

Original Article

## Prevalence of forward head posture and its impact on the activity of daily living among students of Adesh University – A cross-sectional study

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### ABSTRACT

**Objectives:** The aims and objectives of the study were to find the prevalence of forward head posture and to find its impact on activities of daily living in students of Adesh University.

**Materials and Methods:** After the approval from Ethical Committee of Adesh University Survey study was done. A total of 200 subjects were taken according to the inclusion criteria, i.e., craniovertebral angle  $<53^\circ$  from Adesh University, Bathinda by convenient sampling. CV angle was measured by knee registry application, and those who fit under inclusion criteria were given a Northwick park neck pain questionnaire to fill. Filled questionnaires were collected from the subjects.

**Results:** The data of 200 subjects was analyzed and it is found that out of 200 subjects, 146 were having forward head posture, whereas 54 were having normal head posture. The 73% prevalence of forward head posture was found in students. The most of the students were having mild or no pain and numbness in the day and during sleeping. Out of students who have reported moderate or severe neck pain, 8.21% shows that they were having pain during the whole day. The students who reported pain 54.79% show mild pain and 26.02% showed moderate pain while reading and watching TV.

**Conclusion:** It is concluded from the results of this study that there is 73% prevalence of FHP that affects only a little or no activity of daily living.

**Keywords:** Posture, Forward head posture, Activities of daily living, CV angle, Neck pain

### INTRODUCTION

The habit of repetitive use of computers, TV, mobile phones and videogames, and even Bag packs forces the body to exhibit bad posture.<sup>[1]</sup> With the associated muscle shortening and elongation due to muscular imbalance leads to malfunctioning of various parts of the body.<sup>[2]</sup>

From past few years, the head and cervical posture is a major problem due to the biomechanical relationship of head, cervical, and dentofacial structures.<sup>[3]</sup> The anterior positioning of the cervical spine leads to forward head posture and each 1-inch anterior positioning of the head put 10 lbs (4.5 kg) extra weight on the cervical spine, which causes dysfunction of musculoskeletal, Neural and vascular system.<sup>[4-6]</sup>

Many studies have been done to investigate the correlation of forward head posture and neck pain, which shows the decreased length of muscle fibers and decreased capacity of muscles

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to generate tension in forward head posture causes severe neck pain.<sup>[7]</sup> Apart from severe neck pain and muscular imbalance, the forward head posture exhibits symptoms such as fatigue, restricted range of motion, temporomandibular joint dysfunction, teeth clenching, pinched nerves, myofascial pain syndrome, headache, migraine, numbness, tingling in arms and hands, and muscle spasm which ultimately hampers the activity of daily living.<sup>[7,8]</sup> The lack of awareness of posture while working is major factor in causing improper posture of head and neck so the current study was conducted to check the prevalence of forward head posture and its impact on activity of daily living in students so that the proper awareness of posture and ergonomic advise can be given to students to deal with the neck pain.

## MATERIALS AND METHODS

After approval from the Ethical Committee of Adesh University, the written and verbal informed consent was taken from the subjects. Both male and female subjects with an age group of 18–30 years were included in the study. The subjects who were having history of fracture, malignancy, infection, progressive neuromuscular deficit, and myelopathy were excluded from the study. A total of 200 subjects were selected and screened for forward head posture by measuring craniovertebral angle with the help of knee registry application. The subjects whose craniovertebral angle was  $<53^\circ$  were diagnosed as forward head posture. Procedure for assessment of forward head posture was been explained to them.

- A digital imaging technique (knee registry application) was used to evaluate head and neck posture in the standing position
- A mobile was placed at a distance of 150 cm on a tripod stand and height was adjusted according to the level of the subjects shoulder
- The subject was asked to stand in front of camera and was asked to face straight and lateral to camera
- The photo was clicked, and in knee registry application in jpg format. The line was drawn from the spinous process to tragus of ear, and the angle was measured.

### Craniovertebral angle

- The craniovertebral angle is commonly used as a measure to diagnose forward head posture by calculation the angle found at the intersection of a line drawn from the tragus of the ear through the spinous process of C<sub>7</sub> Vertebra and a horizontal line through C<sub>7</sub> Vertebra.<sup>[9]</sup>

The subjects with forward head posture were given Northwick Park Neck Pain Questionnaire to fill to check the effect of forward head posture on activity of daily living.

### Northwick pain rating scale

This questionnaire has been designed to give the information as how the neck pain has affected the ability to manage in everyday life. It covers the following components:<sup>[10]</sup> [Annexure I]

- Pain intensity
- Pain and sleeping
- Pins, needles, and numbness
- Duration of symptoms
- Carrying
- Reading and watching TV
- Working/housework, etc.
- Social activities
- Driving.

## RESULTS

The data of 200 subjects were analyzed using mean percentage to check the prevalence, and it is found that out of 200 subjects, 146 were having forward head posture whereas 54 were having normal head posture. The 73% prevalence of forward head posture was found in students. These 146 students with forward head posture were given Northwick park pain questionnaire to see impact on the activity of daily living. The results obtained from the duly filled questionnaire shows that the students have only mildly affect activities of daily living due to their forward head posture. The most of the students were having mild or no pain and numbness in the day and during sleeping also. Out of students who have reported moderate or severe neck pain, 8.21% shows that they were having pain during the whole day, whereas other activities such as carrying weight, working, doing social activities, and driving were mildly effected with forward head posture. The students who reported pain 54.79% show mild pain, and 26.02% showed moderate pain while reading and watching TV.

The data collected from the subjects with forward head posture in the form of a questionnaire are described [Table 1].

**Table 1:** Distribution of data of Northwick park neck pain questionnaire scoring 0–4, i.e., 0 shows no pain, 1 shows mild pain, 2 shows moderate pain, 3 shows fairly severe pain, and 4 shows severe pain.

S. No.	Section	Q Score				
		0	1	2	3	4
1	Intensity of pain	84	41	15	6	0
2	Pain during sleeping	68	73	5	0	0
3	Numbness	86	60	0	0	0
4	Duration of symptoms	88	25	18	3	12
5	Carrying objects	30	96	7	13	0
6	Reading and watching TV	22	80	38	5	1
7	Pain during work	49	91	4	2	0
8	Problem in social activities	98	43	4	1	0
9	Problem in driving	51	31	2	0	0

## DISCUSSION

The cross-sectional study was done with the main objective to find the prevalence of forward head posture in students and to observe that up to what level the forward head posture affects the activity of daily living in students. From the results of the students, it is found that there is 73% prevalence of forward head posture in the students, which can be due to their routine of study with the flexed neck. Another cross-sectional study done by Mamania and Anap to find the prevalence of forward head posture among physiotherapy students and they have also found that there is 70% of prevalence of forward head posture in physiotherapy students and they found that that students were spending most of the time on books, laptop, and mobile which might be the reason of their result.<sup>[11]</sup>

Furthermore, 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.<sup>[12]</sup> Increasing trend of mobile phone usage among youth is also a major contributing factor to the increased prevalence of FHP.<sup>[11]</sup>

The forward head posture is not associated only with pain, but it also has effects on breathing, palpitation, sleep disorders, and numbness in limbs.<sup>[13,14]</sup> Hence, we can say that it effects the respiratory, musculoskeletal, and nervous system. Due to these completions, it is necessary to check the prevalence of forward head posture in the population to prevent them from further complications.<sup>[11]</sup>

In our study, we found no or mild problems in activities of daily living in students of Adesh University who were having forward head posture. The results of impact of forward head posture on activities of daily living were not significant. As the population selected for the study were mostly physiotherapy students who might be aware of complications of forward head posture and might be taking some precautions so in the results the impact were not significant. The study can be done on a large number of populations. Exercises can be given to prevent forward head posture. Ergonomics can be advised before structural changes occur.

## CONCLUSION

The result of the study shows 73% prevalence of forward head posture in students and the forward head posture affects the activity of daily living to some extent. Postural correction is under our conscious control, so a program that includes postural assessment and exercises explicitly designed to improve posture could increase the postural awareness of participants and potentially change their habitual postures.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

### Conflicts of interest

There are no conflicts of interest.

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## ANNEXURE

## ANNEXURE - I

**Optimal Performance Physical Therapy**

Northwick Park Neck Pain Questionnaire

Name: \_\_\_\_\_ Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Please read: This questionnaire has been designed to give us information as to how Neck Pain has affected your ability to manage in everyday life. Please answer every section and mark in each section ONLY the ONE BOX which applies to you. We realize you may consider that two of the statements in any one section relate to you, BUT PLEASE MARK THE ONE BOX THAT MOST CLOSELY DESCRIBES YOUR PROBLEM.

- **Section 1 - Pain intensity**
  - a. I have no pain at the moment
  - b. My pain is very mild at the moment
  - c. My pain is moderate at the moment
  - d. My pain is fairly severe at the moment
  - e. My pain is very severe at the moment.
- **Section 2 - Pain and sleeping**
  - a. My sleep is never disturbed by pain
  - b. My sleep is occasionally disturbed by pain
  - c. My sleep is regularly disturbed by pain
  - d. Because of pain I have <5 h sleep in total
  - e. Because of pain I have <2 h sleep in total.
- **Section 3 - Pins, needles or numbness in arms at night**
  - a. I have no pins and needles or numbness at night
  - b. I have occasional pins and needles or numbness at night
  - c. My sleep is regularly disturbed by pins and needles or numbness
  - d. Because of pins and needles or numbness I have <5 h sleep in total
  - e. Because of pins and needles or numbness I have <2 h sleep in total.
- **Section 4 - Duration of symptoms**
  - a. My neck and arms feel normal all day
  - b. I have symptoms in my neck or arms on walking, which last <1 h
  - c. Symptoms are present on and off for a total period of 1-4 h
  - d. Symptoms are present on and off for a total of more than 4 h
  - e. Symptoms are present continuously all day.
- **Section 5 -Carrying**
  - a. I can carry heavy objects without extra pain
  - b. I can carry heavy objects, but they give me extra pain
  - c. Pain prevents me from carrying heavy objects, but I can manage medium weight objects
  - d. I can only lift light weight objects
  - e. I cannot lift anything at all.
- **Section 6 – Reading and watching TV**
  - a. I can do this as long as I wish with no problems
  - b. I can do this as long as I wish, if I'm in a suitable position
  - c. I can do this as long as I wish, but it causes extra pain
  - d. Pain causes me to stop doing this sooner than I would like
  - e. Pain prevents me from doing this at all.
- **Section 7 – Working/housework, etc.**
  - a. I can do my usual work without extra pain
  - b. I can do my usual work, but it gives me extra pain
  - c. Pain prevents me from doing my usual work for more than half the usual time
  - d. Pain prevents me from doing my usual work for more than a quarter of the usual time
  - e. Pain prevents me from working at all.
- **Section 8 – Social activities**
  - a. My social life is normal and causes me no extra pain
  - b. My social life is normal but increases the degree of pain
  - c. Pain has restricted my social life, but I am still able to go out
  - d. Pain has restricted my social life to the home
  - e. I have no social life because of pain.
- **Section 9 – Driving (if applicable)**
  - a. I can drive whenever necessary without discomfort
  - b. I can drive whenever necessary, but with discomfort
  - c. Neck pain or stiffness limits my driving occasionally
  - d. Neck pain or stiffness limits my driving frequently
  - e. I cannot drive at all due to neck symptoms.
- **Section 10 – Compared with the last time you answered this question, is your neck pain.**
  - a. Much better
  - b. Slightly better
  - c. The same
  - d. Slightly worse
  - e. Much worse.