Arab American University

Faculty of Graduate Studies

The effect of Kenisio tape on neck muscle power, neck pain, neck range of motion and hand function among individual with non- specific neck pain

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Thesis approval

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Declaration

I, the undersigned, the author of Master thesis entitled as “The Effect of Kinesio Tape on Muscle Power, Pain, Range of Motion and Hand Function Among Individual with Nonspecific Neck Pain” which is submitted to the Arab American University for the Master’s degree and I declare that it is the result of my own research, except as indicated, of which none has been offered for a higher degree to any university or other educational institution.

Khaled Aziz Altomaizi

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22/4/2024

Signature

Dedication

First of all, I would like to dedicate this work to God. This study is dedicated with all my heart to my beloved family, especially to my father who was a source of inspiration for me, and to my mother who was a source of continuous encouragement, to my brothers who shared with me words of advice and guidance.

I also dedicate this study to Dr. Moataz Alawneh, who helped and motivated me throughout the study period.

And thanks to the Arab American University and to the academic staff for what they provided during the study period

Acknowledgment

I would like to express my sincere gratitude to God for completing my thesis successfully, as the master's journey was wonderful despite all the circumstances and pressures of study, and it also constituted a qualitative leap from the scientific point of view.

I also extend my thanks and gratitude to my distinguished supervisor, Dr. Moataz Alawneh, who was with me step by step during this stage.

I also thank everyone who taught me during this period for their continuous support and encouragement.

Abstract

Background: Neck pain is one of the most important causes of diseases of the musculoskeletal system , as its widely spread in the society suffers from, as it is a multifactorial disease, is a common complain increased spread at recent days generally worldwide and particular in group as women and high income countries and with 29% and 40% respectively for men and women , it's a multifactorial condition has many risk factors which can be classified as a work related especially in employees who sit long hours at a disk , or non-work related risk factor , as a direct or indirect truma to the neck who suffer from psychological disorders. Non –specific neck pain is a common symptom related to mechanical or postural cause affect patients life with a common disability outcome more common in urban than rural amen because as characterized by technological progress that negatively affects public health resting from lack of movement and sitting in wrong position

Aim : Study of the effect of KT intervention in the treatment of non-specific neck pain

Methods: This study, Quasi-experimental designs/cross sectional, targeted patients with non-specific neck pain, collected from physiotherapy centers in Hebron, 24 males and 7 females, where KT was used on the participants once for 48 hours, they were evaluated Before and after a visual analog scale (VAS) for assessing pain intensity, a quick dash score for assessing hand function, an Oxford scale for muscle power, a Goniometer for range of motion

Results: The results of using KT showed significant improvements in pain, ROM, muscle power and hand function. Moreover, BMI, age, and sex results did not show any effect on non-specific neck pain

Conclusion: This study showed that the use of KT in the treatment of nonspecific neck pain improved pain, ROM, muscle power and hand function.

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List of abbreviations

CNP : chronic neck pain

KT : kinesio tape

DN : dry nedling

MPS : myofascial pain syndrom

ROM : range of motion

VAS : visual analogue scale

MET :Muscle Energy Technique

Chapter one

Introduction

Neck pain is a common complain increased spread at recent days generally worldwide and particular in group as women and high income countries and with 29% and 40% respectively for men and women , it's a multifactorial condition and has many risk factors which can be classified as a work related especially in employees who sit long hours at a disk , or non-work related risk factor , as a direct or indirect truma to the neck (Kazeminasab et al., 2022) (Ariens et al., 2000)

Neck pain is a widespread disease of the musculoskeletal system that has many causes(Kazeminasab et al., 2022) . Neck pain has been classified as one of the main causes of disability in the world. (Childress & Stuek, 2020)

Neck pain is more prevalent in Europe and North America. About a third of adults suffer from neck pain, and the incidence rate is higher in female than males and depends on age, as the incidence increases with age. (Croft et al., 2001) incidence rate among the different age groups is 10.4%-21.3%. Older people are it higher risk for neck pain, as they are more susceptible to injury due to aging physical changes. (Childress & Stuek, 2020).

Neck pain is a multifactorial condition(Kazeminasab et al., 2022). Thus, neck pain is very common as 80% of people will suffer from neck pain or back pain at least once in their life time. Studies indicated that generally 1 out of 5 people needs treatment for neck pain. (Childress & Stuek, 2020) .Neck pain is a common problem, which accounts for 75.7% of musculoskeletal problems .(Osama & Ur Rehman, 2020) ,50%-85% of the general public suffer from neck pain during their lifetime, as studies indicate that a

person who does not suffer from neck pain may be at risk of injury again after 1-5 years(Tejera et al., 2020) .

Presti et al shows that 31% of people who work in the field of computers suffer from neck pain, neck pain is one of the most common problems , which leads to reduced productivity at work due to absenteeism.(Presti et al., 2020)

Injury to neck leads to a change in functions, as it leads to a restriction in the range of motion, which leads to a reduction in daily activities and functions ،Studies have also shown that the rate of pain affects the range of movement, in addition to the presence of other factors that affect, including the psychological factor. (Tejera et al., 2020), it also causes spine problems and negatively affects the nature of work and daily life and leads to various problems in all parts of the body, (Ye et al., 2017)

There are many causes that lead to neck pain, such as a spinal cord injury or a fracture in the spine, as they are considered serious conditions that may lead to disability and require immediate intervention.(Moffett & McLean, 2006) ،The causes of neck pain are many, which may be a result of degenerative joint disease or may be a result of muscle disorders(Osama & Ur Rehman, 2020)

Neck pain is treated by several methods, either through Medicine and taken by Medication or Injection , physical medicine method including (exercises, hot and cold, traction, laser) manual therapy including (manipulation, mobilization, massage) or by patient education,treated by several methods, either through medications and surgeries, or through the use of physical therapy(Gross et al., 2009) (Moffett & McLean, 2006) ،Physiotherapy is one of the main things in the treatment of neck pain because it contains therapeutic methods and techniques, which include the use of exercises,

manual therapy, manipulation and mobilization.(Gattie et al., 2021), One of the methods used in physical therapy to treat neck pain is the use of exercises, massage and education(Moffett & McLean, 2006).

Muscle Energy Technique(MET) It is considered one of the methods used to treat neck pain, as it works to reduce the severity of the pain and increase the range of motion (Sbardella et al., 2021).

Drug therapy Because of the long impact of neck pain on patient life it's a very important to deal with this condition seriously either by drugs, here there many categories of drugs may be used:

- Acetaminophen : it's the first line treatment in many cases but we should be attention to the medical history of patient especially in patient with liver disease or alcoholism to avoid liver toxicity .
- Non-steroidal anti-inflammatory drugs (NSAID) :has strong effect in patient with acute neck pain and can be used with a companion with acetaminophen.
- Muscle relaxants : in case of neck pain caused by muscle spasm , but its lees effective than NSAID and acetaminophen .
- Opioids : has a strong , short term effectiveness a variety of pain syndromes , recommended when other medication don't provide adequate pain relief (Douglass & Bope, 2004)

Surgical treatment at neck pain have a good result on short term symptoms but it seem to have no strong effect at the long term symptoms compare with conservative treatment but it could be consider with sever or progressive radiculopathy neck pain (Evans, 2014) ,in patients with neuropathic pain or mechanical pain and with certain criteria as

young age non-smoker male sex have been showing satisfactory long term results with surgery compared with conservation treatment .(Cohen, 2015)

Neck pain is described based on the time period, as it is considered the best way to describe it, as it is described as follows: acute (less than 6 weeks), subacute (less than 3 months), chronic (more than 3 months).(Berger et al., 2021) Where this study shows the economic and health burdens resulting from neck pain, as in fact, neck pain in many cases is continuing and developing, neck pain is due to traumatic injury or usually a motor vehicle crack.(Rice et al., 2019).

Acute neck pain : It is a sharp pain that occurs suddenly, sometimes extending to the head or shoulders, sometimes reaching the hands. It is a result of pain in the muscles, ligaments, or joints. The duration of the injury is less than 6 weeks. Rest and physical therapy lead to a reduction in pain.(Gattie et al., 2021)

Chronic neck pain is any type of neck pain that persistent for more than 4 weeks causes an effect on quality of life(Sbardella et al., 2021) is one of the most common problems among adults, due to the fact that it is one of the main causes of disability, as the incidence rate among adults is about 50%.(Mesregah et al., 2020) Where many studies have shown that the incidence of chronic neck pain (CNP) ranges between 50-85%, many cases do not recover completely as the infection often recurs, and the incidence of CNP in women is more than in men(Croft et al., 2001).

Non –specific neck pain It is a simple, non-specific pain that is in the neck area, the causes of which are unknown or specific (Tsakitzidis et al., 2017) a common symptom related to mechanical or postural cause affect patients life with a common disability outcome more common in urban than rural area because as characterized by

technological progress that negatively affects public. Non-specific neck pain is one of the most common neck pains (Cheng et al., 2015) and is a one of the most common diseases and is the 4 main cause of disorders of the musculoskeletal system in the world. The annual incidence rate ranges from 15% to 50%, so that 70% of the population suffers from neck pain throughout their lives.(Z. K. Khan et al., 2022).

Non-specific neck pain is associated with chronic pain, where changes occur in the patient's pathological condition during treatment. In general, non-specific neck pain leads to a change in the range of motion and the inability to control posture.(Espí-López et al., 2021), Non- specific neck pain It is considered one of the common types of neck pain which has unclear pathology with self-limited Couse thin few weak but in some patient it case severly limited daily function (Moffett & McLean, 2006)

So that it affects the daily activities of a person and work. Females are the most affected, 30-50% From the community complaining of neck pain (Spardella et al., 2021) There are no specific signs of non-specific neck pain, such as (lump, sprain, traumatic fracture) through which the cause can be identified. (Hidalgo et al., 2017).

Although the causes of non-specific neck pain are not known, there are risk factors that lead to the knowledge of neck pain, for example the environmental factor, or occupation, headaches, emotional problems or the work environment may be among the factors that lead to non-specific neck pain. (Croft et al., 2001).Among the factors that increase the incidence of neck pain other than body mass index, restless and irregular sleep(Liao et al., 2020)

Since the pain is not associated with specific problems in the vertebrae, many interventions are used to treat it, but based on many literatures, it is not considered a

method of treatment, so it is considered an intervention that helps in treatment. (Silva et al., 2018)

Non-specific neck pain is in the neck area so that it does not spread to the upper extremities, where the pain is in the back of the neck (Z. K. Khan et al., 2022). The location of the pain is between posterior and lateral aspect of neck the superior nuchal line and the spinous process of the first thoracic vertebra(Hidalgo et al., 2017).

Kinesio tape originated in the seventies of the last century by Dr. kense kase.(Soiza et al., 2018) is vary simple and widely speed technique use in medical field which is an elastic therapeutic taping use in defirant condition as an application on scare , edema , swelling . it gained it popularity because of the ease of handling ,also it's a free from any chemical or pharmachological sub stance which is liked by people , plus it is cheap (Nelson, 2016) KT is a non-surgical treatment technique and method that is applied by applying it in a special way(He et al., 2022). Kinesio tape It is a flexible tape that is water resistant and anti-allergic. It does not cause any problems or irritations on the skin. Kinesio tape works to reduce pain, edema reduction, and support.(Soiza et al., 2018) .KT is flexible, as it can extend to 120-140% of its original length, and it is characterized by the fact that it resembles human skin in terms of flexibility, which distinguishes it by increasing movement and giving the patient greater comfort(Wang et al., 2022)

Scope

The main objective of the study is to investigate the effect of using KT in the treatment of non-specific neck pain.

The target samples :

The target population in the study are individuals who suffer from non-specific neck pain, which leads to a decrease in the range of motion , an increase in pain, weakness in muscle strength, and problems in the functions of the hands.

The sampling and data collection will be conducted in the physiotherapy centers in Hebron. Measurements will be taken before and after, where the ROM is measured using Goniometer, pain using VAS, Hand function using Quick DASH SCORE and Muscle power using oxford scale, after that a one-time therapeutic intervention is carried out. The sample size consisted of 31 patients in the group.

Problem Statement

Neck pain is classified as one of the most common diseases in society, as it is classified among one of the 4 main diseases of the musculoskeletal system. Neck pain has many causes, including non-specific neck pain that is the most common.

Neck pain negatively affects daily activities. There are many methods and treatments that are used. The treatment is done either through the use of medications, surgical intervention, or the use of physical therapy, so that it is one of the common treatments in the treatment of neck pain, so that many techniques and methods are used, including the use of kinesio tape.

Kinesio tape is widely used, especially in sports injuries. Kinesio tape is characterized by its ease of use, its cheap price, and also the absence of any side effects for its use, and by reading related literature; it is characterized by its effectiveness in a short period.

So, the research aims to study the effect of kinesio tape on neck muscle power , pain , range of motion and hand function among individual with non-specific neck pain during a short period.

Research Questions

1. What is the effect of Kinesio Taping on neck pain level among individuals with non-Specific neck pain?
2. What is the effect of kinesio taping on neck ROM among individuals with non-Specific neck pain?
3. What is the effect of kinesio taping on muscle power of the neck muscles among individuals with non- Specific neck pain?
4. What is the effect of kinesio taping on hand function among individuals with non-Specific neck pain?

Research Hypotheses

1. Kenisio tape can decrease the neck pain among individuals with non-specific neck pain
2. Kinesio taping can increase the neck ROM among individuals with non- Specific neck pain
3. Kinesio taping can increase the muscle power of neck muscles among individuals with non- Specific neck pain
4. Kinesio taping can increase the hand function among individuals with non- Specific neck pain

Goals

1. To investigates the effect kinesio tape on neck pain among individuals with non – specific neck pain.

2. To Investigates the effect kinesio tape on neck range of motion among individuals with non –specific neck pain.
3. To Investigates the effect kinesio tape on muscle power of neck muscles among individuals with non –specific neck pain.
4. To Investigates the effect kinesio tape on hand function among individuals with non –specific neck pain.

Study Rationale

The results of the study will be useful to physiotherapists, as the study adds a new application for the evidence-based treatment of patients with non-specific neck pain. It also adds benefit to patients with non-specific neck pain as the use of keinesio tape saves time as it is quick to apply and its results are quick, through the fact that the results of the study are quick, and we hope that the results of the study will add a new suggestion to the global literature on non-specific neck pain.

Chapter Two
Review and related literatures

Theoretical Framework

Chronic neck pain is widespread condition in different populations and ages. The risk of neck pain increase during the productive age stage. The incidence rate is higher in women than in men‹(Ylinen et al., 2004) neck pain can be treated by integrating the method of manual therapy and the use of exercises to relieve pain. (“Neck Pain: Combining Exercise and Manual Therapy for Your Neck and Upper Back Leads to Quicker Reductions in Pain,” 2013)

Kinesio tape is vary simple and widely speed technique use in medical field which is an elastic therapeutic taping use in deferent condition as an application on scare , edema , swelling . it gained it popularity because of the ease of handling ,also it’s a free from any chemical or pharmachological sub stance which is liked by people , plus it is cheap (Nelson, 2016).

Several previous studies

Similar studies

Through the study conducted by Espí-López et al on the effect of the extent of using kinesio tape in chronic neck pain, The study included 44people suffering from chronic neck pain, they were divided into two groups randomly, one group used traditional physical therapy and the other group used kinesio tape, Where the study aimed to know the effect of The use of KT reduces the severity of pain and increases the range of motion, in addition to increasing muscle strength , as the results of the study showed the

effectiveness of kinsio tape in increasing muscular endurance, and it also has benefits in a new addition to the traditional physiotherapy method..(Espí-López et al., 2021)

In the study conducted by El-Azeim et al about the effect of using kinesio tape on the upper trapezius in reducing pressure pain threshold and normalized resting Myoelectric activity , where the study was conducted on two groups, the first group (a) KT was used twice during the week for one week, and the second group (b) was not used. Anything the results show about the benefit of using KT in the treatment of subjects with active upper trapezius myofascial trigger points.(El-Azeim et al., 2019)

The results of the study conducted by Rasika et a showed about the effect of KT on mechanical neck pain. The study included 50 participants who were divided into two groups. With physical exercise it has a better effect than using exercise therapy alone in terms of increasing ROM and reducing pain(Rasika et al., 2017)

In a study on the effectiveness of using ultrasound and kinsio tape in the treatment of tennis elbow, where two equal groups were taken, in the first group (ultrasound and exercises) were used, and the second group was used (kinisio tape, exercises). The results of the study showed improvement in both groups, but the effect of kinisio tape is better than ultrasound In reducing the intensity of pain and increasing hand grip strength.(Shaheen et al., 2019) In another study on the effect of KT in the treatment of lateral epicondylitis, the study included 40 participants, who were divided into 3 groups, the first group ultrasound (n=13), the second group extracorporated shock wave therapy (n=14), and the third group kinesio tape (n=13). Where the results of the three groups showed improvement by reducing pain and improving functionality.(Özmen et al., 2021)

In the study conducted on the effect of KT in the treatment of people suffering from subacromial impingement syndrome , the study included 30 participants who were divided control group (n = 15) and treatment group (n = 15), the results showed that the application of KT leads to Improving hand, shoulder and arm disability in people with Subacromial Impingement Syndrome.(Shakeri, 2013)

Kachanathu et al a study he conducted on 40 people suffering from lower back pain, where the work was done on two groups, the first group included 20 people, during which traditional physiotherapy and KT were used, and the second group used traditional physiotherapy, where the results showed an improvement in ROM pain, ADL with or without kinsio tape (Kachanathu et al., 2014)

Mutoharoh et al showed about the effect of using kinesio tape on pregnant women in the third trimester who suffer from lower back pain, as the study included 36 women, where the use of kinesio tape with exercises played a role in reducing pain in pregnant women in the third trimester.(Mutoharoh et al., 2021)

Another study conducted by Baltaci et al about the effect of using kinsio tape in the treatment of pain, edema, ROM for patients who underwent ACL surgery, where 56 people were divided into two groups, the first intervention group containing 28 participants and the second control group containing 28 participants Where they underwent treatment immediately after the operation, it was noticed that the pain decreased quickly for people who used kinsio tape between the first and second day, and for ROM, edema, there was an improvement, but after a short period of treatment (Baltaci et al., 2021)

The study that was conducted on people who suffer from calf muscle fatigue, as it was conducted on 54 university athletes, showed through three groups as follows: KT with 50% tension; For the Sham group, KT without any tension; And for the placebo group, it showed the effect of using KT in reducing muscle fatigue. (Rana et al., 2022)

In the study conducted by Aydoğdu et al.on the effect of using KT in reducing osteoarthritis in reducing the intensity of pain, increasing the range of motion and muscle strength, and increasing functional status, and through the results it was shown that there was an improvement in the KT group in terms of reducing the intensity of pain and increasing the range of Movement and functional status. Clear and fast. (Aydoğdu et al., 2017)

In another study conducted on the effect of using kinesio tape on quadriceps femoris in terms of the functions of elderly women suffering from osteoarthritis, where the study included 22 women, the results showed that the use of kinesio tape has an effect on the function of quadriceps femoris in elderly women. (E. J. Kim & Lee, 2017)

The study conducted by Liao et al. showed the effect of using kinesio tape on patients with stroke in terms of trunk function, balance, and mobility, where the study included 13 patients with stroke, kinesio tape was used on them, where the results were as follows: a positive change in trunk function, balance.(Liao et al., 2020)

In a study conducted on the effect of using kinesio tape on people with Chronic Hemiparesis, the study contained 33 participants who were divided into 3 groups, and in the group on which kinesio tape was performed, it was performed on tibialis anterior and quadriceps to examine mobility and balance ability, where the results showed the

effectiveness of kinesio tape in increasing the ability to move and balance (K. H. Kim & Lee, 2020)

In a study conducted on the effect of using kinesio tape as an assistant in patients with adhesive capsulitis, the study contained 30 participants who were divided into two groups, the first group using the mobilization technique and the second group using the mobilization technique and kinesio tape, where the results showed an auxiliary effect for pain, range of motion and function. (Deshmukh et al., 2021)

Farooqui et al. conducted a study on the effect of using kinesio tape and Muscle Energy Technique in women with Sacro-iliac Joint Dysfunction after childbirth, where the study included 52 participants, whose ages ranged between (20-35), where the results of the study indicated reducing pain and physical disability and decreasing pelvic asymmetry(Farooqui et al., 2022)

The study conducted by Kachanathu et al. on the effect of using kinesio tape with traditional physical therapy on reducing pain and increasing range of motion, the study included 36 participants who were divided into two groups, where the treatment lasted for two weeks, with three sessions during the week, the results of the study showed the effectiveness of using kinesio tape with Traditional Physical Therapy to reduce pain and increase range of motion (Kachanathu et al., 2014)

In the study conducted by Alasmry about the effect of kinesio tape on people suffering from Planter Fasciitis in terms of Functional Disability And Quality Of Life, which included 30 participants, who were divided into two groups, where kinesio tape was used once during the week for four weeks. The results showed improvement in the

group in which kinesio tape was used, which showed improve function, quality of life, and reduce discomfort or pain (Alasmry, 2022)

In the study conducted on the effectiveness of the use of kinesio tape(KT) or dray nedling (DN) in the exercises used for myofascial pain syndrome (MPS) on the Trapezius muscle, so that the study included 3 groups, namely the control group and the KT group, the DN group. The results of the study were the importance of introducing KT and DN in the treatment because of its importance. (Yasar et al., 2021)

Research gap

Neck pain has been classified as one of the most common diseases in society, where its infection leads to an impact on a person's daily life, which negatively affects activities at work and social life. There are many methods and exercises used to treat neck pain, either through operations or medications, which are expensive. Physically, and also physiotherapy is one of the methods used in the treatment of neck pain, where many techniques are used in the treatment of neck pain, one of these techniques used in the treatment of non-specific neck pain is KT, as it is easy to use, does not take time in treatment, is cheap and has no side effects But it is being used without sufficient evidence. The study aimed to show the extent of the effect of kinesio tape in treating neck pain in terms of pain, ROM, hand function and muscle power.

Chapter three
Methods and Procedures

Introduction

This chapter includes the methodological matters used in this study. The adopted methodology includes the population and sample with selection criteria, and finally the statistical methods that were applied in analyzing the data. As it is explained as follows:

Research Methodology

This study aimed to determine the extent of the effect of using KT in treating individuals who suffer from non-specific neck pain. In order to obtain and achieve the objectives of the study, the researcher used the experimental method in order to obtain and achieve the results of the study ،design of one group, then the researcher performs a pre-test on individuals of the group, then perform the treatment on the experimental group members, and then the post-measurement was applied to the experimental group to achieve the desired goals. in this section, there are the methods used in the mechanism of conducting study, comparison, interpretation, and evaluation to reach meaningful generalizations and present research questions.

Study design

This study adopted the cross sectional Quasi-experimental designs.

This study included one group, which is the intervention group, Which included the use of KT on patients, which is one of the methods used in physical therapy

Research setting

This study was conducted in Palestine, where patients were taken and collected in several physiotherapy centers licensed by the Palestinian Syndicate and the Palestinian Ministry of Health So that it contains a specialized, highly skilled physiotherapy staff

who has obtained the practice of the profession from the Palestinian Ministry of Health, as it is equipped with all the necessary equipment and tools , which meet the general safety and health conditions.

Sampling and population

Sampling method

The researcher selected the patients according to the inclusion and exclusion criteria, Where the study included 31 participants suffering from non-specific neck pain diagnosed by an orthopedist, and they were referred to take physiotherapy sessions, where the test was conducted in a center equipped with all the equipment and materials necessary to conduct the study and equipped with all public safety measures

In this study, the intervention was carried out on one group, which is the intervention group containing 31 patients (n = 31).

Research Sample

The study sample consisted of (31) participants who suffer from non-specific neck pain, who were randomly selected, and Table 1 Through which the demographic characteristics of the sample are clarified:

Table 1: Demographic characteristics of the sample

Variable	Variable level	Frequency	Percentage%
Gender	Male	24	77.4
	Female	7	22.6
	Total	**31**	**100.0**
Age	(20-30) years	7	22.6
	(31-40) years	8	25.8
	(41-50) years	11	35.5
	more than 50 years	5	16.1
	Total	**31**	**100.0**
Hight	(150-160)cm	8	25.8
	(161-170)cm	8	25.8
	more than 170 cm	15	48.4

Variable	Variable level	Frequency	Percentage%
	Total	**31**	**100.0**
Weight	(50-70)kg	16	51.6
	(71-90)kg	10	32.3
	more than 90 kg	5	16.1
	Total	**31**	**100.0**
Body Mass Index (BMI)	less than 23 kg/m^2	12	38.7
	(23-28) kg/m^2	11	35.5
	more than 28 kg/m^2	8	25.8
	Total	**31**	**100.0**

Sampling size

The sample included 31 patients with non-specific neck pain , where 31 patients with non-specific neck pain were selected as a sufficient sample size to use the required statistical analysis.

Inclusion criteria

Participants in this study are selected if they are according to the following:

1- Non –specific neck pain

2- Age 20- 55

3- Had a medical referral for physiotherapy.

4- The state of health is stable

Exclusion criteria

1- signs and symptoms of neurological disorders.

2- Bone disease.

3- History of spinal surgery.

4- Pregnant

5- Any whiplash injury – trauma for last 12 months

Study tools

Data collections sheet

The data collection sheet contains:

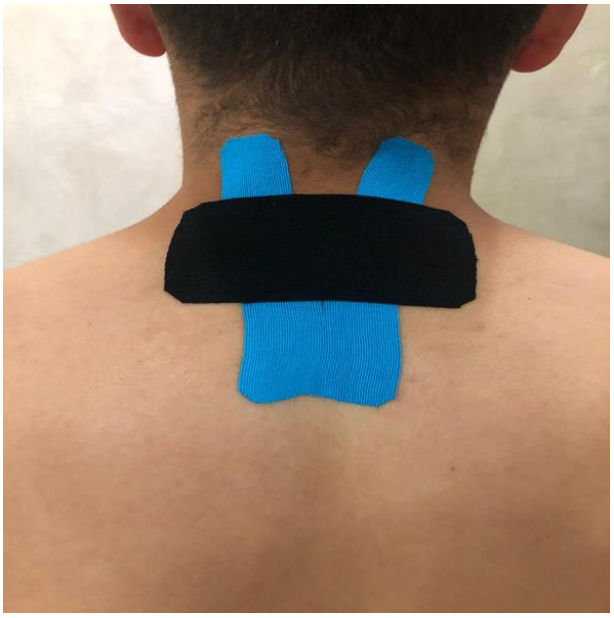
- personal data, which includes:(Name, age ,Height (cm), sex (M/F), weight(kg).
- Status
- Education level
- BMI : is a measure of body mass index based on weight In kilograms divided by the square of the height in meters (kg / m 2), so that it is characterized by its ease of use and cheapness, so that the results indicate the rate of obesity among people, where a percentage less than 18.5 indicates a underweight, between 18.5-24.9 is considered normal, and between 25-29.9 is an Overweight, more than 30 obesity(Centers of disease control, 2011)
- Address
- phone number
- work status

Data collection procedures

After obtaining approval from the Ethics Committee of the Arab American University appendix (2).

The work began where patients were selected according to the inclusion and exclusion criteria. The study mechanism was explained to each patient through the Information sheet appendix(3). After explaining the necessary information to the patient, he is asked to sign the written consent form appendix (4), after that the necessary information is collected from the patient through the data Collection Sheet appendix (5) before starting the intervention.

After taking the necessary information from the patient, the patient is given 5 minutes to rest, and then the patient is asked to take off the clothes from the upper part of the body and asked him to sit, and then the outcome measures are taken from the patient, which is pain , ROM , hand function , muscle power and after completion, the intervention is performed and kinesio is placed tape on the patient, and after completion, the therapist asks the patient if the kinesio tape affects him, and before the patient leaves, he is given instructions and instructions for use, and then he is told about the date of the next session, which will be after 48 hours, and after the patient returns, the therapist removes the kinesio tape from Patient and take Outcome measures again.



(The placement of the kinesio taping)

Intervention

The intervention was conducted on the participants by a physiotherapist (researcher), where all participants were introduced about the nature of the intervention, as the study included the intervention group (n = 31).

Before starting the intervention procedures, the necessary information is taken and muscle strength is measured by oxford scale and pain intensity by VAS and ROM using Goniometer and hand function using Quick DASH SCORE , Where the researcher used in the application (Kinesis tex tape, kinesis holding corporation, albuquerque) (González-Iglesias et al., 2009) As the diffused KT colors do not have any therapeutic effect(Abed et al., 2022) , because there is no difference in the effect of KT colors, the

researcher used blue and black , after that Kenisio tape is applied so that the patient is in a sitting position the first layer of blue color is placed on A _Y shape is placed on (T1-T2) without tension, and then the two tails are placed in a parallel manner around the spine at (C1-C2) with an expansion rate between 15_25% so that the neck is in a rotating position and side bending the second layer of black color .

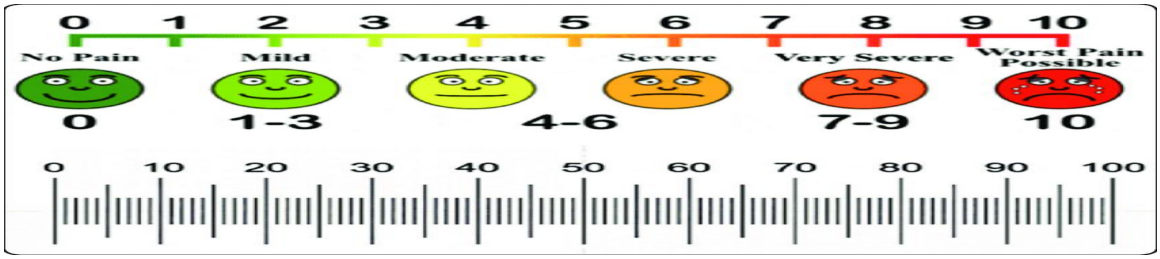
is placed on top The blue layer between (C3-C6) so that the neck flextion position.(González-Iglesias et al., 2009)(Saavedra-Hernández et al., 2012).

After that, it is left for 48 hours, the Kenisio tape is removed, and measurements are taken again.

Outcome measures

Pain (visual analogue scale (VAS))

The researcher used the visual analog Scale to evaluate the severity of the patient's pain, which is valid and reliable (Rabea Begum & Hossain, 2019), VAS is considered one of the most common tools in measuring pain. It is a horizontal line numbered from 0-100 mm, where 0 is considered the lowest value (no pain) and 100 is considered the highest value (severe pain).(Myles et al., 1999) The method of conducting the test was by printing VAS on a paper and then explaining to the patient about VAS, Where the patient was in a comfortable sitting position, the specialist was in front of him holding the paper on which the VAS was printed, and then the patient was asked to determine the level of pain as shown in the picture below



visual analogue scale

Handfunction (Quick DASH SCORE)

Quick DASH SCORE: It is a tool that is widely used in the upper extremities, as it is used to identify or evaluate musculoskeletal disorders in the upper extremities, which is valid and reliable (Qasheesh et al., 2021)

qiuck is a performance through which the extent of the functional performance of the hand during the past week is measured and known, so that it consists of 11 questions that the researcher reads to the patient and asks the patient to choose from 1-5 according to his ability(Budtz et al., 2018), as shown in the Appendixes: (1). Quick Dash disability is calculated according to the equation coming Quick DASH DISABILITY/SYMPTOM SCORE = (sum of n responses) - 1 x 25(Quick, 2013)

The researcher explained the Quick DASH SCORE to the patient, and then the researcher began to ask the patient questions so that the patient answers each question according to his condition, where the patient's position was sitting and the researcher was standing in front of him.

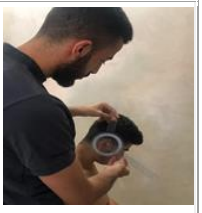
Range of motion (Goniometer)

Goniometer is a A device through which the range of motion of the joints is measured, where the range of motion in the joint is measured (in degrees), where the measurement

is done either by moving the joint active or passive, it consists of 3 main parts, which are the axis, stationary arm and movable arm.(AOK, 2017) Valid and reliable(Yee Won, 2019).

Where the researcher will measure the four movements of the neck (Neck flexion ,Neck extension ,Neck rotation ,Neck said –binding) using the goniometry ,So that the measurement process is carried out as shown in the table below, in addition to making sure before starting that there are no obstacles that may affect the measurements.

Table (2): Shows the method for measuring range of motion using a goniometry .

Motion	Recommended Testing Position	Stabilization	Center	Proximal Arm	Distal Arm	Start	End
Flexion	Sitting, with thoracic & lumbar spine well supported by the back of the chair. Tongue depressor can be held between teeth for reference(Gul et al., 2022)	Shoulder girdle is stabilized to prevent flexion of thoracic & lumbar spine(Gul et al., 2022)	Over the external auditory meatus(Gul et al., 2022)	Perpendicular or parallel to ground(Gul et al., 2022)	With base of nares or parallel to longitudinal axis of tongue depressor(Gul et al., 2022)		
Extension	Sitting, with thoracic & lumbar spine well supported by the back of the chair. Tongue depressor can be held between teeth for reference(Gul et al., 2022)	Shoulder girdle is stabilized to prevent flexion of thoracic & lumbar spine(Gul et al., 2022)	Over the external auditory meatus(Gul et al., 2022)	Perpendicular or parallel to ground(Gul et al., 2022)	With base of nares or parallel to longitudinal axis of tongue depressor(Gul et al., 2022)		
Lateral flexion	Sitting, with thoracic & lumbar spine well supported by the back of the chair. Cervical spine in 0^0 of flex, ext, & rot. Tongue depressor can be held between teeth for reference. (Gul et al., 2022)	Shoulder girdle is stabilized to prevent lateral flexion of thoracic & lumbar spine(Gul et al., 2022)	Over spinous process of C7(Gul et al., 2022)	Spinous processes of thoracic vertebrae so that arm is perpendicular to ground(Gul et al., 2022)	Dorsal midline of head. Reference occipital protuberance. (Gul et al., 2022)		

Motion	Recommended Testing Position	Stabilization	Center	Proximal Arm	Distal Arm	Start	End
Rotation	Sitting, with thoracic & lumbar spine well supported by the back of the chair. Cervical spine in 0^0 of flex, ext, & lat flex. Tongue depressor can be held between teeth for reference(Gul et al., 2022).	Shoulder girdle is stabilized to prevent rotation of thoracic & lumbar spine. (Gul et al., 2022)	Over center of cranial aspect of head(Gul et al., 2022)	Parallel to imaginary line between the two acromial processes(Gul et al., 2022)	With the tip of the nose. If using tongue depressor, parallel to longitudinal axis of tongue depressor(Gul et al., 2022)		

Muscle power (oxford scale)

Muscle strength is a valid and reliable (Cuthbert & Goodheart, 2007), Through the study, muscle power will perform neck movements (flexion and extension) by scale 0-5 so that 0 = no movement 1 = almost non-existent movement 2 = movement with gravity 3 = movement against gravity 4 = movement against gravity with simple resistance 5 = Anti-gravity movement with full resistance(Mohamed et al., 2019)

Table (3): Shows the method of measuring muscle strength using the Oxford scale.

Motion	Grade 0 and 1	Grade 2	Grade 3	Grade 4 and 5
Neck flexion	The patient is in a supine position, where both hands of the therapist are placed on the sternocleidomastoid mascle and feels if	: The patient's position is on the side, and the patient's head is fixed by the therapist. The	The patient is in a supine position, The therapist fixes the abdominal area, then the patient is	The patient is in a supine position, The therapist fixes the abdominal area, then the patient is

Motion	Grade 0 and 1	Grade 2	Grade 3	Grade 4 and 5
	there is movement.	patient is asked to move the cervical spine upwards.	asked to move the cervical spine upwards	asked to move the cervical spine upwards and then the therapist performs resistance
Neck extension	The patient is in a prone position, the therapist palpation muscles of posterior area of neck	The patient's position is on the side, and the patient's head is fixed by the therapist The patient is asked to move the cervical spine backwards.	The patient's position is prone. The therapist installs the thoracic area and scapulae, and then the therapist asks the patient to move the neck area up	The patient's position is prone. The therapist installs the thoracic area and scapulae, and then the therapist asks the patient to move the neck area up and then the therapist performs resistance

Ethical Consideration

All participants received sufficient information about the study through the informed consent sheet appendix (4), where the risks and damages that could occur during the conduct of the study were explained So that the skin may be allergic to the adhesive, and redness may appear in the place of the KT after its removal .

The approval was granted without any coercion of the patient, so that the patient's safety throughout the study period was the responsibility of the researcher. The patient's identity throughout the study period was confidential. The patient was explained to them of their right to withdraw from the study at any time. The collected data was analyzed using codes instead of names, where the data and information will be kept in a safe place that no one can access except the researcher.

Statistical analysis

Data collection and calculation were conducted using the Statistical Package for the Social Sciences (SPSS) program, where the following statistical methods were used::

1. Descriptive statistics: such as, percentage, arithmetic average, It is used to determine the variable categories, according to the researcher's opinion, as indicated in the description of the study variables.
2. Paired Sample T-test for the associated samples to determine the statistical significance of the differences between pre-test and post-test of the dimensions of the study.
3. Cohen's d is a measure of effect size commonly used in statistics to quantify the difference between two means. It indicates the standardized difference between two groups' means in terms of standard deviations. Cohen's d is particularly useful when

comparing the means of two independent groups in experimental or observational studies.

$d = \frac{\overline{X}_1 - \overline{X}_2}{s}$ The formula to calculate Cohen's d is as follows:

Where:

$\overline{X}_1$ is the mean of the first group.

$\overline{X}_2$ is the mean of the second group.

(s) is the pooled standard deviation.

Cohen's d can take positive or negative values. A positive value indicates that the first group's mean is larger than the second group's mean, while a negative value indicates the opposite. The magnitude of Cohen's d represents the effect size. In general, larger values of Cohen's d indicate a larger effect size.

Interpretation of Cohen's d values can vary, but a common guideline is as follows:

- Small effect size: around 0.2
- Medium effect size: around 0.5
- Large effect size: around 0.8 or above

Check the normal distribution of the data:

The researcher uses Shapiro – Wilk test to check if the data distributed normally or not, as shown in table (2).

Table (4): Shapiro – Wilk test

Variable	Test	Shapiro-Wilk		
		Statistic	df	Sig.
Pain	Pretest	0.976	31	0.716
	Posttest	0.944	31	0.119
Muscle Powe flexion	Pretest	0.969	31	0.480
	Posttest	0.981	31	0.848

Muscle power extension	Pretest	0.975	31	0.655
	Posttest	0.965	31	0.387
ROM Flexion	Pretest	0.967	31	0.452
	Posttest	0.967	31	0.443
ROM Extension	Pretest	0.983	31	0.887
	Posttest	0.986	31	0.954
ROM rotation RT	Pretest	0.946	31	0.120
	Posttest	0.943	31	0.100
ROM Rotation LT	Pretest	0.972	31	0.588
	Posttest	0.957	31	0.421
ROM side Bend RT	Pretest	0.977	31	0.737
	Posttest	0.949	31	0.149
ROM Side Bend Lt	Pretest	0.937	31	0.068
	Posttest	0.971	31	0.533
Quick Dash	Pretest	0.953	31	0.193
	Posttest	0.951	31	0.113

It is clear from the data in Table (2) that the statistical significance of all variables was greater than (0.05) on the pre and post measurements, and this indicates that the data is distributed normally, and This allows the use of parametric tests by the researcher in order to obtain answers to the study's questions and examine its hypotheses.

Chapter four
results

Introduction

This chapter contains statistical analysis of the data emerging from the study, in order to answer its questions and hypotheses.

Q1: What is the effect of Kinesio Taping on pain level among individuals with non-Specific neck pain?

From the first question, the following hypothesis emerged:

H1: Kenisio tape can decrease the pain among individuals with non-specific neck pain

To examine the hypothesis, the means and standard deviations of the pre- and the post-test results of the experimental of the effect of using Kinesio tape on pain level among individuals with non-Specific neck pain. Paired samples t-test was used to measure the significance of the differences. Table (5) describes those results.

Table (5): paired samples t-test results of the differences between the pre- and post-test of the experimental of the effect of using Kinesio tape on pain level among individuals with non-Specific neck pain.

Variable	Application	N	Mean	Standard Deviation	t value	Sig.	Cohen's *d*
Pain level	Pre-test	31	6.35	1.76	19.27	0.001	0.783
	Post-test	31	3.65	1.66			

't' table value at (30) df. at (0.05) sig. level equal (2.05**)**
't' table value at (30) df. at (0.01) sig. level equal (2.76)

Table (5) shows that the calculated T. value (19.27) is greater than the table T. value (2.76) in the test, which means that there are statistically significant differences at ($\alpha \leq 0.01$) between the pre and posttest of using Kinesio tape on pain level among

individuals with non-Specific neck pain in favor of the posttest. The average of the post-test was (3.65), while the average of the pre-test was (6.35). This means that the use of Kinesio Tape reduces pain among individuals with non-specific neck pain. Cohen's d value was (0.783), which means that using Kinesio tape has a significant effect in reducing neck pain. Therefore, the first hypothesis was accepted.

Q2: What is the effect of kinesio taping on muscle power among individuals with non- Specific neck pain?

From the 2nd question, the following hypothesis emerged:

H2: Kinesio taping can increase the muscle power among individuals with non-Specific neck pain.

In order to know the second hypothesis, the arithmetic mean and standard deviation of the results obtained by the pre- and post-test were added to the effect of using KT on muscle strength in people suffering from non-specific neck pain, and in order to measure the importance of the differences, the T-test was used, Table No. (6) Explains the results

Table (6): paired samples t-test results of the differences between the pre- and post-test of the experimental of the effect of using Kinesio tape on muscle power among individuals with non-Specific neck pain.

Variables	Application	N	Mean	Standard Deviation	t value	Sig.	Cohen's *d*
Muscle power flexion	Pre-test	31	3.84	0.523	-8.67	0.001	0.497
	Post-test	31	4.61	0.495			
Muscle power extension	Pre-test	31	3.84	0.523	-8.67	0.001	0.497
	Post-test	31	4.61	0.495			

't' table value at (30) df. at (0.05) sig. level equal (2.05**)**
't' table value at (30) df. at (0.01) sig. level equal (2.76)
How come the same ??

Through Table No. (6), it was shown that the calculated T value (8.67) is greater than the tabulated T value (2.76) in the test, and this indicates the presence of statistically significant differences at ($\alpha \leq 0.01$) between the pre and posttest of using Kinesio tape on muscle power flexion among individuals with non-Specific neck pain in favor of the posttest. The average of the post-test was (3.84), while the average of the pre-test was (4.61). This means that the use of Kinesio Tape helps muscle power flexion among individuals with non-specific neck pain. Cohen's d value was (0.497), which means that using Kinesio tape has a moderate effect on flexion muscle strength.

Also, from table (6) we found that the calculated T. value (8.67) is greater than the table T. value (2.76) in the test, which means that there are statistically significant differences at ($\alpha \leq 0.01$) between the pre and posttest of using Kinesio tape on muscle power extension among individuals with non-Specific neck pain in favor of the posttest. The average of the post-test was (3.84), while the average of the pre-test was (4.61). This means that the use of Kinesio Tape helps muscle power extension among individuals with non-specific neck pain. Cohen's d value was (0.497), which means that using Kinesio tape has a moderate effect on flexion muscle strength. Therefore, the second hypothesis was accepted.

Q3: What is the effect of kinesio taping on ROM among individuals with non-Specific neck pain?

From the 3rd question, the following hypothesis emerged:

H3: Kinesio taping can increase the ROM among individuals with non- Specific neck pain.

To examine the 3rd hypothesis, the means and standard deviations of the pre- and the post-test results of the experimental of the effect of using Kinesio tape on ROM among

individuals with non- specific neck pain. Paired samples t-test was used to measure the significance of the differences. Table (7) describes those results.

Table (7): paired samples t-test results of the differences between the pre- and post-test of the experimental of the effect of using Kinesio tape on ROM among individuals with non-Specific neck pain.

Variables	Application	N	Mean	Standard Deviation	t value	Sig.	Cohen's *d*
ROM Flexion	Pre-test	31	23.90	5.69	-14.29	0.001	3.658
	Post-test	31	33.29	5.92			
ROM Extension	Pre-test	31	28.97	9.22	-12.22	0.001	7.098
	Post-test	31	44.55	13.05			
ROM rotation RT	Pre-test	31	45.74	12.33	-11.61	0.001	7.225
	Post-test	31	60.81	10.06			
ROM Rotation LT	Pre-test	31	45.45	9.73	-13.61	0.001	6.675
	Post-test	31	61.77	8.67			
ROM side Bend RT	Pre-test	31	19.42	5.17	-14.46	0.001	3.601
	Post-test	31	28.77	5.63			
ROM Side Bend Lt	Pre-test	31	19.48	5.88	-14.74	0.001	3.547
	Post-test	31	28.87	6.51			

't' table value at (30) df. at (0.05) sig. level equal (2.05)
't' table value at (30) df. at (0.01) sig. level equal (2.76)

From the data presented in Table (7), it is clear that:

1- There is a statistically significant effect of using the Kinesio tape on ROM Flexion, where the calculated (t) value was (14.29), which is greater than the tabular (t) value (2.76), where differences appeared between the means of the pre-test and post-test, in favor of the post-test The arithmetic mean of the posttest was (33.29), compared to (23.90) for the pre-test. Cohen's d was (3.658), which means that there is a large impact of using the Kinesio tape on ROM Flexion.

2- There is a statistically significant effect of using the Kinesio tape on ROM Extension, where the calculated (t) value was (12.22), which is greater than the

tabular (t) value (2.76), where differences appeared between the means of the pre-test and post-test, in favor of the post-test The arithmetic mean of the posttest was (44.55), compared to (28.97) for the pre-test. Cohen's d was (7.098), which means that there is a large impact of using the Kinesio tape on ROM Extension.

3- There is a statistically significant effect of using the Kinesio tape on ROM rotation RT, where the calculated (t) value was (11.61), which is greater than the tabular (t) value (2.76), where differences appeared between the means of the pre-test and post-test, in favor of the post-test The arithmetic mean of the posttest was (60.81), compared to (45.74) for the pre-test. Cohen's d was (7.225), which means that there is a large impact of using the Kinesio tape on ROM rotation RT.

4- There is a statistically significant effect of using the Kinesio tape on ROM Rotation LT, where the calculated (t) value was (13.61), which is greater than the tabular (t) value (2.76), where differences appeared between the means of the pre-test and post-test, in favor of the post-test The arithmetic mean of the posttest was (61.77), compared to (45.45) for the pre-test. Cohen's d was (6.675), which means that there is a large impact of using the Kinesio tape on ROM rotation LT.

5- There is a statistically significant effect of using the Kinesio tape on ROM side Bend RT, where the calculated (t) value was (14.46), which is greater than the tabular (t) value (2.76), where differences appeared between the means of the pre-test and post-test, in favor of the post-test The arithmetic mean of the posttest was (28.77), compared to (19.42) for the pre-test. Cohen's d was (3.601), which means that there is a large impact of using the Kinesio tape on ROM side Bend RT.

6- There is a statistically significant effect of using the Kinesio tape on ROM side Bend LT, where the calculated (t) value was (14.74), which is greater than the tabular (t)

value (2.76), where differences appeared between the means of the pre-test and post-test, in favor of the post-test The arithmetic mean of the posttest was (28.87), compared to (19.48) for the pre-test. Cohen's d was (3.547), which means that there is a large impact of using the Kinesio tape on ROM side Bend LT.

So, from these results we conclude that Kinesio taping can increase the ROM among individuals with non- Specific neck pain, Therefore, the third hypothesis was accepted.

Q4: What is the effect of kinesio taping on hand function among individuals with non- Specific neck pain?

From the 4th question, the following hypothesis emerged:

H4: Kinesio taping can increase the hand function among individuals with non-Specific neck pain.

To study the results of the pre-test and post-test of the use of KT on hand function among individuals suffering from non-specific neck pain, means and standard deviations were chosen . Paired samples t-test was used to measure the significance of the differences. Table (8) describes those results.

Table (8): paired samples t-test results of the differences between the pre- and post-test of the experimental of the effect of using Kinesio tape on the hand function among individuals with non-Specific neck pain.

Variable	Application	N	Mean	Standard Deviation	t value	Sig.	Cohen's *d*
Hand Function	Pre-test	31	228.23	148.15	10.17	0.001	85.627
	Post-test	31	71.77	74.09			

't' table value at (30) df. at (0.05) sig. level equal (2.05**)**
't' table value at (30) df. at (0.01) sig. level equal (2.76)

Table (8) shows that the calculated T. value (10.17) is greater than the table with a T. value of (2.76), this indicates that there are statistically significant differences in the test at ($\alpha \leq 0.01$) between the pre and posttest of using Kinesio tape on the hand function

among individuals with non-Specific neck pain in favor of the posttest. The average of the post-test was (71.77), while the average of the pre-test was (228.23). This means that the use of Kinesio Tape increases the hand function by reducing the pain among individuals with non-specific neck pain. Cohen's d value was (85.627), which means that using Kinesio tape has a significant effect in increasing the hand function. Therefore, the fourth hypothesis was accepted.

Q5: Are there any differences in the scores of the respondents on the pre and post measurements of using the Kinesio tape to the neck pain due to the demographic variables (Gender, Age, Hight, Wight, BMI)?

To answer the 5th question, it was transformed into the following hypotheses:

1st hypothesis: There were no statistically significant differences at the significance level (α≤0.05) in the scores of the respondents before and after using Kinesio tape for neck pain due to gender.

An independent-samples t-test was used to compute the differences in the scores of the respondents before and after using Kinesio tape for neck pain due to gender, as showing in table (9):

Table (9): An independent-samples t-test was conducted to compare averages of the scores of the respondents before and after using Kinesio tape for neck pain due to gender

Variable	Application	Gender	N	mean	Std.	(T) value	Sig.
Pain	Pretest	male	24	6.38	1.74	0.116	0.908
		female	7	6.29	1.98		
	Posttest	male	24	3.75	1.70	0.665	0.521
		female	7	3.29	1.60		
Muscle power flexion	Pretest	male	24	3.88	0.54	0.710	0.483
		female	7	3.71	0.49		
	Posttest	male	24	4.63	0.49	0.248	0.806
		female	7	4.57	0.53		

Variable	Application	Gender	N	mean	Std.	(T) value	Sig.
Muscle power extension	Pretest	male	24	3.88	0.54	0.710	0.483
		female	7	3.71	0.49		
	Posttest	male	24	4.63	0.49	0.248	0.806
		female	7	4.57	0.53		
ROM Flexion	Pretest	male	24	22.54	5.31	-2.714	0.011*
		female	7	28.57	4.61		
	Posttest	male	24	32.00	5.60	-2.421	0.022*
		female	7	37.71	5.09		
ROM Extension	Pretest	male	24	27.46	9.18	-1.745	0.092
		female	7	34.14	7.82		
	Posttest	male	24	42.08	13.10	-2.049	0.027*
		female	7	53.00	9.26		
ROM rotation RT	Pretest	male	24	45.08	13.68	-0.544	0.591
		female	7	48.00	5.92		
	Posttest	male	24	59.29	10.81	-1.592	0.122
		female	7	66.00	4.16		
ROM Rotation LT	Pretest	male	24	44.04	10.15	-1.527	0.138
		female	7	50.29	6.58		
	Posttest	male	24	59.83	8.83	-2.503	0.018*
		female	7	68.43	3.21		
ROM side Bend RT	Pretest	male	24	18.08	4.61	-2.999	0.006**
		female	7	24.00	4.55		
	Posttest	male	24	27.13	4.63	-3.558	0.001**
		female	7	34.43	5.32		
ROM Side Bend Lt	Pretest	male	24	18.38	5.81	-2.046	0.038*
		female	7	23.29	4.61		
	Posttest	male	24	27.42	5.90	-2.498	0.018*
		female	7	33.86	6.36		
Quick Dash	Pretest	male	24	208.33	141.55	-1.407	0.170
		female	7	296.43	161.01		
	Posttest	male	24	61.46	58.97	-1.462	0.154
		female	7	107.14	110.60		

* Statistically significant at (0.05), ** statistically significant at (0.01)

Table (9) shows the following results:

1- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for neck pain due to gender. Where the value of statistical significance for neck pain before using Kenisio tape for males and females was (0.908), which is greater than (0.05) and not statistically significant, and the value of statistical significance for neck pain after using Kenisio tape for males and females was (0.521), which is greater than (0.05) and not statistically significant.

2- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for muscle power flexion due to gender. Where the value of statistical significance for Muscle power flexion before using Kenzo tape for males and females was (0.483), which is greater than (0.05) and not statistically significant, and the value of statistical significance for muscle power flexion after using Kenzo tape for males and females was (0.806), which is greater than (0.05) and not statistically significant.

3- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for muscle power extension due to gender. Where the value of statistical significance for Muscle power flexion before using Kenzo tape for males and females was (0.483), which is greater than (0.05) and not statistically significant, and the value of statistical significance for muscle power extension after using Kenzo tape for males and females was (0.806), which is greater than (0.05) and not statistically significant.

4- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for ROM Flexion due to gender. The differences in the pretest were in favor of females

with an average of (28.57) versus (22.54) for males, and the differences in the posttest were in favor of females with an average of (37.71) versus (32.00) for males.

5- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for ROM extension due to gender. Where the value of statistical significance for ROM extension before using Kenzo tape for males and females was (0.092), which is greater than (0.05) and not statistically significant. While There are differences that are statistically significant on level (0.05) in the averages of the scores of the respondents after using Kinesio tape for ROM extension due to gender. The differences in the posttest were in favor of females with an average of (53.00) versus (42.08) for males.

6- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for ROM rotation RT due to gender. Where the value of statistical significance for ROM rotation RT before using Kenzo tape for males and females was (0.591), which is greater than (0.05) and not statistically significant, and the value of statistical significance for ROM rotation RT after using Kenzo tape for males and females was (0.122), which is greater than (0.05) and not statistically significant.

7- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for ROM Rotation LT due to gender. Where the value of statistical significance for ROM Rotation LT before using Kenzo tape for males and females was (0.138), which is greater than (0.05) and not statistically significant. While There are

differences that are statistically significant on level (0.05) in the averages of the scores of the respondents after using Kinesio tape for ROM Rotation LT due to gender. The differences in the posttest were in favor of females with an average of (68.43) versus (59.83) for males.

8- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for ROM side Bend RT due to gender. The differences in the pretest were in favor of females with an average of (24.00) versus (18.08) for males, and the differences in the posttest were in favor of females with an average of (34.43) versus (27.13) for males.

9- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for ROM Side Bend Lt due to gender. The differences in the pretest were in favor of females with an average of (23.29) versus (18.38) for males, and the differences in the posttest were in favor of females with an average of (33.86) versus (27.42) for males.

10- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for Quick Dash due to gender. Where the value of statistical significance for Quick Dash before using Kenzo tape for males and females was (0.170), It is not statistically significant because it is greater than (0.05), and the value of statistical significance for Quick Dash after using Kenzo tape for males and females was (0.154), It is not statistically significant because it is greater than (0.05).

2nd hypothesis: There were no statistically significant differences at the significance level (α≤0.05) in the scores of the respondents before and after using Kinesio tape for neck pain due to age.

One-Way ANOVA test was conducted to compare the averages of the respondents before and after using Kinesio tape for neck pain due to age.

Table (10): Means, Standard Deviation, conducted to compare the averages of the respondents before and after using Kinesio tape for neck pain due to age.

Variable	Age	N	Pre		Post	
			Mean	Std.	mean	Std.
Pain	(20-30) years	7	6.00	1.15	3.29	1.38
	(31-40) years	8	6.88	1.89	3.88	1.64
	(41-50) years	11	6.00	2.00	3.36	1.69
	more than 50 years	5	6.80	1.92	4.40	2.19
	Total	31	6.35	1.76	3.65	1.66
Muscle power flexion	(20-30) years	7	3.86	0.38	4.71	0.49
	(31-40) years	8	3.88	0.64	4.50	0.53
	(41-50) years	11	3.82	0.60	4.64	0.50
	more than 50 years	5	3.80	0.45	4.60	0.55
	Total	31	3.84	0.52	4.61	0.50
Muscle power extension	(20-30) years	7	3.86	0.38	4.71	0.49
	(31-40) years	8	3.88	0.64	4.50	0.53
	(41-50) years	11	3.82	0.60	4.64	0.50
	more than 50 years	5	3.80	0.45	4.60	0.55
	Total	31	3.84	0.52	4.61	0.50
ROM Flexion	(20-30) years	7	22.86	4.14	34.29	6.02
	(31-40) years	8	25.13	6.17	34.63	5.71
	(41-50) years	11	22.91	6.53	31.91	6.14
	more than 50 years	5	25.60	5.73	32.80	6.83
	Total	31	23.90	5.69	33.29	5.92
ROM Extension	(20-30) years	7	28.86	11.11	44.29	15.81
	(31-40) years	8	26.63	8.50	39.50	12.87
	(41-50) years	11	28.27	9.40	45.00	13.60
	more than 50 years	5	34.40	7.44	52.00	5.34
	Total	31	28.97	9.22	44.55	13.05

Variable	Age	N	Pre		Post	
			Mean	Std.	mean	Std.
ROM rotation RT	(20-30) years	7	47.43	15.55	59.86	13.70
	(31-40) years	8	48.63	7.80	63.00	4.41
	(41-50) years	11	44.27	12.31	60.55	11.92
	more than 50 years	5	42.00	15.72	59.20	8.56
	Total	31	45.74	12.33	60.81	10.06
ROM Rotation LT	(20-30) years	7	47.57	12.83	58.43	13.99
	(31-40) years	8	51.00	6.72	65.63	4.37
	(41-50) years	11	42.73	8.63	63.00	6.94
	more than 50 years	5	39.60	8.08	57.60	6.39
	Total	31	45.45	9.73	61.77	8.67
ROM side Bend RT	(20-30) years	7	19.14	6.09	29.71	6.52
	(31-40) years	8	19.88	3.80	28.63	5.26
	(41-50) years	11	18.91	6.38	28.27	6.50
	more than 50 years	5	20.20	3.96	28.80	4.21
	Total	31	19.42	5.17	28.77	5.63
ROM Side Bend Lt	(20-30) years	7	19.71	6.68	29.71	7.43
	(31-40) years	8	18.50	4.31	27.75	6.23
	(41-50) years	11	19.64	6.20	28.09	6.99
	more than 50 years	5	20.40	7.77	31.20	5.67
	Total	31	19.48	5.88	28.87	6.51
Quick Dash	(20-30) years	7	200.00	168.33	57.14	82.56
	(31-40) years	8	256.25	120.82	87.50	58.25
	(41-50) years	11	181.82	152.11	47.73	58.58
	more than 50 years	5	325.00	134.63	120.00	105.18
	Total	31	228.23	148.15	71.77	74.09

Through the data presented in table (8), it is clear that there are apparent differences between the mean scores of the respondents before and after using Kinesio tape for neck pain due to age. To check the significance of the differences, the researcher use One-Way Anova test as shows in table (9).

Table (9): One-Way ANOVA to check the differences in the scores of the respondents before and after using Kinesio tape for neck pain due to age.

Variable	Source of Variance		Sum of Squares	Df	Mean Square	F	Sig.
Pain	Pre	Between Groups	5.422	3	1.807	0.557	0.648
		Within Groups	87.675	27	3.247		
		Total	93.097	30			
	Post	Between Groups	5.048	3	1.683	0.582	0.632
		Within Groups	78.049	27	2.891		
		Total	83.097	30			
Muscle power flexion	Pre	Between Groups	0.025	3	0.008	0.028	0.994
		Within Groups	8.169	27	0.303		
		Total	8.194	30			
	Post	Between Groups	0.181	3	0.060	0.227	0.877
		Within Groups	7.174	27	0.266		
		Total	7.355	30			
Muscle power extension	Pre	Between Groups	0.025	3	0.008	0.028	0.994
		Within Groups	8.169	27	0.303		
		Total	8.194	30			
	Post	Between Groups	0.181	3	0.060	0.227	0.877
		Within Groups	7.174	27	0.266		
		Total	7.355	30			
ROM Flexion	Pre	Between Groups	44.868	3	14.956	0.435	0.730
		Within Groups	927.841	27	34.364		
		Total	972.710	30			
	Post	Between Groups	43.374	3	14.458	0.387	0.763
		Within Groups	1009.013	27	37.371		
		Total	1052.387	30			
ROM Extension	Pre	Between Groups	196.854	3	65.618	0.753	0.530
		Within Groups	2352.114	27	87.115		
		Total	2548.968	30			
	Post	Between Groups	484.249	3	161.416	0.943	0.434
		Within Groups	4623.429	27	171.238		
		Total	5107.677	30			
ROM Rotation RT	Pre	Between Groups	180.164	3	60.055	0.370	0.775
		Within Groups	4381.771	27	162.288		
		Total	4561.935	30			
	Post	Between Groups	58.454	3	19.485	0.177	0.911
		Within Groups	2976.384	27	110.236		
		Total	3034.839	30			
ROM Rotation LT	Pre	Between Groups	530.581	3	176.860	2.068	0.128
		Within Groups	2309.096	27	85.522		
		Total	2839.677	30			
	Post	Between Groups	300.630	3	100.210	1.386	0.268
		Within Groups	1952.789	27	72.326		
		Total	2253.419	30			
ROM side Bend RT	Pre	Between Groups	8.107	3	2.702	0.092	0.964
		Within Groups	793.441	27	29.387		

Variable	Source of Variance		Sum of Squares	Df	Mean Square	F	Sig.
		Total	801.548	30			
	Post	Between Groups	9.134	3	3.045	0.087	0.966
		Within Groups	942.285	27	34.899		
		Total	951.419	30			
ROM Side Bend Lt	Pre	Between Groups	12.568	3	4.189	0.111	0.953
		Within Groups	1023.174	27	37.895		
		Total	1035.742	30			
	Post	Between Groups	48.846	3	16.282	0.360	0.782
		Within Groups	1220.638	27	45.209		
		Total	1269.484	30			
Quick Dash	Pre	Between Groups	82376.283	3	27458.761	1.287	0.299
		Within Groups	576051.136	27	21335.227		
		Total	658427.419	30			
	Post	Between Groups	21466.380	3	7155.460	1.349	0.279
		Within Groups	143211.039	27	5304.113		
		Total	164677.419	30			

Table (10) shows the following results:

1- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for neck pain due to age. Where the value of statistical significance for neck pain before using Kenzo tape was (0.648), It is not statistically significant because it is greater than (0.05) , and the value of statistical significance for neck pain after using Kenzo tape was (0.632), It is not statistically significant because it is greater than (0.05).

2- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for muscle power flexion due to age. Where the value of statistical significance for Muscle power flexion before using Kenzo tape was (0.994), It is not statistically significant because it is greater than (0.05), and the value of statistical significance for muscle power flexion after using Kenzo tape was (0.877), It is not statistically significant because it is greater than (0.05).

3- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for muscle power extension due to age. Where the value of statistical significance for Muscle power flexion before using Kenzo tape was (0.994), It is not statistically significant because it is greater than (0.05), and the value of statistical significance for muscle power extension after using Kenzo tape was (0.877), It is not statistically significant because it is greater than (0.05).

4- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for ROM Flexion due to age. Where the value of statistical significance for ROM Flexion before using Kenzo tape was (0.730), It is not statistically significant because it is greater than (0.05), and the value of statistical significance for ROM Flexion after using Kenzo tape was (0.763), It is not statistically significant because it is greater than (0.05).

5- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for ROM extension due to age. Where the value of statistical significance for ROM extension before using Kenzo tape was (0.530), It is not statistically significant because it is greater than (0.05).and the value of statistical significance for ROM extension after using Kenzo tape was (0.434), It is not statistically significant because it is greater than (0.05).

6- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for

ROM rotation RT due to age. Where the value of statistical significance for ROM rotation RT before using Kenzo tape was (0.775), It is not statistically significant because it is greater than (0.05), and the value of statistical significance for ROM rotation RT after using Kinesio tape was (0.911), It is not statistically significant because it is greater than (0.05).

7- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for ROM Rotation LT due to age. Where the value of statistical significance for ROM Rotation LT before using Kenzo tape was (0.128), It is not statistically significant because it is greater than (0.05). and the value of statistical significance for ROM Rotation LT after using Kenzo tape was (0.268), It is not statistically significant because it is greater than (0.05).

8- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for ROM side Bend RT due to age. Where the value of statistical significance for ROM side Bend RT before using Kenzo tape was (0.964), It is not statistically significant because it is greater than (0.05). and the value of statistical significance for ROM side Bend RT after using Kenzo tape was (0.966), It is not statistically significant because it is greater than (0.05).

9- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for ROM Side Bend Lt due to age. Where the value of statistical significance for ROM Side Bend Lt before using Kenzo tape was (0.953), It is not statistically significant

because it is greater than (0.05).and the value of statistical significance for ROM Side Bend Lt after using Kenzo tape was (0.782), It is not statistically significant because it is greater than (0.05).

10- (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for Quick Dash due to age. Where the value of statistical significance for Quick Dash before using Kenzo tape was (0.299), It is not statistically significant because it is greater than (0.05), and the value of statistical significance for Quick Dash after using Kenzo tape was (0.279), It is not statistically significant because it is greater than (0.05).

3rd hypothesis: There were no statistically significant differences at the significance level (α≤0.05) in the scores of the respondents before and after using Kinesio tape for neck pain due to Hight.

One-Way ANOVA test was conducted to compare the averages of the respondents before and after using Kinesio tape for neck pain due to Hight.

Table (11): Means, Standard Deviation, conducted to compare the averages of the respondents before and after using Kinesio tape for neck pain due to Hight.

Variable	Hight	N	Pre		Post	
			Mean	Std.	Mean	Std.
Pain	(150-160)cm	8	6.00	2.00	3.13	1.553
	(161-170)cm	8	6.25	1.39	3.63	1.685
	more than 170 cm	15	6.60	1.88	3.93	1.751
	Total	31	6.35	1.76	3.65	1.664
Muscle power flexion	(150-160)cm	8	3.88	0.64	4.63	0.518
	(161-170)cm	8	3.88	0.35	4.88	0.354
	more than 170 cm	15	3.80	0.56	4.47	0.516
	Total	31	3.84	0.52	4.61	0.495
Muscle power extension	(150-160)cm	8	3.88	0.64	4.63	0.518
	(161-170)cm	8	3.88	0.35	4.88	0.354

Variable	Hight	N	Pre		Post	
			Mean	Std.	Mean	Std.
	more than 170 cm	15	3.80	0.56	4.47	0.516
	Total	31	3.84	0.52	4.61	0.495
ROM Flexion	(150-160)cm	8	27.13	5.91	36.25	6.274
	(161-170)cm	8	23.63	6.91	35.13	6.266
	more than 170 cm	15	22.33	4.42	30.73	4.682
	Total	31	23.90	5.69	33.29	5.923
ROM Extension	(150-160)cm	8	33.38	7.56	51.13	10.077
	(161-170)cm	8	33.38	8.80	48.63	12.994
	more than 170 cm	15	24.27	8.30	38.87	12.682
	Total	31	28.97	9.22	44.55	13.048
ROM rotation RT	(150-160)cm	8	48.00	5.48	65.25	4.400
	(161-170)cm	8	49.25	10.79	63.00	8.552
	more than 170 cm	15	42.67	15.25	57.27	11.961
	Total	31	45.74	12.33	60.81	10.058
ROM Rotation LT	(150-160)cm	8	50.63	6.16	68.00	3.207
	(161-170)cm	8	47.25	11.46	60.88	8.340
	more than 170 cm	15	41.73	9.28	58.93	9.475
	Total	31	45.45	9.73	61.77	8.667
ROM side Bend RT	(150-160)cm	8	22.50	5.98	32.88	6.600
	(161-170)cm	8	19.75	4.53	29.75	3.012
	more than 170 cm	15	17.60	4.48	26.07	4.862
	Total	31	19.42	5.17	28.77	5.632
ROM Side Bend Lt	(150-160)cm	8	22.00	5.61	32.75	6.671
	(161-170)cm	8	20.63	5.78	30.13	5.194
	more than 170 cm	15	17.53	5.76	26.13	6.116
	Total	31	19.48	5.88	28.87	6.505
Quick Dash	(150-160)cm	8	262.50	177.28	93.75	109.177
	(161-170)cm	8	243.75	123.74	81.25	56.300
	more than 170 cm	15	201.67	148.64	55.00	59.911
	Total	31	228.23	148.15	71.77	74.089

Through the data presented in table (11), it is clear that There are visible differences between the average scores of the respondents before and after using Kinesio tape for

neck pain due to Hight. In order to prove the validity of the significance of the differences, the researcher used the One-Way Anova test as shown in the table (12).

Table (12): One-Way ANOVA to check the differences in the scores of the respondents before and after using Kinesio tape for neck pain due to Hight.

Variable	Source of Variance		Sum of Squares	df	Mean Square	F	Sig.
Pain	Pre	Between Groups	2.00	2	0.998	0.307	0.738
		Within Groups	91.10	28	3.254		
		Total	93.10	30			
	Post	Between Groups	3.41	2	1.707	0.600	0.556
		Within Groups	79.68	28	2.846		
		Total	83.10	30			
Muscle power flexion	Pre	Between Groups	0.04	2	0.022	0.075	0.928
		Within Groups	8.15	28	0.291		
		Total	8.19	30			
	Post	Between Groups	0.87	2	0.436	1.882	0.171
		Within Groups	6.48	28	0.232		
		Total	7.35	30			
Muscle power extension	Pre	Between Groups	0.04	2	0.022	0.075	0.928
		Within Groups	8.15	28	0.291		
		Total	8.19	30			
	Post	Between Groups	0.87	2	0.436	1.882	0.171
		Within Groups	6.48	28	0.232		
		Total	7.35	30			
ROM Flexion	Pre	Between Groups	120.63	2	60.313	1.982	0.157
		Within Groups	852.08	28	30.432		
		Total	972.71	30			
	Post	Between Groups	195.08	2	97.539	3.186	0.057
		Within Groups	857.31	28	30.618		
		Total	1052.39	30			
ROM Extension	Pre	Between Groups	642.28	2	321.142	4.716	**0.017***
		Within Groups	1906.68	28	68.096		
		Total	2548.97	30			
	Post	Between Groups	963.19	2	481.597	3.254	0.054
		Within Groups	4144.48	28	148.017		
		Total	5107.68	30			
ROM Rotation RT	Pre	Between Groups	281.10	2	140.551	0.919	0.410
		Within Groups	4280.83	28	152.887		
		Total	4561.94	30			
	Post	Between Groups	384.41	2	192.203	2.030	0.150
		Within Groups	2650.43	28	94.658		
		Total	3034.84	30			
ROM Rotation	Pre	Between Groups	447.37	2	223.685	2.618	0.091
		Within Groups	2392.31	28	85.440		
		Total	2839.68	30			

Variable	Source of Variance		Sum of Squares	df	Mean Square	F	Sig.
LT	Post	Between Groups	437.61	2	218.806	3.374	**0.049***
		Within Groups	1815.81	28	64.850		
		Total	2253.42	30			
ROM side Bend RT	Pre	Between Groups	126.45	2	63.224	2.622	0.090
		Within Groups	675.10	28	24.111		
		Total	801.55	30			
	Post	Between Groups	252.11	2	126.056	5.047	**0.013***
		Within Groups	699.31	28	24.975		
		Total	951.42	30			
ROM Side Bend Lt	Pre	Between Groups	118.13	2	59.067	1.802	0.184
		Within Groups	917.61	28	32.772		
		Total	1035.74	30			
	Post	Between Groups	245.38	2	122.688	3.354	**0.049***
		Within Groups	1024.11	28	36.575		
		Total	1269.48	30			
Quick Dash	Pre	Between Groups	21906.59	2	10953.293	0.482	0.623
		Within Groups	636520.83	28	22732.887		
		Total	658427.42	30			
	Post	Between Groups	8802.42	2	4401.210	0.791	0.463
		Within Groups	155875.00	28	5566.964		
		Total	164677.42	30			

Table (12) shows the following results:

1- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for neck pain due to hight. Where the value of statistical significance for neck pain before using Kenzo tape was (0.738), It is not statistically significant because it is greater than (0.05), and the value of statistical significance for neck pain after using Kenzo tape was (0.556), It is not statistically significant because it is greater than (0.05).

2- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for muscle power flexion due to hight. Where the value of statistical significance

for Muscle power flexion before using Kenzo tape was (0.928), It is not statistically significant because it is greater than (0.05)., and the value of statistical significance for muscle power flexion after using Kenzo tape was (0.171), It is not statistically significant because it is greater than (0.05).

3- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for muscle power extension due to hight. Where the value of statistical significance for Muscle power flexion before using Kenzo tape was (0.928), which is greater than (0.05) and not statistically significant, and the value of statistical significance for muscle power extension after using Kenzo tape was (0.171), It is not statistically significant because it is greater than (0.05).

4- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for ROM Flexion due to hight. Where the value of statistical significance for ROM Flexion before using Kenzo tape was (0.157), It is not statistically significant because it is greater than (0.05), and the value of statistical significance for ROM Flexion after using Kenzo tape was (0.057), It is not statistically significant because it is greater than (0.05).

5- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before using Kinesio tape for ROM extension due to hight in the pretest. Where the value of statistical significance for ROM extension before using Kenzo tape was (0.017), which is less than (0.05) and

statistically significant. To find the source of the differences, the researcher use (Scheffe) test as shown in table (13).

Table (13): Scheffe test for two-dimensional comparisons of the differences between averages of the scores of the respondents before using Kinesio tape for ROM extension due to hight in the pretest.

Variable	Comparisons	means	(161-170)cm	more than 170 cm
ROM extension	(150-160)cm	33.38	0.00	9.11*
	(161-170)cm	33.38		9.11*
	more than 170 cm	24.27		

*Statistically significant at (0.05)

As shown in the table (13) that the differences between averages of the scores of the respondents before using Kinesio tape for ROM extension due to hight in the pretest, were between the (150-160cm) and (161-170cm) from side and (more than 170 cm) on the other side in favor of the (150-160cm) and (161-170cm).

Also, from table (11) it was clear that there are no differences that are statistically significant on level (0.05) in the averages of the scores of the respondents after using Kinesio tape for ROM extension due to hight in the posttest. Where the value of statistical significance for ROM extension after using Kenzo tape was (0.054), It is not statistically significant because it is greater than (0.05).

The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for ROM rotation RT due to hight. Where the value of statistical significance for ROM rotation RT before using Kenzo tape was (0.410), It is not statistically significant because it is greater than (0.05), and the value of statistical significance for ROM rotation RT after using Kenzo tape was (0.150), It is not statistically significant because it is greater than (0.05).

6- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before using Kinesio tape for ROM Rotation LT due to hight. Where the value of statistical significance for ROM Rotation LT before using Kenzo tape was (0.091), It is not statistically significant because it is greater than (0.05). But there are differences that are statistically significant on level (0.05) in the averages of the scores of the respondents after using Kinesio tape for ROM Rotation LT due to hight, where the value of statistical significance for ROM Rotation LT was (0.049), which is less than (0.05) and statistically significant. To find the source of the differences, the researcher use (Scheffe) test as shown in table (13).

Table (14): Scheffe test for two-dimensional comparisons of the differences between averages of the scores of the respondents before using Kinesio tape for ROM Rotation LT due to hight in the posttest.

Variable	Comparisons	means	(161-170)cm	more than 170 cm
ROM Rotation LT	(150-160)cm	68.00	7.12	9.07*
	(161-170)cm	60.88		1.95
	more than 170 cm	58.93		

*Statistically significant at (0.05)

It is clear from table (14) that the differences between averages of the scores of the respondents after using Kinesio tape for ROM rotation LT due to hight in the posttest, were between the (150-160cm) and (161-170cm) in favor of the (150-160cm).

7- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before using Kinesio tape for ROM side Bend RT due to hight. Where the value of statistical significance for ROM side Bend RT before using Kenzo tape was (0.090), It is not statistically significant because it is greater than (0.05).But there are differences that are statistically significant on level (0.05) in the averages of the scores of the respondents after using Kinesio tape for ROM side Bend RT due to hight, where the value of statistical significance for ROM side Bend RT was (0.013), which is less than (0.05) and statistically significant. To find the source of the differences, the researcher use (Scheffe) test as shown in table (14).

Table (15): Scheffe test for two-dimensional comparisons of the differences between averages of the scores of the respondents before using Kinesio tape for ROM side Bend RT due to hight in the posttest.

Variable	Comparisons	means	(161-170)cm	more than 170 cm
ROM side Bend RT	(150-160)cm	32.88	3.13	6.81*
	(161-170)cm	29.75		3.68

Variable	Comparisons	means	(161-170)cm	more than 170 cm
	more than 170 cm	26.07		

*Statistically significant at (0.05)

It is clear from table (15) that the differences between averages of the scores of the respondents after using Kinesio tape for ROM side Bend RT due to hight in the posttest, were between the (150-160cm) and (more than 170cm) in favor of the (150-160cm).

8- The statistical significant at the level showed that there were no differences (0.05) in the averages of the scores of the respondents before using Kinesio tape for ROM side Bend LT due to hight. Where the value of statistical significance for ROM side Bend LT before using Kenzo tape was (0.184), It is not statistically significant because it is greater than (0.05). But there are differences that are statistically significant on level (0.05) in the averages of the scores of the respondents after using Kinesio tape for ROM side Bend LT due to hight, where the value of statistical significance for ROM side Bend LT was (0.049), which is less than (0.05) and statistically significant. To find the source of the differences, the researcher use (Scheffe) test as shown in table (15).

Table (16): Scheffe test for two-dimensional comparisons of the differences between averages of the scores of the respondents before using Kinesio tape for ROM side Bend LT due to hight in the posttest.

Variable	Comparisons	means	(161-170)cm	more than 170 cm
ROM side Bend LT	(150-160)cm	32.75	2.62	6.62*
	(161-170)cm	30.13		4.00
	more than 170 cm	26.13		

*Statistically significant at (0.05)

It is clear from table (16) that the differences between averages of the scores of the respondents after using Kinesio tape for ROM side Bend LT due to hight in the posttest, were between the (150-160cm) and (more than 170cm) in favor of the (150-160cm).

9- The statistical significant at the level showed that there were no differences.(0.05) in the averages of the scores of the respondents before and after using Kinesio tape for Quick Dash due to hight. Where the value of statistical significance for Quick Dash before using Kenzo tape was (0.623), It is not statistically significant because it is greater than (0.05) , and the value of statistical significance for Quick Dash after using Kenzo tape was (0.463), It is not statistically significant because it is greater than (0.05).

4th hypothesis: There were no statistically significant differences at the significance level (α≤0.05) in the scores of the respondents before and after using Kinesio tape for neck pain due to weight.

A one-way ANOVA test was used to compare the mean of the sample before and after using Kinesio tape for neck pain due to weight.

Table (17): Means, Standard Deviation, conducted to compare the averages of the respondents before and after using Kinesio tape for neck pain due to weight.

Variable	Weight	N	Pre		Post	
			mean	Std.	Mean	Std.
Pain	(50-70)kg	16	6.25	1.69	3.31	1.54
	(71-90)kg	10	6.50	1.18	4.30	1.25
	more than 90 kg	5	6.40	3.05	3.40	2.61
	Total	31	6.35	1.76	3.65	1.66
Muscle power flexion	(50-70)kg	16	3.88	0.50	4.69	0.48
	(71-90)kg	10	3.80	0.42	4.50	0.53
	more than 90 kg	5	3.80	0.84	4.60	0.55
	Total	31	3.84	0.52	4.61	0.50

Variable	Weight	N	Pre		Post	
			mean	Std.	Mean	Std.
Muscle power extension	(50-70)kg	16	3.88	0.50	4.69	0.48
	(71-90)kg	10	3.80	0.42	4.50	0.53
	more than 90 kg	5	3.80	0.84	4.60	0.55
	Total	31	3.84	0.52	4.61	0.50
ROM Flexion	(50-70)kg	16	25.56	5.01	34.69	6.17
	(71-90)kg	10	20.90	6.21	31.60	5.44
	more than 90 kg	5	24.60	5.32	32.20	6.10
	Total	31	23.90	5.69	33.29	5.92
ROM Extension	(50-70)kg	16	29.88	7.29	47.25	10.21
	(71-90)kg	10	29.00	10.27	43.20	14.12
	more than 90 kg	5	26.00	13.64	38.60	18.96
	Total	31	28.97	9.22	44.55	13.05
ROM rotation RT	(50-70)kg	16	46.94	10.58	63.81	7.50
	(71-90)kg	10	44.00	15.14	58.90	12.18
	more than 90 kg	5	45.40	13.85	55.00	11.25
	Total	31	45.74	12.33	60.81	10.06
ROM Rotation LT	(50-70)kg	16	47.63	8.70	64.19	8.40
	(71-90)kg	10	42.50	10.70	59.20	9.28
	more than 90 kg	5	44.40	11.24	59.20	7.53
	Total	31	45.45	9.73	61.77	8.67
ROM side Bend RT	(50-70)kg	16	20.50	5.14	30.69	6.60
	(71-90)kg	10	18.40	5.70	26.70	4.03
	more than 90 kg	5	18.00	4.30	26.80	2.77
	Total	31	19.42	5.17	28.77	5.63
ROM Side Bend Lt	(50-70)kg	16	20.44	6.36	30.81	7.36
	(71-90)kg	10	18.70	6.04	27.40	5.54
	more than 90 kg	5	18.00	4.18	25.60	3.36
	Total	31	19.48	5.88	28.87	6.51
Quick Dash	(50-70)kg	16	257.81	155.38	84.38	84.59
	(71-90)kg	10	182.50	129.66	45.00	51.10
	more than 90 kg	5	225.00	165.83	85.00	76.24
	Total	31	228.23	148.15	71.77	74.09

Through the data presented in table (17)There are also clear differences between the average scores of the sample members before and after using Kinesio tape for neck pain due to weight.

5th hypothesis: There were no statistically significant differences at the significance level (α≤0.05) in the scores of the respondents before and after using Kinesio tape for neck pain due to function.

One-Way ANOVA test was conducted to compare the averages of the respondents before and after using Kinesio tape for neck pain due to function.

Table (18): Means, Standard Deviation, conducted to compare the averages of the respondents before and after using Kinesio tape for neck pain due to function.

Variable	Factor	N	Pre		Post	
			mean	Std.	mean	Std.
Pain	Factor	7	5.86	0.90	3.29	1.38
	office work	18	6.39	2.09	3.78	1.90
	Teacher	6	6.83	1.47	3.67	1.37
	Total	31	6.35	1.76	3.65	1.66
Muscle power flexion	Factor	7	4.00	0.00	4.71	0.49
	office work	18	3.83	0.62	4.61	0.50
	Teacher	6	3.67	0.52	4.50	0.55
	Total	31	3.84	0.52	4.61	0.50
	Factor	7	4.00	0.00	4.71	0.49

Variable	Factor	N	Pre		Post	
			mean	Std.	mean	Std.
Muscle power extension	office work	18	3.83	0.62	4.61	0.50
	Teacher	6	3.67	0.52	4.50	0.55
	Total	31	3.84	0.52	4.61	0.50
ROM Flexion	Factor	7	22.57	4.04	33.43	6.16
	office work	18	23.44	6.78	32.06	6.23
	Teacher	6	26.83	2.32	36.83	3.54
	Total	31	23.90	5.69	33.29	5.92
ROM Extension	Factor	7	30.00	11.53	47.43	15.61
	office work	18	27.33	8.65	42.56	13.35
	Teacher	6	32.67	8.26	47.17	9.43
	Total	31	28.97	9.22	44.55	13.05
ROM rotation RT	Factor	7	46.29	14.93	61.00	14.61
	office work	18	44.50	13.07	59.11	9.42
	Teacher	6	48.83	6.82	65.67	3.20
	Total	31	45.74	12.33	60.81	10.06
ROM Rotation LT	Factor	7	46.29	12.76	59.00	14.33
	office work	18	43.89	9.69	61.00	6.53
	Teacher	6	49.17	5.19	67.33	3.08
	Total	31	45.45	9.73	61.77	8.67
ROM side Bend RT	Factor	7	18.43	5.56	29.57	6.48
	office work	18	18.56	5.09	27.11	5.11

Variable	Factor	N	Pre		Post	
			mean	Std.	mean	Std.
	Teacher	6	23.17	3.76	32.83	4.54
	Total	31	19.42	5.17	28.77	5.63
ROM Side Bend Lt	Factor	7	20.00	7.02	30.43	7.81
	office work	18	18.22	5.64	27.17	5.77
	Teacher	6	22.67	4.63	32.17	6.37
	Total	31	19.48	5.88	28.87	6.51
Quick Dash	Factor	7	228.57	160.36	67.86	78.68
	office work	18	218.06	153.83	72.22	75.68
	Teacher	6	258.33	137.54	75.00	77.46
	Total	31	228.23	148.15	71.77	74.09

Through the data presented in table (18), it is clear that there are apparent differences between the mean scores of the respondents before and after using Kinesio tape for neck pain due to function. To check the significance of the differences, the researcher use One-Way Anova test as shows in table (18).

Table (19): One-Way ANOVA to check the differences in the scores of the respondents before and after using Kinesio tape for neck pain due to FUNCTION.

Variable	Source of Variance		Sum of Squares	df	Mean Square	F	Sig.
Pain	Pre	Between Groups	3.13	2	1.56	0.49	0.620
		Within Groups	89.97	28	3.21		
		Total	93.10	30			
	Post	Between Groups	1.22	2	0.61	0.21	0.812
		Within Groups	81.87	28	2.92		
		Total	83.10	30			
Muscle power flexion	Pre	Between Groups	0.36	2	0.18	0.64	0.533
		Within Groups	7.83	28	0.28		
		Total	8.19	30			
	Post	Between Groups	0.15	2	0.07	0.29	0.752

Variable	Source of Variance		Sum of Squares	df	Mean Square	F	Sig.
		Within Groups	7.21	28	0.26		
		Total	7.35	30			
Muscle power extension	Pre	Between Groups	0.36	2	0.18	0.64	0.533
		Within Groups	7.83	28	0.28		
		Total	8.19	30			
	Post	Between Groups	0.15	2	0.07	0.29	0.752
		Within Groups	7.21	28	0.26		
		Total	7.35	30			
ROM Flexion	Pre	Between Groups	67.72	2	33.86	1.05	0.364
		Within Groups	904.99	28	32.32		
		Total	972.71	30			
	Post	Between Groups	102.90	2	51.45	1.52	0.237
		Within Groups	949.49	28	33.91		
		Total	1052.39	30			
ROM Extension	Pre	Between Groups	137.63	2	68.82	0.80	0.460
		Within Groups	2411.33	28	86.12		
		Total	2548.97	30			
	Post	Between Groups	170.69	2	85.34	0.48	0.621
		Within Groups	4936.99	28	176.32		
		Total	5107.68	30			
ROM Rotation RT	Pre	Between Groups	87.17	2	43.59	0.27	0.763
		Within Groups	4474.76	28	159.81		
		Total	4561.94	30			
	Post	Between Groups	193.73	2	96.86	0.95	0.397
		Within Groups	2841.11	28	101.47		
		Total	3034.84	30			
ROM Rotation LT	Pre	Between Groups	131.64	2	65.82	0.68	0.515
		Within Groups	2708.04	28	96.72		
		Total	2839.68	30			
	Post	Between Groups	250.09	2	125.04	1.75	0.193
		Within Groups	2003.33	28	71.55		
		Total	2253.42	30			
ROM side Bend RT	Pre	Between Groups	104.56	2	52.28	2.10	0.141
		Within Groups	696.99	28	24.89		
		Total	801.55	30			
	Post	Between Groups	153.09	2	76.55	2.68	0.086
		Within Groups	798.33	28	28.51		
		Total	951.42	30			
ROM Side Bend Lt	Pre	Between Groups	91.30	2	45.65	1.35	0.275
		Within Groups	944.44	28	33.73		
		Total	1035.74	30			
	Post	Between Groups	134.44	2	67.22	1.66	0.209
		Within Groups	1135.05	28	40.54		
		Total	1269.48	30			
Quick Dash	Pre	Between Groups	7301.43	2	3650.71	0.16	0.855
		Within Groups	651125.99	28	23254.50		

Variable	Source of Variance		Sum of Squares	df	Mean Square	F	Sig.
		Total	658427.42	30			
	Post	Between Groups	173.45	2	86.73	0.01	0.985
		Within Groups	164503.97	28	5875.14		
		Total	164677.42	30			

Table (19) shows the following results:

1- There are no differences that are statistically significant on level (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for neck pain due to FUNCTION. Where the value of statistical significance for neck pain before using Kenzo tape was (0.620), which is greater than (0.05) and not statistically significant, and the value of statistical significance for neck pain after using Kenzo tape was (0.812), which is greater than (0.05) and not statistically significant.

2- There are no differences that are statistically significant on level (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for muscle power flexion due to FUNCTION. Where the value of statistical significance for Muscle power flexion before using Kenzo tape was (0.533), which is greater than (0.05) and not statistically significant, and the value of statistical significance for muscle power flexion after using Kenzo tape was (0.752), which is greater than (0.05) and not statistically significant.

3- There are no differences that are statistically significant on level (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for muscle power extension due to weight. Where the value of statistical significance for Muscle power flexion before using Kenzo tape was (0.533),

which is greater than (0.05) and not statistically significant, and the value of statistical significance for muscle power extension after using Kenzo tape was (0.752), which is greater than (0.05) and not statistically significant.

4- There are no differences that are statistically significant on level (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for ROM Flexion due to FUNCTION. Where the value of statistical significance for ROM Flexion before using Kenzo tape was (0.364), which is greater than (0.05) and not statistically significant, and the value of statistical significance for ROM Flexion after using Kenzo tape was (0.237), which is greater than (0.05) and not statistically significant.

5- There are no differences that are statistically significant on level (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for ROM extension due to FUNCTION. Where the value of statistical significance for ROM extension before using Kenzo tape was (0.460), which is greater than (0.05) and not statistically significant. and the value of statistical significance for ROM extension after using Kenzo tape was (0.621), which is greater than (0.05) and not statistically significant.

6- There are no differences that are statistically significant on level (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for ROM rotation RT due to FUNCTION. Where the value of statistical significance for ROM rotation RT before using Kenzo tape was (0.763), which is greater than (0.05) and not statistically significant, and the value of statistical significance for ROM rotation RT after using Kenzo tape was (0.397), which is greater than (0.05) and not statistically significant.

7- There are no differences that are statistically significant on level (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for ROM Rotation LT due to FUNCTION. Where the value of statistical significance for ROM Rotation LT before using Kenzo tape was (0.515), which is greater than (0.05) and not statistically significant. and the value of statistical significance for ROM Rotation LT after using Kenzo tape was (0.193), which is greater than (0.05) and not statistically significant.

8- There are no differences that are statistically significant on level (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for ROM side Bend RT due to FUNCTION. Where the value of statistical significance for ROM side Bend RT before using Kenzo tape was (0.141), which is greater than (0.05) and not statistically significant. and the value of statistical significance for ROM side Bend RT after using Kenzo tape was (0.086), which is greater than (0.05) and not statistically significant.

9- There are no differences that are statistically significant on level (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for ROM Side Bend Lt due to FUNCTION. Where the value of statistical significance for ROM Side Bend Lt before using Kenzo tape was (0.275), which is greater than (0.05) and not statistically significant. and the value of statistical significance for ROM Side Bend Lt after using Kenzo tape was (0.209), which is greater than (0.05) and not statistically significant.

10- There are no differences that are statistically significant on level (0.05) in the averages of the scores of the respondents before and after using Kinesio tape for Quick Dash due to FUNCTION. Where the value of statistical significance for

Quick Dash before using Kenzo tape was (0.855), which is greater than (0.05) and not statistically significant, and the value of statistical significance for Quick Dash after using Kenzo tape was (0.985), which is greater than (0.05) and not statistically significant.

Chapter Five

Discussion

This study examined the effect of using KT in treating non-specific neck pain. This study is considered the first of its kind in Palestine. It is concerned with reducing pain, increasing range of motion, increasing muscle strength, and increasing hand functions.

Where the kenisio tape was used in the treatment of non-specific neck pain as described in the intervention, in order to know the extent of its effect in treating or reducing non-specific neck pain, where the results were that the kenisio tape has an effect in reducing pain and increasing ROM , muscle power and hand function positively in favor of patients with non-specific neck pain.

The results of this study that conducted showed a clear improvement in the use of KT, where the use of KT in the treatment of non-specific neck pain had an effect in terms of reducing pain, increasing ROM, increasing muscle power, and improving hand function.

In the current study, it was found that KT reduced pain in subjects with nonspecific neck pain, which is consistent with other studies (Baltaci et al., 2021) .(Alahmari et al., 2020) (El-Gendy et al., 2018) (Alahmari et al., 2020) (Arshad et al., 2021) , According to the results of previous studies and the results of the current study in terms of the effect of KT in reducing pain, as KT works through the tension that reduces pressure, which works to change the density and concentration of tissues in the dermis and epidermis, and thus the blood circulation is increased, which leads to the drainage of lymphatic fluid And reduce pain, and this is consistent with the results of the study . (Yasar et al., 2021)

The study included 40 participants suffering from non-specific neck pain, the average age of which was 22.55. The duration of the study was 6 months, during which KT was

applied to people suffering from non-specific neck pain. The pain before KT application was 6.50 and the KT application became an average of 2.10(Arshad et al., 2021)

The results of the study, which include the control group, where (hot pack, TENS stretching exercis, home plane) was used, and the experimental group, where the same control group was used, in addition to the use of Kenisio tape, so that the average age of the participants was 42.5, where the results showed an improvement in the experimental group compared with control group in terms of numeric pain reting scale (NPRS) and neck disability index (NDI) in the short and long term .(Gul et al., 2022) As the results of Gul et al., 2022 study are consistent with the results of this study, in which (stretching exercises and Kenisio tape) were used within the experimental group and included control group (stretching exercises), where the average age in the experimental group was 34.72 and 35.83 in the control group, where there was an improvement In (NPRS) and (NDI) in experimental group, where the average (NPRS) was s 6.55+0.33 before, and after 4 weeks it became 3.88+0.21 , and the average (NDI) was 42.33+2.92 , and after 4 weeks it became 15.05+1.56(M. Khan et al., 2022)

The results of the Pruett, 2020 (Pruett, 2020) study are consistent with the result of the Baltaci et al study, where the use of KT has an effect on ACLR, the study includes the intervention group (n=28), and control group (n=28), where the results showed an improvement in the intervention group in terms of reducing edema And reduce pain in the knee (Baltaci et al., 2021) , As the results of these studies are consistent with the results of the study in terms of pain, as the results of the studies showed that the use of KT works to and reduce pain .

In the current study, it was found that the use of KT increased muscle strength in subjects with nonspecific dome pain, and this is consistent with by Copurgensli et al.,

2017 , where the application of KT with multi- mobilization leads to an increase in muscle strength (Copurgensli et al., 2017)

Mahmoud et al., 2021 Its results are consistent with the results of the study that I conducted, so that the application of KT leads to an increase in the strength of the hand grip, when performed with tension by 35%, so that the result is immediate in healthy females(Mahmoud et al., 2021). Also, increasing muscle strength depends on the method of application, so that its use has different effects that depend on the direction of use, and therefore KT improves muscle strength, according to the direction of KT application.(Lopes et al., 2022)

Yam et al., 2019 The results of his study are similar to the results of the study that I conducted, in that KT works to increase muscle strength in the lower extremities, in people who suffer from chronic musculoskeletal diseases and muscle stress(Yam et al., 2019) The results of the Vithoulka et al., 2010 study are similar to theYam et al., 2019 study, where the application of KT to quadriceps increases muscle strength in healthy people.(Vithoulka et al., 2010)

But the result of the study does not agree with the result of the study that I conducted, as the results showed that the application of KT on the trunk extender does not have any effect on increasing or decreasing muscle strength.(Lee & Kim, 2012) Also, the use of KT on muscle performance does not have any effect on muscle performance in healthy soccer players(Alrawaili, 2019)

The results of the study that I conducted showed an improvement in ROM when applying KT in patients with non-specific neck pain positively, as the application of KT increased ROM , The results of the study are also consistent with the result of the study conducted by Yoshida & Kahanov, 2007 about the application of KT on the lower

trunk, which showed that the use of KT on the lower trunk increases ROM.(Yoshida & Kahanov, 2007)

He explained Kashoo & Ahmad, 2020 in his study on the effect of using KT on the lower limbs, where the results showed that using KT works to increase ROM in the knee, the results of which are similar to the results of the study that I conducted (Kashoo & Ahmad, 2020), Also, the results of the study showed that the use of KT on the shoulder works positively in increasing ROM (Ujino et al., 2013)

The results of the study showed that the use of KT in people who suffer from non-specific neck pain has an effect on increasing the hand function, as the standard deviation before the test was 148.15 and after the test 74.09 with a clear improvement, as the results of the study are similar to the results of a study conducted by Farhadian et al., 2019 where the use of KT On people suffering from hand osteoarthritis led to an improvement in hand function.(Farhadian et al., 2019)

The results of the study are similar to the results of the study I conducted, where the use of KT on people with CP works to increase the strength of the hand grip and increase ROM in the wrist and thumb (Allah Rastil et al., 2017) ,and the use of KT in hemiparatic patients works to reduce spasms in the hand(Cavalcante et al., 2018)

Study Limitations

There are many limitations and obstacles that the researcher encountered during the conduct of the study, as the researchers recommend that they be taken into account during any additional research :

- Facing difficulty in convincing the participants to put the kenisio tape so that they refrained from putting it on for aesthetic reasons and that it is inappropriate

- Participants remove the kenisio tape when taking a shower, which makes it difficult to conduct the study because it is a voluntary study
- The scarce similar studies in literature review.

Conclusion

The current study collected 31 patients suffering from non-specific neck pain, 24 males (77.4%) and 7 females (22.6%) suffering from non-specific neck pain. One group, the intervention group, the aim of the study was to investigate the effect of using kinesio tape in treating non-specific neck pain in terms of pain, ROM, hand function, and muscle power.

After conducting this study, the researcher concluded the following:

- The use of kinesio tape in the treatment of non-specific neck pain has been proven to reduce the level of pain.
- The use of kinesio tape in the treatment of non-specific neck pain leads to an improvement in ROM.
- The use of kinesio tape in the treatment of non-specific neck pain leads to an improvement and increase in hand function.
- The use of kinesio tape in the treatment of non-specific neck pain leads to an increase in muscle power.
- Age, gender, and BMI, according to the results of the study, there is no effect on increasing non-specific neck pain.

Recommendations

Based on the results of the current study, the researcher recommends the following:

Recommendations for physiotherapists:

- The use of kenisio tape within the protocol used in the treatment of non-specific neck pain because of its effect on pain, ROM, hand function and muscle power.
- Promote and encourage the use of kenisio tape in all physical therapy centers.
- Work on applying kenisio tape on neck pain as shown in the study.

Recommendations for researchers The researcher also recommends the following for more researchers:

- Examination of the long-term effect of using kenisio tape in the treatment of non-specific neck pain.
- Verifying the effect of using kenisio tape on people over 55 years old.
- Work on increasing the sample size in order to obtain more accurate results

References

Abed, I. S., Farhan, A. F., & Housien, I. G. (2022). the Impact of Kinesiotaping Color on Physical Performance in Adolescent Soccer Players in Ankle Injuries. *Revista Iberoamericana de Psicologia Del Ejercicio y El Deporte*, *17*(3), 129–129.

Alahmari, K. A., Reddy, R. S., Tedla, J. S., Samuel, P. S., Kakaraparthi, V. N., Rengaramanujam, K., & Ahmed, I. (2020). The effect of Kinesio taping on cervical proprioception in athletes with mechanical neck pain-a placebo-controlled trial. *BMC Musculoskeletal Disorders*, *21*(1), 1–9. https://doi.org/10.1186/s12891-020-03681-9

Alasmry, G. (2022). *Short Term Effect Of Kinesio Taping On Functional Disability And Quality Of Life In Treatment Of Patients With Planter Fasciitis : A Randomized Controlled Clinical Trial*. *6*(7), 5969–5979.

Allah Rastil, Z., Shamsoddini, A., Dalvand, H., & Labaf, S. (2017). The effect of Kinesio taping on handgrip and active range of motion of hand in children with cerebral palsy. *Iranian Journal of Child Neurology*, *11*(4), 43–51. https://doi.org/10.22037/ijcn.v11i4.13515

Alrawaili, S. M. (2019). Investigating the clinical effect of kinesio tape on muscle performance in healthy young soccer players – a prospective cohort study. *Clinics*, *74*, 1–3. https://doi.org/10.6061/clinics/2019/e1158

AOK. (2017). *Joint Range of Motion Data Using a Goniometer*. 8. https://aokhealth.securestand.com/xq/ASP/ProductID.614/qx/PDF/Using a Goniometer Effectively.pdf

Ariens, G. A., Van Mechelen, W., Bongers, P. M., Bouter, L. M., & Van Der Wal, G. (2000). Physical risk factors for neck pain Material and methods Identification of studies. *Re Vie Ws Scand J Work Environ Health*, *26*(1), 7–19.

Arshad, K., Malik, S. H., Kubra, K. T., & Baig, M. J. (2021). *Effects of Kinesio Taping in Individuals with Non-Specific Neck Pain*. *3*(1), 17–24.

Aydoğdu, O., Sari, Z., Yurdalan, S. U., & Polat, M. G. (2017). Clinical outcomes of kinesio taping applied in patients with knee osteoarthritis: A randomized controlled trial. *Journal of Back and Musculoskeletal Rehabilitation*, *30*(5), 1045–1051.

https://doi.org/10.3233/BMR-169622

Baltaci, G., Ozunlu Pekyavas, N., & Atay, O. A. (2021). Short-time Effect of Sterile Kinesio Tape applied during Anterior Cruciate Ligament Reconstruction on Edema, Pain and Range of Motion. *Research in Sports Medicine*, *00*(00), 1–12. https://doi.org/10.1080/15438627.2021.2010203

Berger, A. A., Liu, Y., Mosel, L., Champagne, K. A., Ruoff, M. T., Cornett, E. M., Kaye, A. D., Imani, F., Shakeri, A., Varrassi, G., Viswanath, O., & Urits, I. (2021). Efficacy of dry needling and acupuncture in the treatment of neck pain. *Anesthesiology and Pain Medicine*, *11*(2). https://doi.org/10.5812/aapm.113627

Budtz, C. R., Andersen, J. H., De Vos Andersen, N. B., & Christiansen, D. H. (2018). Responsiveness and minimal important change for the quick-DASH in patients with shoulder disorders. *Health and Quality of Life Outcomes*, *16*(1), 1–6. https://doi.org/10.1186/s12955-018-1052-2

Cavalcante, J. G. T. x, Silva, M. do D. C., Silva, J. T. da F., dos Anjos, C. C., & Soutinho, R. S. R. (2018). Effect of Kinesio Taping on Hand Function in Hemiparetic Patients. *World Journal of Neuroscience*, *08*(02), 293–302. https://doi.org/10.4236/wjns.2018.82023

Centers of disease control. (2011). Body mass index: Considerations for practitioners. *Cdc*, 4. http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Body+Mass+Index+:+Considerations+for+Practitioners#3%5Cnhttp://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:Body+mass+index:+Considerations+for+practitioners#3

Cheng, C. H., Su, H. T., Yen, L. W., Liu, W. Y., & Cheng, H. Y. K. (2015). Long-term effects of therapeutic exercise on nonspecific chronic neck pain: A literature review. *Journal of Physical Therapy Science*, *27*(4), 1271–1276. https://doi.org/10.1589/jpts.27.1271

Childress, M. A., & Stuek, S. J. (2020). *Afp20200801P150*. *102*(3).

Cohen, S. P. (2015). Epidemiology, diagnosis, and treatment of neck pain. *Mayo Clinic Proceedings*, *90*(2), 284–299. https://doi.org/10.1016/j.mayocp.2014.09.008

Copurgensli, C., Gur, G., & Tunay, V. B. (2017). A comparison of the effects of Mulligan's mobilization and Kinesio taping on pain, range of motion, muscle strength, and neck disability in patients with Cervical Spondylosis: A randomized controlled study. *Journal of Back and Musculoskeletal Rehabilitation*, *30*(1), 51–62. https://doi.org/10.3233/BMR-160713

Croft, P. R., Lewis, M., Papageorgiou, A. C., Thomas, E., Jayson, M. I. V., Macfarlane, G. J., & Silman, A. J. (2001). Risk factors for neck pain: A longitudinal study in the general population. *Pain*, *93*(3), 317–325. https://doi.org/10.1016/S0304-3959(01)00334-7

Cuthbert, S. C., & Goodheart, G. J. (2007). On the reliability and validity of manual muscle testing: A literature review. *Chiropractic and Osteopathy*, *15*. https://doi.org/10.1186/1746-1340-15-4

Deshmukh, N., Kahile, M., Chaudhary, N., Panchbhudhe, S., & Gawande, V. (2021). Adjunct effect of kinesiotaping on adhesive capsulities of shoulder joint. *International Journal of Current Research and Review*, *13*(8), 48–53. https://doi.org/10.31782/IJCRR.2021.13818

Douglass, A. B., & Bope, E. T. (2004). Evaluation and treatment of posterior neck pain in family practice. *Journal of the American Board of Family Practice*, *17*(SUPPL. 1), 13–22. https://doi.org/10.3122/jabfm.17.suppl_1.s13

El-Azeim, A. S. A., Elhafez, H. M., Ahmed, S. E. B., Draz, A. H., & Kattabei, O. M. (2019). Efficacy of Kinesio tape on pressure pain threshold and normalized resting Myoelectric activity on upper Trapezius Myofascial Trigger points (a randomized clinical trial). *Journal of Advanced Pharmacy Education and Research*, *9*(3), 28–33.

El-Gendy, A. M., Ali, I., Hamada, H. A., Radwan, R., & Elgendy, A. (2018). Effect of kinesio taping on chronic mechanical neck pain: a randomized controlled trial. *Bulletin of Faculty of Physical Therapy 2018 23:2*, *23*(2), 101–107. https://doi.org/10.4103/bfpt.bfpt

Espí-López, G. V., Aguilar-Rodríguez, M., Zarzoso, M., Serra-Añó, P., Martínez De La Fuente, J. M., Inglés, M., & Marques-Sule, E. (2021). Efficacy of a proprioceptive

exercise program in patients with nonspecific neck pain: A randomized controlled trial. *European Journal of Physical and Rehabilitation Medicine*, *57*(3), 397–405. https://doi.org/10.23736/S1973-9087.20.06302-9

Evans, G. (2014). *I d e n t i f y i n g a n d Tre a t i n g t h e Causes of Neck Pain Neck pain Cervical spondylosis Radiculopathy Myelopathy Chronic pain*. *98*, 645–661.

Farhadian, M., Morovati, Z., Zadeh, F. Q., & Shamsoddini, A. (2019). The Effect of Kinesio Taping on the Hand Functions and Symptoms in Patients with Hand Osteoarthritis (a Preliminary Study). *International Journal of Pharmaceutical and Phytopharmacological Research*, *9*(4), 75–80.

Farooqui, S., Khan, M. A., & Khan, A. (2022). *The Effectiveness of Kinesio- Taping and Muscle Energy Technique Among Postpartum Females with Sacro-iliac Joint Dysfunction*. *November*.

Gattie, E., Cleland, J. A., Pandya, J., & Snodgrass, S. (2021). Dry needling adds no benefit to the treatment of neck pain: A sham- controlled randomized clinical trial with 1-year follow-up. *Journal of Orthopaedic and Sports Physical Therapy*, *51*(1), 37–45. https://doi.org/10.2519/jospt.2021.9864

González-Iglesias, J., Fernández-De-Las-Peñas, C., Cleland, J., Huijbregts, P., & Del Rosario Gutiérrez-Vega, M. (2009). Short-term effects of cervical kinesio taping on pain and cervical range of motion in patients with acute whiplash injury: A randomized clinical trial. *Journal of Orthopaedic and Sports Physical Therapy*, *39*(7), 515–521. https://doi.org/10.2519/jospt.2009.3072

Gross, A. R., Haines, T., Goldsmith, C. H., Santaguida, L., Mclaughlin, L. M., Peloso, P., Burnie, S., & Moving, J. (2009). Knowledge to action: A challenge for neck pain treatment. *Journal of Orthopaedic and Sports Physical Therapy*, *39*(5), 351–363. https://doi.org/10.2519/jospt.2009.2831

Gul, A., Afzal, R., Khan, N., Azfar, H., Anjum, H., Khan, Z., & ... (2022). Short and Long Term Effects of Kinesio Taping on Pain Along With Functional Status in Non-Specific Neck Pain. *Osf.Io*, *02*, 1–12. https://doi.org/10.17605/OSF.IO/USJKA

He, F., Wang, X., Yu, M., Chen, Y., Yu, B., & Lu, J. (2022). Effects of Kinesio taping

on skin deformation during knee flexion and extension: a preliminary study. *BMC Musculoskeletal Disorders*, *23*(1), 1–11. https://doi.org/10.1186/s12891-022-05148-5

Hidalgo, B., Hall, T., Bossert, J., Dugeny, A., Cagnie, B., & Pitance, L. (2017). The efficacy of manual therapy and exercise for treating non-specific neck pain: A systematic review. *Journal of Back and Musculoskeletal Rehabilitation*, *30*(6), 1149–1169. https://doi.org/10.3233/BMR-169615

Kachanathu, S. J., Alenazi, A. M., Seif, H. E., Hafez, A. R., & Alroumim, A. M. (2014). Comparison between Kinesio taping and a traditional physical therapy program in treatment of nonspecific low back pain. *Journal of Physical Therapy Science*, *26*(8), 1185–1188. https://doi.org/10.1589/jpts.26.1185

Kashoo, F. Z., & Ahmad, M. (2020). Comment to "The effects of Kinesio taping of lower limbs on functional mobility, spasticity, and range of motion of children with spastic cerebral palsy" by Mirjavad Tabatabaee et al. *Egyptian Journal of Neurology, Psychiatry and Neurosurgery*, *56*(1), 4–9. https://doi.org/10.1186/s41983-020-00169-0

Kazeminasab, S., Nejadghaderi, S. A., Amiri, P., Pourfathi, H., Araj-Khodaei, M., Sullman, M. J. M., Kolahi, A. A., & Safiri, S. (2022). Neck pain: global epidemiology, trends and risk factors. *BMC Musculoskeletal Disorders*, *23*(1), 1–13. https://doi.org/10.1186/s12891-021-04957-4

Khan, M., Riaz, S., Khan, R. R., Hamid, H., Athar, Z. R., & Aamir, T. (2022). Effects of Kinesiotax Taping Over Posterior Neck Muscles on Pain and Functional Disability in patients with Mechanical Neck Pain. *Pakistan Journal of Medical and Health Sciences*, *16*(5), 506–508. https://doi.org/10.53350/pjmhs22165506

Khan, Z. K., Ahmed, S. I., Ahmed, A., Baig, M., & Farooqui, W. A. (2022). Effect of post - isometric relaxation versus myofascial release therapy on pain , functional disability , rom and qol in the management of non - specific neck pain : a randomized controlled trial. *BMC Musculoskeletal Disorders*, 1–11. https://doi.org/10.1186/s12891-022-05516-1

Kim, E. J., & Lee, K. B. (2017). Effects of kinesio taping to the quadriceps femoris

muscles on functions of elderly women. *Journal of Physical Therapy Science*, *29*(7), 1205–1207. https://doi.org/10.1589/jpts.29.1205

Kim, K. H., & Lee, Y. J. (2020). Immediate Effects of Kinesio Taping of Tibialis Anterior and Ankle Joint on Mobility and Balance Ability for Chronic Hemiparesis: Randomized Controlled Cross-Sectional Design. *Physikalische Medizin Rehabilitationsmedizin Kurortmedizin*, *30*(6), 350–357. https://doi.org/10.1055/a-1126-4616

Lee, M.-H., & Kim, S.-Y. (2012). The Immediate Effects of Kinesio Taping on the Maximal Power and Muscle Activity of Erector Spinae in Normal Subjects. *International Journal of Contents*, *8*(4), 70–73. https://doi.org/10.5392/ijoc.2012.8.4.070

Liao, L.-Y., He, X.-H., Li, X.-Z., Ge, Y.-L., & Gao, Q. (2020). Effects of kinesiology taping on trunk function, balance, and mobility in stroke patients: a pilot feasibility study. *Journal of Physical Therapy Science*, *32*(6), 359–364. https://doi.org/10.1589/jpts.32.359

Lopes, M., Torres, R., Romão, D., Dias, M., Valério, S., Espejo-Antúnez, L., Costa, R., & Ribeiro, F. (2022). Kinesiology tape increases muscle tone, stiffness, and elasticity: Effects of the direction of tape application. *Journal of Bodywork and Movement Therapies*, *30*, 176–180. https://doi.org/10.1016/j.jbmt.2022.01.003

Mahmoud, W. S., Kamel, E. M., Atteya, M. R., Ibrahim, A. A., Alrawaili, S. M., & Hussein, H. M. (2021). Immediate and short-term effects of 35% tension Kinesio taping on handgrip strength in healthy females. *Physiotherapy Quarterly*, *29*(4), 9–13. https://doi.org/10.5114/PQ.2021.105746

Mesregah, M. K., Feng, W., Huang, W. H., Chen, W. C., Yoshida, B., Mecum, A., Mandalia, K., & Van Halm-Lutterodt, N. (2020). Clinical effectiveness of interlaminar epidural injections of local anesthetic with or without steroids for managing chronic neck pain: A systematic review and meta-analysis. *Pain Physician*, *23*(4), 335–348.

Moffett, J. K., & McLean, S. (2006). The role of physiotherapy in the management of non-specific back pain and neck pain. *Rheumatology*, *45*(4), 371–378.

https://doi.org/10.1093/rheumatology/kei242

Mohamed, A. M., Mohamed, E. T., & Mohamed, J. A. R. (2019). Exercises Training Program: Its Effect on Muscle Strength and Activity of Daily Living among Elderly People. *Evidence-Based Nursing Research*, *1*(4), 11. https://doi.org/10.47104/ebnrojs3.v1i4.84

Mutoharoh, S., Astuti, D. P., Kusumastuti, K., Rahmadhani, W., & MD, P. T. P. (2021). Effectiveness of Pregnancy Exercise With Kinesio Taping on Lower Back Pain in Pregnant Women in the Third Trimester. *Jurnal Ilmu Kesehatan Masyarakat*, *12*(3), 241–249. https://doi.org/10.26553/jikm.2021.12.3.241-249

Myles, P. S., Troedel, S., Boquest, M., & Reeves, M. (1999). The pain visual analog scale: Is it linear or nonlinear? *Anesthesia and Analgesia*, *89*(6), 1517–1520. https://doi.org/10.1097/00000539-199912000-00038

Neck pain: Combining exercise and manual therapy for your neck and upper back leads to quicker reductions in pain. (2013). *Journal of Orthopaedic and Sports Physical Therapy*, *43*(3), 128. https://doi.org/10.2519/jospt.2013.0502

Nelson, N. L. (2016). Kinesio taping for chronic low back pain: A systematic review. *Journal of Bodywork and Movement Therapies*, *20*(3), 672–681. https://doi.org/10.1016/j.jbmt.2016.04.018

Osama, M., & Ur Rehman, S. S. (2020). Effects of static stretching as compared to autogenic inhibition and reciprocal inhibition muscle energy techniques in the management of mechanical neck pain: A randomized controlled trial. *Journal of the Pakistan Medical Association*, *70*(5), 786–790. https://doi.org/10.5455/JPMA.9596

Özmen, T., Koparal, S. S., Karataş, Ö., Eser, F., Özkurt, B., & Gafuroğlu, Ü. (2021). Comparison of the clinical and sonographic effects of ultrasound therapy, extracorporeal shock wave therapy, and kinesio taping in lateral epicondylitis. *Turkish Journal of Medical Sciences*, *51*(1), 76–83. https://doi.org/10.3906/sag-2001-79

Presti, D. Lo, Carnevale, A., D'Abbraccio, J., Massari, L., Massaroni, C., Sabbadini, R., Zaltieri, M., Di Tocco, J., Bravi, M., Miccinilli, S., Sterzi, S., Longo, U. G.,

Denaro, V., Caponero, M. A., Formica, D., Oddo, C. M., & Schena, E. (2020). A multi-parametric wearable system to monitor neck movements and respiratory frequency of computer workers. *Sensors (Switzerland)*, *20*(2). https://doi.org/10.3390/s20020536

Pruett, A. D. (2020). *Is KT effective in reducing post-op ACL surgery*. https://digitalcommons.pcom.edu/pa_systematic_reviews/561

Qasheesh, M., Ahmed, W. M., Uddin, S., & Fahim, T. (2021). *Validity , Reliability & Responsiveness of ' Shortened Disability Arm Shoulder Hand ' (Quick DASH) Questionnaire in Measuring Functional Incapacity in Individuals with Upper Extremity Injuries*. *10*(8), 266–269. https://doi.org/10.21275/SR21804004629

Quick, D. (2013). Outcome Measure Difficulty Mild Difficulty Moderate Difficulty Difficulty Slightly Moderately Quite a Bit Slightly Limited Moderately Limited Very Limited. *Web Pages*.

Rabea Begum, M., & Hossain, M. A. (2019). Validity and Reliability of Visual Analogue Scale (VAS) for Pain Measurement. *Journal of Medical Case Reports and Reviews*, *2*(11), 11. http://www.jmcrr.info/index.php/jmcrr/article/view/113

Rana, A., Tyagi, D., Alghadir, A. H., & Khan, M. (2022). Effects of Kinesio taping on calf muscle fatigue in college female athletes: A randomized controlled trial. *Medicine (United States)*, *101*(43), E31004. https://doi.org/10.1097/MD.0000000000031004

Rasika, J. S., Ankit, S., Savita, R. A., Ashok, S. A., & Parag, S. K. (2017). Short Term Effects of Kinesiology Taping on Mechanical Neck Pain. *International Journal of Health Sciences & Research (Www.Ijhsr.Org)*, *7*(9), 108. www.ijhsr.org

Rice, D., McNair, P., Huysmans, E., Letzen, J., & Finan, P. (2019). Best evidence rehabilitation for chronic pain part 5: Osteoarthritis. *Journal of Clinical Medicine*, *8*(11). https://doi.org/10.3390/jcm8111769

Saavedra-Hernández, M., Castro-Sánchez, A. M., Arroyo-Morales, M., Cleland, J. A., Lara-Palomo, I. C., & Fernández-De-Las-Peñas, C. (2012). Short-term effects of kinesio taping versus cervical thrust manipulation in patients with mechanical neck pain: A randomized clinical trial. *Journal of Orthopaedic and Sports Physical*

Therapy, *42*(8), 724–730. https://doi.org/10.2519/jospt.2012.4086

Sbardella, S., La Russa, C., Bernetti, A., Mangone, M., Guarnera, A., Pezzi, L., Paoloni, M., Agostini, F., Santilli, V., Saggini, R., & Paolucci, T. (2021). Muscle energy technique in the rehabilitative treatment for acute and chronic non-specific neck pain: A systematic review. *Healthcare (Switzerland)*, *9*(6). https://doi.org/10.3390/healthcare9060746

Shaheen, H., Alarab, A., & S Ahmad, M. (2019). Effectiveness of therapeutic ultrasound and kinesio tape in treatment of tennis elbow. *Journal of Novel Physiotherapy and Rehabilitation*, *3*(1), 025–033. https://doi.org/10.29328/journal.jnpr.1001025

Shakeri, H. (2013). Therapeutic Effect of Kinesio-taping on Disability of Arm, Shoulder, and Hand in Patients with Subacromial Impingement Syndrome: A Randomized Clinical Trial. *Journal of Novel Physiotherapies*, *03*(04), 0–4. https://doi.org/10.4172/2165-7025.1000161

Silva, A. C. D. O., Biasotto-Gonzalez, D. A., Oliveira, F. H. M., Andrade, A. O., Gomes, C. A. F. D. P., Lanza, F. D. C., Amorim, C. F., & Politti, F. (2018). Effect of Osteopathic Visceral Manipulation on Pain, Cervical Range of Motion, and Upper Trapezius Muscle Activity in Patients with Chronic Nonspecific Neck Pain and Functional Dyspepsia: A Randomized, Double-Blind, Placebo-Controlled Pilot Study. *Evidence-Based Complementary and Alternative Medicine*, *2018*. https://doi.org/10.1155/2018/4929271

Soiza, R. L., Donaldson, A. I. C., & Myint, P. K. (2018). Vaccine against arteriosclerosis: an update. *Therapeutic Advances in Vaccines*, *9*(6), 259–261. https://doi.org/10.1177/https

Tejera, D. M., Beltran-Alacreu, H., Cano-De-la-cuerda, R., Hernández, J. V. L., Martín-Pintado-zugasti, A., Calvo-Lobo, C., Gil-Martínez, A., & Fernández-Carnero, J. (2020). Effects of virtual reality versus exercise on pain, functional, somatosensory and psychosocial outcomes in patients with non-specific chronic neck pain: A randomized clinical trial. *International Journal of Environmental Research and Public Health*, *17*(16), 1–19. https://doi.org/10.3390/ijerph17165950

Tsakitzidis, G., Remmen, R., Permans, L., Royen, P. Van, Duchesnes, C., Paulus, D., & Eyssen, M. (2017). Non-specific neck pain: diagnosis and treatment. KCE Reports 119 C (pp. 1-92). Brussels, Belgium. 92.

Ujino, A., Eberman, L. E., Kahanov, L., Renner, C., & Demchak, T. (2013). The effects of kinesio tape and stretching on shoulder ROM. *International Journal of Athletic Therapy and Training*, *18*(2), 24–28. https://doi.org/10.1123/ijatt.18.2.24

Vithoulka, I., Beneka, A., Malliou, P., Aggelousis, N., Karatsolis, K., & Diamantopoulos, K. (2010). The effects of Kinesio-Taping® on quadriceps strength during isokinetic exercise in healthy non athlete women. *Isokinetics and Exercise Science*, *18*(1), 1–6. https://doi.org/10.3233/IES-2010-0352

Wang, Y., Li, X., Sun, C., & Xu, R. (2022). Effectiveness of kinesiology taping on the functions of upper limbs in patients with stroke: a meta-analysis of randomized trial. *Neurological Sciences*, *43*(7), 4145–4156. https://doi.org/10.1007/s10072-022-06010-1

Yam, M. L., Yang, Z., Zee, B. C. Y., & Chong, K. C. (2019). Effects of Kinesio tape on lower limb muscle strength, hop test, and vertical jump performances: A meta-analysis. *BMC Musculoskeletal Disorders*, *20*(1), 1–12. https://doi.org/10.1186/s12891-019-2564-6

Yasar, M. F., Yaksi, E., Kurul, R., Alisik, T., & Seker, Z. (2021). Comparison of dry needling and kinesio taping methods in the treatment of myofascial pain syndrome: A single blinded randomised controlled study. *International Journal of Clinical Practice*, *75*(10). https://doi.org/10.1111/ijcp.14561

Yee Won, Y. K. (2019). The Reliability and Validity on Measuring Tool of Cervical Range of Motion: A Review. *Sports Medicine and Injury Care Journal*, *1*(1), 1–4. https://doi.org/10.24966/smic-8829/100001

Ylinen, J., Takala, E. P., Kautiainen, H., Nykänen, M., Häkkinen, A., Pohjolainen, T., Karppi, S. L., & Airaksinen, O. (2004). Association of neck pain, disability and neck pain during maximal effort with neck muscle strength and range of movement in women with chronic non-specific neck pain. *European Journal of Pain*, *8*(5), 473–478. https://doi.org/10.1016/j.ejpain.2003.11.005

Yoshida, A., & Kahanov, L. (2007). The effect of kinesio taping on lower trunk range of motions. *Research in Sports Medicine*, *15*(2), 103–112. https://doi.org/10.1080/15438620701405206

Appendixes

Appendixes 1 : Quick dash score

	NO DIFFICULTY	MILD DIFFICULTY	MODERATE DIFFICULTY	SEVERE DIFFICULTY	UNABLE
1. Open a tight or new jar.	0	1	2	3	4
2. Do heavy household chores (e.g., wash walls, floors).	0	1	2	3	4
3. Carry a shopping bag or briefcase.	0	1	2	3	4
4. Wash your back.	0	1	2	3	4
5. Use a knife to cut food.	0	1	2	3	4
6. Recreational activities in which you take some force or impact through your arm, shoulder or hand (e.g., golf, hammering, tennis, etc.).	0	1	2	3	4

	NOT AT ALL	SLIGHTLY	MODERATELY	QUITE A BIT	EXTREMELY
7. During the past week, *to what extent* has your arm, shoulder or hand problem interfered with your normal social activities with family, friends, neighbours or groups?	0	1	2	3	4

	NOT AT ALL	SLIGHTLY LIMITED	MODERATELY LIMITED	VERY LIMITED	UNABLE
8. During the past week, were you limited in your work or other regular daily activities as a result of your arm, shoulder or hand problem?	0	1	2	3	

	NONE	MILD	MODERATE	SEVERE	EXTREME
9. Arm, shoulder or hand pain.	0	1	2	3	4

Appendixes 2: Ethical Committee Approval

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الجامعة العربية الامريكية- فلسطين
عمادة البحث العلمي
لجنة أخلاقيات البحث العلمي
تلفون: 1196 ext 04-241-8888
البريد الالكتروني: irb.aaup@aaup.edu

IRB Approval Letter

Study Title: The effect of kinesio tape on muscle power, pain, range of motion and hand function among individual with nonspecific neck pain.

Submitted by: Khaled Azeez Abdelmuhdy Altomaizi

Date received: 20th Jan 2023

Date reviewed: 15th Feb 2023

Date approved: 04th March 2023

Your Study titled **"The effect of kinesio tape on muscle power ,pain , range of motion and hand function among individual with non-specific neck pain"** with archived number **2023/A/37/N** was reviewed by the Arab American University IRB committee and was approved on 4th March 2023.

Reham Khalaf-Nazzal, MD, PhD
IRB committee chairman
Arab American University of Palestine

General Conditions:

1. Valid for 6 months from date of approval.
2. It is important to inform the committee with any modification of the approved study protocol.
3. The committee appreciates a copy of the research when accomplished.

لجنة اخلاقيات البحث العلمي في الجامعة العربية الامريكية

IRB at Arab American University

Appendixes 3 : Information sheet.

Arab American University

الجامعـــة العربيـــة الأمريكيـــة

نموذج المعلومات والتعريف حول البحث

اسم البحث: تاثير الشريط الاصق على قوة العضلات والألم ونطاق الحركة ووظيفة اليد بين الأفراد الذين يعانون من آلام غير محددة في الرقبة

اسم الباحث: خالد عزيز الطميزي

تحية طيبة وبعد

نقدر لكم ثقتكم للمشاركة بهذا البحث، الذي يعتبر جزء من دراسة الماجستير في العلاج الطبيعي في جامعة العربية الامريكية. هذا البحث يهدف إلى التعرف تاثير الشريط الاصق على قوة العضلات والألم ونطاق الحركة ووظيفة اليد بين الأفراد الذين يعانون من آلام غير محددة في الرقبة

معلومات عن دور العلاج الطبيعي

علاج يتم من خلاله التقليل من الم الرقبة الغير نوعية حيث يعمل على تقليل من مستوى الألم و زيادة مدى الحركة و زيادة قوة العضلات و تحسن في وظيفة اليدين ، وذلك من خلال تطبيق الشريط الاصق على الرقبة

لا يوجد أي اثار جانبيه او خطر حول اجراء التدخل العلاجي .

المعالج الذي سوف يقوم بالعلاج ذو خبره و كفاءة ، حيث سيقوم بالعلاج بشكل كامل و على اكمل وجه .

في حال رغبت في الاستمرار في العلاج بالطريقة التي قام الباحث بشرحها لك ، وتم اجابتك عن جميع الأسئلة التي تريد معرفتها ، الرجاء التوقيع على نموذج الموافقة المرفق وتسليمها إلى أخصائي العلاج الطبيعي.

إن انسحابك من الدراسة في أي وقت لن يؤثر او يعمل لك أي عقوبة .

ان مشاركتكم هي طوعيه بحيث تعنمد مشاركتكم من خلال التوقيع على نموذج الموافقة والذي من خلاله يتم فهم هدف البحث ، اذا رغبت في السؤال او معرفة المزيد من المعلومات ،من خلال التواصل مع الباحث (خالد اطميزي) على الرقم 0599744099

شاكرين لكم حسن تعاونكم

خالد اطميزي
اخصائي علاج طبيعي
طالب ماجستير علاج طبيعي
الجامعة العربية الامريكية

Appendixes 4: Consent Form

Arab American University

Scientific Research Deanship

Ethical Review Committee

الجامعـــة العربيـــة الأمريكيـــة

عمادة البحث العلمي

لجنة اخلاقيات البحث العلمي

AAUP-IRB Code No.: …….
AAUP-IRB Date: …….

(اسم المشارك / .....أنا .....
المحددة أدناه:)اختياري) أوافق بموجبه على المشاركة في البحث السريري (دراسة سريرية

تأثير شريط الحركة على قوة العضلات والألم ونطاق الحركة ووظيفة اليد بين الأفراد الذين يعانون من آلام غير محددة في الرقبة

تم شرح طبيعة الدراسة وهدفها وتفسيرها عن طريق الباحث الأساسي خالد عزيز الطميزي .
لقد تم إخباري عن طبيعة البحث من حيث المنهجية والآثار السلبية المحتملة والمضاعفات (حسب ورقة معلومات المشارك).
بعد معرفة وفهم جميع المزايا والعيوب المحتملة لهذا البحث ، أوافق طواعية بمحض إرادتي على المشاركة في البحث السريري المحدد أعلاه.
حيث يمكنني ان انسحب من هذا البحث في أي وقت دون إبداء أي سبب على الإطلاق.

التاريخ: ..... إمضاء المشارك: .....
في حضور:

اسم: .....

تعيين: . ..... إمضاء:
.....

(شاهد على توقيع

المشارك)

أؤكد أنني أوضحت للمريض طبيعة وهدف البحث المذكور أعلاه.
تاريخ: ..... إمضاء: .....

(الباحث)

Appendixes 5 : personal information

Arab American University

الجامعـــة العربيـــة الأمريكيـــة

personal information

Name: Height .....cm

Sex: M / F Weight .....kg

Status : Education :

Age: BMI :

Address : phone number :

PAIN ASSESMENT (VAS)

0_____5_____10

no pain moderate worst

	Pre	**Post**
Pain		

muscle strength (Oxford Scale)

	Pre	**Post**
Neck flexion		
Neck extension		

Range of motion (smart phone)

	Pre		Post	
Neck flexion				
Neck extension				
Neck rotation	**right**	**Left**	**Right**	**Left**
Neck said –binding	**Right**	**Left**	**Right**	**Left**

Hand function test (Quick DASH SCORE)

	NO DIFFICULTY	MILD DIFFICULTY	MODERATE DIFFICULTY	SEVERE DIFFICULTY	UNABLE
1. Open a tight or new jar.	0	1	2	3	4
2. Do heavy household chores (e.g., wash walls, floors).	0	1	2	3	4
3. Carry a shopping bag or briefcase.	0	1	2	3	4
4. Wash your back.	0	1	2	3	4
5. Use a knife to cut food.	0	1	2	3	4
6. Recreational activities in which you take some force or impact through your arm, shoulder or hand (e.g., golf, hammering, tennis, etc.).	0	1	2	3	4

	NOT AT ALL	SLIGHTLY	MODERATELY	QUITE A BIT	EXTREMELY
7. During the past week, *to what extent* has your arm, shoulder or hand problem interfered with your normal social activities with family, friends, neighbours or groups?	0	1	2	3	4

	NOT AT ALL	SLIGHTLY LIMITED	MODERATELY LIMITED	VERY LIMITED	UNABLE
8. During the past week, were you limited in your work or other regular daily activities as a result of your arm, shoulder or hand problem?	0	1	2	3	

	NONE	MILD	MODERATE	SEVERE	EXTREME
9. Arm, shoulder or hand pain.	0	1	2	3	4

خلاصة

المقدمة : تعتبر آلام الرقبة من الأمراض العضلية الهيكلية الرئيسية، حيث تنتشر على نطاق واسع في المجتمع، زاد انتشارها في السنوات الأخيرة بشكل عام في جميع أنحاء العالم وخاصة في فئة النساء بنسبة 29% و40% على التوالي للرجال والنساء، فهي حالة متعددة العوامل ولها العديد من عوامل الخطر التي يمكن تصنيفها على أنها مرتبطة بالعمل خاصة لدى الموظفين الذين يجلسون لساعات طويلة على الحاسوب ،بحيث يمكن الإصابة بالم الرقبة اما عن طريق صدمة مباشرة او غير مباشرة .

الم الرقبة الغير نوعية من المشاكل الأكثر انتشارا وقد يكون سبب الإصابة الوضعية الخاطئة و بالتالي تؤثر سلبا على نشاطات الشخص المصاب ، تكون منتشرة بشكل كبير في المناطق المتقدمة تكنولوجيا

الهدف: هو دراسة آثار تدخل شريط علم الحركة على الام الرقبة الغير نوعية

الطريقة المتبعة في الدراسة : هذه الدراسة ذات تصاميم شبه تجريبية/ مقطعية، استهدفت المرضى الذين يعانون من آلام غير محددة في الرقبة، تم جمعها من مراكز العلاج الطبيعي في الخليل، 24 ذكر و 7 إناث، حيث تم استخدام شريط علم الحركة على المشاركين مرة واحدة لمدة 48 ساعة، وتم تقييمهم. قبل وبعد باستخدام المقياس التناظري البصري لتقييم شدة الألم، درجة سريعة لتقييم وظيفة اليد، مقياس أكسفورد لقوة العضلات، مقياس الزوايا لنطاق الحركة

النتائج: أظهرت نتائج استخدام شريط علم الحركة تحسنا ملحوظا في الألم، ومدى الحركة ، قوة العضلات ووظيفة اليد. علاوة على ذلك، لم تظهر نتائج مؤشر كتلة الجسم والعمر والجنس أي تأثير على آلام الرقبة غير المحددة

الاستنتاج: أظهرت هذه الدراسة أن استخدام شريط علم الحركة في علاج آلام الرقبة غير المحددة أدى إلى تحسين الألم وقوة العضلات ووظيفة اليدين