

# EFFECTIVENESS OF SUB OCCIPITAL MYOFASCIAL RELEASE AND ENDURANCE TRAINING OF DEEP NECK FLEXORS FOR CERVICOGENIC HEADACHE AMONG COLLEGE GOING FEMALE STUDENTS - AN EXPERIMENTAL STUDY

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**Abstract:** Background: Cervicogenic headache is secondary headache to a primary cervical musculoskeletal disorder. The prevalence is four times as higher as in women compared to men in the age group of 18 to 30 years, the myofascial release and deep neck flexor training will be effective in reducing the headache intensity, duration and long term effects and improvement in headache.

**Objectives:** To find the effectiveness of suboccipital myofascial release and deep neck flexor endurance training on reducing pain intensity and to improve muscle endurance, decrease neck symptom in subjects with cervicogenic headache.

**Methodology:** A experimental study consists of 30 subjects with cervicogenic headache who were selected based on selection criteria between the age group of 18 to 25 years and they were randomly allocated into two equal groups, Group A (experimental group) 15 subjects, whereas Group B ( control group) 15, with total duration of 3 times a week for 6 week, pre-test and post-test was measured by using numerical pain rating scale(NPRS), neck disability index(NDI) and deep neck flexor endurance test (DNFE) among college students.

**Result:** Based on statistical analysis Group A Showed better statistical significance in reducing pain, improve cervical muscle endurance and functional independence.

**Conclusion:** This will conclude that the suboccipital myofascial release and deep neck flexor endurance training for CGH among college going female students were more effective.

**Keywords:** Sub occipital myofascial release, cervicogenic headache, endurance training.

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## 1. INTRODUCTION

Headache is one of the most common and often incapacitating condition affecting a large number of individuals. headaches are arising from disorders of the cervical spine termed as cervicogenic headache (CGH) is a unilateral headache associated with neck pain and cervical muscle tenderness are common in it. Weakness in the deep neck flexors has been suggested as a potential cause of neck pain and, by extension, headaches.<sup>(2)</sup>

Due to excessive usage of smart devices there is an continuous stress on the cervical spine because of repeated flexed position of both head and neck and this position can cause musculoskeletal strain and also contribute to limited in neck and head movement, causes poor sleep quality and lethargy.<sup>(3)</sup>

Studies say that only 14-18% of continuous headache that is result from the musculoskeletal dysfunction in the cervical spine,<sup>(33)</sup>Cervicogenic headache is more frequently observed in female university students as compared to male and it is due to the poor posture and prolong use of smart devices.<sup>(3)</sup>

Since the incidence of headache, especially in migraine and Cervicogenic headache CGH is four times greater in women than in men. <sup>(5)</sup>

Since Cervicogenic headache (CGH) commonly affect women, it is important to consider menstruation and hormonal shifts as a contributor to headache Menstrual-type headaches often occur 2 days before menstruation and prevail until last day of cycle 13-14. These headaches are usually classified as migraines, but can also be cervicogenic.<sup>(6)</sup>

### PREVALENCE AND FACTORS INFLUENCING CGH:

The prevalence in the general population is approximately 0.4 - 2.5% where in a pain management clinic, the prevalence is as high as 20% of patient with chronic headache.<sup>(2)</sup>

- Cervicogenic headache are most common among college students in smart phone users with prevalence of 7.21% with neck pain. [Tapas Kumar Pal et.al.,(2023)]
- In India the prevalence of 15.6% in population with frequent headache and 1.70% in general population, between the age group of 18 and 30 and is four times more in women than in men. [Mitul thakur et.al.,(2012)]

## 2. REVIEW OF LITERATURE

1) Priyanka, et al. (2023) states that suboccipital myofascial release has a significant positive effect on the improvement of cervicogenic headaches.

2) Pranjal Gogoi, et al. (2015) states that the endurance training programme for cervical muscle had significantly increases the endurance of the deep cervical muscle apart from which pain and disability also decreases in the subjects.

### OBJECTIVE OF THE STUDY:

- To find the effectiveness of suboccipital myofascial release and deep neck flexor endurance training on reducing pain intensity and improve muscle endurance decrease neck symptom, headache in subjects with cervicogenic headache.

## 3. MATERIALS AND METHODOLOGY

**Study Design and Setting:** This study was designed as an experimental study The study was conducted at Physiotherapy Outpatient Department of Adhiparasakthi College of Physiotherapy, Melmaruvathur.

**Sample Size and Sampling Method:** The sample size was calculated using the formula

$$n = \frac{(z\alpha + z\beta)^2}{(\delta/\sigma)^2}$$

Based on the calculation, a total of 30 participants were selected for the study. The sampling method used was convenient sampling, and all participants were college-going female students aged between 18 and 25 years.

**Inclusion and Exclusion Criteria:** Participants were included are Female college students aged 18 to 25 years with neck pain referring to the suboccipital region were included. They should have headaches at least once per week for the last 6 months and had a history of at least 5 headache per month. Headaches were often associated with neck stiffness or pain, along with a positive CCFR test, pain score between 4 to 10 on the numerical rating scale. They also showed mild to moderate disability as per the NDI. Participants were excluded if they presented with bilateral headaches characteristic of tension-type headache, vertigo, dizziness, or visual disturbances, disc prolapse, spinal stenosis, postoperative complications, severe trauma, instability, torticollis, History of frequent migraine, inflammatory rheumatic diseases, or unwillingness to participate.

**Study Duration:** The duration is 6 weeks, 4 days per week, 20 minutes per session.

**GROUP A (SUBOCCIPITALMYOFASCIAL RELEASE, ENDURANCE TRAINING):** The subjects were instructed to lift their head off the table. The therapist position the tips of the first three fingers over the soft tissue immediately inferior to the arc of atlas. The fingers were positioned in a flexed position - around 45° at the MP and PIP joints. The subjects were asked to rest their head back down so that their fingertips are in the sub-occipital soft tissues and their finger pads rest firmly against the inferior aspect of the atlas. This phase is repeated three times in each session. At the end, for more release, sub-occipital traction will commence. The procedure was done for 2 to 3 minutes. Treatment frequency was four times per week.

Warm up: all neck movements (isolated and combined) and Stretching of the cervical muscles2. stretching the muscles of the cervical region such as the upper trapezius, sternocleidomastoid, and other cervical muscles. The pressure cuff was used as biofeedback to monitor the amount of cervical flattening and to measure the muscular endurance for holding the contraction. The pressure cuff was inflated to 20 mm Hg and the patient was instructed to nod and increase the pressure up to 30 mm Hg and to hold for 10 sec. This was done in three sets with 10 repetitions each (7). The sessions were followed for 6 weeks, 4 days per week. Each session given 15 minutes. The duration of both myofascial release and endurance training done for 20 minutes

**GROUP B (conventional group)** The patient received hot pack therapy in prone lying for 15 minutes, stretching were done for neck and upper chest (30 sec,3 reps each). deep neck flexor strengthening was performed in supine with chin tucks,10 reps held for 10 seconds. protocol was followed 4 times for a week of 6 week.

**TABLE 1.1 ENDURANCE EXERCISE PROTOCOL FOR 6 WEEK:**

ENDURANCE EXERCISE	WEEK (1-2)	WEEK (3-4)	WEEK (5-6)
Warm up (neck movements)	5 rep- 1 set	7 rep- 2 sets	10 rep- 3 sets
Stretching (upper trapezius, Sternocleidomastoid)	5 rep- 1set (30 sec hold)	7 rep- 2 sets (30 sec hold)	10 rep- 3 sets (30 sec hold)
CCF using modified sphygmomanometer	5 rep- 1set(20mmHg)	7 rep- 2sets(25mmHg)	10 rep- 3sets(30mmHg)

**TABLE 1.2 STRENGTHENING EXERCISE PROTOCOL FOR 6 WEEK:**

EXERCISE	WEEK (1-2)	WEEK (3-4)	WEEK (5-6)
STRECHING (Sternocleidomastoid, Upper trapezius, scalene, levator scapulae, pectoralis major and minor, and short suboccipital extensors)	30 sec hold- 3 rep	30 sec hold- 3 rep	30 sec hold- 3 rep
STRENGTHENING EXERCISE(Nodding movement)	10 rep- 10 sec hold	10 rep- 10 sec hold	10 rep- 10 sec hold

**4. FINDING AND ANALYSIS**

A total number of 30 Subjects with Cervicogenic headache were included in this study. They were divided into two group Group A (suboccipital myofascial release and endurance training) and Group B (conventional physiotherapy) the outcomes used are NPRS, NDI, DNFE, showing the following results.

GROUP A	MEAN	S.D	T VALUE	P VALUE
NPRS	3.6	1.2	16	<.000
NDI	13	6.2	10	<.000
DNFE	25	2.5	-10.2	<.000

GROUP B	MEAN	S.D	T VALUE	P VALUE
NPRS	5.2	1.0	12	<.000
NDI	24	8.4	6.6	<.000
DNFE	21	3.0	14	<.000

## 5. CONCLUSION

This study concludes that the suboccipital myofascial release with endurance training of deep neck flexors leads to significant improvement in pain reduction, Muscle endurance. The integration of both manual therapy and endurance training as an effective strategy for managing cervicogenic headache in terms of long term effect among college going female students.

## 6. RECOMMENDATIONS

- The study can be replicated by a large sample and prolong duration.
- This study focus only the female college students and it can be done in all different age group.
- In future, the suboccipital myofascial release, endurance training of deep neck flexor is compared with other alternative treatment comprehensively

## 7. DISCUSSION

Cervicogenic headache is a secondary headache arising from musculoskeletal dysfunction, including **reduced cervical mobility, altered motor control of deep neck flexors, decreased flexor muscle strength.** <sup>(2)</sup>

Falla et al.,(2012) suggests that subjects with cervicogenic headache exhibit poor activation and endurance of DNF, which can be retrained effectively using a sphygmomanometer based intervention. In this study the Modified sphygmomanometer is used instead of pressure bio feedback unit for endurance training because which is a cost effective and reliable tool for both assessing and training deep neck flexor muscles.[Kajal saini et al.,(2024)].According to priyanka et al.,(2022) stating that myofascial release helps alleviate fascial plate restrictions by using pressure and stretching with the intention of restoring range, decreasing pain, and optimizing length and reducing cervicogenic headache symptoms. These findings highlight the clinical relevance of integrating MFR and endurance training into routine physiotherapy programs for cervicogenic headache management given the rising prevalence of CGH among young adults, incorporating these interventions into preventive and rehabilitative strategies could contribute to long -term musculoskeletal health.

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