INTI JOURNAL | Vol.2023:17
eISSN:2600-7320

Evaluation of the Effectiveness of the Active Correction Exercises in Forward Head Posture in Young Adults

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Abstract

Background: The forward head posture is terrible habitual posture of neck that is characterized by forward cervical vertebral translation and upper cervical vertebral hyperextension. Forward head posture for prolonged period of time puts extra strain on posterior aspects of cervical region including ligaments which alters scapular kinetics and kinematics.
Objective: To evaluate and assess the efficiency of active correction exercises in forward head posture of young adults.
Methodology: A Total 30 subjects with forward head posture were chosen using convenient sampling technique based on inclusion and exclusion criteria. Patients were split into two groups (Intervention group-15, Conventional group-15). The Intervention group received active correction exercises for Thoracic Spine, Sternocleidomastoid, Upper Trapezius, Lower Trapezius, Deep Cervical Flexors. Conventional group were not given any intervention. As an outcome measure, the APECS posture evaluation and correction system was utilized to assess pre- and post-test measurements.
Result: The mean value of pre-test was 25.720 and the post-test was 39.140 for conventional group and the mean value of pre-test was 22.187 and the post test was 25.533 for intervention group.
Conclusion: As a result of this finding, it has been concluded that exercises on correcting forward head posture were more effective than conventional group.

Keywords

Active correction exercises, forward head posture

Introduction

A typical postural variation is the forward head posture that affects persons of all ages, from children to the elderly. The forward head posture is terrible habitual posture of neck that is characterized by forward cervical vertebral translation and upper cervical vertebral hyperextension (Sheikhhoseini et al., 2018). Forward head posture for prolonged period of time puts extra strain on posterior aspects of cervical region including ligaments which alters scapular kinetics and kinematics and affects quality of life and daily activities.

Increased compressive pressure on cervical spine tissues, especially the facet joints and ligaments are seen in forward head posture. In forward head posture hyperextension of upper

Submission: 26 June 2023; **Acceptance:** 26 June 2023

cervical spine (C1-C3) and lower cervical spine (C4-C7) flexion are seen (Sheikhhoseini et al., 2018).

The craniovertebral angle (CVA) is a measurement of upper cervical posture that is taken by calculating the angle between the tragus of the ear and a horizontal line passing through the spinous process of C7. If CVA higher, greater will be the forward head in relation to the neck (Kerry, 2003) Musculoskeletal diseases, including neck pain, headaches, and masticatory dysfunction, have been linked to head and neck position. As a result, it has been proposed that FHP treatment may be beneficial in the management of various illnesses (Moustafa et al., 2015).

Short flexor muscles in deep cervical region and scapular retractors of mid thoracic region are both weak in the forward head posture (i.e., rhomboids, middle and lower trapezius, serratus anterior,) and opposing cervical extensors and contraction of pectoralis (also called as upper crossed postural syndrome). Because correction of posture is under our conscious correction to some extent, a programme that incorporates postural evaluation and exercises specifically designed to correct posture could improve postural awareness of the participants and possibly change their terrible neck postures (Harman et al., 2005).

Stretching the shortened upper trapezius, sternocleidomastoid and levator scapulae help to treat forward head posture and it has been discovered that strengthening the deep cervical flexor muscle can be beneficial in forward head posture treatment, therapeutic exercise improves range of motion, decreases neck pain, and improves the asymmetrical muscle activity ratio.

Methodology

Participants were undergone screening by measuring craniovertebral angle before inclusion. AI Posture Evaluation and Correction System (APECS) was used to evaluate the participants. Participants with craniovertebral angle less than 50° were taken in the study. Total of 30 young adults with forward head posture were selected using convenient sample technique based on the inclusion and exclusion criteria after which the participants were given a thorough explanation of the study's methodology, and their signed informed consent were obtained. Participants were allocated into two groups such as Corrective exercise and Conventional group.

Corrective exercise group:
(a) Thoracic spine: Subject was asked to be in crook lying position with bolster placed horizontally on the scapula level of thorax and arms crossed across the chest. Then the subject was asked to roll on the bolster. Tender area was hold for 30 seconds.
(b) Sternocleidomastoid: Subjects were asked to stand with head tilted to the right and your left arm down till they feel a gentle stretch in the neck, then hold for 30 seconds.
(c) Upper trapezius: Participants were instructed to stand or sit and place one hand opposite the other on the side of the head. To attain a deeper stretch, the head was lowered to the shoulder and the neck was squeezed down with the hand overhead and then hold for 30 seconds.
(d) Lower trapezius: (prone floor scaption) The Subjects were instructed to lie prone on the floor. They were told to raise their upper body while letting their upper limb alone and the hold

for 30 seconds after those reps 10–15 with isometric hold for 2-second and eccentric hold for 4 second were performed.

(e) Deep cervical flexors: (quadruped ball chin tucks) The subjects were asked to be in quadruped position in front of the wall and a ball placed in between the head and the wall. Then asked to perform neck exercise 10 to 15 reps with isometric hold for 2-second and eccentric hold for 4 second**.**

Conventional group:
Conventional group did not receive any intervention.

Statistical analysis:
To compile and assess the collected data, descriptive and inferential statistics were employed. All metrics are reported as mean and standard deviation. A paired t-test was used to look at the changes that were statistically significant between the pre-test and post-test measurements. An unpaired t-test was used to report the differences that were statistically significant between the two groups, and a significance level of ($p<0.001$) was that threshold.

Results

From statistical analysis made with the quantitative data revealed statistically significant difference between the conventional protocol and neck and Intervention group.

Table 1: Pre and post-test values of corrective exercise group

APECS		MEAN	SD	t	P
Corrective exercise group	Pre test	22.187	2.409	18.1532	<0.001
	Post test	25.533	2.461		

Table 2: Pre and post-test values of conventional group

APECS		MEAN	SD	t	P
Conventional group	Pre test	25.720	3.467	17.8542	<0.001
	Post test	39.140	1.607		

Table 3: Post test values of corrective exercise and conventional group

APECS		MEAN	SD	t	P
Group-A	Post test	25.533	2.461	17.929	<0.001
Group-B	Post test	39.140	1.607		

Between Corrective exercise and conventional group there was a significant statistical difference, according to the study of the post-test for the AI posture evaluation and correction system (APECS).

Discussion

This study was conducted to evaluate and assess the efficiency of active correction exercises in forward head posture of young adults which had been conducted for a duration of 4 weeks. The goal of the study was to determine how the active correction exercise for the forward neck posture affected posture. AI posture correction and evaluation system were used to measure the outcomes. The mean value of pre-test was 25.720 and the post-test was 39.140 for conventional group and the mean value of pre-test was 22.187 and the post test was 25.533 for intervention group. In comparison to the control group, the effects were much more pronounced in experimental group. The result supported our hypothesis that the effects of active correction exercises results in improving the neck posture.

Users of smartphones frequently lean their heads to their screens for extended periods of time. As a result, individuals develop bad posture, including forward-head, round-shoulder, and slouched posture. Poor posture naturally causes changes in the neck's angle, lowers muscle performance, and exacerbates neck pain symptoms. A bad posture can be improved and prevented with upper body exercise. Exercises that strengthen and stretch the cervico-scapulothoracic region can help with good cervical and scapulothoracic alignment, as well as correct and prevent bad posture. Good cervico-scapulothoracic alignment will improve muscle performance and lessen back, neck, and shoulder pain symptoms (Caneiro et al.,2010).
The return of the normal afferentation process may have a direct impact on the restoration of normal posture. It has been suggested that the head, neck, and shoulder muscles become more stressed due to forward or away movement of head from the vertical axis of the body. Joint dysfunctions brought on by this aberrant head posture result in abnormal afferent information (Seaman et al.,1998; Grod et al.,2002).

Theoretically, it is reasonable to believe that reflexive, involuntary control plays a significant role in maintaining posture. A disturbance in the neuronal control of static upright human posture may be related to forward head posture since the head and neck region contains many reflexive postural control mechanisms (Morningstar et al.,2005).
These findings are in line with those made public by Diab16, who looked at the influence of head posture on three-dimensional parameters of spinal posture and concluded that “Improvement was seen in scoliotic posture in transverse, coronal, and sagittal planes with correction of forward head posture.” (Diab AA,2012).

These findings are consistent with neurophysiological research that has established a neurologic control of upright human posture in static position that is primarily influenced by posture of head. (Lee JH,2016; Ledin et al.,2003).

Conclusion

Between Corrective exercise and conventional group there was a significant statistical difference, according to the study of the post-test for the AI posture evaluation and correction system (APECS). As a result of this finding, it has been concluded that exercises on correcting forward head posture were more effective than conventional group.

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