



INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Effect Of Ultrasound And Stretching Exercise In The Treatment Of Neck Pain: A Comparative Study

*Dr.Pooja Katiyar (Physiotherapist), Assistant Professor

Faculty of paramedical sciences, Bareilly international university, U.P India

Dr. Jyoti Saxena (Physiotherapist)

Principal

COER college of paramedical sciences (Roorkee)

Dr. Nitin Parmar (Physiotherapist)

Mrs. Manisha Saxena (Assistant Professor)

Abstract -

Key words: stretching exercise, ultrasound therapy, neck pain, VAS, neck pain and disability scale (NPADS).

Objective:

To assess the immediate & short term pain relief provide by ultra sound therapy.

To evaluate the effectiveness of stretching exercise in improve neck flexibility & reducing pain

To investigate the safety & tolerability of ultrasound therapy in subject with neck pain.

To measure the impact of these intervention on subjects quality of life & functional ability.

Methodology: A Quasi-Experimental study was conducted in Bareilly city. The study was conducted on 30 subjects with neck pain who were collected from Bareilly. Participants were divided into 2 groups on the basis of treatment method .After VAS & NPAD scale scoring .all subject were fully briefed about study purpose ,benefits ,risk prior to taking consent.

Result: This study shows that the clinical finding significant was moderate in both group .the incidence of neck pain was more likely common in females (56.6%) than males (43.4%) cause of abnormal neck posture while working .

Conclusion: Both the group shows significant decrease in reducing the neck pain between found that group(A) participants shows better results than group (B). Hence, we can conclude that stretching exercise is a better technique for treating neck pain than ultrasound.

Introduction -Neck pain is a social and economic problem and a major public health problem (1). Neck pain is a complete disability and 2/3 of people experience neck pain at some point in their daily life, but this can be seen in adults, neck pain is more common in women than men (2). Neck pain is a common musculoskeletal disorder adults and a major cause of disability and disability (10). Neck pain has been identified as the fourth leading cause of disability worldwide and is considered a major public health problem (3). People suffering from chronic neck pain are often treated with physiotherapy. In many cases of chronic neck pain, these factors are not fully recognized, because it is confusing. Therefore, considering the various factors, the treatments given focus on the clinical characteristics of the patient, such as pain, functional limitation, limitation of movement, and abnormal tissue accumulation (4). The discomfort of the medical characteristics of neck pain occurs because the patient's voice continues to increase during long-term work (6). Cell phones are becoming one of the most important things in life today (8), Neck pain is pain in the neck and shoulders accompanied by motor symptoms, especially by maintaining the position of the neck, neck movement, or palpation of the cervical muscles (9). This condition increases the risk of chronic neck and shoulder pain in office workers. In addition, due to their chronic and frequent nature, the increase in work-related musculoskeletal disorders (10). Neck pain also causes a significant social burden, increasing social costs and contributing to the loss of productivity (4). About two-thirds of people will experience neck pain at some point in their lives at a rate of 15-50% per year (4). It is suggested that the number of neck pain will increase significantly in the coming decades as the sedentary workplace increases and the elderly population of low- and

middle-income countries increases. region, neck region from the upper nuchal line to the first thoracic spinouts process, which may or may not be bright in the upper part (4). The history of neck pain is unclear, and most neck pain has no known cause, such as a tumour, infection, fracture, or inflammation (5) The most common definition of myofascial pain syndrome (MPS) is is local pain. Characterized by the presence of one or more myofascial trigger points (7). Stretching is a technique commonly used in the field of physiotherapy. MET is one of the most advanced exercise techniques. Studies using these methods individually in symptomatic and asymptomatic patients have shown improvement (8).

Interest is stretching exercises, due to the effect of reducing muscle stiffness and improving flexibility. Therefore, this study to determine the effectiveness of the neck stretching exercise program used in our clinic in reducing pain and neck function, as well as improving quality of life. Company employees. (13)

The pain-relieving effect of stretching does not seem to be limited to the immediate post-exercise period, but appears to affect the post-exercise period. (14)

Ultrasound therapy is a non-invasive technique commonly used in the management of musculoskeletal disorders. It is used by 65% to 94% of physical therapists around the world.(1)

Ultrasound electrical probe is a piezoelectric crystal that uses energy applied through a transducer applicator placed body. The waves are usually absorbed tissue (ie. ligaments, tendons, fascia, tendons). The ultrasound therapy cause biological responses, regeneration and inflammation reduction.(2) Ultrasound therapy is a common treatment method, which is often used in exercise or manual therapy to treat various diseases of the body, including neck pain. Ultrasound is defined as "sound waves or pressure waves with frequencies above the range of human hearing (16-20 kHz)". Ultrasound therapy used in regenerative therapy uses a frequency between 1 and 3 MHz

and a power of 0.1 to 2.0 W/CM². Ultrasound at 1 MHz can penetrate 2-4 cm of tissue, while ultrasound at 3 MHz has been shown to penetrate up to 1-2 cm.(3)

Therapeutic ultrasound is a physiotherapy treatment method that has a repair and heat effect on the increase in the an tissue, causing targeted area of metabolism, circulation, tissue extensibility linked to tissue regeneration. Some recent studies have used ultrasound to treat myofascial causes.(4)

Therapeutic ultrasound has a thermal and mechanical effect on deep tissue sites through the transmission of When exposed ultrasonic energy. to soft waves, soft tissue molecules vibrate and generate frictional heat, which is called the "therapeutic effect" of ultrasound.(11)The thermal and non-thermal effects of ultrasound therapy cause biological reactions, including tissue relaxation, tissue regeneration, and inflammation reduction. (3) The thermal, non-thermal and chemical effects shown by ultrasound, make the drug molecules enter the tissue for further penetration, using ultrasound waves including the above drugs it is considered to be painful, harmless and has little effect on time. his administration. In the region and site of pain, phonophoresis is often used for rehabilitation and often aesthetic or anti-inflammatory agents such as lidocaine, salicylates. hydrocortisone and cortisone that target the site of pain. (11)

Material and method-

Sample size- 30 patient of Bareilly who have neck pam,

Participants-This study was conducted on 30 subjects with neck pam, who were collected from Bareilly. Participants were divided into 2 groups on the basis of treatment method After VAS and NPAD scale scoring. All subjects were fully briefed about study purpose, benefits risk prior to taking consent.

Sample collection- Random collection method.

Population area- The subject will take from Bareilly. U.P. India.

Study population-The target population are adult between the age group 20-50 years.

Source of subject- the subject will be taken from Bareilly and there will be no any profession limits

Inclusion criteria- Both gender

Age between (20-50)

Presence of neck pain

Positive finding on

Exclusion criteria- Age <20 and > 50

Shoulder dislocation

Scapula fracture

Any injury of cervical

PROTOCOL

Patients who treated with ultrasound
Patient who treated with stretching exercise

Neck pain and disability scale
Neck pain and disability scale

Functional rating index
Functional rating index

Ultrasound therapy
Stretching exercise

Data analysis

Comparative

result of both techniques

Variables -The most used neck disability questionnaires are the Neck Pain and Disability scale (NPAD) and the Neck Disability Index (NDI). The Neck Pain and Disability scale (NPAD) is a composite index including 20 items which measure the intensity of neck pain and related disability.

Procudure-

Participants were requited from Bareilly on the basis of inclusion and exclusion criteria. Potential participants were verbally given the criteria for inclusion in the study and checked whether they met the criteria, those who met the criteria were included in the study, after the selection of subject the purpose and method of the study were explained and a consent sheet was provided to all participants outlining the purpose of study alongside the benefits and risk of study or participating. Who voluntary participated in the study was included in the study.

Participants were provided both a study information sheet [consent] questionnaire sheet.

Patient was encouraged to ask the questions, and standard answer to common questions was used by researcher to ensure consistency information.

The pre assessment grades and score was giving to the patients using the outcome measure The treatment was given for 1 to both groups. All the grades and score were measured after the treatment time the comparison of pre and post grades and score were performed.

Dividing the patients in 2 groups.

(11) Number of patients - Who treat with ultrasound therapy.

(21) Number of patient- Who treats with stretching exercise.

Apply the treatment for 1 month.

Technique procedure-

Group-A

During first week the consent form was given to the patient. Patient in this group will receive the stretching exercise. Before start the treatment take proper assessment and check intensity of pain by using visual analog scale and as well as check the pain, disability, by using NECK PAIN DISABILITY SCALE. In this technique stretching exercise is apply over the muscle that release tightness and pain throughout the stretching exercise, the same technique applied on the subject for 1 month.

GROUP-B

During 1st week the consent form was given to the patients, patient in this group will receive the ULTRASOUND THERAPY treatment method Before start the treatment take proper assessment and check intensity of pain by using visual analog scale and the neck pain diability, by using neck pain disability index. In this type of treatment metherne etic modality utilized (ULTRASOUND THERAPY] for the pain reliever. The same chnique applied on the subject for 1 month.

Measuring Tools:- scale and questionnaire given below-

1-Measuring pain -with the help of visual analog scale.

The pain VAS is one of the pain rating scale, it is a one-dimensional measure of pain intensity, used to record the severity of pain.

2-Measuring Disability -with NPDI

The most used neck disability questionnaires are the Neck Pain and Disability scale (NPAD) and the Neck Disability Index (NDI). The Neck Pain and Disability scale (NPAD) is a composite index including 20 items which measure the intensity of neck pain and related disability.

STATISTICAL ANALYSIS-

The Data was statistical analyzed by statistical package for the social science SPSS software (version 26.0) and descriptive statistics was used to analyze mean age and gender. Baseline character of the study participants were described in mean and standard deviation (SD). The difference in outcome measure at pre and post score measured in 1 months following the intervention. The significant level was set at $p < 0.05$.

Result-

There were 30 participants were taken for the purpose of the study. out of them 15 participants were randomly allocated to group:- A-ie- STRETCHING EXERCISE, and 15 participants were randomly allocated to group:- Bie ULTRASOUND THERAPY.

Age distribution of study participants:-

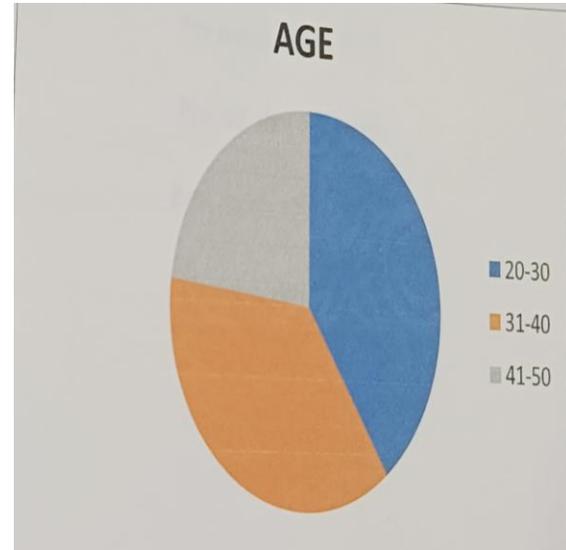
Out of 30 participants 40% participants belonged to an age group of 20-30years, 36.6% belonged to an age group of 31-40 years of age, and 23.3% participants belonged to 41-50 years of age.

Mean age of participants-33.3+8.8

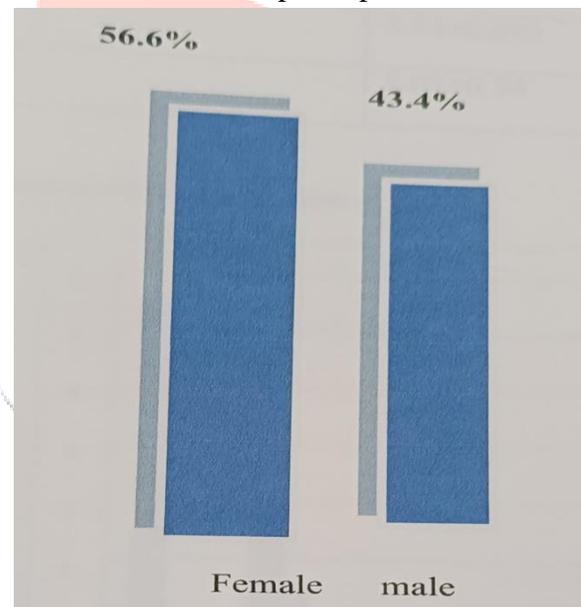
Table-1.1- Age distribution:-

Age Range	Frequency	Parentage
20-30	12	40%
31-40	11	36.6%
41-50	7	23.3%

Figure 1.1 age distribution



Gender distribution: - Out of 30 participants there were 43,4% participants were male and 56.6% participants were



15 participants who treated with stretching exercise as a part of relief for neck pain and marked the intensity of pain by using VAS Scale on a range of 1-10.

Pre mean value-5.53

Pre std. dev-0.6935

Post mean value-2.01

Post std. dev-0.54

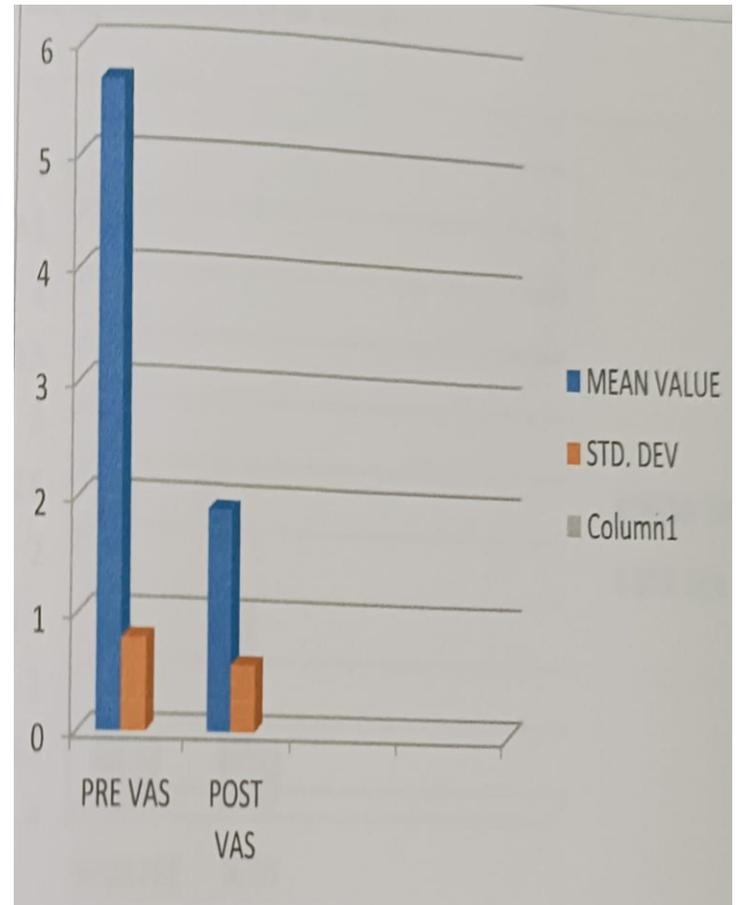
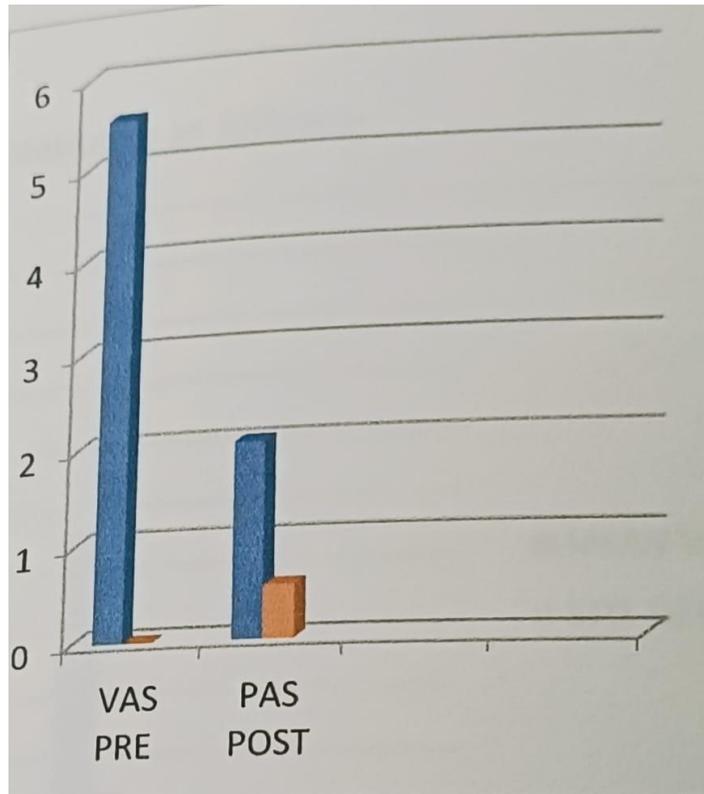
Table 1.2-Descriptive statistics of VAS Score in stretching

VAS Post	1.93-0.583	
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VARIABLE	MEAN- SD	P-VALUE
VAS Pre	5.53+0.693	0.01982
VAS Post	2.01 - 0.54	

Figure1.4- The bar representation is as follow-

Figurel 2- The bar representation is as follow:



15 participants who treated with stretching exercise as a part of relief for neck pain and marked the intensity of pain and neck disability by using by using NPDS on a range of 0-100.

Pre mean value-8.16

Pre std. dev-0.659

Post mean value-5.14

Post std. dev-1.53

Table-1.4 Descriptive statistics of VAS Score in ULTRASOUND

VARIABLE	MEAN-SD	P -VALUE
VAS Pre	5.684-0.8	0.00059

15 participants who treated with ULTRA SOUND THERAPY for relief of neck pain, marked their intensity of pain, disability, by using NPDS, on a range of 0-100.

Pre mean value-4.64

Pre std. dev-0.46

Post mean value-1.53

Post std, dev-0.394

Table -1.6 – description of both techniques.

	VAS	NPDS
Stretching exercise	Mean 2.01 Std dev. 0.54	2.36 0.28
Ultrasound therapy	Mean 1.93 Std dev. 0.583	1.53 0.394

Discussion –

The study synthesized the relationship between neck pain and neck disability. Guability and activity limitation subject with neck pain, there is no significant disability for variables (VAS and NPDS) in both groups.

In this study, conducted a large sample size, and covered wide age range [20-50], they may be would found large disability and activity limitation among the population.

In our study there was a sizeable majority of female (56.6%) reported in this study than males (43.4%), which indicates that neck pain is more likely common in females than males. In both group percentage of female was more than males.

According to **Almir Vieira Dibai-Filho**, Patients with chronic neck pain are usually attended to by rehabilitation and physical therapy services. In most cases of chronic neck pain, the causal factors are not identified precisely, as it is a complex dysfunction.² Therefore, given such multifactorial determinants, the available treatments focus on the patient's clinical conditions, such as pain, functional restrictions, limited range of motion, and altered muscular recruitment.³

According to **Apoorva Phadke** Mechanical neck pain is a generalized neck and/or shoulder pain with mechanical characteristics, including symptoms provoked by maintained neck postures, neck movement, or by palpation of the cervical muscles.

In our study we have seen that moderate VAS and NPDS Scale score present in both group. P. Value in both group is approximately similar, mean value of vas is in group-A [2.01] And NPDS scoring in group is [2.36], and in group B, the mean value of vas is [1.93], and FFI mean value is [1.53].

The statistical analysis of the VAS showed that there was a significant time effect for both groups ($p < 0.001$) which means that both treatment groups

were effective at reducing the mean VAS over the course of the study period.

In this study results reveals that pain status and disability, activity limitation, a pool for both component of pain score (VAS) and pain, disability and activity limitation (NPDS) In both groups (STRETCHING EXERCISE AND ULTRASOUND THERAPY) This is may be due to small sample size and age factor of sample population, Application of the direct STRETCHING EXERCISE helps in effective reduction of pain in eck and also helps in quick recovery, it also helps the structure to elongate and in bilitate the disability in the neck by removing the adhesions. Many studies supported that retching produces significant improvement in the neck pain,

LIMITATION - This study presents some limitations. Firstly the subjective method of measurements use in data collection. Second one is small sample size with narrow age range covered only Bareilly population.

Third one is limitation of collecting subjects from Bareilly only.

FUTURE STUDY-The same study will be conducted with some objective variable and in luge sample size of patient of all age group and large number of population.

Conclusion: This study shows that the clinical finding significant was moderate in both group .the incidence of neck pain was more likely common in females (56.6%) than males (43.4%) cause of abnormal neck posture while working .

Both the group shows significant decrease in reducing the neck pain between found that group(A) participants shows better results than group (B). Hence, we can conclude that stretching exercise is a better technique for treating neck pain than ultrasound.

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