

# Prevalence of Forward Head Posture Amongst Physiotherapy Students - A Cross Sectional Study

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## ABSTRACT

**Background:** Forward head posture (FHP) described as excessive anterior positioning of the head in relation to a vertical reference line, involving increased cervical spine lordosis (upper cervical spine extended, lower cervical spine flexed) and rounded shoulders with thoracic kyphosis in later stages. Prevalence of forward head posture is high amongst children and adolescents due to excessive use of mobile phones and laptops. But very less studies have been done in India amongst physiotherapy students though their work routine is in prolonged standing position with neck flexed. So, aim of the study is to study the prevalence of FHP amongst population and further progression of this postural abnormality can be prevented.

**Materials and methodology:** 60 participants were recruited according to inclusion and exclusion criteria. Craniovertebral angle were evaluated through photogrammetry method, through Surgimap.

**Results:** In this study 60 students were evaluated, consisting of 40 females and 20 males. From 20 males, 12 males were identified as having FHP (60%), and the 40 females evaluated from that 30 females were identified as having forward FHP (75%). In this study the prevalence of total physiotherapy students identified having FHP is 42 out of 60, that is 70%.

**Conclusion:** Present study shows that prevalence of FHP amongst physiotherapy population is 70%.

**Keywords:** forward head posture, Craniovertebral angle, Surgimap, physiotherapy.

## INTRODUCTION

A good posture is defined as, keeping one's ears aligned with the shoulders and having the angel wings or shoulder blades retracted.<sup>(1)</sup>

Epidemiological studies have reported a high prevalence of spinal postural deviations in children and adolescent or people with all ages.<sup>(2)</sup> According to the previous study, FHP changes the biomechanical stress of the cervical spine and leads to musculoskeletal disorders such as cervical pain, headache, temporomandibular disorders and muscular dysfunctions.<sup>(3)</sup> Forward head posture (FHP) commonly recognized type of poor

head posture in the sagittal plane in population with cervical pain or (neck pain) or without cervical pain. But later stage it will cause definitely neck pain.<sup>(4)</sup>

Head and shoulder postural misalignments are causes of muscular imbalances surrounding the shoulder and upper thorax area. Like shortening of the upper trapezius, the splenius capitis, cervicis and semispinalis capitis, cervical erector spinae and the levator scapulae musculature.<sup>(5)</sup> This posture can change the position of the scapula on the thoracic wall and can decrease the ability of the scapula to rotate upwardly.<sup>(6)</sup>

To prevent these postural misalignments it is necessary to find out postural abnormality. Clinical assessment of FHP is based on the visual observation but this will give only qualitative measurement which is not reliable method, to find out quantitative measurement multiple objective methods have been used for measurement of the FHP.

For example, previous studies shows horizontal distance between vertical lines passing through the apex of thoracic kyphosis and the midcervical point and reported that this interval is 6 cm in normal posture.<sup>(3,7)</sup> Measuring the distance between anatomical references is a simple method to quantify FHP, but there is not enough information about the validity of this method.<sup>(8)</sup>

Other methods were used to evaluate this posture like the use of instruments including head posture and spinal curvature, electronic head posture,<sup>(3)</sup> cervical Range of Motion.<sup>(9)</sup> Imaging such as plain radiographs and photography were also used.<sup>(10,11,12)</sup> The use of photography, or photogrammetric method, to assess FHP has been reliable and sensitive. It is a valid method that correlates well with radiographs.<sup>(13)</sup> Further, it is a simple, feasible and economic method that can be used in various clinical settings.

One of the study has been done by Vlad Andrei Darabont that shows that physiotherapist have to adapt poor postures like forced or vicious work positions (twisted body, curved column, weight unevenly distributed on the lower limbs etc.) sitting work position for long periods of time with neck is in flexed position, Stress of certain group of muscles and joints by monotonous or repetitive movements especially in upper spinal area, shoulder area, and upper thorax area and manual handling of heavy loads for prolong period of time, this will cause postural abnormality and later on this will cause musculoskeletal related disorders in which FHP is most common postural abnormality. So to find out the prevalence in specific population is important so that further progression can be

prevented and treatment should begin as early as possible.<sup>(14)</sup> So aim of this study was to find out the prevalence of FHP amongst physiotherapy students.

## MATERIALS & METHODS

It is a cross sectional study; institutional ethical committee approved this study. Participants voluntarily participated in this study and written informed consent was obtained from all participants. All subjects were included according to inclusion and exclusion criteria. Inclusion criteria were physiotherapy student, age between 18 to 25, male and female individual. Participants were excluded who were undergoing treatment for neck pain, postural syndrome and dysfunction were excluded, if they had visual deficits, diagnosed balance disorders, or musculoskeletal pathologies (such as a history of shoulder surgery, or cervical or thoracic fractures, whiplash injury), if they were nonambulatory (using wheelchair); if they have functional or structural scoliosis; or if they had excessive thoracic kyphosis. All parameters were assessed through observation and examination.

60 participants of age between 18 to 25 years were included who were willing to participate in this study, out of 60 participants, 20 were male and 40 were female.

## OUTCOME MEASURES

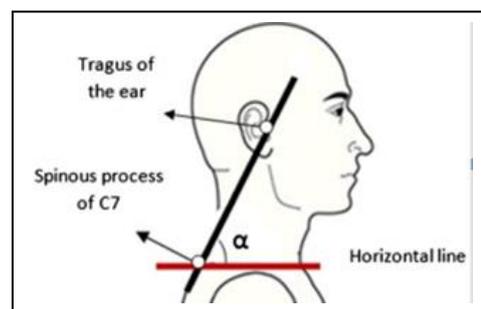


Figure 1: shows CV angle

CV angle, the angle formed at the intersection of a horizontal line through the spinous process of C7 and a line to the tragus of the ear. If the cervical angle is less than 50°, the participants were considered

having FHP. Angles were obtained through photogrammetry method in which Surgimap was used to take angle which has high reliability and validity.<sup>(15)</sup>

### PHOTOGRAMMETRY

<sup>(16)</sup> it is a digital imaging technique that is used to evaluate head and neck posture in the standing position. A digital camera (I phone 11 pro) was placed at a distance of 1.5 meter on a fixed base without rotation or tilt. The height of the camera was adjusted according to the individuals shoulder level. Patient was asked to achieve a self balanced position to standardize the head and neck posture, subjects were asked to move their head and neck into flexion and extension in the full range and gradually reduced the range of motion to cease movement and maintained the head and neck in the participant's neutral position and were then instructed to assume their neutral standing position on a paper sheet barefoot. The necessity of remaining in neutral posture during taking photographs was explained by the assessor. Double sided tape was used to identify landmark, so tape was place over landmark: over spinous process of C7, over external corner of eye, over tragus of the ear. The examiner locates the C7 spinous process by asking the subject to move the cervical spine into the flexion and extension. While doing extension the C7 spinous process is more prominent, and the C6 spinous process is absent on palpation. Photographs were assessed through Surgimap application. Participants if having CV angle less than 50 degrees<sup>(17)</sup> would be considered having forward head posture.

### RESULT

In this study 60 students were evaluated consisting of 40 females and 20 males. From 20 males, 12 males were identified as having FHP (60%), and the 40 females evaluated from that 30 females were identified as having forward FHP (75%). In this study the prevalence of total physiotherapy students identified having FHP is 42 out of 60 that is 70%.

Table 1: Mean and Standard Deviation of Age

AGE	MEAN±SD
Age	22.38±2.06

Table 2: Mean and Standard Deviation of Craniovertebral Angle

CRANIOVERTEBRAL ANGLE	MEAN±SD
CV Angle	46.748±5.773

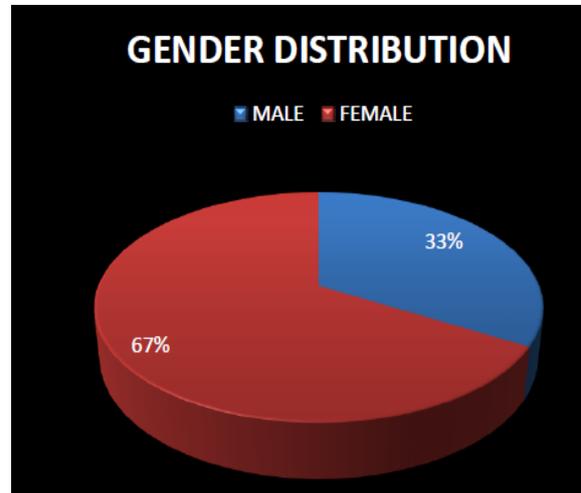


Figure 2: male and female distribution

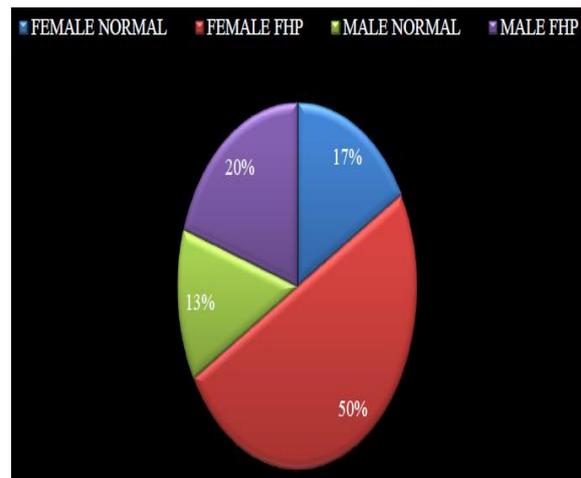


Figure 3: quantification of population with and without FHP

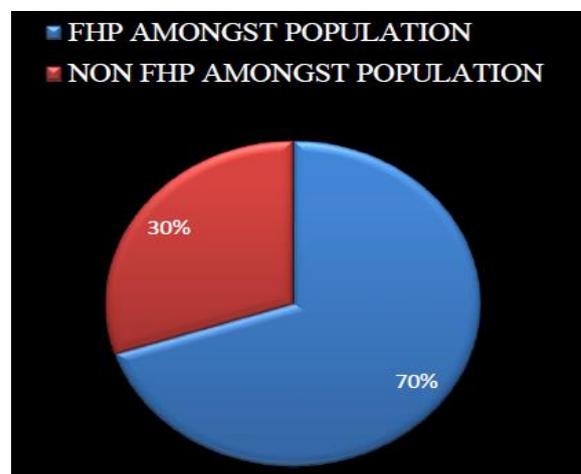


Figure 4: Prevalence of FHP amongst Population

## DISCUSSION

The study was intended to find the prevalence of forward head posture amongst physiotherapy population. As per the finding of the present study, out of 60 subjects 42 subjects were found to have forward head posture which is 70% of the total population. In the present study it was found that prevalence of FHP in female is more, that is 75% when compare to male which is 60%, this statement is also supported by other studies. This factor is due to psychosocial issues such as stress partly associated with secondary sexual characteristics.<sup>(18)</sup>This high prevalence of FHP is seen in different occupations with similar postures (FHP) like school going students, housewives, office workers, visual display terminal workers, dentists, and call center operators are supported by several articles for example in 2018, Shivani Lalitkumar Verma et al studied that prevalence of 63% of FHP among 12–16-year-old school going students.<sup>(19)</sup> Kenneth Ashok et al shows that prevalence of FHP amongst population is 60.63% in computer users.<sup>(20)</sup>A study by Laila Vakili et al shows that a prevalence of FHP amongst dentist is 85.5%.<sup>(21)</sup> Very less studies has been conducted on prevalence of FHP amongst physiotherapy students. As the study shows that 70% of population has FHP amongst physiotherapy population which is very high because of the modern lifestyle. It was observed that participants were more of into the use of laptops, mobile phones and attaining particular position or attaining improper posture for prolong period of time like constant working with patients during treatment time or in assessing for hours with poor posture like working in head down position so it will cause muscular imbalance which could be one of the reasons behind forward head posture. Many studies shows that FHP will lead to others abnormality like myofascial trigger points, cervicogenic headaches, neck pain and reduced lung capacity,<sup>(23)</sup> severe FHP will also affect the dynamic posture.<sup>(1)</sup> To prevent this symptom and to prevent further

musculoskeletal disorders it is necessary to find out prevalence of FHP amongst population so we can treat as soon as possible.

### Limitation of this study

sample size was too small, not evaluating contributing factors to this high prevalence of FHP such as working clinical hours, hours of using laptops and mobile phones.

## CONCLUSION

Present study shows that prevalence of FHP amongst physiotherapy population was 70%. This high prevalence suggests that there is a potential for the developing postural abnormality due to their work routine. For the future physiotherapist it is necessary to give knowledge about proper ergonomics to prevent musculoskeletal related disease.

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**Conflict of Interest:** there is no conflict of interest.

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**Ethical Approval:** Approved

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