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The effect of therapeutic massage and rehabilitation exercises in treating chronic neck muscle tension in regular physical exercisers

subhan yunis sultan mahdi alhayalii

University of Mosul College of Physical Education & Sports Sciences

sabhan.alhayali83@uomosul.edu.iq

ABSTRACT

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The importance of this study lies in preparing therapeutic massage and rehabilitation exercises in the treatment of chronic muscle tension of the neck muscles, which depends on scientific and practical research methods. The study was conducted on (8) injured people, whose ages ranged from (19-24) years. The rehabilitation program lasted for (8) weeks, as the research sample was chosen intentionally. They did not undergo any rehabilitation program or previous surgical intervention in the back. The rehabilitation program was applied for (8) weeks, as the research sample was chosen intentionally. The results of the study showed that the use of (therapeutic massage and rehabilitation exercises) was sufficient to improve the study variables and that there were statistically significant differences between the pre- and post-measurements of the rehabilitation group in favor of the post-test. The researcher used the experimental method with a (single group) design with a pre- and post-test. Rehabilitation exercises were applied to injured athletes, and there was improvement in the injured, and the duration of the program was sufficient to improve the study variables. The researcher also reached several conclusions, including that rehabilitation exercises have a positive effect on the degree of pain, which reduces the

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1 - 1 Introduction and the importance of research:

Given the close connection between the development and progress of society in general, and the development of sports in particular, officials and workers in the field of physical education and sports must work to raise the level of physical fitness for all segments of society. Neck pain is widespread worldwide and has increased in recent times. Neck pain is considered one of the diseases that have recently increased or one of the diseases of luxury that have emerged. The cervical vertebrae are one of the most complex areas of the spine from an anatomical point of view and contain many nerves and muscles, so they are one of the areas most exposed to injury. The neck is characterized by ease of movement and is exposed to many problems for both athletes and non-athletes during the incorrect practice of sports activities or some professions that require sitting for long periods. Neck pain is one of the problems that many individuals we live with are exposed to, which clearly affects the production process and limits movement. The problem of neck pain, which causes the patient to suffer from difficulty in being able to move or perform daily tasks, and the percentage of those afflicted with these conditions is many, and it varies in its severity, location, and degree of continuity from one individual to another. These pains are due to multiple causes that are difficult to enumerate, including what It is attached to the spine and surrounding muscles and ligaments.

Pain resulting from movement-related causes, whether sudden activity or overuse of the musculoskeletal system, is related to clinical causes that may be acute or chronic. Massage can be used as a treatment for muscle pain, elbow injuries, muscle spasms, and lower back pain. The main cause of chronic muscle spasms is related to impaired blood circulation to the muscle. They may also occur after muscle strain or strenuous exercise that the muscles are not accustomed to. Temperature fluctuations also play a major role, as can the loss of water or salts, both of which can lead to chronic muscle spasms. To help treat such cases, the affected person should resort to rest, rehabilitation, and rehabilitative exercises along with massage sessions and stretching exercises for the affected muscles. Therefore, attention must be paid to massage for the purpose of warming up, as well as warm-up exercises, flexibility exercises, and stretching of the muscles before starting work or training. We must know that good muscle exercise increases its size and strength. When a muscle spasm occurs, the affected muscle is painful when examined by hand. There is usually a crunching sensation felt by the examining hand when the muscle part meets the tendon part.

In cases of muscle spasms, therapeutic massage can begin from the first or second day after diagnosis, as early massage significantly shortens the recovery period and helps relieve pain and complete muscle relaxation

They also confirm that the effectiveness of therapeutic massage increases significantly when accompanied by therapeutic exercises. Stretching exercises have many benefits, including reducing fatigue, pain, and muscle tension, and increasing physical and mental relaxation. Stretching and physical exercises are part of rehabilitation programs. These exercises aim to increase muscle and joint flexibility, especially in cases of muscle shortening that hinders movement of the injured part, such as muscle spasms.

Hence, the importance of research in preparing the use of therapeutic massage, rehabilitation exercises and some other means and working on combining more than one method in treating many sports injuries in the back area in general and the neck area in particular.

Therefore, how to treat the problem of chronic neck muscle spasm, which many injured people of different ages suffer from and which is considered one of the most common problems that have increased in prevalence with this technological progress - therefore, the researcher sought to identify the effectiveness of combining therapeutic massage and rehabilitation exercises in treating chronic neck muscle spasm, by measuring pain, measuring the range of motion of the neck muscles, measuring the strength of the neck muscles and measuring the strength of the back muscles .

1 – 2 Research problem:

Most female athletes are exposed to what are called cervical and lumbar spine injuries, which result from many reasons, including carrying heavier objects than they can handle for longer periods, improper training preparation for long periods, and insufficient warm-up for longer periods, which causes muscle and ligament tears or sprains beyond the spine's ability to handle. In addition, unexpected injuries occur, which over time cause muscle strain in the neck muscles. Calcifications may also occur in the vertebral bodies, leading to numerous injuries, including chronic neck muscle strain. The research problem is based on the scarcity or lack of therapeutic massage and rehabilitative exercises that rely on scientific approaches and experience in the sports field and rehabilitation for the injured, as they often avoid rehabilitation. Therefore, the researcher decided to develop rehabilitative exercises for those with neck muscle strain to increase the strength and length of the working muscles, increase the range of motion, and reduce the degree of spinal pain in the cervical vertebrae, with the aim of rehabilitating the injured person to increase their ability to perform their normal work and mobility.

1-3 Research Objectives:

- Preparing a therapeutic massage program and rehabilitation exercises to treat chronic muscle strain in the neck muscles for injured athletes, to improve the

degree of pain and increase the range of motion in all directions of the neck area.

- To determine the effect of therapeutic massage and rehabilitation exercises in treating chronic neck muscle strain in injured athletes in improving neck muscle strength.

1-4 Imposing Research:

- There are statistically significant differences between the results of the pre- and post-tests in improving the muscle strength of the neck area.
- There are statistically significant differences between the results of the pre- and post-tests in improving the degree of pain and range of motion in all directions of the neck area.

1.5 Research areas

1.5.1 Human field: A group of injured students from the College of Physical Education and Sports Sciences, University of Mosul Their ages range between (19 and 24) years .

1.5.2 Time Domain: The study was conducted for the period from 14/8/2025 to 1/6/2025.

1-5-3 Spatial field: The researcher conducted this study at the Rehabilitation Center in Adam Medical Consulting Complex, Department of Physiotherapy and Rehabilitation in Mosul.

2 - 1 Research Methodology:

The researcher used the experimental method using one experimental group and applying (pre-post) measurement to suit the nature of the research.

2 - 2 Research sample: -

The research community and sample consisted of (8) students from the College of Physical Education and Sports Sciences. The researcher chose the research sample intentionally, from athletes suffering from chronic muscle strain in the neck muscles who visit (Mosul Rehabilitation and Physiotherapy Center) in Mosul Governorate

2 – 3 Means, devices and tools used in research: -

- Collection of information and resources from Arab and foreign sources and references, scientific observation, tests and measurements, data, and statistical methods..

- The tools used in the research were a German-made genometer, a Japanese-made dynamometer for measuring muscle strength, a genometer, a pain intensity scale, a Chinese-made medical scale for measuring body weight, belts, a height ruler, devices, a digital medical scale, and rubber bands.

- The devices used in the research were a laptop, a Sony camera, and two (KISLO) electronic stopwatches.

2.4 Research tests used

Neck range of motion measurement:
An electronic flexometer (Model SR630) is used. The patient assumes a sitting position during the measurement, keeping the pelvis and shoulders stable. The flexometer is then secured to the center of the head using a belt on the lateral side. The indicator is then held in a vertical position. The patient then bends their head forward as far as possible, and the degree is measured. The degree is then measured. The patient then bends their head backward as far as possible, and this is repeated on both sides. Flexibility and range of motion are determined by the degree shown on the indicator connected to the device.

2.4.1 Neck Muscle Strength Test Using a Dynamometer (Huang;2023: 13(1), 10716)

Purpose : Neck Range of Motion Testing Using a Muscle Dynamometer
Purpose: To measure neck range of motion .
Equipment: Electronic Neck Flexibility Range of Motion Meter (model SR630), .with the patient in a sitting position during the measurement
Necessary instruments: Electronic neck flexometer (Model SR630) where the patient is in a sitting position during the measurement.

Performance Description: The patient sits in a chair facing the meter. The meter is mounted on a fixed pole at head level, ensuring the torso is stable. The meter is attached to the ring on the patient's head. The indicator reading is taken, and the measurement is taken three times, and the average is calculated .

Recording: Recording: The meter reading is taken while the patient is performing the movement.

- **2.4.2 Maximum neck muscle strength testing using a dynamometer (Bakri, 2023; 328).**

Its purpose: Harvest from it: Maximum neck muscle strength was measured.
Necessary instruments: Equipment needed: A dynamometer measuring neck muscle strength.

Performance Description: The dynamometer (Model.Lb250) (kg) is used to measure the back muscles, so that the individual, the research sample, stands on the device correctly and balanced, then holds the bar of the device, provided that the iron chain is appropriate for his height. Then the patient pulls the bar upwards without bending the knees or bending the arms from the elbow, while exerting maximum forces when measuring. Then the amount of force is calculated by reading the indicator in kilograms.

Recording: Recording the reading of the device in kilograms.

2.4.3 A test is used to measure strength **(Salmon ; 2011: 987)**

Purpose: To measure trunk muscle extension

Necessary tools: Equipment needed: A recording form and a timer for performing the tests.

Performance Description: Performance description: Determining the time and methods of therapeutic massage used in treating the injured. Determining the time and type of rehabilitation exercises used in treating the injured. Measuring the degree of pain and the range of motion of the neck in all directions, the muscle strength of the neck muscles, and the muscle strength of the back muscles of the injured before and after the end of the program, and two weeks after the end of the program to follow up on the cases after the end of the program.

Recording: Taking measurements for each of (muscle strength - muscle strength - muscle strength - muscle strength - shoulder strength for the back.

2.4.4 Test to measure Measuring the degree of pain, the range of motion of the neck in all directions, the muscle strength of the neck muscles, and the muscle strength of the neck muscles in patients**(Salmon ; 2004: 25)**

Purpose : Farmer: Measure the flexibility of the vertebrae during flexion and then backward movements.

Necessary tools: Tools required: A scale (range of vertebrae) found in the medical file.

Performance description: Performance description: The patient lies on the medical bed where the joint fluid is pushed (flexed and extended) forward and then backward and the patient is asked through measuring the pain on the visual patient the degree of pain from (0 to 10) and finished from the highest and lowest) and is determined after completing the book and asking the patient questions to answer the pain (VAS) according to the form that was prepared for that, an index

number is given for the severity of the pain or bringing the pain closer or pushing it.

Recording: The distance to point (0) reached at the end of the readings is recorded on the second measuring end of the neck.

2.4.5 Forward neck flexion test from a sitting position on a chair (Sihawong ; 2011: 62-71).

Purpose: To measure cervical flexibility from a sitting position.

Equipment and supplies: Range of motion measuring device.

Performance Description: The patient sits facing the device, slowly and forcefully bending the neck forward and downward while remaining steady. Posterior neck muscle strength: The patient sits facing the device, while the readings are taken. Try to bend the neck backward slowly and forcefully while remaining steady. Right neck muscle strength: The patient sits on the left side facing the device, slowly and forcefully bending the head to the right while remaining steady. Left neck muscle strength: The patient sits on the right side facing the device, slowly and forcefully bending the head to the left while remaining steady.

2.4.6 Cervical vertebrae flexibility test (Sefton JM; 2010: 723-32)

2 - 5 Application of the main experience: -

2 – 5 – 1 Pre-test: -The main experiment of the research sample was applied on Sunday (1/6/2025) to the sample individuals and ended on Friday (14/8/2023) (three sessions) in a week, and the number of training units was (24) training units, and the time of each training unit took (35-55) minutes, and the therapeutic massage rehabilitation exercises were designed to know its effect on the dependent variables under study, and the application of the program took (8) weeks at a rate of three sessions per week according to scientific principles in medical rehabilitation and physical therapy.

2 – 5 – 2 Post-test: -

The researcher conducted the post-tests after completing the 24 treatment sessions, taking into account all the conditions, terms, and procedures specific to the pre-tests.

2 - 6 Statistical means: -

The researcher used appropriate statistical methods to process the data generated by the pre- and post-tests using SPSS.

3 - Presentation and discussion of the results: -

3-1 Displaying the results and analyzing the results of the pre-tests of the research variables for the research sample

Significance of differences between the experimental group in the pre-measurement in the variables of pain, range of motion, and muscle strength of the neck muscles

Table (1)

Variables	Unit of measurement	Experimental group n=8				U	Significance
		M	A	Average rank	Total ranks		
Pain level	degree	8.125	0.6409	8.88	71	29	0.725
Neck range of motion right flexion	degree	10.75	2.121	8.56	68.50	31.50	0.958
Neck range of motion tens left	degree	10.75	1.49	7.63	61	25	0.453
Range of motion of the neck forward flexion	degree	11.63	1.408	7.81	62.50	26.50	0.555
Range of motion of the neck backward flexion	degree	12.00	2.138	8.06	64.50	28.50	0.709
Range of motion of the neck right rotation	degree	14.50	2.673	8.25	66	30	0.832
Range of motion of the neck left rotation	degree	25.235	1.623	9.22	80	22	0.903
Neck muscle strength bend right	kg	1.900	0.2563	8.13	65	29	0.750
Neck muscle strength, bend left	kg	1.863	0.1598	7.69	61.5	25.50	0.588
Neck muscle strength forward flexion	kg	2.138	0.3021	7.81	62.5	26.50	0.560
Neck muscle strength backward flexion	kg	2.013	0.4051	7.81	62.5	26.50	0.561
Back muscle strength	kg	58.25	7.972	8.75	70	30	0.833

Significance of differences between the experimental group in the post-test in the variables of pain, range of motion, and muscle strength of the neck using tests

Table (2)

Variables	Unit of measurement	Experimental group n=8				U	Significance
		M	A	Average rank	Total ranks		
Pain level	degree	8	0.7071	10.94	87.50	*12.50	0.039
Neck range of motion right flexion	degree	31.00	2.391	11.13	89	*11	0.027
Neck range of motion tens left	degree	31.375	2.825	11.38	91	*9	0.015
Range of motion of the neck forward flexion	degree	35.125	1.246	12.50	100	1.*	0.001
Range of motion of the neck backward flexion	degree	38.00	0.200	12.50	100	10.*	0.001
Range of motion of the neck right rotation	degree	38.250	3.196	10.75	86	14*	0.057
Range of motion of the neck left rotation	degree	38.625	2.825	11.25	90	*10	0.020
Neck muscle strength bend right	kg	6.70	0.393	12.38	99	*1	0.001
Neck muscle strength, bend left	kg	6.738	0.489	12.50	100	*0.00	0.001
Neck muscle strength forward flexion	kg	7.975	0.205	10.94	87.50	*0.0	0.039
Neck muscle strength backward flexion	kg	8.050	.239	11.81	94.50	*5.50	0.005
Back muscle strength	kg	104.38	7.998	10.88	87	*13	0.045

There are statistically significant differences between the post-measurement in favor of the experimental group for each of the degree of pain, range of motion, and muscle strength of the neck muscles.

3-2 Discussing the results of the research variables tests between the pre- and post-tests.

Discuss the results of the research variables tests between the pre- and post-tests. The table above shows statistically significant differences in the normal measurement with the restoration of full neck range of motion, strength of the neck and back muscles, restoration of neuromuscular coordination of the neck muscles, and restoration of the functional state of the back muscles as a whole and

the neck in particular. The researcher attributes the reasons for these differences to the effect of therapeutic massage and rehabilitation exercises on both anatomical and physiological potential. Neck exercises and increased elasticity and flexibility of the neck muscles contributed to achieving a better range of motion and returning the neck to its normal state. This is confirmed by ( ), "Muscle stretching helps maintain the muscle's ability to protect itself, as the ability of these muscles depends largely on the individual's anatomical and physiological structure." The rehabilitation exercise session begins as follows

As The researcher also indicates that he used standardized therapeutic massage as follows: (surface scanning - deep scanning - kneading - vibration) (quoted from). The massage session begins in the first week with surface scanning massage, followed by deep scanning in the third session of the first week, followed by surface scanning and deep scanning in the second week, followed by surface scanning, deep scanning, kneading, and vibration massage in the remaining weeks, with kneading massage taking up the largest portion of the sessions. The therapeutic massage session concludes with scanning massage, which plays a significant role in improving and reducing the degree of pain, improving muscle contraction and range of motion, and restoring normalcy. It is important to note that transitioning from one technique to another should be done sequentially. The time distribution for each technique should be adhered to, or the increase or decrease should be adjusted according to the condition of the contracted muscles of each individual patient, so as not to cause any pain during the therapeutic massage session .

He also worked hard to assume responsibility, and he also experimented with the matter, allowing him to learn all the details about each employee, their job practices, and the extent to which the task differed from one person to another. Consequently, he learned the principle of individual differences, the scientific foundations, and the administrative requirements for implementing the practice.

4.1 Conclusions:

- The disappearance of pain resulting from chronic muscle spasm of the neck muscles in favor of the single experimental group in the post-measurement and in the post-follow-up measurement after the end of the program.

- Restoration of the range of motion in all directions of the neck area in favor of the experimental group in the post-test and in the post-test after the program ended.

- Improvement in the muscle strength of the neck and back area in favor of

the experimental group in the post-test and post-test measurements.

- Therapeutic massage increases the muscles' ability to stretch, which leads to an increase in the neck's range of motion.

- Therapeutic massage and rehabilitation exercises have a positive and effective impact on speeding up treatment, eliminating pain, and restoring the most important basic and natural functions of the neck muscles in particular and the back in general.

4.2 Recommendations:

- Pay attention to proper neck postures when standing, sitting, sleeping, reading, and all different life activities, as they have a significant impact on the emergence of problems in the neck area.

- Application of the proposed rehabilitation program (therapeutic massage and rehabilitation exercises) to individuals suffering from chronic muscle spasm of the neck muscles.

- Paying attention to early detection of chronic neck muscle spasms has a positive role in preventing the condition from worsening and determining early treatment in its early stages, which reduces the effort expended by the therapist and the patient and increases the likelihood of treatment and complete recovery.

- Pay attention to doing some rehabilitation exercises for the neck muscles area every hour if the work requires bending and tilting the neck for long periods of time.

- The necessity of paying attention to practicing any sporting activity due to its effective impact on the body's motor system in particular and the rest of the body's systems in general.

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