



## ICE MASSAGE VERSUS POSITIONAL RELEASE ON TRAPEZIUS TRIGGER POINTS IN NONSPECIFIC NECK PAIN

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### Abstract

**Background:** Nonspecific neck pain is a common and increasing health problem, one of its most important causes is trapezius trigger points. This is a very common cause of physical limitations and a decline in quality of life.

**Objective:** The purpose of this study was to compare the effect of and Ice massage versus the effect of positional release on treating non-specific neck pain.in reducing pain, improving function, pain pressure threshold and increasing cervical range of motion (ROM)

**Patients and methods:** fifty-one subjects from both sexes (9males and 42 females) with Trapezius trigger points took part in this study. They were aged from 18 to 35 years old and selected from outpatient clinic, faculty of physical therapy, Horus University-Egypt in New Damietta city, Patients were randomized into three groups of equal numbers (17 patients for each group) Group A(ice massage):they received ice massage plus conventional therapy, Group B: (positional release) they received positional release plus conventional therapy, Group C: (Control group) they received conventional therapy All patients in all groups received conventional therapy(tens application & stretching exercise and life style modification) for three times/ 6weeks . All outcome measures were measured for all patients before and after 6 weeks of treatment application through VAS (for measuring pain intensity), Bournemouth Questionnaire (for measuring function), Algometer (for measuring pain pressure threshold) and CROM (for measuring cervical range of motion).

**Results:** Post treatment, the one-way ANOVA test found that there was a highly significant improvement in all measured variables ( $P<0.001$ ) in group B, there was a significant difference between group A&C in favor of group A.as there was an increase in ROM, functional abilities and pain threshold ( $p<0.001$ ). There was a less improvement in group (C) than other groups.

**Conclusion:** It was concluded that: 6 weeks of positional release plus conventional therapy can significantly decrease pain, improve function, pain pressure threshold and rom. Keywords: Trapezius trigger points, Ice massage, Positional release.

**Keywords:**Trapezius trigger points, Ice massage, Positional release.

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## 1. INTRODUCTION

Nonspecific neck pain is a very common and an increasing health problem one of its most important causes is trapezius trigger points This is a very common cause of physical limitations and a decline in quality of life.<sup>1</sup>

Trigger points are hyperirritable spots located in a taut band of any skeletal muscle. They produce pain locally and in a referred pattern and often accompany chronic musculoskeletal disorders.<sup>2</sup>

Trigger points which occur in the trapezius muscle may feel like a knot in the upper back, shoulder, or neck. Those trigger points may feel especially

painful when touched, and the pain may radiate beyond the immediate area.<sup>3</sup>

The general traditional physiotherapy treatment for TTrPsis massage therapy, application of heat or ice, transcutaneous electrical nerve stimulation, and Stretch technique.<sup>4</sup> Ice massage is a therapeutic manual technique it is a quick and easy way to get the benefits of ice that can benefit both acute injuries and chronic problems. Ice can help decrease pain, swelling, and inflammation.<sup>5</sup>

Positional Release Therapy (PRT) also known by its parent term, strain counterstrain, is a form manual medicine that resolves pain and tissue dysfunction. Through positioning the body and tissue in positions of comfort.<sup>6</sup>

## 2. PATIENTS AND METHODS

A randomized controlled trial, with pre-test post-test design was carried out from 17<sup>th</sup> November 2022 till 25<sup>th</sup> February 2023, at the outpatient clinic of the Faculty of Physical Therapy, Horus University in Egypt. Fifty-one patients from both genders (9 males and 42 females) suffering from trapezius trigger points took part in this randomized controlled study after signing an informed consent form prior to data collection. They're aged from 18-35 years. Patients were only included if they are medically and clinically stable. Sample size was calculated considering the difference in pain among the 3 groups to be 0.45 (effect size), significance level= 0.05, and with 80% power. Sample size was calculated to be 17 individuals per group, 1:1:1 ratio. The presumed effect size was based on data of pain derived from **Marzieh et al.** (2016) who found a significant difference in Pain between groups, sample size calculation was conducted using G\*POWER statistical software [version 3.1.9.2; Universität Kiel, Germany] and F tests-ANOVA: one-way. The patients were randomized into Ice massage group (n=17), Positional release group (n=17) as well as control group (n=17) by a colleague who did not participate in recruiting, treating or evaluating participants selected and opened one envelop of the opaque, sealed envelopes, containing the name of one of each group (group A, group B, group C).

- **Exclusion criteria were:** subjects Traumatic Neck Injury, Fracture of cervical vertebrae, Cervical Spinal Cord Compromise, Cervical Radiculopathy, Spondylolisthesis of the cervical spine, A history of heart disease or the presence of a pacemaker, epilepsy, a psychological disorder or pregnancy.<sup>7,8</sup>

- **Inclusion criteria were:** Cervical Pain with less than 3 months, Subjects of sub-acute trapezii with trigger points.

Or subjects with Taut band palpable in upper trapezius muscle.<sup>7</sup>

Subjects with Excruciating spot tenderness at one point along the length of the taut band of the upper trapezius muscle with Restriction in cervical lateral flexion when measured and have Pain that increased by elongating (stretching) the trapezius muscle.

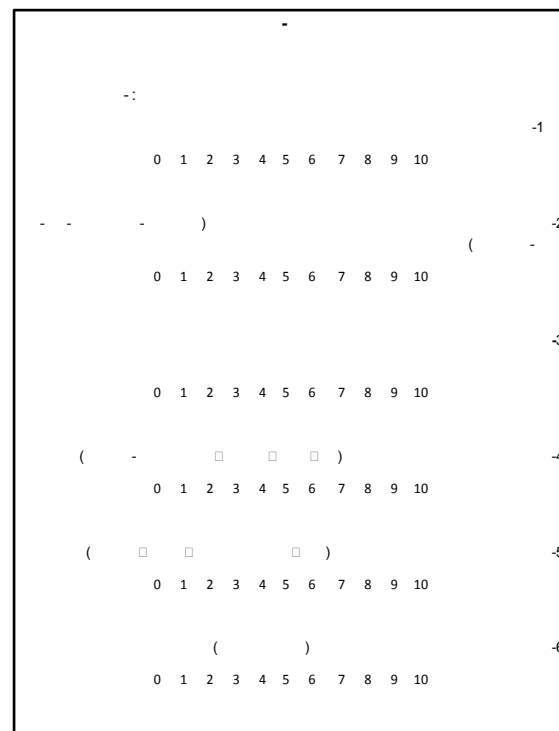
### • MEASUREMENT PROCEDURES

#### 1. Visual analog scale (VAS):

Visual analog scale is a reliable and valid measure of pain which is used frequently in clinical and research settings, it consists of a 10-cm line anchored at each end. The left-hand anchor reads "no pain" and the right-hand anchor reads "worst possible pain". patients marked a line to represent their pain level it Was completed by the patients themselves. They marked on the line the point that they feel represents their perception of their current state.<sup>9</sup>

#### 2. Bournemouth questionnaire:

It Is a reliable and valid multi-dimensional outcome tool assessing patients' outcome of care in a routine clinical setting. The questionnaire exists in two different versions.<sup>10</sup> [The Neck and back Bournemouth Questionnaires, we obviously used the Arabic version the first one.<sup>11</sup> Completing the test had taken approximately 5 minutes. The questionnaires consist of 7 questions Each item is rated on a numeric Rating scale from 0 to 10: (0= Much better, 5= no change and 10= much worse). The score for each measure was added. This produced a value between a minimum score of 0, and a maximum score of 70. The higher the score reflects the degree of impact on a patient's life.



#### 3. Pressure algometer

A valid and reliable digital electronic pressure algometer was used.<sup>12</sup> It was used to measure active myofascial trigger points tenderness by determining the pressure pain threshold using a pressure transducer probe that was placed on the MTPs.

To assess tenderness in upper trapezius the subject was asked to determine the area of pain. The area was confirmed by pincer palpation and then marked it. The transducer probe tip was applied perpendicularly over the myofascial trigger points,<sup>13</sup> and the power was switched ON. A required pressure was exerted on the site of myofascial trigger points by pressing the transducer firmly downwards. The digital display gave the actual pressure applied at the site in kg/cm force. Exerted pressure was held and gradually increased

until the subject indicated first sign of pain and said "STOP".

#### **4. Cervical range of motion (CROM):**

The CROM device is a validated and reliable type of goniometers with a specific design for the cervical spine and was used for measuring CROM.<sup>14</sup>

each subject was instructed to sit in upright position and both hands rested on thigh. Hip and knee in flexion 90°, CROM was strapped around head. Active flexion and extension: The subject have asked to bend the neck forward into flexion then back to starting position then bend the neck back into extension. Active lateral bending: The subject was asked to relax both shoulders then bend the neck laterally to one side then bend to the other side. Active rotation: The subject was asked to fix trunk and shoulder and then rotate to one side then to the starting position then rotate to the other side.<sup>15</sup>

#### **TREATMENT PROCEDURES**

All patients in the treatment groups completed a 6-weeks of treatment program (3 sessions / week) consisting of either ice massage and conventional therapy (in ice massage group) or positional release and conventional therapy (in positional release group) or conventional therapy in form of stretching of cervical muscles, Tense application , and life style modifications (in control group)

##### **• ICE MASSAGE GROUP:**

Seventeen patients had received ice massage Applied by using a Cryocup, before starting ice treatment, a thermal test had been done to all patients in this group to ensure intact sensation and body reactions for ice. Then, A 3/4 paper cup was filled with water and put in freezer overnight until it had been totally frozen. After that a 3/4 of the paper cup was Teared away leaving the bottom of the cup to hold onto. Ice cup was applied for about 3-5 minutes in a slow circular motion to the selected treated area depending on the location and size of the trigger points in the upper trapezius for each patient. A towel has been used and placed directly under the affected area being iced because it would melt and drip everywhere.<sup>8</sup>

##### **• POSITIONAL RELEASE GROUP:**

Seventeen patients had received positional release, the subject lied in supine-lying position with therapist standing on the affected side; tender points were palpated along the upper fibers of the trapezius. Pressure have been applied by pinching the muscle between the thumb and fingers. The subject's head was laterally flexed toward the side of tender point, then therapist grasped the subject's forearm and abducted shoulder to approximately 90° a slight flexion or extension was added to obtain fine- tune. The ideal position of comfort achieved was held for a period of 90 seconds and

followed by a passive return of the body part to an anatomically neutral position continued for 5 minutes.<sup>6</sup>

##### **• CONTROL GROUP:**

Applied to seventeen subjects Started by applying Tense using TENS was applied at high frequency (from 50 Hz to 130 Hz), low intensity (comfortable, not painful) and small pulse duration (50  $\mu$ s to 200  $\mu$ s) and for 20 minutes.<sup>16</sup> Then Upper fibers of trapezius stretch was applied, Patient Sat upright in a chair and made sure that his posture is correct. therapist was standing behind the participants. Therapist placed one hand on the shoulder joint of the affected side and other one on the head of the participants.<sup>17</sup> Stretch was applied for 5 repetitions, every one of them held for 30 seconds.

##### **• OUTCOME MEASURES**

The primary measures for determining treatment outcomes were pain intensity, quality of life, pain pressure threshold cervical ROM and the measurement tools were VAS, Bournemouth questionnaire, pressure algometer and the CROM. All measures were assessed before treatment application (pre-treatment) and after 6 weeks of treatment application (post-treatment) for each patient in all three groups of the study (ice massage group, positional release group and control group).

#### **STATISTICAL ANALYSIS**

Statistical testing was done with SPSS 28.0 (Statistical Package for the Social Sciences).

If the P-value was less than 0.05, the differences were considered significant. Age, height, weight, as well as body mass index were presented as means and standard deviations across all three groups, while the distribution of gender was presented as frequencies and percentages. Paired t-test was utilized to test the differences in measured variables within groups pre and post treatment for parametric data, whereas One-way ANOVA test utilized to test the differences in the measured variables between groups pre and post treatment for parametric data. Pairwise comparisons were conducted using post hoc (Bonferroni) test to compare the differences in outcome measures between groups post treatment in case of overall significance.

#### **3. RESULTS**

The main purpose of this study was to compare the effect of ice massage versus positional release technique on pain intensity, pain pressure threshold, cervical ROM and cervical function in TATrPs in non-specific neck pain.

This study was intended to present the collected data as patients' demographic data, scores of visual analog scale (pain intensity), bournemouth questionnaire (function and health status assessment), pressure algometer (pain pressure threshold) and the CROM (cervical range of motion assessment) were assessed before and after 6 successive weeks of intervention for each patient in all groups of the study.

Demographic and clinical characteristics of patients The demographic data of the patients in all groups, such as age, weight, height, as well as BMI, were compared using a one-way ANOVA test, and the results showed no significant differences among groups ( $p > 0.05$ ), as demonstrated in **Table (1)**.

#### Gender distribution of patients

The frequency distribution of gender between groups, was compared using a Chi-squared test, and the results showed no significant difference among groups ( $p$ -value  $> 0.05$ , as demonstrated in **Table (1)**.

Demographic and clinical characteristics of patients Comparing the general characteristics of the patients of all groups by one-way ANOVA test revealed that there were no significant differences found between groups in the demographic characteristics, including age, weight, height and BMI ( $p > 0.05$ ) as shown in **Table (1)**.

**Table (1):**Demographic and clinical characteristics of patients in all groups

Variables	Age (years)	Height (m)	Weight (kg)	BMI (Kg/m <sup>2</sup> )	Gender [N (%)]		
					Male	Female	
Group A (20) ( $\bar{x} \pm SD$ )	27.05 $\pm$ 2.30	1.66 $\pm$ 0.07	76.58 $\pm$ 7.39	28.47 $\pm$ 2.87	2 (11.76 %)	15 (88.24 %)	
Group B (20) ( $\bar{x} \pm SD$ )	28.05 $\pm$ 3.64	1.62 $\pm$ 0.09	26.48 $\pm$ 4.95	26.12 $\pm$ 1.13	2 (11.76 %)	15 (88.24 %)	
Group C (20) ( $\bar{x} \pm SD$ )	26.29 $\pm$ 3.60	1.63 $\pm$ 0.08	71.08 $\pm$ 9.41	26.67 $\pm$ 3.78	5 (29.4 %)	12 (70.6 %)	
F-Value	1.264	1.278	1.509	1.308			
P-Value	0.292	0.288	0.231	0.280	0.297		
$\chi^2$						2.43	
Sig.	NS	NS	NS	NS	NS		

$\bar{x}$ : Mean

$\chi^2$ : Chi square test

P-Value: Probability value

SD: Standard Deviation

F-value: one-way ANOVA test

NS: Non-significant

#### Pre and post treatment comparison in mean scores of all outcome measures for each group (within groups)

In each group (group A, B and C), "Paired t-test" revealed that there was a highly significant difference in mean scores of all outcome measures within each group after 6 weeks of treatment application (post treatment) when compared to pre-treatment ( $P < 0.05$ ) **Table (2)**.

#### Comparison of pre-treatment values in all outcome measures between groups

One-way ANOVA test revealed that there was no significant difference between groups in all outcome measures pre-treatment as P-value = 0.743. **Table (2)**.

#### Comparison of post treatment values in all outcome measures between groups

One-way ANOVA test revealed that there was a highly significant difference between groups in all outcome measures post treatment as P-value  $< 0.001$ . **Table (2)**.

**Table (2):**comparison of pre and post treatment values in all outcome measures for all groups (within & between groups)

Variables	Group A (20) ( $\bar{x} \pm SD$ )	Group B (20) ( $\bar{x} \pm SD$ )	Group C (20) ( $\bar{x} \pm SD$ )	F-Value	P-Value	Sig.
<b>1. Visual analogue scale (VAS)</b>						
Pre	7.41 $\pm$ 0.71	7.58 $\pm$ 0.71	7.41 $\pm$ 0.87	0.299	0.743	NS
Post	7.41 $\pm$ 0.71	7.58 $\pm$ 0.71	7.41 $\pm$ 0.87	11.168	$< 0.001^*$	S
t-value	17.23	37.53	14.83			
P-Value	$< 0.001$	$< 0.001$	$< 0.001$			
Sig.	S	S	S			
% of change	$\downarrow$ 54.79 %	$\downarrow$ 66.62 %	$\downarrow$ 42.91 %			
<b>2. Cervical flexion ROM</b>						
Pre	2.75 $\pm$ 0.44	2.90 $\pm$ 0.30	2.91 $\pm$ 0.31	1.228	0.302	NS
Post	1.0 $\pm$ 0.0	1.20 $\pm$ 0.41	2.0 $\pm$ 0.46	15.479	$< 0.001^*$	S

<b>t-value</b>	10.49	11.19	10.49			
<b>P-Value</b>	< 0.001*	< 0.001*	< 0.001*			
<b>Sig.</b>	S	S	S			
<b>% of change</b>	↑ 27.76 %	↑ 19.99 %	↑ 9.68 %			
<b>3.Cervical extension ROM</b>						
<b>Pre</b>	33.61 ± 8.31	33.56 ± 11.78	31.47 ± 6.55	0.305	0.739	NS
<b>Post</b>	42.74 ± 5.55	43.53 ± 4.93	34.41 ± 4.96	16.316	< 0.001*	S
<b>t-value</b>	6.24	4.69	2.78			
<b>P-Value</b>	< 0.001*	< 0.001*	< 0.001*			
<b>Sig.</b>	S	S	S			
<b>% of change</b>	↑ 27.16 %	↑ 29.70 %	↑ 9.34 %			
<b>4.Cervical side-bending ROM – Right side</b>						
<b>Pre</b>	35.86 ± 8.18	34.95 ± 6.17	35.47 ± 4.67	0.084	0.920	NS
<b>Post</b>	41.76 ± 4.98	44.98 ± 6.51	39.11 ± 5.15	4.720	0.013*	S
<b>t-value</b>	5.42	8.45	4.76			
<b>P-Value</b>	< 0.001	< 0.001	< 0.002			
<b>Sig.</b>	S	S	S			
<b>% of change</b>	↑ 16.45 %	↑ 28.69 %	↑ 10.26 %			
<b>5.Cervical side-bending ROM – Left side</b>						
<b>Pre</b>	38.21 ± 5.69	36.11 ± 5.92	38.17 ± 3.41	0.925	0.403	NS
<b>Post</b>	45.00 ± 4.33	44.60 ± 5.94	42.05 ± 2.53	2.142	0.128	S
<b>t-value</b>	7.55	4.61	3.57			
<b>P-Value</b>	< 0.001*	< 0.0003*	< 0.0026*			
<b>Sig.</b>	S	S	S			
<b>% of change</b>	↑ 17.77 %	↑ 23.51 %	↑ 10.16 %			
<b>6.Cervical rotation ROM – Right side</b>						
<b>Pre</b>	57.14 ± 7.88	60.77 ± 7.47	59.11 ± 9.39	0.819	0.447	NS
<b>Post</b>	66.29 ± 5.19	70.97 ± 3.49	62.74 ± 5.65	12.229	< 0.001*	S
<b>t-value</b>	4.175	5.18	2.96			
<b>P-Value</b>	< 0.0007*	< 0.001*	< 0.0091*			
<b>Sig.</b>	S	S	S			
<b>% of change</b>	↑ 16.01 %	↑ 16.78 %	↑ 6.14 %			
<b>7.Cervical rotation ROM – Left side</b>						
<b>Pre</b>	58.43 ± 3.65	59.01 ± 11.00	59.11 ± 5.65	0.041	0.960	NS
<b>Post</b>	69.11 ± 3.63	70.38 ± 4.02	64.80 ± 4.36	9.025	< 0.001*	S
<b>t-value</b>	8.10	5.23	4.31			
<b>P-Value</b>	< 0.001	< 0.001	< 0.0005			
<b>Sig.</b>	S	S	S			
<b>% of change</b>	↑ 18.27 %	↑ 19.26 %	↑ 9.62 %			
<b>8.Pain pressure threshold – Point 1 – Right side</b>						
<b>Pre</b>	0.91 ± 0.25	1.09 ± 0.35	1.09 ± 0.21	2.40	0.102	NS
<b>Post</b>	1.31 ± 0.22	1.66 ± 0.23	1.31 ± 0.19	15.597	< 0.001*	S
<b>t-value</b>	20.45	6.22	10.62			
<b>P-Value</b>	< 0.001*	< 0.001*	< 0.001*			
<b>Sig.</b>	S	S	S			
<b>% of change</b>	↑ 43.95 %	↑ 52.29 %	↑ 20.18 %			
<b>9.Pain pressure threshold – Point 2 – Right side</b>						
<b>Pre</b>	0.76 ± 0.21	0.87 ± 0.21	0.87 ± 0.24	1.337	0.272	NS
<b>Post</b>	1.32 ± 0.26	1.84 ± 0.23	1.13 ± 0.24	36.858	< 0.001*	S
<b>t-value</b>	13.83	18.21	19.46			
<b>P-Value</b>	< 0.001*	< 0.001*	< 0.001*			
<b>Sig.</b>	S	S	S			
<b>% of change</b>	↑ 73.68 %	↑ 111.5 %	↑ 29.88 %			
<b>10.Pain pressure threshold – Point 3 – Right side</b>						
<b>Pre</b>	1.12 ± 0.37	1.25 ± 0.34	1.37 ± 0.40	1.860	0.167	NS
<b>Post</b>	1.51 ± 0.33	1.98 ± 0.29	1.60 ± 0.25	12.086	< 0.001*	S
<b>t-value</b>	11.95	6.30	2.46			
<b>P-Value</b>	< 0.001	< 0.001	0.025			

Sig.	S	S	S			
% of change	↑ 34.82 %	↑ 58.4 %	↑ 16.78 %			
<b>11.Pain pressure threshold – Point 1 – Left side</b>						
Pre	0.85 ± 0.15	0.96 ± 0.21	0.93 ± 0.24	1.402	0.256	NS
Post	1.28 ± 0.19	1.67 ± 0.22	1.17 ± 0.25	22.845	<0.001*	S
t-value	14.19	13.68	10.42			
P-Value	< 0.001*	< 0.001*	< 0.001*			
Sig.	S	S	S			
% of change	↑ 50.58 %	↑ 73.95 %	↑ 25.80 %			
<b>12.Pain pressure threshold – Point 2 – left side</b>						
Pre	0.75 ± 0.29	0.84 ± 0.32	0.90 ± 0.33	0.874	0.424	NS
Post	1.32 ± 0.26	1.80 ± 0.17	1.07 ± 0.36	30.894	<0.001*	S
t-value	18.28	16.01	5.40			
P-Value	< 0.001*	< 0.001*	< 0.001*			
Sig.	S	S	S			
% of change	↑ 76 %	↑ 114.3 %	↑ 18.88 %			
<b>13.Pain pressure threshold – Point 3 – Left side</b>						
Pre	1.16 ± 0.34	1.14 ± 0.36	1.18 ± 0.46	0.052	0.950	NS
Post	1.68 ± 0.26	1.89 ± 0.33	1.29 ± 0.42	13.246	<0.001*	S
t-value	8.97	13.69	1.63			
P-Value	< 0.001	< 0.001	0.121			
Sig.	S	S	S			
% of change	↑ 44.82 %	↑ 65.78 %	↑ 9.32 %			
<b>14. Cervical function - The Bournemouth Questionnaire (scores)</b>						
Pre	39.88 ± 6.02	41.82 ± 6.05	38.41 ± 3.91	1.694	0.195	NS
Post	13.23 ± 2.88	11.11 ± 3.35	18.00 ± 3.14	21.535	<0.001*	S
t-value	20.63	16.37	22.19			
P-Value	< 0.001*	< 0.001*	< 0.001*			
Sig.	S	S	S			
% of change	↓ 66.82 %	↓ 73.43 %	↓ 53.13%			

Pairwise comparisons were conducted using post hoc (Bonferroni) test to compare the differences in all outcome measures between groups post treatment and revealed that there was a highly significant difference between group B & group C in favor to group B. while, there was no significant difference between group A & group B in all measured variables except Pain pressure threshold RT Point 1,2,3 and LT point 1,2, there was

significant difference in favor of group B. Also, when comparing group, A & group C there was no significant difference between them post treatment in all measured variables except cervical flexion, extension and LT rotation ROM, Pain pressure threshold LT Point 3 and Bournemouth Questionnaire there was a significant difference in favor to group A. **Table (3).**

**Table (3):**comparison of the difference in all outcome measures between groups post treatment

<b>Multiple pairwise comparisons between both groups (group effect)</b>				
<b>Visual analogue scale (VAS)</b>				
<b>Group effect</b>		<b>MD</b>	<b>P-value</b>	<b>Significance</b>
<b>Post-treatment</b>	Group A vs. Group B	0.823	0.081	NS
	Group A vs. Group C	-0.882	0.055	NS
	Group B vs. Group C	-1.705	<0.001*	S
<b>Cervical flexion ROM</b>				
<b>Group effect</b>		<b>MD</b>	<b>P-value</b>	<b>Significance</b>
<b>Post-treatment</b>	Group A vs. Group B	0.288	1.00	NS
	Group A vs. Group C	9.294	<0.001*	S
	Group B vs. Group C	9.005	<0.001*	S
<b>Cervical extension ROM</b>				
<b>Group effect</b>		<b>MD</b>	<b>P-value</b>	<b>Significance</b>
<b>Post-treatment</b>	Group A vs. Group B	-0.788	1.00	NS
	Group A vs. Group C	8.330	<0.001*	S
	Group B vs. Group C	9.120	<0.001*	S
<b>Cervical side-bending ROM – Right side</b>				

Group effect		MD	P-value	Significance
Post-treatment	Group A vs. Group B	-3.22	0.298	NS
	Group A vs. Group C	2.65	0.516	NS
	Group B vs. Group C	5.88	0.011*	S
<b>Cervical rotation ROM – right side</b>				
Group effect		MD	P-value	Significance
Post-treatment	Group A vs. Group B	-4.68	0.022*	S
	Group A vs. Group C	3.55	0.116	NS
	Group B vs. Group C	8.23	0.0001*	S
<b>Cervical rotation ROM – left side</b>				
Group effect		MD	P-value	Significance
Post-treatment	Group A vs. Group B	-1.27	1.00	NS
	Group A vs. Group C	4.31	0.009*	S
	Group B vs. Group C	5.58	0.001*	S
<b>Pain pressure threshold – Point 1 – Right side</b>				
Group effect		MD	P-value	Significance
Post-treatment	Group A vs. Group B	-0.355	0.001*	S
	Group A vs. Group C	0.00	1.00	NS
	Group B vs. Group C	0.355	0.001*	S
<b>Pain pressure threshold – Point 2 – Right side</b>				
Group effect		MD	P-value	Significance
Post-treatment	Group A vs. Group B	-0.516	0.001*	S
	Group A vs. Group C	0.195	0.081	NS
	Group B vs. Group C	0.711	0.001*	S
<b>Pain pressure threshold – Point 3 – Right side</b>				
Group effect		MD	P-value	Significance
Post-treatment	Group A vs. Group B	-0.470	0.001*	S
	Group A vs. Group C	-0.092	1.00	NS
	Group B vs. Group C	0.376	0.002*	S
<b>Pain pressure threshold – Point 1 – Left side</b>				
Group effect		MD	P-value	Significance
Post-treatment	Group A vs. Group B	-0.382	0.001*	S
	Group A vs. Group C	0.111	0.465	NS
	Group B vs. Group C	0.493	0.001*	S
<b>Pain pressure threshold – Point 2 – Left side</b>				
Group effect		MD	P-value	Significance
Post-treatment	Group A vs. Group B	-0.480	0.001*	S
	Group A vs. Group C	0.253	0.031*	S
	Group B vs. Group C	0.733	0.001*	S
<b>Pain pressure threshold – Point 3 – Left side</b>				
Group effect		MD	P-value	Significance
Post-treatment	Group A vs. Group B	-0.209	0.263	NS
	Group A vs. Group C	0.398	0.005*	S
	Group B vs. Group C	0.608	0.0001*	S
<b>Cervical function - The Bournemouth Questionnaire (scores)</b>				
Group effect		MD	P-value	Significance
Post-treatment	Group A vs. Group B	2.117	0.163	NS
	Group A vs. Group C	-4.764	0.0001*	S
	Group B vs. Group C	-6.882	0.0001*	S

#### **4. DISCUSSION**

This study was carried out to discover the effect of ice massage versus the effect of positional release on trapezius trigger points in patients with non-specific neck pain.

Both techniques were chosen to be used as they were affordable easy techniques to learn, could be easily applied and added to the conventional therapy and could easily modified to be added to a home program once they approved their efficiency

This study was carried out on fifty one patients of both sex. They were suffering from trapezius trigger points They're aged from 18-35 years and they were recruited from out clinic of faculty of physical therapy at Horus University in Egypt. The study was carried out from. 17/11/ 2022 till 25/2/ 2023. after receiving approval from the Ethics Committee of the Faculty of Physical Therapy, Cairo University (No: **P.T.REC/012/004582**), recruitment started.

The results of the present study revealed that there was a highly significant decrease in cervical pain and improvement in ROM and pain threshold in patients with trapezius active trigger points (TATrPs) in favor to positional release group rather than other groups ( $p < 0.001$ ).

There was a highly significant difference between ice massage and positional release group in favor to positional release group on VAS, ROM and pain threshold ( $p < 0.001$ ).

However, there was a significant difference between ice massage and control group in favor to group 1.as there was an increase in ROM, functional abilities and pain threshold ( $p < 0.001$ ).

there was a significant difference between groups in favor to ice massage and positional release group in increasing functional abilities.

There was a less improvement in the control group than other groups.

So, results show that positional release has a more effect on trapezius active trigger points than other groups, in improving rom, function, pain threshold and reducing pain. However, using ice massage to enhance conventional therapy would lead to a better result than using only conventional therapy in improving ROM, pain threshold, function and decreasing the pain. It was believed that in the present study, Positional release technique had utilized passive body positioning of spasmed muscles and dysfunctional joints toward positions of comfort that compress or shorten the offending structure. The movement toward shortening is proposed to relax aberrant reflexes that produce the spasm. In another meaning we take the restricted tissue into a position of ease to help to break neurological feedback signals which are keeping it spasmed, as PRT works to unkink the tissues and muscle fibers by decreasing the neural activation of them by both mechanically shortening them and also by changing the neurochemical bonding formed due to pain and inflammation. Further, the interruption of the neural signal created by pain and inflammation, decreases neural activation at the spinal cord, brain stem and at the local tissue level. Decreasing the sympathetic drive of the neurologic system over time helps to sustain a normal tissue length, eliminating or decreasing pain permanently.<sup>18</sup>

Once a tissue is released and pain is eliminated, the treated region must often be rehabilitated by using other manual techniques as stretching and then the new tissue length would be sustained. After treatment with positional release technique, joints influenced by the now-relaxed muscle function optimally, will be relaxed increasing range of motion and easing muscle pain. As, the spasmed tissue will not only causes pain, but inside that twisted tissue are blood vessels and nerves that also become compressed, decreasing blood flow and neural activation, which decreases tissue health. So, by reversing this process the points of tenderness will subside gradually and because of all those factors positional release technique has increases rom, functional abilities, pain threshold and decreases the pain more than other modalities (ice massage & control group).



As for ice massage technique, it is believed that When our body exposed to cold, it responds by constricting blood vessels (also known as vasoconstriction), so the blood gets pushed toward the organs. "This causes the blood to acquire more oxygen and become nutrient rich, "Once you leave the cold the blood vessels expand (also known as vasodilation),<sup>19</sup> As the blood vessels open up, oxygen- and nutrient-rich blood flows back to your tissues, helping flush out any inflammation. Leading to decrease pain and muscle spasm in addition to that, using ice will create an analgesic, or pain-relieving, effect by blunting nerve transmission (when a nerve fires a signal to the brain) in pain cells<sup>20</sup>, as the use of ice massage has reduced the pain it is believed that adding other manual modalities as manual stretch after the sedative, reliving effect of ice massage leads to a significant increase in ROM and other function which explain the significant increase in ROM, function and the reduce in pain in ice massage group than the control group.

Several studies investigating positional release therapy report decreased pain or palpation tenderness. A randomized control study found that after 4 weeks of treatment using PRT there was a significant decrease in pain for all subjects, those receiving PRT demonstrated significantly larger decreases than those receiving exercise alone.<sup>21</sup>

The systematic review by Wong et al.<sup>22</sup> included randomized control trials looking at tender point palpation pain after disconnected positional release treatment contrasted with control conditions evaluated with a visual analog scale. The systematic review and meta-analysis discovered low quality evidence recommending that strain positional release may lessen tender point palpation pain.

On other hand, research by Pathan et al.<sup>23</sup> found that positional release technique was not superior to other approach and Both groups (PRT and MTpR) showed an increase in range of motion on CROM and a decrease in pain intensity.

A randomized controlled trial was done to investigate the effect of ice massage on active trigger points in the upper trapezius of persons having mechanical neck pain. Forty participants diagnosed as mechanical neck pain with upper trapezius active myofascial trigger points. The treatment program continued for 2 weeks (3 sessions/week). The outcome measures are the pain intensity, pain pressure threshold, cervical lateral side bending and neck daily functions. Results show that adding ice massage is an effective method to reduce pain, improve pain threshold and function, and increase side bending of cervical region in subjects with mechanical neck pain and active trigger points at the upper trapezius muscle.<sup>8</sup>

However, research done by<sup>24</sup> to investigate the effects of ice massage Twenty-two subjects has found that ice massage treatment was not superior to other conservative treatment.

#### **LIMITATION OF THE STUDY:**

Include: patient tolerance for ice massage differs in winter than summer although all attempts to modify room temperature.

#### **CONCLUSION**

It can be concluded that using positional release technique in addition to conventional therapy (stretching exercise and lifestyle modification) has a better effect on patient with trapezius active trigger points than using ice massage in addition to conventional therapy or using only conventional therapy.

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Nil.

#### **Conflicts of interest**

There is no conflict of interest

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