RESEARCH PAPER

A Comparative Study on the Effectiveness of Instrument-Assisted Soft Tissue Mobilization versus Myofascial Gun in Managing Neck Pain Among Undergraduate Student

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ABSTRACT

Background: Neck pain is a prevalent musculoskeletal problem characterized by discomfort in the neck and shoulder region that is frequently observed among undergraduate students due to prolonged use of electronic devices, poor posture, academic stress and sedentary lifestyle habits. It can have a big impact on everyday activities, academic performance, and overall quality of life. Various physiotherapy interventions such as Instrument – Assisted Soft Tissue Mobilization and Myofascial gun therapy are commonly utilized for the management of neck pain. Although both treatment techniques are widely effective, limited studies have compared their effectiveness specifically among Undergraduate students.

Aim of the study: This study aims to compare the effect of Instrument- assisted soft tissue mobilization and Myofascial gun therapy in managing neck pain among undergraduate students.

Method: A randomized interventional study was conducted among 92 undergraduate students aged 18-25 with generalized neck pain and discomfort. Individuals chosen were randomly allocated into 2 groups consisting of 46 subjects each. Group A received IASTM along with conventional physiotherapy, while Group B received Myofascial gun therapy along with conventional physiotherapy. The intervention was provided for 3 sessions over a timeframe of 2 weeks. Outcome measures included the Numeric Pain Rating Scale, Neck Disability Index, and Northwick Park Neck Pain Questionnaire (NPQ). Evaluations were conducted both prior to and following the intervention to assess changes in pain and functional disability.

Result: The Paired t Test and Wilcoxon's Signed Rank Test were used to evaluate the impact of Group A. The Paired t Test and Wilcoxon's Signed Rank Test were used to evaluate the impact of Group B. There was an analysis done between the two groups using an Unpaired t Test/ Mann- Whitney Test. When comparing group A to group B, there was a statistically relevant variation (p value < 0.001*) between the pre and post evaluations on the Northwick Park Neck Pain Questionnaire (NPQ), Neck Disability Index (NDI), and Numerical Pain Rating Scale (NPRS).

Conclusion: The present study revealed that students with neck pain and discomfort experienced a statistically noteworthy enhancement in their neck pain and neck disability, along with improvement in their functional ability with both Instrument – Assisted Soft Tissue Mobilization and conventional physiotherapy and Myofascial Gun Therapy and Conventional physiotherapy ($p < 0.001$). However, the group that received Instrument- Assisted Soft Tissue Mobilization with conventional physiotherapy showed a much greater improvement in Neck pain, neck disability and functional ability scores as compared to the group that received Myofascial gun therapy along with conventional physiotherapy. Therefore, Instrument- Assisted Soft Tissue Mobilization appears to be a more effective treatment approach for improving clinical outcomes in Undergraduate students with Neck pain.

Keywords- Neck Pain, Undergraduate Students, Instrument- Assisted Soft Tissue Mobilization (IASTM), Myofascial gun, Numeric pain rating scale (NPRS), Neck Disability Index (NDI), Northwick Park Neck Pain Questionnaire (NPQ).

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INTRODUCTION

Neck pain refers to a widespread feeling of discomfort or stiffness in the neck and shoulder region, often caused by maintaining the same posture for long periods or performing repeated movements. (1) Problems affecting any of the neck's tissues might cause neck pain. (2) Causes of neck pain in students may involve improper cushion use, staying awake late at night, poor sitting posture in classrooms, lack of physical activity, psychosomatic symptoms, emotional stress, prolonged daily use of electronic devices, sustained forward head posture, elevated stress levels, sedentary lifestyle, inadequate sleep quality, incorrect keyboard positioning, carrying heavy schoolbags, increasing age, sleeping during travel such as

on buses or in cars, exposure to cold or damp wind, neck fatigue, poor alignment of the head and neck, insufficient rest, computer screens positioned below or above eye level, mismatched desk and chair heights, excessive social media use, academic major, duration of smart phone use, and participation in high-level sports activities etc [3].

The neck muscles primarily perform an isometric function, counteracting the force of gravity to maintain the head and neck in an upright posture.

Additionally, these muscles contribute to the active positioning and mobility of the cervical region and head [2]. Research indicates that mechanical neck pain affects around 45% to 54% of people at some stage in their daily life, sometimes leading to a significant disability.[1]

Biomechanics of cervical spine –

Biomechanically, the cervical spine allows flexion, extension, lateral flexion, and rotation in all three planes. Normal cervical ROM includes about 80–90° forward bending, 70° backward bending, 20–40° side flexion, and up to 90° rotation on each side. These movements are achieved through coordinated interaction between vertebral structures, inter vertebral discs, ligaments, and muscles. [4]

The frequent use of gadgets without adequate ergonomic consideration is believed to be a major driver behind the rising incidence of these health issues among young adults in educational settings. [2] Additionally, spending extended periods hunched over desks leads to a higher occurrence of neck pain among students.[3]

IASTM-

In recent years, soft tissue and mobilization techniques are becoming increasingly common in rehabilitation settings as conservative therapies for musculoskeletal problems such as neck discomfort. Instrument-Assisted Soft Tissue Mobilization (IASTM) has been shown in numerous studies to improve functional outcomes and significantly reduce discomfort. By helping to break down excessive fibrosis and promoting collagen repair and regeneration through increased fibroblast activity, IASTM is thought to stimulate connective tissue remodeling. This procedure aids in reducing scar tissue, releasing fascial limitations, and dissolving adhesions. Furthermore, IASTM has shown to provide physiological effects such enhanced blood flow, reduced tissue density, myofascial release, and pain regulation. [5]

MYOFASCIAL GUN THERAPY-

An alternative strategy entails that in recent years; portable percussion massage therapy has become more and more widespread for both clinical and athletic purposes. Percussion devices for self-massage and therapist massage are available from various manufacturers. These gadgets may vibrate at various frequencies up to 53 Hz. Local points can be massaged by attaching multiple attachment heads to the devices, depending on the kind of tissue [6]. Percussive treatment (PT), also referred to as massage gun technology, targets the tendon or muscle bellies by gliding the device across the skin's surface and applying fast pressure pulses and vibrations at short intervals.[7]

Although both the interventions differ in their route of administration, the degree of extent and Sensory feedback, they work through comparable mechanisms such as enhancing tissue flexibility, activating mechanical receptors, and regulating the muscle tone. [8]

However evidence indicates that therapeutic exercise can help reduce neck pain. Isometric exercises, which involve static muscle contractions, are useful for strengthening weakened muscles without irritating pain-sensitive tissues such as ligaments, tendons, or cervical joints. Because these exercises produce muscle activation without altering muscle length or causing joint movement, they are generally well tolerated by patients. In addition, they are simple to perform, require no special equipment, and can be carried out almost anywhere. Owing to their simplicity, convenience, and low cost, isometric neck exercises may encourage better patient compliance with treatment. [9] [15]

METHODOLOGY

An Interventional Randomized clinical study conducted at D.Y. Patil College of Physiotherapy Kolhapur on 46 participants in each group. The research was carried out for six months. The subjects were chosen based on their compliance with inclusion and exclusion criteria. Minimum sample size was 46 in each group

Inclusion criteria-

Age Range -18 to 25 years, Duration–participants experiencing non-specific neck pain from 3 weeks to 6 weeks and above, Participants with limited neck mobility, stiffness or neck discomfort and pain, individuals with neck pain who are willing to taking part.

Exclusion criteria-

Individuals with previous neck surgery, previous cervical spine fracture, recent whiplash injury. Neurological conditions like fibromyalgia, participants diagnosed with inflammatory conditions. Individuals on pain medications or muscle relaxants, skin conditions over the neck or shoulder.

Materials Used-

Myofascial gun, IASTM Tool, Data collection sheet, Consent Form, NPRS,
NDI Scale, NPQ Scale.

NPRS -

Guidelines for the Numerical Pain Rating Scale: The patient is asked to rate their present, optimal, and most severe pain during the previous twenty-four hours. The patient's degree of pain during the preceding twenty-four hours is represented by the averages of the three assessments.

In individuals who are educated (r=0.94, p=0.001) and in patients who lack literacy (r=0.71, p=0.001). In individuals with rheumatoid arthritis and other pain problems, there is a strong correlation with the VAS. Correlation ranges from 0.86 to 0.95. [10]

NDI -

The purpose of the questionnaire is to gather data regarding the impact of neck pain and the capacity of a person to handle their daily lives with the pain. Individuals are requested to complete each part, checking only the box that pertains to them.

The NDI has demonstrated good validity, such as concurrent validity, construct validity, and content validity. With an interclass correlation coefficient (ICC) ranging from 0.50 to 0.98, the NDI demonstrates strong reliability. [11]

Northwick Park neck pain questionnaire-

The translated Hindi version of the NPQ showed a three-factor structure that explained 76.7% of the variance, according to factor evaluation. Test-retest reliability was evaluated using an ICC of 0.935 (95 percent confidence interval: 0.906–0.958), while internal reliability was indicated by a Cronbach's alpha of 0.936. Each of the components of the translated Hindi and original English NPQs showed significant relationships. In conclusion, the English-to-Hindi translation of the NPQ showed comparable psychometric qualities to the original English version and a good factor structure. As a result, it might be suggested for use in Indian study on neck discomfort. [12]

PROCEDURE-

1. The research study protocol was presented for clearance in front of the institutional ethical committee and the Protocol committee of D.Y. Patil University Kolhapur, Following that, consulted subjects were chosen from D.Y. Patil College based on the eligibility criteria and given an explanation of the study.
2. The subject was given an explanation of the process. The subjects who agreed to participate gave their written consent.
3. The individuals were pleasantly positioned and had their conditions carefully evaluated.
4. The Northwick Park Neck Pain Questionnaire, the Pain Numerical Rating Scale, and the Neck Disability Index were used to measure pain before and after treatment.
5. There were two distinct groups, Group A and Group B, each with 46 members.
6. Group A included IASTM with conventional physiotherapy.
7. Group B included Myofascial gun with conventional physiotherapy.
8. Treatment was given for 3 sessions in two weeks.
9. Demographic data, including age, gender, years of experience, and outcome indicators, were recorded according to the data collection sheet.
10. The subjects were examined with the help of NPRS scale, NDI scale and NPQ scale.

GROUP A:

Position of the participant- Seated position with the shoulder area exposed.

Position of the therapist- Standing behind the patient.

Duration of the treatment- IASTM was given to the specific points for three to four minutes

The individuals in group A were given Instrumet- assisted soft tissue mobilization for a period of two weeks, with 3 sessions per week.

With their head and arms resting on a pillow, the subject sat comfortably on the treatment table with their arms folded.

After using a saline cotton swab to clean the subject's skin and the blade, a lubricant such as Vaseline was used, and the upper trapezius was subjected to a thorough yet comfortable soft tissue mobilization from origin to insertion for about three minutes using a sweeping method.

If the individual experienced heat or if the therapy was painful, the procedure was modified as necessary to give them a rest.

Afterward, tissues were used to clean and wipe the skin. The subjects were told that mild cutaneous hyperemia is typical and should go away before the following session. Bilateral treatment was administered. [13]

GROUP B:

Position of the participant–Seated position with the shoulder area exposed.

Position of the therapist- Standing behind the patient.

Duration of the treatment- Myofascial gun therapy was used for three to four minutes on the specified regions.

The treatment regimen was adhered correctly, and patients receiving percussion therapy were positioned adequately. The individual's shoulder region was uncovered while they were seated.

By adding more cushions or shifting to a more comfortable position, the subject's comfort was guaranteed.

The treatment head was first applied to the selected muscle's origin and insertion ends for three to four minutes each.

Trigger points and taut bands were then found by scanning the muscle along its length. These areas received three to four minutes of Myofascial gun therapy. After that, the muscle was treated with the treatment head for three minutes using circular strokes.

The percussion device's treatment head was gently applied to the skin, exerting more force where bands of tightness were felt. The application pressure was modified based on the subject's threshold.

The entire course of treatment took twenty-five to thirty minutes in total.

The NPRS, NDI Scale, and NPQ measurements were made Prior to and following the treatment,

The choice of laying their heads on pillows was provided to the subjects if necessary. For ten minutes, the shoulder area was exposed to moist heat along the muscle path. The subjects were instructed on general stretching and requested to actively execute it. When necessary, passive

stretching was administered and further isometric neck exercises with ten repetitions in three sets each was given. Stretching exercises and cold therapy, if needed, would conclude the treatment. The entire program of treatment would run between twenty-five and thirty minutes. [2]

RESULTS

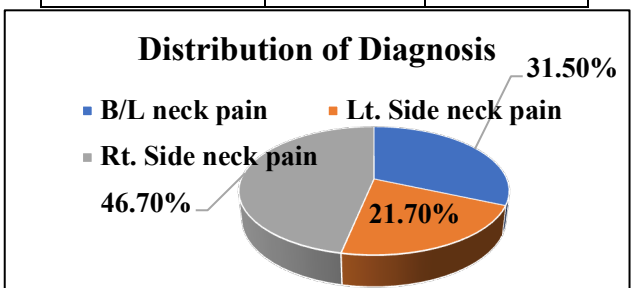
A total of Ninety-Two Undergraduate students with non-specific neck pain from D.Y. Patil College of Physiotherapy, Kolhapur, were selected for the study, of 75 (81.50%) were Female and 17 (18.50%) were Male.

They were divided into two groups A and B, each with 46 individuals. The Age of the students varied from 18 to 25 years, averaging a mean age of 22.23 (±1.79) years.

	Mean	Std. Deviation
AGE	22.23	1.79

The mean percentage of Distribution of the Area of Neck pain in both the groups was taken and results showed the percentage of bilateral neck pain in both groups was 31.50%, the Percentage of Lt. Side neck pain was 21.70% and the percentage of Rt. Side neck pain was 46.70%.

DIAGNOSIS	Frequency	Percentage
B/L neck pain	29	31.50%
Lt. Side neck pain	20	21.70%
Rt. Side neck pain	43	46.70%
Total	**92**	**100%**



A paired t- test was used to statistically analyze the mean and standard deviation of the individual's pre and post-session difference in the NPRS, NDI and NPQ tests for both groups, Group A and Group B.

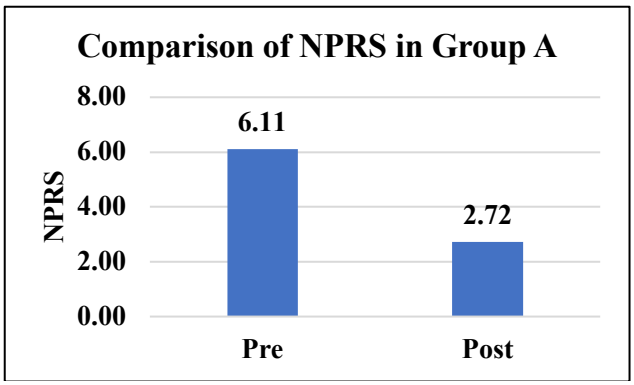
GROUP A:

The table below represents the pre- and post-intervention comparison of outcome measures in Group A participants who received IASTM (Instrument – assisted soft tissue mobilization). The outcome measures used in this study were the Numeric Pain Rating Scale (NPRS) to assess pain intensity, Neck disability Index (NDI) and Northwick Park Q Scale (NPQ) to evaluate functional disability associated with neck pain.

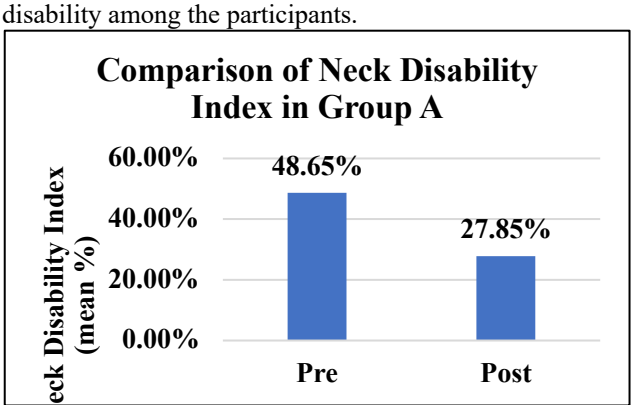
Parameters	Assessment Period	Mean	Std. Deviation	p-value
NPRS	Pre	6.11	1.40	<0.001*
	Post	2.72	1.47	
Neck Disability Index	Pre	48.65%	10.71%	<0.001*
	Post	27.85%	10.01%	
Northwick Park Q Scale	Pre	46.76%	10.70%	<0.001*
	Post	25.78%	8.46%	

GENDER	Frequency	Percentage
Female	75	81.50%
Male	17	18.50%
Total	**92**	**100%**

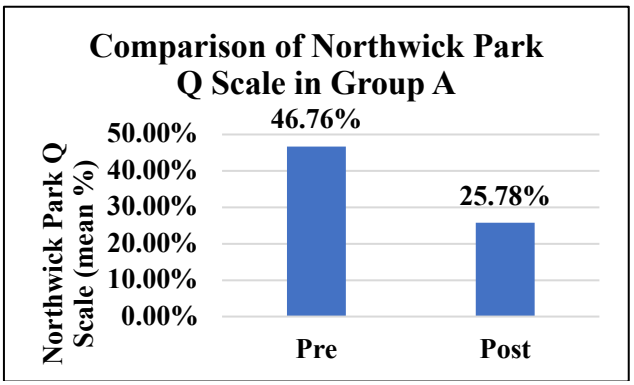
For the Numeric Pain Rating Scale, the mean pre-intervention score was 6.11 with a standard deviation of 1.40, indicating that participants experienced moderate levels of pain before the intervention. After the intervention period, the mean post-intervention score reduced to 2.72 with a standard deviation of 1.47, suggesting a considerable reduction in pain intensity following the application of IASTM. The decrease in the mean NPRS score demonstrates that the participants experienced significant relief in neck pain post the treatment intervention.



Similarly, improvement was also observed in functional ability as measured by the Neck disability Index and the Northwick Park neck pain Questionnaire. The mean pre-intervention NDI score was 48.65 % with a standard deviation of 10.71%, while the mean pre-intervention NPQ score was 46.76% with a standard deviation of 10.70%, which indicates that the participants had moderate functional disability due to neck pain before the intervention. Following the treatment program, the mean post-intervention NDI score decreased to 27.85% with a standard deviation of 10.01%, while the mean post-intervention NPQ score decreased to 25.78% with a standard deviation of 8.46%, indicating a substantial improvement in functional ability and reduction in disability among the participants.



The graph titled "Neck Disability Index" provides a visual representation of the changes in disability levels before and after the intervention in Group A. The bar representing the pre-intervention score (48.65%) is noticeably higher than the bar representing the post-intervention score (27.85%).



The graph titled "Comparison of Northwick Park Q Scale" provides a visual representation of the changes in disability levels before and after the intervention in Group A. The bar representing the pre-intervention score (46.76%) is noticeably higher than the bar representing the post-intervention score (25.78%). This large difference between the two bars visually illustrates a marked reduction in disability following the intervention. The graph supports the results obtained from the statistical analysis by clearly showing the improvement in functional ability among the participants. The reduction in the NPQ score reflects an improvement in the participants' capacity to perform daily activities with less limitation due to neck pain, indicating that the intervention provided to Group A was effective in enhancing functional outcomes.

The statistical analysis revealed a p-value of <0.001, which indicates that the difference between the pre- and post-intervention scores is statistically highly significant. This significant p-value suggests that the reduction in pain intensity observed after the intervention was not due to chance but rather due to the effectiveness of the treatment provided to the participants in Group A. Therefore, the findings from the table indicate that the intervention administered to Group A was effective in significantly reducing pain intensity among individuals suffering from neck pain.

GROUP B

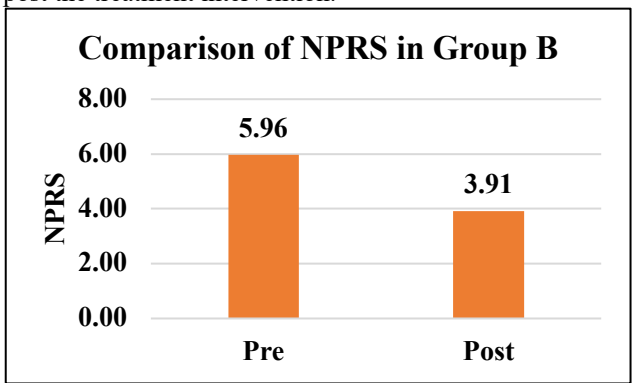
The present study also evaluated the effectiveness of the intervention in Group B by comparing the pre-intervention and post-intervention values of NPRS, Neck Disability Index (NDI), and Northwick Park Questionnaire (NPQ).

The table below represents the pre- and post-intervention comparison of outcome measures in Group B participants who received Myofascial Gun Therapy. The outcome measures used in this study were the Numeric Pain Rating Scale (NPRS) to assess pain intensity, Neck disability Index (NDI) and Northwick Park Q Scale (NPQ) to evaluate functional disability associated with neck pain.

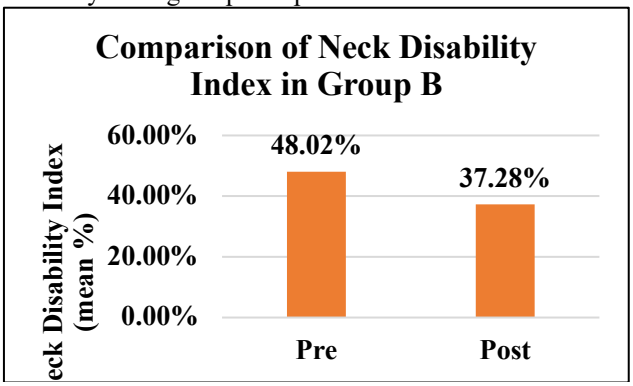
Parameters	Assessment Period	Mean	Std. Deviation	p-value

			n	e
NPRS	Pre	5.96	1.33	<0.0 01*
	Post	3.91	1.35	
Neck Disability Index	Pre	48.0 2%	9.64%	<0.0 01*
	Post	37.2 8%	10.23%	
Northwick Park Q Scale	Pre	48.4 3%	9.02%	<0.0 01*
	Post	37.6 7%	8.97%	

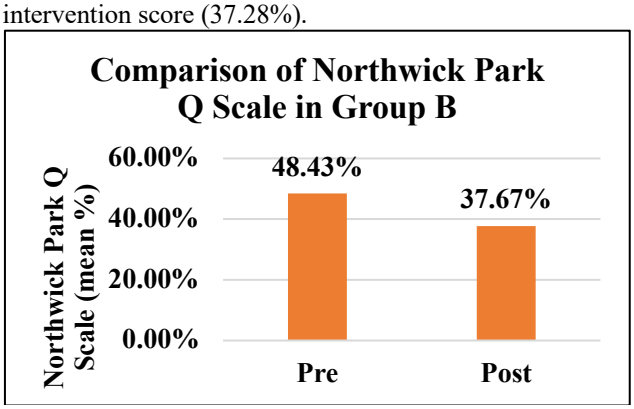
For the Numeric Pain Rating Scale, the mean pre-intervention score was 5.96 with a standard deviation of 1.33, indicating that participants experienced moderate levels of pain before the intervention. After the intervention period, the mean post-intervention score reduced to 3.91 with a standard deviation of 1.35, suggesting a considerable reduction in pain intensity following the application of Myofascial gun therapy. The decrease in the mean NPRS score demonstrates that the participants experienced significant relief in neck pain post the treatment intervention.



Similarly, improvement was also observed in functional ability as measured by the Neck disability Index and the Northwick Park neck pain Questionnaire. The mean pre-intervention NDI score was 48.02% with a standard deviation of10.23%, while the mean pre-intervention NPQ score was 48.43% with a standard deviation of 9.02%, which indicates that the participants had moderate functional disability due to neck pain before the intervention. Following the treatment program, the mean post-intervention NDI score decreased to 37.28% with a standard deviation of 10.23%, while the mean post-intervention NPQ score decreased to 37.67% with a standard deviation of 8.97%, indicating a substantial improvement in functional ability and reduction in disability among the participants.



The graph titled "Neck Disability Index" provides a visual representation of the changes in disability levels before and after the intervention in Group B. The bar representing the pre-intervention score (48.02%) is noticeably higher than the bar representing the post-intervention score (37.28%).

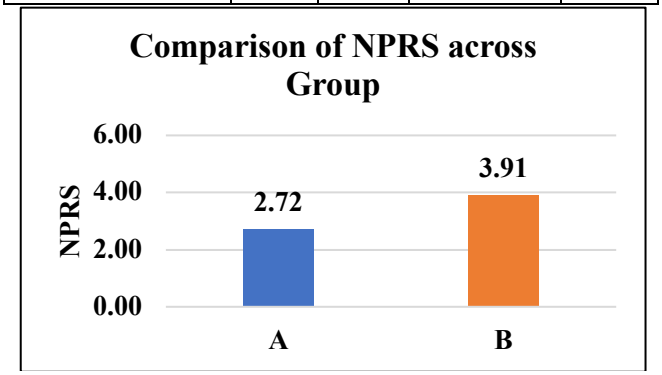


The graph titled "Comparison of Northwick Park Q Scale" provides a visual representation of the changes in disability levels before and after the intervention in Group B. The bar representing the pre-intervention score (48.43%) is noticeably higher than the bar representing the post-intervention score (37.67%). This large difference between the two bars visually illustrates a marked reduction in disability following the intervention. The graph supports the results obtained from the statistical analysis by clearly showing the improvement in functional ability among the participants. The reduction in the NPQ score reflects an improvement in the participants' capacity to perform daily activities with less limitation due to neck pain, indicating that the intervention provided to Group B was effective in enhancing functional outcomes.

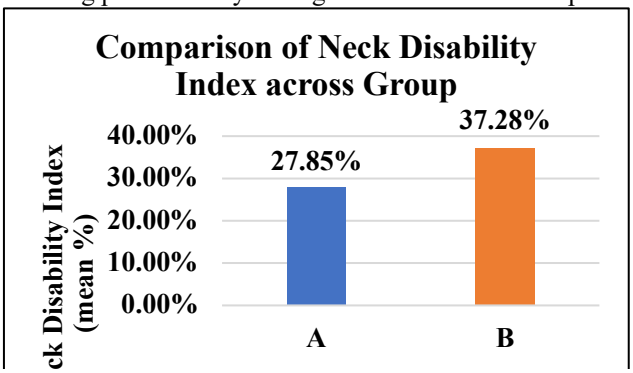
The statistical analysis revealed a p-value of <0.001, which indicates that the difference between the pre- and post-intervention scores is statistically highly significant. This significant p-value suggests that the reduction in pain intensity observed after the intervention was not due to chance but rather due to the effectiveness of the treatment provided to the participants in Group B. Therefore, the findings from the table indicate that the intervention administered to Group B was effective in significantly reducing pain intensity among individuals suffering from neck pain.

GROUP COMPARISON

Parameters	Group	Mean	Std. Deviation	p-value
NPRS	A	2.72	1.47	<0.001*
	B	3.91	1.35	
Neck Disability Index	A	27.85 %	10.01%	<0.001*
	B	37.28 %	10.23%	
Northwick Park Q Scale	A	25.78 %	8.46%	<0.001*
	B	37.67 %	8.97%	

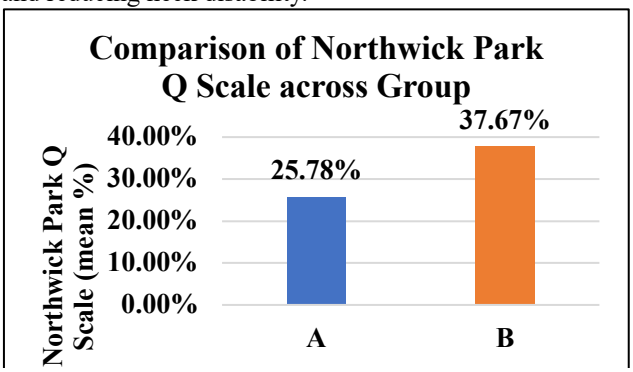


The graph represents the comparison of Numerical Pain Rating Scale (NPRS) scores between Group A and Group B after the intervention. The mean NPRS score in Group A was 2.72, whereas the mean score in Group B was 3.91. The lower mean value in Group A indicates a greater reduction in pain compared to Group B. This suggests that the intervention given to Group A was more effective in reducing pain intensity among individuals with neck pain.



Comparison of Neck Disability Index (NDI) between Group A and Group B

The graph illustrates the comparison of Neck Disability Index (NDI) scores between Group A and Group B after the intervention. The mean NDI score in Group A was 27.85%, while the mean score in Group B was 37.28%. The lower mean value observed in Group A indicates a greater improvement in neck-related disability compared to Group B. This implies that the intervention provided to Group A was more efficient in lowering functional ability and reducing neck disability.



Comparison of Northwick Park Questionnaire (NPQ) between Group A and Group B

The graph shows the comparison of Northwick Park Questionnaire (NPQ) scores between Group A and Group B after the intervention. The mean NPQ score in Group A was 25.78%, whereas the mean score in Group B was 37.67%. The lower mean value in Group A indicates a greater improvement in neck function and daily activities compared to Group B. These findings suggest that the intervention applied in Group A was more efficient in lowering functional impairment among individuals with neck pain.

DISCUSSION

Neck pain is associated with widespread shoulder and neck discomfort brought on by extended postures or repeated motions. Problems affecting any of the neck's structures may cause neck pain. Neck pain has emerged as a classic musculoskeletal complaint amidst student

population because of extended sitting, lack of ergonomic habits, and reduced physical activity. These factors contribute to sustained forward head and increased mechanical stress on the cervical spine, leading to pain, stiffness and functional limitations.

The present randomized controlled study was conducted to compare the effectiveness of IASTM and Myofascial Gun in managing Neck pain among Undergraduate students. A total of 92 participants with Non-specific neck pain were included in the study using an Inclusion and Exclusion criteria, and were randomly separated up into two groups A and B . Group A with 46 participants each and Group B with 46 participants each. IASTM was given to group A while Myofascial gun therapy was given to group B. In order to compare the findings before and after the intervention, the outcome markers utilized in this study were the NPRS, NDI and NPQ , which are reliable and widely accepted tools for accessing pain and functional disability. The intervention protocol for both groups was carried out for three sessions per week for a duration of two weeks.

Assessments were carried out both before and after the intervention utilizing the selected evaluation metrics to evaluate the effectiveness of the interventions.

A randomized controlled study conducted by Boston and Kaya (2023), to evaluate the effectiveness of IASTM combined with exercise therapy in patients with chronic neck pain, reported that IASTM significantly improved pain and muscular endurance, when used in conjunction with physical therapy for those suffering from persistent neck pain . This study aligns with the present study where both the groups received conventional exercises along with treatment, contributing to the overall improvement.[5]

Lin et al. (2016) in their systematic review and meta-analysis, of the efficacy of instrument assisted soft tissue mobilization in patients with neck pain, analyzed multiple randomized controlled trials and reported that IASTM significantly reduced discomfort and enhanced functional outcomes in individuals with neck pain. [14]

Another study conducted by Reshi et al. (2023) comparing the effects of Thera gun versus Physical Activity in Young adults was conducted and the results showcased that the group that received Thera gun demonstrated a noticeably higher level of improvement than the standard exercise group.. [2]

Menek et al. (2025) conducted a randomized control trial to compare the effects of IASTM versus PM therapy gun in individuals with CDH. The study evaluated pain, kinesiophobia and proprioceptive function. The results demonstrated that both IASTM and Percussion massage therapy were effective in reducing pain and improving functional outcomes. [8]

A previous study by Shewail et al. (2023) compared IASTM with Myofascial Release Technique in individuals with chronic Neck pain. The study reported that there was an insignificant difference between both the groups, regarding an improvement in pain and Function. [13]

The present study comparing IASTM vs Myofascial Gun therapy in the management of neck pain among undergraduate students interprets that majority of the participants belonged to age groups 18- 25 years. A higher prevalence was observed among female undergraduate students.

The pre- treatment assessment revealed that participants of both the groups A (IASTM) and B(Myofascial Gun) exhibited moderate to severe pain, mild to moderate functional disability that were assessed using the NPRS, NDI and NPQ scales.

The parameter values of both the groups A and B shows the average measurements, whereas the standard deviation shows how the data is distributed across the mean. Pre interventional baseline values show the initial status of the condition (A High NPRS value, Higher NDI value, and a high NPQ value), while the post interventional values reflect the changes after the treatment (reduced pain and reduced functional disability).

The parameters and assessment in post- interventional period evaluated three-outcome measures- NPRS scale, NDI scale and the NPQ scale.

The comparative analysis of Group A and B for NPRS was-

The comparison of NPRS scores were observed between the two groups after the intervention. The mean NPRS score in Group A was 2.72, whereas the mean score in Group B was 3.91. The lower mean value in Group A indicated a greater reduction in pain in contrast to Group B. This suggested that the intervention given to Group A was more effective in reducing pain intensity among individuals with neck pain. Both groups demonstrated a significant enhancement but group A (IASTM) exhibited a larger reduction in pain.

The comparative analysis of Group A and B for NDI was-

The comparison of NDI scores were observed between the two groups after the intervention. The mean NDI score in Group A was 27.85%, while the mean score in Group B was 37.28%. The lower mean value observed in Group A indicated a greater improvement in neck-related disability compared to Group B. This suggested, the intervention provided to Group A was particularly successful in improving functional ability and reducing neck disability.

The comparative analysis of Group A and B for NPQ was-

The comparison of NPQ scores were observed between the two groups after the intervention. The mean NPQ score in Group A was 25.78%, whereas the mean score in Group B was 37.67%. The lower mean value in Group A indicated a greater improvement in neck function and daily activities compared to Group B. These findings suggested that the intervention applied in Group A was more effective in reducing functional disability among individuals with neck pain.

On comparing post –treatment outcomes between the two groups, GROUP A INSTUMENT-ASSISTED SOFT TISSUE MOBILIZATION demonstrated comparatively greater improvements across most outcome measures

compared to GROUP B (MYOFASCIAL GUN THERAPY). The mechanical and targeted nature of the IASTM tool may contribute to better soft tissue mobilization, improved circulation, and enhanced neuromuscular function, especially in individuals exposed to prolonged static postures and academic stress.

The findings of this study suggest that INSTUMENT-ASSISTED SOFT TISSUE MOBILIZATION can be considered as a more effective therapeutic intervention as compared to Myofascial Gun therapy for reducing pain and improving functional outcomes in undergraduate students suffering from neck pain.

CONCLUSION

The present study evaluated the comparative effect of Instrument –Assisted Soft Tissue Mobilization and Myofascial on Neck pain among undergraduate students.

The findings demonstrated that both the interventions were efficient in minimizing neck pain, reducing neck disability and advancing overall functional disability. There was a noticeable reduction in pain intensity (NPRS) and functional disability (NDI & NPQ) following the intervention in both the groups.

However, Instrument- Assisted Soft Tissue Mobilization demonstrates a significantly greater improvement compared to Myofascial Gun therapy.

However, the statistical analysis showed a highly significant difference ($p < 0.001$) between the groups, indicating superior effectiveness of IASTM, over Myofascial Gun therapy.

IASTM resulted in greater reduction in neck discomfort and functional disability. Therefore, it can be concluded that while both techniques are beneficial in managing Neck pain among undergraduate students, IASTM appears to be a more effective intervention than Myofascial Gun therapy.

CONFLICT OF INTEREST –

No possible competing interests concerning the research work, authorship, or publication of this article have been declared by the authors.

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