RESEARCH ARTICLE

ASSOCIATION BETWEEN FORWARD HEAD POSTURE, PAIN SEVERITY AND DISABILITY IN UNDER-GRADUATE PHYSICAL THERAPY STUDENTS WITH NECK PAIN

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ABSTRACT

Background: Excessive neck flexion may lead to a forward head posture in which Craino-vertebral angle (CV angle) is decreased. Prolonged forward head posture may lead to postural impairment. Pain and disability of neck is increased with forward head posture. **Objective**: To find out the association of forward head posture with pain and disability in under-graduate physical therapy (PT) students. **Methodology**: A correlational study was conducted on n=34 male and female undergraduate PT students, with forward head posture. The n=34 participants were divided into group A having crainovertebral angle <50 with neck pain and without neck pain were assigned to group B. The Craniovertebral angle, Northwick Park Neck Pain Questionnaire and Numeric Pain Rating Scale were used to measure head posture, pain and disability. The Pearson moment correlation was used find association among the variables. **Results**: The mean age of study participants was 21.1±1.87. The results showed that there is no significant association ($p<0.05$) in both groups, between forward head posture (CV angle) with pain and self-perceived disability due to neck pain. **Conclusion**: Neck pain and disability showed no association with craniovertebral angle in both groups.

Keywords: Disability, neck pain, posture.

INTRODUCTION

Excessive neck flexion may lead to a forward head posture in which Craino-vertebral angle (CV angle) is decreased. Prolonged forward head posture may lead to postural impairment. Pain and disability of neck is increased with forward head posture. Forward head posture is assessed by the CV angle.[1] The CV angle can be measured while the patient is seated or standing. It is the landmark for the assessment of head and neck posture. A smaller CV angle indicates a greater forward head posture and less than 48-50 is defined as Forward Head Posture (FHP). FHP is identified by measuring CV angle. Measurement of CV angle is from C7 spinous process to tragus of ear.[2] Spinal deviation occurs due to prolonged sitting in poor posture during driving, texting and reading. Weakness of anterior neck muscles and tightening of posterior neck muscles due to muscle imbalance are the end result of FHP.[3]

Teenagers who are engaged in the excessive use of electronic tools for prolonged durations suffered from psychological problems like insomnia, depression, anxiety as well as fatigue, neck pain and faulty postural alignment such as forward head.[4] Prolonged period of neck flexion is a source of increased neck flexion angle. It is observed that there is a considerable difference in Craniovertebral (CV) angle on the basis of gender.[5] Yong- Soo Kong and colleagues conducted a study on smart phone users who have forward head position and neck pain. Spinal curve is not maintained in normal position because of musculoskeletal problems in neck and shoulder. Forward head posture is adopted when using a computer and smart phone with head down in long duration. The normal spinal curvature is not maintained because of the forward head posture adopted when using a computer or smartphone for a long time. Digital device users experience an increase in musculoskeletal problems in the neck and shoulder.[6] Eun-Kyung Kim and colleagues conducted a study to find the relation among forward head posture and associated neck pain. This study showed significant relationship between neck pain and FHP.[7] Kim conducted a study on neck pain in adults with forward head posture. Subjects having forward head posture experience pain in the head and neck region and their purposeful activities are restricted.[8] Hyun Jae Noh conducted a study to reveal such problems which are directly related to poor posture. Study indicated that bad head posture is frequently seen in clinical setups in subjects having neck problems.[9] Forward head posture cause neck pain and disability in students due to excessive head down activities. In other work places where head down posture was involved increased neck pain and

forward head posture. Advancement of technology and use of communication devices increase this problem. Computer workers, Smartphone users and students during reading or writing suffered neck pain with excessive head down posture.

There are many studies on pain and forward head posture; in this study two groups were involved to show the comparison either forward head posture has any correlation with neck pain. This study was based on diagnostic level assessment. There are no studies on physical therapy students to find the correlation among CV angle and associated neck pain. The purpose of this study was to determine the association between CV angle, neck pain and disability in undergraduate physical therapy students.

METHODOLOGY

A cross-sectional study was conducted among undergraduate students of Riphah international university, Lahore and The Sahara College, Narowal. The study was conducted from 30th March 2020 to 1st February 2021 after the approval of research ethical committee at Faculty of Rehabilitation and Allied Health Sciences, Riphah International University, Lahore (REC/RCRS/20/1050). Convenience sampling technique was used. Sample size was 34, calculated by online EPITOOL sample size calculator.[10] Male and female students with age ranged from 18-25 years with forward head posture with < 50 CV angle[(11)] and chronic neck pain were allocated in Group A while the students with forward head posture with <50 CV angle but without neck pain were allocated in Group B. Neck pain with paresthesia over upper limb, neck pain with numbness over the upper limb, chronic neck pain, pain during working, reading were included in the study while participants diagnosed with any previous trauma/fracture of neck, any surgical procedure to the neck, idiopathic scoliosis, spasmodic torticollis, bone cancer and neurological motion disorder were excluded from the study. Written informed consent was taken. Numeric Pain Rating Scale (NPRS) for pain assessment has a good construct validity ranged from 0.86 to 0.95 and Northwick Park Neck Pain Questionnaire (NPQ) that is used to assess self-perceived disability of neck pain. NPQ has good content and construct validity, high test-retest reliability ICC=0.94 and Cronbach's alpha=0.88.[12] Students were asked to complete NPRS and NPQ[13] and for the measurement of neck angle participants from both groups were examined by the one researcher. Picture of the participants lateral view was taken using a digital camera (Canon, model IXUS) placed and fixed 1.5 m away from the participants at their shoulder level. The angle measurements were carried out using AutoCAD Software Version 12.[11] A straight line drawn from the C7 vertebrae and a line joining this line straighten along the tragus of the ear. The point where both lines intersected was marked as C7 vertebrae and angle formed between these lines was measured.[14] Data was analyzed through SPSS version 25. Pearson correlations were used to measure the correlation of CV angle with pain and disability.

RESULTS

Participants were distributed into two groups i.e. group A with neck pain (n=17), group B without neck pain (n=17). Mean age of group A was 20.80 ±1.20 years and group B was 21.40 ±1.35 years. In Group A, 6 males and 9 females while in Group B, 3 males and 12 females were participated. Mean Values of outcome measure were shown in Table 1. Result showed insignificant differences between Craniovertebral angles, pain and disability. Craniovertebral angle was weakly positively associated with NPQ (r= .075, p=.790) of group A and weakly negative association with NPQ (r= -.266, p= .339) of group B shown in Table 1. NPQ for Group B was used to assess the self-perceived disability of the participant. Craniovertebral angle shows negative correlation with NPRS (r= -.303, p=.273) of group A shown in Table 1.

Table 1: Correlation among CV angle, NPQ and NPRS in Group A & B

Group A		Cranio-Vertebral (CV) Angle	
		48.40±3.22	
		r	*p-value*
Northwick Park Neck Pain Questionnaire	26.83±14.6	0.07	0.79
Numeric Pain Rating Scale	8.06±1.22	-0.30	0.27
Group B		**CV Angle**	
		49.5±4.26	
		r	*p-value*
Northwick Park Neck Pain Questionnaire (For self-perceived Disability)	7.31±6.5	-0.26	0.40

Significance level: p<0.05

DISCUSSION

The purpose was to compare the correlations of CV angle with neck pain and disability in participants with forward head posture in undergraduate students with and without neck pain. Weak correlations of CV angle were found with neck pain and disability. Reza Rajabi et al (2015) concluded that there is no relationship between neck pain and CV angle among PhD male students, with their prolonged study duration. The findings of this study show no affiliation of neck pain from graduate to PhD level males.[15] The current study revealed the negative correlation between CV angle and neck pain in undergraduate physical therapy students but it was a very weak relationship and does not lead to any significant result.

Age play an important role as a confounding factor in the relation between FHP and neck pain. The results of a systematic review showed that adults with neck pain show increased FHP when compared to asymptomatic adults and that FHP is significantly correlated with neck pain measures in adults and older adults. No association was found between FHP and most of neck pain measures in adolescents.[1]

In 2018 Arfa Naz et al conducted a study on prevalence of foward head posture among university students. The forward head posture is very prevalent among the university students. The lower the Craniovertebral angle, the greater the neck pain and disability in undergraduate physical therapy students showed no similarity with the current study.[16]

Arun et al in 2017 conducted a study on relationship among head posture, pain intensity, disability and flexor muscles. It revealed a significant moderate negative correlation of CVA with neck pain and a significantly weak negative correlation with disability.[17]

Limitation of the study was sample size because in cross sectional surveys a large sample size is required. There are some limitations of this study that the measurements were taken once, so that more measurements were found valuable for less chance of error. The key limitation of co-relational study is that it doesn't show cause and effect relationship. More researches on this topic should be taken with larger sample size and including more population from different areas to find significant results

CONCLUSION

It is concluded that there is no association of forward head posture with pain severity and disability in undergraduate physical therapy students.

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