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ORIGINAL RESEARCH

Prevalence of Forward Head Posture amongst Physiotherapy Students: A Cross-sectional Study

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ABSTRACT

Background: Forward head posture (FHP) is one of the commonest postural malalignment found in today's youth. This postural malalignment is one of the major cause of musculoskeletal (MSK) conditions in the body. If these postural changes are detected early, the MSK conditions can be treated as well as further progression can be prevented. Hence, the purpose of the study was to find out the prevalence of FHP amongst physiotherapy students.

Materials and methods: Total 50 participants were included in the study. Participants were evaluated for FHP using 'ON Protractor' mobile application via craniovertebral and craniohorizontal angle.

Result: Seventy percent of participants had forward head posture.

Conclusion: Prevalence of FHP is high amongst physiotherapy students.

Keywords: Forward head posture, Prevalence, Students.

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INTRODUCTION

Ideally, the human body should display a relaxed posture of shoulder and head. This relaxed posture is-nothing but external auditory meatus aligned in a straight line with acromion process of shoulder and chin tucked in.[1] 'Turtle neck posture' or 'forward head posture' is one of the common postural disorder. FHP is commonly described as-forward head with hyperextension of the cervical spine.[2]

Forward head posture is defined by Hertling et al. as follows: "When the head is held anteriorly, the line of vision will extend downward if the normal angle at which the head and neck meet is maintained. To correct for visual needs there is a tilting of the head backward [posterior cranial rotation (PCR)], flexion of the neck over the thorax, and posterior migration of the mandible."[3] This change in cervical joint position affects entire body balance, gait control, and postural awareness.[4] In the past decade, this postural deviation has been a topic of greater importance. This is due to various reasons-prolong exposure to television, computers, heavily loaded school bags, and backpacks.[5]

FHP is associated with tension neck syndrome, which results in stiffness, pain, and tenderness in neck and trapezius muscle. These spasm or trigger points around trapezius muscle and neck region, often turn out to be a disabling factor amongst the population in cervical and shoulder movement.[6] The symptoms of this syndrome may not just remain localized to the neck; pain may also occur between the shoulder blades or radiate down the arms or up to the skull.[5]

With FHP there also occurs affection to cervical joint position sense. A study by Pinsault et al. wherein cervical joint proprioception was assessed using cervico-cephalic relocation test to the neutral head position has shown to degradation of cervical proprioception along with muscular fatigue.[4]

FHP not only leads to another abnormal postures-protracted shoulder, thoracic kyphosis but also has a negative effect like-difficulty in breathing, palpitation, chest distress, sleep disorders and numbness of arm.[1,7] So in general, one can conclude that it has an effect on the entire body including the musculoskeletal, respiratory and nervous system. Also, a study by Ibrahim Mustafa et al. has shown positive results on correction of forward head posture in reducing pain due to lumbar radiculopathy.[8]

Owing to such ill-effects of FHP, it is necessary to evaluate the prevalence of forward head posture to avoid future complications amongst the population. Also, in the researcher's knowledge, there has been no study conducted to assess the prevalence of FHP amongst physiotherapist or physiotherapy students who themselves are involved in dealing with postural malalignment or other musculoskeletal problems. Hence, the purpose of this study was to find out the prevalence

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of forward head posture amongst physiotherapists and physiotherapy students.

MATERIALS AND METHODS

In this cross-sectional study, after obtaining Institutional Ethical Clearance, 50 participants of age between 20 and 30 years were included who were willing to participate. Out of these 50 participants, 5 were males, and 45 were females. Participants with recent surgery around the cervical or thoracic region or who were undergoing treatment for neck pain, postural syndrome and dysfunction were excluded. Participants not willing to participate in the study were also excluded from the study. Before starting the study, consent was obtained from the participants.

Procedure

Participants were made to sit on a stool in an erect posture; with hip and in the knee in 900 flexions and foot flat on the ground. Markers were placed at C7, tragus and canthus and participants were asked to concentrate on a particular point. LG Nexus 5× phone was used, wherein the mobile was placed on tripod stand to avoid error. Using 'ON Protractor' mobile application angles were measured for-craniovertebral and cranio-horizontal angles.[9]

Craniovertebral angle is the angle formed between the line joining the markers connecting C7 to tragus and a horizontal line from C7.[10] Cranio-horizontal angle is the angle formed by the markers connecting tragus to canthus and a horizontal line from tragus.[11] Photographs were clicked according to the mentioned procedure and participants having a craniovertebral angle between 490 to 590 were considered to have forward head posture.[12]

RESULTS

Table 1 gives information about mean and standard deviation of anthropometric data.

In this cross-sectional study, there were in total 50 participants recruited. Each participant was evaluated for anthropometric data and cervical angles.

Table 1: Mean and standard deviation of anthropometric data

Anthropometric data	*Mean ± SD*
Age	22.96 ± 2.21
Height	162.98 ± 8.28
Weight	58.38 ± 11.35
BMI	22.04 ± 3.92

Table 3: Percentage of participants with forwarding head posture

Total no. of participants	*Percentage prevalence of FHP*	*Percentage of normal head-neck posture*
50	70%	30%

Table 2 gives information about mean and standard deviation of Craniovertebral and craniohorizontal angle.

The study concluded that 70% of students had forward head posture and 30% of students had normal head-neck posture (Table 3 and Graph 1).

DISCUSSION

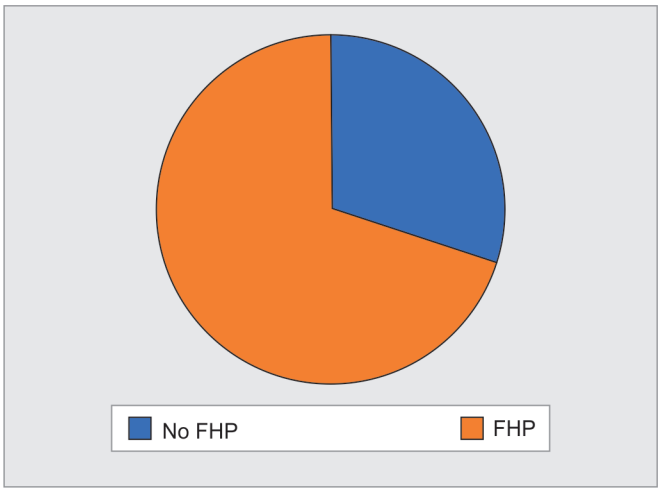
The study aimed to investigate the prevalence of FHP amongst physiotherapy students and physiotherapists. It was found that 70% of participants had forward head posture.

This prevalence was due to the difference in lifestyle. It was observed that participants were more of into use of laptops and attaining particular position or attaining improper posture for prolong period of time which could be one of the reasons behind forward head posture. Also, the work positions attained by them during standing, namely during assessment and treatment time could be one of the reason. Also, while working in standing position, especially during the treatment period, neck postures are asymmetric or at extremes flexion or in other words, in ergonomically inappropriate body position.[6]

Also, a study by Guan on the head and cervical posture while viewing mobile phone has revealed that while using a mobile phone, the user tends to attain FHP.[13] Increasing trend of mobile phone usage amongst youth is also a major contributing factor to the increased prevalence of FHP.

Table 2: Mean and standard deviation of craniovertebral and cranio-horizontal angle

Angles	*Mean ± SD*
Craniovertebral angle	55.94 ± 3.80
Cranio-horizontal angle	30.14 ± 4.85



Graph 1: Prevalence of forward head posture

A study by Netaji et al. also have same results, the study concluded that improper working position, poor ergonomics of chair, desk and computer position to be one of the confounding factors to forward head posture.[14] In a survey on Chinese adolescents in 2008, the prevalence of forward head posture was reported as high as 25%.[15] Pool et al. reported that patients with neck pain showed decreased ability in maintaining balance and gait. However, this study revealed that heavy computer users have relatively protruded heads and their COG was shifted anteriorly to maintain balance. In quantification of their balancing abilities, these individuals had posture imbalance and relatively reduced motor control ability.[16]

Lee et al. conducted a study wherein they found a correlation between FHP and MSK pain. The study concluded that with FHP, muscle activity of upper and middle trapezius, splenii and sternocleidomastoid was reduced. Also, head-on-trunk misalignment led to increased cervical lordosis along with increased thoracic kyphosis. This reduced muscle activity leads to an alteration in force-generating capacity of the muscle leading to changes in the length-tension relationship of the muscle.[17] This alteration in a length-tension relationship will lead to shortening of pectorals, upper trapezius, levator scapulae, sternocleidomastoid and lengthening of the lower and middle trapezius, serratus anterior, rhomboid major and minor. The overall effect will be spasm and trigger point formation around upper trapezius and reduced cervical range of motion. Analysis of prevalence amongst the population is necessary because this postural malalignment if screened early can help in treating these complications early.

CONCLUSION

Prevalence of forward head posture was found to be high amongst physiotherapists and physiotherapy students.

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