

Impact of Temporomandibular Joint Disorders on Visual Performance among University Students

Ghulam Zahra Malik¹, Dr. Kaynat Imtiaz², Dr Sara Afzal³, Ayesha Sajid⁴,
Mahnoor Akhtar⁵, Zaryab Khan⁶

¹ Superior University Lahore, Qualification: DPT, Ms OMPT. ORCID: 0009-0002-9474-0618
Email: Zahramalik12500@gmail.com

² Clinical Physical Therapist, Doctor of Physical Therapy, Azra Naheed Medical College, Superior University Lahore. Email: kaynatimtiaz1@gmail.com

³ Lecturer and Consultant Physical Therapist. Email: drsaraafzal5@gmail.com

⁴ Optometrist, Faculty of Allied Health Sciences, Superior University Lahore
Email: Sajid31ash@gmail.com

⁵ Ms Rehabilitation Sciences in Clinical Optometry. Email: su91-msrsw-f23-077@superior.edu.pk

⁶ Lecturer, The Superior University, Sargodha. ORCID: 0009-0009-6772-1957
Email: zaryabbakhar@gmail.com

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Abstract

Background

It is common for TMJ to cause headache but most of us ignore the fact that people with TMD may have vision impairment or TMD is the root source of vision impairment in people. Because TMJ is connected to the skull, ligament, nerves and muscle, so it can have an effect on your vision. There are several factors that lead to vision impairment like cataract, diabetic retinopathy, retinal disorder, TMD and macular degeneration. **Aims:** To find out association of visionary insufficiency and TMJ disorder. **Methodology:** This was a Cross-sectional study. There are 100 health science students from different universities. Out of which 82 questionnaires were enrolled after screening. Different eye test were performed on each participant to identify visionary problem other than hyperopia and myopia. Data was collected with the help of standardized questionnaire was analyzed with the help of SPSS-21 software. **Results:** Chi-square test was use to compare the data ,1.2% people have Asymmetry. 31.7% people had joint pain while 26.8% people had muscle pain. 50% people presented with headache while 39.0% presented with neck pain. 67.1% people have visionary insufficiency with correction while 32.9% have visionary insufficiency without correction. The results of corneal bright reflex test showed that 65.9% normal near view while 34.1% have blur near view. 68.3% have normal far view while 31.7% have blur far view. Only 6.1% people are presented with hypo function ocular mobility. No any person is presented with abnormal head position. **Conclusion:** Overall TMD is related to vision insufficiency. According to data there is a positive relation of TMD with vision impairment. Some of our participants shown the effect of TMD on vision and some shown no effect.

Key Words: Temporomandibular Joint Disorders, Vision, Students

Introduction

Temporomandibular joint is a synovial joint located on both sides of face in front of the prominence of the ear. There are several essential elements of TMJ capsule, articular disc, TMJ

ligament, muscle. TMD is the disorder of temporomandibular joint. TMD disorder includes a wide range of disorders that may affect muscles of TMJ, joint, articular disc and nerves. According to NICDR (National Institute of Dental and Craniofacial Research), TMD is divided into three basic prime categories. Degenerative joint disease, A variety of symptoms are shown in TMD. May be a single symptom of temporomandibular disorder is because of the multiple involvement like muscle, nerve, joint, bone and connective tissue (1). TMD is the disorder of temporomandibular joint. TMD disorder includes a wide range of disorders that may affect muscles of TMJ, joint, articular disc and nerves. According to NICDR (National Institute of Dental and Craniofacial Research), TMD is divided into three basic prime categories. Degenerative joint disease, A variety of symptoms are shown in TMD. May be a single symptom of temporomandibular disorder is because of the multiple involvement like muscle, nerve, joint, bone and connective tissue.(2)

Vision impairment is the decreased ability and function of the eyes. Vision impairment may affect one or both eyes. A person with vision impairment has difficulty to see to a certain degree. The most frequent vision impairments are hyperopia and myopia. Hyperopia is farsightedness, or person can't see nearby object clearly. Myopia is near-sightedness, or a person can't see distant objects clearly. There are several factors that lead to vision impairment like cataract, diabetic retinopathy, retinal disorder, TMD and macular degeneration. In the developing world and because of the constant increase in pressure in daily life, almost 90% of people suffer from vision impairment. (3)

TMD and vision impairment are interlinked in different ways. It is common for TMJ to cause headache but most of us ignore the fact that people with TMD may have vision impairment or TMD is the root source of vision impairment in people. Because TMJ is connected to the skull, ligament, nerves and muscle, so it can have an effect on your vision. In the latest studies, a positive connection between TMD and vision impairment.(4) Antonino marco Cucciet al. Am J dent facial Orthop in May 2008, Hideo Shigeishi in July 2016 and Wolters Kluwer in 2020 are enlisted in those scientist who published the researches that shows positive relation between TMD and different type of vision impairment like hyperopia and myopia. The US National Library of Medicine stated "the pathological condition in one area of body can also affect the other area of body". In some patients, eye pain and pressure are the major symptom of TMD, because TMD headache can increase strain on eyes. Through trigeminal nerve and its vast network of 3 branches, relate TMD and vision impairment with each other. The vast network of 3 branches of trigeminal nerve (maxillary, mandibular and ophthalmic) connect almost everything in the face (5).

Through these branches of the trigeminal nerve, temporomandibular joint pain is transferred to different sites like the eyes (blurry vision, near-sightedness, farsightedness, and watery eye), neck, ear and head. In addition, the pain in the eye is due to the trigeminal nerve irritation. TMD pain is referred to the other parts of face. Due to the abrasion of TMJ, eye discomfort and distress was observed. By this study, we are able to relate TMJ disorder with eye problems. Very little research has been done on this topic so far (6).

Moreover, in this incredibly fast-growing world, the chance of having eye problems due to TMJ disorders is even greater because of increasing stress. Our main goal in conducting this research or study is to create an awareness in society especially university students. Because more than half of the people ignore the fact that eye problem can also be due to the TMJ disorder (7).

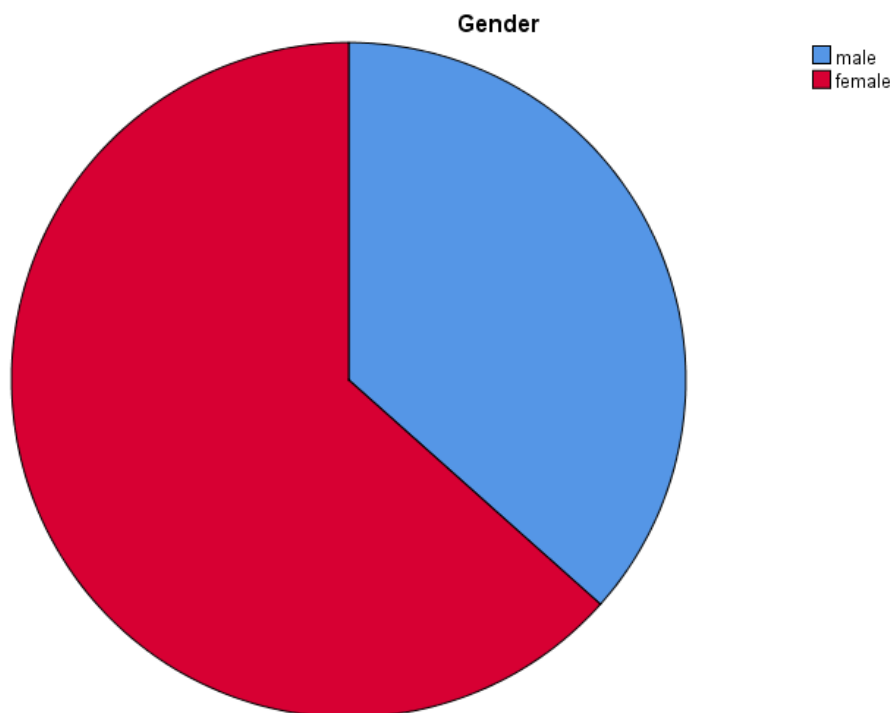
Methodology

This was a Cross sectional study , conducted to define a relation between TMJ disorder and vision insufficiency. People who wear glasses was eligible for this research. There are 100 health science students from different universities. Out of which 82 questionnaires were screened from University of Management and Technology, University of Lahore, Aleem Medical College and RIPHA

International University. Different eye test was performed on each participant to identify visionary problem other than hyperopia and myopia. Data that we collected via standardized questionnaire and analyzed via **SPSS-21** software.(8)

Results

Complete sample of 82 people were divided into two further groups based on genders 30 males and 52 females. In our complete sample of 82 participants, 93.9% have no malocclusion while 4.9% people have class 1 and 1.2% people have class 2 malocclusion. 70.7% do not have any teeth deformity while 19.5% have OVJ, 7.3% have OVB and 2.4% people have cross bite. Only 2.4% people presented with Vertical posterior height loss. 1.2% people have Asymmetry. 31.7% people had joint pain while 26.8% people had muscle pain. 50% people presented with headache while 39.0% presented with neck pain. Chi-square test was use to compare the data.



CLICKING

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	20	24.4	24.4	24.4
	no	62	75.6	75.6	100.0
	Total	82	100.0	100.0	

67.1% people have visionary insufficiency with correction while 32.9% have visionary insufficiency without correction. The results of corneal bright reflex test showed that 65.9% normal near view while 34.1% have blur near view. 68.3% have normal far view while 31.7% have blur far view. Only 6.1% people are presented with hypo function ocular mobility. No any person is presented with abnormal head position.

VISION

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	with correction	55	67.1	67.1	67.1
	without correction	27	32.9	32.9	100.0
	Total	82	100.0	100.0	

Near (Corneal Bright Reflex Test)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Normal	54	65.9	65.9	65.9
	Blur	28	34.1	34.1	100.0
	Total	82	100.0	100.0	

Far (Corneal Bright Reflex Test)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Normal	56	68.3	68.3	68.3
	Blur	26	31.7	31.7	100.0
	Total	82	100.0	100.0	

Ocular Mobility

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Normal	77	93.9	93.9	93.9
	hypo function	5	6.1	6.1	100.0
	Total	82	100.0	100.0	

Discussion

Marchesi, Alessandro, et al. in 2024 study The influence of temporomandibular joint disorders and mandibular position on visual capacities: a case-control study TMD headache was also found significantly associated with hyperopia. But in contrast in our study we focus more on health science students and if someone has TMD and how it effects on his/her vision. Most common vision impairment (hyperopia, myopia) in our research.(1)

Zieliński, Grzegorz, et al. in 2021 study The organ of vision and the stomatognathic system a Review of association studies and evidence-based discussion. But in our research we explain how TMD can affect vision in long run.(9)

Khijmatgar, Shahnawaz, et al. in 2025 study on Occlusal splint effects on visual capacities in patients with temporomandibular disorders (TMD): a prospective interventional cohort study. The novelty of our study is that we explain a chain connection between blurry vision, double vision, headaches and also TMJ. In this study we explain how TMJ disorder can cause blur vision and headache through several factors. How your TMJ pain express as eye pain and headache.(10)

Terán, Aidé, et al. in 2025 "Analysis of the degree of visual acuity in patients with mandibular asymmetry." In our study we focus on eye pain, swelling and TMJ bust, with these three parameters we also include TMJ disorders with eye problem like hyperopia and myopia. TMJ disorder in some

cases is the leading cause of hyperopia and myopia that most people ignore when treating eye problems.(11)

Conclusion

According to our data analysis, it is concluded that temporomandibular joint disorder may have effect on vision but some people do not have any effect related to this. It is not wrong to say that the creator has made human body very complicated and everybody behaves differently, so a confirmed theory can't be stated but both null and alternative hypothesis seems correct in this research data analysis. Overall TMD is related to vision insufficiency. Some where we have seen a positive relationship and somewhere we have seen a negative relationship. But if someone wants a stronger results, then there is some recommended studies like SCM (sternocleidomastoid muscle) relation with TMD and vision insufficiency that make the result more promising result. According to our data we can conclude that there is a positive relation of TMD with vision impairment. Some of our participants shown the effect of TMD on vision and some shown no effect.

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