ORIGINAL RESEARCH PAPER

Physiotherapy

EFFCIENCY OF TELEREHABILITATION ON PAIN AND FORWARD HEAD POSTURE AMONG STUDENTS WITH NONSPECIFIC NECK PAIN IN PANDEMIC SITUATION – A QUASI EXPERIMENTALSTUDY

KEY WORDS:
Telerehabilitaion , Nonspecific neck pain , Forward head posture

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ABSTRACT

INTRODUCTION: The neck pain and forward head posture are the most prevailing condition among the college students due to increased smart phone usage and causes activity limitation. At current situation providing rehabilitation via face to face increases the risk of spread of the pandemic(COVID 19). The deep neck flexor strengthening and ergonomic correction via telerehabilitation improves the functional activity among college students and limits the spread of disease.

MATREIALS AND METHODOLGY: Subjects with (n=15), who fulfil the screening criteria were given the exercise protocol that is deep neck flexor strengthening and ergonomic correction via telerehabilitation mode for a period of 4 weeks and the outcome measures included neck pain and forward head posture.

RESULT: There is a significant statistical difference between pre test and post test values of pain and forward head posture.

CONCLUSION: Telerehabilitation platform provides a greater efficiency for treating pain and forward head posture among college students in pandemic situation.

INTRODUCTION

In late December 2019, a novel corona virus disease (COVID – 19) emerged and spread throughout the world, acquiring the category of pandemic by World Health Organization in 2020[1].Non- pharmacological interventions reduce the transmission rate of the virus recommended by WHO includes,

Social distance.
Social isolation.
Quarantine.

As a consequence, almost all musculoskeletal physical therapist have suspended their non-urgent professional activities. Although this decision underscores the high social responsibility of physical therapist, it also may create a sense of bewilderment – both among patients, who may be living with pain and disability and among professionals [2].

There are a limited number of physiotherapist particularly in rural area, thus affecting quality of physiotherapy services[3].A client from a rural area , therefore needs to travel a distance to an available physiotherapy centre which involves money and time expenditure[3].

Neck pain is one of the most common painful musculoskeletal disorders with the prevalence ranges from 6% to 22% and up to 38% of the elderly population, while lifetime prevalence ranges from 14.2% to 71%. For the majority of neck disorders there is an absence of an identifiable underlying disease or abnormal anatomical structure. As a consequence, they are classified as "non-specific neck pain [4, 5].

Prolonged use of computers during daily work activities and recreation is often cited as a cause of neck pain. For neck pain in general population, the lifetime prevalence has been reported to be greater than 67%. The one-year prevalence of neck pain among adults ranges from 12.1% to 71.5%. The point prevalence of neck pain is reported to be between 12% and 34%. The weekly prevalence of neck and shoulder pain in adolescence range from 17% to 28% in the years 1989 to 1996. An increased prevalence of musculoskeletal illness for users of computers and video display units has been observed. Some studies reveal that one year prevalence of neck pain in office workers range from 17.7% to 63% [6].

For neck pain in general population, the lifetime prevalence has been reported to be greater than 67%. The one-year prevalence of neck pain among adults ranges from 12.1% to 71.5%. The point prevalence of neck pain is reported to be between 12% and 34%. The weekly prevalence of neck and shoulder pain in adolescence range from 17% to 28% in the years 1989 to 1996. An increased prevalence of musculoskeletal illness for users of computers and video display units has been observed. Some studies reveal that one year prevalence of neck pain in office workers range from 17.7% to 63% [7].

Aim And Objectives:

Aim: The aim of this study is to find the efficiency of tele rehabilitation on pain and forward head posture among students with non-specific neck pain in pandemic situation.

Objectives:

1. To find the efficiency of tele rehabilitation for severity of pain and its interference using brief pain inventory among students with non- specific neck pain.
2. To find the efficiency of telerehabilitation for forward head posture using craniovertebral angle among students with non-specific neck pain.

Materials And Methodology:

This is an quasi experimental study conducted during pandemic among students attending online classess. The study recruited 15 subjects using the assessment form that has been given through Google forms generated in online.

Inclusion Criteria:

- Active, Painful Range of Motion of neck.
- Subject who score 5 or above in both pain and interference subscale in Brief pain inventory.
- Craniovertebral angle less than 50degree (normal 40 to 54degree).
- Age – 18 to 25 years.

- Both male and females are included.

Exclusion Criteria:
- History of recent surgery or open wounds in neck.
- Neoplasm.
- Cervical disc prolapse.
- Impaired circulation.
- Vertebra basilar insufficiency.
- Rheumatoid arthritis, spondylitis.
- Radiculopathy, myelopathy.
- Psychological disorder.
- Pregnancy.
- Under medication for neck pain or therapy for neck pain.

The 15 subjects are selected based on the inclusion and exclusion criteria. They all received a tele rehabilitation via ZOOM in which the deep neck flexor strengthening was demonstrated and ergonomic advice was shown as picture.

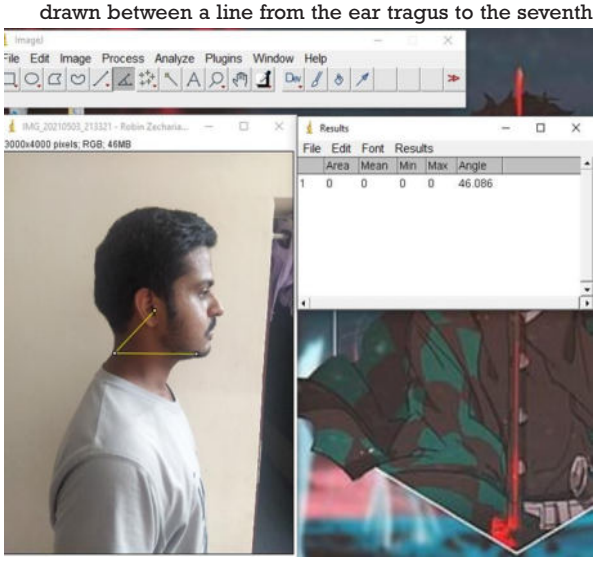
The pre - test measurement was obtained from brief pain inventory scale for pain and pain interference and image J software for forward head posture via Google forms.

The Google forms filling link were sent to subjects via WhatsApp. The pain subscale has total of 4 questions and pain interference subscale has a total of 7 questions. The score for pain and pain interference is obtained as an average scores of that section.

Measurement Of Craniovertebral Angle:

Patient position: Sitting on a stool

Procedure:
- The subject was asked to sit with an upright neutral posture on a chair and lateral photograph of the spine was taken.
- Adhesive markers were fixed on the ear tragus and the spinous processes of seventh cervical vertebra.
- A vertical plumb line was suspended from a platform attached to the wall.
- The image J software was used to draw a horizontal line perpendicular to the plumb line.
- The craniovertebral angle was then measured as an angle drawn between a line from the ear tragus to the seventh



Deep Neck Flexor Strengthning:
The subject was given an instruction via the telecommunication system.

Method 1:

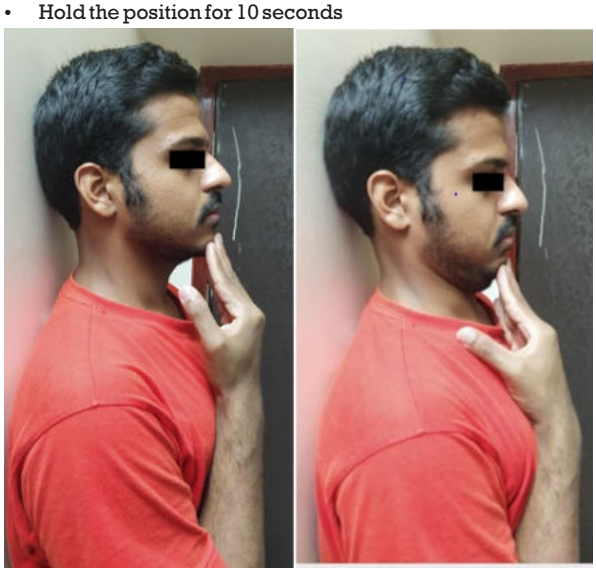
Patient position: Supine lying

Instructions:
- The patient is in supine and cervical spine is in neutral position by placing a folded towel under head.
- The patient is instructed to flatten the curve of the neck by nodding the head.
- This position is held for 10 seconds, and repeated for 10 times.
- The therapist monitors the less activation of sternocleidomastoid activation via screen during this movement.

Method 2:

Patient position : Sitting or Standing.

Instructions:
- Sit or stand upright and look straight ahead with the ears directly over the shoulder.
- Place a finger on the chin.
- Without moving the finger PULL THE CHIN AND THE HEAD until a good stretch is felt at the base of the neck and top of the neck.
- Hold the position for 10 seconds



INITIALPOSITION **FINAL POSITION**

Protocol:
- Treatment duration : 4 weeks
- It was given 3 sets a day
- Each set has 10 repetitions
- Each repetition is performed for 10 seconds.

Ergonomics Advice:
- Hold the Smartphone near chest level rather than waist level.
- Avoid cradling the phone between your ear and shoulder.
- Holding the phone to your ear with your hand can also cause fatigue so use Bluetooth headset instead.
- Vary the way Smartphone is held and alternate between

using thumbs and the fingers when typing.
- Take breaks and change positions frequently while using Smartphone.
- Keep the wrists while holding or typing.
- Use features including predictive text or auto complete tools to reduce typing frequency
- Choose a Smartphone that fits your hands properly.
- Those who need to occasionally use their Smartphone one handed, make sure you can hold the phone securely and still be able to tap with the thumb on all targets without strain.

RESULTS:

A total of 15 subjects were enrolled in to the study. The pain and its interference are assessed using brief pain inventory scale (Table 1).

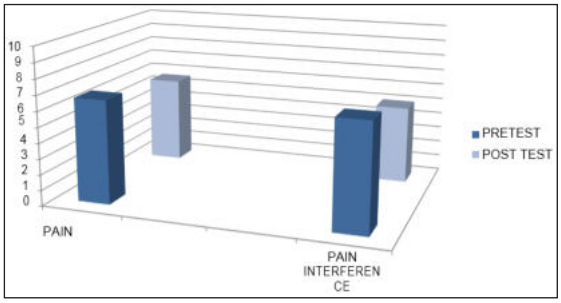
Table 1 : Pain Severity:

Outcome Measure	Mean Value		t value	p value
	Pre Test	Post Test		
Pain Severity	6.65	5.61	3.24	<0.05
Pain Interference	6.84	5.81	4.18	<0.05
Forward Head Posture	46.3	47.9	3.18	<0.05

Pre-test and post-test values of pain severity obtained from brief pain inventory scale was analysed using paired 't' test. For 14 degrees of freedom and 5% level of significance the table t value is 2.145 and the calculated value is 3.24 with the Standard Deviation of ± 1.23 [p <0.05]. Since the table t value is lesser than the calculated t value null hypothesis is rejected.

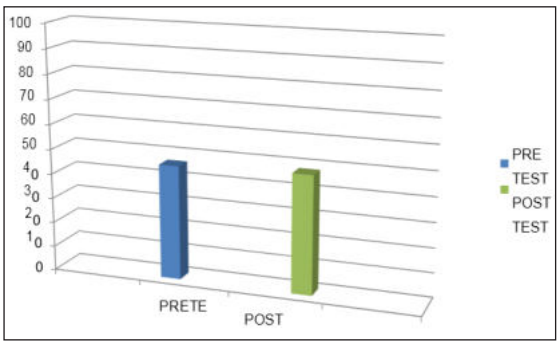
Pain Interference:

Pre-test and post-test values of pain interference obtained from brief pain inventory scale was analysed using paired 't' test. For 14 degrees of freedom and 5% level of significance the table t value is 2.145 and the calculated value is 4.18 with the Standard Deviation of ± 0.95[p <0.05]. Since the table t value is lesser than the calculated t value null hypothesis is rejected.



Forward Head Posture:

Pre-test and post-test values of cranio vertebral angle obtained from image J software was analysed using paired 't' test. For 14 degrees of freedom and 5% level of significance the table t value is 2.145 and the calculated value is 3.18 with the Standard Deviation of ± 1.93 [p <0.05].. Since the table t value is lesser than the calculated t value null hypothesis is rejected.



DISCUSSION

The purpose of the study was to find out the efficiency of telerehabilitation on neck pain and forward head posture among college students in post pandemic situation. Telerehabilitation has expanded dramatically in recent years. This type of rehabilitation is made necessary to reach people during this pandemic situation.

In clinical practice, pain indicates the severity of condition and is a vital measure to evaluate the effects of therapeutic intervention. Having the screen in an inappropriate position, occupational risk factors like psychological stress, poor social support and neck bending in a work place results in non-specific neck pain. The pain results in disability of a person in doing their regular day to day activities [1].

There is a positive relationship between the head, cervical and thoracic spine. The subjects with neck pain showed an altered head posture. The subjects who scored maximum in multidimensional pain inventory relatively shown a lesser degree of craniovertebral angle during assessment. The prevalence of forward head posture was 63.79% among college students which was due to prolonged Smartphone, desktop use and poor posture at the time of lectures [7].Forward head posture increases the workload on the deep neck flexor muscles on the anterior (front) of neck and stretches the posterior neck muscles. It also compresses the facet joint and results in pain in neck. Due to prolonged contraction of deep neck flexor in forward head posture, these muscles undergo weakness. So strengthening of these muscles and providing ergonomic correction may alter the posture. As the posture is corrected the pain due to the faulty posture is also reduced [8,9].

The subjects with non-specific neck pain and the related forward head posture were given a deep neck flexor strengthening and ergonomic correction for a period of 4 weeks via telerehabilitation. Subjects were asked to fill the Brief pain inventory provided through Google forms and craniovertebral angle was measured using image J software (image was also obtained via Google forms). Subjects who fall under the inclusion criteria are taken and received an informed consent form via Google forms.

Every subject was individually consulted via the Zoom application (video conferencing application) and given instruction about the ergonomic correction and demo of exercise to be done. The whole session was recorded and provided for the subjects for their further reference. The post test was also measured using Google forms.

There is an improvement in pain reduction and posture correction. The advantages that subjects felt for the telerehabilitation are:
- Economically feasible.
- Interesting.
- Avoidance of contact with people.
- Avoid transport and time consuming.
- Getting their services without interruption because of present situation.
- Accessible of rehabilitation in remote areas.
- Easier communication and numbers of repetition is possible.

CONCLUSION:

This study was conducted to find out the efficiancy of Telerehabilitation on pain and forward head posture among students with non-specific neck pain in pandemic situation. In this study 15 members who had a non-specific neck pain were included. They were included on the basis of inclusion criteria and given deep neck flexor strengthening exercise and ergonomic correction for a period of 4 weeks with 3 sets a day and 10 repetitions per set.Initially exercise was taught via ZOOM application (Telerehabilitation) and the recorded

session was sent to the subjects for further reference. The pain and posture changes were measured using brief pain inventory scale and image J software respectively at the end of 4 weeks. The data collected before the treatment (Pre-test) and after the treatment (Post-test) were analysed using paired 't' test.

The statistical analysis from the paired 't' test concluded that there was a significant improvement in pain and its interference and forward head posture in subjects with non-specific neck pain. It is concluded that telerehabilitation is efficient in improving the pain and forward head posture in this pandemic situation.

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