

# Prevalence of Cervicogenic Headache among Hospital Working Nurses - A Case Control Study

Dr. Krutika Kale<sup>1</sup>, Dr. Chitra Mridha<sup>2</sup>, Dr. Ashwini Malokar<sup>3</sup>

<sup>1</sup>MPTH, <sup>2</sup>Professor, <sup>3</sup>MPTH;

<sup>1,2,3</sup>Department of Neurophysiotherapy, Dr. Ulhas Patil College of Physiotherapy, Jalgaon.

Corresponding Author: Dr. Krutika Ishwarrao Kale

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## ABSTRACT

**Aim:** To find out prevalence of cervicogenic headache among hospital working nurses.

**Background:** Cervicogenic neck pain and headache can be closely related in nurses as they often work long hours in physically demanding positions which can lead to poor posture and musculoskeletal issues and headache.

**Procedure:** This Case-Control study was conducted on 230 nursing staffs and screened through flexion rotation test for which 140 subjects were tested positive. They were recruited using convenient sampling method. A neck and headache disability index were filled out form subjects.

**Results:** The prevalence rate of neck disability index was found as 31.4% and headache disability index was found as 27.14 %.

**Conclusion:** There is high prevalence of cervicogenic neck pain and headache among hospital working nurses.

**Keywords:** Cervicogenic Headache, Headache disability index, Neck disability index.

## INTRODUCTION

Nursing is the very Nobel profession which is the heart and soul of the healthcare system.

<sup>(1)</sup> Cervicogenic neck pain and headache can be closely related in nurses as they often work long hours in physically demanding positions which can lead to poor posture and musculoskeletal issues and headache. Nurses play a crucial role in patient care. <sup>(2)</sup> They are on the front-line and at the point of care, 24 hours a day, 7 days a week and are the most visible faces who provide a critical surveillance function in healthcare organizations, particularly in hospitals, by monitoring care and safeguarding patients. <sup>(3)</sup> India currently has 1.7 nurses per 1,000 people, compared to the World Health Organization (WHO) norm of 3 nurses per 1,000. The low nurse-patient ratio leads to increased workload, lengthy working hours,

multiple shifts, and other factors contributing to poor treatment quality. <sup>(4)</sup>

Cervicogenic headache can impact job performance and productivity, and it can affect their ability to provide an optimal patient care. <sup>(5)</sup> A cervicogenic headache (CGH) presents as unilateral pain that starts in the neck and is referred from bony structures or soft tissues of the neck. It is a common chronic and recurrent headache that usually starts after neck movement. It usually accompanies a reduced range of motion (ROM) of the neck. It could be confused with a migraine, tension headache, or other primary headache syndromes. <sup>(6)</sup>

The actual source of pain originates not in the head but in the cervical spine joint complex. Structures innervated by cervical nerves C1-C3 have been shown to be capable of producing cervicogenic headache pain. Possible sources of pain include the C2-C3

intervertebral disk annular fibres, muscles, joints, ligaments, and related dura mater of the upper cervical spine.<sup>(7)</sup>

According to Bogduk (1992), pain sensitive structures in the neck that are innervated by nociceptive fibers from cervical spinal nerves, especially cervical spinal nerves one (C1), two (C2) and three (C3), have the potential to refer pain into the head. The pain is perceived in the forehead, orbital region, temporal region, vertex or ears, and thus, manifests as a headache.<sup>(8)</sup>

Patients usually complain of unilateral pain without a side shift. It is ordinarily predominant in females. Pain topography usually stems from the neck, spreading to the oculo frontotemporal area with episodes of carrying duration or fluctuating continuous pain increased by head movement. Pain is of variable duration and moderate to severe intensity, but not excruciating or throbbing.<sup>(9)</sup>

According to the WHO (2016), headache is a symptom of a range of neurobiological disorders and adults aged 20 to 50 years are most likely to suffer. Globally, an estimated prevalence of headache experienced by adults at least once during the preceding year is around 50%. Occurrence of headache for 15 or more days every month affects 1.7 - 4% of this population. Headache occurs in both sexes and in all age groups but the highest prevalence is among women between 20 and 50 years.<sup>(10)</sup>

IHS diagnostic criteria for cervicogenic headache

A. Pain localized to neck and occipital region. May project to fore-head, orbital region, temples, vertex, or ears.

B. Pain is precipitated or aggravated by special neck movements or sustained neck posture.

C. At least one of the following:

1. Resistance to or limitation of passive neck movements.
2. Changes in neck muscle contour, texture, tone, or response to active and passive stretching and contraction.
3. Abnormal tenderness of neck muscles.<sup>(11)</sup>

The flexion–rotation test performed actively and passively: a comparison of range of motion in patients with cervicogenic headache. The FRT-P has been found to have a high degree of sensitivity (90–91%) and specificity (88–90%) when used to examine patients with Cervicogenic Headache. Hall and Robinson found the FRT-P to be positive in patients with Cervicogenic Headache originating from C1/C2. Significant differences have been shown in FRT-P results when comparing Unilateral rotation ROM in patients with Cervicogenic Headache to those with migraine headaches and multiple headache forms.<sup>(12)</sup>

The Neck Disability Index (NDI) can be used to assess neck pain and disability in nurses, just like it can be used for individuals in various professions. Ultimately, the NDI can provide valuable insights into how neck pain affects the quality of life and work performance of nurses, which can inform targeted strategies for prevention and treatment. Questions include activities of daily living, such as: personal care, lifting, reading, work, driving, sleeping, recreational activities, pain intensity, concentration and headache.<sup>(13)</sup>

The Headache Disability Index (HDI) is a tool used to assess the impact of headaches on a person's daily life and functioning. The HDI typically includes questions related to the frequency, severity, and duration of headaches, as well as how headaches affect activities like work, social interactions, and daily tasks. To quantify the impact of headache of daily living, it includes a 25-item headache disability inventory (HDI) which probes the functional and emotional effects of headache on everyday life. The HDI has high internal consistency reliability and good content validity.<sup>(14)</sup>

The purpose of studying cervicogenic headache among nurses is to understand the scope of the issue within this specific occupational group and evaluate the overall physical and mental health as well as the quality of life and again assessing how it affects nurses' performance including

absenteeism, reduced productivity and the quality of patient care.

## MATERIALS & METHODS

### Materials -

Pen, Paper, Plinth, Informed consent form, Questionnaire

### Methodology-

- Sample Size – 230
- Study Type- Case Control Study
- Study Design- Cross Sectional study design.
- Target Population- Nurses working in hospital.
- Sampling method - Convenient sampling method.
- Study Setting - Dr. Ulhas Patil Medical College and Hospital Jalgaon.
- Study duration- 1 year.

### Inclusion criteria.

- a) Age between 31- 50 years.
- b) Subjects who have intermittent or continuous neck pain and headache.
- c) Subjects who were willing to participate.

### The Exclusion criteria

- a) Subjects having previous trauma or accident.
- b) Subjects with neurological symptoms.
- c) Subjects with any musculoskeletal injury.
- d) Subjects having migraine, vertigo, tension headache, Any cervical instability, cervical myelopathy, occipital neuralgia, intracranial pathology and vascular pathologies of neck should be ruled out.

### Outcome measures

1. Neck Disability Index<sup>(13)</sup> (ICC = 0.92).
2. Headache disability Index<sup>(14)</sup> (ICC=0.89)

## PROCEDURE

To conduct the following study ethical clearance was obtained from the institutional ethics committee. The purpose & procedure of the study was explained to participant. A

written consent was obtained from participants. The sample size was found to be 230. Subjects were taken according to inclusion and exclusion criteria. A screening test was performed using Flexion – Rotation test to differentiate from other condition. After screening 140 subjected were tested positive for the results and then were provided with question are of neck disability index and headache disability index.

### • Flexion Rotation test<sup>(13)</sup> –

- i. Patient Position – Supine- lying
  - ii. Procedure - An examiner passively positions the patient’s neck into full flexion to pre-tension the structures of the middle and lower cervical spine, then the patient’s head is passively rotated each direction while the flexed position is maintained.
  - iii. Since the C1/C2 motion segment accounts for 40–60% of the total cervical ROM, this test is intended to isolate motion at that segment.
  - iv. The flexion–rotation test has been described as a method to differentiate rotational motions taking place at the upper versus lower cervical spine.
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- ### • Interpretation –
- i. Criteria for a positive test consists of ROM restriction with firm resistance.
  - ii. A 10-degree difference in motion between painful and non-painful sides, and pain provocation.

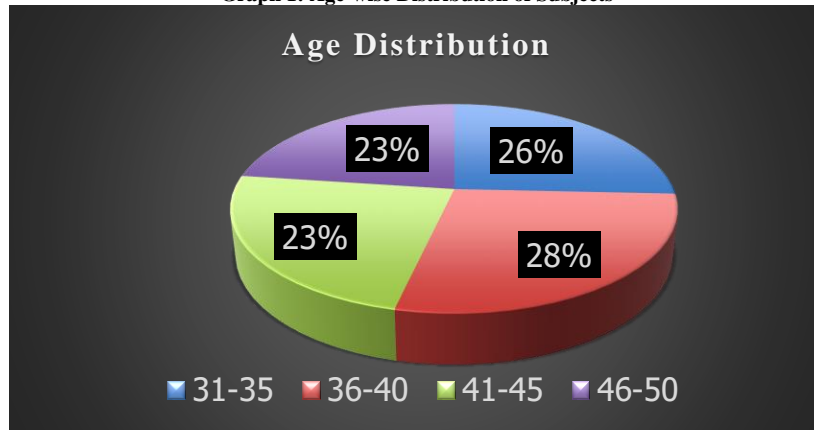
## DATA ANALYSIS

Data was entered in excel spreadsheet, tabulated and subjected to statistical analysis. Data was analysed by using Graph pad Instat, checking the prevalence of pain and disability among hospital working nursing Dr. Ulhas Patil Medical College and Hospital.

Table 1: Age-wise Distribution of Subjects

Sr No	Age	No. of Subjects	Percentage
1.	31-35	36	26%
2.	36-40	39	39%
3.	41-45	33	33%
4.	46-50	32	32%

Graph 1: Age-wise Distribution of Subjects

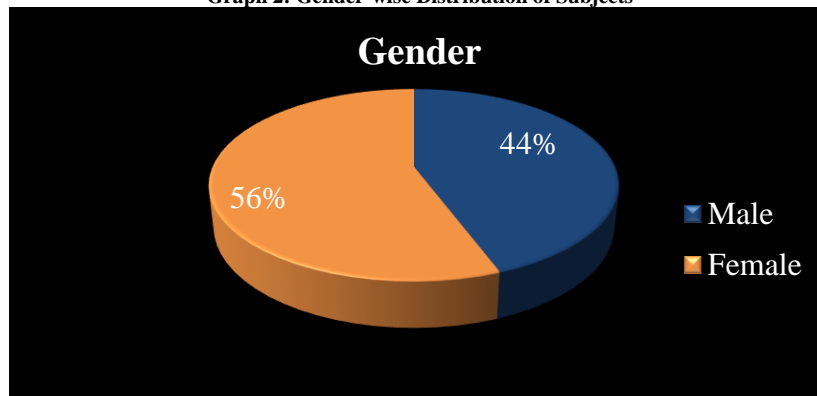


**Comment:** The table and Graph no. 1 shows age wise distribution of subjects of which in 31- 35 includes 26 subjects, 36-40 includes 39 subjects, 41-50 includes 33 subjects and 46- 50 includes 32 subjects

Table 2: Gender-wise Distribution of Subjects

Sr No.	Gender	No. of Subjects	Percentage
1.	Male	62	44%
2.	Female	78	56%

Graph 2: Gender-wise Distribution of Subjects

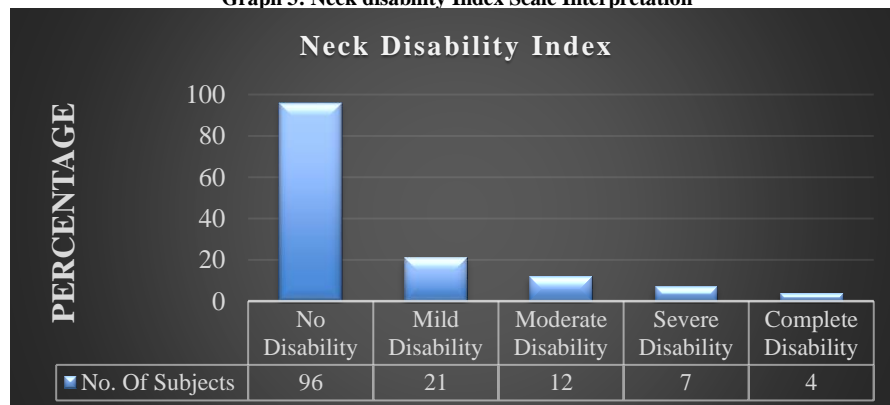


**Comment:** Table and Pie Diagram no. 2 shows gender wise distribution of subjects of which 62 were males & 78 were females out of 140 subjects.

Table 3: Neck disability Index Scale Interpretation

Sr. No	Score	Interpretation	No. of Subjects
1.	0-8%	No Disability	96
2.	10-28%	Mild Disability	21
3.	30-48%	Moderate Disability	12
4.	50-64%	Severe Disability	7
5.	70-100%	Complete Disability	4

Graph 3: Neck disability Index Scale Interpretation

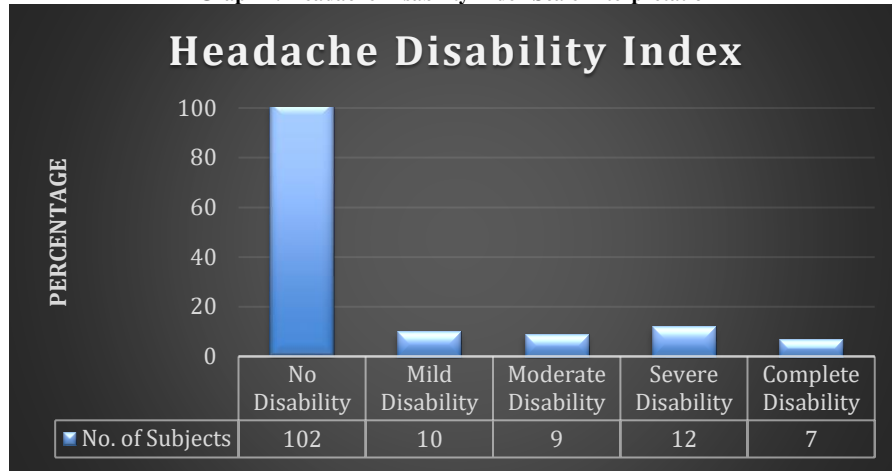


**Comment :** Table 3 & Graph 3 interpretes males. The neck disability index interprets there were 96 subjects with no disability, 21 subjects with mild disability, 12 subjects with moderate disability, 7 subjects with severe disability and 4 subjects with complete disability.

**Table 4: Headache Disability Index Scale Interpretation**

Sr. No	Score	Interpretation	No. of Subjects
1.	0-10%	No Disability	102
2.	10-28%	Mild Disability	10
3.	30-48%	Moderate Disability	9
4.	50-68%	Severe Disability	12
5.	72%<	Complete Disability	7

**Graph 4: Headache Disability Index Scale Interpretation**



**Comment:** Table 4 & Graph 4 interprets there were 102 subjects with no disability, 10 subjects with mild disability, 9 subjects with moderate disability, 12 subjects with severe disability and 7 subjects with complete disability.

## RESULT

A total of 230 subjects were assessed for the study. The Flexion-Rotation screening test was performed to differentiate cervicogenic headache from other conditions and 140 subjects were found to be positive for the tests. The age of 31- 35 includes 26 subjects, 36-40 includes 39 subjects, 41-50 includes 33 subjects and 46- 50 includes 32 subjects. There was a total of 78 females and 62 males. The neck disability index interprets there were 96 subjects with no disability ,21 subjects with mild disability, 12 subjects with moderate disability, 7 subjects with severe disability and 4 subjects with complete disability. The headache disability index interprets there were 102 subjects with no disability, 10 subjects with mild disability, 9 subjects with moderate disability, 12 subjects with severe disability and 7 subjects with complete disability.

The prevalence rate of neck disability index was found as 31.4% and headache disability index was found as 27.14.

## DISCUSSION

The primary aim of the study was to find out the prevalence of Cervicogenic headaches among hospital working nurses.

The prevalence rate of neck disability index was found as 31.4%. In Sub analysis it was found that there were 96 subjects with no disability ,21 subjects with mild disability, 12 subjects with moderate disability, 7 subjects with severe disability and 4 subjects with complete disability.

The prevalence rate of headache disability index was found as 27.14 %. In sub analysis it was found that there were 102 subjects with no disability, 10 subjects with mild disability, 9 subjects with moderate disability, 12 subjects with severe disability and 7 subjects with complete disability.

About 70 percent of cases of cervicogenic headache involve pathology of the C2-3 zygapophyseal joint, making it the most frequent source.<sup>(15)</sup>

Less common sources of cervicogenic headache include the upper cervical

intervertebral discs, C3-4 zygapophyseal joint, and lower cervical zygapophyseal joints.<sup>(16)</sup>

The C1-C3 nerves relay pain signals to the nociceptive nucleus of the head and neck, the trigeminocervical nucleus. From the trigeminal nerve and the upper three cervical spinal nerves. This connection is thought to be the cause of referred pain to the occiput and/or eyes. Aseptic inflammation and neurotransmission within the C-fibers caused by cervical disc pathology are thought to produce and worsen the pain in a cervicogenic headache. The trigeminocervical nucleus receives afferents from the trigeminal nerve and the upper three cervical spinal nerves. A lower pain threshold makes patients more susceptible to more severe pain. For this reason, early diagnosis and therapeutic intervention are very important.<sup>(17)</sup>

From the biomechanical aspect, the risks are characterized by load lifting, frequency and intensity of execution of the tasks, repeatability, excessive use of force, vibrations and mechanical compressions, usually associated with incorrect postures. These activities include moving and transporting patients, removing and placing monitors in shelves and side tables, organizing equipment and accessories at the bedside and in special rooms and arranging the consumables in the work station, using an incorrect body posture which leads to continuous tension of the most requested muscles, causing muscle pain or discomfort, dissatisfaction and fatigue.<sup>(18)</sup>

Although positioning the patient in the bed of the ICU has been found to be the highest risk activity, it was observed that, regardless of the nursing sector, the postures related with bending the body, neck flexion, shoulder elevation beyond 90°, repetitive movements — associated or not with load supporting were used by most of the workers. Joint kinematics and muscle recruitment, promoting an increase of the compressive load on the neck, with pain and disorders in this region.<sup>(18)</sup>

Ariens et al. observed that the flexion of the head beyond 20° for at least 70% of the working period increased the risk of neck pain. In these terms, all the tasks performed by the nursing workers may be considered as being hazardous, and they should be ergonomically replanned in order to control the head flexion extent. However, ergonomic studies have been conducted to analyze the physical postures used in the execution of the nursing work activities aiming to adjust such activities to respect the principles of biomechanics.<sup>(18)</sup>

In accordance with our study conducted by Sjaastad O et al cervicogenic headache is a chronic headache most common in people who are 30 to 44 years old. Its prevalence among patients with headaches is 0.4 to 4%, depending on how many criteria are fulfilled and based on many studies. Age at onset is thought to be the early 30s, but the age the patients seek medical attention and diagnosis is at age 49.4. Compared with other headache patients, these patients have pericranial muscle tenderness on the painful side and a significantly reduced cervicogenic headache.<sup>(19)</sup>

Darakhsan Nosheen et al conducted study on Prevalence of work-related neck pain among nurses and found 57.8% prevalence of neck pain, with 51.4% participants report neck pain for more than 3 months.<sup>(20)</sup>

Nurses' health may have an effect on the quality of the services offered by the health care system therefore, it is of great interest to do everything possible to preserve their health. This may be achieved by reducing the workload and by strengthening the available resources.<sup>(21)</sup>

## CONCLUSION

In Conclusion, the available data suggests a high prevalence of cervicogenic neck pain and headache among hospital working nurses. Further research and targeted intervention may be necessary to address the issue and improve the well-being of nursing.

**Declaration by Authors**

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**Conflict of Interest:** None

**Source of Funding:** None

**Ethical Approval:** Study was approved by Institutional Ethics Committee of DUPCOP, Jalgaon

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