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**The Effect of Passive Manual Kinesiotherapy in Short
and Midterm Management of Patients with Chronic
Neck Pain**

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**The Effect of Passive Manual Kinesiotherapy in Short and
Midterm Management of Patients with Chronic Neck Pain**

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Midterm Management of Patients with Chronic Neck Pain**

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Dedication

I dedicate this dissertation to my parents, for their inspiration and encouragement. I also dedicate this dissertation to my wife, for her unwavering support and to my wonderful family for being my source of joy and hope for the future.

Declaration

This thesis was submitted in partial fulfillment of the requirement for the Master's degree in physiotherapy.

I declare that the content of this thesis (or any part of the same) has not been submitted for a higher degree to any other university or institution.

Mohammed Amjad Mohammed Saadi Salayma

Signed: [Salayma](#)

Date: 18-7-2023

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The Effect of Passive Manual Kinesiotherapy in Short and Midterm Management of Patients with Chronic Neck Pain

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Abstract:

Background Chronic neck pain (CNP) is one of the most common musculoskeletal disorders in this time that affects individuals' daily life. Thus, different manual therapy techniques were used to manage CNP without consideration of all underlying structures. However a little literature is known about this subject.

Objective This study aims to investigate the short and midterm effectiveness of suggested holistic approaches on patients with CNP.

Methods Fifteen patients with CNP enrolled in one group. A randomized controlled trial was adopted, and the experimental group underwent to Passive oriented manual kinesiotherapy techniques for two weeks. The cervical spine range of motion, muscle strength, and muscle endurance were all assessed. Neck Disability Index (NDI) as a primary functional outcome measure. Visual analog scale, CAROM, and Modified Sphygmomanometer were used to study and investigate the effect of the suggested program.

Result The suggested therapeutic intervention for the management of CNP leads to significant improvement in the clinical, physical, and functional. Initially, the utilized treatment methods led to fast improvements in clinical and physical aspects of neck mobility at the end of each therapeutic session. the rate of improvement gradually slowed down.

The progressive passive to active manual kinesiotherapy techniques found effective in reducing pain intensity, increasing pain-free range of motion, and in improving muscle strength in neck mobility.

Conclusion: The hot packs, classical massage, Maitland mobilization, and active exercises, results in significant improvements of clinical, physical, and functional aspects among patients with chronic neck mobility.

Keywords: Chronic Neck pain, Exercise, Mobilization, Massage.

دراسة لتأثير العلاج اليدوي والحركي في التأثير القصير والمتوسط الامد على مرضى آلام الرقبة المزمنة

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ملخص عن الدراسة باللغة العربية

مقدمة: آلام الرقبة المزمنة (CNP) هي إحدى أكثر اضطرابات الجهاز العضلي الهيكلي شيوعاً في هذا الوقت والتي تؤثر على جودة حياة الأفراد اليومية. ولذلك تم استخدام تقنيات العلاج اليدوي لعلاج آلام الرقبة. ومع ذلك، ليس هناك الكثير من المعلومات المتاحة حتى الان حول هذا الموضوع.

الهدف: تهدف هذه الدراسة إلى التحقق من فعالية النهج الشامل المقترح في المدى القصير والمتوسط على المرضى الذين يعانون من الام الرقبة المزمنة.

منهج الدراسة: تم مشاركة خمسة عشر مريضاً مصاباً بآلام الرقبة المزمنة في مجموعة واحدة، وقام المشاركون بتطبيق تقنيات العلاج اليدوي المطبق من المعالج لمدة أسبوعين. تم تقييم شدة الألم والمدى الحركي للرقبة وقوة العضلات والمؤشر الوظيفي للعجز الحركي في للرقبة NDI لدراسة واستكشاف تأثير البرنامج المقترح.

النتائج: أدى التدخل العلاجي المقترح لإدارة آلام الرقبة المزمنة إلى تحسين كبير في الجوانب السريرية والبدنية والوظيفية للمرضى. في البداية، أدت طرق العلاج المستخدمة إلى تحسن سريع في الجوانب السريرية والبدنية في منطقة الرقبة مع نهاية كل جلسة علاج، ومع استمرار البرنامج، بدأ معدل التحسن يبطأ تدريجياً.

تم التوصل إلى أن تقنيات العلاج اليدوي التدريجي المستخدمة فعالة في تقليل شدة الألم وزيادة المدى الحركي الخالي من الألم في منطقة الرقبة. وفي التحسن الوظيفي العام لحركة المريض اثناء نشاط حياته اليومي.

الاستنتاجات: يؤدي العلاج المقترح لإدارة آلام الرقبة المزمنة، والذي يشمل الكمادات الساخنة، والتدليك التقليدي، وتحريك ميتلاند، والتمارين العلاجية، إلى تحسن كبير في الجوانب السريرية والبدنية والوظيفية للمرضى .

المصطلحات: آلام الرقبة المزمنة، التمرين العلاجي، الحركة، التدليك.

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List of abbreviations

- CNP: Chronic Neck pain.
- MKTs: Manual Kinesiotherapy Techniques
- CM: Classic massage
- BMI: Body Mass Index
- VAS: Visual Analog Scale
- NDI: Neck Disability Index
- Passive Oriented Manual Kinesiotherapy Techniques: Techniques that applied passively (Passive stretch, Classic massage, Maitland).

Chapter One: Introduction

- 1.1 Background**
- 1.2 Problem Statement**
- 1.3 Study Justification**
- 1.4 Study objectives**
- 1.5 Study hypotheses**
- 1.6 Study fields**
- 1.7 Terminology**

Chapter one: Introduction

1.1 Background

Neck pain is widely spread in the population. the majority of cases involving acute neck pain tend to improve spontaneously, with or without treatment. Nonetheless, a subset of patients may persistently experience some level of pain or frequent episodes(Cohen, 2015). Chronic neck pain (CNP) is one of the most common musculoskeletal disorders that affects individuals' daily life. CNP described as symptoms persist for more than 12 weeks form assessment(Cohen, 2015). CNP recently is considered as the fourth cues of disability(Van Halm-Lutterodt, 2020). A number of 2860 million people is estimated as suffering from disabilities due to neck pain in 2017 worldwide(Safiri, Kolahi, Hoy, et al., 2020). The onset and course of neck pain is affected by personal and environmental factors (Mansournia, 2019). CNP may be followed by a restricted range of motion and a particular feeling of stiffness. In addition, there are different treatments used to manage the CNP that is include pain medications, neck exercises, heat therapy, postural changes, spinal manipulation, massage therapy, acupuncture, and manual kinesiotherapy. Manual Kinesiotherapy (MKT) is a specialized area for the management of musculoskeletal conditions. Actually, Static stretching (SS), Classic Massage (CM), and Mobilization are categorized under the umbrella of Manual Therapy Techniques.

Static stretching is widely used. It is considered as a helpful technique for muscles. Stretching is supposed to provide many physical benefits including improved flexibility, injury prevention, improved muscle or athletic performance, improved running economy, promotion of healing and possibly decreased of set of muscle soreness(H., 1979).

A different modality applied for functional recovery and pain relief in the dealing of CNP is massage therapy with a variation of soft tissue techniques(Patel et al., 2012).

Although the precise mechanism of action of massage therapy remains unclear, it is believed to operate through various theoretical mechanisms. These include pain reduction through the gate-control mechanism, enhancement of lymph flow, regulation of circulatory systems, normalization of muscle tone by reducing spasms, softening of adhesions, and improvement in the mobility of soft tissues(Bakar et al., 2014),(Field, 1998). While massage therapy is considered safe and potentially advantageous in the treatment of chronic neck pain (CNP), numerous studies have indicated that its effectiveness is still uncertain. Consequently, further clinical trials are required to validate and establish the true effects of massage therapy in treating CNP(Patel et al., 2012),(Sherman et al., 2009). Classic massage (CM) is a hands-on massage technique primarily employed for the treatment of musculoskeletal disorders. It effectively alleviates neck pain by providing pain relief and enhancing the range of motion in the neck. During the massage therapy sessions, special attention was given to the neck area, with a specific focus on the upper trapezius, erector spine, and levator scapulae muscles. The technique employed followed the Swedish approach and lasted around 20 minutes. It involved three cycles of gentle stroking (effleurage), kneading, and another round of effleurage, all applied with moderate pressure. The participant received the massage while lying in a comfortable and face-down position(Bakar et al., 2014).

Mobilization is one of the manual therapy techniques that deal with orthogenic dysfunction. It is work to facilitate accessory movement that's occurring in joint. It could applied passively or actively.

Maitland's techniques involve the application of passive and accessory oscillatory movements to spinal and vertebral joints to treat pain and stiffness.

These techniques are selected based on logical thinking by which each treatment is handling a specified structure. One addition to the validity of these common techniques could be the idea of having a sequence for applying treatment approaches and deals with musculoskeletal structures. A little literature is done on using holistic approaches in clinics and how sequences of the applied techniques may affect the improvement of patients. Consequently, this study investigates a holistic approach and the validity of certain techniques with a certain sequence on patients with CNP.

1.2 Problem Statement

In fact, neck pain is considered to be one of the important topics that are still under debate on how to treat it. It is hard to find chronic neck pain caused by one reason, within 12 weeks many consequences are taking place on the neck structures. Now a days physiotherapist are witnessing endless choices of techniques to manage CNP. The literature found doesn't discuss the idea of a holistic approach depending on type and logical sequence of indicated techniques "protocol".

1.3 Study Rational:

Each approach understands and treats pathology from a different angle. Clients may present a wide variety of symptoms and pathologies. In fact, applying comprehensive approaches that fulfill the client's needs is really crucial. Bringing this idea to the present context, scholarly literature shows that these comprehensive techniques have not been reported in practical experiences. After tracking this line of research, it was found that applying a set of comprehensive approaches on CNP has not been addressed before.

1.4 Study Objectives:

- To measure the short-term effect of the passive oriented approaches on neck ROM, head alignment, muscle endurance and strength, among patients with CNP.
- To assess the midterm effect of passive oriented manual kinesiotherapy protocol on the functional status of patients with CNP.

1.5 Study Hypothesis:

- The passive oriented manual kinesiotherapy therapy is effective on short-term management of pain, neck movements ROM, and muscle strength, among patients with CNP.
- Passive oriented manual kinesiotherapy therapy is effective on mid-term management of functional activities among patients with CNP.

1.6 Study fields:

1.6.1 Humanitarian field: Male patients with CNP.

1.6.2 Time field:

January to May 2023

1.6.3 Place field:

Sha'ban Center in Hebron / Palestine.

Chapter Two: Literature Review

2.1 Theoretical Framework

2.1.1 Definition

2.1.2 Incidence and prevalence

2.1.3 Anatomy and Physiology

2.1.4 Pathophysiology of chronic neck pain (CNP)

2.1.5 Main causes of chronic neck pain (CNP)

2.1.6 Risk factors of CNP

2.1.7 Signs and Symptoms of CNP

2.1.8 Physical therapy role in CNP management

2.2 Similar Studies

Chapter Two: Literature Review

2.1 Theoretical framework

Chronic Pain defines cervical spinal pain as "pain perceived anywhere in the posterior region of the cervical spine, from the superior nuchal line to the first thoracic spinous process". Pain is classified as chronic when it has a duration of 12 weeks or more (Van Halm-Lutterodt, 2020). Chronic neck pain often presents as widespread hyperalgesia on palpation and in both passive and active movements in neck and shoulder area (PMC2943658, n.d.).

2.1.1 Definition

Neck pain is defined as discomforting sensation, either sensory or emotional, associated with real or possible damage to the tissues in the neck area. It typically originates from the upper nuchal line and extends along the vicinity of the scapular spine, occasionally radiating to the head, trunk, and upper limbs (Ishaq et al., 2023). Chronic neck pain is characterized as neck pain that persists for three months or more (Chung & Jeong, 2018).

2.1.2 Incidence and prevalence

According to a study called The Global Burden of Disease, which covered 195 countries worldwide, neck pain was ranked as the fourth most commonly reported musculoskeletal issue (Safiri, Kolahi, Smith, et al., 2020). The prevalence of chronic neck pain (CNP) exceeds 30% of the population (Cohen, 2015).

Moreover, over the past 25 years, there has been a significant increase in the occurrence of CNP, making it one of the leading causes of disability among adult patients (Hurwitz et al.,

2018). However, specific data regarding the prevalence of chronic neck pain in Palestine is currently unavailable.

2.1.3 Anatomy and Physiology

The cervical portion of the spinal column comprises seven vertebrae that span from the base of the skull (C1 or Atlas vertebra) to the thoracic region (C7). Within the cervical vertebrae, there are six intervertebral discs (IVD) that separate them. These cervical IVDs are comparatively smaller than those found in other regions of the spine, mainly because the cervical area experiences less load-bearing stress (H., 1979).

2.1.4 Pathophysiology of chronic neck pain (CNP)

The pathophysiology of chronic neck pain (CNP) is complex and multifactorial, involving various biological, mechanical, and psychosocial factors. Here are some key aspects of the pathophysiology of CNP supported by recent evidence-based research:

1. Neural sensitization: Studies have indicated that chronic neck pain is associated with increased neural sensitization, where the nerves in the neck become more sensitive to stimuli, including mechanical, chemical, and thermal factors (Snodgrass et al., 2014). This heightened neural sensitivity can contribute to the persistence of pain and increased pain perception in individuals with CNP.
2. Muscular abnormalities: Evidence suggests that individuals with CNP may exhibit muscular abnormalities, such as muscle imbalances, reduced muscle strength, and altered muscle activation patterns (Falla et al., 2017). These muscular dysfunctions can

lead to impaired control and coordination of the neck muscles, contributing to pain and functional limitations.

3. **Structural changes:** Chronic neck pain may be associated with structural changes in the cervical spine, including disc degeneration, facet joint osteoarthritis, and spinal stenosis (Yin & Bogduk, 2008). These structural alterations can affect the biomechanics of the neck and contribute to pain generation and reduced spinal stability.
4. **Central sensitization:** Central sensitization, characterized by an amplification of pain signals in the central nervous system, has been implicated in the pathophysiology of CNP (Nijs et al., 2014). It involves changes in the processing of pain signals, leading to an increased sensitivity to pain and a lower pain threshold.
5. **Psychosocial factors:** Psychological and psychosocial factors, such as stress, anxiety, depression, and fear-avoidance beliefs, can influence the experience and persistence of CNP (Walton et al., 2013). These factors can interact with the biological mechanisms of pain and contribute to the development and maintenance of chronic neck pain.

2.1.5 Main causes of chronic neck pain (CNP)

The main causes of chronic neck pain, supported by evidence-based research, include:

1. **Mechanical factors:** Poor posture, repetitive movements, and awkward positions can contribute to the development of chronic neck pain (Holm et al., 2009).
2. **Musculoskeletal disorders:** Conditions such as cervical disc degeneration, cervical spondylosis, and osteoarthritis can lead to chronic neck pain (Carroll et al., 2009).
3. **Whiplash-associated disorders:** Neck injuries resulting from motor vehicle accidents, particularly whiplash, can cause persistent neck pain (Elliott et al., 2011).

4. Psychological factors: Psychological distress, including depression, anxiety, and stress, have been linked to the development and persistence of chronic neck pain (Fernández-de-Las-Peñas et al., 2007).
5. Work-related factors: Occupational factors such as high job demands, repetitive tasks, and poor ergonomics have been associated with an increased risk of chronic neck pain (Andersen et al., 2011).
6. Traumatic injuries: Falls, sports injuries, and other traumatic incidents can cause structural damage to the neck, leading to chronic pain (Andersen et al., 2011).
7. Central sensitization: The central nervous system's increased sensitivity to pain signals can contribute to the development and persistence of chronic neck pain (Woolf, 2011).

2.1.6 Risk factors of CNP

Redisposing risk factors for CNP include:

1. Age: Older age has been consistently identified as a risk factor for chronic neck pain, with the prevalence increasing as individuals get older (Nolet et al., 2015).
2. Female gender: Studies have shown that females are more likely to experience chronic neck pain compared to males (Carroll et al., 2009).
3. Poor psychosocial factors: Psychological factors such as high levels of stress, anxiety, depression, and low job satisfaction have been linked to an increased risk of developing chronic neck pain (Nolet et al., 2015; McLean et al., 2005).
4. Smoking: Smoking has been associated with an increased risk of chronic neck pain, possibly due to its negative effects on blood flow and tissue healing (Nolet et al., 2015).

5. Occupational factors: Jobs involving high physical demands, repetitive tasks, prolonged sitting, and poor ergonomic conditions have been identified as risk factors for chronic neck pain (Andersen et al., 2011).
6. Previous neck injuries: Individuals with a history of neck injuries, such as whiplash-associated disorders or previous neck trauma, are at an increased risk of developing chronic neck pain (Nolet et al., 2015).
7. Genetic factors: Some genetic factors have been implicated in the development of chronic neck pain, although further research is needed to understand the specific genes involved (Nolet et al., 2015).

2.1.7 Signs and Symptoms of CNP

1. Neck pain: Persistent or recurrent pain in the neck region is the primary symptom of CNP. The pain may be localized or radiate to the shoulders, head, or upper limbs (Cohen, 2015).
2. Stiffness and reduced range of motion: CNP can lead to stiffness and limited movement in the neck, making it difficult to turn or tilt the head fully (Bier et al., 2018).
3. Muscle tenderness and spasms: Tender points and muscle spasms in the neck area are common in CNP. These can contribute to increased pain and discomfort (Fernández-de-Las-Peñas et al., 2007).
4. Headaches: CNP is often associated with headaches, particularly tension-type headaches or cervicogenic headaches that originate from the neck (Cohen, 2015).

5. Fatigue and sleep disturbances: Chronic pain can lead to fatigue and sleep disturbances, affecting overall energy levels and quality of sleep (Fernández-de-Las-Peñas et al., 2007).
6. Psychological distress: CNP can be associated with psychological symptoms such as anxiety and depression. The presence of psychological distress can worsen pain perception and impact overall well-being (Cohen, 2015).
7. Functional limitations: CNP may restrict daily activities and functional abilities, such as difficulty in performing work-related tasks, driving, or engaging in physical activities (Bier et al., 2018).

2.1.8 Physical therapy role in CNP management

1. Exercise therapy: Therapeutic exercises tailored to the individual's specific needs and abilities have been shown to be effective in reducing pain and improving neck function in CNP (Bahat, Watt, et al., 2020).
2. These exercises may include stretching, strengthening, and range of motion exercises targeting the neck and surrounding muscles.
3. Manual therapy: Various manual therapy techniques, such as joint mobilization, manipulation, and soft tissue mobilization, have demonstrated effectiveness in reducing pain and improving function in CNP (Farrell et al., 2016). Manual therapy can help restore joint mobility, alleviate muscle tension, and improve overall neck mechanics.
4. Posture correction and ergonomics: Addressing faulty posture and providing guidance on ergonomic modifications in daily activities and work environments have shown positive effects in managing CNP (Sihawong et al., 2016). This includes educating

individuals on proper sitting and standing posture, as well as recommending ergonomic adjustments to reduce strain on the neck.

5. Multimodal approaches: Combining different physical therapy interventions, such as exercise therapy, manual therapy, and modalities like heat or cold therapy, can enhance the effectiveness of CNP management (Bahat, Hadar, et al., 2020). Individualized treatment plans that incorporate multiple modalities have been found to yield better outcomes.

2.2 Similar Studies

Seyda et al. (2021) "there was an increase in rotation movements after applying cervical stabilization exercise and classical massage for patient with chronic neck pain (CNP), whereas kinesio taping + cervical stabilization exercise was superior in improving disability and QoL compared to CM + CSE". The primary goal of this study was to evaluate the effects of both KT and CM, in combination with CSE, on patients diagnosed with CNP (Celenay et al., 2021).

Buket B., et al (2017) discuss the impact of Sternocleidomastoid stretching and massage on kinesiophobia, pain intensity, range of motion, endurance, disability, and range of motion in individuals suffering from chronic neck pain (CNP). "This treatment may therefore be considered for use as an alternative method in treating CNP" (Büyükturan et al., 2021).

Harald, et al (2003) reported that massage therapy has the potential to be just as effective as SMC (standard medical care) in treating chronic pain syndromes. The researchers found that the positive effects of massage therapy were comparable to those of SMC, but they tended to be longer-lasting and more influential in psychological aspects. Since this study was a pilot, it is

important to replicate the results for confirmation, but the researchers believe that their findings could be valuable to other scientists conducting similar research(Walach et al., 2003).

J Wilke, et al (2014) The utilization of acupuncture alongside stretching exercises demonstrated potential as a viable treatment approach for enhancing cervical movement and reducing pain caused by trigger points in the short term. Nevertheless, further research is needed to better differentiate the effects of placebo in such interventions. The objective of this clinical trial was to assess the immediate efficacy of combining acupuncture with stretching in relieving pain and enhancing the range of motion among individuals suffering from cervical myofascial pain syndrome(Wilke et al., 2014).

The objective of this clinical trial was to assess the immediate efficacy of combining acupuncture with stretching in relieving pain and enhancing range of motion among individuals suffering from cervical myofascial pain syndrome. Syeda Nida ,et al (2020) The utilization of acupuncture alongside stretching exercises demonstrated potential as a viable treatment approach for enhancing cervical movement and reducing pain caused by trigger points in the short term. Nevertheless, further research is needed to better differentiate the effects of placebo in such interventions(Gillani et al., 2020).

In (2019) Yasin et, al revealed that both deep friction massage and static stretching were equally successful in reducing nonspecific neck pain by relieving pain and improving neck mobility. However, deep friction massage demonstrated superior effects in terms of reducing the Neck Disability Index (NDI). The objective of this study was to determine if two interventions produced comparable outcomes and whether one method could serve as a substitute for the other in terms of effectiveness(Yasin et al., 2019).

The aim of this research was to evaluate the impact of Maitland mobilization on individuals suffering from long-lasting neck pain caused by myofascial issues.

In (2021) Maryam Shabbir, et al indicated that the various grades (I-IV) of Maitland mobilization were successful in decreasing pain and enhancing the functional ability measured by the NDI scale, as well as increasing the range of motion in the cervical spine among patients with chronic myofascial neck pain(Shabbir et al., 2021).

In this research (2017), the effectiveness of joint mobilization and therapeutic exercise in treating functional limitations resulting from chronic neck pain was examined. Keun-Su Lee, et al revealed that applying joint mobilization and therapeutic exercise to address functional impairments caused by chronic neck pain significantly impacted various types of functional limitations(Lee & Lee, 2017).

This randomized controlled trial compared the effectiveness of Mulligan's SNAGs (spinal accessory nerve glides) and Maitland's Mobilization techniques in treating neck pain. Abdullah Al Shehri, et al (2018) suggest that both SNAGs and Maitland's Mobilization techniques are effective in alleviating neck pain symptoms. However, the Maitland's Mobilization group exhibited greater improvement compared to the SNAGs group. Based on these results, it is recommended that Maitland mobilization, combined with conventional therapy, be considered as the preferred treatment option for neck pain, rather than SNAGs with conventional therapy(Al Shehri et al., 2018).

Chapter Three: Methods and Procedures

3.1 Study Method and design

3.2 Study sample

3.2.1 Eligibility criteria

3.2.1.1 Inclusion criteria

3.2.1.2 Exclusion criteria

3.3 Tools Of Data collection

3.3.1 Study Variables

3.3.2 Tests and measurements

3.4 Suggested Intervention

3.5 Ethical approval

3.6 Study strengths

3.7 Study limitations

3.8 Statistical analysis

Chapter 3: Methods and Procedures

3.1 Study Method and design:

An experimental pre-posttest of one group design was adopted to achieve the objectives of this study.

3.2 Study Sample:

The eligible patients for the study were 15 males aged (18-58 years) with chronic neck pain. The patients were recruited by convenient sampling when they come to Sha'ban Center based on the suitability criteria. The participants were enrolled in Passive oriented MKTs group. Musculoskeletal, and functional assessment, was done to monitor the level of participant's intensity of pain, and physical and functional health before and after the application of the holistic approaches.

3.2.1 Eligibility criteria:

3.2.1.1 Inclusion criteria

- Males who aged from 18–58 years.
- Neck pain continued for at least the last 12 weeks.

3.2.1.2 Exclusion criteria:

- Vertebral fractures.
- Osteoporosis.

- Osteoarthritis.
- Rheumatoid arthritis.
- Upper motor neuron lesion (CVA...).
- Acute neck pain.
- Neck pain associated with vertigo.
- Postural deformities (hyper thoracic kyphosis...).
- Previous neck surgery.
- Red flags (Night pain, severe muscle spasm, loss of involuntary weight, symptom mismatch).

3.3 Tools of data collection

3.3.1 Study variables:

3.3.1.1 Manipulative independent variables:

- Passive oriented approach (Static stretch, Classic massage, and Maitland).

3.3.1.2 non-Manipulative independent variables:

- Anthropometric variable of study sample: Age, Total body Height, and weight, head and waist circumference.
- Ergonomic variables of sample patients: Type of work, duration of daily work, and total time of work.

3.3.1.3 Dependent variables:

- Pain severity and behavior “duration, irritating factors, release...”
- Neck movements ROM
- Muscle strength in Neck movements
- Functional disability among CNP patients.

3.3.2 Tests and measurements “Tools of data collection”

Clinically: Visual analog scale (VAS) for pain:

It's a measurement instrument used to determine pain intensity by patients on a horizontal line that describes the severity of pain from 0 to 100 mm, where 0 presents “painless” and 100 presents “the worst pain imaginable”(Price et al., 1983).

Physically:

Before and after each therapeutic session in the suggested therapeutic program, the following objective measurements applied to regularly quantify the short-term effect of the session:

- **CAROM**
A scientific instrument used to measure: flexion, extension, and ipsilateral and contralateral bending as well as ipsilateral and contralateral rotations of CNP with the cervical range of motion instrument (CROM). A previous study had revealed CROM's intrarater reliability with ICC3,1 ranging from 0.87 (95% CI, 0.76-0.95) to 0.94 (95% CI, 0.87-0.97)(Fletcher & Bandy, 2008).

- **Static Muscle strength and endurance**

- Modified Sphygmomanometer Dynamometer**

- MSD is a reliable instrument for the evaluation of isometric muscle strength in the neck in normal and symptomatic patients(Vernon et al., 1992).

- Functionally:**

- Post functional assessment by Neck Disability Index NDI**

- It's a scientific tool used to assess the neck pain during everyday life by questionnaire answered by patients. Neck pain scored by scale from 0 to 5 where 0 means “painless” and 5 means “the worst pain imaginable” for each 10 sections including, pain, personal care, weight gain, reading, headache, concentration, work, driving, sleeping, and leisure. The points allocated form each section are converted into a percentage that reflects the level of the disability, that are categorized as the following: 0–8%, without disability; 10–28%, mild; 30–48%, moderate; 50–64%, serious; and 70–100%, complete(Kovacs et al., 2008),(Cleland et al., 2006).

Neck Disability Index (NDI)

| NECK DISABILITY INDEX Dieser Fragebogen hilft ihrer Ärztin oder ihrem Arzt festzustellen, inwieweit Ihre Nackenschmerzen Ihren Alltag beeinflussen. Bitte wählen Sie aus jedem Abschnitt <i>eine einzige</i> Aussage aus. Wir sind uns bewusst, dass mehrere Aussagen pro Abschnitt auf Sie zutreffen können, doch bitten wir Sie, nur diejenige Aussage zu wählen, welche Ihre Situation am besten beschreibt. | |
|---|---|
| Abschnitt 1 - Schmerzintensität <input type="checkbox"/> Ich habe zurzeit keine Schmerzen. <input type="checkbox"/> Ich habe zurzeit nur sehr leichte Schmerzen. <input type="checkbox"/> Ich habe zurzeit mässige Schmerzen. <input type="checkbox"/> Ich habe zurzeit ziemlich starke Schmerzen. <input type="checkbox"/> Ich habe zurzeit sehr starke Schmerzen. <input type="checkbox"/> Ich habe zurzeit die stärksten Schmerzen, die ich mir vorstellen kann. | Abschnitt 2 - Körperpflege (Waschen, Ankleiden usw.) <input type="checkbox"/> Ich kann meine Körperpflege wie gewohnt und ohne zusätzliche Schmerzen durchführen. <input type="checkbox"/> Ich kann meine Körperpflege wie gewohnt durchführen, doch verursacht dies zusätzliche Schmerzen. <input type="checkbox"/> Meine Körperpflege verursacht Schmerzen; ich führe sie langsam und vorsichtig durch. <input type="checkbox"/> Ich führe meine Körperpflege weitgehend selbständig durch, doch brauche ich bei einigen Tätigkeiten etwas Hilfe. <input type="checkbox"/> Ich brauche täglich Hilfe bei den meisten Tätigkeiten der Körperpflege. <input type="checkbox"/> Ich kann mich nicht ankleiden; es fällt mir schwer, mich zu waschen, und ich bleibe im Bett. |
| Abschnitt 3 - Lasten heben <input type="checkbox"/> Ich kann schwere Lasten ohne zusätzliche Schmerzen heben. <input type="checkbox"/> Ich kann schwere Lasten heben, doch verursacht dies zusätzliche Schmerzen. <input type="checkbox"/> Ich kann aufgrund der Schmerzen keine schweren Gegenstände vom Boden hochheben, doch schaffe ich es, wenn sie sich auf einer günstigen Höhe befinden, beispielsweise auf einem Tisch. <input type="checkbox"/> Ich kann aufgrund der Schmerzen keine schweren Lasten heben, doch kann ich mittelschwere und leichte Gegenstände heben, die sich auf einer günstigen Höhe befinden. <input type="checkbox"/> Ich kann nur ganz leichte Lasten heben. <input type="checkbox"/> Ich kann überhaupt nichts heben oder tragen. | Abschnitt 4 - Lesen <input type="checkbox"/> Ich kann so lange lesen, wie ich will, ohne Nackenschmerzen zu bekommen. <input type="checkbox"/> Ich kann so lange lesen, wie ich will, und habe dabei leichte Nackenschmerzen. <input type="checkbox"/> Ich kann so lange lesen, wie ich will, und habe dabei mässige Nackenschmerzen. <input type="checkbox"/> Ich kann wegen mässiger Nackenschmerzen nicht so lange lesen, wie ich will. <input type="checkbox"/> Ich kann wegen starker Nackenschmerzen kaum lesen. <input type="checkbox"/> Ich kann überhaupt nicht lesen. |
| Abschnitt 5 - Kopfschmerzen <input type="checkbox"/> Ich habe keine Kopfschmerzen. <input type="checkbox"/> Ich habe selten auftretende, leichte Kopfschmerzen. <input type="checkbox"/> Ich habe selten auftretende, mässige Kopfschmerzen. <input type="checkbox"/> Ich habe häufig auftretende, mässige Kopfschmerzen. <input type="checkbox"/> Ich habe häufig auftretende, starke Kopfschmerzen. <input type="checkbox"/> Ich habe fast immer Kopfschmerzen. | Abschnitt 6 - Konzentration <input type="checkbox"/> Ich kann mich problemlos voll konzentrieren, wann immer ich will. <input type="checkbox"/> Ich kann mich mit leichten Schwierigkeiten voll konzentrieren, wann immer ich will. <input type="checkbox"/> Es fällt mir ziemlich schwer, mich zu konzentrieren. <input type="checkbox"/> Es fällt mir sehr schwer, mich zu konzentrieren. <input type="checkbox"/> Es bereitet mir grösste Mühe, mich zu konzentrieren. <input type="checkbox"/> Ich kann mich überhaupt nicht konzentrieren. |
| Abschnitt 7 - Arbeit <input type="checkbox"/> Ich kann so viel arbeiten, wie ich will. <input type="checkbox"/> Ich kann meine gewohnte Arbeit erledigen, jedoch nicht mehr. <input type="checkbox"/> Ich kann meine gewohnte Arbeit grösstenteils erledigen, jedoch nicht mehr. <input type="checkbox"/> Ich kann meine gewohnte Arbeit nicht erledigen. <input type="checkbox"/> Ich kann kaum arbeiten. <input type="checkbox"/> Ich kann überhaupt nicht arbeiten. | Abschnitt 8 - Autofahren <input type="checkbox"/> Ich kann ohne Nackenschmerzen Auto fahren. <input type="checkbox"/> Ich kann so lange Auto fahren, wie ich will, und habe dabei leichte Nackenschmerzen. <input type="checkbox"/> Ich kann so lange Auto fahren, wie ich will, und habe dabei mässige Nackenschmerzen. <input type="checkbox"/> Ich kann wegen mässiger Nackenschmerzen nicht so lange Auto fahren, wie ich will. <input type="checkbox"/> Ich kann wegen starker Nackenschmerzen kaum Auto fahren. <input type="checkbox"/> Ich kann überhaupt nicht Auto fahren. |
| Abschnitt 9 - Schlafen <input type="checkbox"/> Ich kann problemlos schlafen. <input type="checkbox"/> Mein Schlaf ist sehr leicht gestört (ich liege weniger als 1 Stunde wach). <input type="checkbox"/> Mein Schlaf ist leicht gestört (ich liege 1-2 Stunden wach). <input type="checkbox"/> Mein Schlaf ist mässig gestört (ich liege 2-3 Stunden wach). <input type="checkbox"/> Mein Schlaf ist stark gestört (ich liege 3-5 Stunden wach). <input type="checkbox"/> Mein Schlaf ist völlig gestört (ich liege 5-7 Stunden wach). | Abschnitt 10 - Freizeit <input type="checkbox"/> Ich kann ohne Nackenschmerzen allen meinen Freizeitaktivitäten nachgehen. <input type="checkbox"/> Ich kann trotz meiner Nackenschmerzen allen meinen Freizeitaktivitäten nachgehen. <input type="checkbox"/> Ich kann trotz meiner Nackenschmerzen den meisten meiner gewohnten Freizeitaktivitäten nachgehen. <input type="checkbox"/> Ich kann wegen meiner Nackenschmerzen nur wenigen meiner gewohnten Freizeitaktivitäten nachgehen. <input type="checkbox"/> Ich kann wegen meiner Nackenschmerzen kaum irgendwelchen Freizeitaktivitäten nachgehen. Ich kann überhaupt keinen Freizeitaktivitäten nachgehen. |
| Ich kann Frage __ nicht beantworten weil... Ich kann Frage __ nicht beantworten weil... | |

3.4 Suggested Intervention:

A comprehensive program based on Active and Passive oriented approach used to manage physical and functional limitations among patients with CNP.

The program continues for two weeks, at the rate of 3 sessions in the first week and 4 sessions in the second week for 50 minutes duration in each session.

First week focused on pain management. 10 minutes hot pack warm up in both groups, slowly active movements in range free of pain for 5 minutes before and after applying massage techniques for 20 minutes, stretching techniques cooling down for 5 minutes, and 5 minutes mobilization techniques.

Second week will be more physical and functional oriented facilitation and training. As mentioned before but with expanding time to 10 minutes for applying each stretching and mobilization techniques. Whereas, decreasing massage techniques for 10 minutes.

| January to May 2023 | week one | | | | week two | | | |
|--------------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|---|
| | session 1 | session 2 | session 3 | session 4 | session 5 | session 6 | session 7 | |
| Eligibility before initiate to study | ✓ | | | | | | | |
| Informed consent | ✓ | | | | | | | |
| Allocation | ✓ | | | | | | | |
| Pre-test measures | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Treatment | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Post-test measures | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Statistical analysis | | | | | | | | ✓ |

- ☒ Red color expresses pain severity, neck movement ROM, static muscle strength and endurance, functional level and quality of life. Whereas, green color expresses all mentioned before accepting functional level and quality of life.

| Sessions number | Passive Oriented Group |
|-----------------|--|
| Session 1 to 3 | <ol style="list-style-type: none"> 1. Active movements in range free of pain (ROFP)→5m 2. Classic massage→20m 3. Active movements in (ROFP)→5m 4. Passive stretch→ 5m 5. Maitland→5m |
| Session 4 | <ol style="list-style-type: none"> 1. Active movements in range free of pain (ROFP)→2.5m 2. Classic massage→15m 3. Active movements in (ROFP)→2.5m 4. Passive stretch→ 7.5m 5. Maitland→7.5m 6. Exercise (static > motive > resistive)→5m |
| Session 5 | <ol style="list-style-type: none"> 1. Active movements in range free of pain (ROFP)→2.5m 2. Classic massage→10m 3. Active movements in (ROFP)→2.5m 4. Passive stretch→ 7.5m 5. Maitland→7.5m 6. Exercise (static > motive > resistive)→10m |
| Session 6 | <ol style="list-style-type: none"> 1. Active movements in range free of pain (ROFP)→2.5m 2. Classic massage→5m 3. Active movements in (ROFP)→2.5m 4. Passive stretch→ 7.5m 5. Maitland→7.5m 6. Exercise (static > motive > resistive)→15m |
| Session 7 | <ol style="list-style-type: none"> 1. Classic massage→5m 2. Active movements in (ROFP)→2.5m 3. Passive stretch→ 7.5m 4. Maitland→5m 5. Exercise (static > motive > resistive)→20m |

Pain management.
 Focus on ROM
 Facilitation of physical and functional ability

- ☒ 10 minutes Hot pack is a warming up modality for starting all sessions.

3.5 Ethical Considerations

Ethical approval was obtained from the central research ethical committee REC at Al-Quds University, consent form was signed by each participant in the study sample before the formal participation in the study. See appendix V for the REC letter from AQU.

3.6 Study strengths

1. The study serves as a foundational step towards developing a comprehensive therapeutic approach that addresses the various factors contributing to chronic neck pain, specifically focusing on the different structures of the cervical spine. By identifying and understanding these contributing factors, the study lays the groundwork for designing targeted interventions that alleviate chronic neck pain and improve patient outcomes in a short period.
2. The Study investigates the physical aspect as short-term effect of pre-post intervention in every session for chronic neck pain. Regular pre-post assessments provide a comprehensive picture of the patient's progress over time. It allows healthcare professionals to monitor changes in pain levels, range of motion, muscle strength, or other physical indicators, facilitating effective tracking of treatment efficacy and adjusting the intervention.
3. Functional assessment was used in the mid-term effect of the suggested protocol.

3.7 Study limitations

1. The long-term effects of the intervention were not obtained within the scope of this research. For instance, there was no examination of patients' progression after a specific

period of time at the end of the applied intervention. Thus, the study did not assess the sustained impact of the intervention over an extended period of time.

2. The findings of this study might better represent the population if a larger sample size had been recruited. leading to better statistical validity and greater generalizability of study results.
3. The absence of a control group presents a challenge in accurately assessing the actual effects of the intervention under investigation.
4. The absence of females makes it difficult to compare how the suggested therapeutic program differently affects females compared to males.

3.8 Statistical analysis

Nonparametric Descriptive statistical tests “frequencies and ratios” and charts were used to describe the qualitative - demographic, medical history and working variables of study sample, Central tendency measures “means” and dispersion measures “standard deviation” of parametric descriptive statistics were used to describe the level of anthropometric measurements, physical variables and the summated functional variables in pre and posttests of interventional group. Inferential statistical tests of repeated measure ANOVA and chi-square were used to test hypothesis concerning the mean and the rank difference in the interventional group, respectively in physical and functional data of both the baseline “pretest” and the posttest data.

Chapter Four:

Results presentation, Analysis and Discussion

4.1 Results presentation and analysis

4.1.1 descriptive statistics of study sample

4.1.2 Comparative results between pre & posttest data of pain intensity in each session of the program

4.1.3 Comparative results between pre & posttest data of neck movements ROM in each session of the suggested program

4.1.4 Comparative results between pre & posttest data of neck movements strength in each session of the suggested program

4.1.5 Comparative results between pre & posttest data in parameters of functional activities among study patients

4.2 Results Discussion

Chapter Four: Results presentation, Analysis and Discussion

4.1 Results presentation and analysis

4.1.1 Descriptive statistics of study sample

Table4.1 Shows descriptive statistics of demographic and Ergonomic variables among study patients

| | | Count | Column N % | X ² (sig) |
|--------------------------|--------------------------|-------|------------|----------------------|
| Gender | male | 15 | 100.0% | 1.00 |
| | female | 0 | 0.0% | |
| Living site | city | 13 | 86.7% | |
| | village | 2 | 13.3% | |
| | camp | 0 | 0.0% | |
| Marital status | married | 7 | 46.7% | .796 |
| | single | 8 | 53.3% | |
| | divorced | 0 | 0.0% | |
| | widow | 0 | 0.0% | |
| Work type | builder | 1 | 6.7% | .984 |
| | office worker | 3 | 20.0% | |
| | engineer | 2 | 13.3% | |
| | upholstered | 1 | 6.7% | |
| | shoemaker | 1 | 6.7% | |
| | electrician | 1 | 6.7% | |
| | auto mechanic | 1 | 6.7% | |
| | medical student | 1 | 6.7% | |
| | chef | 1 | 6.7% | |
| | cashier | 1 | 6.7% | |
| | physiotherapist | 1 | 6.7% | |
| | medical laboratory | 1 | 6.7% | |
| Weight categories | low(60-75) | 6 | 40.0% | .549 |
| | Normal(76-90) | 3 | 20.0% | |
| | High(91-103) | 6 | 40.0% | |
| BMI Categories | Normal(18-26) | 8 | 53.3% | .796 |
| | Overweight(>27) | 7 | 46.7% | |
| Diagnosis | myofascial pain syndrome | 9 | 60% | .439 |
| | Facet joint | 6 | 40% | |

There was no significant difference between the categories of all the matched nominal demographic, and ergonomic variables .

Table4.2 Shows descriptive statistics of Anthropometric measurements among study patients

| | N | Mean | Std. Deviation |
|------------------------|----|--------|----------------|
| Age | 15 | 30.80 | 11.353 |
| Duration of daily work | 15 | 8.20 | 2.336 |
| Total of work | 15 | 193.33 | 58.937 |
| Weight | 15 | 83.83 | 13.152 |
| Height | 15 | 176.07 | 6.638 |
| Head Circumference | 15 | 57.100 | 3.3817 |
| Waist Circumference | 15 | 98.667 | 13.3666 |

The above table ensures that SDs are less than the matched means.

4.1.2 Comparative results between pre & posttest data of pain intensity in each session of the program

Table 4.3 Shows descriptive statistics and the significance of mean difference in pain intensity along the pre-posttests of the seven therapeutic sessions.

| | VAS Mean pre | Std.D | VAS Mean post | Std.D | Mean Difference | Sig.b |
|----------------|--------------|-------|---------------|-------|-----------------|-------------|
| Session1 | 5.73 | 1.033 | 4.20 | 1.568 | 1.533* | .018 |
| Session2 | 3.80 | 1.781 | 3.07 | 1.751 | .733 | .288 |
| Session3 | 3.07 | 2.187 | 2.00 | 1.464 | 1.067 | .553 |
| Session4 | 2.47 | 1.060 | 1.40 | .986 | 1.067 | .067 |
| Session5 | 1.67 | 1.047 | .93 | 1.163 | .733 | 1.000 |
| Session6 | 1.20 | 1.265 | .80 | 1.146 | .400 | .779 |
| Session7 | .60 | .828 | .53 | .834 | .067 | 1.000 |
| VAS1_ VAS7post | 5.73 | 1.033 | .60 | .828 | 5.200* | .000 |

The table above shows the mean and standard deviation of pain intensity with a higher value (M=5.73, SD=1.033) before intervention and a lower value after intervention, where a decrease in the intensity of pain was observed (M=.53, SD=.834) . No significant mean difference observed between the pre-posttests of all sessions except the first one (1.533) with P<.018. Whereas, there was a high mean difference (5.200*) and strong significance P<.000 in pre and post-intervention.

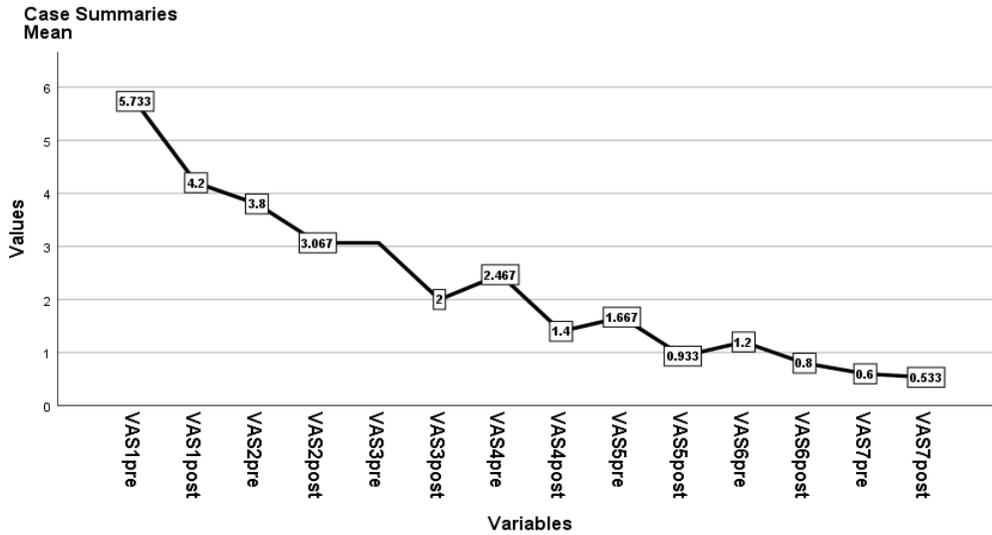


Chart 4.1: Describes the VAS mean along the pre and posttests of the seven therapeutic sessions.

Table 4.4 shows the results of Repeated –Measures ANOVA through the pre-posttests of pain intensity along the seven therapeutic sessions.

| Source | | Type III Sum of Squares | df | Mean Square | F | Sig. | PES | Observed Power ^a |
|--------|---------------------------|-------------------------|--------------|----------------|---------------|-------------|-------------|-----------------------------|
| VAS | Sphericity Assumed | 471.790 | 13 | 36.292 | 36.307 | .000 | .722 | 1.000 |
| | Greenhouse-Geisser | 471.790 | 3.169 | 148.884 | 36.307 | .000 | .722 | 1.000 |
| | Huynh-Feldt | 471.790 | 4.204 | 112.228 | 36.307 | .000 | .722 | 1.000 |
| | Lower-bound | 471.790 | 1.000 | 471.790 | 36.307 | .000 | .722 | 1.000 |

A repeated-measures ANOVA was performed to compare the effect of the suggested therapeutic program on pain intensity during the seven sessions. There was a statistically significant difference ($F=36.307, p < .000$).

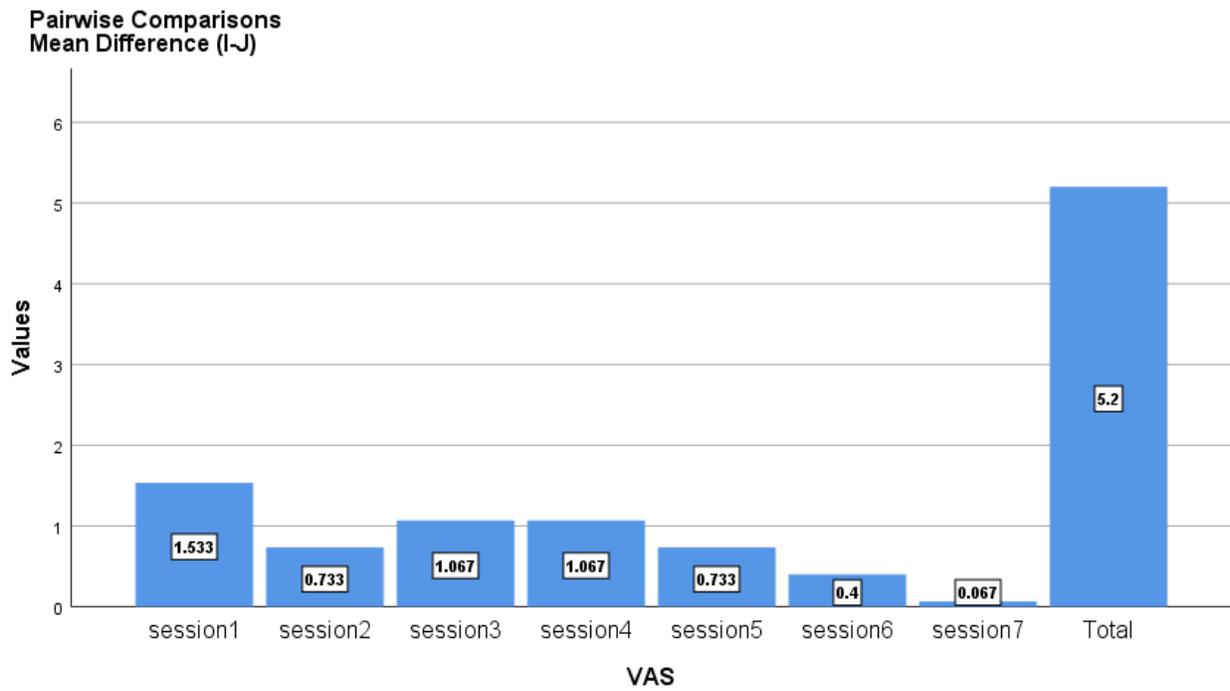


Chart 4.2: Describes the mean difference as improvement of pain intensity between the pre and posts tests along the seven therapeutic sessions.

4.1.3 Comparative results between pre & posttest data of neck movements ROM in each session of the suggested program

Table4.5 Shows descriptive statistics, and the significance of mean difference in ROM along the pre-posttests of the seven therapeutic sessions.

| | Mean pre | Std.D | Mean post | Std.D | Mean Difference | Sig |
|------------|----------|-------|-----------|-------|-----------------|-------|
| CF.ROM1 | 49.80 | 8.402 | 55.73 | 9.917 | -5.933 | .129 |
| CF.ROM2 | 58.40 | 8.043 | 60.87 | 8.400 | -2.467 | 1.000 |
| CF.ROM3 | 61.33 | 7.432 | 63.73 | 8.154 | -2.400 | 1.000 |
| CF.ROM4 | 63.20 | 7.599 | 64.53 | 6.781 | -1.333 | 1.000 |
| CF.ROM5 | 61.80 | 8.178 | 65.27 | 6.649 | -3.467 | .426 |
| CF.ROM6 | 64.80 | 7.360 | 65.80 | 6.247 | -1.000 | 1.000 |
| CF.ROM7 | 65.47 | 6.739 | 65.73 | 6.453 | -.267 | 1.000 |
| CE.ROM1 | 58.93 | 9.684 | 65.27 | 7.146 | -6.333 | .060 |
| CE.ROM2 | 64.13 | 6.685 | 68.20 | 5.480 | -4.067 | .319 |
| CE.ROM3 | 66.53 | 5.502 | 69.07 | 5.637 | -2.533 | 1.000 |
| CE.ROM4 | 69.40 | 6.367 | 69.73 | 6.250 | -.333 | 1.000 |
| CE.ROM5 | 68.80 | 7.033 | 71.00 | 7.161 | -2.200 | 1.000 |
| CE.ROM6 | 70.13 | 7.577 | 70.60 | 6.812 | -.467 | 1.000 |
| CE.ROM7 | 70.67 | 7.287 | 71.00 | 7.121 | -.333 | 1.000 |
| CRtLB.ROM1 | 40.47 | 8.417 | 50.53 | 9.149 | -10.067 | .000 |
| CRtLB.ROM2 | 50.33 | 8.423 | 54.60 | 6.936 | -4.267 | .048 |
| CRtLB.ROM3 | 52.73 | 6.766 | 56.93 | 8.689 | -4.200 | 1.000 |
| CRtLB.ROM4 | 56.07 | 7.156 | 58.47 | 5.817 | -2.400 | 1.000 |
| CRtLB.ROM5 | 57.00 | 6.633 | 58.13 | 6.446 | -1.133 | 1.000 |
| CRtLB.ROM6 | 57.07 | 7.695 | 58.80 | 6.549 | -1.733 | .452 |
| CRtLB.ROM7 | 59.67 | 7.547 | 60.93 | 8.093 | -1.267 | 1.000 |
| CLtLB.ROM1 | 47.00 | 5.632 | 52.33 | 6.914 | -5.333 | .069 |
| CLtLB.ROM2 | 51.20 | 5.074 | 56.47 | 5.153 | -5.267 | .008 |
| CLtLB.ROM3 | 55.80 | 5.797 | 58.93 | 5.035 | -3.133 | 1.000 |
| CLtLB.ROM4 | 56.60 | 4.940 | 58.47 | 5.449 | -1.867 | 1.000 |
| CLtLB.ROM5 | 59.60 | 6.379 | 60.80 | 7.341 | -1.200 | 1.000 |
| CLtLB.ROM6 | 59.20 | 8.205 | 61.07 | 6.892 | -1.867 | 1.000 |
| CLtLB.ROM7 | 61.00 | 7.309 | 62.20 | 8.073 | -1.200 | 1.000 |
| CRtR.ROM1 | 62.40 | 9.553 | 70.40 | 6.674 | -8.000 | .011 |
| CRtR.ROM2 | 72.47 | 6.022 | 75.67 | 5.486 | -3.200 | .175 |
| CRtR.ROM3 | 74.00 | 5.412 | 76.93 | 5.612 | -2.933 | .018 |

| | | | | | | |
|------------------|-------|--------|-------|-------|--------|-------|
| CRtR.ROM4 | 76.67 | 5.615 | 79.33 | 5.420 | -2.667 | .923 |
| CRtR.ROM5 | 77.20 | 6.516 | 79.40 | 4.748 | -2.200 | 1.000 |
| CRtR.ROM6 | 78.40 | 5.462 | 79.20 | 4.648 | -.800 | 1.000 |
| CRtR.ROM7 | 79.40 | 5.514 | 80.47 | 5.579 | -1.067 | 1.000 |
| CLtRROM1 | 61.93 | 7.732 | 66.00 | 6.059 | -4.067 | 1.000 |
| CLtRROM2 | 67.67 | 10.356 | 72.93 | 9.369 | -5.267 | 1.000 |
| CLtRROM3 | 71.47 | 4.719 | 75.67 | 5.287 | -4.200 | .085 |
| CLtRROM4 | 73.67 | 5.420 | 76.80 | 5.735 | -3.133 | .331 |
| CLtRROM5 | 76.87 | 5.604 | 78.27 | 6.193 | -1.400 | .978 |
| CLtRROM6 | 77.47 | 6.435 | 78.40 | 5.792 | -.933 | 1.000 |
| CLtRROM7 | 79.07 | 5.750 | 80.33 | 5.287 | -1.267 | 1.000 |

The above table presents the descriptive statistics “mean and standard deviation” of physical data “cervical range of motion” at pre-posttests along the seven sessions. For post-intervention to every session, the mean for cervical flexion, cervical extension, cervical right lateral bending, Cervical left lateral bending, right rotation, and Cervical left rotation, showed that mean values were greater than the mean values of pre-intervention in all variables. According to the "mean difference and sig value" for all cervical movements, there were no mean differences and statistical significance except the CRtLB and CRtR in the first session, CLtLB in the second session, and CRtR in the third session.

Table4.6 shows the results of Repeated –Measures ANOVA through the pre-posttests of ROM along the seven therapeutic sessions.

| Source | Measure | Type III Sum of Squares | df | Mean Square | F | Sig | PES | Observed Power ^a | |
|--------|---------|-------------------------|----------|-------------|----------|--------|------|-----------------------------|-------|
| Tests | CF | Sphericity Assumed | 4086.614 | 13 | 314.355 | 21.514 | .000 | .606 | 1.000 |
| | | Greenhouse-Geisser | 4086.614 | 3.581 | 1141.044 | 21.514 | .000 | .606 | 1.000 |
| | CE | Sphericity Assumed | 2247.429 | 13 | 172.879 | 8.724 | .000 | .384 | 1.000 |
| | | Greenhouse-Geisser | 2247.429 | 2.709 | 829.733 | 8.724 | .000 | .384 | .985 |
| | CRB | Sphericity Assumed | 5466.514 | 13 | 420.501 | 24.889 | .000 | .640 | 1.000 |

| | | | | | | | | | |
|------------|--|---------------------------|-----------------|--------------|-----------------|---------------|-------------|-------------|--------------|
| | | Greenhouse-Geisser | 5466.514 | 4.486 | 1218.575 | 24.889 | .000 | .640 | 1.000 |
| CLB | | Sphericity Assumed | 3724.514 | 13 | 286.501 | 23.890 | .000 | .631 | 1.000 |
| | | Greenhouse-Geisser | 3724.514 | 4.065 | 916.312 | 23.890 | .000 | .631 | 1.000 |
| CRR | | Sphericity Assumed | 4583.224 | 13 | 352.556 | 23.042 | .000 | .622 | 1.000 |
| | | Greenhouse-Geisser | 4583.224 | 4.702 | 974.679 | 23.042 | .000 | .622 | 1.000 |
| CLR | | Sphericity Assumed | 5873.429 | 13 | 451.802 | 24.577 | .000 | .637 | 1.000 |
| | | Greenhouse-Geisser | 5873.429 | 4.434 | 1324.688 | 24.577 | .000 | .637 | 1.000 |

A repeated-measures ANOVA was performed to compare the effect of the suggested therapeutic program on ROM during the seven sessions. There was a statistically significant difference in all cervical ROM ($p < .000$). The Partial Eta Squared in all movements was approximately arranged (from .606 to .640) except CE (.384). Also, the observed power was (1.000) in all movements except CE with (.985).

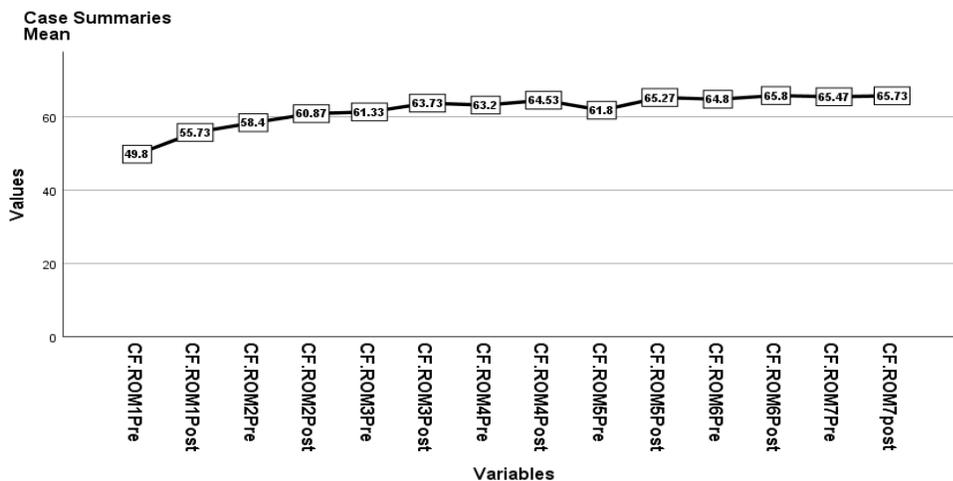


Chart 4.3: Describes the cervical flexion ROM mean along the pre and posttests of the seven therapeutic sessions.

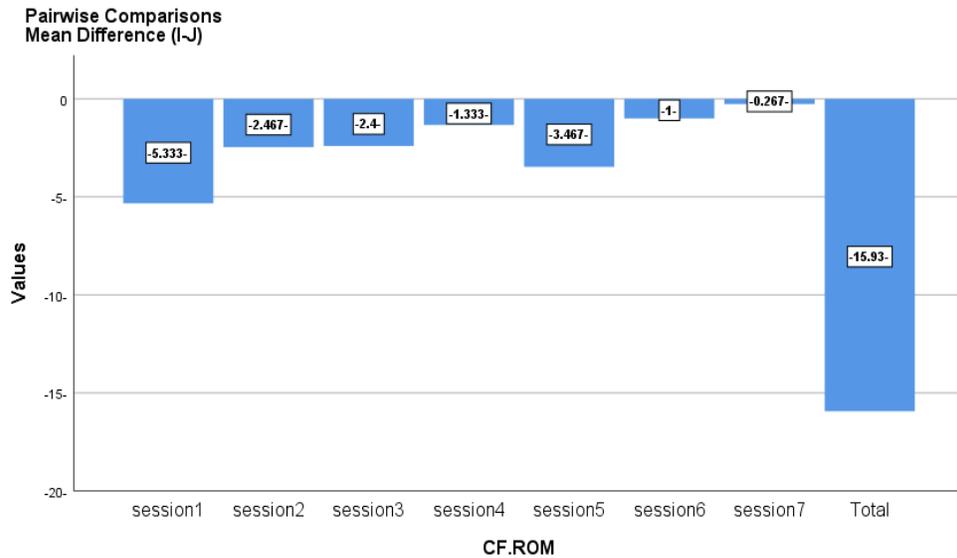


Chart 4.4: Describes the mean difference “improvement” in cervical Flexion ROM along the subsequent sessions of the suggest program.

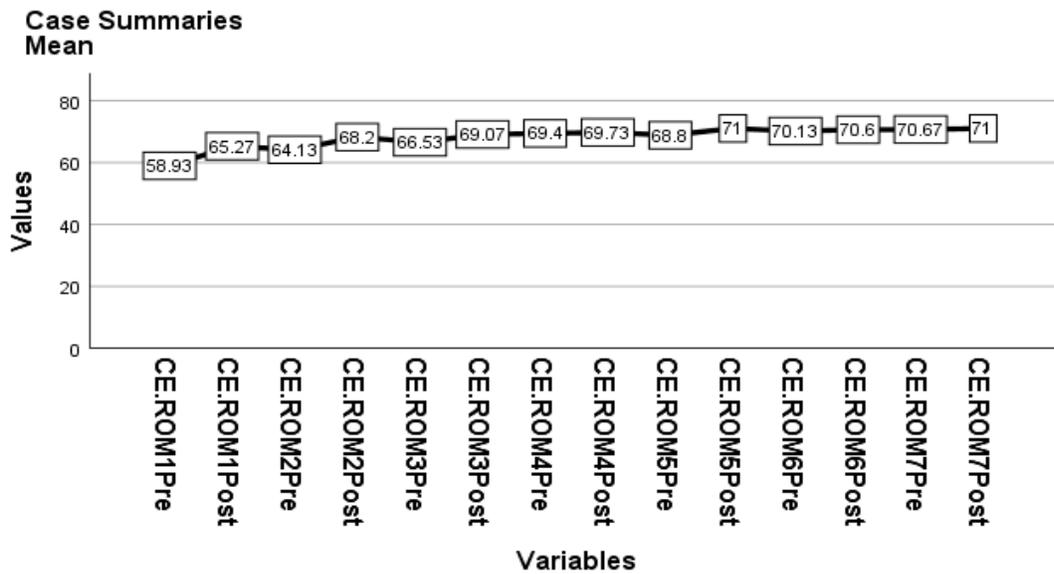


Chart 4.5: Describes the cervical extension ROM mean along the pre and posttests of the seven therapeutic sessions.

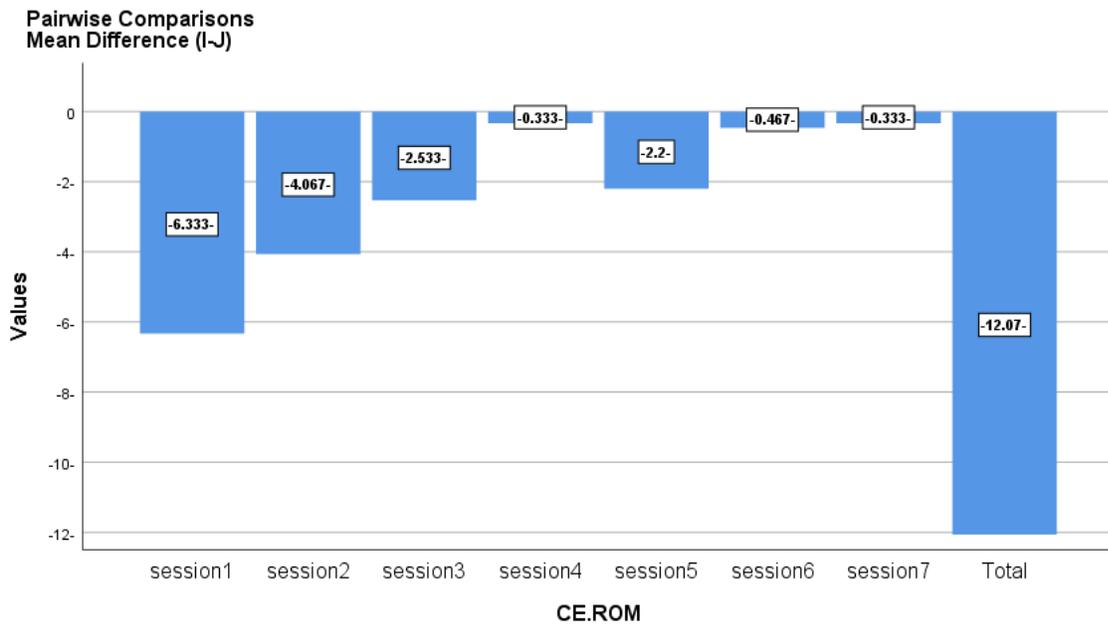


Chart 4.6: Describes the mean difference as improvement of cervical extension ROM between the pre and posts tests along the seven therapeutic sessions.

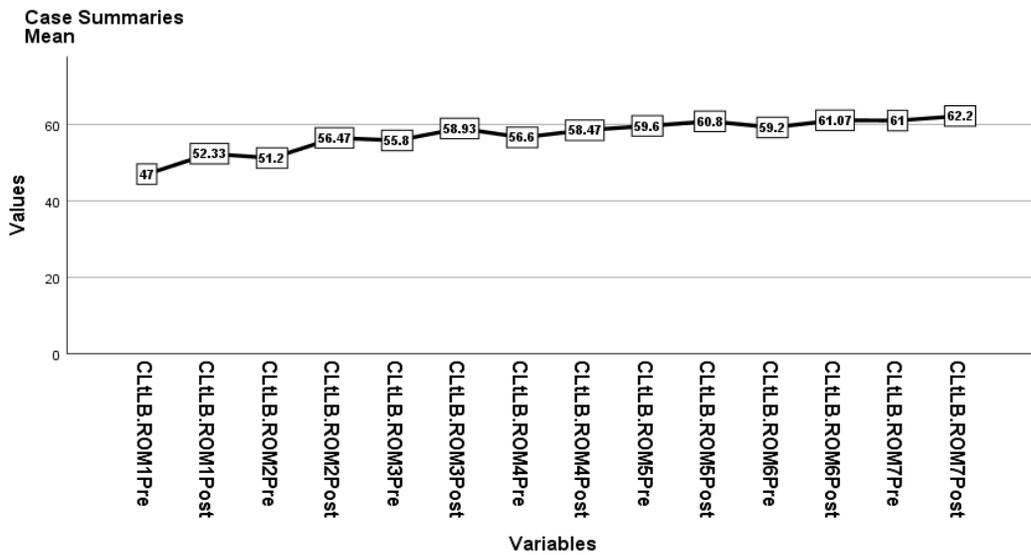


Chart 4.7: Describes the cervical left bending ROM mean along the pre and posttests of the seven therapeutic sessions.

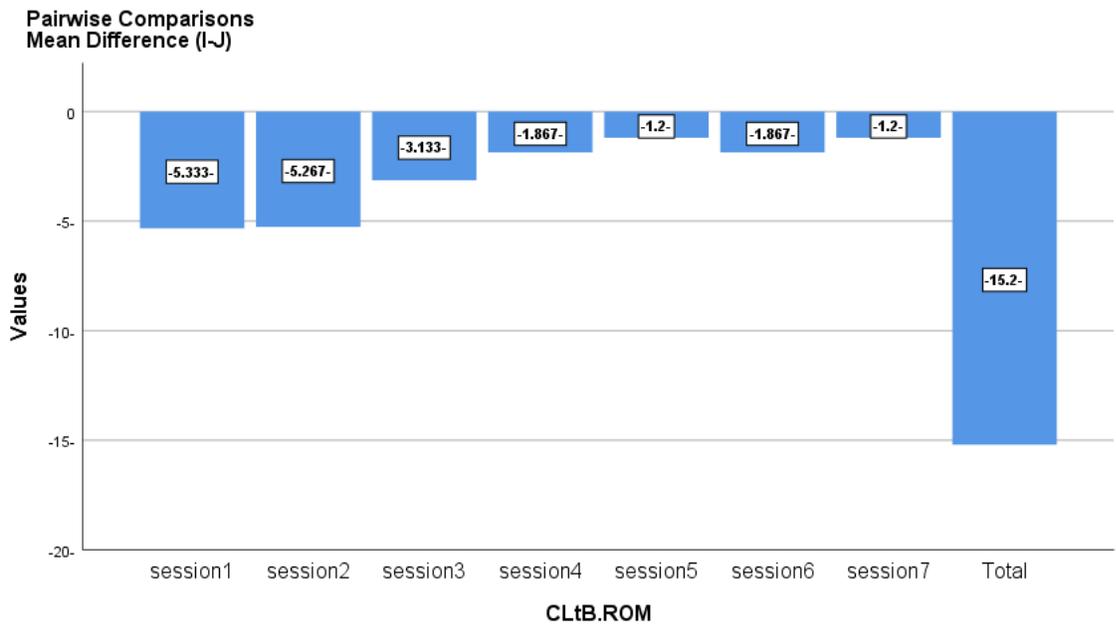


Chart 4.8: Describes the mean difference as improvement of cervical left bending ROM between the pre and posts tests along the seven therapeutic sessions.

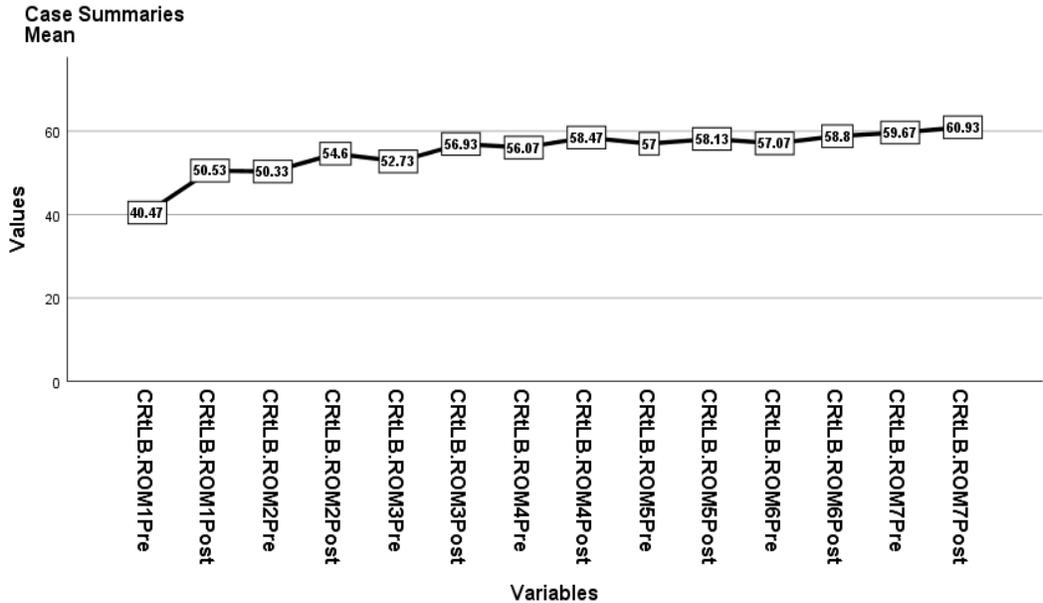


Chart 4.9: Describes the cervical right bending ROM mean along the pre and posttests of the seven therapeutic sessions.

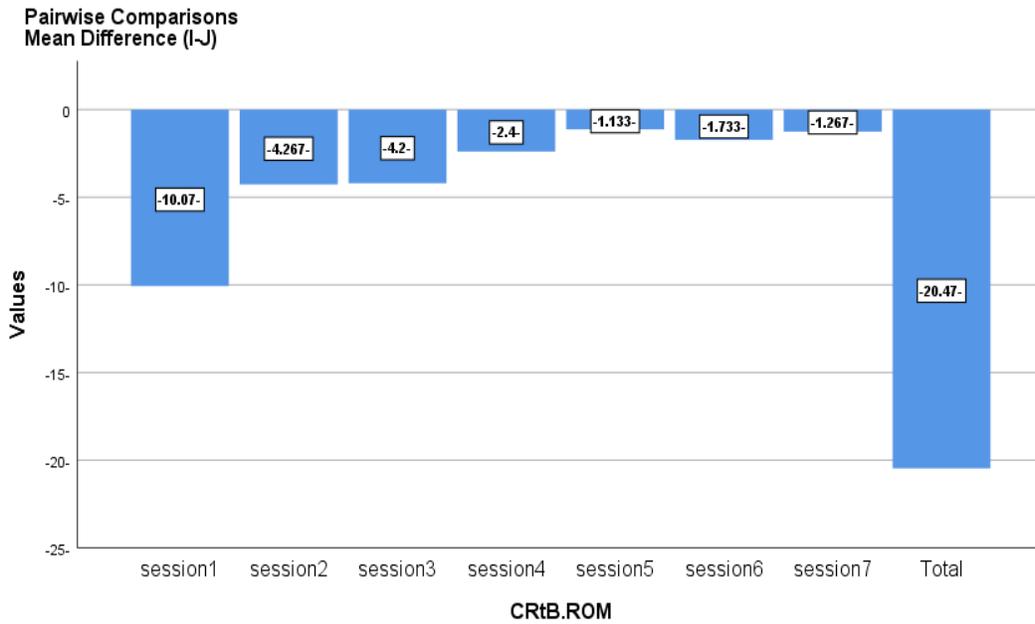


Chart 4.10: Describes the mean difference as improvement of cervical right bending ROM between the pre and posts tests along the seven therapeutic sessions.

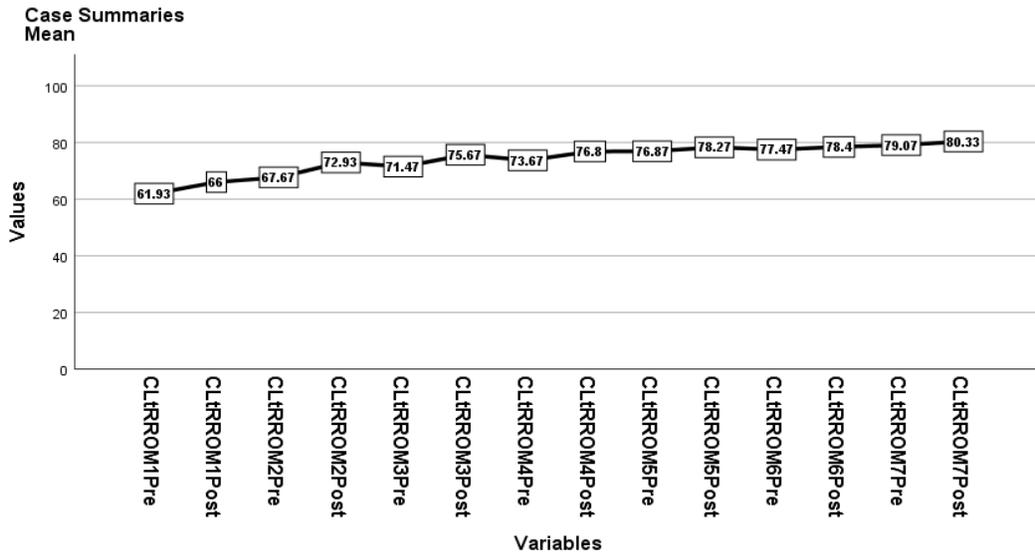


Chart 4.11: Describes the cervical left rotation ROM mean along the pre and posttests of the seven therapeutic sessions.

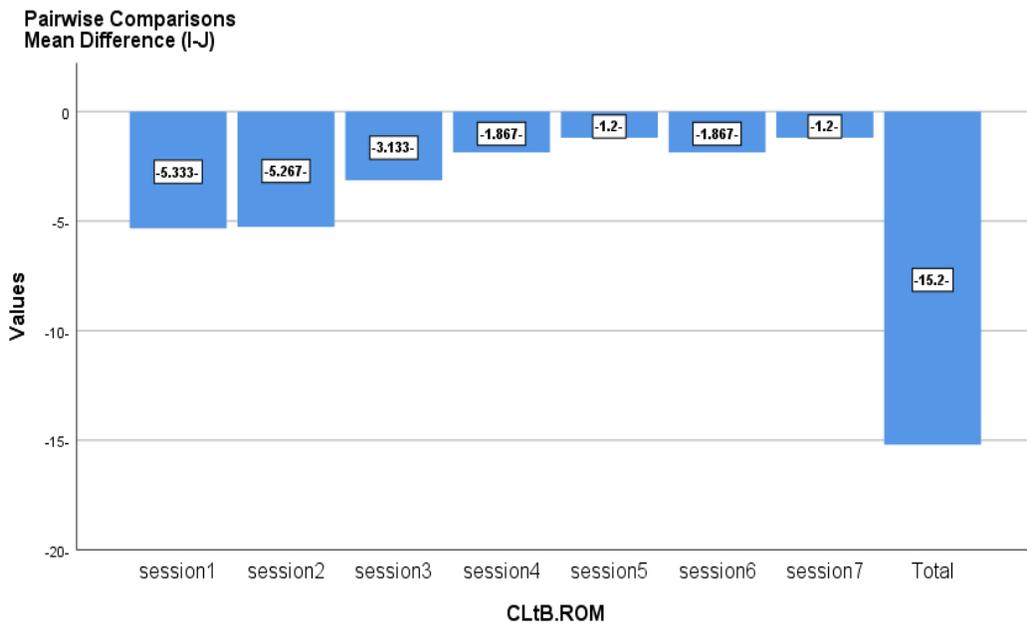


Chart 4.12: Describes the mean difference as improvement of cervical left bending ROM between the pre and posts tests along the seven therapeutic sessions.

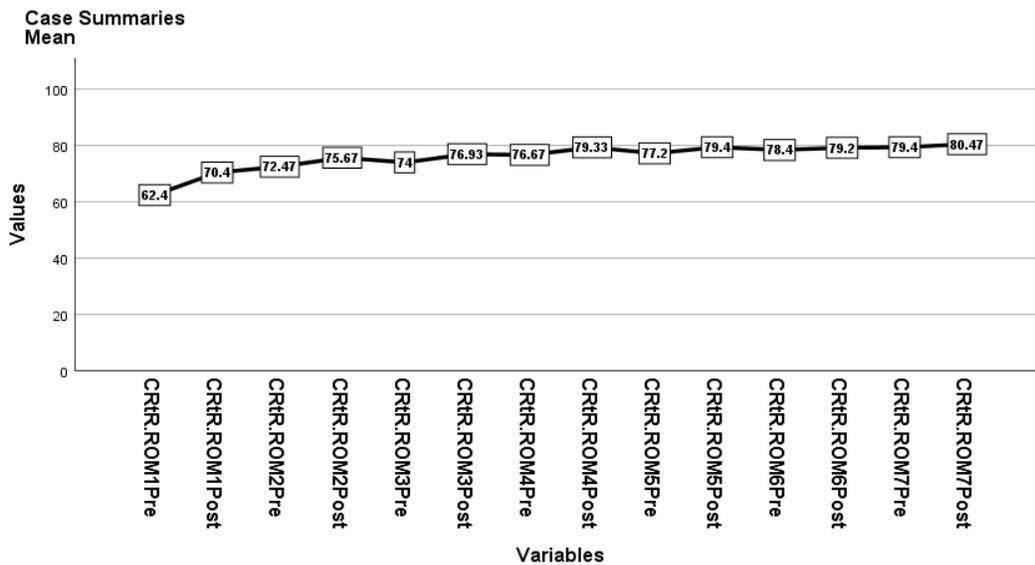


Chart 4.13: Describes the cervical right rotation ROM mean along the pre and posttests of the seven therapeutic sessions.

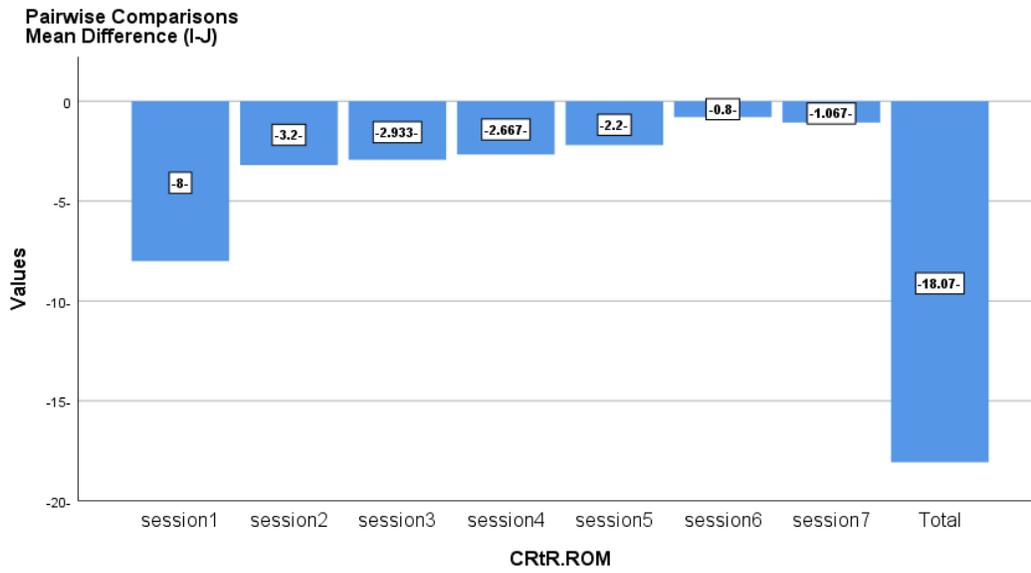


Chart 4.14: Describes the mean difference as improvement of cervical right rotation ROM between the pre and posts tests along the seven therapeutic sessions.

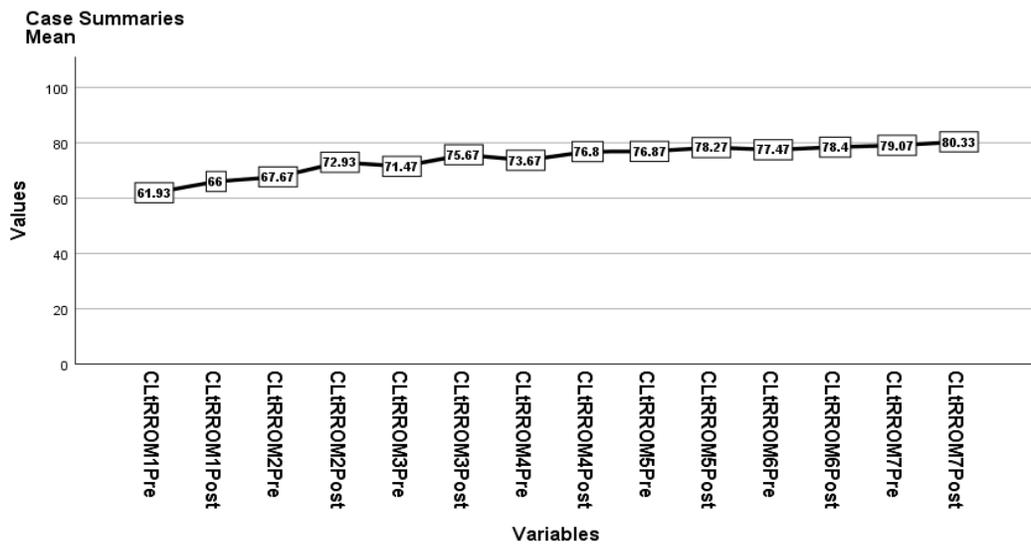


Chart 4.15: Describes the cervical left rotation ROM mean along the pre and posttests of the seven therapeutic sessions.

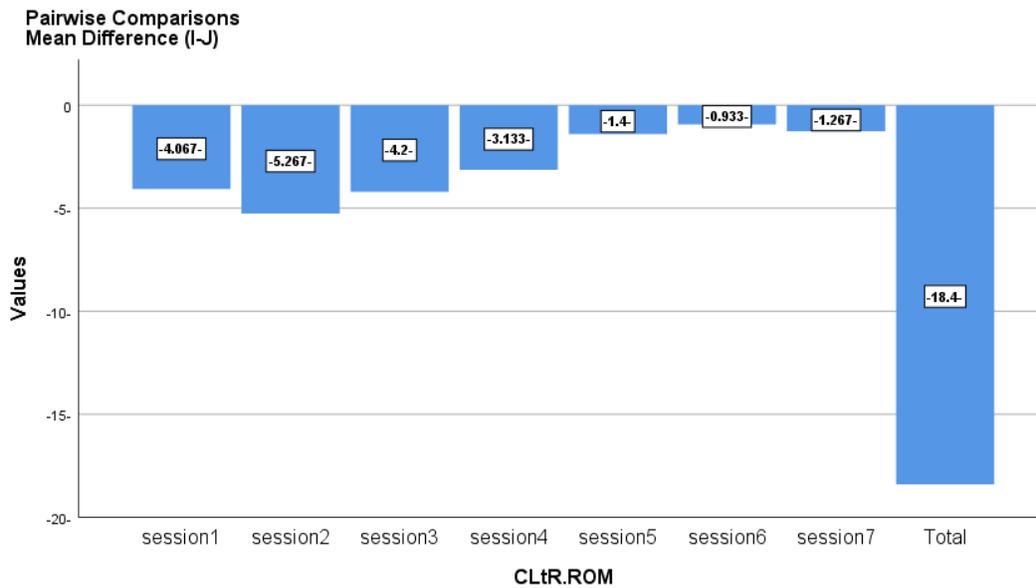


Chart 4.16: Describes the mean difference as improvement of cervical left rotation ROM between the pre and posts tests along the seven therapeutic sessions.

Table 4.7: Illustrates the C.ROM total mean improvement in posttest results of RM ANOVA between the pre-post measures in the suggested program.

| pre-post intervention | Mean Difference | Sig. |
|-----------------------|-----------------|------|
| CF.ROM1-7 | -15.933 | .000 |
| CE.ROM1-7 | -12.067 | .093 |
| CRLB.ROM1-7 | -20.467 | .000 |
| CLLB.ROM1-7 | -15.200 | .000 |
| CRR.ROM1-7 | -18.067 | .000 |
| CLRRROM1-7 | -18.400 | .000 |

The mentioned table above explains there were a mean difference and significance in all cervical movements $P < .000$, except the Cervical Extension (-12.067) with $P < .093$.

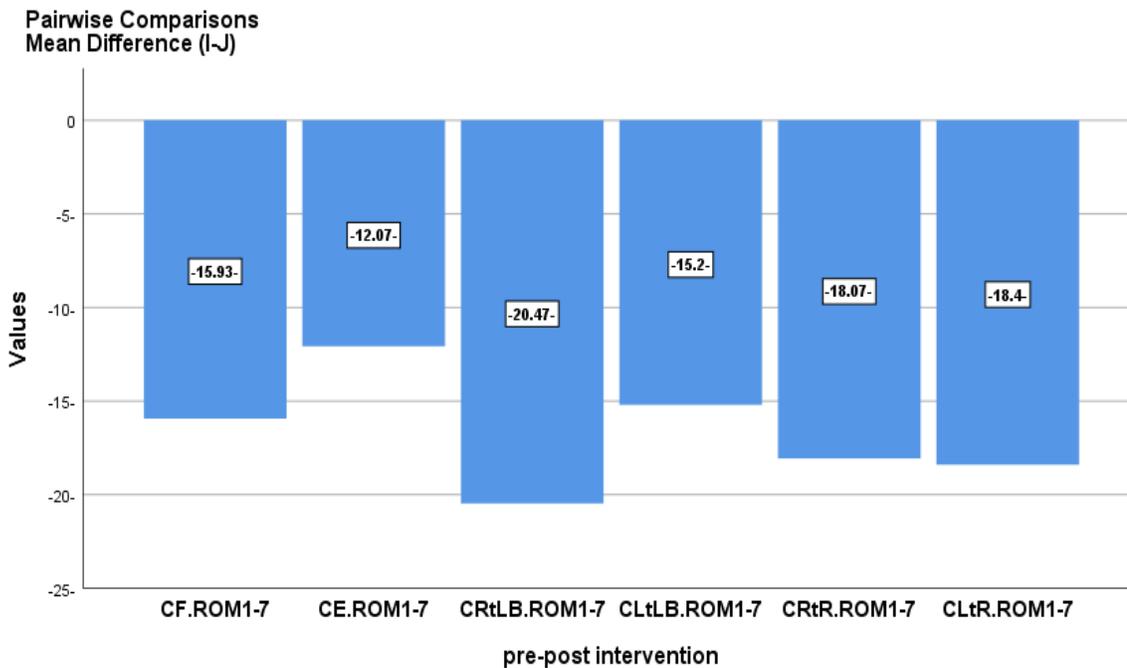


Chart 4.17: Describes all cervical ROM mean difference pre-post the therapeutic program.

4.1.4 Comparative results between pre & posttest data of neck movements strength in each session of the suggested program

Table 4.8: Shows descriptive statistics, and the significance of mean difference in MVIC along the pre-posttests of the seven therapeutic sessions.

| | Mean pre | Std.D | Mean post | Std.D | Mean Difference | Sig.b |
|----------|----------|--------|-----------|--------|-----------------|-------|
| CF.MVIC1 | 96.13 | 22.756 | 106.60 | 26.742 | -10.467 | .839 |
| CF.MVIC2 | 118.67 | 24.599 | 124.00 | 30.718 | -5.333 | 1.000 |
| CF.MVIC3 | 129.53 | 32.516 | 137.40 | 34.653 | -7.867 | .559 |
| CF.MVIC4 | 139.07 | 36.599 | 145.40 | 35.753 | -6.333 | .766 |
| CF.MVIC5 | 146.47 | 34.405 | 150.33 | 37.301 | -3.867 | 1.000 |
| CF.MVIC6 | 153.00 | 34.596 | 157.33 | 37.885 | -4.333 | 1.000 |
| CF.MVIC7 | 163.40 | 33.509 | 165.33 | 35.278 | -1.933 | 1.000 |
| CE.MVIC1 | 95.80 | 27.742 | 99.13 | 26.400 | -3.333 | 1.000 |

| | | | | | | |
|---------------------|--------|--------|--------|--------|---------|-------|
| CE.MVIC2 | 113.53 | 26.981 | 120.07 | 33.480 | -6.533 | 1.000 |
| CE.MVIC3 | 125.47 | 35.492 | 131.67 | 34.756 | -2.533 | 1.000 |
| CE.MVIC4 | 135.87 | 37.996 | 139.20 | 38.892 | -8.466 | 1.000 |
| CE.MVIC5 | 141.40 | 35.173 | 148.00 | 35.525 | -6.600 | .211 |
| CE.MVIC6 | 150.33 | 35.075 | 152.60 | 39.095 | -2.267 | 1.000 |
| CE.MVIC7 | 159.20 | 37.076 | 160.33 | 36.862 | -1.133 | 1.000 |
| C.RtLB.MVIC1 | 90.47 | 25.354 | 100.73 | 22.821 | -10.267 | .120 |
| C.RtLB.MVIC2 | 105.73 | 26.228 | 112.27 | 28.589 | -6.533 | 1.000 |
| C.RtLB.MVIC3 | 115.73 | 25.695 | 123.53 | 30.178 | -7.800 | 1.000 |
| C.RtLB.MVIC4 | 123.47 | 29.677 | 131.00 | 33.400 | -7.533 | .103 |
| C.RtLB.MVIC5 | 128.80 | 29.511 | 133.40 | 29.966 | -4.600 | 1.000 |
| C.RtLB.MVIC6 | 132.00 | 29.209 | 141.67 | 33.617 | -9.667 | 1.000 |
| C.RtLB.MVIC7 | 145.47 | 32.713 | 147.53 | 33.814 | -2.067 | 1.000 |
| C.LtLB.MVIC1 | 91.20 | 22.098 | 102.07 | 23.001 | -10.867 | .318 |
| C.LtLB.MVIC2 | 109.80 | 22.898 | 113.53 | 24.012 | -3.733 | 1.000 |
| C.LtLB.MVIC3 | 113.87 | 25.994 | 121.00 | 27.269 | -7.133 | .932 |
| C.LtLB.MVIC4 | 122.13 | 27.250 | 130.00 | 30.135 | -7.867 | 1.000 |
| C.LtLB.MVIC5 | 128.73 | 26.853 | 137.20 | 26.579 | -8.467 | .059 |
| C.LtLB.MVIC6 | 138.93 | 25.841 | 142.73 | 32.181 | -3.800 | 1.000 |
| C.LtLB.MVIC7 | 144.80 | 25.772 | 150.53 | 30.671 | -5.733 | 1.000 |
| CRtR.MVIC1 | 93.73 | 21.462 | 98.60 | 21.447 | -14.133 | .264 |
| CRtR.MVIC2 | 107.87 | 24.894 | 113.20 | 24.243 | -5.333 | 1.000 |
| CRtR.MVIC3 | 116.73 | 25.608 | 123.87 | 25.196 | -7.133 | 1.000 |
| CRtR.MVIC4 | 124.07 | 25.107 | 133.07 | 25.756 | -9.000 | .066 |
| CRtR.MVIC5 | 133.07 | 25.387 | 138.47 | 27.761 | -5.400 | 1.000 |
| CRtR.MVIC6 | 139.60 | 26.177 | 145.47 | 29.491 | -5.867 | 1.000 |
| CRtR.MVIC7 | 146.33 | 29.849 | 151.93 | 29.574 | -5.600 | .455 |
| CLtR.MVIC1 | 89.53 | 20.343 | 94.07 | 19.652 | -4.533 | 1.000 |
| CLtR.MVIC2 | 102.87 | 20.163 | 104.67 | 19.500 | -1.800 | 1.000 |
| CLtR.MVIC3 | 110.93 | 21.760 | 120.27 | 24.531 | -9.333 | .863 |
| CLtR.MVIC4 | 119.67 | 25.413 | 126.13 | 25.411 | -6.467 | .281 |
| CLtR.MVIC5 | 124.87 | 23.360 | 130.53 | 23.268 | -5.667 | 1.000 |
| CLtR.MVIC6 | 131.60 | 22.264 | 134.20 | 25.655 | -2.600 | 1.000 |
| CLtR.MVIC7 | 140.93 | 23.091 | 145.80 | 25.075 | -4.867 | 1.000 |

Regarding the above Table 5.1 the descriptive statistics “mean and standard deviation” of physical data “Maximum voluntary isometric contraction” at pre-posttest along the seven sessions. For post-intervention to every session, the mean for cervical flexion, cervical extension, cervical right lateral bending, Cervical left lateral bending, right rotation, and Cervical left rotation, showed that mean values were greater than the mean values of pre-intervention in all variables. According to the "mean difference and sig value" for all cervical movements, there were no mean differences and statistical significance.

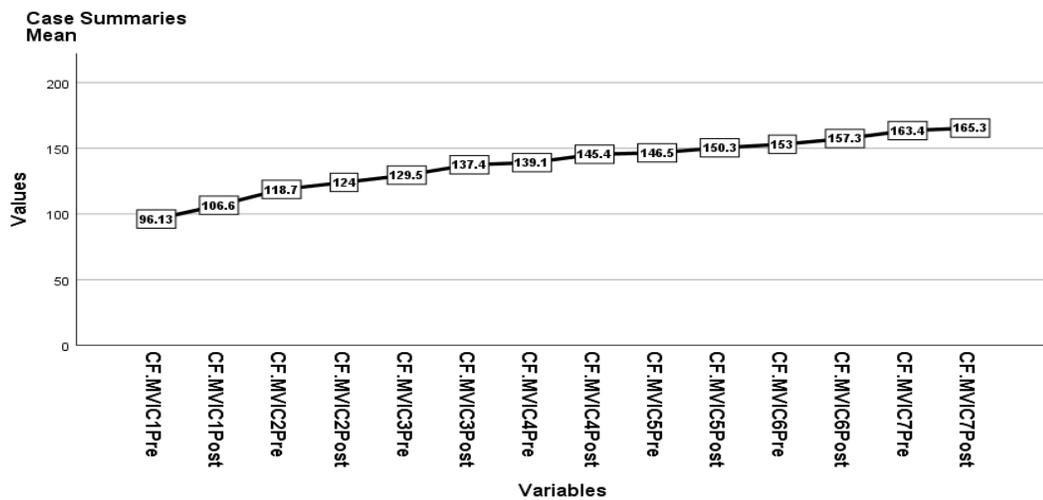


Chart 4.18: Describes the cervical flexion MVIC mean along the pre and posttests of the seven therapeutic sessions.

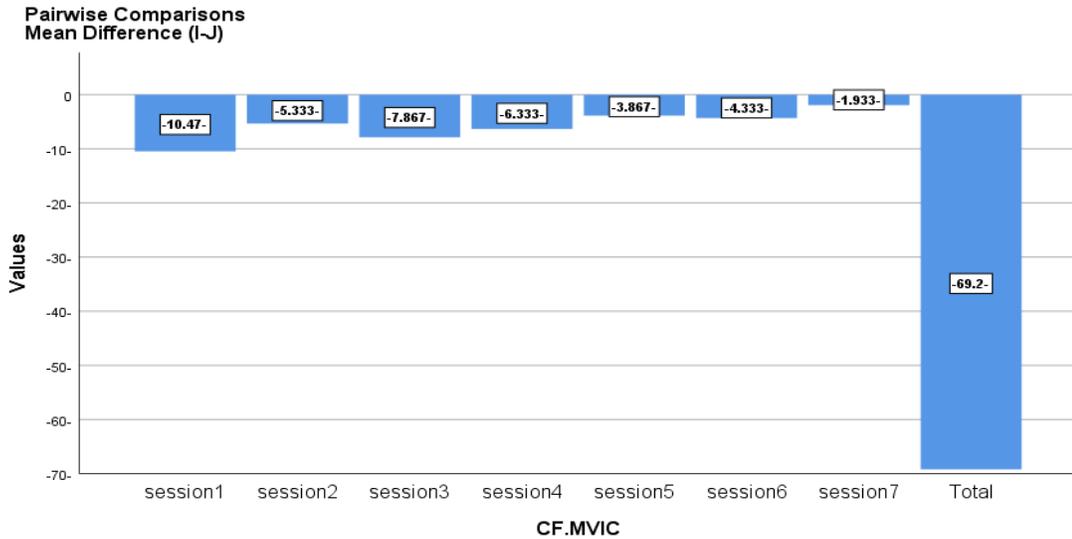


Chart 4.19: Describes the mean difference as improvement of cervical flexion MVIC between the pre and posts tests along the seven therapeutic sessions.

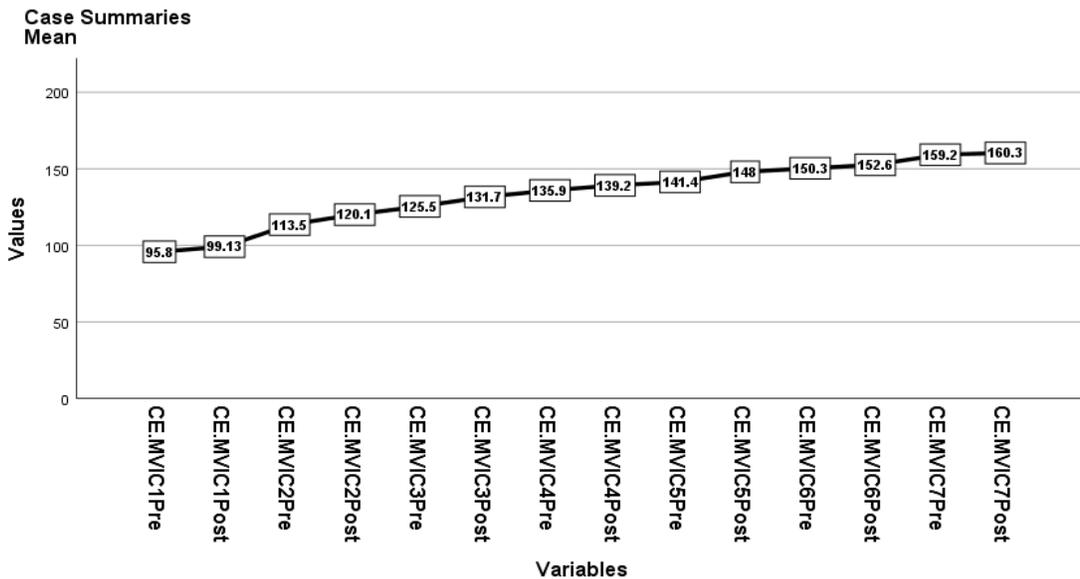


Chart 4.20: Describes the cervical extension MVIC mean along the pre and posttests of the seven therapeutic sessions.

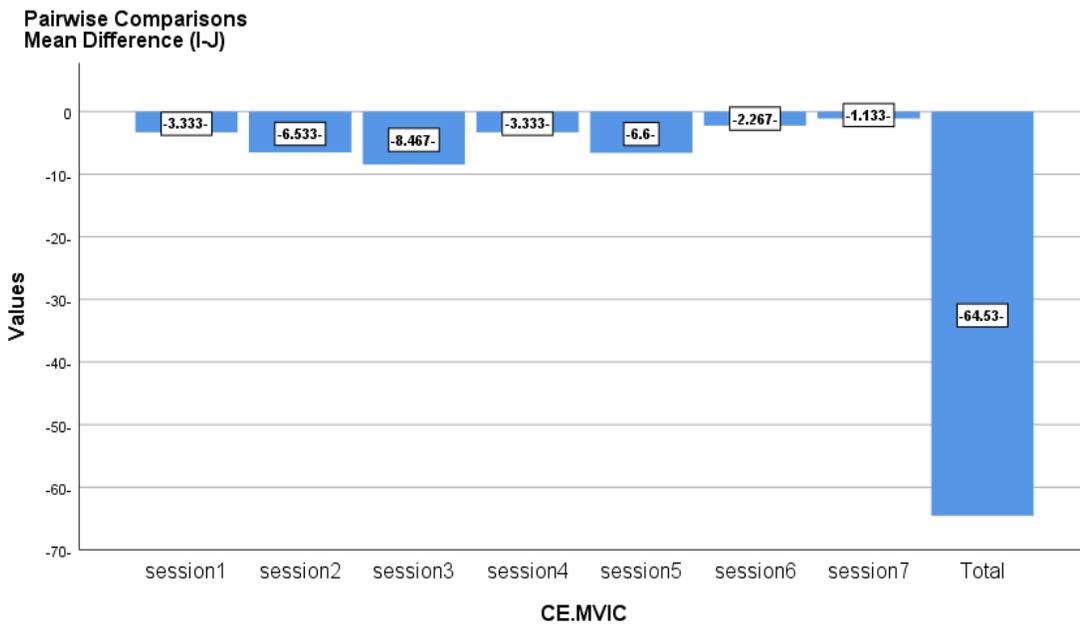


Chart 4.21: Describes the mean difference as improvement of cervical extension MVIC between the pre and posts tests along the seven therapeutic sessions.

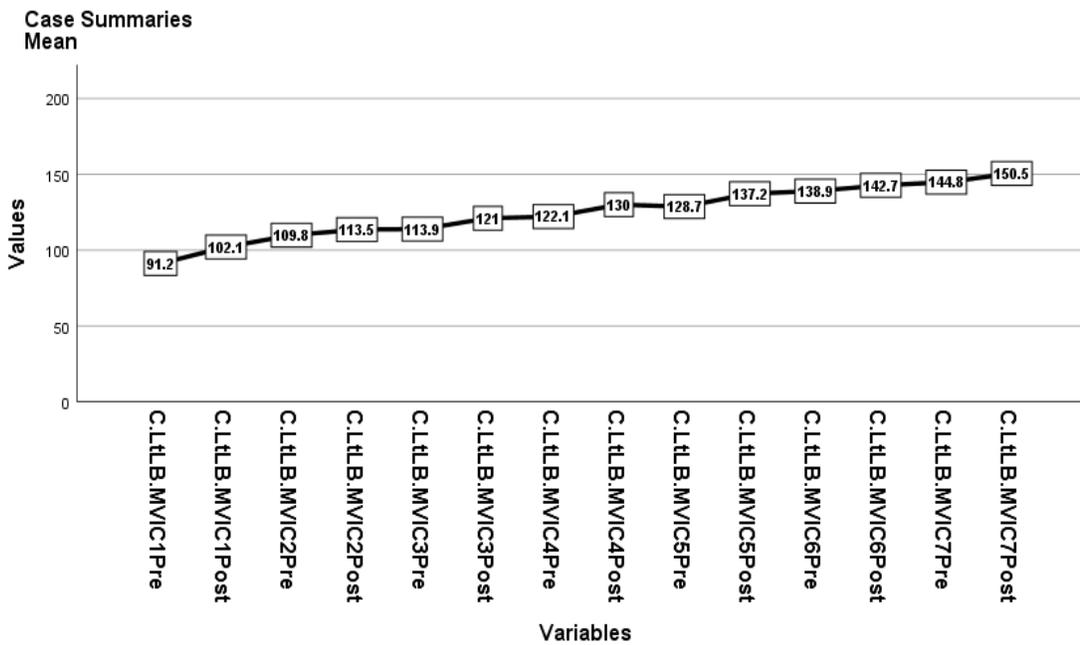


Chart 4.22: Describes the cervical left bending MVIC mean along the pre and posttests of the seven therapeutic sessions.

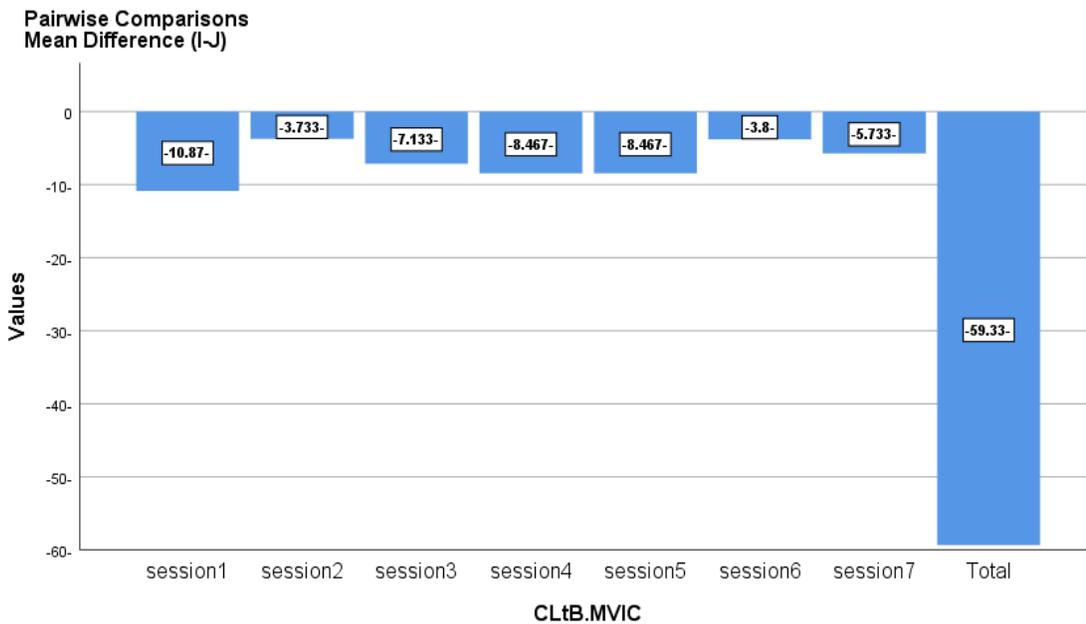


Chart 4.23: Describes the mean difference as improvement of cervical left bending MVIC between the pre and posts tests along the seven therapeutic sessions.

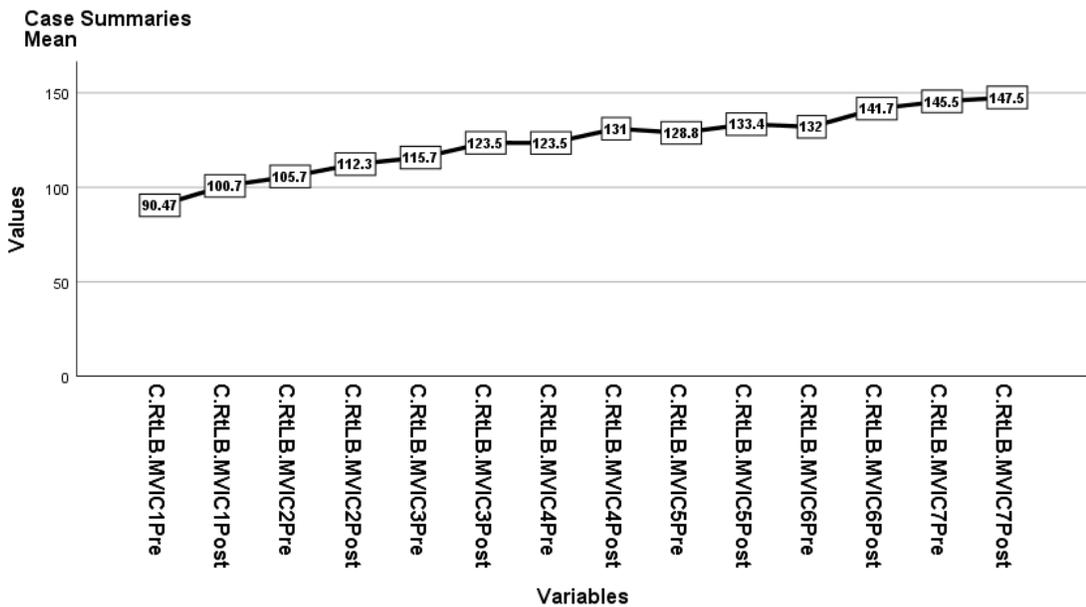


Chart 4.24: Describes the cervical right bending MVIC mean along the pre and posttests of the seven therapeutic sessions.

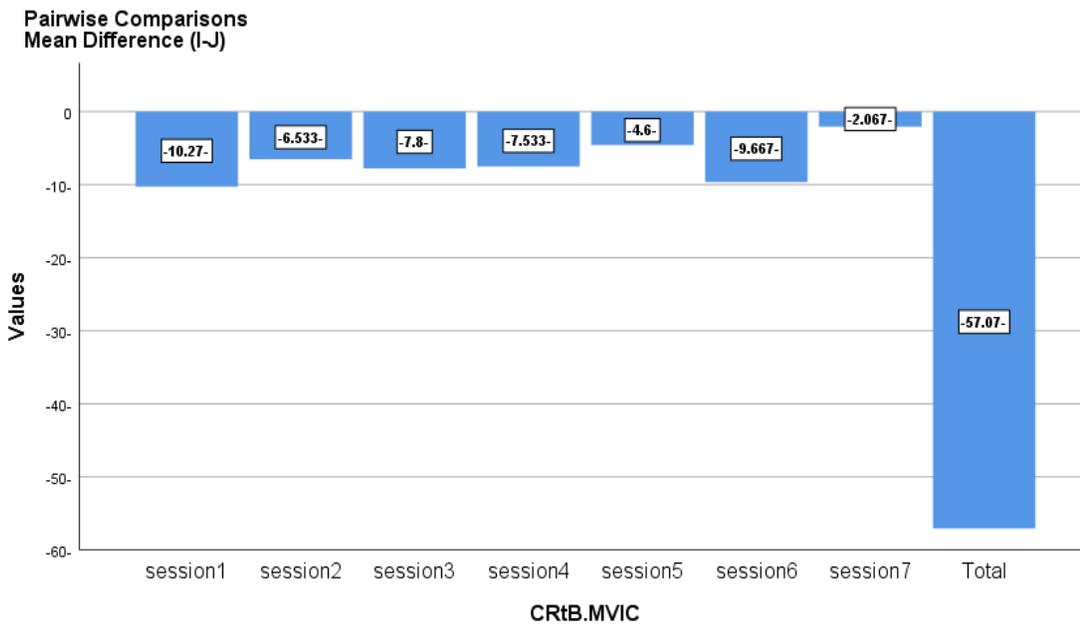


Chart 4.25: Describes the mean difference as improvement of cervical right bending MVIC between the pre and posts tests along the seven therapeutic sessions.

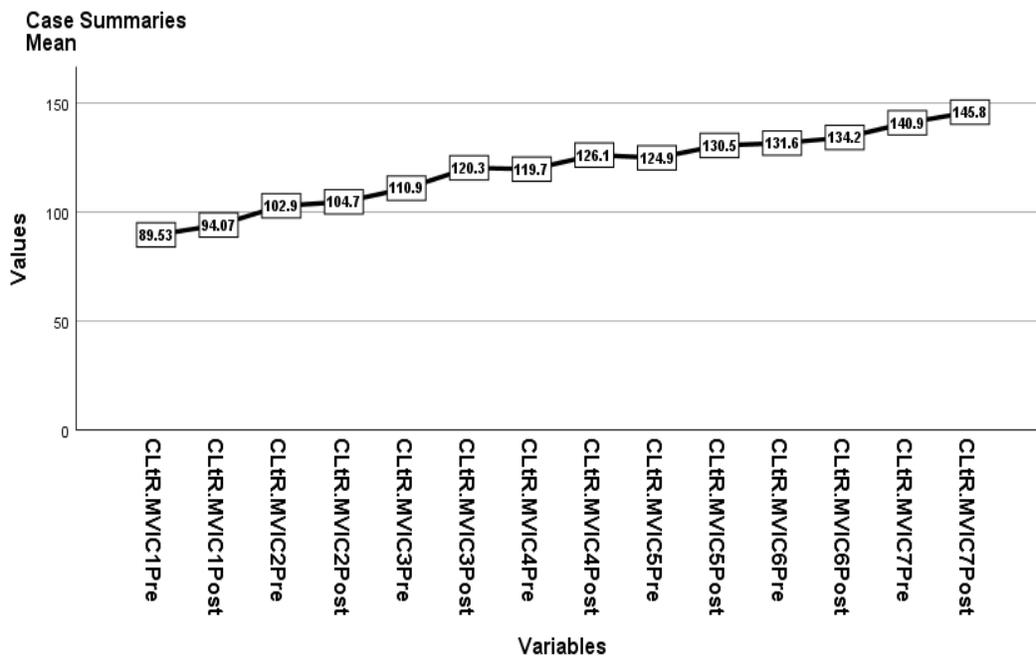


Chart 4.26: Describes the cervical left bending MVIC mean along the pre and posttests of the seven therapeutic sessions.

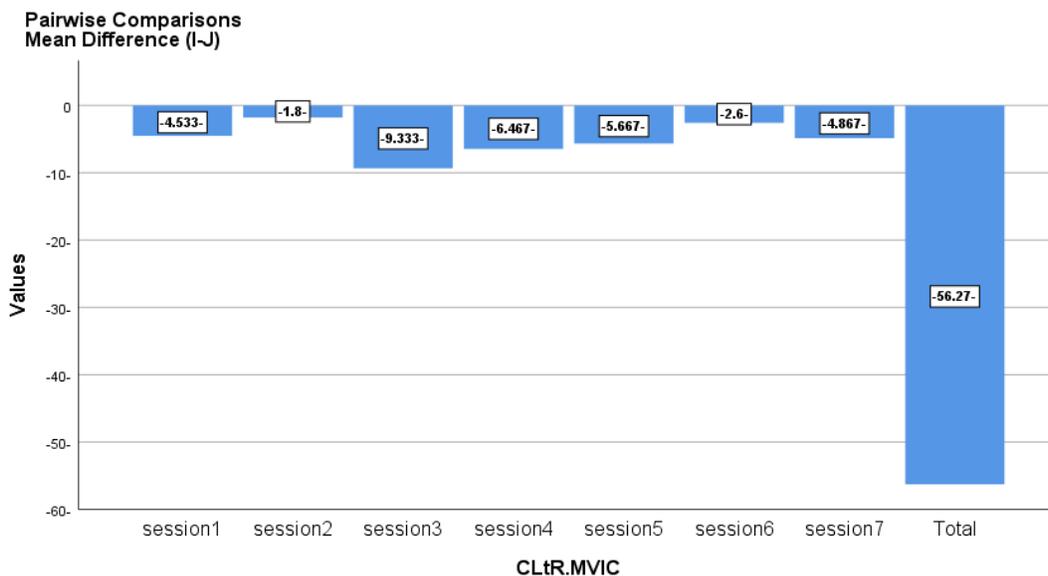


Chart 4.27: Describes the mean difference as improvement of cervical left rotation MVIC between the pre and posts tests along the seven therapeutic sessions.

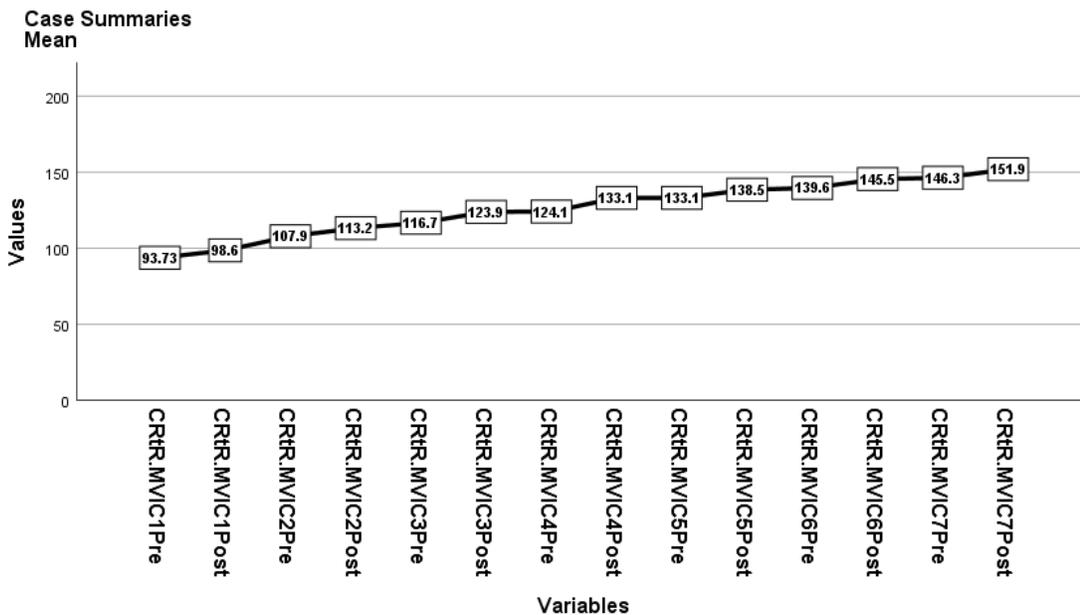


Chart 4.28: Describes the cervical right rotation MVIC mean along the pre and posttests of the seven therapeutic sessions.

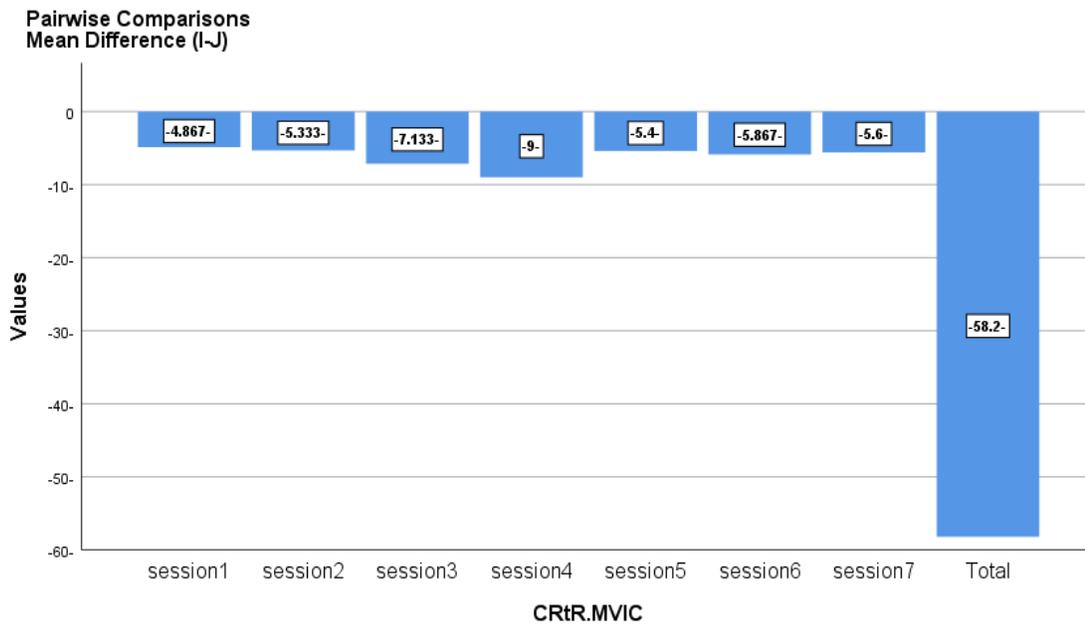


Chart 4.29: Describes the mean difference as improvement of cervical right rotation MVIC between the pre and posts tests along the seven therapeutic sessions.

Table 4.9: shows the results of Repeated –Measures ANOVA through the pre-posttests of MVIC along the therapeutic sessions.

| Source | Measure | Type III Sum of Squares | df | Mean Square | F | Sig. | PES | Observed Powera | |
|--------|----------|-------------------------|------------------|--------------|------------------|---------------|-------------|-----------------|--------------|
| Tests | CF.MVIC | Sphericity Assumed | 84769.657 | 13 | 6520.743 | 68.411 | .000 | .830 | 1.000 |
| | | Greenhouse-Geisser | 84769.657 | 3.814 | 22228.737 | 68.411 | .000 | .830 | 1.000 |
| | CE.MVIC | Sphericity Assumed | 83818.348 | 13 | 6447.565 | 52.891 | .000 | .791 | 1.000 |
| | | Greenhouse-Geisser | 83818.348 | 3.185 | 26313.539 | 52.891 | .000 | .791 | 1.000 |
| | CRB.MVIC | Sphericity Assumed | 56338.367 | 13 | 4333.721 | 33.214 | .000 | .703 | 1.000 |
| | | Greenhouse-Geisser | 56338.367 | 3.757 | 14996.258 | 33.214 | .000 | .703 | 1.000 |
| | CLB.MVIC | Sphericity Assumed | 58778.857 | 13 | 4521.451 | 36.714 | .000 | .724 | 1.000 |
| | | Greenhouse-Geisser | 58778.857 | 3.474 | 16918.247 | 36.714 | .000 | .724 | 1.000 |
| | CRR.MVIC | Sphericity Assumed | 64254.248 | 13 | 4942.634 | 43.030 | .000 | .755 | 1.000 |
| | | Greenhouse-Geisser | 64254.248 | 3.440 | 18676.345 | 43.030 | .000 | .755 | 1.000 |
| | CLR.MVIC | Sphericity Assumed | 57344.957 | 13 | 4411.151 | 36.962 | .000 | .725 | 1.000 |
| | | Greenhouse-Geisser | 57344.957 | 3.005 | 19080.894 | 36.962 | .000 | .725 | 1.000 |

A repeated-measures ANOVA was performed to compare the effect of the suggested therapeutic program on Cervical MVIC during the seven sessions. There was a statistically significant difference in all Cervical MVIC ($p < .000$). The Partial Eta Squared in all movements was approximately arranged (from .703 to 830). Also, the observed power was (1.000) in all movements.

Table 4.10: Illustrates the C. MVIC mean difference in posttest results of RM ANOVA between the pre-post measures of the seven therapeutic sessions in the suggested program.

| pre-post intervention | Mean Difference | Sig |
|-----------------------|-----------------|------|
| CF.MVIC1-7 | -69.200 | .000 |
| CE.MVIC1-7 | -64.533 | .000 |
| CRB.MVIC1-7 | -57.067 | .000 |
| CLB.MVIC1-7 | -59.333 | .000 |
| CRR.MVIC1-7 | -58.200 | .000 |
| CLR.MVIC1-7 | -56.267 | .000 |

The above-mentioned table above explains there were a mean difference and significance in all Cervical Maximum voluntary isometric contraction $P < .000$.

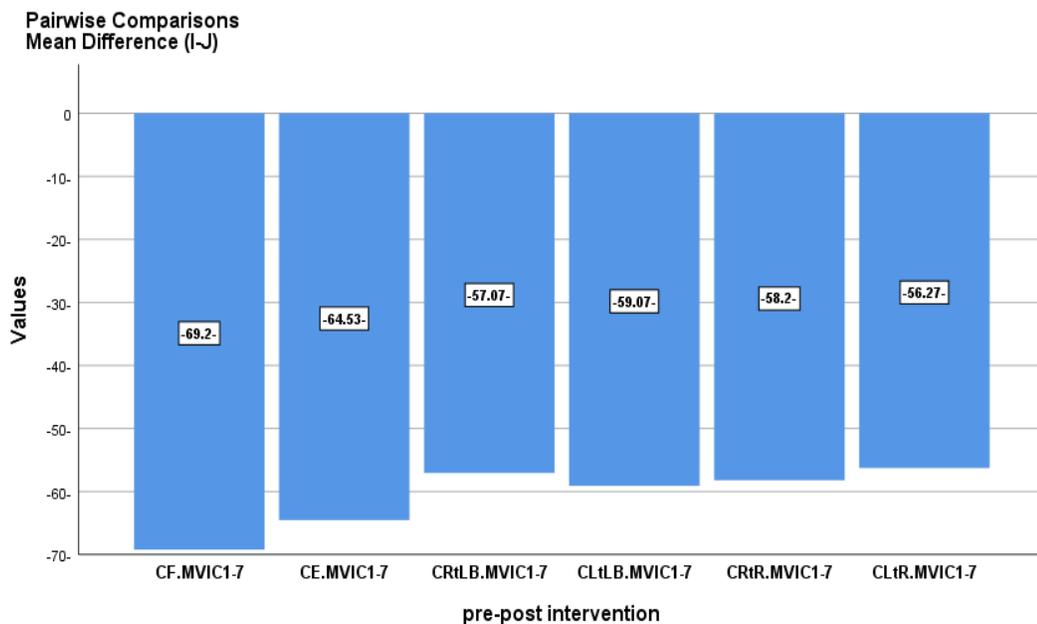


Chart 4.30: Describes all cervical MVIC mean difference pre-post the therapeutic program.

4.1.5 Comparative results between pre & posttest data in parameters of functional activities among study patients

Table 4.11: Shows descriptive statistics for pre-post intervention in NDI.

| | Mean | N | Std. Deviation |
|-------------|-------|----|----------------|
| NDI.100.Pre | 35.87 | 15 | 11.940 |
| NDI.100Post | 8.13 | 15 | 6.739 |

The above table illustrates the mean and standard deviation of NDI total score pre-post suggested therapeutic program.

Table 4.12: Compares the results of pre-post intervention in NDI.

| | Paired Differences | | | | | t | df | Sig |
|---------------------------|--------------------|--------|-----------------|---|--------|-------|----|-----|
| | Mean | SD | Std. Error Mean | 95% Confidence Interval of the Difference | | | | |
| | | | | Lower | Upper | | | |
| NDI.100.Pre – NDI.100Post | 27.733 | 12.418 | 3.206 | 20.856 | 34.610 | 8.650 | 14 | |

The table illustrates a strong significant difference with p (.000) between pre-post intervention of NDI

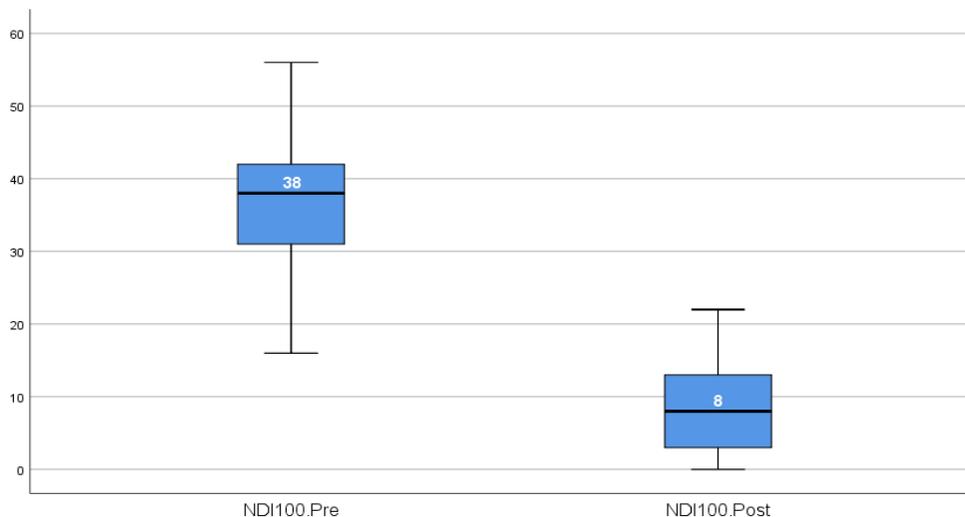


Chart 4.31: Describes the mean difference as improvement of neck disability between the pre and posts suggested therapeutic program.

Table4.13: Shows descriptive statistics and significance for the participant's answers to NDI questions pre-intervention.

| Neck Disability Index Questions (Pre) | | Count | Column N % | X ² (sig) |
|---------------------------------------|---|-------|------------|----------------------|
| Q1. Pain Pre | I have no pain at the moment | 0 | 0.0% | .068 |
| | The pain is mild at the moment | 3 | 20.0% | |
| | The pain comes and goes and is moderate | 1 | 6.7% | |
| | The pain is moderate and does not vary much | 8 | 53.3% | |
| | The pain is severe but comes and goes | 3 | 20.0% | |
| | The pain is severe and does not vary much | 0 | 0.0% | |
| Q2. Personal care Pre | I can look after myself normally without causing extra pain | 9 | 60.0% | .041 |
| | I can look after myself normally but it causes extra pain | 5 | 33.3% | |
| | It is painful to look after myself and i am slow and careful | 1 | 6.7% | |
| | I need some help but can manage most of my personal car | 0 | 0.0% | |
| | I need help every day in most aspect of self-care | 0 | 0.0% | |
| | I do not get dressed, i wash with difficulty, and stay in bed | 0 | 0.0% | |
| Q3. lifting Pre | i can lift heavy weights without extra pain | 1 | 6.7% | .168 |
| | I can lift heavy weights, but it causes extra pain | 5 | 33.3% | |
| | Pain prevents me from lifting heavy weights off the floor | 5 | 33.3% | |
| | Pain prevents me but I can manage light to medium weights if they are conveniently positioned | 2 | 13.3% | |
| | I can lift very light weights | 1 | 6.7% | |
| | I cannot lift or carry anything at all | 1 | 6.7% | |

| | | | | |
|-----------------------|--|---|-------|-------------|
| Q4. Reading Pre | I can read as much as i want to with no pain in my neck | 2 | 13.3% | .086 |
| | I can read as much as i want to with slight pain in my neck | 2 | 13.3% | |
| | I can read as much as i want to with moderate pain in my neck | 8 | 53.3% | |
| | I can't read as much as i want because of moderate pain in my neck | 3 | 20.0% | |
| | I can hardly read at all because of severe pain in my neck | 0 | 0.0% | |
| | I cannot read at all | 0 | 0.0% | |
| Q5. Headaches Pre | I have no headaches at all | 2 | 13.3% | .579 |
| | I have slight headaches, which come infrequently | 2 | 13.3% | |
| | I have moderate headaches, which com infrequently | 5 | 33.3% | |
| | I have moderate headaches, which com frequently | 3 | 20.0% | |
| | I have severe headaches, which com frequently | 2 | 13.3% | |
| | I have headaches almost all the time | 1 | 6.7% | |
| Q6. Concentration Pre | I can concentrate fully when I want to with no difficulty | 1 | 6.7% | .023 |
| | I can concentrate fully when I want to with slight difficulty | 8 | 53.3% | |
| | I have a fair degree of difficulty in concentrating when I want to | 2 | 13.3% | |
| | I have a lot of difficulty in concentrating when I want to | 3 | 20.0% | |
| | I have a great deal of difficulty in concentrating when I want to | 1 | 6.7% | |
| | I cannot concentrate at all | 0 | 0.0% | |

| | | | | |
|--------------------|---|---|-------|-------------|
| Q7. Work Pre | I can do as much work as I want to | 1 | 6.7% | .023 |
| | I can only do my usual work, but no more | 8 | 53.3% | |
| | I can do most of my usual work, but no more | 1 | 6.7% | |
| | I cannot do my usual work | 3 | 20.0% | |
| | I can hardly do any work at all | 2 | 13.3% | |
| | I can't do any work at all | 0 | 0.0% | |
| Q8.driving Pre | I can drive my car without any neck pain | 1 | 6.7% | .070 |
| | I can drive my car as long as I want with slight pain in my neck | 7 | 46.7% | |
| | I can drive my car as long as I want with moderate pain in my neck | 4 | 26.7% | |
| | I can't drive my car as long as I want because of moderate pain in my neck | 2 | 13.3% | |
| | I can hardly drive at all because of severe pain in my neck | 0 | 0.0% | |
| | I can't drive my car at all | 1 | 6.7% | |
| Q9.Sleeping Pre | I have no trouble sleeping | 4 | 26.7% | |
| | My sleep is slightly disturbed (less than 1 hr. sleepless) | 3 | 20.0% | |
| | My sleep is mildly disturbed (1-2 hrs. sleepless) | 3 | 20.0% | |
| | My sleep is moderately disturbed (2-3 hrs. sleepless) | 3 | 20.0% | |
| | My sleep is greatly disturbed (3-5 hrs. sleepless) | 2 | 13.3% | |
| | My sleep is completely disturbed (5-7 hrs. sleepless) | 0 | 0.0% | |
| Q10.Recreation Pre | I am able to engage in all my recreation activities with no neck pain at all | 0 | 0.0% | .042 |
| | I am able to engage in all my recreation activities, with some pain in my neck | 7 | 46.7% | |
| | I am able to engage in most, but not all of my usual recreation activities because of pain in my neck | 6 | 40.0% | |

| | | | | |
|--|---|---|------|--|
| | I am able to engage in a few of my usual recreation activities because of pain in my neck | 1 | 6.7% | |
| | I can hardly do any recreation activities because of pain in my neck | 1 | 6.7% | |
| | I can't do any recreation activities at all | 0 | 0.0% | |

The highlights sig. values ensure significant difference between the ordinal ranks of the matched variables.

Table 4.14: Shows descriptive statistics and significance for the participant's answers to NDI questions post-intervention.

| Neck Disability Index Questions (Post) | | Count | Column N % | X ² (sig) |
|--|---|-------|------------|----------------------|
| Q1. Pain Post | I have no pain at the moment | 7 | 46.7% | .796 |
| | The pain is mild at the moment | 8 | 53.3% | |
| | The pain comes and goes and is moderate | 0 | 0.0% | |
| | The pain is moderate and does not vary much | 0 | 0.0% | |
| | The pain is severe but comes and goes | 0 | 0.0% | |
| | The pain is severe and does not vary much | 0 | 0.0% | |
| Q2. Personal care Post | I can look after myself normally without causing extra pain | 15 | 100.0% | 1.00 |
| | I can look after myself normally but it causes extra pain | 0 | 0.0% | |
| | It is painful to look after myself and i am slow and careful | 0 | 0.0% | |
| | I need some help but can manage most of my personal car | 0 | 0.0% | |
| | I need help every day in most aspect of self-care | 0 | 0.0% | |
| | I do not get dressed, i wash with difficulty, and stay in bed | 0 | 0.0% | |

| | | | | |
|-----------------------|---|----|-------|-------------|
| Q3.lifting Post | i can lift heavy weights without extra pain | 12 | 80.0% | .000 |
| | I can lift heavy weights, but it causes extra pain | 1 | 6.7% | |
| | Pain prevents me from lifting heavy weights off the floor | 0 | 0.0% | |
| | Pain prevents me but I can manage light to medium weights if they are conveniently positioned | 1 | 6.7% | |
| | I can lift very light weights | 1 | 6.7% | |
| | I cannot lift or carry anything at all | 0 | 0.0% | |
| Q4.Reading Post | I can read as much as i want to with no pain in my neck | 11 | 73.3% | .071 |
| | I can read as much as i want to with slight pain in my neck | 4 | 26.7% | |
| | I can read as much as i want to with moderate pain in my neck | 0 | 0.0% | |
| | I can't read as much as i want because of moderate pain in my neck | 0 | 0.0% | |
| | I can hardly read at all because of severe pain in my neck | 0 | 0.0% | |
| | I cannot read at all | 0 | 0.0% | |
| Q5.Headaches Post | I have no headaches at all | 10 | 66.7% | .015 |
| | I have slight headaches, which come infrequently | 4 | 26.7% | |
| | I have moderate headaches, which come infrequently | 1 | 6.7% | |
| | I have moderate headaches, which come frequently | 0 | 0.0% | |
| | I have severe headaches, which come frequently | 0 | 0.0% | |
| | I have headaches almost all the time | 0 | 0.0% | |
| Q6.Concentration Post | I can concentrate fully when I want to with no difficulty | 9 | 60.0% | .439 |

| | | | | |
|------------------|--|----|-------|------|
| | I can concentrate fully when I want to with slight difficulty | 6 | 40.0% | |
| | I have a fair degree of difficulty in concentrating when I want to | 0 | 0.0% | |
| | I have a lot of difficulty in concentrating when I want to | 0 | 0.0% | |
| | I have a great deal of difficulty in concentrating when I want to | 0 | 0.0% | |
| | I cannot concentrate at all | 0 | 0.0% | |
| Q7.Work Post | I can do as much work as I want to | 9 | 60.0% | .439 |
| | I can only do my usual work, but no more | 6 | 40.0% | |
| | I can do most of my usual work, but no more | 0 | 0.0% | |
| | I cannot do my usual work | 0 | 0.0% | |
| | I can hardly do any work at all | 0 | 0.0% | |
| | I can't do any work at all | 0 | 0.0% | |
| Q8.driving Post | I can drive my car without any neck pain | 11 | 73.3% | .004 |
| | I can drive my car as long as I want with slight pain in my neck | 3 | 20.0% | |
| | I can drive my car as long as I want with moderate pain in my neck | 0 | 0.0% | |
| | I can't drive my car as long as I want because of moderate pain in my neck | 0 | 0.0% | |
| | I can hardly drive at all because of severe pain in my neck | 0 | 0.0% | |
| | I can't drive my car at all | 1 | 6.7% | |
| Q9.Sleeping Post | I have no trouble sleeping | 6 | 40.0% | .439 |
| | My sleep is slightly disturbed (less than 1 hr. sleepless) | 9 | 60.0% | |
| | My sleep is mildly disturbed (1-2 hrs. sleepless) | 0 | 0.0% | |

| | | | | |
|---------------------|---|---|-------|------|
| | My sleep is moderately disturbed (2-3 hrs. sleepless) | 0 | 0.0% | |
| | My sleep is greatly disturbed (3-5 hrs. sleepless) | 0 | 0.0% | |
| | My sleep is completely disturbed (5-7 hrs. sleepless) | 0 | 0.0% | |
| Q10.Recreation Post | I am able to engage in all my recreation activities with no neck pain at all | 9 | 60.0% | .439 |
| | I am able to engage in all my recreation activities, with some pain in my neck | 6 | 40.0% | |
| | I am able to engage in most, but not all of my usual recreation activities because of pain in my neck | 0 | 0.0% | |
| | I am able to engage in a few of my usual recreation activities because of pain in my neck | 0 | 0.0% | |
| | I can hardly do any recreation activities because of pain in my neck | 0 | 0.0% | |
| | I can't do any recreation activities at all | 0 | 0.0% | |

The highlights sig. values ensure significant difference between the ordinal ranks of the matched variables.

4.2 Results Discussion

The goals of this study were, firstly, to construct a suggested therapeutic program, mainly based on manual kinesiotherapy techniques for the treatment of patients with chronic neck pain, secondly, to assess the effect of the suggested therapeutic program in the management of CNP, thirdly, to identify the effect of non-manipulative demographic variables of CNP patients on the severity and heal ability of CNP symptoms. In other words, the study tried to determine the pain severity, the level of physical impairment, and functional disability, within the interventional group, at baseline, every session and after two weeks of pain-oriented manual kinesiotherapy techniques, then to determine if there are significant differences before and after the suggested program regarding the physical function (ROM, endurance), and finally, to determine if there are significant differences between pre and posttests of the functional activity at baseline, and after two weeks of the intervention.

The average age of the participants was 30.8 years, , which was expected as the range of the inclusion criteria was between 18-58 years. In terms of gender, in the current study, male constitutes 100% of the participants there weren't enrolled any female due to the lack of a qualified specialist to work in this field, and this is considered one of the obstacles to this study. According to participant's weight, BMI categorized with overweight were reached to 46% have >27. The criteria for defining obesity and overweight followed the guidelines set by the World Health Organization (WHO), individuals were classified as overweight if their Body Mass Index (BMI) was equal to or greater than 25. On the other hand, obesity was defined as having a BMI equal to or exceeding 30(Al-Qahtani, 2019).

One of the core findings in this study was that there is a significant reduction of pain intensity according to (VAS) scale at the end of the suggested therapeutic program compared to baseline.

The intensity of pain is expected to be decreased by hot pack, classical massage, Maitland mobilization, and exercise.

Another core finding in this study was a significant improvement in active Neck ROM pre and post-test compared to baseline, with no significant improvement within every session. Whereas, there was a good significance in all cervical movements with $P < .000$, except the Cervical Extension with $P < .093$. A limited range of motion can occur due to various factors, including increased pain levels, muscle spasms or muscle weakness. These factors can contribute to restrictions on the ability to move joints and perform certain movements (Mahmoud et al., 2019).

Moreover, the manual kinesiotherapy techniques of static stretch exercises contribute in pain and range of motion improvement which is similar to many studies that concluded the positive effect of isometric cervical exercises or cervical range of motion exercises on improving neck range of motion and decreasing disability. Syeda Nida Gillani, et al (2020) found that both static stretching exercises combined with cervical segmental mobilization techniques were equally effective in reducing pain, improving cervical range of motion, and decreasing neck disability.

Furthermore, the results of this study showed improvement differences in the used modified sphygmomanometer measurements to assess MVIC according to our results, there was a good statistically significant in all cervical MVIC with ($p < .000$) in pre and post-test compared to baseline after intervention. Buket B., et al (2017) revealed that the impact of Sternocleidomastoid stretching and massage on kinesiophobia, pain intensity, range of motion, endurance, disability, and range of motion in individuals suffering from chronic neck pain (CNP).

Finally, and regarding the interpretation of the diagnosed improvement in Neck Disability Index (NDI), the significant improvement of NDI total scores at posttest results compared to baseline, with p-value (.000), and, the total score mean of NDI at pretest was 35.9 decreased to 8.1 at the end of therapeutic program. This significant improvement occurs as a result of the applied interventions on the cervical muscles and soft tissues, and vertebra mobilization, lead to decrease muscles spasm and increased blood supply in the treated area, which lead to decreased pain intensity and improve the physical functioning and the functional activities of the patient.

The work done in the current study was due to the NDI scale where the patients showed good improvement after the intervention, 80.0% of the participants reported the condition "I can lift heavy weights without extra pain". the results indicated that the number of patients who reported no and slight headache after intervention respectively with (66.7%, 26.7%) which is referred to Maitland and exercise. In (2022) Monika Rani, et al indicate that both spinal mobilization and postural correction exercises are effective in managing cervicogenic headaches and decreases in neck disability(Rani & Kaur, 2022).

Based on the given information provided by Clinical Practice Guideline, a physical therapist may consider various treatments for a patient suffering from chronic neck pain, such as massage and thermal agents. However, these treatments have limited impact when compared to other interventions or placebos. The main objectives of the physical therapist are to focus on treatments that have demonstrated positive effects, distinct from placebos or alternative therapies. As a result, the recommended course of action involves mobilization, manipulation, and exercise therapy, ideally combined to achieve the best results for the patient(Bier et al., 2018).

In our study, the assessment of physical and functional outcomes was conducted without considering any measurements to determine which techniques were responsible for achieving greater improvements compared to others. However, based on the guideline, may the combination of Maitland mobilization and exercise was associated with greater pain reduction and a decrease in disability compering with classical massage and hot packs.

Chapter Five

Conclusions and recommendations

5.1 Conclusions

5.2 Recommendations

Chapter Five: Conclusions and recommendations

5.1 Conclusions

1. The used modalities in the suggested therapeutic intervention for the management of chronic neck pain, including: hot pack, classical massage, Maitland mobilization, and active exercises, lead to significant improvement in the clinical, physical and functional objectives of therapeutic plan.
2. The short-term effect of the used modalities, at the end of each therapeutic session, started as fast onset improvement in clinical as well as in physical parameters of neck mobility, then, the improvement slow down with the progress of the subsequent sessions of that program.
3. The cumulative improvement in clinical, then in physical parameters of therapeutic intervention, effectively interact to achieve the targeted level of physical functioning, and functional outcomes among patients with chronic neck pain symptoms.
4. The progressive passive to active manual kinesiotherapy techniques, are effective to reduce pain intensity, and to increase the free of pain ROM in neck mobility.

5.2 Recommendations

1. Clinical improvement is the key for physical improvement, and physical improvement is the baseline for functional improvement among patients with chronic neck pain
2. Using the progressive passive to active manual kinesiotherapy techniques, to get fast as well as delayed onset improvement in the treatment of patients with chronic neck pain.
3. The passive and active work through the free of pain ROM in neck movements, is effective to safely, quickly, and significantly increase that free of pain ROM.

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List of Appendices

Appendix I: Technical procedures of physical testing

Appendix II: English version of NDI

Appendix III: Arabic version of NDI

Appendix IV: Research ethical committee REC at Al-Quds University

Appendix I: Technical procedures of performing the used test items of physical assessment

Section I: Personal Data

1. Name of participant.....
2. Phone number :.....
3. Date of birth :.....
4. Gender: ■ Female ■ Male
5. Place of residence: ■village ■ city ■ camp
6. Marital status: ■Married ■widow ■divorced
 ■single
7. Type of work..... Duration of daily work..... Total time of work.....

Section II: Anthropometric measurements

1. Weight:
2. Height
3. BML.....
4. Categories: Underweight / healthy weight / overweight / Obese.
5. Head circumference
6. Waist circumference

Section III: Head Postural alignment

1. Head postural alignment

| Sessions | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | |
|--------------------------------|-----|------|-----|------|-----|------|-----|------|-----|------|-----|------|-----|------|
| | Pre | Post |
| Cervical flexion | | | | | | | | | | | | | | |
| Cervical extension | | | | | | | | | | | | | | |
| Cervical lateral bending to Lt | | | | | | | | | | | | | | |
| Cervical lateral bending to Rt | | | | | | | | | | | | | | |
| Cervical rotation to Lt | | | | | | | | | | | | | | |
| Cervical rotation to Rt | | | | | | | | | | | | | | |

- Muscle strength and endurance:

Section IV: Past medical history

1. Diagnosis.....

2. Onset of past disease

| Disease | Date of onset: | Yes | No |
|------------------|----------------|-----|----|
| Diabetic: | | | |
| HTN: | | | |
| Previous Surgery | | | |
| Smoking: | | | |

Section V: Physical data: Instruments of data collection

- Visual analog scale (VAS) for pain:

| Sessions | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | |
|-----------|-----|------|-----|------|-----|------|-----|------|-----|------|-----|------|-----|------|
| | Pre | Post |
| VAS score | | | | | | | | | | | | | | |

- CAROM

| Sessions | 1 | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | |
|--------------------------------|-----|------|-----|------|-----|------|-----|------|-----|------|-----|------|-----|------|
| | Pre | Post |
| Cervical flexion | | | | | | | | | | | | | | |
| Cervical extension | | | | | | | | | | | | | | |
| Cervical lateral bending to Lt | | | | | | | | | | | | | | |
| Cervical lateral bending to Rt | | | | | | | | | | | | | | |
| Cervical rotation to Lt | | | | | | | | | | | | | | |

Appendix II: English version of NDI

| NECK DISABILITY INDEX Dieser Fragebogen hilft ihrer Ärztin oder ihrem Arzt festzustellen, inwieweit Ihre Nackenschmerzen Ihren Alltag beeinflussen. Bitte wählen Sie aus jedem Abschnitt <i>eine einzige</i> Aussage aus. Wir sind uns bewusst, dass mehrere Aussagen pro Abschnitt auf Sie zutreffen können, doch bitten wir Sie, nur diejenige Aussage zu wählen, welche Ihre Situation am besten beschreibt. | |
|---|---|
| Abschnitt 1 - Schmerzintensität <input type="checkbox"/> Ich habe zurzeit keine Schmerzen. <input type="checkbox"/> Ich habe zurzeit nur sehr leichte Schmerzen. <input type="checkbox"/> Ich habe zurzeit mässige Schmerzen. <input type="checkbox"/> Ich habe zurzeit ziemlich starke Schmerzen. <input type="checkbox"/> Ich habe zurzeit sehr starke Schmerzen. <input type="checkbox"/> Ich habe zurzeit die stärksten Schmerzen, die ich mir vorstellen kann. | Abschnitt 2 - Körperpflege (Waschen, Ankleiden usw.) <input type="checkbox"/> Ich kann meine Körperpflege wie gewohnt und ohne zusätzliche Schmerzen durchführen. <input type="checkbox"/> Ich kann meine Körperpflege wie gewohnt durchführen, doch verursacht dies zusätzliche Schmerzen. <input type="checkbox"/> Meine Körperpflege verursacht Schmerzen; ich führe sie langsam und vorsichtig durch. <input type="checkbox"/> Ich führe meine Körperpflege weitgehend selbständig durch, doch brauche ich bei einigen Tätigkeiten etwas Hilfe. <input type="checkbox"/> Ich brauche täglich Hilfe bei den meisten Tätigkeiten der Körperpflege. <input type="checkbox"/> Ich kann mich nicht ankleiden; es fällt mir schwer, mich zu waschen, und ich bleibe im Bett. |
| Abschnitt 3 - Lasten heben <input type="checkbox"/> Ich kann schwere Lasten ohne zusätzliche Schmerzen heben. <input type="checkbox"/> Ich kann schwere Lasten heben, doch verursacht dies zusätzliche Schmerzen. <input type="checkbox"/> Ich kann aufgrund der Schmerzen keine schweren Gegenstände vom Boden hochheben, doch schaffe ich es, wenn sie sich auf einer günstigen Höhe befinden, beispielsweise auf einem Tisch. <input type="checkbox"/> Ich kann aufgrund der Schmerzen keine schweren Lasten heben, doch kann ich mittelschwere und leichte Gegenstände heben, die sich auf einer günstigen Höhe befinden. <input type="checkbox"/> Ich kann nur ganz leichte Lasten heben. <input type="checkbox"/> Ich kann überhaupt nichts heben oder tragen. | Abschnitt 4 - Lesen <input type="checkbox"/> Ich kann so lange lesen, wie ich will, ohne Nackenschmerzen zu bekommen. <input type="checkbox"/> Ich kann so lange lesen, wie ich will, und habe dabei leichte Nackenschmerzen. <input type="checkbox"/> Ich kann so lange lesen, wie ich will, und habe dabei mässige Nackenschmerzen. <input type="checkbox"/> Ich kann wegen mässiger Nackenschmerzen nicht so lange lesen, wie ich will. <input type="checkbox"/> Ich kann wegen starker Nackenschmerzen kaum lesen. <input type="checkbox"/> Ich kann überhaupt nicht lesen. |
| Abschnitt 5 - Kopfschmerzen <input type="checkbox"/> Ich habe keine Kopfschmerzen. <input type="checkbox"/> Ich habe selten auftretende, leichte Kopfschmerzen. <input type="checkbox"/> Ich habe selten auftretende, mässige Kopfschmerzen. <input type="checkbox"/> Ich habe häufig auftretende, mässige Kopfschmerzen. <input type="checkbox"/> Ich habe häufig auftretende, starke Kopfschmerzen. <input type="checkbox"/> Ich habe fast immer Kopfschmerzen. | Abschnitt 6 - Konzentration <input type="checkbox"/> Ich kann mich problemlos voll konzentrieren, wann immer ich will. <input type="checkbox"/> Ich kann mich mit leichten Schwierigkeiten voll konzentrieren, wann immer ich will. <input type="checkbox"/> Es fällt mir ziemlich schwer, mich zu konzentrieren. <input type="checkbox"/> Es fällt mir sehr schwer, mich zu konzentrieren. <input type="checkbox"/> Es bereitet mir grösste Mühe, mich zu konzentrieren. <input type="checkbox"/> Ich kann mich überhaupt nicht konzentrieren. |
| Abschnitt 7 - Arbeit <input type="checkbox"/> Ich kann so viel arbeiten, wie ich will. <input type="checkbox"/> Ich kann meine gewohnte Arbeit erledigen, jedoch nicht mehr. <input type="checkbox"/> Ich kann meine gewohnte Arbeit grösstenteils erledigen, jedoch nicht mehr. <input type="checkbox"/> Ich kann meine gewohnte Arbeit nicht erledigen. <input type="checkbox"/> Ich kann kaum arbeiten. <input type="checkbox"/> Ich kann überhaupt nicht arbeiten. | Abschnitt 8 - Autofahren <input type="checkbox"/> Ich kann ohne Nackenschmerzen Auto fahren. <input type="checkbox"/> Ich kann so lange Auto fahren, wie ich will, und habe dabei leichte Nackenschmerzen. <input type="checkbox"/> Ich kann so lange Auto fahren, wie ich will, und habe dabei mässige Nackenschmerzen. <input type="checkbox"/> Ich kann wegen mässiger Nackenschmerzen nicht so lange Auto fahren, wie ich will. <input type="checkbox"/> Ich kann wegen starker Nackenschmerzen kaum Auto fahren. <input type="checkbox"/> Ich kann überhaupt nicht Auto fahren. |
| Abschnitt 9 - Schlafen <input type="checkbox"/> Ich kann problemlos schlafen. <input type="checkbox"/> Mein Schlaf ist sehr leicht gestört (ich liege weniger als 1 Stunde wach). <input type="checkbox"/> Mein Schlaf ist leicht gestört (ich liege 1-2 Stunden wach). <input type="checkbox"/> Mein Schlaf ist mässig gestört (ich liege 2-3 Stunden wach). <input type="checkbox"/> Mein Schlaf ist stark gestört (ich liege 3-5 Stunden wach). <input type="checkbox"/> Mein Schlaf ist völlig gestört (ich liege 5-7 Stunden wach). | Abschnitt 10 - Freizeit <input type="checkbox"/> Ich kann ohne Nackenschmerzen allen meinen Freizeitaktivitäten nachgehen. <input type="checkbox"/> Ich kann trotz meiner Nackenschmerzen allen meinen Freizeitaktivitäten nachgehen. <input type="checkbox"/> Ich kann trotz meiner Nackenschmerzen den meisten meiner gewohnten Freizeitaktivitäten nachgehen. <input type="checkbox"/> Ich kann wegen meiner Nackenschmerzen nur wenigen meiner gewohnten Freizeitaktivitäten nachgehen. <input type="checkbox"/> Ich kann wegen meiner Nackenschmerzen kaum irgendwelchen Freizeitaktivitäten nachgehen. Ich kann überhaupt keinen Freizeitaktivitäten nachgehen. |
| Ich kann Frage __ nicht beantworten weil... Ich kann Frage __ nicht beantworten weil... | |

Appendix III: Arabic version of NDI

o أعاني من الصداع طوال الوقت تقريبًا

الجزء السادس: التركيز

- o أستطيع التركيز بالشكل الكامل عندما أريد نون أي مصوبة
- o أستطيع التركيز بالشكل الكامل عندما أريد مع الفليل من المصوبة
- o لدي درجة معقولة من المصوبة في التركيز عندما أريد ذلك
- o أجد مصوبة كثيرة في التركيز عندما أريد ذلك
- o أجد مصوبة كثيرة جدًا في التركيز عندما أريد ذلك
- o لا أستطيع التركيز نهائيًا

الجزء السابع: العمل

- o يمكنني القيام بالكثير من العمل كما أريد
- o يمكنني القيام بالعمل المعتاد فقط بزيادة
- o يمكنني القيام بالعمل فوق المعتاد لكن بزيادة
- o لا يمكنني القيام بالعمل المعتاد
- o أستطيع القيام بأي عمل بشكل شاق
- o لا أستطيع القيام بأي عمل على الإطلاق

الجزء الثامن: السيقان

- o أستطيع قيادة سيارتي بدون ألم يذكر في الركبة
- o يمكنني قيادة سيارتي عندما أريد مع ألم خفيف في رجلي
- o يمكنني قيادة سيارتي عندما أريد مع ألم متوسط في رجلي
- o لا يمكنني قيادة سيارتي عندما أريد مع ألم متوسط في رجلي
- o أواجه مصوبة في القيادة بسبب وجود التشنج في الركبة
- o لا يمكنني القيادة على الإطلاق

الجزء التاسع: النوم

- o لا أعاني من اضطراب أثناء النوم
- o أعاني من اضطراب قليل أثناء النوم (أقل من ساعة بلا نوم)
- o أعاني من اضطراب غير معتدل أثناء النوم (1-2 ساعة بلا نوم)
- o أعاني من اضطراب متوسط أثناء النوم (2-3 بلا نوم)
- o أعاني من اضطراب بشكل كبير أثناء النوم (3-5 بلا نوم)
- o أعاني من اضطراب أثناء النوم بشكل كامل (5-7 بلا نوم)

الجزء العاشر: الترفيه

- o أنا قادر على الانخراط في جميع أنشطة الترفيه دون ألم في الركبة على الإطلاق
- o أنا قادر على الانخراط في جميع أنشطة الترفيه لكن مع بعض الألم في الركبة
- o أنا قادر على الانخراط في أغلب أنشطة الترفيه المعتادة لكن ليس فيأكملها لوجود ألم في الركبة
- o أنا قادر على الانخراط في القليل من أنشطة الترفيه المعتادة وذلك لوجود ألم في رجلي
- o أنا قادر على عمل جميع نشاطاتي الترفيهية لكن بمصوبة وذلك لوجود ألم في رجلي
- o أنا غير قادر على القيام بأي نشاط ترفيهي على الإطلاق

Section VI: Arabic Neck disability index

استبيان فحص العجز الوظيفي الناتج عن الام الرقبية المزمنة

هذا الاستبيان صمم ليزودنا بمعلومات عن العجزات التي تطرأ على فعالية الوظائف التي نمارس يومياً بسبب آلام الرقبة. أرجو الإجابة على جميع الأجزاء المنوطة، ووضع إشارة في المربع الذي يتوافق مع اجابته فقط. افهم انه يتوافق مع حالتك أكثر من غير، ولكن أرجو اختيار الجارة الأكثر توافقاً لحالتك.

الجزء الأول: شدة الألم

- o لا أعاني من ألم حالياً
- o الألم خفيف جداً حالياً
- o لدي ألم خفيف حالياً
- o لدي التشنج إلى حد ما حالياً
- o لدي التشنج جداً حالياً
- o لدي ألم لا يطاق حالياً

الجزء الثاني: العلية الشخصية (الاستحمام، ارتداء الملابس، الخ)

- o لدي القدرة على العناية بنفسني بشكل اعتيادي دون الشعور بمزيد من الألم
- o لدي القدرة على العناية بنفسني بشكل اعتيادي لكن بمزيد من الألم
- o من المؤلم أن أعني بنفسني مع مراعاة النظف والحذر
- o احتاج إلى بعض المساعدة إلا أنني أعتبر الأمر في غالب الأحيان
- o احتاج المساعدة في معظم الجوانب المتعلقة بالعناية الشخصية
- o لا أستطيع من ارتداء الملابس فأنا أفضل بصوب وألقي بالسرير

الجزء الثالث: الرفع

- o أستطيع أن أرفع أوزان ثقيلة بدون الشعور بزيادة في الألم
- o أستطيع أن أرفع أوزان ثقيلة لكن بمزيد من الألم
- o يمنعني الألم من رفع الأوزان الثقيلة عن الأرض إلا إذا وضعت في مكان ملائم على الطاولة
- o يمنعني الألم من رفع الأوزان الثقيلة ولكنني أستطيع رفع الأوزان الخفيفة والمتوسطة في حال واجههم في وضعية ملائمة
- o أستطيع رفع الأوزان الخفيفة فقط
- o لا أستطيع أن أرفع أن أحمل أو أرفع أي شيء

الجزء الرابع: القراءة

- o أستطيع أن أقرأ بقر ما أريد دون ألم في رجلي
- o أستطيع أن أقرأ بقر ما أريد لكن بوجود ألم خفيف في رجلي
- o أستطيع أن أقرأ بقر ما أريد لكن بوجود ألم متوسط في رجلي
- o لا أستطيع أن أقرأ بقر ما أريد بسبب وجود ألم متوسط في رجلي
- o أستطيع القراءة بمصوبة بسبب وجود التشنج في رجلي
- o لا أستطيع القراءة على الإطلاق

الجزء الخامس: أيام الفراش

- o لا أعاني من صداع على الإطلاق
- o أعاني من صداع خفيف والذي يحدث بشكل غير متكرر
- o أعاني من صداع متوسط والذي يحدث بشكل غير متكرر
- o أعاني من صداع متوسط والذي يحدث بشكل متكرر
- o أعاني من صداع شديد والذي يحدث بشكل متكرر

Appendix IV: Research ethical committee REC at al-Quds University

| | |
|---|--|
| Al-Quds University Jerusalem Deanship of Scientific Research | <p>بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ</p>  <p>جامعة القدس القدس عمادة البحث العلمي</p> |
| <div style="border: 1px solid black; padding: 5px; display: inline-block;">Research Ethics Committee Committee's Decision Letter</div> | |
| <hr/> | |
| <p>Date: March 09, 2021 Ref No: 172/REC/2021</p> | |
| <p>Dear Dr. Abdulhamid M. Zeer, Mr. Mohammad Salayma,</p> | |
| <p>Thank you for submitting your application for research ethics approval. After reviewing your application entitled "Active vs. passive oriented manual kinesiotherapy protocols in short and midterm management among chronic neck pain patients: A Randomized Controlled Trial.", the Research Ethics Committee confirms that your application is in accordance with the research ethics guidelines at Al-Quds University.</p> | |
| <p>We would appreciate receiving a copy of your final research report/ publication.</p> | |
| <p>Thank you again and wish you a productive research that serves the best interests of your subjects.</p> | |
| <p>PS: This letter will be valid for two years.</p> | |
| <p>Sincerely,</p> | |
| <p>Suheir Ereqat, PhD Associate Professor of Molecular Biology</p> | |
|  Research Ethics Committee Chair | |
| <p>Cc. Prof. Imad Abu Kishek - President Cc. Members of the committee Cc. file</p> | |
| <hr/> | |
| Abu-Dies, Jerusalem P.O.Box 20002 Tel-Fax: #970-02-2791293 | أبوديس، القدس ص.ب. 20002 تلفاكس: #970-02-2791293 |
| research@admin.alquds.edu | |

Appendix VI: Informed consent to participate in Research

عزيزي المشارك /المشاركة:

يجري العلماء والباحثون الدراسات البحثية من أجل تطوير وتحسين علاج الحالات المرضية . بموجب هذه الدراسة فان الباحث يقوم بدراسة وتطبيق وسائل العلاج اليدوي الحركي المطبق من المعالج في التأثير القصير و متوسط الامد على مرضى آلام الرقبة المزمنة.

توقيعك اثناء على نموذج الموافقة هذا هو بموجب موافقة مكتوبة وموقعة على المشاركة في الدراسة البحثية التي يقوم بها الباحث كجهد سلامته، وهو اقرار بأن الباحث قد شرح لك أهداف البحث وطبيعة وطريقة الفحوصات والتدخلات العلاجية للبحث. وانه قد تم توضيح حقوقك المتضمنة:

- سرية المعلومات التي تصرح بها وعدم إطلاع اي شخص عليها وحفظها في مكان امن لا يصل اليه سوى الباحث.
- إخفاء بياناتك الشخصية المبينة لاسمك عند التحليل البحث والنتائج.
- استخدام المعلومات للأغراض الطبية فقط.
- حرية انسحابك في اي وقت من الدراسة ومن دون الحاجة لإبداء الأسباب وبدون اية عواقب شخصية او مالية نتيجة الانسحاب.
- حقك في الاطلاع على نتيجة فحوصاتك ونتائج البحث النهائية.

وأنه في حال كان لديك أسئلة حول الدراسة او حول اي معلومة متعلقة بها، يرجى الاتصال بالباحث: كجد سلامته ٠٥٦٨٩١٥٥٥٩.

موافقة المشارك

لقد تم وصف الدراسة البحثية لي شفويا، وبما فيه المعلومات المدرجة أعلاه، وأوافق على المشاركة بهذه الدراسة البحثية. سوف أحصل على نسخة موقعة من هذا النموذج للاحتفاظ بها في سجلاتي، وعليه أوافق على المشاركة بهذه الدراسة.

اسم المشارك الرباعي: _____

توقيع المشارك: _____ التاريخ: _____

اسم وتوقيع الشاهد: _____ التاريخ: _____



Informed consent to participate in Research

نموذج الموافقة على المشاركة في البحث

اسم البحث:

دراسة لتأثير العلاج اليدوي والحركي في التأثير القصير والمتوسط الامد على مرضى آلام الرقبة المزمنة

اسم الباحث: كجد سلامته

Patient name:

Patient code:

Evaluator name:

Date of evaluation and signature