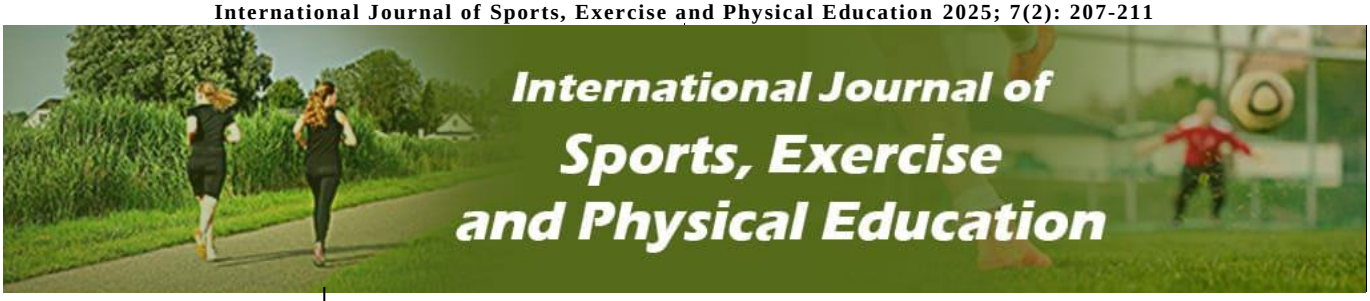

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Vidhyananth
Department of Physiotherapy, College of Physiotherapy, Sri Ramakrishna Institute of Paramedical Science, Coimbatore, Tamil Nadu, India

Porkodi
Department of Physiotherapy (Orthopaedics), College of Physiotherapy, Sri Ramakrishna Institute of Paramedical Science, Coimbatore, Tamil Nadu, India

Jaivanth
Department of Physiotherapy (Orthopaedics), College of Physiotherapy, Sri Ramakrishna Institute of Paramedical Science, Coimbatore, Tamil Nadu, India

Gokula Priya
Department of Physiotherapy (Orthopaedics), College of Physiotherapy, Sri Ramakrishna Institute of Paramedical Science, Coimbatore, Tamil Nadu, India

Justine Tony
Department of Physiotherapy (Orthopaedics), College of Physiotherapy, Sri Ramakrishna Institute of Paramedical Science, Coimbatore, Tamil Nadu, India

Corresponding Author:
Vidhyananth
Department of Physiotherapy, College of Physiotherapy, Sri Ramakrishna Institute of Paramedical Science, Coimbatore, Tamil Nadu, India

Evaluating the efficacy of myofascial release technique in managing forward head posture among school students

Vidhyananth, Porkodi, Jaivanth, Gokula Priya and Justine Tony

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Abstract
This study aimed to evaluate the effectiveness of the myofascial release technique combined with corrective exercise in the management of forward head posture (FHP) among school students. A quasi-experimental design was implemented at the Government Higher Secondary School, Reddiyapatti, Virudhunagar, involving 30 students diagnosed with FHP. Participants were selected using convenience sampling and randomly allocated into two groups (n=15). Group A received myofascial release combined with corrective exercise, while Group B performed corrective exercise alone, three times per week for four weeks. Pain intensity (NPRS) and cranio-vertebral angle were assessed pre- and post-intervention. Group A demonstrated significantly greater improvements (t=5.579, t=13.229) than Group B. The results indicate that integrating myofascial release with corrective exercise is more effective than corrective exercise alone in reducing pain and improving posture.

Keywords: Forward head posture, myofascial release, corrective exercise, cranio-vertebral angle, pain reduction

Introduction
The pandemic of cell phones and handheld electronic devices and their widespread use in addition to heavy backpacks among school aged children and adolescents has caused this age group to develop a constellation of musculoskeletal symptoms collectively called forward head posture. The prevalence of Forward head posture is 66% among the school going children [1].

The intricate human cervical spine is designed to serve a unique biomechanical function. Besides its supporting and protective role for the skull, the cervical spine acts as a shock absorber for the brain structures. In addition, the cervical spine allows for the passage of the nervous system from the head to the spine. Mechanically, it transfers the weight and bending motions of the head. To perform its function effectively, the head posture should align vertically with the body's centre of gravity, which places minimum stress and strain on the spinal muscles [2].

Forward head posture (FHP), recognized as an excessive extension between the atlanto-occipital joint and superior cervical spine and elevated flexion between the inferior cervical spine and superior chest [3]. This spinal deviation is often related to prolonged poor sitting posture during driving, reading, or even texting on smart devices. Muscle imbalances could result from FHP in the form of a lengthening and weakening of the anterior neck muscles and a shortening and tightening of the posterior neck muscles [5].

According to Sharon, the upper thoracic spine is involved in the physiologic motion of the neck. The decreased movement of the upper cervical spine can cause excessive movement of the lower cervical spine. Individuals with FHP have been shown to require less muscle activity compared to normal cranio-vertebral (CV) angle participants while performing retraction and protraction of the neck. increase fatigue in the sternocleidomastoid, serratus anterior & upper trapezius, cause changes of neck posture & breathing patterns & a decrease in range of motion. Rounded shoulders, increased tilting angle of the first thoracic vertebra, thoracic kyphosis, and lower cervical lordosis are potential disorders associated with FHP

[6]. Head in forward posture can add upto 30 pounds of abnormal leverage on the cervical spine, this can pull the entire spine out of alignment. Forward head posture may result in the loss of 30% of vital capacity [7].

If the head posture is untreated for a long duration, it leads to unusual stress on the neck, which causes pain, tightness, and faulty posture. All these factors affect not only the upper body but also induce adverse effects on the whole body by reducing joint proprioception which leads to posture imbalance [8]. Early identification and correction in the childhood can reduce the future complications.

Materials and Methodology

Materials Used

The following tools and instruments were utilized for intervention and assessment: Treatment table, Chair, Pillow, Evaluation tools, Pen, Consent form, Assessment form

Study Design and Setting

This study employed a quasi-experimental pre- and post-test design and was conducted at Government higher secondary school - Reddiyapatti, Virudhunagar over a period of 1 year.

Participants and Sampling

A total of 30 subjects randomly allocated 15 people per each group

- GROUP A: Myofascial release technique along with corrective exercise
- GROUP B: Corrective exercise

Inclusion Criteria

- Age group: 12-16 years
- Male school students
- Using smartphones &/or computers/laptops for more than a year with 2-3 hours/day
- Cranio-vertebral angle <50 degree
- Subject with neck pain for a month

Exclusion Criteria

- Any fracture of the cervical &/or thoracic spine in the past 3 months.
- Exhibited positive neurologic signs consistent with nerve root compression.
- Subjects who are presented with any other deformities of neck & shoulder.
- Any history of tumor, vascular problems of spine, disc related pathology, early degenerative changes, vertigo problem and cognitive impairment.
- Patients with headache/migraine.
- Involved in any other physical activity program.
- Presence of cervical rib.
- History of upper limb injury in the past 6 months.
- Systemic illness, hand injuries, carpal tunnel syndrome, trigger finger
- Recent surgeries (within 2 months).
- Visual/hearing impairments.
- Regular gym activity (more than 1 month).

Outcome Measures

- Cranio-vertebral angle
- NPRS-Numeric pain rating scale

Treatment Procedure

- A group of 30 individuals with forward head posture were selected under the
- Inclusion and exclusion criteria. Informed consent was obtained from the
- Participants. Demographic data of the participants were collected. Before treatment
- The pain and CVA were assessed. 30 participants were separated into two groups
- Such as group A and group B with 15 participants in each group. Group A receives
- Myofascial release technique along with corrective exercise and Group B receives
- Corrective exercise alone. After the treatment session of 4 weeks post data were
- Collected. Pre-test and post-test data were compared for evaluation.

Treatment Technique

- Myofascial release technique
- Technique: Fascial Manipulation
- Procedure

Initial Assessment (5 minutes)

- Visual inspection of cervical spine and shoulder alignment
- Palpation of suboccipital and cervical fascia

Fascial Manipulation (15 minutes per side)

Step 1: Suboccipital Release

- Therapist's hand positions: thumb on suboccipital muscles, fingers on occipital bone
- Gentle, sustained pressure (3-5 minutes)

Step 2: Cervical Fascial Release

- Therapist's hand positions: Thumb supporting the head, fingers on lateral neck
- Gentle, sustained pressure (3-5 minutes)

Step 3: Shoulder Fascial Release

- Therapist's hand positions: fingers on shoulder, thumb on upper arm
- Gentle, sustained pressure (3-5 minutes)

Corrective exercises

Exercise 1: Chin Tucks

- Technique: Isometric contraction of cervical retractors
- Patient position: Sitting or standing with good posture
- Therapist position: Standing behind the patient

Procedure

1. Patient looks straight ahead.
2. Therapist places fingers on patient's chin
3. Patient tucks chin in, keeping head level.
4. Hold 5-10 seconds, release
5. Repeat 10-15 times, 3 sets.

Exercise 2: Shoulder Rolls

- Technique: Relaxation of shoulder muscles
- Patient position: Sitting or standing
- Therapist position: Standing beside the patient

Procedure
1. Patient rolls shoulders forward and up.
2. Then, rolls shoulders back and down.
3. Repeat 10-15 times, 3 sets.

Exercise 3: Neck Stretches
- Technique: Static stretching of cervical extensors
- Patient position: Sitting or standing
- Therapist position: Standing beside the patient

Procedure (left side)
1. Patient turns head right.
2. Therapist gently assists stretch.
3. Hold 30 seconds.
4. Repeat on right side.
5. Repeat 3 sets each side.

Exercise 4: Scapular Squeezes
- Technique: Strengthening of scapular stabilizers
- Patient position: Sitting or standing
- Therapist position: Standing behind the patient

Procedure
1. Patient squeezes shoulder blades together.
2. Hold 5-10 seconds, release.
3. Repeat 10-15 times, 3 sets.

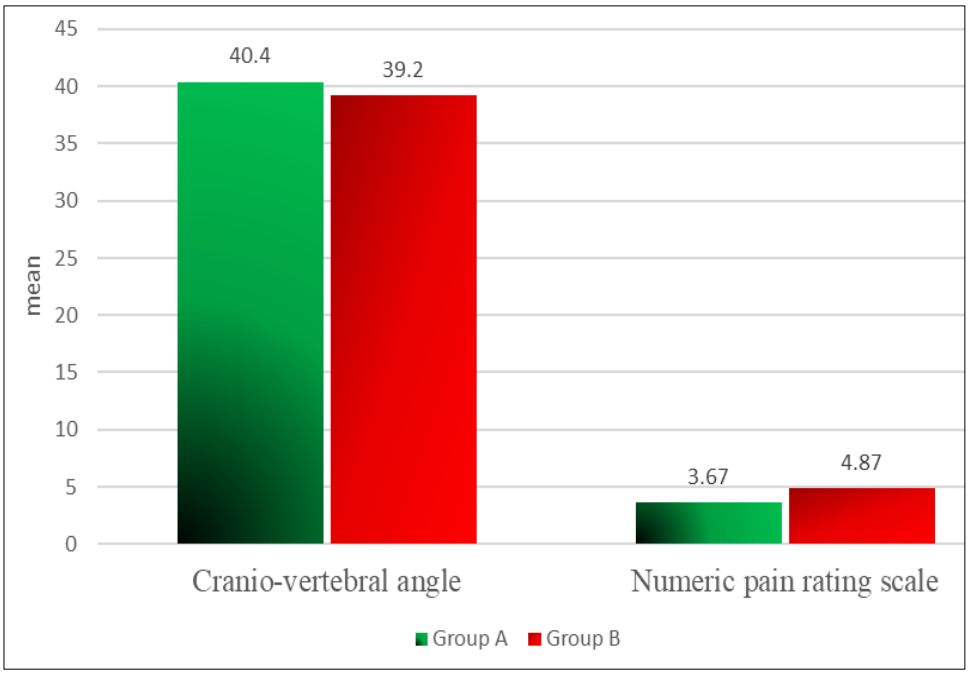
Exercise 5: Cervical Extensions
- Technique: Strengthening of cervical extensors
- Patient position: Prone or sitting
- Therapist position: Standing beside the patient

Procedure
1. Patient slowly lifts head, keeping chin tucked.
2. Hold 5-10 seconds, release.
3. Repeat 10-15 times, 3 sets.

Result

Pre-test and post-test values of the study were collected and assessed for variations in improvement and their results were analysed using independent 't' test and parried 't' test. The statically analysis of the study showed that there is a significant difference. The calculated 't' value is 5.579 and 13.229 for myofascial release technique and corrective exercise using cranio-vertebral angle and Numerical Pain Rating Scale respectively which is greater than the table value of 2.048.

Comparison of Results



Discussion

The findings of this study demonstrate that both myofascial releases combined with corrective exercise and corrective exercise alone produced clinically significant improvements in forward head posture; however, the combined approach yielded superior results. Participants in Group A showed greater reductions in pain, as measured by the Numeric Pain Rating Scale, and greater improvements in cranio-vertebral angle compared to Group B. Independent *t*-test analysis confirmed these differences, with 't' values of 5.579 for cranio-vertebral angle and 13.229 for pain scores, both exceeding the critical value of 2.048, indicating statistical significance. These results suggest that integrating myofascial release into corrective exercise protocols provides enhanced therapeutic benefits, likely due to its ability to reduce myofascial restrictions, improve tissue mobility, and facilitate more effective postural correction. The null hypothesis was therefore rejected in favour of the alternative.

Conclusion

The study was conducted to determine the optimal treatment strategy for Forward Head Posture. This study aimed to assess the effectiveness of Myofascial Release Technique combined with Corrective Exercise and Corrective Exercise alone on pain and cranio-vertebral angle in individuals with Forward Head Posture. Based on statistical analysis, both groups showed clinically significant effects, particularly the Myofascial Release Technique combined with Corrective Exercise, which demonstrated significant reduction in pain

and improvement in cranio-vertebral angle compared to Corrective Exercise alone.

Hence, the null hypothesis is rejected, and the alternate hypothesis is accepted, which stated that there is a significant difference between Myofascial Release Technique combined with Corrective Exercise and Corrective Exercise alone in individuals with Forward Head Posture in reducing pain and improving cranio-vertebral angle.

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