

## THE PREVALENCE OF REDUCED UPPER CERVICAL MOBILITY AND NECK DISABILITY AMONG UNIVERSITY COMPUTER WORKERS

Dr. Yash Patel<sup>1\*</sup>, Dr. Nupur Shah<sup>2</sup>

<sup>1</sup>\* FYMPT student, L.J. Institute of Physiotherapy, Ahmedabad, Gujarat, India

<sup>2</sup>Assistant professor at L.J. Institute of Physiotherapy, Ahmedabad, Gujarat, India

\*Corresponding Author: yash66769@gmail.com

ISSN: 2321-5690  
DOI: <https://doi.org/10.63299/ijopt.060450>

### ABSTRACT

**Background:** Prolonged computer use raises the risk of neck disability and decreased upper cervical mobility, particularly for university employees. Musculoskeletal imbalances brought on by repetitive and static postures can result in discomfort, limited mobility, and functional limitations.

**AIM:** This study aims to determine the prevalence of reduced upper cervical mobility and neck disability in university computer workers.

**Methodology:** This cross-sectional study was conducted among 100 university computer workers aged between 18 to 65 years. The assessment was carried out using the cervical flexion-rotation test to assess restriction in upper cervical mobility and the Neck Disability Index questionnaire to assess neck disability in university computer workers.

**Result:** In this study conducted among 100 computer workers, the mean age of the participants was 37.03 years, and the average daily computer use duration was 6.69 hours. During the cervical flexion-rotation test, 20% of the participants were found to have limitations in upper cervical mobility. An assessment through the Neck Disability Index (NDI) revealed that 52% of the participants reported no disability, 39% had mild disability, 8% showed moderate disability, and 1% experienced severe disability, while none reported complete disability.

**Conclusion:** The study indicates that a small portion of computer workers experience upper cervical mobility limitations and varying degrees of neck disability. While over half reported no disability, a notable percentage exhibited mild to severe impairments, highlighting the need for ergonomic interventions and preventive measures.

**Keywords:** university computer workers, Cervical flexion-rotation test, Neck Disability Index questionnaire.

### INTRODUCTION

Neck pain is the pain experienced anywhere from the base of the skull at ear level to the upper part of the back or shoulder.(1)People of all ages experience neck pain, a common musculoskeletal complaint that can significantly impact daily activities and quality of life. Numerous factors, such as bad

posture, strained muscles, degenerative illnesses like cervical spondylosis, or traumatic injuries, can cause it. Depending on the underlying cause, physical therapy, ergonomic changes, medication, and, occasionally, interventional procedures are used to treat neck pain.(2)(3)

The term "Neck Disability" refers to the functional limitations and restrictions in day-to-day activities resulting from cervical spine disorders or neck pain. It can lower a person's quality of life by impairing their ability to carry out daily activities, such as driving, working, or even taking care of themselves.(4)(5)

Computer use at workstations has become widespread among university employees. Most office workers are required to spend long hours on a computer, which places increased physical and mental strain on them.(6) It is well established that poor posture while working, repetitive computer tasks such as typing and using a mouse, and prolonged sitting can lead to symptoms affecting the neck, upper limbs, thoracic spine, and lower back in computer users.(7)

Extended computer use during daily work activities and recreational time is frequently associated with neck pain. There is a clear link between neck pain and computer use, primarily due to extended periods of sitting in a fixed posture without taking breaks to relax the neck muscles.(1) Neck posture is defined as the alignment of the cervical spine. The cervical spine normally has a slight lordotic curvature. However, maintaining a fixed position during prolonged computer use can lead to poor neck posture, which may disrupt the natural curvature of the neck.(8) Forward head posture has become increasingly common in today's society. it is characterized by the head being positioned in front of the shoulder's midline. it is caused by several factors, with prolonged computer use and insufficient rest for the neck muscles being among the most common. These changes are often associated with poor posture, which can lead to neck pain.(9) Sustained computer use with the neck bent forward can cause the anterior neck muscles, like the scalene, sternocleidomastoid muscles, are shorten and become tighter, while the posterior neck muscles, like the trapezius, levator scapulae, and semispinalis capitis muscles, may become lengthened and weakened.(1)

Other Factors, such as the length of computer use, frequency of breaks, typing technique, monitor placement, and the type and usage of input devices, are also linked to the development of neck pain in computer workers.(1)

The most commonly used questionnaire for assessing neck pain is the Neck Disability Index

(NDI). It was first created to assess everyday living activities in patients who had incapacitating neck pain, especially whiplash-related neck pain. Ten questions make up the NDI, seven of which look at functional activities, two of which enquire about symptoms, and the last of which asks about focus.(5)

The flexion-rotation test is recognized as a technique to distinguish between rotational movements occurring at the upper cervical spine and those at the lower cervical spine. This test is typically conducted passively. During the passive flexion-rotation test, the patient lies on their back. An examiner gently moves the patient's neck into full flexion to create tension in the structures of the middle and lower cervical spine. Afterward, the examiner passively rotates the patient's head to each side while maintaining the flexed position. Considering that the C1/C2 motion segment contributes to 40-60% of the overall cervical range of motion, this test specifically assesses movement at that segment. A positive test is indicated by restricted range of motion accompanied by firm resistance, a 10-degree difference between the painful and non-painful sides, and the presence of pain upon testing.(10)

Due to poor ergonomics and extended sitting, university computer workers frequently experience neck pain and decreased cervical mobility, making this study crucial. Despite its widespread use, there is little scholarly research on it. By identifying risks and refining interventions, an understanding of these issues can improve staff productivity and well-being.

This study aims to determine the prevalence of reduced upper cervical mobility and neck disability in university computer workers.

## METHODOLOGY

Ethical approval was obtained from the Institutional Ethics Committee (No. LJIPT/IEC/16/2024) of L.J. Institute of Physiotherapy, L.J. University.

Study design: Cross-sectional study.

Sampling method: Convenient sampling.

Study duration: 6 months.

Study setting: university.

Study population: University computer workers.

### Inclusion Criteria:

- Full-time employees who have been working at the university for at least 6 months.
- Individuals aged between 18 and 65 years.
- Working hours are between 3 to 8 hours.

### Exclusion Criteria:

- Individuals with a history of significant trauma to the neck or upper spine. (within 6 months)
- Those with prior surgical interventions in the cervical spine. (within 6 months)
- Individuals with neurological disorders or other conditions affecting musculoskeletal function.

### Procedure

The participant was informed about the procedure and the purpose of the study, and consent was obtained for the study. Selection of the participants was made as per the inclusion and exclusion criteria of the research study. Demographic data were recorded, where the working hours/day. The cervical flexion rotation test was performed on the participants to check restriction in the cervical range of motion. Following this, the participants were asked to complete the neck disability index questionnaire to assess the disability of the neck.

### Cervical flexion-rotation test

The patient was in a supine lying position, and the examiner flexed the cervical spine fully to block the rotational movement below the atlantoaxial joint. Then, the examiner passively rotated the head left and right. Normal rotation in the flexed position should be about 45° each way. Maintaining the flexed position is more likely to isolate the rotation to the C1–C2 area so that C1–C2 dysfunction may be evident if the rotation is less (hypomobility) or more (hypermobility) than normal. For determining C1/2 segment movement impairment and the Cervical Flexion Rotation Test (CFRT) exhibits strong diagnostic validity and inter-tester reliability. (11)(12)

### Neck disability index questionnaire

The NDI questionnaire is a patient-completed, condition-specific functional status questionnaire with 10 items, including pain, personal care, lifting, headaches, concentration, work, driving, sleeping,

and recreation. The NDI has a fair to moderate test-retest reliability in patients with neck pain.

The NDI has 10 sections in which the participant is asked to answer every section, and in each section, mark only one box that applies to the participant.

Each section is scored on a 0–5 rating scale, in which 0 means “No Pain” and 5 means “Worst imaginable pain.” Points are then summed to a total score. A higher score indicates more patient-rated disability.

The neck disability index is a commonly used and reliable instrument for evaluating neck-related disability because it has good construct validity and excellent reliability across a range of populations and conditions. (4)(5)

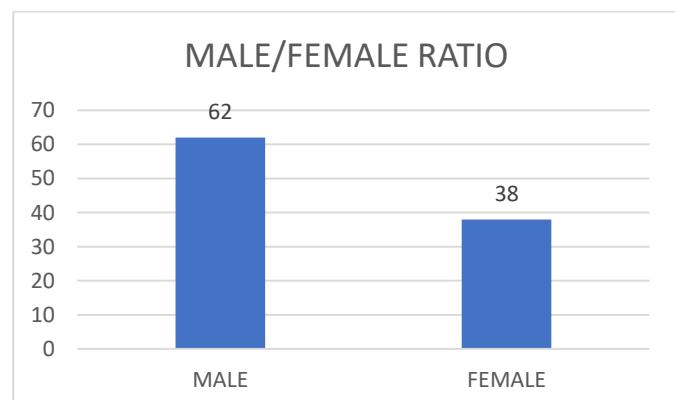
### RESULT

In this study, 100 computer workers were assessed. The mean age of participants was 37.03 years, and the average duration of daily computer use was 6.69 hours. Microsoft Office was used for performing descriptive statistics, and percentages were recorded.

Male	Female
62	38

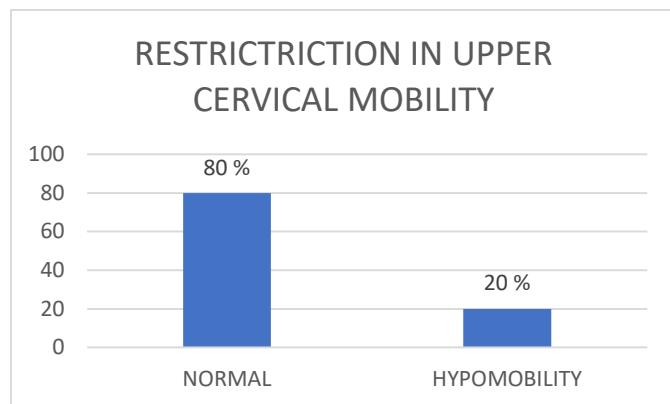
Table 1: Male and female ratio

This table demonstrates the male and female ratio of the study. In this study, 62 males and 38 females participated.



Graph 1: The graph illustrates the male and female ratio among university computer workers.

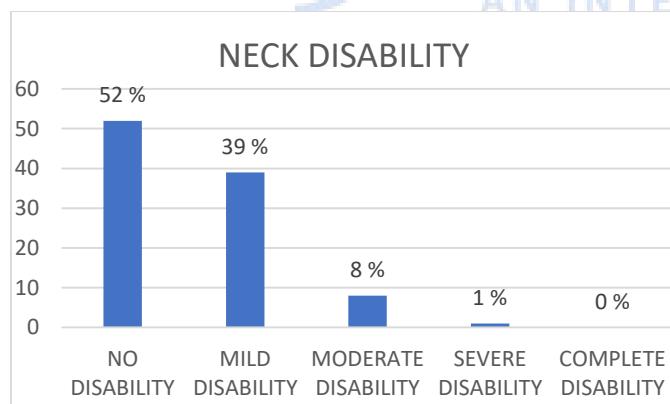
This graph demonstrates the male and female ratio of the study. In this study, 62 males and 38 females participated.



Graph 2:- The score of Restriction in the upper cervical mobility in the number of university computer workers by using the cervical flexion-rotation test.

The provided bar graph demonstrated the results of a cervical flexion-rotation test conducted on computer workers to assess upper cervical mobility. The graph compares the percentage of workers with no restriction in mobility to those with restrictions.

This graph demonstrates that 80% computer workers have no restriction and 20% have a restriction in upper cervical mobility.



Graph 3:- This graph demonstrates the percentage of disability that is derived from the Neck Disability Index in university computer workers.

The image presents a bar graph demonstrating Neck Disability Index (NDI) scores among computer workers. The graph displays the percentage of workers reporting different levels of disability, ranging from no disability to complete disability. The scores are derived from the NDI questionnaire.

The graph indicates that 52% of the computer workers reported no neck disability, while 39% have experienced mild disability, 8% have moderate disability, and 1% have severe neck disability.

## DISCUSSION

This study aimed to find the prevalence of upper cervical mobility and neck disability in university computer workers with prolonged use of computers.

In this study conducted on 100 computer workers, the mean age of participants was 37.03 years, and the average duration of daily computer use was 6.69 hours. During the cervical flexion-rotation test, 20% of the participants were found to have limitations in upper cervical mobility. This restriction can be attributed to factors such as prolonged computer use, poor posture, and musculoskeletal pain commonly associated with sustained static positions. These findings suggest early signs of cervical dysfunction, particularly in the upper cervical spine, which may lead to issues such as cervicogenic headaches or reduced neck mobility if left unaddressed.

Assessment through the Neck Disability Index (NDI) revealed that 52% of the participants reported no disability, 39% had mild disability, 8% showed moderate disability, and 1% experienced severe disability, while none reported complete disability. Although over half of the workers exhibited no signs of neck-related functional limitation, the presence of mild to moderate disability in nearly half of the sample indicates a growing occupational health concern. These results highlight the importance of preventive strategies such as ergonomic adjustments, postural training, and regular physical activity to mitigate the risk of developing chronic neck pain and functional impairment among computer users.

In a study by Sandeep Kumar et al., it was shown that the results showed a statistically significant positive correlation between level of pain and working hours ( $r = 0.185$ ), level of disability and working hours ( $r = 0.165$ ), as well as pain and level of disability ( $r = 0.798$ ). (13)

In a study by Yakshi Bhardwaj et al., it was shown that the prevalence of neck pain was 99.2% and disability due to neck pain was 65.8%. (9)

## LIMITATION

The small sample size may limit the study's conclusions.

## FUTURE IMPLICATION

To improve the overall credibility and strength of the study's conclusions, future research should use a much larger and more diverse population sample. This will help produce results that are more reliable and broadly applicable.

## CONCLUSION

According to the study's findings, a small percentage of participants had restrictions in their upper cervical mobility, which were primarily linked to issues like pain, bad posture, and extended computer use. According to the Neck Disability Index results, a smaller percentage of participants reported moderate to severe impairment, while the majority reported minimal to mild disability. These results emphasise how crucial it is to treat cervical mobility problems and encourage good posture, especially in people who use computers for extended periods of time. Effective strategies for enhancing cervical mobility and lowering neck disability require more investigation.

## REFERENCES

1. Nejati P, Lotfian S, Moezy A, Nejati M. The study of correlation between forward head posture and neck pain in Iranian office workers. *Int J Occup Med Environ Health*. 2015;28(2):295–303.
2. Vos T, Abajobir AA, Abate KH, Abbafati C, Abbas KM, Abd-Allah F, et al. Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *The Lancet*. 2017 Sep 16;390(10100):1211–59.
3. GBD 2016 Disease and Injury Incidence and Prevalence Collaborators. Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet Lond Engl*. 2017 Sep 16;390(10100):1211–59.
4. Saltychev M, Pylkäs K, Karklins A, Juhola J. Psychometric properties of neck disability index – a systematic review and meta-analysis. *Disabil Rehabil*. 2024 Nov 5;46(23):5415–31.
5. Vernon H, Mior S. The Neck Disability Index: a study of reliability and validity. *J Manipulative Physiol Ther*. 1991 Sep 1;14(7):409–15.
6. Ergonomics & Computer Use | University Health Services [Internet]. [cited 2025 Jul 4]. Available from: <https://uhs.princeton.edu/health-resources/ergonomics-computer-use>
7. Computer work and musculoskeletal disorders of the neck and upper extremity: A systematic review | BMC Musculoskeletal Disorders [Internet]. [cited 2025 Jun 9]. Available from: <https://link.springer.com/article/10.1186/1471-2474-11-79>
8. Cho J, Lee E, Lee S. Upper thoracic spine mobilization and mobility exercise versus upper cervical spine mobilization and stabilization exercise in individuals with forward head posture: a randomized clinical trial. *BMC Musculoskelet Disord*. 2017 Dec 12;18(1):525.
9. Bhardwaj Y, Mahajan R. Prevalence of Neck Pain and Disability in Computer Users. 2015;6(8).
10. The flexion–rotation test performed actively and passively: a comparison of range of motion in patients with cervicogenic headache: Journal of Manual & Manipulative Therapy: Vol 23, No 2 [Internet]. [cited 2025 Jun 9]. Available from: <https://www.tandfonline.com/doi/abs/10.1179/2042618614Y.0000000085>
11. Hall TM, Briffa K, Hopper D, Robinson KW. The relationship between cervicogenic headache and impairment determined by the flexion-rotation test. *J Manipulative Physiol Ther*. 2010;33(9):666–71.
12. A perspective on the use of the cervical flexion rotation test in the physical therapy management of cervicogenic headaches | Archives of Physiotherapy [Internet]. [cited 2025 Aug 11]. Available from: <https://www.archivesofphysiotherapy.com/index.php/aop/article/view/2807>

13.Lecturer, University College of Physiotherapy,  
Baba Farid University of Health Sciences, India,  
Kumar S. "Analysis of disability and pain in  
Computer Professionals with Neck Pain." IOSR J  
Nurs Health Sci. 2013;3(1):06–9.

ISSN: 2321-5690

