Original Article

Immediate effects of positional release therapy and manual trigger point release on neck pain and range of motion in computer users with upper trapezitis

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Abstract

Background/Objective: The intent of the current study was to compare the immediate effects of positional release therapy (PRT) and manual trigger point release (MTpR) on neck range of motion and pain in upper trapezitis. **Materials and Methods:** Sixty participants with upper trapezius myofascial trigger points (MTrPs)' participated in this study. Subjects were randomly classified into two groups (30 in each group): the subjects in Group A received PRT in a shortened position while those in Group B received MTpR in the neutral position for the upper trapezius muscle. They received four therapy sessions every day for four days. The pain intensity and range of motion were measured using the Numerical Pain Rating Scale (NPRS) and cervical range of motion (CROM), respectively, before treatment sessions and repeated immediately after the first and fourth treatment sessions in each group till the last day of their interventions. **Results:** Paired and unpaired t-Test was used for the data analysis. Pre- and postinterventional effects measured on each day and between groups, revealed that CROM and NPRS values were significantly improved in (MTpR) group (CROM, and NPRS $P < 0.05$). **Conclusion:** Both groups (PRT and MTpR) showed an increase in range of motion on CROM and a decrease in pain intensity on the NPRS during four sessions of therapy, but MTpR showed to be more effectual in these participants.

Keywords: Cervical range of motion, manual trigger point release, positional release therapy, upper trapezius muscle

Background

A myofascial trigger point (MTrP) is a hyperirritable station or site, usually within a taut band of skeletal muscle or in the muscle fascia which is painful on compression and can give rise to characteristic referred pain and motor dysfunction.[1] Musculoskeletal disorders have been the most notorious and common causes of severe long-term pain and physical disability. The health care professionals are prone to injury due to their routine work.[2] Work-related neck pain (WRNP) among female desk-job workers is higher than males due to computer usage exceeding 4–6 hours.[3] Musculoskeletal disorders (MSDs) and other occupational health problems are frequent because of more manual work and unergonomic designing of tools and workplaces. The ergonomic intervention can be a gamechanger to improve the wellbeing of workers which is ultimately beneficial in their productivity, revenue generation, and reducing the rejection cost.[4] The forearm support and

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the arm angles are the important factors that determine upper trapezius and anterior deltoid activity, which reveals that it is notable to consider the forearm support, in addition to the shoulder posture to estimate the neck/shoulder activation.[5] There is a direct relationship between sustained trapezius muscle activity and neck-shoulder pain.[5] Serratus anterior muscle strength, age, lower trapezius muscle strength, and rounded shoulder angles are the other few variables that can be considered as a part of the evaluation and intervening in upper trapezius pain withMTrPs.[6] The local inflammatory sequelae by these MTrPs upsets the soft tissues, muscles, and fascia, and these are characterized as the first vital sign of overloading of a muscle.[7]

So far, various lines of treatment regimens discussed to deal with the MTrPs through both surgical and nonsurgical ways such as PRT, manual therapies, physical therapy modalities, dry needling, or MTrP injection.[8] Furthermore, there are some combinations of physical therapy interventions added which include mainly ischemic compression along with the application of hot pack, active ROM, stretch with spray, hot pack application along with active ROM, and stretch in combination with spray as well as transcutaneous electrical nerve stimulation (TENS), hot pack plus active ROM, and interferential current as well as myofascial release technique can be the most trusted methods to release MTrP pain and increasing cervical ROM.[9] On the other hand, manual pressure release has been reported effective in relieving pain and improving cervical ROM in the short term.[8] The manual therapy (MT) techniques are known for their quick and safe application, with no side effects. The aim of the current study was to investigate the immediate effects of PRT and MTpR on pain intensity and cervical range of motion in both gendered computer users with latent trigger points in the upper trapezius muscle.

Methodology

Design and subject selection

In the current double-blinded randomized clinical trial, sixty office workers aged between 18 and 35 with latent trigger points of upper trapezius muscle were recruited from MGM's Musculoskeletal Physiotherapy OPD, Aurangabad, India. A diagnosis of myofascial trigger point was made after manual palpation. Before randomization, the allocation to the groups was concealed from the participants. Once the patients met the inclusion criteria of this current study, a signed consent form was obtained. After the first evaluation stage, all the participants were asked to pick one of the 60 papers from an envelope. Thirty papers had printed as G1 and the other 30 had printed G2. All papers inside the envelope had been shuffled. The paper picked by each participant determined their respective grouping; i.e., G1 for PRT group and G2 for MTpR. Both groups were evaluated and treated by experienced physiotherapist colleague unaware of the group characteristics, participants recruited were also blind about their group. All participants continually received a total of four sessions every day. The ethical approval was obtained before from the MGM Department of Physiotherapy and Hospital. Ethical Committee Approval was obtained 25th October 2017.

Inclusion criteria[10]

- Computer users of both genders, aged between 18 and 35 with latent trigger points.
- Pain intensity of 3 on the NPRS and presence of at least one latent trigger point in a taut band in the neck region.
- At least 4 h in a sitting position work via computers.

Exclusion criteria[10]

- Diagnosis of fibromyalgia.
- Cervical pathologies like radiculopathy, myelopathy
- Patients consuming painkillers or steroids during sessions.
- Recent trauma to the cervical region.

Interventions

Positional release therapy

In the G1 group (PRT) before the sessions, the assessor picked up the trigger points by palpation in the upper trapezius muscle by pincer palpation method and distinguished with dots on the skin. Participants were made supine lying and relaxed by maintaining the cervical spine in a neutral position. The assessor steadily increased pressure by his thumb on the noted trigger points. In the next step, the assessor achieved a new relaxed position which exerted less tension with pain reduction up to 80%. Slight contralateral flexion, extension, and ipsilateral side flexion were the positions in which the pain was dropped. The patient's both upper extremities were maintained in the abduction and sustained for 90 s passively by the assessor.[1] This was done three times in each treatment with a 20-s rest interval in between.

In the upper trapezius muscle, palpation was done with pincer palpation method, the assessor noted dots on the skin. He picked up the trigger points in the G1 group, and this procedure was done before the session. The cervical spine was maintained in a neutral position, so that the participants were relaxed as they were made in the supine position lying. The pain was dropped in the positions such as slight contralateral flexion, extension, ipsilateral flexion. The assessor achieved this new relaxed position, which exerted less tension with subjective pain reduction up to 80%.[1] This was done three times in each treatment with a 20-s rest interval in between.

Manual trigger point release group

At the beginning of the interventions, the assessor identified the latent trigger points in the upper trapezius muscle by the pincer palpation method. The assessor applied a total of five slow and sufficient compressions to the MTrP until the subject reported a "moderate but easily tolerable" pain.[2] 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.[3]

Outcome measures

2.2.1. Pain intensity: To measure the pain intensity, the Numerical Pain Rating Scale (NPRS) was used. In this, the patient was asked to rate their pain on the NPRS scale. The NPRS is a subjective

measure in which individuals evaluate their pain on an 11-point numerical scale. The scale consists of points from 0 (no pain at all) to 10 (worst imaginable pain).

2.2.2 Range of motion (ROM): In the current study a cervical range of motion (CROM) device was utilized for measurement in MTpR and PRT groups.

All the study participants were in a sitting position during measurements.

2.2.3. Analysis of Data

SPSS (version 23) was used to analyze the data. Baseline and four post sessions of intervention were compared within and between groups using paired and unpaired t- tests, with a 95% confidence level. *P* values < 0.05 were considered as significant findings.

Results

Twelve males and eighteen females and eighteen males and twelve females were divided into MTpR and PRT, respectively. The pain intensity and CROM values were measured using the NPRS and CROM device, respectively pre- and post-intervention level. The pain intensity and CROM values were found significantly improved in MTpR group than PRT group [Tables 1-12].

Table 1: Comparison of mean values of cervical flexion pain in groups on Day 1, 2, 3, and 4, respectively in pre- and post-treatment sessions

	Group A mean±SD	Group B mean±SD	*t*	*P*
Day 1				
Pretreatment	4.3±2.0	3.8±1.8	1.01	0.31
Post-treatment	3.1±1.5	2.6±1.5	1.29	0.20
Day 2				
Pretreatment	3.7±1.4	3.1±1.5	1.60	0.11
Post-treatment	2.7±1.4	2.2±1.2	1.48	0.14
Day 3				
Pretreatment	3.0±1.2	2.6±1.1	1.34	0.18
Post-treatment	2.0±1.4	1.8±1.1	0.61	0.54
Day 4				
Pretreatment	2.1±1.2	2.0±1.3	0.30	0.75
Post-treatment	1.2±1.5	1.0±1.0	0.60	0.54

Table 2: Comparison of mean values of cervical flexion ROM in groups on Day 1, 2, 3, and 4, respectively in pre- and post-treatment sessions

	Group A mean±SD	Group B mean±SD	*t*	*P*
Day 1				
Pretreatment	50.5±8.7	53.3±10.8	1.10	0.27
Post-treatment	55.8±10.6	58.6±9.5	1.07	0.28
Day 2				
Pretreatment	52.1±8.9	54.9±9.8	1.15	0.25
Post-treatment	57.0±9.2	58.1±8.6	0.47	0.63
Day 3				
Pretreatment	54.7±10.3	54.5±10.5	0.07	0.94
Post-treatment	60.0±10.9	60.8±8.4	0.31	0.75
Day 4				
Pretreatment	56.3±8.5	57.8±8.5	0.68	0.49
Post-treatment	61.9±9.9	61.4±9.2	0.84	0.20

Table 3: Comparison of mean values of cervical extension pain in groups on Day 1, 2, 3, and 4, respectively in pre- and post-treatment sessions

	Group A Mean±SD	Group B Mean±SD	*t*	*P*
Day 1				
Pretreatment	4.1±1.4	3.5±1.4	1.65	0.10
Post-treatment	3.0±1.4	2.0±1.6	2.57	0.01
Day 2				
Pretreatment	3.9±1.4	2.6±1.3	3.72	0.004
Post-treatment	2.7±1.3	1.8±1.3	2.68	0.009
Day 3				
Pretreatment	3.3±1.2	2.1±1.4	3.56	0.0007
Post-treatment	2.2±1.3	1.3±1.2	2.78	0.007
Day 4				
Pretreatment	2.4±1.3	2.1±1.1	0.96	0.33
Post-treatment	1.4±1.3	1.0±1.1	1.28	0.20

Discussion

The present study was steered to investigate and compare the immediate effects of MTpR and PRT in reducing pain and improving ROM in computer users with neck pain and tenderness in the trapezius muscle area. The subjects belonging to the present study were between the age of 18 and 35 years. The subjects were matched for age and gender thus giving a homogenous population for the study.

PRT is trusted to achieve its benefit by means of an automatic resetting of muscle spindles, which further helps to quantify the extent of the length, tone[4], and increase in the length of sarcomeres in the contracted knotty areas. In the application of the PRT technique, the muscle is engrossed in the utmost comfortable position. This sort of positioning results in tissue relaxation,[11] which ultimately improves vascular circulation and removes chemical mediators, which are believed to be the roots of the inflammation process. The PRT technique also aids in the eradication of the peripheral and central sensitization. Furthermore, the above-mentioned technique also has a direct impact on central sensitization by curbing the effect on the facilitated segment located in the spinal cord region. Additionally, it also plays an important role in breaking the vicious cycle of pain-spasm-pain in the muscles.[12,13]

The manual pressure release acts in two ways: Firstly, when pressure is applied on the marked trigger points, the native chemistry gets altered due to blanching of the lumps in addition to this there is a stimulation of mechanoreceptors which has an influence on pain gate mechanism, thus leading to reduction of pain. Secondly, when compression is released, it results in hyperemia (increase blood flow to the tissues) and an increase in the lymphatic circulation

Table 4: Comparison of mean values of cervical extension ROM in groups on Day 1, 2, 3, and 4, respectively in pre and post-treatment sessions

	Group A Mean±SD	Group B Mean±SD	*t*	*P*
Day 1				
Pretreatment	54.2±12.2	52.2±10.0	0.69	0.49
Post-treatment	57.0±11.4	56.8±10.4	0.07	0.94
Day 2				
Pretreatment	53.9±11.6	52.8±10.2	0.39	0.69
Post-treatment	59.1±10.9	56.4±10.3	0.98	0.32
Day 3				
Pretreatment	55.1±10.7	54.0±9.9	0.41	0.68
Post-treatment	59.4±11.5	58.0±9.0	0.52	0.60
Day 4				
Pretreatment	57.6±10.5	55.8±11.3	0.63	0.52
Post-treatment	61.1±11.3	58.4±10.1	0.97	0.33

Table 5: Comparison of mean values of right side cervical flexion pain in groups on Day 1, 2, 3, and 4, respectively in pre- and post-treatment sessions

	Group A Mean±SD	Group B Mean±SD	*t*	*P*
Day 1				
Pretreatment	4.1±1.5	4.1±1.8	0	1.00
Post-treatment	3.3±1.3	2.67±1.51	1.73	0.08
Day 2				
Pretreatment	3.6±1.4	3.3±1.64	0.76	0.44
Post-treatment	2.8±1.1	2.57±1.28	0.74	0.45
Day 3				
Pretreatment	3.2±1.4	2.63±1.25	1.66	0.10
Post-treatment	2.4±1.1	1.83±1.13	1.97	0.05
Day 4				
Pretreatment	2.3±1.4	2.07±1.21	0.68	0.49
Post-treatment	1.3±1.3	1.27±1.12	0.09	0.92

from that treated area which eliminates hypoxic condition and improves the scores in cellular metabolism, [14] which finally flushes out the inflammatory chemical substances such as prostaglandins, histamine, and bradykinin (pain metabolites); therefore, reduction of sensitization of the nociceptors occurs. In addition to this, it breakdowns the scar tissue, desensitizes the nerve endings, and reduces muscle tone. There are a number of possible mechanisms behind the effectiveness of MTpR. Simons has proposed that MTpR may equalize the length of sarcomeres in the involved MTrPs and consequently decrease the palpable knot and pain. On the other hand, Hou *et al.* suggested that pain reduction in MTrPs following MTpR may result from reactive hyperemia in the local reaction due to counterirritant effect or a spinal reflex mechanism that may

Table 6: Comparison of mean values of right side cervical flexion ROM in groups on Day 1, 2, 3, and 4, respectively in pre- and post-treatment sessions

	Group A Mean±SD	Group B Mean±SD	*t*	*P*
Day 1				
Pretreatment	41.0±6.6	41.2±8.45	0.10	0.91
Post-treatment	45.2±4.7	44±5.95	0.86	0.38
Day 2				
Pretreatment	43.3±6.4	42.7±7.85	0.32	0.74
Post-treatment	46.4±8.3	46.4±7.1	0	1
Day 3				
Pretreatment	44.6±7.2	45±6.98	0.21	0.82
Post-treatment	50.5±8.3	47.8±6.84	1.37	0.17
Day 4				
Pretreatment	46.2±7.4	46±7.45	0.10	0.91
Post-treatment	51.6±9.0	48.6±8.05	1.36	0.17

Table 7: Comparison of mean values of left side cervical flexion pain in groups on Day 1, 2, 3, and 4, respectively in pre- and post-treatment sessions

	Group A Mean±SD	Group B Mean±SD	*t*	*P*
Day 1				
Pretreatment	3.8±1.2	3.9±1.7	0.26	0.79
Post-treatment	3.0±1.3	2.6±1.5	1.10	0.27
Day 2				
Pretreatment	3.9±1.4	3.5±1.3	1.14	0.25
Post-treatment	2.8±1.4	2.6±1.3	0.57	0.56
Day 3				
Pretreatment	3.4±1.4	3.0±1.0	1.27	0.20
Post-treatment	2.6±1.3	2.1±1.1	1.60	0.11
Day 4				
Pretreatment	2.4±1.4	2.2±1.2	0.59	0.55
Post-treatment	1.2±1.6	1.1±1.1	0.28	0.77

Table 8: Comparison of mean values of left side cervical flexion ROM in groups on Day 1, 2, 3, and 4, respectively in pre and post-treatment sessions

	Group A Mean±SD	Group B Mean±SD	*t*	*P*
Day 1				
Pretreatment	45.4±6.6	45.5±5.5	0.06	0.94
Post-treatment	46.3±6.6	47.2±6.0	0.55	0.58
Day 2				
Pretreatment	44.2±8.0	46.3±5.7	1.17	0.24
Post-treatment	47.8±6.1	48.7±6.3	0.56	0.57
Day 3				
Pretreatment	45.5±6.6	46.9±4.7	0.94	0.34
Post-treatment	49.0±7.0	49.7±6.6	0.39	0.69
Day 4				
Pretreatment	47.0±6.0	48.0±6.2	0.63	0.52
Post-treatment	51±9	50.0±8.0	0.45	0.65

produce reflex relaxation of the involved muscle. While analyzing the outcome measure of our study, it showed a significant difference

Table 9: Comparison of mean values of right side rotation pain in groups on Day 1, 2, 3, and 4, respectively in pre- and post-treatment sessions

	Group A Mean±SD	Group B Mean±SD	*t*	*P*
Day 1				
Pretreatment	3.0±1.9	2.8±2.01	0.39	0.69
Post-treatment	2.2±1.6	1.93±1.69	0.63	0.52
Day 2				
Pretreatment	2.5±1.7	2.17±1.71	0.74	0.45
Post-treatment	1.9±1.5	1.7±1.35	0.54	0.58
Day 3				
Pretreatment	2.0±1.5	1.7±1.37	0.80	0.42
Post-treatment	1.6±1.5	1.43±1.41	0.45	0.65
Day 4				
Pretreatment	1.6±1.4	1.3±1.16	0.90	0.36
Post-treatment	1.0±1.4	0.63±1.05	1.15	0.25

Table 10: Comparison of mean values of right side rotation ROM in groups on Day 1, 2, 3, and 4, respectively in pre- and post-treatment sessions

	Group A Mean±SD	Group B Mean±SD	*t*	*P*
Day 1				
Pretreatment	58.7±8.6	54.8±8.61	1.75	0.08
Post-treatment	61.8±8.7	60.1±9.03	0.74	0.46
Day 2				
Pretreatment	59.4±8.4	60.3±7.3	0.44	0.65
Post-treatment	64.2±10.6	63.6±8.24	0.24	0.80
Day 3				
Pretreatment	60.0±9.2	59.3±6.02	0.34	0.72
Post-treatment	63.4±10.0	63.6±8.34	0.08	0.93
Day 4				
Pretreatment	62.2±8.4	61.5±6.21	0.36	0.71
Post-treatment	65.4±8.9	64.6±9.02	0.34	0.73

Table 11: Comparison of mean values of left side rotation pain in groups on Day 1, 2, 3, and 4, respectively in pre- and post-treatment sessions

	Group A Mean±SD	Group B Mean±SD	*t*	*P*
Day 1				
Pretreatment	2.7±1.8	2.8±1.9	0.20	0.83
Post-treatment	2.3±1.6	1.7±1.6	1.45	0.15
Day 2				
Pretreatment	2.8±1.6	2.2±1.8	1.36	0.17
Post-treatment	1.9±1.5	1.3±1.3	1.65	0.10
Day 3				
Pretreatment	2.5±1.5	1.6±1.3	2.48	0.01
Post-treatment	1.8±1.5	1.2±1.3	1.65	0.10
Day 4				
Pretreatment	1.4±1.6	1.1±1.1	0.84	0.40
Post-treatment	0.9±1.2	0.5±1	1.40	0.16

Table 12: Comparison of mean values of left side rotation ROM in groups on Day 1, 2, 3, and 4, respectively in pre- and post-treatment sessions

	Group A Mean±SD	Group B Mean±SD	*t*	*P*
Day 1				
Pretreatment	61.5±9.4	58.1±10.9	1.29	0.20
Post-treatment	63.4±9.5	61.3±8.8	0.88	0.37
Day 2				
Pretreatment	61.5±10.4	61.4±6.9	0.04	0.96
Post-treatment	65.0±9.1	63.1±8.5	0.83	0.40
Day 3				
Pretreatment	62.3±9.4	62.4±7.0	0.04	0.96
Post-treatment	65.4±9.2	63.7±7.8	0.77	0.44
Day 4				
Pretreatment	64.3±8.7	64.4±6.9	0.04	0.96
Post-treatment	68.2±8.2	65.4±9.0	1.25	0.21

regarding pain pressure threshold (PPT) between pre- and post-treatment in MTpR group.[15] Treatment of upper trapezius MTrPs with 60 s of MTpR produced a significant immediate decrease in sensitivity of MTrPs to manual pressure. These findings are consistent with reports from other authors including Hou *et al.*[7] who found that MTpR decreases the sensitivity of MTrPs. In addition, the results came in agreement with Aguilera *et al.*,[16] who examine the effect of MTpR treatments using ischemic compression on a latent MTrP in the trapezius muscle. They found that MTrPs sensitivity of the trapezius muscle gaining short-term positive effects with the use of ischemic compression**.** Fernandez-de-las-Penas *et al.*,[17] compared the immediate effect of ischemic compression to that of the transverse friction massage in 40 subjects. They found that ischemic compression is effective in relieving pain and significant improvement in discomfort and referral patterns when compared to control.

The results also came in agreement with Kostopoulos *et al.*,[18] who searched the effect of ischemic compression (IC), passive stretching (PS), and the combination of compression and stretching on pain perception from MTrPs. The results showed that all treatments demonstrated a decline in pain perception. In addition to Hains *et al.*,[19] who examined the effect of MTpR using ischemic compression on shoulder trigger points in patients with chronic shoulder pain. They found it effective in decreasing functional disability in the shoulder joint.

Regarding the ROM in this study, there was a significant improvement in active neck flexion, extension, side bending, and rotation ROM. MTpR applied downward on a MTrP tends to lengthen sarcomeres and can be effective in increasing ROM and reducing muscle tension. The increase of PPT in tender MTrPs permits some pain-free range of neck motion. The results of this current study also came in agreement with Priyanka Rishi, Premlata, and Gurpreet Singh (2019) who concluded in their study that positional release therapy technique is a very useful therapeutic tool to deal to enhance the range of motion, physical functional abilities of the patient and to improve pain threshold levels in patients suffering from cervical-originated headaches.[20] Another study submitted by authors Kamrani Faraz, Letafatkar,

and Javadhneh observed that PRT techniques in combination with neck stabilization exercises have a very decisive influence on the dwindling pain intensity and boosting up the ROM in men with a history of chronic neck pain.[21]

2.2.6. Conclusion According to our current study, both groups (PRT and MTpR) showed an increase in range of motion on CROM and a decrease in pain intensity on the NPRS during four sessions of therapy, but MTpR showed to be more effectual in these participants.

Highlights of Study

The important observations of this current study denote that PRT interventions can be a gamechanger while treating patients with neck pain, individuals suffering from upper trapezitis and chronic neck pain. The regular follow-up of such patients should be incorporated to observe the effects of the interventions and the recurrence frequency of the symptoms. Neck strengthening exercises, and muscle energy techniques can be used in combination with PRT to evaluate the interventional effects.

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Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Nambi Gs, Sharma R, Inbasekaran D, Vaghesiya A, Bhatt U. Difference in effect between ischemic compression and muscle energy technique on upper trepezius myofascial trigger points: Comparative study. Int J Health Allied Sci 2013;2:17.
2. Muruganantham B, Nayak B, Dave D, Kotia P. Work-related musculoskeletal disorders among Indian Physiotherapists. Physiotherapy 2015;101:E1059–60.
3. Darivemula Sb, Goswami K, Gupta Sk, Salve H, Singh U, Goswami Ak. Work-related neck pain among desk job workers of tertiary care hospital in New Delhi, India: Burden and determinants. Indian J Community Med Off Publ Indian Assoc Prev Soc Med 2016;41:50–4.
4. Sain, M.K. and Meena, M.L., 2016. Occupational health and ergonomic intervention in Indian small scale industries: a review. Int J Recent Adv Mechanical Engin, 5(1), pp.13-24.
5. Hanvold TN, Wærsted M, Mengshoel AM, Bjertness E, Stigum H, Twisk J, *et al.* The effect of work-related sustained trapezius muscle activity on the development of neck and shoulder pain among young adults. Scand J Work Environ Health 2013;39:390–400.
6. Hwang U-J, Kwon O-Y, Yi C-H, Jeon H-S, Weon J-H, Ha S-M. Predictors of upper trapezius pain with myofascial trigger points in food service workers. Medicine (Baltimore) 2017 Jun 30 [Cited 2019 Jul 27];96. Available From: https://www.Ncbi.Nlm.Nih.Gov/Pmc/Articles/Pmc5500039/.
7. Kisilewicz A, Janusiak M, Szafraniec R, Smoter M, Ciszek B, Madeleine P, *et al.* Changes in muscle stiffness of the trapezius muscle after application of ischemic compression into myofascial trigger points in professional basketball players. J Hum Kinet 2018;64:35–45.
8. Al-Shawabka SAM, Shenouda MMSS, Balbaa AA. Positional release technique versus manual pressure release on the upper trapezius muscle in patients with myofascial pain dysfunction syndrome. Bull Fac Phys Ther 2013;18. Available from: http://Erepository.Cu.Edu.Eg/Index.Php/Bfpth/Article/View/527.
9. Hou C-R, Tsai L-C, Cheng K-F, Chung K-C, Hong C-Z. Immediate effects of various physical therapeutic modalities on cervical myofascial pain and trigger-point sensitivity. Arch Phys Med Rehabil 2002;83:1406–14.
10. Mohammadi Kojidi M, Okhovatian F, Rahimi A, Baghban AA, Azimi H. The influence of positional release therapy on the myofascial trigger points of the upper trapezius muscle in computer users. J Bodyw Mov Ther 2016;20:767–73.
11. Beal, M.C. ed., 1989. The principles of palpatory diagnosis and manipulative technique. Indianapolis, IN: American Academy of Osteopathy.
12. Shah JP, Thaker N, Heimur J, Aredo JV, Sikdar S, Gerber LH. Myofascial trigger points then and now: A historical and scientific perspective. Pm R 2015;7:746–61.
13. Pattanshetty RB, Raikar AS, Post Graduate Student, Kleu Institute Of Physiotherapy, Belgaum, Karnataka, India. Immediate effect of three soft tissue manipulation techniques on pain response and flexibility in chronic plantar fasciitis: A randomized clinical trial. Int J Physiother Res 2015;3:875–84.
14. Moraska AF, Hickner RC, Kohrt WM, Brewer A. Changes in blood flow and cellular metabolism at a myofascial trigger point with trigger point release (Ischemic Compression): A proof-of-principle pilot study. Arch Phys Med Rehabil 2013;94:196–200.
15. Fryer G, Hodgson L. The effect of manual pressure release on myofascial trigger points in the upper trapezius muscle. J Bodyw Mov Ther 2005;9:248–55.
16. Aguilera FJM, Martín DP, Masanet RA, Botella AC, Soler LB, Morell FB. Immediate effect of ultrasound and ischemic compression techniques for the treatment of trapezius latent myofascial trigger points in healthy subjects: A randomized controlled study. J Manipulative Physiol Ther 2009;32:515–20.
17. Fernández-De-Las-Peñas C, Alonso-Blanco C, Fernández-Carnero J, Carlos Miangolarra-Page J. The immediate effect of ischemic compression technique and transverse friction massage on tenderness of active and latent myofascial trigger points: A pilot study. J Bodyw Mov Ther 2006;10:3–9.
18. Kostopoulos D, Nelson AJ Jr, Ingber RS, Larkin RW. Reduction of spontaneous electrical activity and pain perception of trigger points in the upper trapezius muscle through trigger point compression and passive stretching. J Musculoskelet Pain 2008;16:266–78.
19. Hains G, Descarreaux M, Hains F. Chronic shoulder pain of myofascial origin: A randomized clinical trial using ischemic compression therapy. J Manipulative Physiol Ther 2010;33:362–9.
20. Premlata, Rishi P, Singh G. Effect of positional release technique versus ischemic compression on pressure pain threshold, range of motion, and headache disability in cervicogenic headache patients among college going, students. A randomized controlled trial. Int J Physiother 2019;6:140-8.
21. Javdaneh N, Letafatkar A, Kamrani N. Comparison of stability training with and without positional release technique on the pain, neck range of motion in men with chronic neck pain. Military Caring Sci 2019;6:49–60.