



## Prevalence of Neck Disability Among Tooth Brace Users

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### Abstract

**Background:** The prevalence of neck pain among tooth brace users are reported in recent days. The strain in the neck muscles affects the posture and it may reflect in the Temporomandibular joint. Neck pain has a direct impact on life, active days at work, and health care costs. The Neck Disability, TMJ, and Cervical Spine Disorder were investigated in this study.

**Objective:** To find out the prevalence of neck disability among tooth brace users.

**Methodology:** The study design was non-experimental, the study type was observational, the Sampling method was convenient sampling, and the Study setting was at SRM Institute of Science and Technology, Kattankulathur.

**Procedure:** Adults with a known case of a neck disability, who satisfy the inclusion and exclusion criteria were selected and informed consent was obtained from the patients with a detailed explanation of the procedure. A diagnostic test of neck disabilities and myofascial disorder with the help of the Neck Disability Index (NDI-100) to see neck disability among tooth brace users.

**Outcome Measure:** The outcome measure are Neck Disability Index

**Result and Conclusion:** The result shows that there is neck disability among tooth brace users, but there is no significant association between neck disabilities among tooth brace users.

**Keywords:** Neck Disability Index; Tooth Brace Users; Temporomandibular Disorder; Neck Pain; Cervical Disorder; Myofascial Pain

### Introduction

Neck pain is the most common discomfort found among many people. Neck pain can occur due to various problems, and associated problems need to be specified, and analyzed for the prevention of disorders [1].

Improper posture can lead to muscle strain, over time muscle strain can lead to a decrease in quality of life. Repetition also leads to pain and stiffness. Growth is a rare case which includes tumours, cysts, and bone spurs. Also, health conditions such as meningitis, and rheumatoid arthritis can lead to neck pain [2].

Neck pain restricts the activities of daily life and the symptoms can include tenderness, and radicular pain along with shoulder and arm which feels like burning and searing. Headaches can also be present finally numbness and weakness on the arm or finger develops (trouble while lifting or gripping the objects).

Straightening crooked teeth, aligning the upper and lower jaws, improving the appearance of smiles and faces, and relieving strain on the temporomandibular joints are all benefits of dental braces. Even though braces are most often utilized during adolescence, a growing number of adults are receiving orthodontic treatment.

Braces are attached to your teeth using metal or ceramic braces, along with wires and bonding material.

There are five types of tooth braces, they are metal, ceramic, speed, Invisalign, and retainers (each arch). These braces work by applying continual pressure to your teeth over a long period. The shape of your jaw changes over time to accommodate the pressure. Our teeth are often thought to be physically related to our jawbone, making it difficult to comprehend how they can be moved. However, beneath your gums lies a membrane that connects your teeth to your jaw and is surrounded by bones. This membrane regulates your teeth's position and reacts to the pressure exerted on them by braces.

Dentists and dental hygienists routinely overstretch their arms and hands by holding them in an unnatural position for lengthy periods to treat little teeth in the mouth. As a result, they frequently suffer from musculoskeletal disorders. According to a recent study, musculoskeletal discomfort affects dental employees, particularly in the neck, shoulder, wrist, and upper back regions [3].

The musculoskeletal condition that affects the muscle of mastication, temporomandibular joint (TMJ) and related structures is referred to as temporomandibular disorder. Evidence-based TMJ disorders are frequently linked to other jaw and neck conditions, such as cervical spine disorder. The muscles which are involved in the temporomandibular joint are temporalis, masseter, lateral and medial pterygoids, digastric, stylohyoid, mylohyoid, geniohyoid and platysma. Higher level of neck impairment leads to tenderness in the jaw and cervical region [4].

Mandible pain, clenching at night, trouble chewing and pain when yawning are all symptoms of TMJ limitations. The position of the neck has an impact on jaw mobility. Limits in the upper neck (upper cervical extension) and restrictions in the Centre of the neck are the key factors influencing how well you can expand your jaw (middle cervical flexion).

Dental health is a key component of overall health. Because tooth alignment changes can affect a person's quality of life negatively it will affect their daily life activities eating, smiling, speaking, as well as affect their social life also. Due to these variable activities, their oral functional limitations will be affected by other aspects such as emotional well-being.

Most people will grind and clench their teeth but some people have issues with grinding and clenching. Due to these issues stress

and pain around the neck region. Bite issues can also cause problems in the jaw region, which can add stress to the head, neck, and shoulder areas. Our bad bite will change the alignment at the 1<sup>st</sup> and 2<sup>nd</sup> vertebrae, it compresses the cervical spine then it manifests as neck pain [3].

Neck discomfort is a common alignment that affects almost two-thirds of adults at some point in their lives. Women are more likely to be impacted than males, and one explanation for this is that women have lesser muscle strength than men. Although it is thought that maximum muscle strength peaks between the ages of 18 and 25 [2].

There is no evidence about the effects of metal brace users on the problem associated with lower jaw abnormalities. Muscle tenderness is the most prevalent symptom in patients with TMD, but muscle pain was not found in TMD patients.

Neck discomfort was found to be 70% of the time linked to TMD. The NDI questionnaire was created to offer information about how neck discomfort affects a person's capacity to function in daily life, and it has been proven to be accurate and reliable in measuring neck disability. The present study shows, high prevalence was found in neck disability [7].

## Methodology

The study design was non-experimental, the study type was observational and the study sampling method was convenient sampling. Study setting was at SRM Institute of Science and Technology, Kattankulathur. The inclusion criteria of adults within the age group of 18-25 years, a known case of learning neck disabilities, and adults who satisfy NDI criteria, exclusion criteria with neurological disorder, musculoskeletal disorder, repeated change of tooth brace, use of other tooth braces- invisible tooth braces and recent surgeries- jaw correction, root canal treatment, outcome measures were taken using Neck Disability Index Questionnaire.

42 adults with known cases of neck disability, who satisfy the inclusion and exclusion criteria were selected with convenient sampling and informed consent was obtained from the patients with a detailed explanation of the procedure.

A diagnostic test of the Neck disability Index was used to suspect NDI with the help of scoring will be done accordingly with the help of parents. According to the scoring the adults were classified into no disability, mild disability, moderate, and no severe disability [7,12].

The selected adults with Neck disabilities were checked with the Neck Disability Index (NDI). NDI was one of the most reliable tests for daily life activities for tooth brace users, the daily life activities are headache, pain intensity, sleeping, work, personal care, concentration, recreational activities, driving, and lifting are among the topics included in the survey. Each question is assigned a score of 0 (no disability) to 10 (extreme disability). 100 is the overall scoring, each component is calculated and the final score is multiplied by 2 [12].

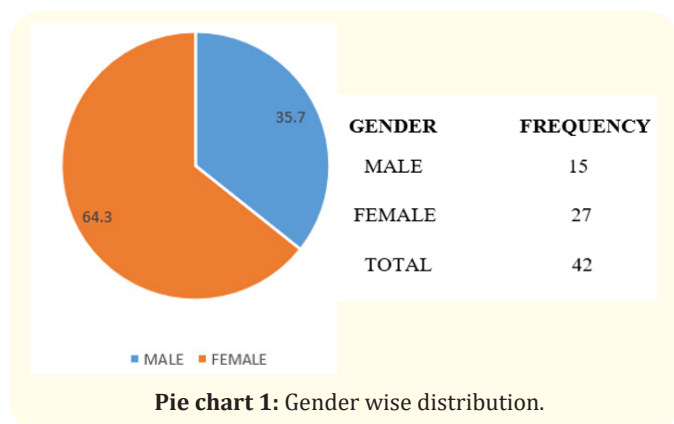
Each subtest contains many activities with the scoring, in addition, all score were evaluated. The total score of each adult is checked with 100 as the scoring is higher than 25 points with 50% disability the adult is prone to have a neck disability.

**Results**

According to the study, there is no neck disability among tooth brace users with temporomandibular joint disorder. A neck disability was not significant among tooth brace users with temporomandibular joints ( $r = 0.915, p < 0.001$ ). Among the 42 samples that were taken 16 of them had no disability, 22 showed mild disability, 4 had moderate disability and no subjects had severe disability. Table 1 and Pie Chart 1 shows that the valid percentage for males is 35.7 and for females, 64.3 TABLE 2 and BAR DIAGRAM 1 shows that there is no severe neck disability among tooth brace users. Patient score according to the NDI scale total percent is 100.0. TABLE 3 shows that the significant value between tooth brace users and neck disability index scores was less or greater than equal to 116.

	Frequency	Percent
Male	15	35.7
Female	27	64.3

**Table 1:** Percentage wise gender distribution.



**Pie chart 1:** Gender wise distribution.

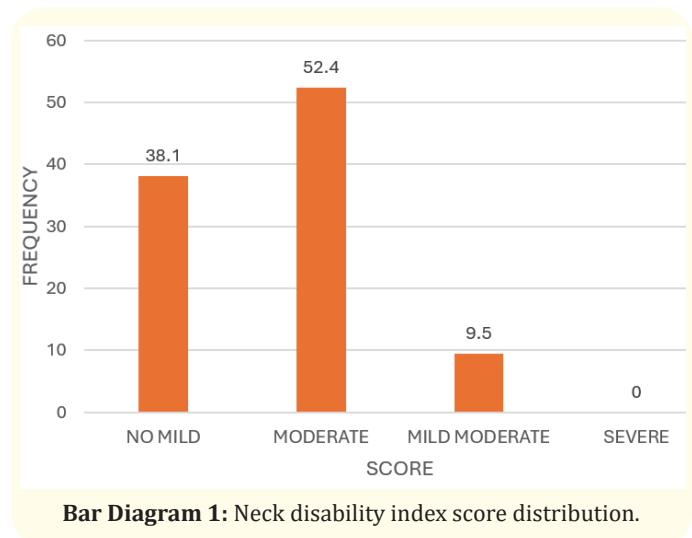
Table 1 shows that Frequency of Male 15 and Female 27; Percentage of male 35.7 and Female 64.3.

Pie Chart shows the gender frequency with 15 male and 27 female.

	Frequency	Percent	Valid Percent	Cumulative Percent
No disability	16	38.1	38.1	38.1
Mild disability	22	52.4	52.4	90.5
Moderate disability	4	9.5	9.5	100.0
Total	42	100.0	100.0	

**Table 2:** Neck Disability Index Score Distribution.

Table 2 shows that there is no severe disability among tooth brace users.

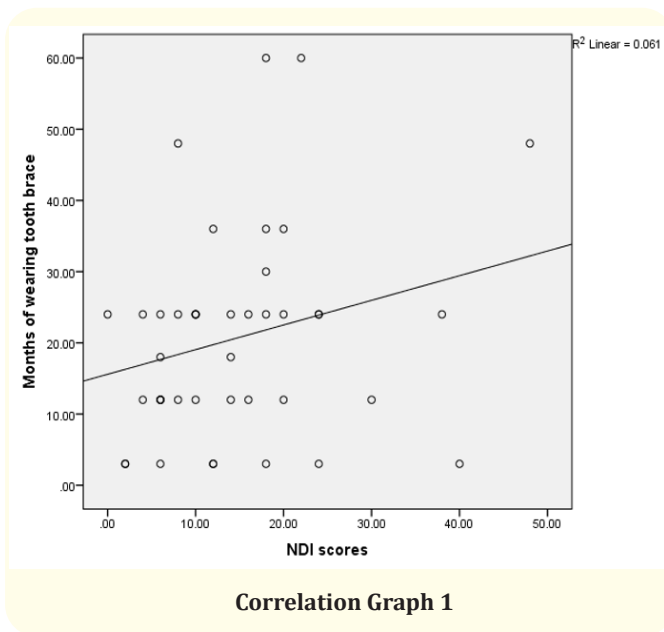


**Bar Diagram 1:** Neck disability index score distribution.

Correlation		Significance
Months of wearing tooth brace	Pearson Correlation	.246
	Sig. (2-tailed)	.116
	N	42

**Table 3:** Correlation between tooth brace users and neck disability index score.

Table 3 shows that the significant value between tooth brace users and neck disability index score was less or greater than equal to 116.



## Discussion

The purpose the study is to find out the prevalence of neck disability among tooth brace users. This study shows that there are no neck disabilities with tooth brace users and no Myofascial disorders or TMD. Compared to metal tooth braces nowadays most people preferred fashion braces for teeth alignment. According to the public, knowledge about fashion tooth braces has elevated the cosmetic effects rather than advocating the knowledge about temporomandibular joint dysfunction [21].

The prevalence of neck disability patients doesn't have the temporomandibular joint disorder. If neck muscles get affected TMJ muscles get affected because the neck muscles are attached to TMJ. Neck disability has a direct impact on life, active days at work, and health care costs. Neck Disability, TMJ, and Cervical Spine Disorder were investigated in this study. According to this study, there is no neck disability among tooth brace users and also there is no jaw alignment.

The negative effects of braces or common side effects of tooth brace use are irritation of the inner aspect of the mouth when some movements occur, they feel difficulty in chewing and eating food items (it was a regular complaint from tooth brace users), they can't eat solid food for a short period and tooth decay or gum diseases, etc [5].

Anelisa Silveira concluded that the results of this study have highlighted the importance of assessing TMD patients not only in craniofacial region but also in the neck and other parts of the body [15].

Susan Larmijo-Olivo stated that the results strength evaluation is one of several assessment factors that used to be addressed when evaluating musculoskeletal painful conditions such as TMD and neck disorders, but strength evaluation cannot be considered as a direct measure of disability [13].

S Armijo Olivo concluded that patients with TMD have neck disability in addition to jaw disability, treatment needs to focus on both areas because the improvement of one could influence the other [9].

These are few studies, that have a positive impact on temporomandibular joint disorders and neck disability among different components like jaw restriction, decreased range of motion, etc.

In this study, the percentage of gender-wise distribution was 35.7 are male participants and 64.3 percentage of female participants. The percentage of neck disability index score was distributed as no disability 38.1%, mild disability 90.5, moderate disability 100.0 and the difference among this disability index is higher in the correlation values between months of nearly tooth brace and NDI score is 241, which is statistically, not significant.

As my study results reflect no correlation, and it goes in hand with the following studies.

There seems to be muscle weakness and unsatisfactory cervical spine motion, according to Juhani Multanen., *et al.* (2021). More research is needed to see if the strength of neck muscles and the mobility of the cervical spine might predict future neck pain [22].

H Nadri F Fashi-Ramandi concluded that Neck pain is common among dentists, according to the study. The findings of this study assessed a person's perspective on pain's impact on his life [19].

According to the study results, there is no neck disability among tooth brace users, muscle tenderness, myofascial disorder, TMJ dysfunction, and cervical spine disorder. In this study, we have recruited 42 participants with a male participant percentage of 35.7 and a female participant percentage of 64.3. The participants wore the tooth brace for a minimum of 3.00 months and a maximum of 60.00 months.

## Conclusion

This study concludes that there is no symptoms of neck disability, muscle tenderness, myofascial disorder and temporomandibu-

lar disorder among tooth brace users. Rather than advocating an understanding about temporomandibular joint disorders, public awareness towards fashionable dental braces has heightened by cosmic impacts. As a result, the impact of neck disabilities can increase in the future.

The limitation of the study was the smaller sample size, due to the smaller sample size may be statistically no correlation between the tooth brace user and neck disability. The neck disability index will take less time, adults will not get tensed they will be cooperative with this test.

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### Conflict of Interest

The author (s) declared no conflict of interest concerning research, or authorship of this article.

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