ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25jul681

Effectiveness of Dry Needling on Text Neck Syndrome

Vibha Atul Raibagkar[1]; Dr. Vaishali Kale[2]

[1]BPTh Intern
Rashtrasant Janardhan College of Physiotherapy,
Rashtrasant Janardhan Swami College of Physiotherapy, Kokamthan, Maharashtra, India

[2]MPTh (Musculoskeletal Physiotherapy)
Associate Professor Department of Musculoskeletal Physiotherapy,
Rashtrasant Janardhan Swami College of Physiotherapy, Kokamthan, Maharashtra, India

Publication Date: 2025/07/15

Abstract:

- ***Introduction***

Text Neck Syndrome (TNS) results from prolonged forward head posture due to smartphone use, leading to neck pain and limited mobility. This study aimed to evaluate the immediate effect of dry needling on neck pain and function in individuals with TNS.

- ***Methodology***

A pre-post experimental study was conducted on 50 participants aged 18–40 years with active upper trapezius trigger points. Pain and disability were assessed using the Numerical Pain Rating Scale (NPRS) and Northwick Park Questionnaire (NPQ) before and immediately after a single dry needling session.

- ***Results***

The mean NPRS score reduced significantly from 6.64 to 3.88 (t = 17.73, p = 0.000), and the mean NPQ score decreased from 29.04 to 24.88 (t = 16.77, p = 0.000), indicating significant improvement in pain and neck function post-intervention.

- ***Conclusion***

Dry needling produced immediate, statistically significant pain relief and functional improvement in patients with Text Neck Syndrome.

Keywords: *Dry Needling, Text Neck Syndrome, Stretching, Neck Pain, Myofascial Trigger Points, Trapezitis.*

How to Cite: Vibha Atul Raibagkar; Dr. Vaishali Kale (2025) Effectiveness of Dry Needling on Text Neck Syndrome. *International Journal of Innovative Science and Research Technology*, 10(7), 637-643. https://doi.org/10.38124/ijisrt/25jul681

I. INTRODUCTION

There are seven vertebrae in the cervical spine, from C1 to C7. An intervertebral disc, which serves as a cushion and aids in smooth movement while absorbing shock during everyday tasks, lies between each vertebra.[1] A complicated muscle system, which includes the sternocleidomastoid, trapezius, scalene and levator scapulae, stabilizes and moves the cervical spine. These muscles collaborate to regulate head movement and support posture. Ligaments offer extra support and restrict overly aggressive motion.[2]

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25jul681

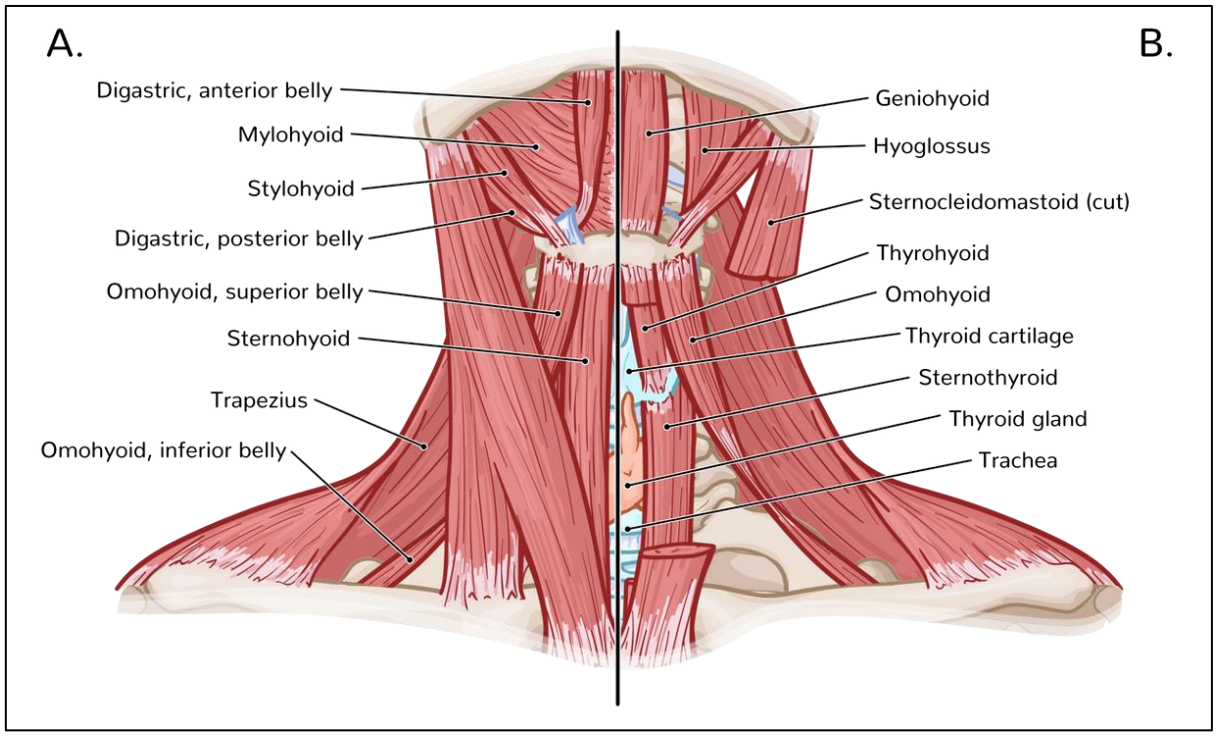


Fig 1 : Neck Diagram

Smartphones have become one of the most popular gadgets among young people. Text messaging (SMS) is the most frequent mode of communication, according to studies done on American college students. A more recent study found that 79% of persons aged 18 to 44 carry their mobile phones with them almost constantly, spending only around two hours of their waking day without them.[15] Text Neck Syndrome, which was initially supported by Dr. Dean L. Fishman, describes a repetitive strain injury to the neck caused by prolonged forward head posture while using handheld devices like smartphones and tablets. The disorder is linked to prolonged excessive neck flexion. These people develop neck pain and limited cervical range of motion due to tension on their neck muscles and cervical spine. Females made up 80% of the impacted population. [3,4] If not treated, text neck can cause serious long-term harm, such as permanent conditions like stiff neck, spinal misalignment, spinal degeneration, disc herniation, and localized pain in the neck and trapezius muscle areas. Radiating pain into the arms from nerve compression may also be a symptom.[5] Users of smartphones frequently tend to tilt their heads down for extended periods. This results in an excessive anterior curvature of the lower cervical vertebrae. As the head tilts forward, the stress on the neck increases significantly, with different angles producing the following weights: 4.5-5.4 kg at 15 degrees; 12.3 kg, 18.2 kg, 22.3 kg, and 27.3 kg at 30, 45, and 60 degrees, respectively.[6] Text Neck Syndrome has a prevalence of 32% in India. It was 41% among academic staff at a Malaysian university where smartphones were frequently used. In medical students from Jeddah and Saudi Arabia, the prevalence was 68.1%. According to research, 79% of those between the ages of 18 and 44 carry their phones with them almost all the time, spending only about two hours of their walking day without them.[5] Prolonged cervical spine flexion, which is typical when using smartphones, tablets, or laptops, or when leaning forward to look at a computer screen, is a major factor in the development of this illness. These positions cause mechanical stress on the cervical spine, which can result in misalignment and bad posture. This is related to abnormal movement patterns, impaired balance, and dysfunction in several systems, such as the respiratory, circulatory, digestive, and nervous systems. Poor sleeping posture can also exacerbate the onset of trapezius myofascial pain and dysfunction, such as lying prone with cervical extension and rotation or sleeping in a side-lying "C" shape.[17]

A myofascial trigger point is characterized as an extremely sensitive area within a taut band of muscle, which is frequently experienced as a tiny pea-sized or rope-like lump. When this area is pressed, it becomes painful and may induce pain, tenderness, or an autonomic reaction in remote areas. Trauma, overuse, mechanical strain, and bad posture can all cause trigger points. Muscles tend to become weaker and gradually tighter in today's sedentary culture, where people spend long hours in one place.[7] Myofascial pain syndrome (MPS), a prevalent regional pain disorder, is characterized by myofascial trigger points (MTrPs). MPS is frequently caused by repetitive muscle activity or prolonged bad posture, which is common in jobs like office work or among college students. Neck pain, which affects 45–54% of the population, is becoming a more common health issue. Myofascial trigger points (MTrPs) are hyperirritable nodules found in taut bands of skeletal muscle and are believed to be caused by motor endplate malfunction. It is usually defined by one or more trigger sites, most frequently located in the upper trapezius (UT). These regions are sensitive to palpation and may be linked to referred pain, motor impairments, and autonomic reactions.[16]

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25jul681

Dry Needling is a specialized method that uses thin filiform needles to puncture the skin and deeper tissues with the goal of addressing bodily structures and functions in order to treat pain, movement disorders, and neuro-musculoskeletal conditions. Dry needling (DN) is thought to eliminate myofascial trigger points (MTrPs) via a variety of mechanical, neurophysiological, and biochemical processes. MTrPs clinically manifest as taut bands in skeletal muscle, which contribute to capillary constriction, local ischemia, and tissue hypoxia. DN primarily targets dysfunctional motor units, where mechanical stimulation induces a local twitch response (LTR). This response may help lower excessive acetylcholine at the motor end plate, as well as decrease spontaneous electrical activity and actin-myosin filament overlap. Furthermore, needle insertion may activate Aβ fibres, which encourage segmental inhibition through gate control mechanisms. The neurophysiological effects include a reduction in peripheral and central sensitization by removing the MTrP as a nociceptive source, which in turn decreases afferent input to the dorsal horn and enhances descending inhibitory pathways. Additionally, DN has been shown to affect the levels of important biochemical mediators involved in pain, inflammation, and tissue oxygenation, such as β-endorphin, TNF-α, COX-2, HIF-1α, iNOS, and VEGF. These results suggest that the therapeutic effects of DN are the result of intricate interactions between the hormonal, nervous and immune systems.[15] Contraindications for dry needling include allergies, sensitivities, implants, and areas of acute inflammation or acute systemic infections.[8] It has been proposed that dry needling may enhance microcirculation and affect metabolic mediators. Changes in inflammatory mediators were observed by Shah and Gilliams following dry needling of the upper trapezius, which they ascribed to an increase in local blood flow around the trigger point area.[9] Once the needle is inserted, it can be moved in a piston-like motion or rotated. This manipulation causes collagen fibres to be pulled toward the needle, which induces specific alterations in fibroblasts. The needling technique efficiently releases or deactivate contraction knots in myofascial trigger points by mechanically disrupting them.[10]

II. METHOD

This study was designed as a pre-post experimental investigation to assess the immediate effects of dry needling on neck pain and functional disability in individuals diagnosed with Text Neck Syndrome (TNS). The research was conducted over a period of six months at the Physiotherapy Department of RJS College of Physiotherapy, Kokamthan, in association with SJS Hospital. The sample consisted of 50 participants, including both male and female subjects, selected through a convenient sampling method. Participants were primarily college students and office workers, representing a population with high exposure to prolonged smartphone usage. Prior to participation, all individuals were screened for eligibility based on specific inclusion and exclusion criteria. Participants presenting with active myofascial trigger points in the upper trapezius and symptoms consistent with TNS were included. The Smartphone Addiction Scale was used as a preliminary screening tool to confirm prolonged device usage, a known contributing factor to TNS. All participants provided written informed consent before commencing the intervention. The primary outcome measure used in this study was the Numerical Pain Rating Scale (NPRS) to evaluate pain intensity. The Northwick Park Neck Pain Questionnaire (NPQ) was employed as a secondary outcome measure to assess functional limitations caused by neck pain. Both tools are well-established, valid, and reliable in clinical and research settings.

Participants were assessed before and immediately after a single session of dry needling. The pre- and post-intervention scores of NPRS and NPQ were statistically compared to determine the effectiveness of the treatment.

➢ *Inclusion Criteria:*

- Age between 18 and 40 years
- Bilateral neck pain lasting more than 3 months
- Active myofascial trigger points in the upper trapezius
- High smartphone usage as per Smartphone Addiction Scale

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25jul681

III. PROCEDURE

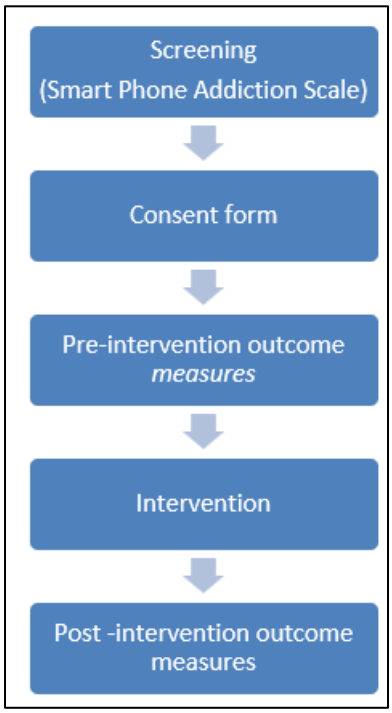


Fig 2 : Flow Chart

Participants were initially screened using the Smartphone Addiction Scale to identify individuals with high mobile phone usage, which is a common contributing factor to Text Neck Syndrome (TNS). Those who met the screening criteria were further evaluated for eligibility based on the inclusion and exclusion criteria. After confirming their eligibility, all participants were informed about the study procedure and written informed consent was obtained. Before the intervention, baseline assessment was done using the Numerical Pain Rating Scale (NPRS) to measure pain intensity and the Northwick Park Neck Pain Questionnaire (NPQ) to evaluate functional disability associated with neck pain. These assessments were conducted by the therapist prior to the dry needling procedure. Each participant was positioned in a prone lying position on a treatment table. The upper trapezius region was exposed, and the area was cleaned using a sterile spirit swab. The therapist palpated the upper trapezius muscle to locate the active myofascial trigger point. Once identified, the muscle was held using a pincer grip and a sterile 25 mm dry needle was inserted into the trigger point using a superolateral direction. The needle was manipulated with a pistoning or fishing technique for approximately 5 to 6 minutes to elicit a local twitch response (LTR), which is an indication of proper trigger point stimulation. After the needling session, the area was again disinfected. A passive stretch of the upper trapezius muscle was then performed, where the muscle was stretched for 5 seconds and relaxed for 8 seconds, repeated for 3 cycles to enhance relaxation and release muscle tension. Immediately following the intervention, post-treatment assessments were conducted using NPRS and NPQ to evaluate any instantaneous changes in pain levels and functional status. The pre- and post-intervention scores were then statistically analysed to determine the immediate effect of dry needling in individuals with Text Neck Syndrome.

IV. OUTCOME MEASURES

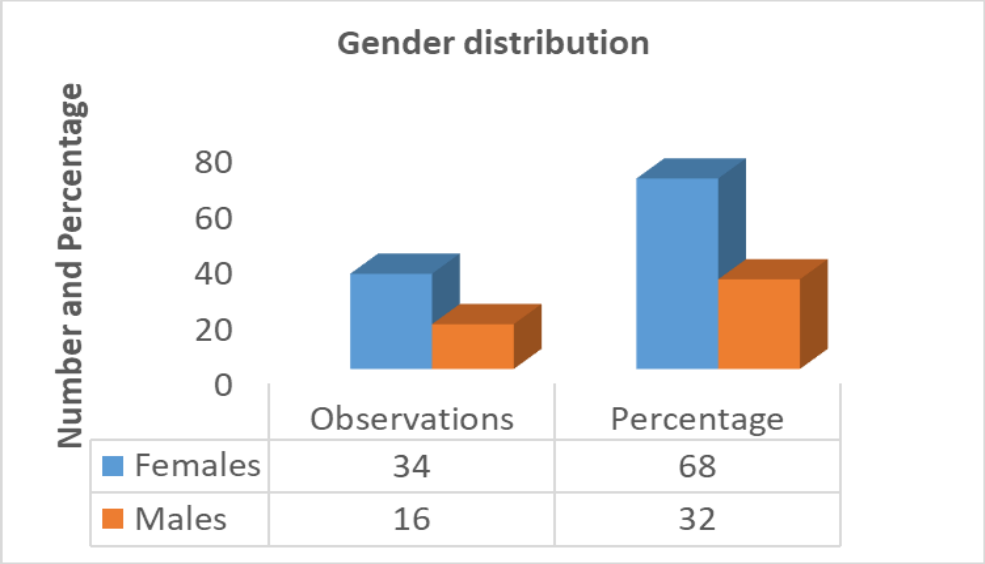
To evaluate the effectiveness of the intervention, two standardized outcome measures were used before and immediately after the dry needling treatment. The Numerical Pain Rating Scale (NPRS) was utilized to assess the intensity of neck pain, where participants rated their pain on a scale from 0 (no pain) to 10 (worst possible pain). Additionally, the Northwick Park Neck Pain Questionnaire (NPQ) was used to evaluate functional disability related to neck pain in daily activities such as sleeping, reading, working and concentration. Both outcome measures are widely accepted for their reliability, validity and clinical relevance in assessing musculoskeletal pain and functional limitations.

V. DATA ANALYSIS

To understand whether the treatment given was effective, we compared the scores before and after the treatment using the NORTHWICK questionnaire and the NPRS (Numerical Pain Rating Scale). For the NORTHWICK scores, the statistical test gave us a t value of 16.77, and the p value was 0.000, which means the result is highly significant. In simple words, there was a clear and important difference in the scores before and after the treatment. The average (mean) NORTHWICK score before the treatment was 29.04 and after the treatment, it dropped to 24.88. This shows that the participants improved after the treatment. Similarly, for the NPRS scores, the t value came out to be 17.73, with a p value of 0.000, again showing a significant change. The average NPRS score after the treatment was 6.64, which is

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25jul681

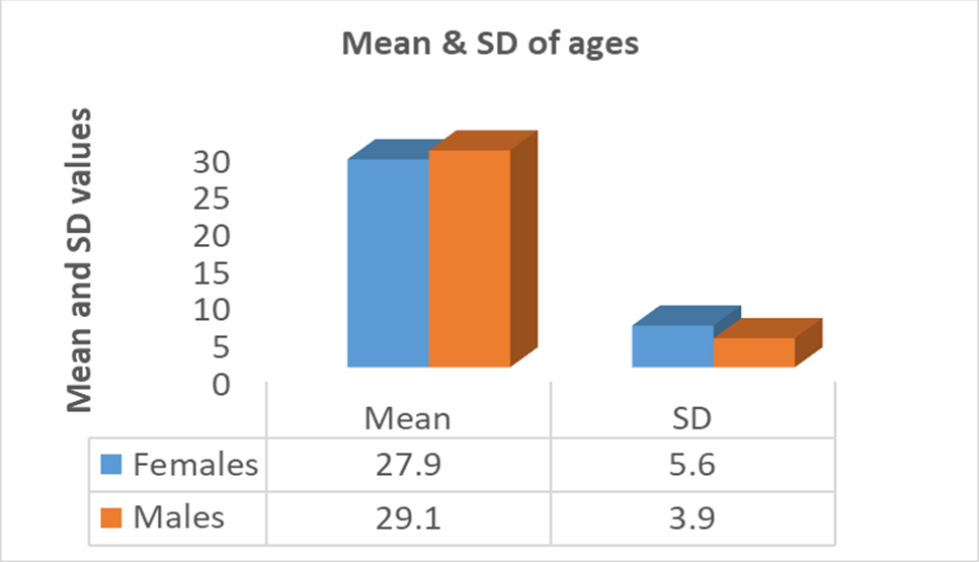
lower than before, indicating that the participants experienced less pain after the intervention. These results clearly show that the treatment had a positive effect. Both functional improvement (NORTHWICK) and pain reduction (NPRS) were seen after the intervention and the changes were statistically significant. So, we can confidently say that the treatment worked well in helping the participants feel better.



Graph. 1 : Distribution of Gender

Table 1 : Gender Distribution

Table of Gender Distribution	Observations	Percentage
Females	34	68%
Males	16	32%



Graph 2 : Distribution of Age

Table 2 : Age Distribution

Table of Mean and SD of Ages		
	Mean	**SD**
Females	**27.9**	**5.6**
Males	**29.1**	**3.9**

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25jul681

VI. RESULTS

In this study, a total of 50 participants with Text Neck Syndrome were included, out of which 34 were females (68%) and 16 were males (32%). The average age of female participants was 27.9 years with a standard deviation of 5.6, while for males, the average age was 29.1 years with a standard deviation of 3.9. This shows that most of the affected population in this study were young adults. All participants were assessed for neck pain and disability levels using the Numerical Pain Rating Scale (NPRS) and Northwick Park Neck Pain Questionnaire (NPQ) before and after the dry needling intervention. Before treatment, most participants reported moderate to severe pain on the NPRS scale. The average pre-treatment score was found to be on the higher side, indicating that participants were experiencing significant neck pain due to prolonged smartphone use and poor posture. After the dry needling intervention, there was a noticeable and significant decrease in the NPRS scores across the group. Almost all participants reported a reduction in pain levels immediately after the treatment. This indicates that dry needling helped reduce muscle tightness and pain associated with the active trigger points in the upper trapezius. When analysing the NPQ scores, participants initially showed higher disability levels due to neck pain affecting their daily activities like sleeping, concentration, driving, reading, and working. Post-treatment, there was a clear improvement in NPQ scores. Most participants reported that their neck pain was less disturbing, and they felt better in performing daily tasks like looking over their shoulder, sleeping comfortably, and concentrating at work or study. The immediate reduction in NPQ scores reflects better cervical range of motion and reduced neck disability after dry needling.

Statistical analysis showed that the difference between pre-treatment and post-treatment scores for both NPRS and NPQ was significant, with dry needling showing a positive immediate effect on pain relief and functional improvement in participants with Text Neck Syndrome.

VII. DISCUSSION

This study was done to check the immediate effect of dry needling on neck pain and movement in people who have Text Neck Syndrome. Nowadays, many young adults use smartphones for long hours, which causes them to bend their necks forward for a long time. This poor posture puts too much pressure on the neck muscles, especially the upper trapezius, and over time leads to pain, stiffness, and reduced neck movement. In many of these people, we can feel tight muscle knots called trigger points that cause more pain and limit movement. Dry needling is a physiotherapy treatment where a thin needle is inserted directly into these painful points to relax the muscles and reduce pain. In this study, 50 participants between 18 to 40 years were selected, with 34 females and 16 males. All of them had neck pain for more than 3 months and active trigger points in the upper trapezius muscle. They were first assessed for their pain and disability using two tools: the Numerical Pain Rating Scale (NPRS), which measures how bad the pain feels on a scale of 0 to 10, and the Northwick Park Neck Pain Questionnaire (NPQ), which checks how the pain is affecting daily activities like sleeping, driving, or working. These scores were recorded before the dry needling session. The dry needling procedure was done with proper care. After the treatment, both NPRS and NPQ scores were again recorded. The results showed that dry needling gave a significant reduction in pain and improvement in neck function. The average NPRS score reduced from 6.64 before treatment to a much lower score after treatment. The NPQ score also showed improvement, meaning participants could perform their daily tasks better after just one session. To understand how meaningful these changes were, a paired t-test was used. This test compares the results before and after treatment in the same group. For the NPQ, the t-value was 16.77 and for NPRS it was 17.73. In both cases, the p-value was 0.000, which means the results are statistically very significant. A p-value less than 0.05 is usually considered significant, and here the value was less than 0.01, showing that the improvement was not by chance, but because of the treatment. This positive effect of dry needling is likely because the needle hits the tight muscle band and causes a local twitch response, which helps the muscle relax. It also increases blood flow in the area, removes pain chemicals, and helps in normal muscle function. Similar results were seen in other studies too. For example, Barbara Cagnie and team found that dry needling improves blood circulation and oxygen level in the muscle. Other studies also showed quick pain relief and better muscle performance after dry needling. Another important finding was that many participants felt better immediately after just one session, which is very useful for students and office workers who don't have time for long treatments. Most of the participants in this study were young adults, and more females were affected, which matches earlier studies on text neck syndrome. In conclusion, this study clearly shows that dry needling is effective in giving quick pain relief and improving movement in patients with text neck syndrome. It is a safe, simple, and effective treatment option for physiotherapists to use, especially in patients with trigger points in the upper trapezius muscle. It can be added to regular physiotherapy sessions along with posture correction and exercise. However, more research can be done to see how long the effects last after treatment.

VIII. CONCLUSION

The study concluded that dry needling is effective in providing immediate relief from neck pain and improving functional outcomes in individuals with Text Neck Syndrome. Significant reduction in pain and disability scores suggests that dry needling can be a beneficial intervention for patients with active myofascial trigger points in the upper trapezius due to prolonged smartphone use.

ABBREVIATIONS

- TNS: Text Neck Syndrome
- DN: Dry Needling
- NPRS: Numerical Pain Rating Scale
- NPQ : Northwick Park Neck Pain Questionnaire
- MTrP: Myofascial Trigger Point
- MPS: Myofascial Pain Syndrome

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25jul681

- LTR: Local Twitch Response
- UT: Upper Trapezius

REFERENCES

[1]. Levangie PK, Norkin CC. Joint structure and function: a comprehensive analysis. FA Davis; 2011 Mar 9.
[2]. Chaurasia BD. Human anatomy. New Delhi, India: CBS Publisher; 2004.
[3]. Sathya P, Tamboli SA. Prevalence of text neck syndrome in young-adult population. Int J Med Exerc Sci. 2020 Jun;6:749-59.
[4]. Kamaraj N, Rajasekar VD, Rangasamy S. A study on prevalence of text neck syndrome among under-graduate students of a medical college in Puducherry. Int J Community Med Public Health 2022;9:2919-22.
[5]. Shinde S, Bhende R. Evidence based treatment strategies for "Text Neck Syndrome": a review. International Journal of Occupational Safety and Health. 2023 Mar 15;13(2):245-57.
[6]. Sarraf F, Abbasi S, Varmazyar S. Self-management exercises intervention on text neck syndrome among university students using smartphones. Pain Management Nursing. 2023 Dec 1;24(6):595-602.
[7]. Ziaeifar M, Arab AM, Karimi N, Nourbakhsh MR. The effect of dry needling on pain, pressure pain threshold and disability in patients with a myofascial trigger point in the upper trapezius muscle. Journal of bodywork and movement therapies. 2014 Apr 1;18(2):298-305
[8]. Caramagno J, Adrian L, Mueller L, Purl J. Analysis of competencies for dry needling by physical therapists. Hum. Resouces Res. Organ. 2015 Jul 10;33:5-7.
[9]. Cagnie B, Barbe T, De Ridder E, Van Oosterwijck J, Cools A, Danneels L. The influence of dry needling of the trapezius muscle on muscle blood flow and oxygenation. Journal of manipulative and physiological therapeutics. 2012 Nov 1;35(9):685-91.
[10]. Dr. Subhanjan Das, Illustrated Manual of Dry Needling, pg no. 8
[11]. Gonzalez T, Balsa A, de Murieta JS, Zamorano E, González I, Martin-Mola E. Spanish version of the Northwick Park Neck Pain Questionnaire: reliability and validity. Clinical and experimental rheumatology. 2001 Jan 1;19(1):41-6.
[12]. Young IA, Dunning J, Butts R, Mourad F, Cleland JA. Reliability, construct validity, and responsiveness of the neck disability index and numeric pain rating scale in patients with mechanical neck pain without upper extremity symptoms. Physiotherapy theory and practice. 2019 Dec 2;35(12):1328-35.
[13]. Neupane S, Ali U, Mathew A. Text neck syndrome-systematic review. Imperial journal of interdisciplinary research. 2017;3(7):141-8.
[14]. Ziaeifar M, Arab AM, Mosallanezhad Z, Nourbakhsh MR. Dry needling versus trigger point compression of the upper trapezius: a randomized clinical trial with two-week and three-month follow-up. Journal of Manual & Manipulative Therapy. 2019 May 27;27(3):152-61.
[15]. Viola DM. Negative health review of cell phones and social media. Journal of mental health and clinical psychology. 2021;5(1):7-18.
[16]. Lee S, Lee IS, Chae Y. Similarities between Ashi acupoints and myofascial trigger points: Exploring the relationship between body surface treatment points. Frontiers in neuroscience. 2022 Nov 2;16:947884.
[17]. Monti-Ballano S, Márquez-Gonzalvo S, Lucha-López MO, Ferrández-Laliena L, Vicente-Pina L, Sánchez-Rodríguez R, Tricás-Vidal HJ, Tricás-Moreno JM. Effects of dry needling on active myofascial trigger points and pain intensity in tension-type headache: a randomized controlled study. Journal of Personalized Medicine. 2024 Mar 22;14(4):332.