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The Effect of Combination Therapy; Manual Therapy and Exercise, in Patients With Non-Specific Chronic Neck Pain: A review

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Abstract-

Purpose: Neck pain is one of the most common health problems that its prevalence ranges from 34% to 50%. Chronic Neck Pain (CNP) is also a frequent complaint in the general population. The pathogenesis of nonspecific CNP is not clear. This study aimed to assess the effects of combined treatment on neck Range of Motion (ROM), Neck Disability Index (NDI), and pain in patients with nonspecific CNP Prognosis for chronic neck pain is generally poor, and the associated disability seems to be more persistent than low back pain. 66% of the population will suffer from neck pain at some point during their lifetime. More than one-third of people affected still have low grade symptoms or recurrences more than one year after treatment, often leading to chronic pain.

Aim: To determine the efficacy of Combined treatment of manual therapy and exercise in neck pain patients.

Method: This review mainly includes randomized controlled trails (RCTs). Searching done by mobilization, manipulation, exercise and physiotherapy management.

Result: Present outcomes shows that manual therapy treatment is effective technique in reducing pain and increasing Range of motion (ROM) in neck pain patients without adverse effects. The search resulted in 100 articles but only 5 articles were selected for the study based on criteria.

Conclusion: Manual therapy program designed for neck pain treatment can be more effective at increasing neck ROM and reducing pain.

Key words-combination therapy, non- specific chronic neck pain, exercise, manual therapy

INTRODUCTION-Neck pain is a major problem for public health and its rate is steadily rising [1]. The prevalence of neck pain ranges from 34% to 50% [2-5]. The underlying causes of neck pain can be structural or functional disorders of the spine, muscles, ligaments, joints, or poor posture. However in most cases, the underlying pathophysiology of neck pain is unknown and as a result it is referred to "non-specific neck pain." Sometimes neck pain becomes chronic and incur a lot of cost and time to medical health system regarding its diagnosis and treatment process [6- 8.] Also Chronic Neck Pain (CNP) may lead to absence from work and reduce the quality of life [9-11]

Mechanical neck pain is characterized as a generalized neck pain with or without mechanical features of the shoulder, including symptoms created by sustained posture of the neck, movement, or cervical muscle palpation.

In the cervical region, mechanical neck pain is pain, often followed by decreased range of motion (ROM) and physical disability. Neck pain and its associated disease pose a considerable socioeconomic strain on society [12.] EMG bio-feedback, electrical stimulation, thermotherapy, acupuncture, therapeutic exercises, or combination therapies for intense neck pain are not indicated. Manipulation, mobilization and rehabilitation are favored over standard treatment in order to reduce intense neck pain at short-term follow-up [13]

Evidence-based treatments have compared the short- and long-term effects of combination therapy (manual therapy plus exercise) for the treatment of non-specific neck pain, along with using other therapies like electrotherapy, medication, acupuncture and patient education. According to these studies, combination therapy has been the most effective method so far. There are also evidence proving the short- and long-term effects of exercise therapy on neck pain and function [14, 15, 16]. Exercise programs differ with regard to intensity, duration, and frequency [17]. Studies revealed isometric exercises, neck stabilization exercises, and strength training (as a rehabilitation method) has positive effects on neck pain, reduce the pain and improve its function [18-20]. Therefore this study was designed to assess the effects of exercise and manual therapy on neck ROM and pain in patients with nonspecific chronic neck pain.

METHODOLOGY- A literature search of randomized controlled trials (RCTs) published in English between 1st January 2000 and 31st December 2015, on the efficacy of MT in the treatment of NP was conducted by two reviewers in four electronic databases: MEDLINE (PUBMED), Cochrane-Register-of-Controlled Trials (CRCT), Physiotherapy-Evidence-Database (PEDro), EMBASE. The detailed search strategy in MEDLINE is presented in Appendix 1, and was adapted to search in the other databases. Based on information revealed in the titles and abstracts, a first selection of articles was performed using the inclusion criteria based on consensus between experts (i.e. authors). A final selection was conducted after critical appraisal of the quality of the studies.

Inclusions criteria - In this review RCTs articles were used only (i) If they posed low prejudice chances. (ii) Where patients with Neck Pain have been allotted randomly to take Manual Therapy or a "no treatment" group, placebo or additional typical traditional treatment for neck Pain. (iii)Where instructions for random allocation is necessary and clearly specified. (iv) Where single-blind assessor or double-blinded assessor design was used. Both male and female patients between 18-60 years of age with acute/sub-acute (3 months) Neck Pain were utilized. NP was differentiated on the basis of duration of the pain episode, with acute pain < 6 weeks, sub acute pain 6–12 weeks, and chronic pain > 12 weeks. We also used a combination of duration, location, and signs/symptoms to determine the study population [26,27]

Intervention Considered experiments are those which involve mobilization, Manipulation, different types of exercise irrespective of strength and durations. Exercises programs included, strengthening exercises, flexibility exercises, stretching exercises.

The key result tests are VAS, NDI, Goniometry, BDI, Short Form-36, individuals Specific Functional Scale,

Exclusion criteria - Any other languages than English.

AuthoR	Study design	Subject	Intervention	Study Duration	Outcome measure	Result
Abdullah Al Shehri, Shabana Khan et al. 2018 [21]	Randomized controlled trial	N=50	Group A: This group received conventional therapy (Active, Isometrics exercises, moist hot packs) plus SNAG Group B: This group received conventional therapy (Active, Isometrics	Duration of study is four weeks, three sessions per week & one	VAS, NDI, Goniometry for Cervical Range of Motio	treated with Maitland mobilizati on and conventio nal therapy, and

			exercises, moist hot packs) plus Maitland's mobilization	session per day.		Mulligan (SNAGs) mobilization and conventional therapy in both groups. Both mobilization techniques are clinically significant in reducing the individual's symptoms. But Maitland mobilization is statistically significant in decreasing the individual's symptoms when it is compared Mulligan SNAGs mobilization
Oznur Buyukturan, Buket Buyukturan et al. 2018 (22)	Randomized controlled trial, doubleblind	N=42	Group A: this group received traditional physiotherapy included heat therapy, electrotherapy (TENS, & US therapy), exercises therapy. Group B: This group received traditional physiotherapyMulligan mobilization; The MMT was applied in addition to the	10 sessions for 2 weeks 5 days in week for once a day	The cervical vertebrae ROM were measured using an universal goniometer. Depression degree of the participants was	After therapy ($p < 0,05$), pain, ROM, functional level, kinesiophobia, depression and QoL increased in both

			treatment program applied to the TP group. For 2 weeks, individuals received SNAGs five days per week		measured using BDI which consists of 21 categories with 4 options in each category. Short form-36-for review.	classes. When comparing the outcomes of these two therapy systems, it was found that in terms of ROM, kinesiophobia, depression and QoL, the TPMM community had a greater result ($p < 0.05$). MMT has been found to have significant effects on pain, ROM, functional level, kinesiophobia, depression and QoL in older adults with NP, as long as it is done by a specialist.
Keun Su Lee, Joon Hee Lee 2017 [23]	RCTs	N=18	Group A: In this group only therapeutic exercise was applied to the upper thoracic & cervical spine. Group B: In this group joint mobilization & therapeutic exercise were applied.	Therapy was given for one hour a day, 3 times a week, for 2 weeks for each group	VAS, neck disability index, ACROM, static balance capacity, & muscle tone were assessed.	In both groups VAS, NDI, & ACROM is improved significantly. Group B improved

						significantly more on right lateral flexion and rightward rotation. Muscle tone improved significantly in the upper trapezius in both groups. In addition, the group which receive both joint mobilization and therapeutic exercise were applied, significantly more improvement in the pain index, NDI, and ACROM was seen than in the group that received only therapeutic exercise
Hossam alden albassiouny, Salwa shendy et al. 2019(24)	Randomized controlled trial	N=30	Group-A: Received upper thoracic mobilization and traditional physical therapy program. Group-B: Received the traditional physical therapy program only (IR 15 min, TENS, Stretching exercises for Upper Trapezius,	Both groups were received a traditional program for 4 weeks, 3 sessions per week.	Pain level was measured by a Visual Analog Scale (VAS) and neck disability was measured	There is a statistical significant difference between both groups. There is a positive effect of upper

			Levator Scapulae, Sternocleidomastoid and Scalenes muscles, each stretching exercise maintain 30 second and repeated 5 times for each side		by Neck Disability Index (NDI)	thoracic mobilization on CROM and neck function when comparing with routine physical therapy, there was no a statistical significant effect of upper thoracic mobilization on resting pain level when compared with routine physical therapy
Ghodrati M, Mosallanezhad Z, Shati M, Rastgar Koutenaei F, Nourbakhsh MR, Noroozi M 2017 (25)	Randomized controlled trial	N-24	Group A received intervention treatment and group B, as control, received no treatment for 21 days. Each group consisted of 12 participants who were selected considering inclusion and exclusion criteria. Each patient in group A received manual treatment protocols (soft tissue release and muscle energy techniques) plus exercise therapy, in six sessions, one session per day, two days a week over a period of 21 day	one session per day, two days a week over a period of 21 day	e. Clinical assessments included neck ROM, NDI and pain based on Visual Analogue Scale (VAS)	In the intervention group, the indexes showed significant improvements ($P<0.001$). The study results support the effectiveness of the combination therapy (soft tissue release, muscle energy techniques plus exercise

						therapy) with some improvements in the neck ROM, NDI and pain (Based on VAS scores) for the management of patients with non-specific CNP

DISCUSSION-This review was conducted to determine the efficacy of manual therapy approaches in improving quality of life in patients with neck pain. Evidences from RCTs is used to assess the efficacy of manual therapy approaches in neck pains, researchers mentioned below proved manual therapy interventions to be equally effective in decreasing pain and improving ROM in patients with neck pain.

Based on the study results of Maryam Ghodrati [28], combination therapy (soft tissue release, muscle energy techniques and exercise) have significant effects in patients with non-Specific CNP. This combination therapy increases ROM, and decreases NDI and pain in patients with nonspecific CNP.

Evans et al. [27]studied the effectiveness of manual therapy (MT1 HVLA manipulation) (to the Cx and Tx for 20 sessions of 15–20 minutes) paired with high dose (20 sessions of 1-hour) controlled strengthening exercise (neck and upper body strengthening), versus moderate dose controlled strengthening exercise alone, and low dose home exercise and instruction for chronic NP individuals. There were clinically significant result at 12 weeks for both high dosage exercise groups for pain and general health benefits ($p < 0.001$) in relation to home exercise and a tendency for impairment for MT1 associated with exercise activity towards home exercise. The authors concluded that high dose exercise combined or not with MT1 achieved better outcomes than home exercise especially in the medium term (3 months)

Zemadanis Konstantinos et al I his study concluded that Implementation of manual therapy techniques, in the form of HVLA/LVLA, acutely improves the clinical status of patients with chronic neck pain, thereby enhancing therapeutic guidelines of MT application. Reduction in IL-1β concentration indicates o potential mechanism of action interpreting therapeutic effect. 25

CONCLUSION-This review was conducted to investigate The Effect of Combination Therapy; Manual Therapy and Exercise, in Patients With Non-Specific Chronic Neck Pain by summarizing the evidences from randomized controlled trials (RCTs). We conclude that manual therapy program designed for neck pain treatment can be more effective at increasing neck ROM and reducing pain. In addition, neck pain patients can improve self-reported with isometric exercises including ROM exercises, either with or without electrotherapy.

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