

EFFICACY OF PILATES IN CONJUNCTION WITH CONVENTIONAL EXERCISE PROGRAM IN SUBJECTS WITH TEXT NECK SYNDROME

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ABSTRACT

BACKGROUND :

Text neck syndrome is a commonly found condition in students as they hang their head downwards for a long period of time while using mobile phones. It most commonly causes neck pain and soreness. In the modern world, with the increasing use of technology, text neck syndrome is becoming more common. Determining an effective treatment for this condition is essential for public health. So, this study investigates the effectiveness of Pilates along with conventional exercise program and conventional exercise program alone in reducing the symptoms of text neck syndrome.

AIM OF THE STUDY: The aim of the study is to find the efficacy of pilates in conjunction with conventional exercise program in subjects with text neck syndrome.

MATERIALS AND METHODS : This experimental study was conducted with 30 participants in the age group 18-24, they were selected based on the inclusion and exclusion criteria. They were divided into two groups, Group A-15 patients underwent conventional exercise alone and Group B-15 patients underwent Pilates along with conventional exercise. An assessment for outcome measures (NPRS, NDI, MMT, and CMET) was done prior to starting of the treatment and after 6 weeks of intervention.

RESULTS AND CONCLUSION: The results found in this study revealed that after a six week treatment program, both groups attained a significant improvement in the strength and endurance of neck muscles along with reduced pain and disability. But statistically greater significant improvement was seen in Group B as compared to Group A.

KEYWORDS: Pilates, Neck disability index, Numerical pain rating scale, Smart phones, Text neck syndrome, Cervical muscle strength, endurance.

INTRODUCTION

The neck or cervical spine is a coordinated network of nerves, bones, joint and muscles directed by the brain and spinal cord. Additionally, irritation along the nerve pathways can cause pain into the shoulder, arm and hand. "Text neck" is the term used to describe the neck pain and damage sustained from looking down at the cell phone, tablets or other wireless devices too frequently and for too long⁽²⁾. Various studies have been conducted to assess the prevalence of text neck syndrome and most were involving the young adult population, the major population with the greatest attachment to smartphones. Outcome of a study in 2021 done among 283 college students in India showed 76.6% of total respondents reported text neck syndrome⁽⁸⁾. A recent study shows that 79% of the population between the age of 18-44 have their cell phones with them almost all the time, with only 2 hours of their waking day spend without their cell on hand. Text neck most commonly causes neck pain and soreness. In addition, looking down at your smartphone too much can lead to upper back pain ranging from chronic, nagging pain to sharp and severe upper back spasm. Shoulder pain and tightness, possibly resulting in painful shoulder muscle spasm⁽²⁾.

The term “Text neck” was coined by Dr. Dean L. Fishman, who is a US chiropractor. The term text neck is used to describe a repetitive stress injury where a person has his/her head hung or flexed in a forward position and bent down looking at mobile or other electronic device for prolonged periods of time. Maintaining this poor position at most time may eventually cause the flattening of the normal curvature of the cervical spine and stretch the neck musculature leading to chronic neck pain, upper back muscle tightness and spasms, shoulder pain, and headache. In today's world, where the mobile technology has advanced so much, there are more and more people who are spending an increased amount of time in the handheld devices, such as smartphones, computers, tablets and e-readers. The end result is prolonged flexion of the neck resulting in the “text neck”. This condition is a growing health concern and has the potential to affect millions of people all over the world⁽²⁾. Text neck may cause many harmful symptoms such as neck pain, shoulder pain, upper back pain, chronic headaches, and increased curvature of the spine⁽²⁾. Text neck directly affects the spine while flexing the head forward at varying degrees - when the head tilts forward at 15 degrees, the forces on the neck surge to 27 pounds, at 30 degrees 40 pounds, at 45 degrees 49 pounds and at 60 degrees 60 pounds⁽²⁾. In the upright posture, when the ears are aligned with the centre of your shoulders, the weight of the average head exerts approximately 10-12 lbs of force through the muscles of neck. But when your head is moved forward by one inch away from this neutral position, the weight of your head dramatically increases approximately six times as much force can be generated⁽²⁾. If left untreated, a ‘text neck’ can lead to the Inflammation of the neck ligaments, Nerve irritate, Increased curvature in the spine.

OBJECTIVE OF THE STUDY :

To evaluate the effects of pilates along with conventional exercise in reducing pain, neck disability and improving cervical muscle strength and endurance in patients with text neck syndrome.

To determine the conventional exercise alone in reducing pain, neck disability and improving cervical muscle strength and endurance in patients with text neck syndrome

To compare the effects of pilates along with conventional exercise and conventional exercise alone in reducing pain, neck disability and improving cervical muscle strength and endurance in patients with text neck syndrome.

REVIEW OF LITERATURE :

Ata Elvan et al.,(2024): Conducted study with 62 patients the association between mobile phone usage duration, neck muscle endurance, and neck pain among university students. The study concluded that substantial association between neck pain, muscle endurance, and the duration of phone usage and indicates that students who use their phones for more than 4 hours daily exhibit diminished flexor muscle endurance and report increased pain levels.

Angelina febrina(2023): Text neck syndrome: A growing health concern states that outcomes of a study in 2021 among 283 college students in India showed 76.6% of total respondents reported text neck syndrome. The study concluded that this situation creates a health concern when smartphone users spend hours on their phones and bend their head down to a certain angle that may overburden the neck and upper back muscles.

STUDY DESIGN:

This study was designed as an experimental study conducted in the Physiotherapy Outpatient Department of Adhiparasakthi College of Physiotherapy(APCOPT) located in Melmaruvathur. A convenient sampling method was employed to select participants. The data collection was carried out over a period of six weeks, 5 session per week.

INCLUSION CRITERIA:

Individuals aged between 18 and 24 years, including both males and females, using smartphones for atleast 4 hours a day and with Cervical muscle strain, Neck pain, upper back pain, Cervical muscle spasm, Individuals who were willing to be a part of the study.

EXCLUSION CRITERIA:

Individual with history of cervical/ head trauma, Cervical vertebra fracture, neurological deficit, Any shoulder, neck or arm injury, History of surgical intervention done in the neck area, Individuals with severe neck pain which required medical treatment, Malignant tumors, Cervical radiculopathy.

METHODOLOGY: A total of 30 subjects were chosen from APCOPT and assigned to two groups, namely conventional exercise alone (n=15) and pilates along with conventional exercise(n=15), based on inclusion and exclusion criteria. NPRS, NDI, MMT, and CMET were used as outcome measures.

TREATMENT TECHNIQUE:

1. Conventional exercise alone
2. Pilates along with conventional exercise

CONVENTIONAL EXERCISE:

Conventional exercise refers to traditional or well established exercise for text neck syndrome usually includes cervical muscle stretching, active range of motion exercise, cervical isometrics, neck curl with chin tuck in.

PILATES EXERCISE:

According to Joseph pilates, “ The pilates method of body conditioning develops the body uniformly, corrects posture, restores vitality invigorates the mind and elevates the spirit”.It focuses on strengthening of the core muscles, improving flexibility, balance and posture, enhancing mind body awareness.principles of pilates are Breath, Concentration, Centring,Control, Precision and flow. The exercise are spine twist, clam level1, shoulder bridge level 1, double leg stretch, arm opening 1, breast stroke, swan dive, the saw and scissors.

RESULT:

Data analysis was performed using statistical software SPSS v26.0 applying paired sample t-tests to compare pre- and post-intervention outcomes within both groups. In Group A, the Numerical Pain Rating Scale decreased significantly from a pretest mean of 7.000 to 5.533 ($t = 11.000$, $p < 0.001$), and the Neck Disability Index improved from 43.646 to 35.046 ($t = 9.630$, $p < 0.001$). Manual muscle testing showed a small increase (3.200 to 3.533, $t = -2.646$, $p = 0.019$), but cervical flexor endurance showed no significant change (21.4667 to 22.7333, $t = -1.604$, $p = 0.131$). However, cervical extensor endurance improved from 17.8000 to 19.4667 ($t = -5.801$, $p < 0.001$).

In Group B, the Numerical Pain Rating Scale decreased from 7.533 to 3.933 ($t = 15.317$, $p < 0.001$), and the Neck Disability Index dropped from 41.500 to 27.0467 ($t = 9.358$, $p < 0.001$). Manual muscle testing showed a significant improvement (3.400 to 4.4667, $t = -16.000$, $p < 0.001$), while cervical flexor endurance improved substantially from 18.7333 to 23.5333 ($t = -11.86$, $p < 0.001$). Cervical extensor endurance also increased from 15.5333 to 21.0667 ($t = -10.74$, $p < 0.001$).

DISCUSSION:

The main purpose of the study is to find the efficacy of pilates in conjunction with conventional exercise program in subjects with text neck syndrome. It was hypothesized that in patients with text neck syndrome, there would be a significant improvement in Pilates along with conventional exercise to reduce pain, neck disability and improve cervical muscle strength and endurance. The result of this study accepted this hypothesis. Pilates is described by as a unique technique of physical fitness that uses a combination of muscle strengthening and muscle lengthening along with breathing control to restore muscle balance. Pilates encourages a neutral cervical spine position with slight upper cervical flexion at cranio-cervical junction leading to activation of the deep neck flexor muscles. Pilates helps by encouraging activation of the deep cervical neck flexor muscles with a neutral position of the cervical spine. This helps to build strength and endurance of the cervical muscles and thus reducing pain and disability. Conventional exercises often focus more on strengthening muscles rather than addressing posture control and specific imbalances. It has limited focus on proprioceptive awareness and long-term habit formation. But,pilates places significant emphasis on body awareness and proper alignment of the head, neck, and spine.

This helps to correct the forward head posture associated with text neck syndrome. Pilates incorporates breathing techniques and promotes mindfulness, reducing stress related tension in the neck and shoulders. When pilates is integrated into a conventional exercise program, patients typically experience long term benefits in reduction of pain, neck disability, and improvements in posture, cervical muscle strength and endurance. Melda soysal tomruk et al.,(2020) Conducted study with 36 patients on effects of pilates exercises on pain, disability, and postural control in

patients with chronic neck pain. The outcome measures, measured using VAS, Neck disability index(NDI), and postural control evaluation. The study concluded that pilates exercises can be useful to provide improvement in anteroposterior postural stability and sensory interactions for balance in patients with chronic neck pain. Ata Elvan et al.,(2024): Conducted study with 62 patients the association between mobile phone usage duration, neck muscle endurance, and neck pain among university students. The study concluded that substantial association between neck pain, muscle endurance, and the duration of phone usage and indicates that students who use their phones for more than 4 hours daily exhibit diminished flexor muscle endurance and report increased pain levels.

CONCLUSION:

In the experimental conditions used in this study, both the groups showed significant improvement in pain, disability, cervical muscle strength and endurance. But the use of Pilates along with conventional exercise program evidenced a significantly greater improvement in reducing pain, neck disability, increasing cervical muscle strength and endurance.

LIMITATIONS AND SUGGESTIONS:

LIMITATIONS:

The study was conducted on a small sample size which may have an impact on the affect the generalization of results, duration of the study was less, conducted only with particular age group, All outcome measures were taken manually and this may introduce human error which could affect the reliability of the study, The study does not address eye strain, nearsightedness or headache symptoms associated with text neck syndrome.

SUGGESTION:

The study can be done with long term follow up, to establish greater efficacy of the treatment, the study should be undertaken in a large sample size and a longer follow up. Individuals of elder age group can be studied with longer treatment duration. Further intervention procedures can be taken up to manage nearsightedness and headache symptoms associated with text neck syndrome.

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