



**A COMPARATIVE STUDY ON THE EFFECTIVENESS OF TRANSCUTANEOUS  
ELECTRICAL NERVE STIMULATION WITH MYOFASCIAL RELEASE  
TECHNIQUE ON TRIGGER POINTS IN TRAPEZITIS**

**Dissertation work submitted to  
THE TAMIL NADU DR. M. G. R. MEDICAL UNIVERSITY,  
Chennai-32**

**towards partial fulfillment of the requirements of  
MASTER OF PHYSIOTHERAPY**

**Degree Programme**

**Submitted by**

**Reg No: 27102304**



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**THE DISSERTATION ENTITLED**  
**A COMPARATIVE STUDY ON THE EFFECTIVENESS OF TRANSCUTANEOUS**  
**ELECTRICAL NERVE STIMULATION WITH MYOFASCIAL RELEASE**  
**TECHNIQUE ON TRIGGER POINTS IN TRAPEZITIS**

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**Dissertation submitted to**  
**THE TAMILNADU DR. M. G. R. MEDICAL UNIVERSITY,**  
**CHENNAI- 2.**

**Dissertation evaluated on -----**

**Internal Examiner**

**External Examiner**

## **CERTIFICATE I**

This is to certify that the dissertation entitled “**A COMPARATIVE STUDY ON THE EFFECTIVENESS OF TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION WITH MYOFASCIAL RELEASE TECHNIQUE ON TRIGGER POINTS IN TRAPEZITIS** ” was carried out by **Reg. No. 27102304**, P.P.G College of Physiotherapy, Coimbatore-35, affiliated to the Tamilnadu Dr. M.G.R medical university, Chennai-32, under the guidance of **Prof. C. SIVAKUMAR, MPT., (Ortho)., MIAP.**

**Prof. K. RAJA SENTHIL M.P.T (Cardio-Resp).,MIAP.,Ph.d**

**Principal**

## **CERTIFICATE II**

This is to certify that the dissertation entitled “**A COMPARATIVE STUDY ON THE EFFECTIVENESS OF TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION WITH MYOFASCIAL RELEASE TECHNIQUE ON TRIGGER POINTS IN TRAPEZITIS** ” was carried out by Reg. No. 27102312 P.P.G College of physiotherapy, Coimbatore-35, affiliated to the Tamilnadu Dr. M.G.R medical university, Chennai-32, under my guidance and direct supervision.

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**Professor**

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# **CHAPTER I**

## **INTRODUCTION**

### **1.1. INTRODUCTION**

Trapezititis is defined as the inflammation of the Trapezius muscle and the pain that originates from Trapezius muscle and last longer than 3-6 months. It has been steadily increasing over past two decades. Women are more likely than men to suffer from persistent neck pain. Around 75% of patients has a Trigger points as the sole of their pain.

There are various reasons suggested in the literature for the development of Trapezitis. The overuse of the shoulder muscles and a Trigger points along with myofascial restriction has been identified as the commonest causes.

The Trapezius is a common muscle that is exposed to overuse. People who use their arms for extended periods of time that requires holding their arms out in front, like operating computers, bike riding, car driving or an assembly line worker will recognize a burning pain between the shoulder blades. These Trigger points are normally activated by certain activities involving the muscles used in the motion, by chronically bad posture, bad mechanics, repetitive motion, structural deficiencies such as short neck posture can also produce Trapezitis.

There are various causes for Trapezitis, Myofascial Restriction (MFR) and Trigger Points (TrP) being the most important among them. Apart from various conventional therapies, used to reduce the Trapezius pain such as TENS, Heat modalities, Electrotherapy, Cervical Traction and various Manual Therapies, Myofascial Release (MFR) and Trigger point Release (TrPR) have also been practiced from many years. MFR causes soft tissue mobilization causing loosening of constricted connective tissue and freeing impinged structure of muscular and nervous system therefore enhances proper re-organization of connective tissue fibers and collagen fibers. Thus increases normal resting length of the muscle. In Trigger point Release finger pressure is applied on the persisting Trigger point to break the scar tissue and relief pain by removing toxic metabolic waste. Though both the technique have been practiced to reduce Trapezitis, the purpose of my study is to choose the better one as the first line of treatment.

Myofascial release is a soft tissue mobilization technique. If the condition is treated in the acute stage, then symptoms will be aggravated. If treated in the chronic stage, the symptoms will be alleviating. Myofascial release techniques stem from the foundation that fascia, a connective tissue found throughout the body, reorganizes itself in response to physical stress and thickness along the lines of tension. By myofascial release there is a change in the viscosity of the ground substance to a more fluid state which eliminates the fascia's excessive pressure on the pain sensitive structure and restores proper alignment.

Hence myofascial release is proposed to act as a catalyst in the resolution of Trapezitis. The present study was undertaken with the intention to find out the effect of transcutaneous electrical nerve stimulation and effect of transcutaneous electrical nerve stimulation along with myofascial release technique on trigger points in trapezitis.

The trapezius muscle resembles a trapezium or diamond shaped quadrilateral. It has three fibers upper, middle and lower.

**Upper fibers** of the trapezius arise from the external occipital protuberance, the medial third of the superior nuchal line of the occipital bone and the ligamentum nuchae. From this origin they proceed downward and laterally to be inserted into the posterior border of the lateral third of clavicle.

**Middle fibers** of the trapezius arise from the spinous process of the seventh cervical, and the spinous process of the first, second and third thoracic vertebrae. They are inserted into the medial margin of the acromion, and into the superior lip of the posterior border of the spine of the scapula.

**Lower fibers** of the trapezius arise from the spinous processes of the fourth to twelfth thoracic vertebrae. From this origin they proceed upwards and laterally to converge near the scapula and end in an aponeurosis which glides over the smooth triangular surface on the medial end of the spine, to be inserted into a tubercle at the apex of this smooth triangular surface.

## 1.2 NEED FOR THE STUDY

Myofascial pain syndrome is a common clinical problem of muscle pain caused by trigger Point. It is a muscle stress syndrome characterized by presence of trigger points in Muscles . The problem these syndrome pose lies not in making diagnosis rather it is to identify the Underlying cause of chronic muscle pain in order to develop specific treatment plan. In myofascial trigger point the soft tissue becomes restricted due to strenuous use of particular muscle, sustained repeated contraction of the muscle like lifting heavy weight, keeping the effected muscle shortened for a longer period of time, nutritional deficiency anaemia, hyperurecaemia:

Myofascial pain syndrome is more prevalent in women than in men, patients complain of Persistent pain ranging in intensity & most frequently found in head neck extremities and Low back ,the trapezius muscle is probably the most often beset by myofascial trigger points.

Management in myofascial pain focuses on relieving pain and correction of the shortened Muscle by stretching & improving the joint range of motion.

Transcutaneous electrical nerve stimulation (TENS) appears to have an immediate effect Muscle by stretching & improving the joint range of motion . Transcutaneous electrical nerve stimulation (TENS) appears to have an immediate effect in decreasing pain intensity in myofascial trigger point of upper back and neck, high intensity tens is effective in reducing myofacial Pain . Literature on effectiveness of TENS reports wide range of outcome TENS provides initial relief of treatment in 70-80% of patients, High frequency may benefit myofascial pain, currently there is insufficient Evidence from well-designed control trials to support this use , hence there is a need of Further study .

Myofascial release technique utilizes the stretching of fascia & muscle to help increase In range of motion and decrease pain by breaking adhesions in the fascia. Many authors have conducted the individual studies regarding effect of TENS and effect of Myofascial release technique in management of trapezitis but not many have amalgamated The effect of TENS and myofascial release technique in management of trapezitis. Due to The above factors further studies are necessary to evaluate the most effective and safest treatment for the management of trapezitis.

### **1.3 AIM AND OBJECTIVES**

#### **AIM OF THE STUDY**

The aim of study is to find out effectiveness of transcutaneous electrical nerve stimulation with myofascial release technique on trigger points in trapezitis.

#### **OBJECTIVES OF THE STUDY**

The objective of the study is to investigate, in a randomized, prospective study the effect of TENS versus the effect of TENS with Myofascial Release Technique, in patients with trapezitis, on pain reduction and increase in cervical joint range of motion.

Specifically, to determine

- The effect of TENS on pain reduction and improvement of cervical joint range of motion in trapezitis .
- The effect of Myofascial Release Technique on pain reduction and improvement in cervical joint range of motion in trapezitis.

## **1.4 HYPOTHESIS**

### **Null hypothesis (H<sub>0</sub>)**

There is no significant difference between the effects of TENS and the effect of TENS with Myofascial Release Technique on patients with trapezitis .

### **Alternative hypothesis (H<sub>1</sub>)**

There is significant difference between the effects of TENS and the effect of TENS with Myofascial Release Technique on patients with trapezitis.

## **CHAPTER II**

### **REVIEW OF LITERATURE**

➤ **Andrew and Fischer (2011 October)**

Andrew & Fischer conducted studies on the validity & reproducibility of pressure algometer and conclude that it is useful in quantification of deep muscle tenderness, trigger point, fibrositis, myalgic spots & assessment of sensitivity to pain can be diagnosed by pressure threshold meter (PMT)

➤ **Fusun Ardic, et al (2011 May)**

Fusun Ardic, Merin Sarhes, oyatopus conducted study effect of TENS & EMS on myofascial trigger points patients were divided in 3 groups , group I was treated with TENS & trapezius stretching exercise , group ii was treated with EMS & trapezius stretching exercise & group iii with trapezius stretching exercise pain intensity with vas ROM & pressure threshold were assessed before & immediately after 2 weeks of treatment there was significant reduction in vas , increase in ROM & pressure threshold at the end of treatment when compared with control group hence concluded that TENS was more effective immediately after the treatment.

➤ **Hug Gemmell DC and Axell Hilland(2011 February)**

Hug Gemmell DC, and Axell Hilland conducted study on immediate effect of tens in treating latent upper trapezius trigger point . a double blind randomized placebo controlled trial was conducted & further concluded that it helps in reduction of pain in treating upper trapezius trigger point.

➤ **ARROYO.MORALES M et al (2008, Dec 14)**

The aim of this study was to evaluate the effect of MTrP Release on mechanical nociceptive threshold (NMT), mood state and neuromuscular recruitment. This was a prospective randomized clinical trials. 62 healthy active (age 18-56) participants were taken randomly. MTrP Release decreases EMG amplitude when applied on a passive recovery technique.

➤ **R.Anderson et al (2007, July 7)**

This case study analysis indicates that MFRT represents an effective therapeutic approach for the management of chronic trapezius pain. Global response assessments of moderately improved or markedly improved, considered clinical success were reported by 72% of patients. More than half of patients treated with had a 25% greater improvement. The scores decreases significantly by a median of 8 points. PPSS and National Institute of Health showed similar levels of improvement after MFRT protocol therapy.

➤ **John L Reeve, et al., (2005 June)**

John L. Reeves, Bernadette Jaeger & Steven B Graff Radford conducted study on reliability of pressure algometer in measurement of myofascial trigger point sensitivity which showed high reliability between & within the experimenters when measuring trigger point location .

➤ **Michelle H. Cameron (2003)**

Physical agents in rehabilitation; stated that the hot packs are very effective to improve the circulation, increases the muscle & tissue temperature and spasm are relaxed.

➤ **Hou CR, Tsai LC , Cheng KF ,Hong CZ (2002 October)**

Hou CR, Tsai LC , Cheng KF ,Hong CZ conducted studies on the effect of various therapeutic modalities on myofascial pain in upper trapezius and concluded that hot pack & active ROM along with tens & MFR are most effective in easing myofascial trigger point pain & increasing the cervical range of motion.

➤ **Kruger LR vander linden WJ Cleaton Jones PT(1998 February)**

Kruger LR Van Der linden WJ Cleaton Jones pt conducted study on effect of TENS & conservative therapy on myofascial pain dysfunction a single blind trial session was conducted & concluded that TENS did not increase the symptom .

➤ **Tousignant M (1993 October)**

Tousignant M conducted study on validity of goniometer in cervical range of motion, correlation test was used to evaluate the criterion validity of goniometer and concluded that it is valid in measurement of cervical flexion & extension.

➤ **Tousignant M (1993 October)**

Tousignant M conducted study on cervical range of motion device for lateral flexion in patients with neck pain comparison study was done with radiography and concluded that cervical range of motion device showed very good validity for measurement of lateral flexion in population of neck pain.

➤ **Phero JC (1987 October)**

Phero JC conducted study on effect of TENS & myoneural injection therapy for management of myofascial pain and concluded that TENS therapy is a safe & non invasive technique in treating myofascial pain.

➤ **Gary Fryer Laura Hodgson (1987 October)**

Gary Fryer Laura Hodgson conducted study on effect of manual pressure release technique on trigger point using novel pressure algometer by recording pressure pain threshold and concluded that manual pressure release may be effective in upper trapezius trigger point .

➤ **Graff Radford SB Reeves JL , Baker RL (1984 April)**

Graff Radford SB Reeves JL , Baker RL conducted study on effect TENS on myofascial trigger points and concluded that high intensity is effective in reducing myofascial pain and these pain reduction does not reflect changes in local trigger point sensitivity .

➤ **VERNON H, et al**

The purpose of this study was to review the most commonly used treatment procedures in physiotherapy for MPS and MTrPs. A total of 112 articles were identified. Review of these articles resulted in the following recommendations regarding treatment: Strong evidence supports manipulation and MTrP Release for immediate pain relief at MTrPs, but only limited evidence exists for long-term pain relief at MTrPs. Evidence supports laser therapy transcutaneous electrical nerve stimulation, acupuncture, and magnet therapy (all moderate) for MTrPs and MPS, although the duration of relief varies among therapies. Limited evidence supports electrical muscle stimulation, high-voltage galvanic stimulation, interferential current, and frequency modulated neural stimulation in the treatment of MTrPs and MPS. Evidence is weak for ultrasound therapy. A Manual-type therapy that is MTrP Release and some physiotherapeutic modalities have acceptable evidentiary support in the treatment of MPS and TrPs.

## **CHAPTER III**

### **MATERIALS AND METHODOLOGY**

#### **3.1 MATERIALS (TOOLS)**

- Visual analog scale (1-10 cm)
- Neck disability index
- Couch
- Therapeutic TENS
- Moist heat therapy (Hot Packs)
- Data collection sheet and recording sheet

#### **3.2 METHODOLOGY**

##### **3.2.1 Study Design**

This study is carried out by two groups, each group having 15 patients for both groups pre test and post test will be taken.

**Group A.** Transcutaneous electrical nerve stimulation with myofascial release technique.

**Group B.** Transcutaneous electrical nerve stimulation.

##### **3.2.2 Study Setting**

This study is proposed to conduct in outpatient department of orthopedics and various other departments Aswin multi specialty Hospital Coimbatore and PPG college of physiotherapy, Coimbatore.

##### **3.2.3 Study Duration**

The study extended for a period of 6 months.

### **3.2.4 Treatment Duration**

Each patients received the treatment for about two weeks. Treatment was given for 15 mins. single session and every alternate days.

### **3.2.5 Sampling technique**

The sample included in this study is simple random sampling. Each group assigned with 15 patients.

### **3.2.6 Selection criteria**

#### **Inclusion criteria**

- Subjects with neck pain and unilateral upper trapezius spasm.
- Both genders
- Age group - 25 - 35 years
- Subjects with unaffected side trapezius full range of motion.

#### **Exclusion criteria**

- Subjects with torticollis
- Subjects with radiating pain down to the arm or hand.
- Subjects with cervical rib.
- Subjects who received corticosteroid injection ( last 3 months).
- Infective condition around the neck.
- Subjects with fever.
- Subjects who are unable to communicate.
- Subjects not willing to participate in this study.
- Any other conditions that contra indicate stretching and similar manual therapy techniques.



### Student's 't' test

Paired 't' – test

The intra group analysis of results were done with paired 't' test with 5% level of significance.

$$t = \frac{\bar{d}\sqrt{n}}{S}$$

$$S = \sqrt{\frac{\sum d^2 - \frac{(\sum d)^2}{n}}{n-1}}$$

$\bar{d}$  = difference between the pre-test Vs post test

$\bar{d}$  = mean difference

n= number of observations

s = standard deviation

### To compare Group A and Group B

Statistical analysis is done by using independent 't' test

$$t = \frac{\bar{x}_1 - \bar{x}_2}{S} \sqrt{\frac{n_1 n_2}{(n_1 + n_2)}}$$

$$S = \sqrt{\frac{\sum (x_1 - \bar{x}_1)^2 + \sum (x_2 - \bar{x}_2)^2}{n_1 + n_2 - 2}}$$

**Where,**

S = Combined Standard deviation.

$x_1$  = Difference between pre test and post test in Group A

$\bar{x}_1$  = Mean difference of the Group A.

$x_2$  = Difference between pre test and post test in Group B

$\bar{x}_2$  = Mean difference of the Group B.

$n_1$  = Number of patients in Group A

$n_2$  = Number of patients in Group B

### **3.2.10 Treatment techniques**

#### **Myofascial Release**

While performing MFR, the area was palpated before during and after the treatment. In this technique, the subjects with chronic Trapezius pain were examined and treated by palpating from superficial structure to deeper structure to avoid a mistake in identifying the structure or tissue that is restricted. Technique was applied with the least amount of force that is appropriate for achieving the established goal.

A key to success of myofascial release technique is to keep the pressure and stretch extremely mild and opposite direction. A small amount of pressure was applied therefore the fascia was softened and then it was released after the pressure was sustained over time, that is 20-30 seconds.

#### **Upper trapezius:**

The Patient was in supine lying position and was fully relaxed. The patient's head was guided to contra lateral side and then myofascial stretch was given in upper fibers into opposite direction and was hold it for 20 seconds and relaxed. Rest was given for 10 seconds in between each release. Five repetition for each side have was done.

#### **Middle trapezius:**

The patient was in prone position with arm elevated to 90 Degree. Midthoracic spine was stabilized by one hand and another hand was placed over scapula and then myofascial release was given in two opposite direction for 20 seconds and then was relaxed for 10 seconds and was repeated 5 times bilaterally.

#### **Lower trapezius:**

Patient was in prone position. Arm was elevated at 135 degree. Scapula was stabilized with one hand and another hand over mid to lower thoracic area and then myofascial release was given into opposite direction for 20 seconds and then was relaxed for 10 seconds. The procedure was repeated 5 times bilaterally.

**Trigger Point release:**

Patient will be in relaxed position in prone lying Prior to these techniques, Moist Heat was given for 10-15 minutes to make the tissue warm, After Moist Heat, as tissue became warmer and more elastic, it was easy to sink more deeply into the muscle without hurting the patient and then go for compression to break down Trigger point and adhesions in muscle which may be painful for the patient. TrP Release was given on palpable taut bands and Trigger point (small dense nodules) by using finger pressure perpendicular to the muscle, and the pressure was sustained on the smallest and most irritable point. Force was delivered through fingertips, knuckle, and elbow. The Compression was sustained for approximately 10-20 seconds and then micro movements on the spot was used. To diffuse a trigger point a static compression was applied for 10 seconds, and released, then pressure was applied for 10 more seconds in a pumping action while the patient breaths deeply. like this 5 repetition is given for each trigger point.

**TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION****Tens Protocol****Procedure:**

- Patient in prone lying with a pillow below the knee.
- Treatment part was exposed and other areas surrounding were covered with a towel.
- 2 electrodes were placed over Trapezius muscle
- Time 30 minute.
- Pulse duration 50ms
- Frequency 40-50 hz

**CHAPTER IV**  
**DATA PRESENTATION**

**TABLE No. 1**  
**VISUAL ANALOG SCALE - GROUP A AND B**

<b>S.No.</b>	<b>Group A</b>		<b>Group B</b>	
	<b>Pre test</b>	<b>Post test</b>	<b>Pre test</b>	<b>Post test</b>
1	8	2	8	3
2	8	2	7	4
3	9	3	9	4
4	7	4	9	4
5	9	2	8	3
6	8	2	7	4
7	7	4	7	5
8	9	3	9	4
9	7	3	8	3
10	8	2	8	3
11	8	4	7	5
12	7	3	9	4
13	9	3	9	4
14	9	3	8	5
15	8	2	7	2

**TABLE No. 2**  
**NECK DISABILITY INDEX - GROUP A AND GROUP B**

<b>S.No.</b>	<b>Group A</b>		<b>Group B</b>	
	<b>Pre test</b>	<b>Post test</b>	<b>Pre test</b>	<b>Post test</b>
1	30	21	30	23
2	20	10	29	23
3	23	14	26	16
4	27	17	36	30
5	25	16	33	25
6	25	14	25	16
7	23	12	29	22
8	25	18	27	18
9	35	24	25	20
10	25	14	26	18
11	31	24	28	20
12	29	23	25	16
13	30	12	29	23
14	25	14	26	18
15	26	17	28	20

## CHAPTER V

### DATA ANALYSIS AND INTERPRETATION

The calculation was tabulated for easier statistical calculations and better comprehension. The pre test values and post test values obtained by using visual analogue scale and neck disability index scale were as follows

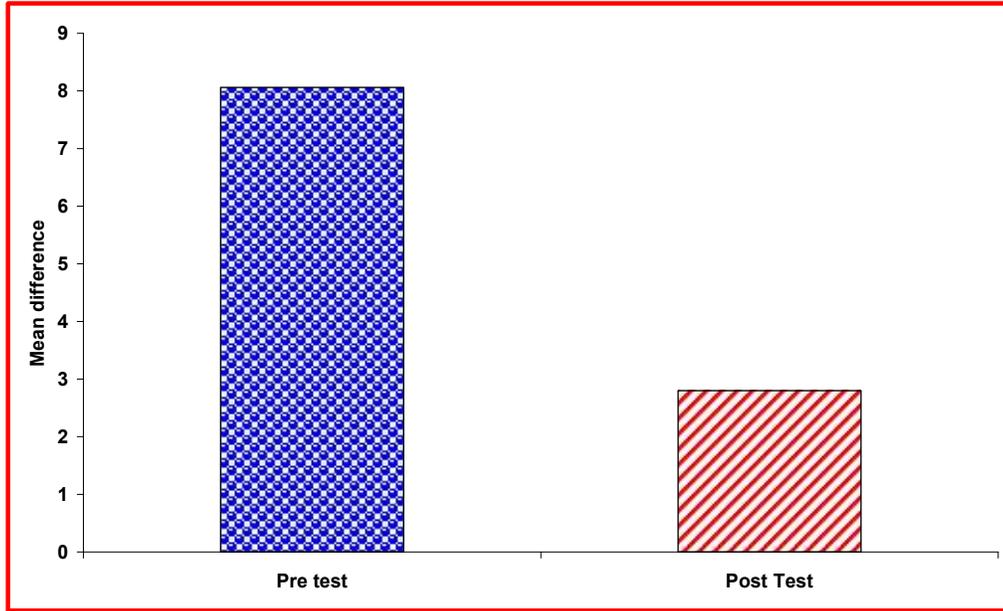
**TABLE No. 3**  
**MEAN DIFFERENCE BETWEEN PRE AND POST TEST**  
**GROUP A (VAS SCORE)**

<b>VAS</b>	<b>Mean</b>	<b>S</b>	<b>t value</b>
Pre test	8.06	1.175	14.31
Post Test	2.8	.703	

**Interpretation:**

Above table shows paired T test of group A VAS pre test mean  $8.06 \pm 1.175$  and post test mean  $2.8 \pm 0.703$ .

**GRAPH No. 1**  
**MEAN DIFFERENCE BETWEEN PRE AND POST TEST**  
**GROUP A (VAS SCORE)**



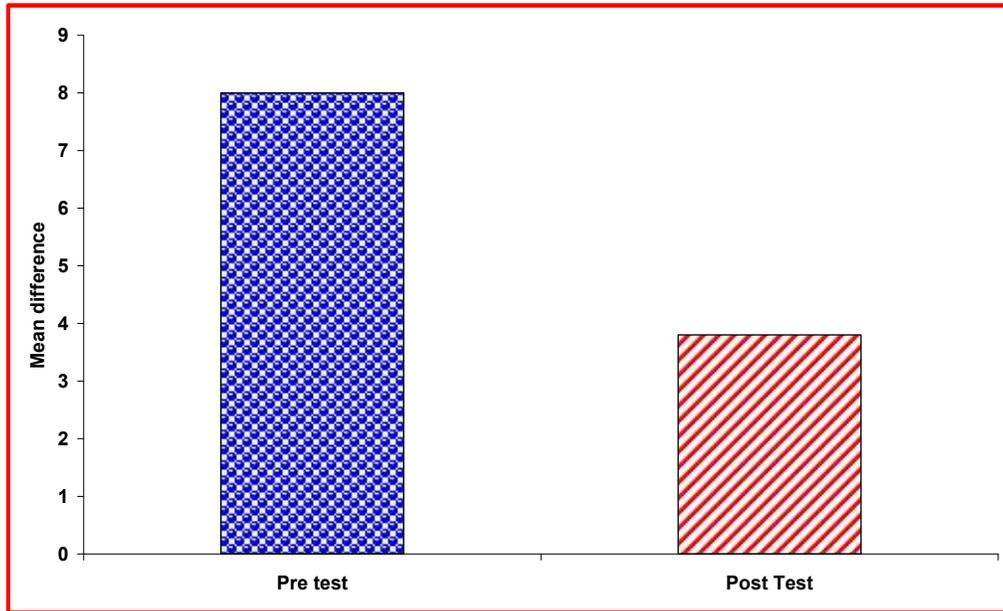
**TABLE No. 4**  
**MEAN DIFFERENCE BETWEEN PRE AND POST TEST**  
**GROUP B (VAS SCORE)**

VAS	Mean	S	t value
Pre test	8	.798	24.37
Post Test	3.8	.654	

**Interpretation:**

Above table shows paired T test of group B VAS pre test mean  $8 \pm .798$  and post test mean  $3.8 \pm 0.654$ .

**GRAPH No. 2**  
**MEAN DIFFERENCE BETWEEN PRE AND POST TEST**  
**GROUP B (VAS SCORE)**



**TABLE No. 5**  
**MEAN DIFFERENCE BETWEEN GROUP A AND GROUP B (VAS)**

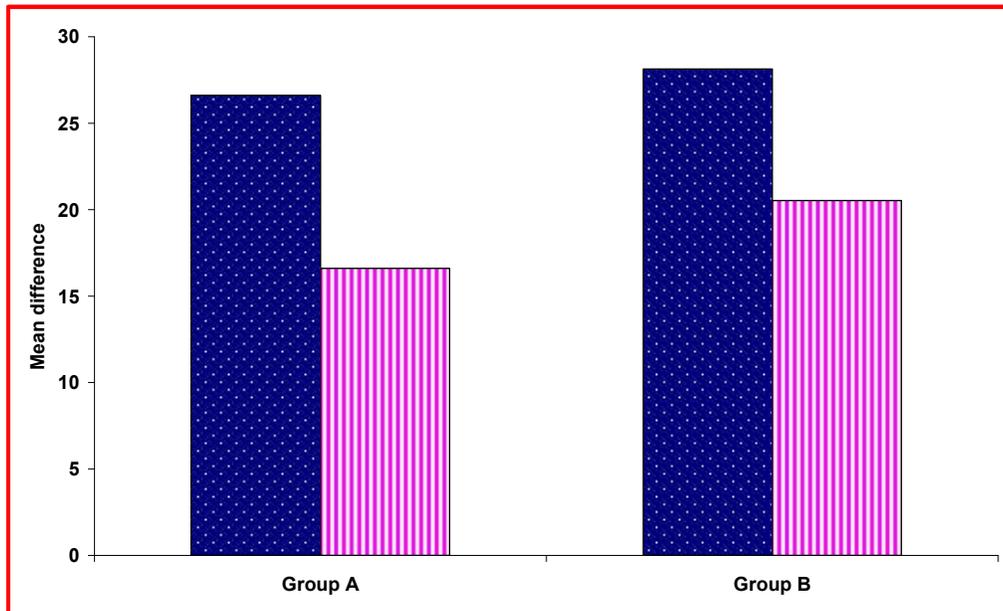
<b>VISUAL ANALOGUE SCALE</b>					
	<b>Mean value</b>			<b>Calculated 't' value</b>	Table 't' value
	Pre-test	Post-test	SD		
Group A	26.6	16.6	.98	2.184	2.763
Group B	28.13	20.53			

**Interpretation:**

Above table shows independent T test Visual Analogue Scale pre test and post test difference in group A  $10 \pm .98$  and group B is  $7.6 \pm .98$ .

**GRAPH No. 3**

**MEAN DIFFERENCE BETWEEN GROUP A AND GROUP B (VAS)**



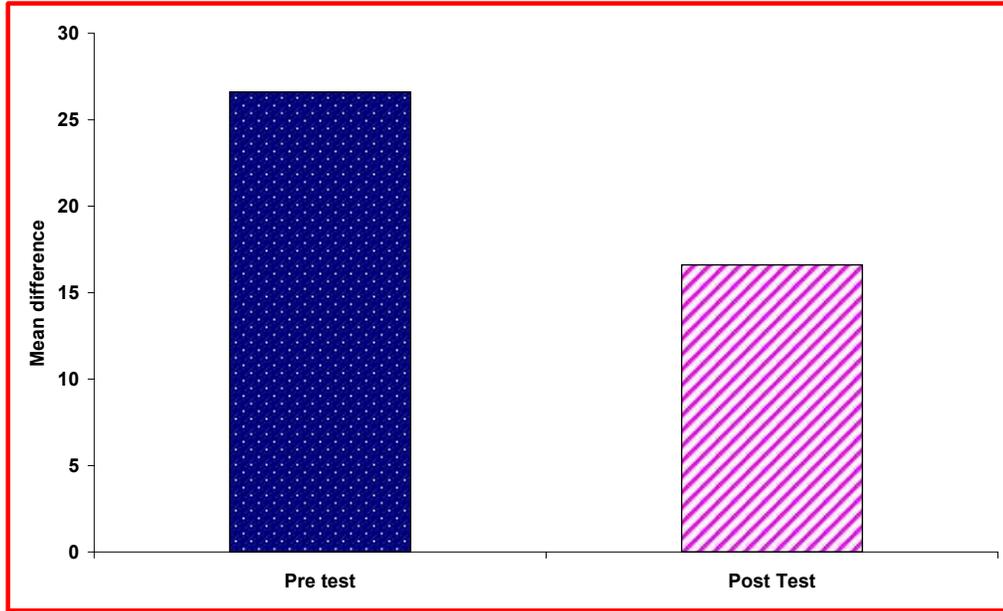
**TABLE No. 6**  
**MEAN DIFFERENCE BETWEEN PRE AND POST TEST**  
**GROUP A (NECK DISABILITY INDEX)**

NDI	Mean	S	t value
Pre test	26.6	3.28	11.72
Post Test	16.6	1.45	

**Interpretation:**

Above table shows paired T test of group A Neck Disability Index pre test mean  $26.6 \pm 3.28$  and post test mean  $16.6 \pm 1.45$ .

**GRAPH No. 4**  
**MEAN DIFFERENCE BETWEEN PRE AND POST TEST**  
**GROUP A (NECK DISABILITY INDEX)**



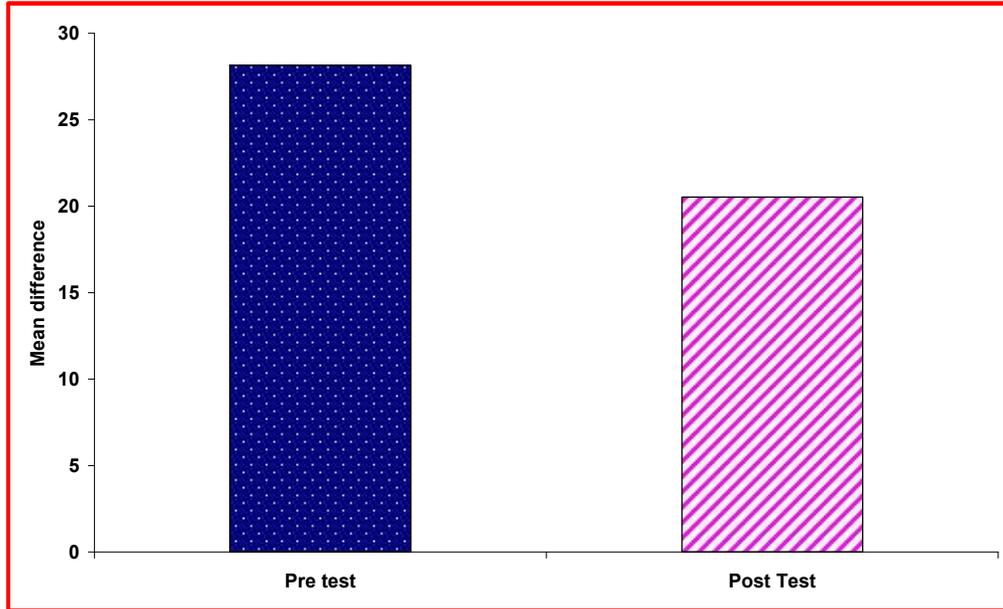
**TABLE No. 7**  
**MEAN DIFFERENCE BETWEEN PRE AND POST TEST**  
**GROUP B (NECK DISABILITY INDEX)**

NDI	Mean	SD	t value
Pre test	28.13	2.74	27.04
Post Test	20.53	1.32	

**Interpretation:**

Above table shows paired T test of group B Neck Disability Index pre test mean  $28.13 \pm 2.74$  and post test mean  $20.53 \pm 1.32$ .

**GRAPH No. 5**  
**MEAN DIFFERENCE BETWEEN PRE AND POST TEST**  
**GROUP B (NECK DISABILITY INDEX)**



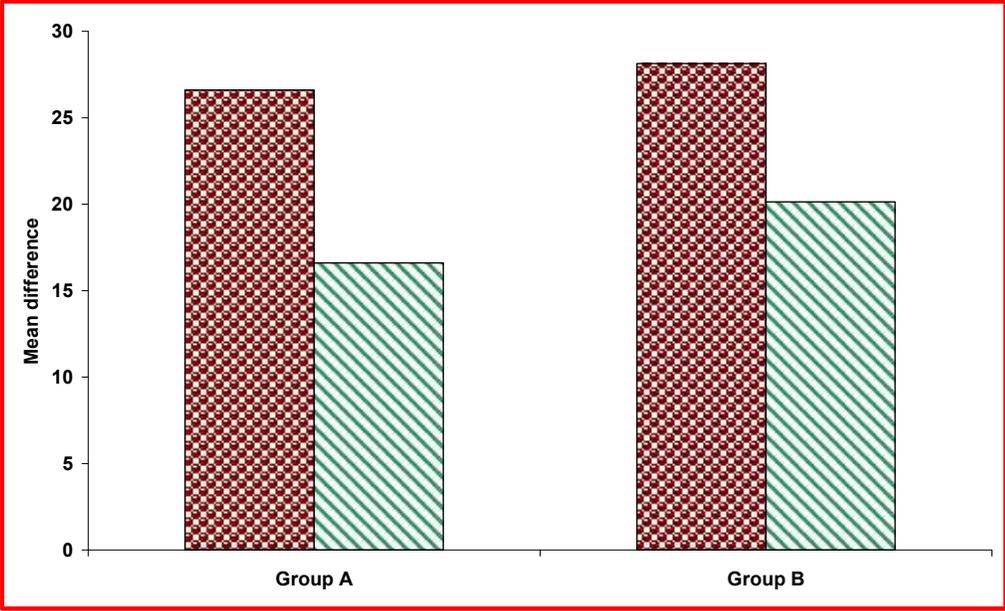
**TABLE No. 8**  
**MEANS DIFFERENCE BETWEEN GROUP A AND GROUP B NECK**  
**DISABILITY INDEX**

<b>NECK DISABILITY INDEX</b>					
	<b>Mean value</b>			<b>Calculated 't' value</b>	Table 't' value
	Pre-test	Post-test	SD		
Group A	26.6	16.6	.072	2.325	2.763
Group B	28.13	20.13			

**Interpretation:**

Above table shows independent T test Neck Disability Index pre test and post test difference in group A  $10 \pm .072$  and group B is  $7.6 \pm .072$ .

**GRAPH No. 6**  
**MEANS DIFFERENCE BETWEEN GROUP A AND GROUP B NECK**  
**DISABILITY INDEX**



## **CHAPTER VI**

### **RESULT**

This was a comparative study between the effectiveness of transcutaneous electrical nerve stimulation with myofascial release technique on trigger points in trapezitis.

Pain was found to decrease effectively in Group A when compared to Group B. Using the independent 't' test the 't' value is 2.184 . this 't' value greater than the one tale table value 2.04 with 28 degrees of freedom at  $P = 0.05$  respectively. In paired t test Pain was found to decrease effectively in Group A when compared to Group B by using the parameter visual analogue scale the 't' value is 14.31 and 24.37 respectively. This 't' values are greater than the one tale table value 2.04 with 28 degrees of freedom at  $P = 0.05$  respectively. Hence we can reject the null hypothesis and accept the alternative hypothesis. Therefore treatments given in Group A and Group

In functional improvement of neck The independent 't' test the 't' value is 2.325. This 't' value greater than the one tale table value 2.04 with 28 degrees of freedom at  $P = 0.05$  respectively. Using the paired t test the t values are 11.72 and 27.04 respectively. This t values are greater than the tale table value 2.04 with 28 degrees of freedom at  $p = 0.05$  respectively. There fore treatment given in Group A increases functional improvement of neck effectively than treatment given in Group B.

Hence we can reject the null hypothesis and accept the alternative hypothesis.

## **CHAPTER VII**

### **DISCUSSION**

Overall results shows that the group which received transcutaneous electrical nerve stimulation with myofascial release was more improvement in pain and disability than the group received transcutaneous electrical stimulation alone.

The purpose of this study was to compare the effectiveness of transcutaneous electrical nerve stimulation with myofascial release technique over transcutaneous electrical nerve stimulation alone in treating patients with Trigger points in Trapezitis. A total number of 30 patients, included in this study, were randomly assigned into two groups. Group A and Group B. The patients Group A. Trans cutaneous electrical nerve stimulation with myofascial release technique and Group B. Transcutaneous electrical nerve stimulation only.

1. **Graff Radford SB ReevesJL, Baker RL**, conducted study on effect TENS on myofascial trigger points and concluded that high intensity is effective in reducing myofascial pain and these pain reduction does not reflect changes in local trigger point sensitivity .
  
2. **Kruger LR Van Der lindEn WJ Cleaton Jones PT** conducted study on effect of TENS & conservative therapy on myofascial pain dysfunction a single blind trial session was conducted & concluded that TENS did not increase the symptom .

In my study also there was a significant improvement on both the groups in Pain and disability. But the patients who received TENS with myofascial release technique had significant increase in pain and disability compare with TENS alone.

## CHAPTER VII

### SUMMARY AND CONCLUSION

#### SUMMARY

In an effort to find out the effectiveness of myofascial release with transcutaneous electrical stimulation on trapezitis, 30 subjects were selected using simple random sampling technique and assigned in to two experimental groups with 15 subjects each.

Group A was treated with myofascial release with transcutaneous electrical stimulation and group B was treated with transcutaneous electrical nerve stimulation alone, each patient for a period of two weeks.

Pre-test and Post-test scores are noted and analysis was done using independent 't' test where the post test scores favored the alternate hypothesis.

The intra group analysis was done and results were analyzed using paired 't' test, which favored the alternate hypothesis.

Statistical analysis shows that there is significant improvement on the subjects who are treated in group A compared to group B.

#### CONCLUSION

The literature review and statistical analysis done from the data collected from the study have shown that Transcutaneous electrical nerve stimulation along with myofascial release helps in early pain relief and improves functional activities effectively on Trigger points in Trapezitis than Transcutaneous electrical nerve stimulation alone.

Hence the alternative hypothesis of this study is accepted and stated as **"There is significant difference between transcutaneous electrical nerve stimulation with myofascial release technique over transcutaneous electrical nerve stimulation alone in treating patients with Trigger points in Trapezitis "**.

## **CHAPTER IX**

### **LIMITATIONS AND SUGGESTIONS**

#### **LIMITATIONS**

1. The study was limited with an age group of 25 – 35 years.
2. The study was limited to only patients with trapizitis caused by trigger points.
3. The study was limited to assess only the Pain Intensity and Neck Disability Index.
4. This study couldn't be generalized to everyone, as the sample size was small.

#### **SUGGESTIONS**

1. Muscle energy technique (MET) along with TENS and tens alone can be compared in patients with Trigger point in Trapezitis.
2. Myofacial release technique and joint mobilization technique can be compared in patients with Trigger points in Trapezitis .

## CHAPTER X

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## APPENDICES

### APPENDIX - I

#### CASE ASSESSMENT PROFORMA

##### SUBJECTIVE ASSESSMENT

Name :  
Age :  
Sex :  
Occupation :  
Address :  
IP/ OP Number :  
Date of evaluation :  
Chief complaints :

##### HISTORY

Past medical history :  
Present medical history :  
    Onset :  
    Duration :  
Surgical history :  
Drug history :  
Personal history :

##### ASSOCIATED PROBLEMS

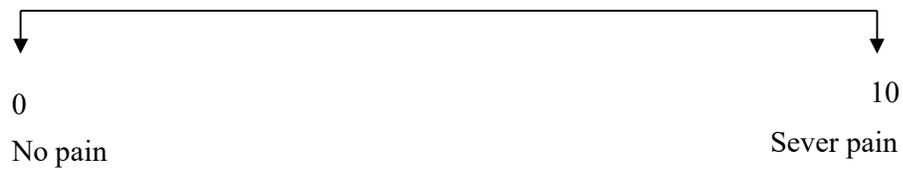
###### Vital signs

❖ Temperature :  
❖ Pulse rate :  
❖ Respiratory rate :  
❖ Blood pressure :

### **PAIN ASSESSMENT**

- ❖ Side :
- ❖ Site :
- ❖ Type of pain :
- ❖ Duration of pain :
- ❖ Aggravating factors :
- ❖ Relieving factors :
- ❖ Grading of pain :

### **VISUAL ANALOGUE SCALE (VAS)**



### **OBJECTIVE ASSESSMENT**

#### **ON OBSERVATION**

- ❖ Built :
- ❖ Posture :
- ❖ Postural changes :
- ❖ Tropical changes :
- ❖ Oedema :

#### **ON PALPATION**

- ❖ Tenderness :
- ❖ Warmth :
- ❖ Swelling :

**ON EXAMINATION**

**Motor Evaluation**

**Range of Motion**

<b>Movement</b>	<b>Pre treatment</b>	<b>Post treatment</b>
Lateral Flexion		
Rotation		

**SENSATIONS**

- ❖ Superficial :
- ❖ Deep :

**SPECIAL TEST**

- ❖ Upper trapezius test

**INVESTIGATION**

**DIAGNOSIS** :

**PROBLEM LIST** :

**AIMS** :

**MANAGEMENT** :

**HOME PROGRAM** :

**FOLLOW UP CHART**

Name :

Age :

Sex :

Diagnosis :

<b>Parameters</b>	<b>Pre test</b>	<b>Post test</b>
VAS		
Range of motion		
Cervical Rotation		
Lateral Flexion		
Neck disability index		

**Treatment Plan** : **Group A/ Group B**

## APPENDIX – II

### PATIENT CONSENT FORM

#### TITLE

A COMPARATIVE STUDY ON THE EFFECTIVENESS OF TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION WITH MYOFASCIAL RELEASE TECHNIQUE ON TRIGGER POINTS IN TRAPEZITIS

INVESTIGATOR: \_\_\_\_\_

#### PURPOSE OF THE STUDY:

I \_\_\_\_\_, have been informed that this study will work towards achieving on the functional activities of daily living in post-stroke conditions for me and other patients.

#### PROCEDURE:

Each term of the study protocol has been explained to me in detail. I understand that during the procedure, I will be receiving the treatment for one time a day. I understand that I will have to take this treatment for four weeks.

I understand that this will be done under investigator, \_\_\_\_\_ supervision. I am aware also that I have to follow therapist's instructions as has been told to me.

#### CONFIDENTIALITY:

I understand that medical information provided by this study will be confidential. If the data are used for publication in the medical literature or for teaching purposes, no names will be used and other literature such as audio or video tapes will be used only with permission.

**RISK AND DISCOMFORT:**

I understand that there are no potential risks associated with this procedure, and understand that investigator will accompany me during this procedure. There are no known hazards associated with this procedure.

**REFUSAL OR WITHDRAWAL OF PARTICIPATION:**

I understand that the decision my participation is wholly voluntary and I may refuse participate, may withdraw consent at any time during the study.

I also understand that the investigator may terminate my participation in the study at anytime after researcher has explained me the reasons to do so.

I \_\_\_\_\_ have explained to ..... the purpose of the research, the procedures required and the possible risks and benefits, to the best of my ability.

.....

**Investigator**

**Date**

I ..... Confirm that researcher has explained me the purpose of the research, the study procedure and the possible risks and benefits that I may experience. I have read and I have understood this consent to participate as a subject in this research project.

.....

**Subject**

.....

**Date**

.....

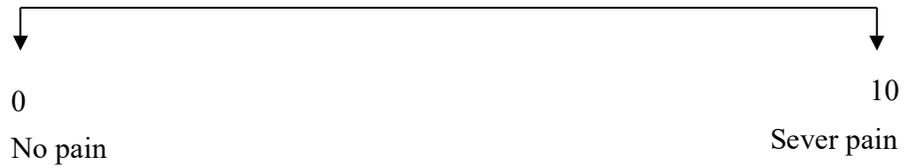
**Signature of the Witness**

.....

**Date**

### APPENDIX – III

#### VISUAL ANALOGUE SCALE (VAS):



VAS is used to quantify the severity of pain. VAS consists of 10cm horizontal line with 2 end points. One end was labeled as "No pain" and other end labeled as "Severe pain".

The patients were required to mark the line at a point corresponding to the severity of pain which indicates the level of pain intensity presently felt by the patient.

The investigator then measures the distance from the 2 ends at the VAS for the evaluation of pain. VAS was used as a numerical index for severity of pain.

**APPENDIX - IV**  
**NECK DISABILITY INDEX**

Functional disability can be measured using the neck disability index (NDI) score which is a functional index comprising of 10 items in the form of activities of daily living with each item scoring from 0-5 where 0 is no difficulty in performing that activity and 5 is inability to do that activity. The total scores are given out of 50, where 0-4 : no disability, 5-14 : mild disability, 15-24; moderate disability. 25-34 severe disability and more than 35 : complete disability. Scoring for all the 10 items is done by asking the subject to mark his/her ability to perform each of the ten activities. The NDI has been found to have a high degree of reliability and internal consistency as compared to other sickness impact profiles in various conditions of neck pain.

**NECK DISABILITY INDEX**

**Name :** \_\_\_\_\_ **Date** \_\_\_\_\_ **Patient** \_\_\_\_\_

This questionnaire is designed to enable us to understand how much your neck pain has affected your ability to manage in everyday life. Please answer every section and mark in each section only the one circle, which applies to you. We realize you may consider that two of the statements in any section may relate to you, but please just mark the circle, which most closely described your probe.

**Section 1 : Pain intensity**

- ❖ I have no pain at the movement
- ❖ The pain is very mild at the movement
- ❖ The pain is moderate at the movement
- ❖ The pain is fairly severe at the movement
- ❖ The pain is very severe at the movement
- ❖ The pain is the worst imaginable at the movement

## **Section 2 – Personal care**

- ❖ I can look after myself normally without causing extra pain .
- ❖ I cannot look after myself normally but it causes extra pain.
- ❖ It is painful to look after myself and I am slow and careful.
- ❖ I need some help but manage most of my personal care.
- ❖ I need help everyday in most aspects of self care.
- ❖ I do not get dressed ; I wash with difficulty and stay in bed .

## **Section – 3 : Lifting (skip if you have not attempted lifting since the onset of your neck pain)**

- ❖ I can lift heavy weights without extra pain.
- ❖ I can lift heavy weights but it gives extra pain.
- ❖ Pain prevents me from lifting heavy weights off the floor, but I can manage if they are conveniently positioned e.g. on a table.
- ❖ Pain prevents me from lifting heavy weights but I can manage light to medium weights if they are conveniently positioned.
- ❖ I can only very lightweights
- ❖ I cannot lift or carry anything at all.

## **Section 4 – Reading**

- ❖ I can read as much as I want to with no pain in my neck.
- ❖ I can read as much as I want to with slight pain in my neck.
- ❖ I can read as much as I want with moderate pain in my neck.
- ❖ I cannot read as much as I want because of moderate pain in my neck.
- ❖ I can hardly read at all because of severe pain in my neck.
- ❖ I cannot read at all.

## **Section 5 : Headaches**

- ❖ I have no headaches at all.
- ❖ I have slight headaches, which come frequently.
- ❖ I have moderate headaches, which come infrequently.

- ❖ I have moderate headaches, which come frequently.
- ❖ I have severe headaches, which come frequently.
- ❖ I have headaches at all times.

#### **Section 6 : Concentration**

- ❖ I can concentrate fully when I want to with no difficulty.
- ❖ I can concentrate fully when I want to with no slight difficulty.
- ❖ I have a fair degree of difficulty in concentrating when I want to
- ❖ I have a lot of difficulty in concentrating when I want to
- ❖ I have a great deal of difficulty in concentrating when I want to
- ❖ I cannot concentrate at all.

#### **Section 7 : Work**

- ❖ I can do as much as I want to
- ❖ I can only do my usual work, but no more
- ❖ I can do most of my usual work, but no more
- ❖ I cannot do my usual work
- ❖ I can hardly do any work at all
- ❖ I cannot do any work at all

#### **Section 8 : Driving**

- ❖ I can drive my car without any neck pain
- ❖ I can drive my car as long as I want with slight neck pain.
- ❖ I can drive my car as long as I want with moderate neck pain
- ❖ I can drive my car as long as I want because of neck pain
- ❖ I can hardly drive at all because of severe neck pain
- ❖ I cannot drive my car at all

#### **Section 9 : Sleeping**

- ❖ I have no trouble sleeping
- ❖ My sleep is slightly disturbed (less than 1 hr of sleep loss)
- ❖ My sleep is mildly disturbed (1-2 hrs. of sleep loss)
- ❖ My sleep is moderately disturbed (2-3 hrs. of sleep loss)

- ❖ My sleep is greatly disturbed (3-5 hrs. of sleep loss)
- ❖ My sleep is completely disturbed (5-7 hrs. of sleep loss)

**Section 10 : Recreation**

- ❖ I am able to engage in all my recreation activities with no neck pain.
- ❖ I am able to engage in all my recreation activities, with some neck pain.
- ❖ I am able to engage in most, but not all of my recreation activities because of neck pain.
- ❖ I am able to engage in a few of my usual recreation activities because of neck pain.
- ❖ I can hardly do any recreation activities because of neck pain.
- ❖ I cannot do any recreation activities at all.