significance** |
| **Pre** | 9 | 20.444 | -11.222 | 4.362±4.975 | 16.439 | <0.0001 | statistically significant |
| **Post** | 31.667 |



**CERVICAL SIDE ROTATION GROUP B**

40

31.667

30

20.444

20

10

0

PRE

POST

**Graph8 - Comparison of pre and post intervention cervical side rotation of group(PIR)**

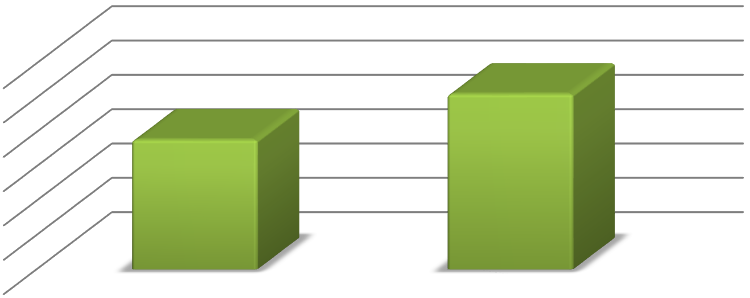
### TABLE 13 – INTER GROUP COMPARISON OF NPRS BETWEEN GROUP A (MTPR)AND GROUP B(PIR)-

Inter group comparison of data difference between groups. In group A difference value of NPRS mean is 3.778 with SD 0.6667; when it is compared with group B value with mean of 5.111 with SD 1.167, the obtained p value is 0.0089 and statistically significant difference is found between groups. (table 13 & graph 9).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Group** | **n** | **Mean** | **Mean**  **Difference** | **SD** | **t**  **Value** | **p Value** | **Level of Significance** |
| **A** | 9 | 3.778 | 1.333 | 0.6667±1.167 | 2.977 | 0.0089 | statistically significant |
| **B** | 9 | 5.111 |

|  |  |  |
| --- | --- | --- |
| 5 | 3.778 |  |
| 4 |  |  |
| 3 |  |  |
| 2 |  |  |
| 1 |  |  |
| 0 |  |  |
|  | GROUP A | GROUP B |

**Graph 9 – Comparison of pre and post intervention NPRS of group A (MTPR) and group B (PIR)**



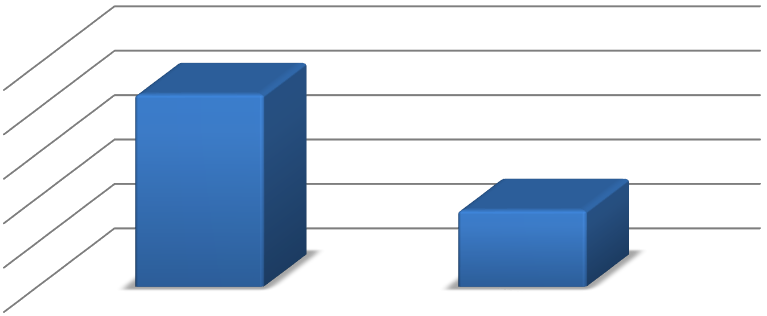
**Comparison of NPRS o F Group A & B**

6

5.111

### TABLE 14 – INTER GROUP COMPARISON OF CERVICAL ROM (FLEXION) BETWEEN GROUP A (MTPR)AND GROUP B(PIR)-

Inter group comparison of data difference between groups. In group A difference value of Cervical ROM ( Flexion) mean is 43.333 with SD 7.500; when it is compared with group B value with mean of 17.222 with SD 6.180, the obtained p value is <0.0001 and statistically significant difference is found between groups. (table 14 & graph 10).



**Comparison of Cervical Flexion ROM of Group A & B**

43.333

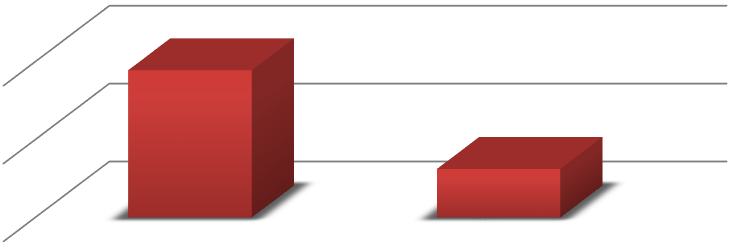
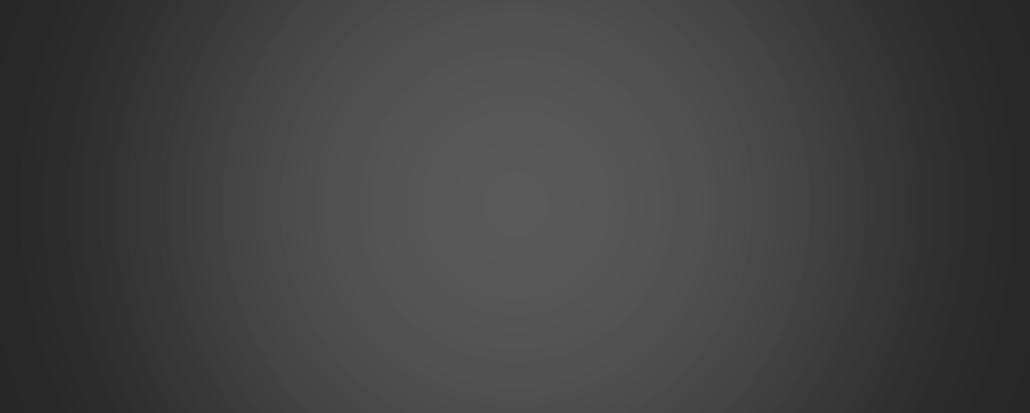
|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Group** | **n** | **Mean** | **SD** | **t**  **Value** | **p Value** | **Level of Significance** |
| **A** | 9 | 43.333 | 7.500±6.180 | 8.060 | <0.0001 | statistically significant |
| **B** | 9 | 17.222 |

|  |  |
| --- | --- |
| 50 |  |
| 40 |  |
| 30 | 17.222 |
| 20 |  |
| 10 |  |
| 0 |  |
| GROUP A | GROUP B |

**Graph 10 – Comparison of pre and post intervention Cervical ROM (FLEXION) of group A (MTPR) and group B (PIR)**

### TABLE 15 – INTER GROUP COMPARISON OF CERVICAL ROM (EXTENSION) BETWEEN GROUP A (MTPR)AND GROUP B(PIR)-

Inter group comparison of data difference between groups. In group A difference value of Cervical ROM (Extension) mean is 37.777 with SD 9.052; when it is compared with group B value with mean of 12.444 with SD 4.558, the obtained p value is <0.0001 and statistically significant difference is found between groups. (table 15 & graph 11).



|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Group | n | Mean | SD | t Value | p Value | Level of Significance |
| A | 9 | 37.777 | 9.052±4.558 | 7.499 | <0.0001 | statistically significant |
| B | 9 | 12.444 |

**Comparison of Cervical Extension ROM of Group A & B**

37.777

40

20

12.444

0

GROUP A GROUP B

**Graph 11 – Comparison of pre and post intervention Cervical ROM (EXTENSION) of group A (MTPR) and group B (PIR)**

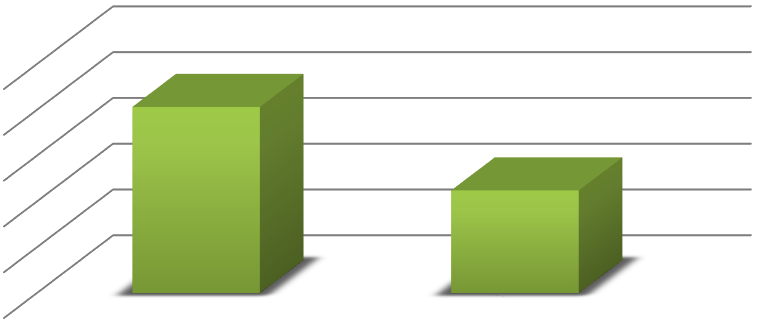
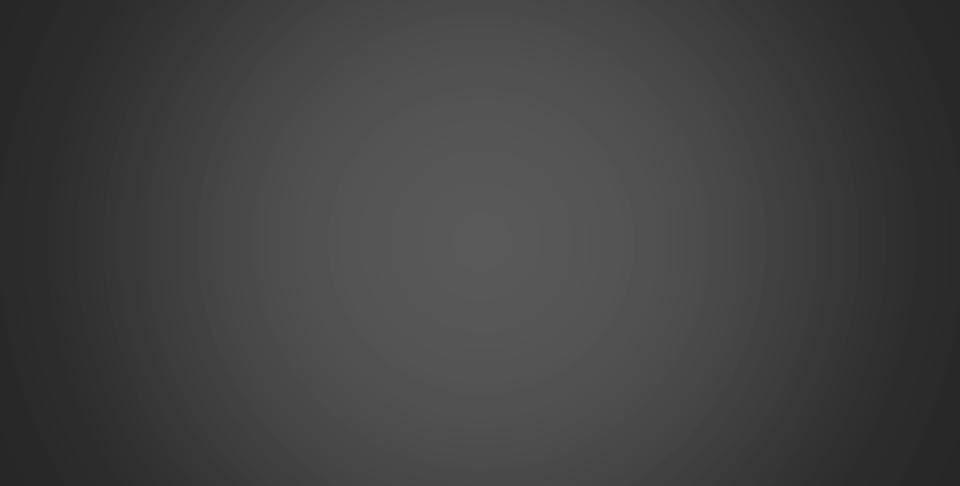
### TABLE 16 – INTER GROUP COMPARISON OF CERVICAL ROM (SIDE ROTATION) BETWEEN GROUP A (MTPR)AND GROUP B(PIR)-

Inter group comparison of data difference between groups. In group A difference value of Cervical ROM ( Side Rotation) mean is 43.333 with SD 7.500; when it is compared with group B value with mean of 17.222 with SD 6.180, the obtained p value is <0.0001 and statistically significant difference is found between groups.(table16 & graph 12).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Group** | **n** | **Mean** | **SD** | **t**  **Value** | **p Value** | **Level of Significance** |
| **A** | 9 | 20.333 | 6.164±2.048 | 4.208 | 0.0007 | statistically significant |
| **B** | 9 | 11.222 |

|  |  |  |
| --- | --- | --- |
| 25 | 20.333 |  |
| 20 |  |  |
| 15 |  | 11.22 |
| 10 |  |  |
| 5 |  |  |
| 0 |  |  |
|  | GROUP A | GROUP B |

**Graph 12 – Comparison of pre and post intervention Cervical ROM (SIDE ROTATION) of group A (MTPR) and group B (PIR)**



**Comparison of Cervical Side Rotation ROM Of**

**Group A & B**

## DISCUSSION

The aim of this study was to compare the immediate effect of manual trigger point release & post isometric relaxation technique in college students with trapezitis. A total 18 college students were assigned to one of two groups in this study. Group A receives manual trigger point release & Group B receives post-isometric relaxation. Their ages ranged from 18 to 25 year. This Study was designed to immediate effect of manual trigger point release & post-isometric relaxation among college students with trapezitis. This study proved the efficacy of manual trigger point release & post isometric relaxation among college students with trapezitis by reducing pain intensity & improving cervical ROM.

In the Comparison of both these technique for the immediate effectiveness it was found that manual trigger point release is more effective than the post-isometric relaxation in reducing pain & improving Cervical ROM in college students with trapezitis. When comparing between group the study was stastically extremely significant which shows manual trigger point release is more effective than post-isometric relaxation technique in college students with trapezitis . Hence, study accept the alternative hypothesis.

Our findings show that TrP pressure release decreases pain intensity and increases cervical range of motion. As a result, it lends support to the findings of Rob Grieve et al., who discovered that a single TrP pressure release intervention 14 enhances active dorsiflexion range. The approach works by increasing blood flow to the trigger point location, bringing more oxygen and nutrients to the hypoxic area. As a result, calcium ions are returned to the SR(Sarcoplasmic retinaculum) and excessive muscular tension is reduced. Furthermore, it lengthens the 1 contracted sarcomere and relieves the taut band.

Leon Chaitow emphasised the usefulness of PRT in the treatment of MTrPs. The findings of our investigation revealed that a single session of PRT lowers discomfort and enhances ROM. As a result, our findings lend support to the findings of Ali Ghanbari et al. and Francisco Jose Saavedra et al., who discovered that PRT lowers muscular tension and TrP sensitivity. It works by reducing inappropriate muscle spindle activity and gamma motor neurone activity, which, in turn, reduces basal tone in the previously hyperactive muscle. Additionally, it enhances local blood circulation, which flushes out inflammatory molecules such as prostaglandins and bradykinin, which cause pain.

“Manual Trigger Point Release (MTpR) involves the application of sustained manual pressure to specific trigger points using the fingers, thumbs, elbows, or other tools. This technique, often referred to as ischemic compression, temporarily reduces blood flow to the area, followed by a surge of oxygen and nutrients upon release. This process helps to break up tight muscle fibers, increase local blood flow, and relieve pain patterns associated with active myofascial trigger points” [8].

Dr. M. tarik dal et al., 2022 conducted “a study on Post Isometric Relaxation (PIR) technique was compared to PRT, with both methods showing effectiveness in reducing pain, improving ROM, and increasing neck functional activities. However, PIR was found to be more effective than PRT in these aspects due to PIR refers to the presumed effect of diminished tone experienced by a muscle or group of muscles .The inhibitory golgi tendon reflex ,which is induced during isometric contraction and leads to muscle reflex relaxation , may be responsible for pain relief after PIR . Activation of muscle and joint mechanoreceptors also causes sympatho-excitation which is elicited by somatic efferents ,as well as localized activation of periaqueductal grey matter ,which aids in pain modulation furthermore , isometric workouts may reduce pain by increasing endorphins , which occur naturally after training , and improving neuromuscular control. Isometric exercise causes intense muscle contractions , which activate muscle stretch receptors . These afferents stimulate the release of endogenous opiates as well beta endorphins from the pituitary gland ;these secretions may help to reduce pain . Increased ROM after PIR could be explained by physiological mechanisms. Underlying changes in muscular extensibility , which leads to an increase in muscle length by a combination of creep and plastic change in the connective tissue”.These findings suggest that various manual therapy techniques can provide immediate relief for college students suffering from trapezitis.

“Post isometric relaxation (PIR) is a MET used to relax and lengthen a hypertonic and shortened muscle. This gentle stretching technique is typically used on postural muscles. These muscles often become short and tight and can lead to muscle imbalances. This can limit range of motion and cause joint restrictions. Several muscles in the upper body fall under this category such as the upper trapezius, and levator scapulae. When these muscles become shortened they can restrict range of motion in the head, neck and shoulder and often become painful” [26].

In our study we found that manual trigger point release is more immediately effective than post isometric relaxation is due to the manual trigger point release works in two ways. Firstly, when pressure is placed on the indicated trigger locations, the native chemical changes due to blanching of the lumps. In addition, mechanoreceptors are stimulated, which influences the pain gate mechanism and so reduces pain. Second, when compression is released, it causes hyperaemia (increased blood flow to the tissues) and an increase in lymphatic circulation from that treated area, which eliminates hypoxia and improves cellular metabolism scores, flushing out inflammatory chemical substances such as prostaglandins, histamine, and bradykinin (pain metabolites); as a result, nociceptors' sensitisation is reduced. Furthermore, it breaks away scar tissue, desensitizes nerve endings, and lowers muscular tone.

## CONCLUSION

The present study concluded that manual trigger point release is more immediately effective than post-isometric relaxation technique in college students with trapezitis .

## LIMITATION

**Small Sample Size**: If the study was conducted on a limited number of students, the results may not be generalizable to the wider population.

**Short-Term Focus**: The study evaluates immediate effects only, so long-term outcomes and sustainability of the interventions remain unknown.

## RECOMMENDATIONS FOR FUTURE STUDY

**Long-Term Effectiveness Studies**: Future research can explore the long-term effects of both interventions over weeks or months to assess sustainability and recurrence & long term follow will be taken for increase clinical significance.

**Comparison with Other Techniques:** Studies can compare manual trigger point release and PIR with other methods like dry needling, myofascial release, or Kinesio taping.

**Inclusion of Objective Measures:** pressure algometry, or motion analysis to provide more objective insights into muscle relaxation and functional improvement.

**Broader Demographics:** Expanding the study to include different age groups, occupational groups, or individuals with chronic musculoskeletal disorders.

## CONSENT

As per international standards or University standards , Participants’ written consent has been collected and preserved by

the author(s).

## ETHICAL APPROVAL

The study protocol was reviewed and approved by the institutional Ethics Committee of the rehabilitation facility. Participants were ensured confidentiality , voluntary participation , and the right to withdraw from the study at any time. There was no ethical issue highlighted throughout the study.

## DISCLAIMER (ARTIFICAL INTELLIGENCE)

Author(S) Hereby Declare That NO Generative Ai Technologies Such as Large Language Models (ChatGPT, COPILOT, Etc.) And Text-To-Image Generators Have Been Used During the Writing or Editing of This Manuscript.

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