

Literature Review on Instrument Assisted Soft Tissue Mobilization in Text Neck Syndrome

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Abstract:

BACKGROUND- The contemporary lifestyle of today, has become much dominated by technology with the use of computers, and the overuse of digital tasks on handheld devices, which induces “text neck” which is a worldwide health effect. Flexing the head forward to use any handheld device has direct effect on the spine. Extreme cases which can cause irreversible damage i.e., if neglected can be the result of conditions quite like work-related overuse syndromes or even repeated stress/strain injuries.

AIM- To identify any previous studies that have been done with relation to text neck syndrome, primarily, instrument assisted soft tissue mobilization in text neck syndrome.

SEARCH METHOD- All the articles for this literature review were collected from well-known data bases- google scholar, pub med and other journals.

SELECTION CRITERIA- Inclusion Criteria- Articles about text neck syndrome, presence of trigger point in upper trapezius, IASTM (Instrument Assisted Soft Tissue Mobilization) on upper trapezius.

Exclusion Criteria- Use of any invasive techniques such as steroid injections, based on the inclusion and exclusion criteria the above studies were selected to review the efficacy of IASTM in text neck syndrome, studies that were done in individuals having mechanical neck pain.

RESULTS- Owing to a wide gap in the given literature, taking into consideration that previous studies using IASTM in text neck syndrome specifically have not been done, further studies can be done to check the efficacy of IASTM in text neck syndrome to target the breakdown of adhesions in the fascia and relief from pain caused due to trigger points in the muscle.

CONCLUSION- Therefore, it can be concluded that more research studies can be done to further study the role of physiotherapy, specifically the efficacy of instrument assisted soft tissue mobilization targeting trigger point and taut band release in text neck syndrome, it's biomechanics and examine other treatment protocols that can be given in order to reduce the occurrence of this syndrome.

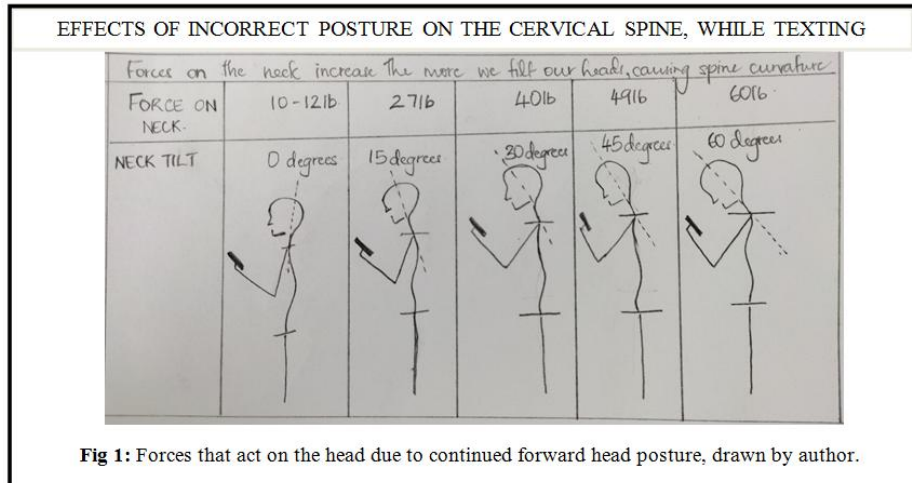
KEYWORDS- text neck syndrome, myofascial trigger point, IASTM.

Date of Submission: 04-05-2022

Date of Acceptance: 19-05-2022

I. Introduction

The term “Text neck” was coined by Dr. Dean L. Fishman, a chiropractor in the USA. This term is used to describe a repetitive stress injury or an overuse syndrome where a person has his/her head in a continuous flexed position bending the head forward while using the mobile phone or any other hand-held device for a prolonged period.¹ It is also known Turtleneck Syndrome. In this syndrome it is observed that apart from neck pain, it can also cause shoulder pain upper back pain, headaches and an increased thoracic kyphosis.²



The contemporary lifestyle of people in today’s day and age, has become much dominated by technology with the use of computers, and the overuse of digital tasks on handheld devices, which induces “text neck” which is a worldwide health effect. Flexing the head forward to use any handheld device affects the spine directly. Serious permanent damage in extreme cases i.e., untreated text neck can be the result of conditions quite like occupational overuse syndromes or even repeated stress/strain injuries.

Effects on cervical spine-

The cervical spine is the pathway ranging from the brain to the spinal cord, which is a continuous and coordinated network of muscles, nerves and joints. Irritation along this pathway leads to pain. If this condition is not given timely management, it can lead to serious irreversible damage and can end up resulting in an overuse syndrome or repeated stress injury. Untreated text neck over a prolonged period of time, may result in inflammation of the ligaments, muscles and nerves in the neck which would lead to permanent arthritic changes.³

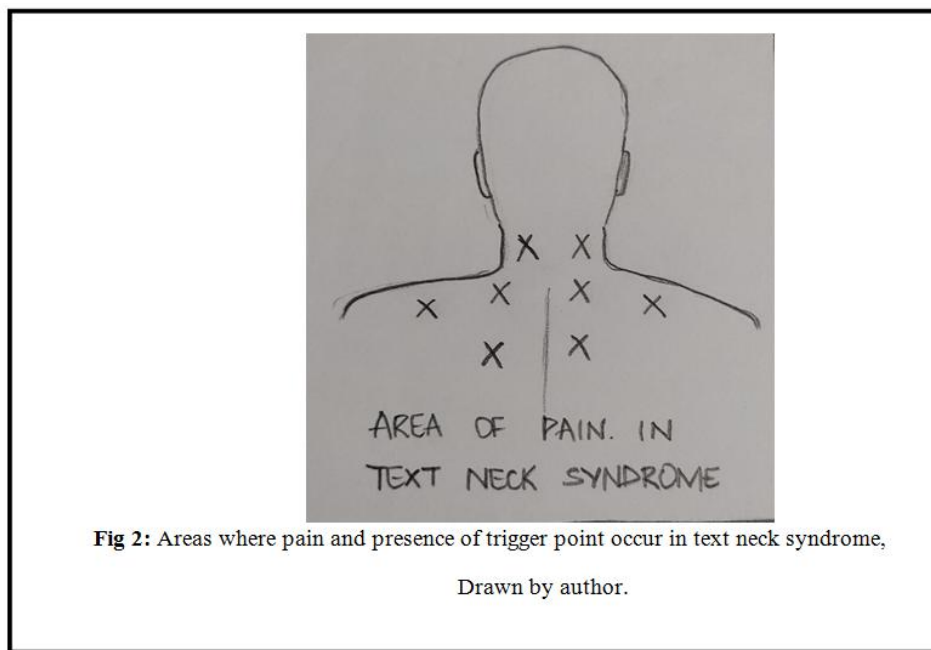


Fig 2: Areas where pain and presence of trigger point occur in text neck syndrome,
Drawn by author.

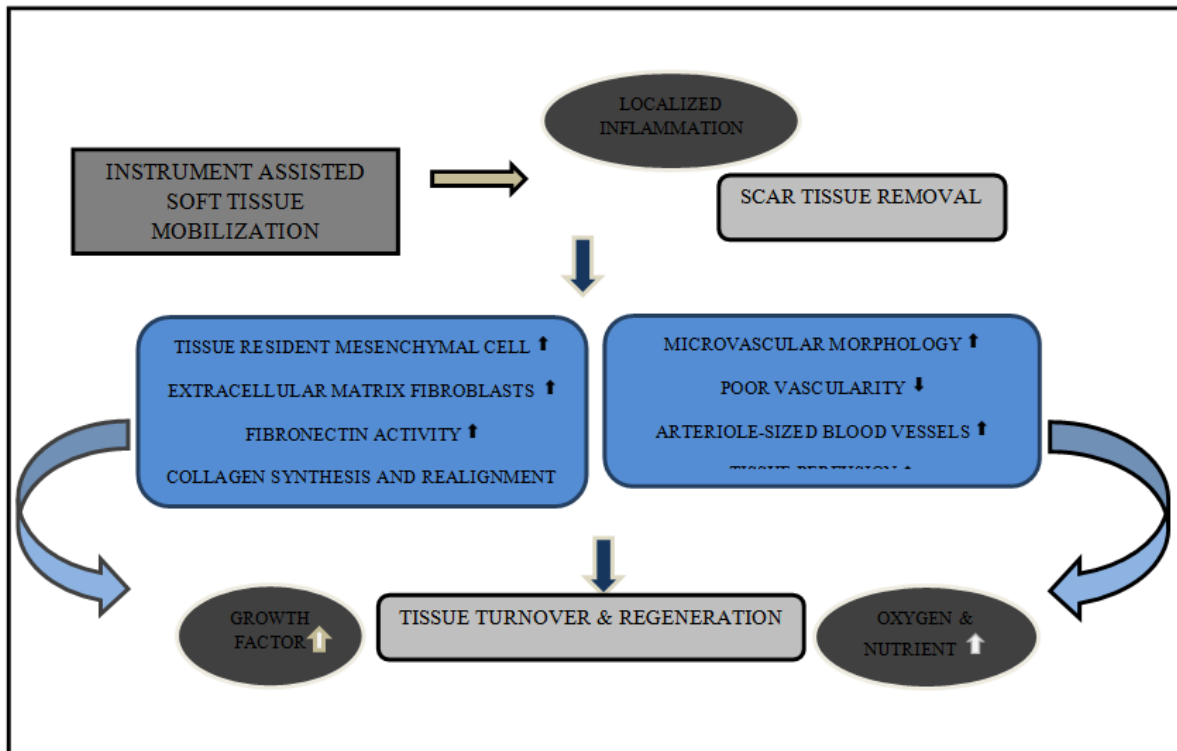
Text neck commonly causes-

Muscular weakness in the shoulder muscles namely trapezius, rhomboids, and shoulder external rotators. It is also commonly causing neck pain and soreness. In addition, pain in the upper back ranging from a chronic nagging type of pain to a sharp type of pain causing severe upper back muscle spasms. Shoulder pain and

tightness resulting in painful shoulder spasm. Text neck can also cause sub-occipital muscle tightness which can result in tension type headaches.²

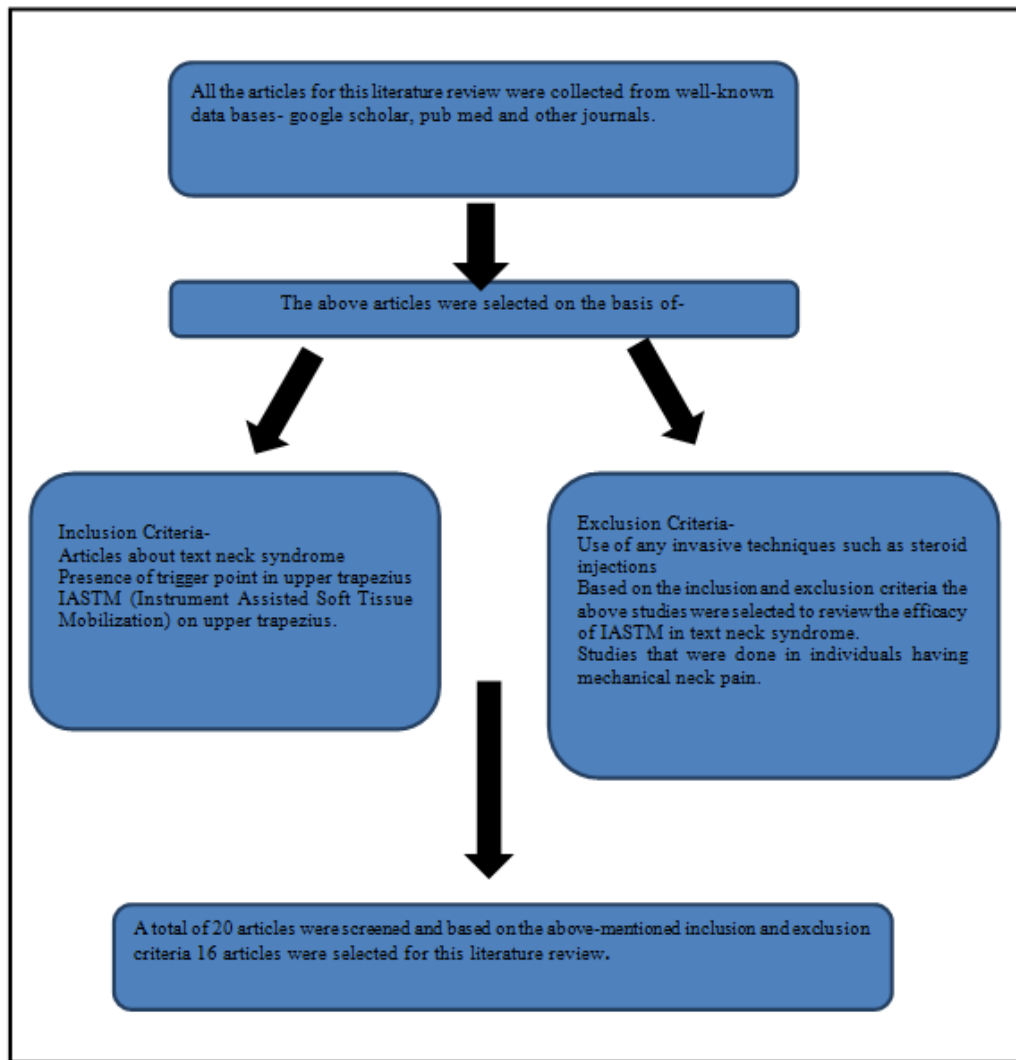
Instrument assisted soft tissue mobilization (IASTM)

Instrument assisted soft tissue mobilization is defined as a technique that uses instruments to remove scar tissues from soft tissues that are injured, facilitate healing process through the formation of new extracellular matrix proteins such as collagen. Evidence from previous experimental studies shows that IASTM does significantly improve soft tissue function and range of motion while also reducing pain. Many studies have proven that there is a significant effect of IASTM on upper trapezius trigger points in the treatment and pain management involving neck pain.



Flow chart 1: Mechanism of instrument assisted soft tissue mobilization on injury.

II. Material And Methods



III. Summary of articles

| S.NO | AUTHOR | PUBLISHED YEAR | MODE OF INTERVENTION | RESULT |
|------|--|----------------|---|--|
| 1. | Priyal P.Shah, Megha S Sheth | 2018 | The study examined 100 healthy physiotherapy students of a college in Ahmedabad within the age group of 20-25 years. Students were asked to fill questionnaires of Smartphone Addiction Scale (SAS), Neck disability index (NDI), and Cornell Hand Discomfort Questionnaire. | The results showed that there was a predominance in females over males. The study showed that musculoskeletal problems in neck and hand (thumb) can be seen in smartphone addicted students which may be short term initially but can become long term if not treated appropriately. ¹ |
| 2. | Jyoti Kataria | 2018 | This study was conducted to observe the effects that this condition has on the posture of the neck. It was found that symptoms included stiff neck, pain (which in some cases may be radiating), muscle weakness, upper back pain, shoulder pain and tightness. The management was found to involve the rehabilitation which is very effective in treating the stress injury that results from text neck. | This study concluded that the rehab programme can be designed as a 2-4-week programme starting with soft tissue mobilization which would include stretches both active and passive of tight muscles and then progressing to muscle strengthening, posture retraining and a home exercise programme. In conclusion posture of the neck is affected by text neck due to smartphone overuse. ² |
| 3. | Pankti P. Samani, Neeraj A. Athavale, Ashok Shyam, Parag K | 2018 | This study was an observational study, done on a population of 311 persons. A self-administered questionnaire was distributed to all the subjects. | This study stated that about 1/4 th of the population knew about text neck syndrome out of which only less than half had knowledge of preventive |

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| | Sancheti | | | measures for text neck syndrome. In conclusion this study showed that there was a low-level awareness of text neck syndrome amongst young adult population as well as lack of proper preventive measures in this population. ³ |
| 4. | Sohel Ahmed, Rahemun Akter, Nikita Pokhrel, Asir John Samuel | 2019 | A cross sectional study was conducted using random sampling method from a reputed institution. A total of 113 students, both males and females in the age groups 17-25years participated in this study. The participants were asked to fill out the Nomophobia Questionnaire (NMP-Q), Neck Disability Index (NDI) and the Cornell Hand Discomfort Questionnaire (CHDQ). | From the results of the questionnaire, it showed that, of the study population, 46.9% reported having pain in the neck, 42.5% reported having mild to severe disability in their neck and 29.2% reported having pain in their thumb due to prolonged use of the smartphone. This study concluded therefore that text neck syndrome and SMS thumb are seen in nomophobic students. These musculoskeletal problems may be short term initially, but it can develop into long-term disabilities if proper precaution is not taken. ⁴ |
| 5. | Abdullah Farooq Khan, Syed Faraz Ul Hassan Shah Gillani, Ahsan Farooq Khan, Alia Wahid. | 2018 | This study was a cross sectional survey, using nonprobability convenient sampling method. This study was conducted at a dental college in Lahore from June 2018 to July 2018. 101 students were a part of the study, those who were using smart phone, laptop for 6 months or more. A questionnaire was given to each of them to fill out. | This study concluded that a majority of the students were having neck pain which aggravated with use of a smart phone or laptop, especially if no proper warm up was done before using these devices. ⁵ |
| 6. | Gerson Moreira Damasceno, Arthur Sa Ferreira | 2018 | An observational cross-sectional study on 150 students in the age groups of 18-21 years at a public school in Rio de Janeiro. The students were given a questionnaire to be filled out which consisted of details in sociodemographic factors, anthropometric factors, time spent in texting or playing on the phone, visual impairments and concern with body posture. The young spine questionnaire was used to analyze the neck pain. | The results showed that there is no association between posture, assessed by self-perception and neck pain, nor between neck posture assessed by physiotherapist. There was also no association between neck posture as assessed by the physiotherapist and the frequency of neck pain. This study concluded that there is no association between text neck and neck pain in 18–21-year young old adults. The findings challenge the belief that neck pain in this age group is associated to the growing prevalence of neck pain. ⁶ |
| 7. | Mr Rohit Banerjee, Mr. Tapas Kumar | 2021 | The purpose of this study was to evaluate the effectiveness of IASTM on myofascial syndrome (taut bands and trigger points) and its correlation with pain and disabilities associated with cervicogenic headache when applied along with exercises. In this study, 10 participants who were college going students (4 males and 6 females) were included in this study. The treatment protocol included infrared radiation followed by IASTM using Graston tool and exercises were given for 2 weeks. Outcome measures were pain pressure algometer, headache disability index, which were measured at baseline and after 2 weeks of treatment. | This study concluded that IASTM is an effective intervention for the treatment of MTrPs and headache disabilities associated with prolonged smartphone use among college students. ⁷ |
| 8. | Matteo Castaldo | 2019 | This study aimed to investigate the association between pressure pain thresholds, trigger points, and health conditions in patients with chronic neck pain. Samples consisted of 68 patients divided in two groups of 34 each having chronic mechanical neck pain and whiplash-associated injuries respectively. | This study concluded that widespread pressure pain hypersensitivity was associated with duration of the conditions, suggesting that long-lasting health issues may act as a triggering factor therefore increasing pain in individuals with chronic neck pain. Active trigger points may be associated |

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| | | | An assessment of pressure pain thresholds over the upper trapezius, extensor carpi radialis longus, and tibialis anterior muscles was done and they were screened for the presence of trigger points in the upper trapezius muscle. | with high pressure hypersensitivity. ⁸ |
| 9. | Mohamed Serag | 2020 | In this study 30 subjects, both males and females, were randomly allocated into two groups ranging from 25-40 years of age. Group A was given therapy with Graston technique and to group B was given traditional therapy. Both groups were evaluated pre and post treatment for neck pain severity by using VAS, NDI and range of motion using an inclinometer. | The results showed that there was significant difference between instrument assisted soft tissue mobilization that was more effective than control group in relieving pain, functional disability and range of motion. Instrument assisted soft tissue mobilization does have a greater effect in relieving neck pain, improving functional disability and range of motion. ⁹ |
| 10. | Mohamed N.H | 2020 | In this study, the effects of IASTM using m2t blade and trigger point release with relation to lateral flexion of the neck and rotation range of motion on upper trapezius and myofascial trigger points in individuals with mechanical neck pain was done. 40 patients were selected, in the age group 18-55 and were divided into two groups. To one group was given trigger point release and passive stretching and the other group received one session of IASTM using m2t blade and passive stretching. The range of motion for flexion and lateral rotation was done using a tape measure. | This study concluded that IASTM using m2t blade was effective in treating those with mechanical neck pain and upper trapezius myofascial trigger points. ¹⁰ |
| 11. | Haytham M | 2020 | This study was done to observe the effects of Instrument assisted soft tissue mobilization (IASTM) and stripping massage on myofascial trigger points in right upper trapezius. Forty patients were divided into two groups, 20 in each group, in the age group of 18-23 years with the presence of active trigger points in the right upper trapezius. To group A was given IASTM using the M2T blade and group B was given stripping massage. Both the groups were given treatment twice a week for 4 weeks. Outcome measures were VAS and NDI. | This study concluded that both IASTM and stripping massage are effective techniques in the treatment of trigger points and for improving pain and function in right upper trapezius. ¹¹ |
| 12. | Steven Cohen | 2017 | In this study conducted a review was done to examine the prevalence of neck pain and the advances in treatment for those subjects with neck pain. The databases, Medline, Embase, Google scholar, and the Cochrane database using the search terms, "cervical pain", "neck pain", "cervical radiculopathy", cervical radicular pain, and cervical myelopathy, with minimal restrictions. | The strongest evidence is for exercise, and weaker evidence supporting massage, acupuncture, yoga and spinal manipulation in different contexts. For cervical radiculopathy and facet arthropathy there was weak evidence. In short term, more than conservative treatment surgery is more effective but not in the long term and clinical observation is a reasonable strategy before surgery. ¹² |
| 13. | Jooyoung Kim | 2017 | A review study on the mechanism of Instrument Assisted Soft Tissue Mobilization (IASTM) and the guidelines that need to be followed in practical application was conducted. In recent times, frequent use of this method of treatment has increased in the field of sports and rehabilitation. Various studies have reported the effect that IASTM has a significant role in the improvement of the function of soft tissue as well as range of motion most commonly following a sports injury. | This study concluded that few experimental studies however have been done on the mechanism and effects of IASTM and have concluded that future studies can be done through well-designed experimental studies to focus on tendons, the need to broaden its scope toward other soft tissues. ¹³ |

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| 14. | Dina Othman | 2019 | This study done was to compare the effects of active soft tissue therapy vs IASTM using Graston tool in chronic neck pain patients with latent trigger points in upper trapezius. 45 females with chronic neck pain were selected, having presence of latent trigger points and were randomly divided into groups consisting of 15 in each. Group A was given stretching and active soft tissue therapy, group B was given stretching exercise and Graston technique and group C was given stretching exercise only. Pain pressure threshold and cervical ranges of motion were the primary outcome measures for this study. | Results of the study showed that there was an increase in pain pressure threshold and cervical flexion, extension and lateral flexion and rotation toward in group A and B. Therefore, concluding that further studies can be done using the various tools under IASTM to examine its effects on neck pain and the associated muscles involved. ¹⁵ |
| 15. | Tahir Mahmood | 2021 | This RCT was conducted on male patients between 10-40 years of age, having upper cross syndrome. The subjects were randomised into 2 groups, one was given routine physiotherapy and the other was given IASTM along with routine physiotherapy. The inclinometer was used to measure range of motion and the numeric pain rating scale for checking pain levels. | The results of the study showed that IASTM with a combination of stretching exercises was found to be more effective in the management of neck pain in upper crossed syndrome when compared to routine physiotherapy. ¹⁵ |
| 16. | Cesar Fernandez | 2007 | This study was done to check the effect of the presence of trigger points in neck-shoulder muscles on conditions like cervicogenic headache, tension type headache, migraines, etc, essentially in mechanical neck pain and other chronic neck pain syndromes. | This study concluded that active trigger points in neck-shoulder muscles and cervical joint dysfunctions may be a contribution to the perception of neck pain. Presence of trigger points in the suboccipital, upper trapezius, sternocleidomastoid could cause referred pain in conditions like cervicogenic headaches or tension type headaches. ¹⁶ |
| 17. | Anjali Suresh, SG Sudhan, Prasanna Mohan, A Thangamani Ramalingam | 2021 | This study was a cross-sectional type of study, conducted at Garden City University, on students aged between 18-25 years using non-probability sampling technique. The data was collected from August to September 2019. The Smartphone Addiction Scale Short Version (SAS-SV) and the Neck Disability Index (NDI) were used to measure the addiction level and the neck disability level respectively. Spearman's correlation test was performed to analyze the relationship between smartphone assessment scale-short version and NDI. | This study concluded that the longer use of smartphones would result in a significant amount of neck pain and disability. Those students who came under the category of addiction to smartphone would require advice on ergonomics and education about the various risks related to musculoskeletal disorders that the overuse of smartphone can cause. ¹⁷ |

IV. Results

From previous studies it can be observed that text neck syndrome is a quite common occurrence in the student population, owing to the continuous use or overuse of mobile phones, laptop or other hand-held devices. Taking into consideration the common occurrence of text neck syndrome in the student population due to the increased use of hand held devices over the years, many studies were conducted to check the awareness, prevalence of text neck, but limited studies however were done to identify the ideal forms of treatment that would prove effective in reducing pain and target the break-down of adhesions and trigger points in the deep neck flexors as well as upper trapezius muscle, which was found to be involved in text neck syndrome.

Instrument assisted soft tissue mobilization has been done in many various conditions related to the neck such as upper cross, syndrome, cervicogenic headache, mechanical neck pain, etc. and has proven to be effective in treating the same. Owing to this wide gap in the literature, considering that previous studies have not been done using instrument assisted soft tissue mobilization (IASTM) in text neck syndrome specifically,

further studies can be done to check the efficacy of IASTM in text neck syndrome to target the breakdown of adhesions in the fascia and relief from pain caused due to trigger points in the muscle.

This absence of clear proof might largely attribute to the inconsistencies that exist now among therapists concerning treatment procedures. Actual research trends support the usage and exercise of manual therapy. Based on existing patterns of literature and practice a group of people with neck pain seem to be involved in responding positively to a mix of mobility/manipulation, exercise and potentially traction procedures.

V. Discussion

The leading cause contributing to neck pain is the forward head rounded shoulder posture. Forward head posture can be seen when the neck slants forward therefore placing the head in front of the shoulders. This position leads to several problems in the neck and shoulder as it puts the neck and shoulder muscles in a compromised position. In this review the condition focused on was text neck syndrome commonly known as “turtle neck posture”.

Text neck syndrome is caused mainly due to tightness in the muscles of the neck, which occurs due to forward head position. The forward pull of the weight of the head puts undue stress on the lower neck vertebrae, contributing to degenerative disc disease and other related neck problems. This posture puts the muscles of the upper back in overuse to in order to counterbalance the pull of gravity from the forward head posture. The position is often followed by forward shoulders and a rounded upper back, which not only adds onto the existing problem but can also cause pain in the shoulders.

The more time spent with this posture, the more likely it will develop into neck and shoulder related problems. The part of the neck that is particularly vulnerable to forward head posture is the lower part, just above the shoulder that is the lower cervical vertebra c5 and c6 may slightly slide or shear forward relative to one another as a result of the persistent pull of gravity on a forward head. This force can be problem for those with job requiring them to look down or forward all day.

Forward head posture leads to prolonged shearing of the vertebrae which would eventually cause an irritation in the small facet joints of the neck as well as the ligaments and soft tissues. This can result in neck pain that would radiate down to the shoulder blades and upper back, potentially causing a variety of conditions, including: the presence of trigger points in the muscles, along with limited range of motion, disc degeneration problems, which may lead to degenerative disc disease in the neck, cervical osteoarthritis (OA), or even a herniated disc, etc.

IASTM refers to a technique that is done with the help of an instrument to remove scar tissue, adhesions in the fascia, etc., that may have formed in soft tissues and promotes the healing process by activating fibroblasts. The release of fibroblasts occurs because of the inflammatory response that is created when IASTM is administered over a muscle. The fibroblast production causes an increase in the synthesis of collagen and the regeneration of tissues which would in turn speed up the healing process.

Adding on to this healing process, IASTM also results in an increase in the tissue temperature and an increase in blood flow as well due the friction between the tool and the tissue, which would contribute to improving tissue oxygenation and the removal of localized waste metabolites. IASTM is simple and practical and requires only a short period of time for a single treatment. According to previous studies, IASTM was found to improve soft tissue function and ROM in acute or chronic sports injuries to soft tissues, while also reducing pain.

This review aimed primarily at highlighting the efficacy of IASTM in text neck syndrome but intensive research has proved that there are not much studies done on IASTM in text neck syndrome. This gives room for further studies that can be done in the same, since it has already been identified that text neck syndrome is common in young adult population due to the overuse of hand-held devices. Previous studies have only thrown light on the awareness and corrective exercise or posture than can be taught to the concerned population on text neck syndrome but not many studies have been done on treatment for the same. IASTM has been proved to be effective for other neck related conditions as well as in the release of trigger points and break down of adhesions in the upper trapezius, sternocleidomastoid and scaleni (all three fibres), giving room for further experimentation of the same.

VI. CONCLUSION

Text neck syndrome, a condition commonly occurring among young adult population- the age group of 18-25 years owing to the maximal use of smartphones and other hand-held electronic devices for various activities like texting, calling, gaming, social media etc. and the use of laptops for the same as well. Till date, studies that have been conducted were focused more on creating the awareness about text neck syndrome and its relation to other parts such as the hand and thumb. These studies were more focused on creating the awareness

about text neck syndrome its causes, signs and symptoms creating knowledge about the syndrome and how it can be managed.

On the other hand, studies relating to IASTM in text neck syndrome specifically have not been done but IASTM has been administered in other studies relating to mechanical neck pain and other conditions relating to neck pain. Further studies can be done to compare or to analyze other methods of treatment in physiotherapy in order to treat text neck syndrome and its prevalence among students and those who have prolonged use of smartphone or other hand-held electronic devices.

Therefore, it can be concluded that more research studies can be done to further study the role of physiotherapy, specifically the efficacy of instrument assisted soft tissue mobilization targeting trigger point and taut band release in text neck syndrome, it's biomechanics and examine other treatment protocols that can be given in order to reduce the occurrence of this syndrome.

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BEN JOSHUA, et. al. "Literature Review on Instrument Assisted Soft Tissue Mobilization in Text Neck Syndrome." *IOSR Journal of Sports and Physical Education (IOSR-JSPE)*, 9(03) (2022): 21-29.