IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

The Effectiveness Of Isometric Exercise And Stretching Using Telerehabilitation In Adult With Chronic Non-Specific Neck Pain (An Experimental Study).

[1]Jayashri Jadhao, [2]Dr. Jahnvi Panwar.

[1]Intern, Modern College of physiotherapy, [2] Assistant Professor, Modern College of physiotherapy.

PES Modern College of Physiotherapy, Pune, Maharashtra, India.

Abstract:

Background:

The Nonspecific neck pain is defined as pain in the posterior neck between the superior nuchal line and the spinous process of the first thoracic vertebra. The annual prevalence of nonspecific neck pain ranges in Industrialized countries from 27% to 48%. Although the duration and course of the pain may vary, most patients experience chronic or recurrent pain. Neck pain (NP) is a disabling musculoskeletal disorder (MSD) caused by occupation, lifestyle and age-related factors. In recent years, there has been an emerging body of knowledge on telerehabilitation (TR), a mode of delivering rehabilitation services to the patients via information and communication technology as a medium.

Aim:

To evaluate the effectiveness of isometric exercise and stretching using Telerehabilitation in adult with chronic non-specific neck pain after 4 week.

Methodology:

Adult of age 18-35 with chronic Non-Specific neck pain has been included in the study, pre and post evaluation has been done using outcome measure. Isometric exercises and stretching exercise done using Telerehabilitation for 3times a week for 4 consecutive week.

Outcome measures:

NPRS (numerical pain rating scale), Cervical ROM (Flex, Ext, RT. Side rotation, Lt. side rotation, LT. side flexion, RT. Side flexion),NDI (10 point neck disability index questioner), Cervical MMT.

Results:

Isometric exercise and stretching using Telerehabilitation is effective in improving strength and reducing neck disability in adult with chronic non-specific neck pain. Which was proved statistically significant [p=0.0001].

Conclusion:

This study shows that isometric exercise and stretching using tele rehab is effective in reducing pain, increasing ROM, improving strength and reducing neck disability in adults with chronic non-specific neck pain. So, it is concluded that Telerehabilitation should be used as effective means for treatment of chronic non-specific neck pain.

Keywords:

NPRS(numerical pain rating scale),cervical ROM (cervical range of motion), cervical MMT (cervical manual muscle testing), NDI(neck disability scale).

INTRODUCTION

The Nonspecific neck pain is defined as pain in the posterior neck between the superior nuchal line and the spinous process of the first thoracic vertebra. The annual prevalence of nonspecific neck pain ranges in industrialized countries from 27% to 48%. Although the duration and course of the pain may vary, most patients experience chronic or recurrent pain. [(1)] Functional

impairments develop in about 10% of patients and disabilities in5%.Neck pain (NP) is a disabling musculoskeletal disorder (MSD) caused by occupation, lifestyle and age-related factors. In recent years, there has been an emerging body of knowledge on telerehabilitation (TR), a mode of delivering rehabilitation services to the patients via information and communication technology as a medium. [2] Telerehabilitation is the common term utilized by the physiotherapist internationally for telehealth application. Telephysiotherapy is the technology used for virtual visit, consultations and protocols, which makes use of information and communication to facilitate rehabilitation of patients who are confined in their homes. It is an ultimate tool to provide high-quality personalized musculoskeletal physiotherapy practice in the society and an effective way to reduce crowding of patients and accompanying persons in clinics/hospitals at this crucial time of COVID pandemic. [3] Conventional isometric training (CIT) aims at improving isometric function of neck muscle, which counteracts the forces of gravity in order to maintain head and neck in upright position. It was found that peak isometric neck strength values were statistically reduced in subjects with chronic NP as compared to those in healthy controls in all the directions. [4] Exercise programs that focus on strengthening of the cervical musculature have been found to be beneficial and exercise interventions are commonly used to improve neck muscle function and thereby decrease pain and disability. [5]

NEED OF STUDY

Previous studies have studied the Telerehabilitation for the patient with knee osteoarthritis. [6] Due to the COVID-19 crisis, medical professionals have increased the usage of telemedicine, in which medical information is distributed via electronic mean between individuals who are in different locations.

Telerehabilitation can be use as means of treatment mode for People With neck pain, who lives in and around city generally face difficulties in assessing health care due to long distance and waiting list.

AIM

To evaluate the effectiveness of isometric exercise and stretching using Telerehabilitation in adult with chronic non-specific neck pain after 4week.

OBJECTIVES

To study the effectiveness of Isometric exercise and stretching using telerehabilitation in adult with chronic non-specific neck pain after 4week.

HYPOTHESIS

Null hypothesis (h0)- There will be no Significant effect of Isometric exercise and stretching using telerehabilitation in adult with chronic non-specific neck pain after 4week.

Alternative hypothesis (h1)- There will be Significant effect of Isometric exercise and stretching using telerehabilitation in adult with chronic non-specific neck pain after 4week.

METHODOLOGY

Sample size: 60

Study setting: OPDs, hospital in and around PUNE.

Study Design: Quasi Experimental

Study Sample method: Purposive Sample

Study population: Adults age (18-35yr) students.

Study duration: 6months.

Intervention period: 3 times a week for consecutive 4 week.

MATERIALS

Pen
Paper
Chair
Video Calling App (Google duo)

INCLUSION CRITERIA

Age 18-34 years student [7]

Non-specific, chronic neck pain lasting over 3 months. [8]

The subject having score of 4 to 10 on Numerical pain rating scale [9]

The subject had a score of <_15 (out of possible 50) on neck disability index [NDI] <_15 indicate mild to moderate intensity.

The person should have knowledge in handling mobile phone.

EXCLUSION CRITERIA

Disc prolapsed

Spinal stenosis

Post -op condition

Frequent migraine

Peripheral nerve entrapment

Fibromyalgia

Severe psychiatric illness

Inflammatory rheumatic disease

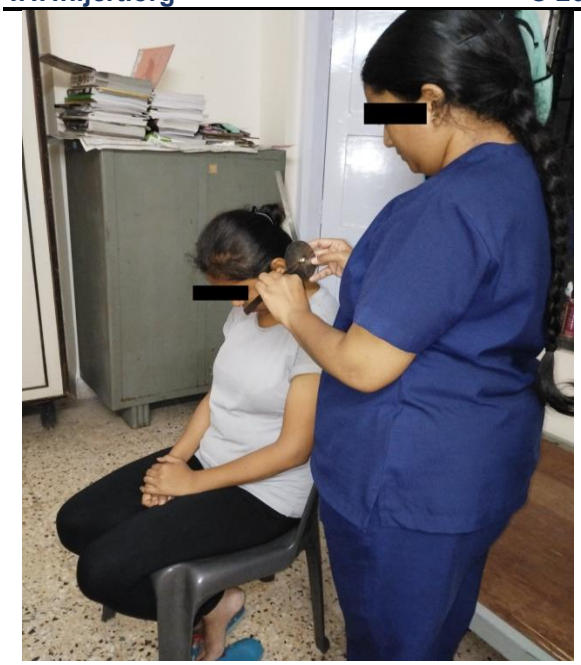
Malignancy, Vertebral fracture ,Tumors.

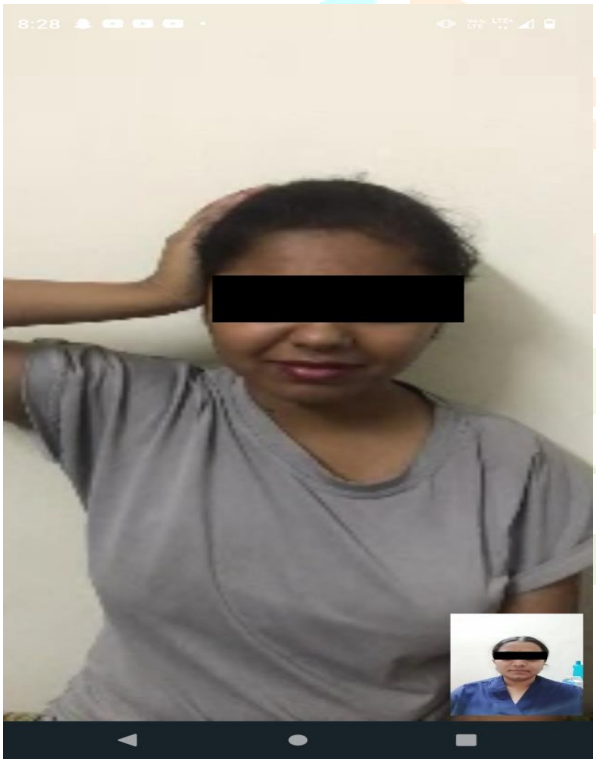
PROCEDURE

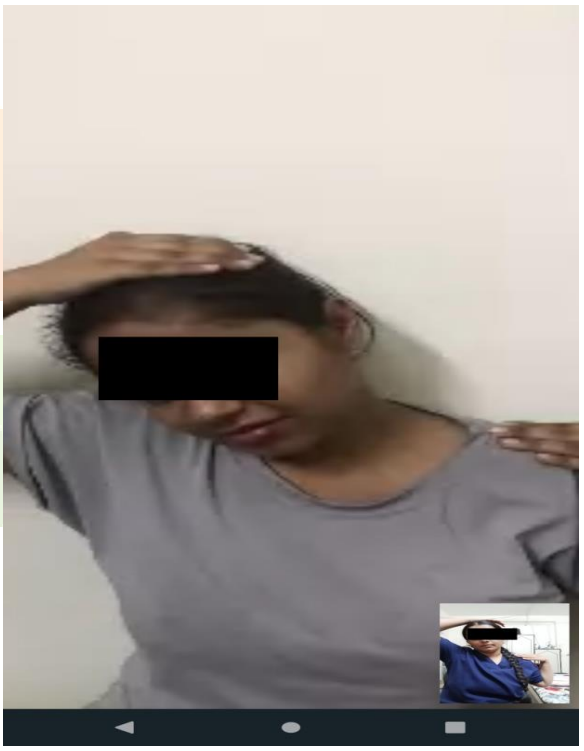
Study began with the presentation of synopsis to the ethical committee of PES MCOP. Ethical clearence was granted by the committee. Then the subject was selected on the basis of inclusion and exclusion criteria. The subjects was explained about the studies before starting the procedure. Consent was taken from the Subjects who wish to Participate in this study. Assessments were done on the basis of numerical pain rating scale (NPRS), cervical ROM, cervical MMT, neck disability index questioner (NDI). Training included exercise for the duration of 4 week. Isometric exercise along with stretching were taught to the patient via virtual platform. At the end of 4thweek the re-evaluation of patient was done using (NPRS) cervical ROM, cervical MMT, neck disability index (NDI).

PROTOCOL

The sessions were conducted for 30 min, 3 times a week for 4 consecutive weeks, with a total of 12 sessions. The procedure was explained to the patient, how the treatment is to be done via video call. The isometric exercises included as follows: a) cervical flexion - Bend your neck slightly forward and put your hand on your forehead. Try to bend your head forward while pushing back with your hand. b) cervical extension - Keep your back and your neck straight and place your hands at the back of your head. Try to push your head backwards while pushing forward with your hands. C) cervical side bending - Put your left hand at chin level and turn your head slightly to the right. Try to bring your head down to your right shoulder while pushing with your right hand. Repeat the side bending to the left side with your left hand. d) cervical rotation - Put your left hand at chin level and turn your head slightly to the right. Put your right hand on the right side of your face. Turn your head to the right while pushing it back with your right hand. Repeat the Rotation Exercise, on the left side of your face and with left hand. Stretching exercises - Begin each exercise with your neck in midline position. Your head should be centered and not tilted forward, back, or to the side. you can do this exercise in sitting position.1) flexion stretch: chin to chest - Gently bend your head forward while bringing your chin toward your chest. Stop when a stretch is felt in the back of your neck. Hold position for 30 seconds, return to starting position. Repeat this 3more times. 2) extension stretch : eyes to sky - Gently bend your head backward so that **your** eyes are looking up to the “sky.” Stop when a stretch is felt in the front of your neck. Hold position for 30 seconds, return to starting position. Repeat this 3more times.3) rotation : side to side - Gently turn your head to the left, looking over your left shoulder. Stop when a stretch is felt in the right side of your neck. Stop when a stretch is felt in the right side of your neck. Hold position for 30 seconds, return to starting position. Repeat above stretch 3times. Repeat above stretch on the other side. 4)Lateral flexion :ear to shoulder - Gently bend your neck in attempts to touch your left ear to your shoulder. Stop when a stretch is felt in the right side of your neck. Hold position for 30 seconds. Return to starting position. Repeat above stretch three more times. Repeat above stretch on other side.





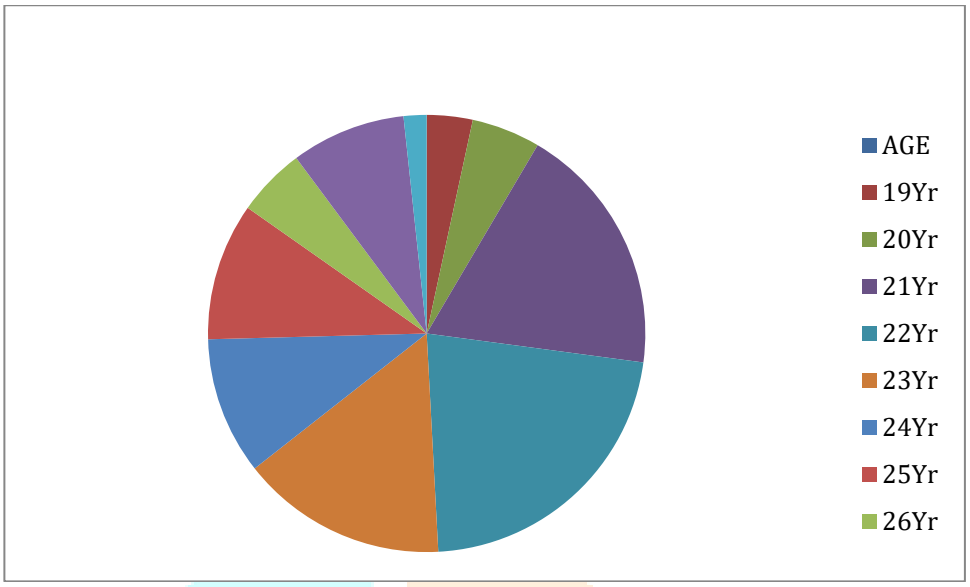


STATISTICAL ANALYSIS

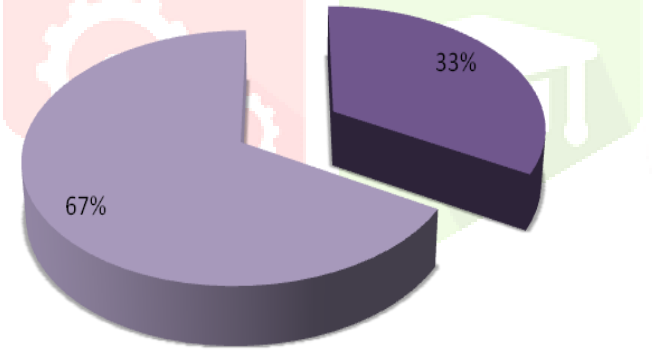
Statistical analysis was done by Paired t-test was to compare the pre and post neck disability index [NDI] of chronic non-specific neck pain which showed p value <0.0001 which is consider extremely significant**.** Microsoft Excel and Word was used for designing the table.

DATA COLLECTION AND ANALYSIS

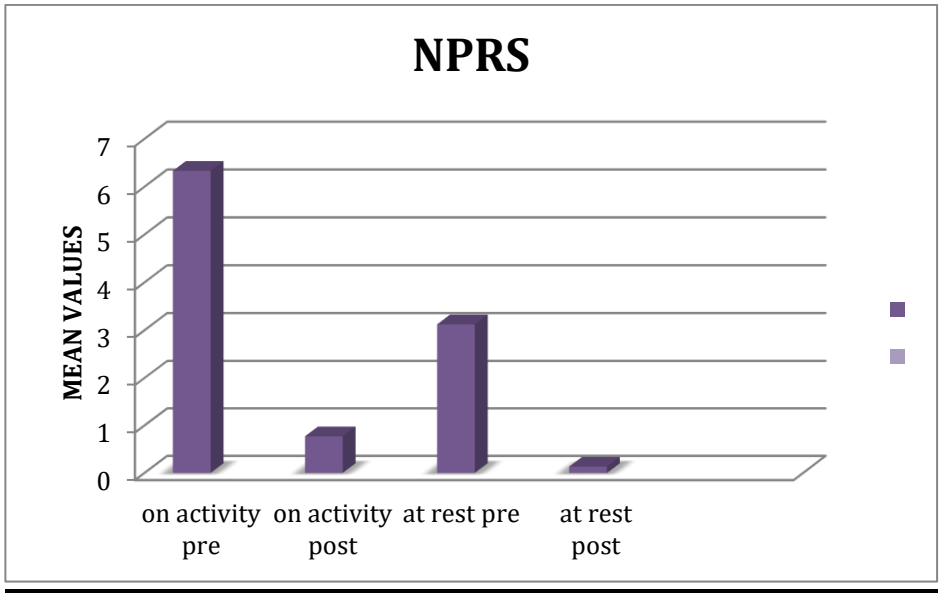
A. AGE DISTRIBUTION



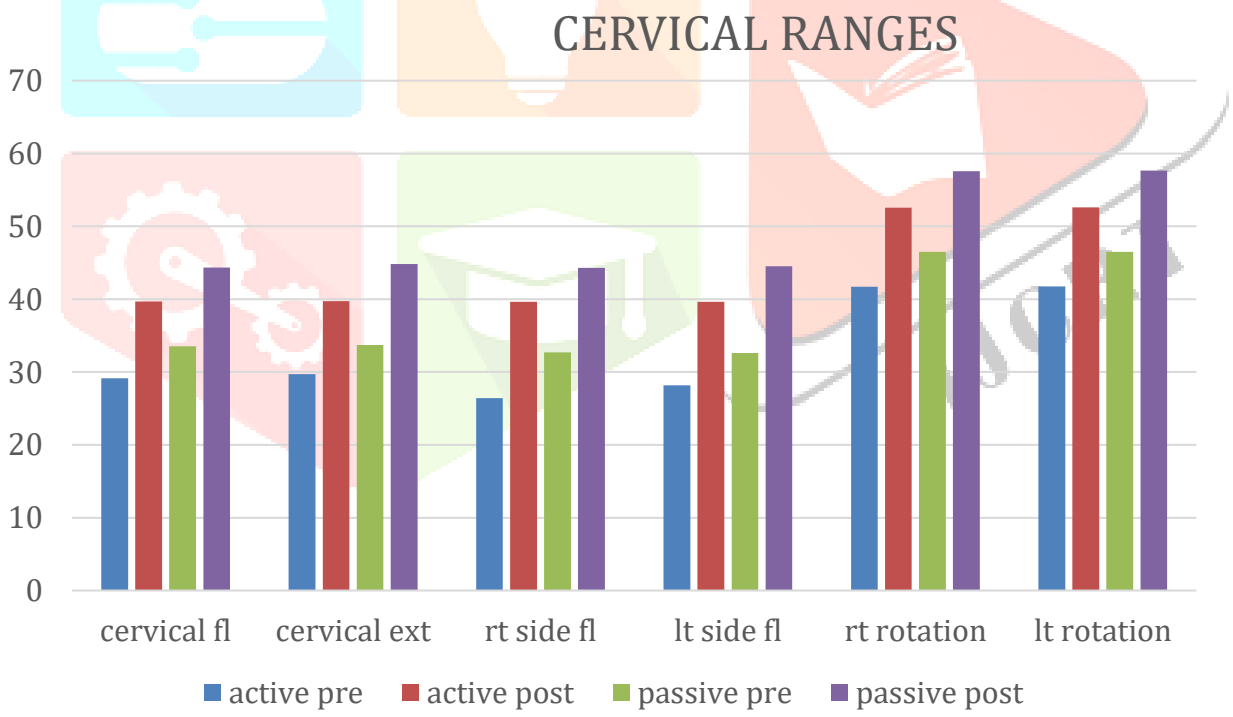
GENDER DISTRIBUTION



B. NUMERICAL PAIN RATING SCALE [NPRS]

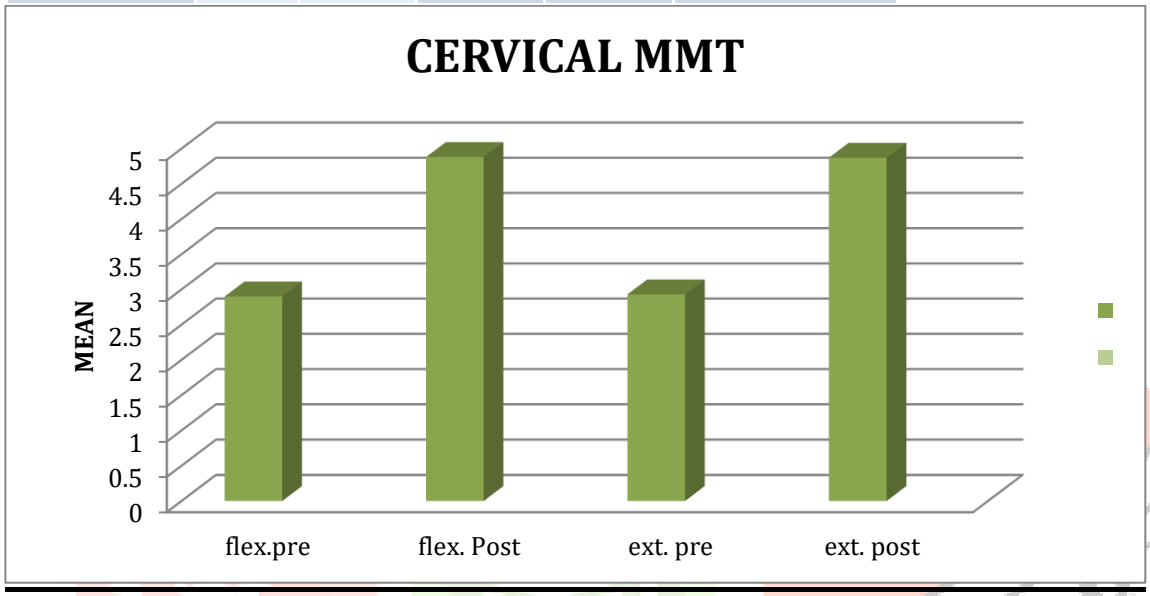


C. CERVICAL RANGES



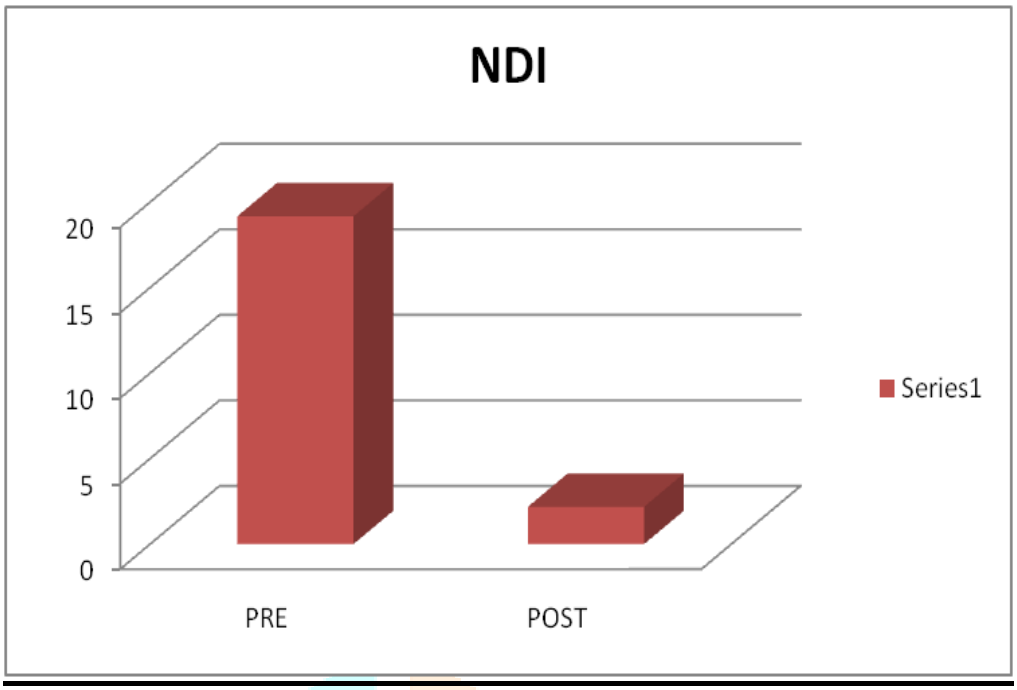
D.CERVICAL MMT

CERVICAL MMT		MEAN	T VALUE	P VALUE	SIGNIFICANCE
FLEXION	PRE	2.90	44.654	<0.0001	EXTREMELY SIGNIFICANT
	POST	4.88			
EXTENSION	PRE	2.93	20.419	<0.0001	EXTREMELY SIGNIFICANT
	POST	4.87			



E. NECK DISABILITY INDEX [NDI]

OUTECOME MEASURE NDI	MEAN	T VALUE	P VALUE	SIGNIFICANCE
PRE	19.17	39.362	<0.0001	EXTREMELY SIGNIFICANT
POST	2.18			



RESULTS

This study evaluated 60 subjects of age group 18-34 yr.

Paired t-test was done to compare the pre and post NPRS of chronic non-specific neck pain which showed p value <0.0001 which is consider extremely significant.

Paired t-test was done to compare the pre and post cervical rom active, passive [flexion, extension, rt. side flexion, lt. side flexion, rt. Side rotation, lt. side rotation] of chronic non-specific neck pain which showed p value <0.0001 which is consider extremely significant.

Paired t-test was done to compare the pre and post cervical MMT active, passive of chronic non-specific neck pain which showed p value <0.0001 which is consider extremely significant.

Paired t-test was done to compare the pre and post neck disability index [NDI] of chronic non-specific neck pain which showed p value <0.0001 which is consider extremely significant.

DISCUSSION

This study was intended to see the effectiveness of Isometric exercise and stretching using TELEREHAB in reducing pain, increasing ROM, strength and reducing disability in adults with Chronic non-specific neck pain. In this study, total 60 individuals both males and females participated. The result showed that Isometric exercise and stretching have significant effect on reducing pain. The result shows that Isometric exercise and stretching using tele -rehabilitation has significant effect in improving cervical ranges. The result shows that Isometric exercise and stretching using tele- rehabilitation has significant effect in improving strength. The result shows that Isometric exercise and stretching using tele -rehabilitation has significant effect in reducing neck disability. Study conducted by Cottrell et al shows that video conferencing enables the physiotherapist to provide individualized instruction, feedback and training program for patient in real time. In addition it has been shown that video conferencing can be carried out using a low-bandwidth internet connection. Study conducted by Trevor G. Russel et al shows that technology can be used to provide effective rehabilitation services after acute post operative care for patient who have undergone total knee replacement. Study conducted by Hana Alsobayel et al. shows that tele rehabilitation may be a viable option for providing physiotherapy assessment and intervention for non-surgical patients suffering from musculoskeletal disorders who reside outside urban communities were access to clinics can be difficult and time consuming for both patients and clinicians. It also found that home based tele rehabilitation may serve as an alternative option for delivering out-patient rehabilitation for patients suffering from chronic musculoskeletal pain compare to the usual health care or home-based rehabilitation. Isometric exercise involved contraction of muscles without any movement in surrounding joint. The constant tension on the muscles may help to improve muscle endurance and support dynamic exercise. By applying constant tension to muscles, isometric exercise can be useful for improving endurance, posture by strengthening and stabilizing the muscles. Holding the muscles contraction allow the tissue to fill with blood and create metabolic stress on the muscle. This can help to improve pain, strength, endurance. The finding of this study are in line with result of the study by kosterink et. Al who investigated the effect of 4week telerehabilitation treatment service on subject with non-specific neck pain and shoulder pain, where they showed that treatment was effective in reducing pain

intensity and disability over time. In line with study conducted in Norway on subject with musculoskeletal problems, the result of this study indicated that tele rehab was cost saving.

CONCLUSION

This study shows that isometric exercise and stretching using tele rehab is effective in reducing pain, increasing ROM, improving strength and reducing neck disability in adults with chronic non –specific neck pain.

Hence, our null hypothesis is rejected and alternate hypothesis is accepted.

So, it is concluded that Tele rehab should be used as effective means for treatment of chronic non-specific neck pain.

CLINICAL IMPLICATION

Isometric Exercise and Stretching using Telerehabilitation is an inexpensive method and help in reducing pain, improve ROM, improve strength, reduce neck disability.

It is easy to learn and perform these exercises, once learned assistance is not required.

It is not time consuming program.

Telerehabilitation help to reduce cost effectiveness of the treatment.

Telerehabilitation help to deliver treatment through easy mean and help to save time over long waiting list in clinics and hospitals.

LIMITATION

The study included only adult population.

FUTURE SCOPE OF STUDY

The same protocol could be implemented in different populations like elderly, desk workers (IT professionals, school students, etc).

More research can be carried out by increasing follow up.

Similar study can be done to rule out reliability of assessment through tele rehab.

Effectiveness of tele rehabilitation can be studied for different condition.

Gender wise classification can be done.

Comparative study can be done between effectiveness of conventional physiotherapy and telerehabilitation based physiotherapy.

REFERENCES

1.Systematic review of manual therapies for nonspecific neck pari Karl Vincent a, Jean-Yves Maigne b, ∗, Cyril Fischhoff a, Olivier Lanloc, Simon Dagenais da Société franco-européenne de chiropratique (SOFEC), 25, avenue du Raincy, 93250 Villemomble, France b Service de médecine physique, Hôtel-Dieu de Paris, 1, place du Parvis-Notre-Dame, 75181 Paris cedex 04, France c Institut franco- européen de chiropratique (IFEC), 24, boulevard Paul-Vaillant-Couturier, 94200 Ivry-sur-Seine, France d Division de chirurgie demédecine, université d'Ottawa, 451, chemin Smyth, Ottawa, Ontario K1H8M5, Canada doi:10.1016/j.jbspin.2012.10.006

2.Concurrent validity and reliability of telerehabilitation-based physiotherapy assessment of cervical spine in adults with non-specific neck pain Suresh Mani1, Shobha Sharma2 and Devinder KA Singh3. https://doi.org/10.1177/1357633X19861802

3.Role of Telerehabilitation in Musculoskeletal Conditions during COVID-19 Pandemic. http://www.indianjpain.org/

4.Effect of Deep Cervical Flexor Training vs Conventional Isometric Training on Forward Head Posture, Pain, Neck Disability Index In Dentists Suffering from Chronic Neck Pain. Bhuvan Deep Gupta, Shagun Aggarwal2, Bharat Gupta3, Madhuri Gupta4, Neha Gupta5. 10.7860/JCDR/2013/6072.3487

5.Isometric Exercise for the Cervical Extensors Can Help ResNeck Physiological Lordosis and Reduce Neck Pain A Randomized Controlled Trial Mahmut Alpayci, MD and Server İlter, Mddoi: 10.1097/PHM.0000000000000698

6.Telerehabilitation for Patients With Knee Osteoarthritis:A Focused Review of Technologies and Teleservice Mreza Naeemabadi MSc, BME; Hesam Fazlali MSc, BME; Samira Najafi MSc, BME; Birthe Dinesen1, PhD;John Hansen4, PhD doi:10.2196/16991

7.Immediate Effects and Acceptability of an Application-Based Stretching Exercise Incorporating Deep Slow Breathing for Neck Pain Self-management. Sadudee Thongtipmak, Orawan Buranruk, Wichai Eungpinichpong, Kurusart Konharn Healthcare informatics research 26 (1), 50-60, 2020 DOI: https://doi.org/10.4258/hir.2020.26.1.50

8.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 Jari Ylinen a, * , Esa-Pekka Takala b, Hannu Kautiainen c, Matti Nyk€anen d,Arja H€akkinen a, Timo Pohjolainen , Sirkka-Liisa Karppi f, Olavi Airaksinen g. Doi:10.1016/j.ejpain.2003.11.005

9.The perceived benefits of an artificial intelligence–embedded Mobile app implementing evidence-based guidelines for the self-Management of Chronic Neck and Back Pain Wai Leung Ambrose Lo, Di Lei, Le Li,Dong Feng Huang, Kin-Fai Ton JMIR mHealth and uHealth 6 (11), e198, 2018. doi:10.2196/mhealth.8127

10. Clinical effects of deep cervical flexor muscle activation in patients with chronic neck pain Jin Young Kim, Kwang Il Kwag Journal of physical therapy science 28 (1), 269-273, 2016. J. Phys. Ther. Sci. 28: 269–273, 2016

11. The Neck Disability Index: a study of reliability and validity. Howard Vernon, Silvano Mior Journal of manipulative and physiological therapeutics, 1991Vernon, H., & Mior, S. (1991). The Neck Disability