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# TO ANALYZE THE FREQUENCY OF UPPER CROSSED SYNDROME AND THE EXTENT OF NECK DISABILITY AMONG IT PROFESSIONALS

**[1]*Dr. Jyothi Seshan, [2]Dr. Senthil Selvam, [3]Dr. Sundaram and [4]I. Umashankar**

[1]M.P.T (Ortho), Asst. Prof in School of Physiotherapy, VISTAS, Thalambur, Chennai.

[2]M.P.T (Ortho), Ph. D, Prof & HOD in School of Physiotherapy, VISTAS, Thalambur, Chennai.

[3]M.P.T (Sports), Ph. D, Prof in, School of Physiotherapy VISTAS, Thalambur, Chennai.

[4]B.P.T Final Year Student in School of Physiotherapy VISTAS, Thalambur, Chennai.

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***Corresponding Author**
**Dr. Jyothi Seshan**
M.P.T (Ortho), Asst. Prof in School of Physiotherapy, VISTAS, Thalambur, Chennai.

## ABSTRACT

**Background:** The previous research Junaid Chandsaheb Mujawar, et al. have stated that occurrence of upper cross syndrome in laundry workers is more due in appropriate position during their work. The present study is focused upper crossed syndrome among IT professionals due to their postural abnormality during their work reported by Junaid Chandsaheb Mujawar et al. **Aim and Objectives:** The aim of the study is to analyze the frequency of upper crossed syndrome and the extent of neck disability among IT professionals. **Methods:** Sixty IT professionals were in included in this study who fulfilled the inclusion criteria. The subjects were taken to observe the frequency of upper crossed syndrome and the extent of neck disability. The outcome measures used were Neck disability index (NDI), Pectoralis major contracture test, Trapezius weakness test. **Results:** The result shows that the mean value for Neck Disability Index (NDI)- 13.0, Pectoralis major contractue test (0.38), and Trapezius weakness test (0.42). **Conclusion:** The study observed that 38.3% affected with upper cross syndrome showed positive result for pectoralis major contracture test and 41.7% affected with upper cross syndrome showed positive result for trapezius weakness test.

**KEYWORDS:** Upper crossed syndrome, Neck disability, Pectoralis major contracture test, Trapezius weakness test.

## INTRODUCTION

The World Health Organisation defines work related musculoskeletal disorders as 'an appropriate nomenclature for constellation of disorders that have been shown to have strong association with one or more place exposure'.[17]

Computers have entered our daily, personal, commercial and military lives. Worldwide 15-25% of all computer users are estimated to have work related musculoskeletal disorders. About 76% of computer professionals in India reported musculoskeletal pain and discomfort in various epidemiological studies. Studies done in Western countries and in India show a high prevalence of musculoskeletal disorders in computer professionals and computer users.[17]

Intensive computer use is associated with increased risk for musculoskeletal disorders. Although the physical demand of computer work may be relatively low in terms of the forces and moments generated, the static postures maintained by the body during computer use has been identified as a major risk factor for work related musculoskeletal disorders among computer users.[5]

In particular, static neck and upper limb postures associated with computer use has been linked with prolonged low level muscle activity in neck shoulder stabilizers, which in turn may contribute to substantial loading in the musculoskeletal system.[5]

Muscular imbalances can have certain consequences in the body. Janda classifies these muscular imbalance patterns into three types including upper cross syndrome, lower cross syndrome, and layered syndrome. The upper cross syndrome occurs in the neck and the scapular areas. In this syndrome, upper posterior and anterior muscles in the neck, which are tonic muscles, are shortened and the lower posterior muscles of the spine in the neck area and the lower posterior muscles of the scapulae, which are mainly phasic muscles, are restrained, stretched, and weekened.[6]

Upper cross syndrome is a common postural dysfunctional pattern that describes the dysfunctional tone of the musculature of the shoulder girdle/cervicothoracic region of the body.this condition is given its name because an 'X', in other words a cross, can be drawn across the upper body. One arm of the cross indicates the muscles that are typically tight/overly facilitated and the other arm of the cross indicates the muscles that are typically

weak/overly inhibited. The term rounded shoulders is often used to describe the rounded forward shoulder girdle and arm posture that is part of the upper crossed syndrome. This condition is designated as the upper crossed syndrome because a similar postural dysfunctional pattern called the lower crossed syndrome is found across the pelvic girdle/lumbosacral region.[16]

Upper cross syndrome(UCS) is also implied as proximal or shoulder support crossed confusion. In upper coss syndrome, coziness of the upper trapezius and levator scapulae on the dorsal side crsses with coziness of the pectoralis major and minor. Weakness of the significant cervical flexors ventrally crosses with inadequacy of the middle and lower trapezius this case of unevenness makes joint brokenness, particularly at the atlanto occipital joint C4-C5 area, cervicothoracic joint, glenohumeral joint and T4-T5 involved smaller.[4]

Upper cross syndrome (UCS) is defined as the tightness of the upper trapezius, pectoralis major, pectoralis minor, levator scapulae and weakness of deep flexors of neck, middle and lower trapezius, serratus anterior. This syndrome otherwise known as proximal or shoulder griddle crossed syndrome. This syndrome mainly arises as a result of improper posture which leads to muscular imbalance. Individuals who present with upper crossed syndrome will show a forward head posture (FHP), hunching of thoracic spine (rounded upper back), elevated and protracted shoulders, scapular winging and decreased mobility of the thoracic spine.[2]

Individuals who present with upper cross syndrome will show a forward head posture(FHP), hunching of the thoracic spine(rounded upper back), elevated and protracted shoulders, scapular winging, and decreased mobility of the spine. The simultaneous occurrence of forward head posture and rounded shoulder is nothing but upper cross syndrome.[3]

The syndrome mainly arises as a result of muscular imbalance that usually develops between tonic and weak muscles. There are two types of muscles present in our body – postural muscle such as pectoralis major, upper trapezius and sternocleidomastoid and other phasic muscles such as deep neck flexors and lower trapezius. Pectoral muscle tightness and neck pain present as the main symptoms associated with upper cross syndrome. Lower and middle trapezius is weak, and forward head –and- neck posture is present.[3]

The prevalence of CANS among those with occupational use of computers has been reported to be in the range of 54%-64% in European studies. A study done in Asia also revealed a similar prevalence of 64%. Pectoral muscle tightness is the most common, and the first sign is showed with 34%. Lower trapezius muscle weakness is common and showed with 34%. Middle trapezius muscle weakness is also common and showed with 36%.[3]

While sitting, forward head position includes flexion of lower cervical region, extension of upper cervical region, and rounded shoulders, which in average reduces the length of muscle fibers, resulting in extensor torque around the joints of cervical region. This abnormal state results in musculoskeletal abnormalities which includes decreased scapular upward rotation, greater internal rotation and anterior tilt, resulting in difficulty to maintain upright siiting posture. Antagonistic muscular imbalances, upper cross syndrome give rise to postural disturbance.[2]

## AIM OF THE STUDY

The aim of the study is to analyze the frequency of upper crossed syndrome and the extent of neck disability among IT professionals.

## OBJECTIVE OF THE STUDY

- To analyze the frequency of upper cross syndrome among IT professionals.
- To analyze the extent of neck disability among IT professionals.

## NEED OF THE STUDY

Most of the study shown prevalence of neck disability and shoulder discomfort but the evidence of upper cross syndrome is not shown in IT workers, so the need of the study is to find out the prevalence and functional disability of neck in upper crossed syndrome which is used for further study and ergonomic intervention.

## BACKGROUND OF THE STUDY

The previous research Junaid Chandsaheb Mujawar, et al, 2019, have stated that occurrence of upper cross syndrome in laundry workers is more due in appropriate position during their work. The present study is focused upper crossed syndrome among IT professionals due to their postural abnormality during their work.

## METHODOLOGY

➢ **Study Type**

- Non-experimental study

➢ **Study Design**

- Convenient sampling

➢ **Study Duration**

- 4 week

➢ **Study Setting**

- HCL Technology

➢ **Sample Size**

- 60 samples

## SAMPLE SELECTION

**Inclusion Criteria**

- IT professionals
- Male
- Age group 20-40
- Working with computer for more than 5 hours.

**Exclusion Criteria**

- Occasional computer users.
- History of postural and structural deformity
- Recent fracture around the shoulder
- Recent surgery

## OUTCOME MEASURE

- Neck disability index (NDI) questionnaire
- Pectoralis major contracture test
- Trapezius weakness test

## MATERIALS REQUIRED

- Couch

- Pillow
- Pen
- Questionnaire

**PROCEDURE**

Individuals are explained about the procedure and selected according to the inclusion and exclusion criteria. Informed consent was taken from all the included subjects before starting the procedure the study.60 subjects were recruited in the study. Pre -test (pectoralis major contracture test and trapezius weakness test) was done before and post -test after th intervention.

**1. PECTORALIS MAJOR CONTRACTURE TEST**

**Purpose:** To check the pectoral muscle tightness

**Patient Positon**

The patient lies supine and clasps the hands together behind the head.

**Procedure**

The arms are then lowered until the elbows touch the examining table.

**Positive Result**

A positive test occurs if the elbows do not reach the table and indicates a tight pectoralis major muscle (Fig 1)

**Fig 1: Pectoralis major contracture test.**

## 2. TRAPEZIUS WEAKNESS TEST

### Middle trapezius muscle

### Patient Position

The patient position is prone lying with the arms abducted to 90 degree and laterally rotated.

### Therapist Position

The test involves the examiner resting horizontal extension of the arm watching for retraction of the scapula, which should normally occur.

### Positive Result

If scapular protraction occurs, the middle fibers of trapezius are weak (Fig 2).

### Lower trapezius muscle

### Patient Position

The patient position is prone lying with the arm abducted to 120 degree and shoulder laterally rotated.

### Therapist Position

The examiner applies resistance to diagonal extension and watches for scapular retraction that should normally occur.

### Positive Result

If scapular protraction occurs, the lower trapezius is weak (Fig 3).

**Fig 2: Middle trapezius weakness test.**

**Fig. 3: Lower trapezius weakness test.**

## DATA ANALYSIS AND INTERPRETATION

**Table 1: Neck Disability Index (Ndi).**

| NDI | MEAN | SD | SE |
|---|---|---|---|
| | 13.00 | 7.85 | 1.01 |

**TABLE 1: Shows the mean value of Neck Disability Index(NDI)**

**GRAPH 1**

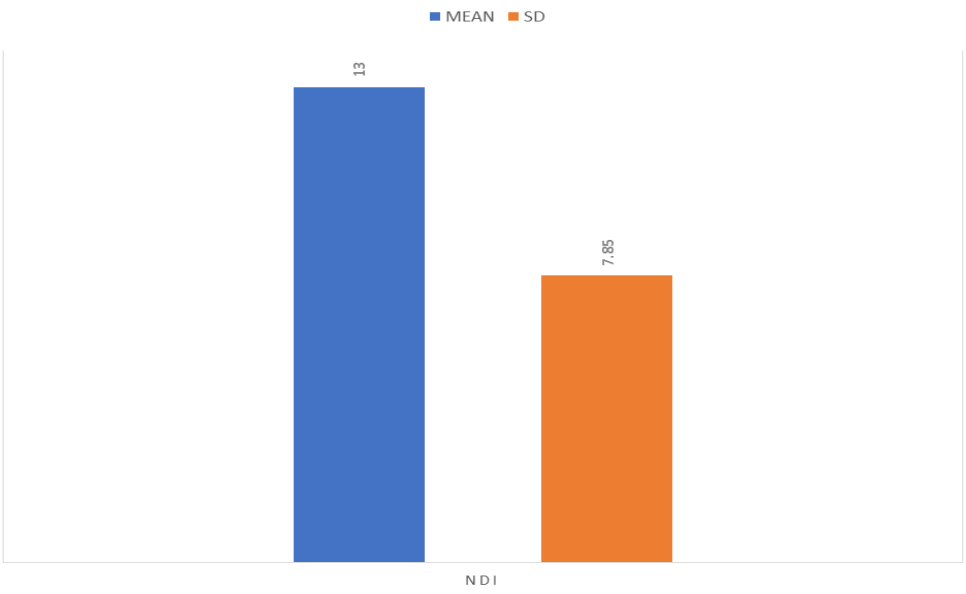


**Table 2: Pectoralis Major Contracture Test.**

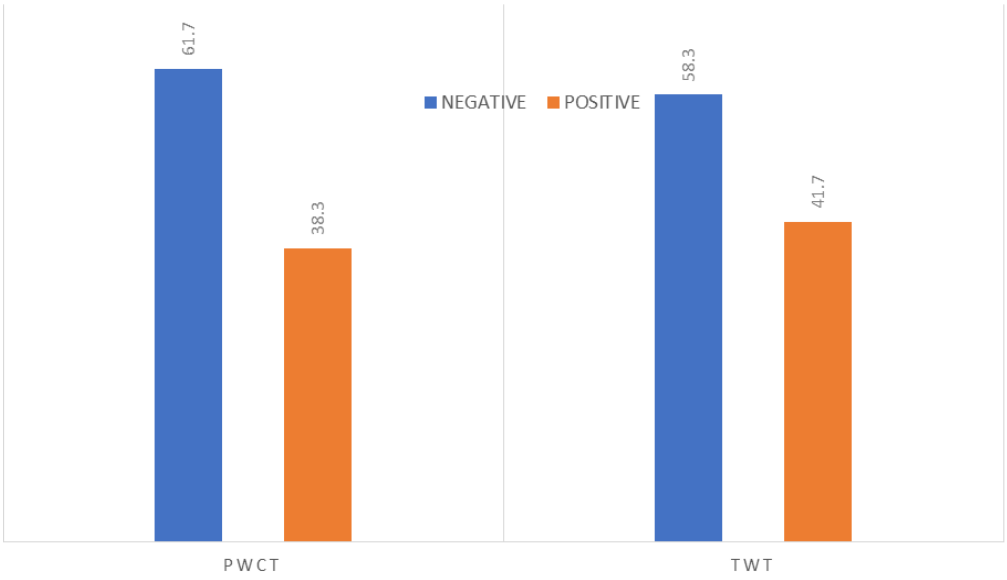
| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| | 0 | 37 | 61.7 | 61.7 | 61.7 |
| | 1 | 23 | 38.3 | 38.3 | 100.0 |
| | Total | 60 | 100.0 | 100.0 | |

Table 2: Shows the percentage of individuals showed positive result for pectoralis major contracture test.

**Table 3: Trapezius Weakness Test.**

| TWT | | | | | |
|---|---|---|---|---|---|
| | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | 0 | 35 | 58.3 | 58.3 | 58.3 |
| | 1 | 25 | 41.7 | 41.7 | 100.0 |
| | Total | 60 | 100.0 | 100.0 | |

**Table 3: Shows the Percentage of Individuals Showed Positive Result For Trapezius Weakness Test.**




**Graph 2 and Graph 3.**

## RESULTS

### Table 1

From the above given table, it has been arrived to the descriptive statistics, mean, standard deviation and standard error is calculated for NDI (13.0).

**Table 2**

From the above given table, it has been arrived to the descriptive statistics, 38.3% of individuals showed positive result for pectoralis major contracture test. 23 individuals were affected with upper cross syndrome by evaluation of pectoralis major contracture test.

**Table3**

From the above given table, it has been arrived to the descriptive statistics, 41.7% of individuals showed positive result for trapezius weakness test. 23 individuals were affected with upper cross syndrome by evaluation of trapezius weakness test.

## DISCUSSION

The aim of the study is to analyse the upper cross syndrome and the extent of neck disability among IT professionals.

The sample in this study with upper cross syndrome was evaluated with pectoralis major contracture test, trapezius weakness test and neck disability index (NDI).

According to the result the present study, the mean value of pectoralis major contracture test (0.38), trapezius weakness test (0.42) and neck disability index (NDI) (13.00).

A study by Juniad Chandsaheb Mujawar, Javid Hussain Sagar et al, 2019, reported the impact and extent of upper cross syndrome. He found a significant prevalence of upper cross syndrome in laundry workers. Neck pain presents as the main symptom, these patients also present with forward head and neck posture.[3]

A study by Grace P.Y. Szeto, Keith S.W. et al, 2007, examined the effects of angled position of computer display screen on muscle activities of the neck- shoulder stabilizers and reported that higher muscle activities with angled screen position may indicate greater biomechanical exposure that may in turn contribute to musculoskeletal disorders, especially with prolonged computer use.[5]

A study by Razieh Karimian, Nader Rahnama, Gholamali Ghasemi, Shahram Lenjannejadian et al, 2019, reported prevalence of upper cross syndrome is 11-60% in different societies and ages.

Hence, it is concluded with 23 individuals showed positive result for pectoralis major contracture test and 25 individuals showed positive result for trapezius weakness test among 60 IT professionals.

## CONCLUSION

The study concluded that 38.3% affected with upper cross syndrome showed positive result for pectoralis major contracture test and 41.7% affected with upper cross syndrome showed positive result for trapezius weakness test.

### Limitations of The Study

- The population included in this study were only Men, as because of nature of this study it was necessary to evaluate without clothing.
- Small samples only taken for this study.

### Recommentations of The Study

- This study can conduct for females.
- UCS software application can be used for precise diagnosis.

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