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Original Article

Prevalence of Temporomandibular Joint Pain Associated with Stress in Undergraduate University Students: A Cross-Sectional Study

Khushboo Gulzar[1], Farooq Islam[1], Asim Raza Thakur[1], Sidra Shahzad[1*], Saqlain Haider[2], Hamza Tanveer[2]

[1]University Institute of Physical Therapy, The University of Chenab, Gujrat, Pakistan
[2]Univeristy of Lahore, Gujrat Campus

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***Corresponding Author:**

Sidra Shahzad,
University Institute of Physical Therapy, The University of Chenab, Gujrat, Pakistan
sidrashahzad799@gmail.com

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ABSTRACT

The Temporomandibular Joint (TMJ) is created by the articulation of the mandible and the temporal bone of the skull. It is stationed anterior-lateral to the tragus of the ear, on the lateral part of the face. The mandibular fossa and articular tubercle (from the squamous portion of the temporal bone), as well as the head of the jaw, constitute the TMJ. **Objective:** To find the prevalence of TMJ pain due to stress in undergraduate university students. **Methods:** A sample of 253 participants was selected by non-probability convenient sampling technique. Then participants were required to sign a consent form first then the Fonseca questionnaire (FQ), and Perceived Stress Scale (PSS) was given to them. The patients were interviewed, examined, diagnosed, and rated. **Results:** This study was conducted on 253 undergraduate university students. FQ and PSS questionnaires were given to them. 87 males (34.4%) and 166 females (65.6%), 37.5% of participants with moderate stress showed severe TMJ pain, 5.9% of cases were reported with mild pain. The percentage of TMJ pain is calculated to be 58.1% in university students **Conclusions:** It is concluded that stress is a factor that causes TMJ pain in undergraduate university students. This study shows that stress and TMJ pain have a direct positive and strong correlation between them. The result concludes that the prevalence of TMJ pain among students of university is high.

INTRODUCTION

The temporomandibular joint (TMJ) is created by the articulation of the mandible and the temporal bone of the skull. It is stationed anterior-lateral to the tragus of the ear, on the lateral part of the face [1]. The mandibular fossa and articular tubercle (from the squamous portion of the temporal bone), as well as the head of the jaw, constitute the TMJ [2]. The articular surfaces of the bones never come into touch with each other in this joint because they are separated by an articular disc. When such a disc is present, the joint is divided into two synovial joint chambers, each bordered by a synovial membrane. Fibrocartilage, not hyaline cartilage, covers the articular surfaces of the bones [3]. TMJ also known as the mandibular joint, is a bi-condylar articulation formed by an ellipsoid variation of the right and left synovial joints. This joint has a fibrous capsule, a disc, synovial membrane, fluid, and tough neighboring ligaments, which all common characteristics of synovial joints. The craniomandibular articulation is the right word for the joint because the mandible is a single bone and the skull is mechanically a single stable component [4]. A vast number of epidemiological studies on the epidemiology of TMDs in both patient and non-patient groups have been undertaken. TMD indications are present in 50 percent –75 percent of the population at some point in their lives, while an estimated 35 percent display moderate symptoms, according to studies [5]. TMJ arthritis has a variety of causes, including OA and rheumatoid arthritis (RA), as well as viral, metabolic (gout), and immunologic conditions (ankylosing spondylitis, lupus). The etiology of DJD,

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commonly known as OA, is complex, including biomechanical, metabolic, inflammatory, and immunologic insults [6]. TMJ is a bi-condylar joint in which the condyles at the two ends of the jaw operate at the same time. It links the mandible to the skull and governs mandibular mobility [7]. Between the articular surfaces of the temporal bone and the mandibular condyle lies a cartilaginous disc. Although most articular cartilages are made of hyaline cartilage, this disc is made of fibrocartilage, which has a significantly larger amount of collagen than hyaline cartilage, enhancing its stiffness and durability [8]. The disc has no direct vascularization or innervation; nevertheless, the disc's posterior attachment (also known as retrodiscal tissue is both vascularized and innervated, making it relevant to the subject of joint pain [9]. Mastication and speaking are the two most essential functions of the TMJ. Jaw and TMJ mobility are controlled by strong muscles. The mandible is raised by the temporalis muscle, which connects to the temporal bone. The masseter muscle is the major mastication muscle that shuts the mouth. 45 The form of the bones, muscles, ligaments, and the occlusion of the teeth guide movement. The TMJ moves back and forth in a hinge and gliding action [10]. TMJ motions are complicated because the joint contains three degrees of freedom, each of which is connected with a different axis of rotation. The two major motions are rotation and anterior translation. The other two TMJ motions are posterior translation and mediolateral translation [11]. The TMJ explanation is extraordinary in the body in that the two joints should constantly move all the while. Two particular developments turn and interpretation, happen in the joint during mandibular opening and shutting of the TMJ, in this manner, is known as a ginglymoarthroidal joint [12]. Dr. Meyer makes sense of the TMJ confusion (TMJ) can create over the long haul. This is because of fretful, stress-actuated rest where you are grating your teeth and jaw holding unwittingly. Consistent mileage can skew your jaw and cause constant neck and muscle strain too [13]. TMJ is one of the most convoluted joints of the body and assumes a significant part in the head and neck framework. One of the elements influencing the TMJ and leading to temporomandibular jumble is tension with every one of the occasions causing it [14]. TMJ is liable for opening and shutting developments of the mouth and furthermore the projection, withdrawal, and sidelong deviation developments of the mandible on the fleeting bone. It is a critical construction, on the grounds that its capacity is straightforwardly connected with a setting that includes correspondence, passionate articulation, and taking care of, i.e., a bunch of variables that influence the singular's nature of life. Among the gamble factors for TMD, there are the malicious propensities that depart from typical and hurt an organ or framework. Among them are biting gum, gnawing pencils, nail gnawing, snapping or gripping, and stress and passionate preferences [15].

METHODS

A cross-sectional study was conducted. The sample was selected by non-probability convenient sampling Fonseca questionnaire (FQ) was used for TMJ pain and the perceived stress scale was used for evaluating the stress in undergraduate students of the university. After signing the consent forms, the Patient Health Questionnaire (PHQ) and FQ were used to pattern the percentage of TMJ pain amongst students. A standardized questionnaire was used to collect data and SPSS was used to analyze the research data. The answers to questions in our research were encoded in Statistical Package of Social Sciences software as their research and data was analyzed.

RESULTS

Out of the total sample size of 253, 62 participants lie in 16-20 years of age group, 139 (54.9%) fall within 21-24 years of age group, and 52 (20.6%) in 25-29 years of age group. While in case of gender,166 (65.6%) were females and 87 (34.4%) were male (Table 1).

Variables	Categories	n (%)
Age Group (Years)	16 - 20	62 (24.5)
	21 - 24	139 (54.9)
	25 - 29	52 (20.6)
Gender	Male	87 (34.4)
	Female	166 (65.6)
Total		253 (100)

Table 1: Percentage of participants according to their gender and age group

Out of the total sample size of 253 participants, 55 (21.7%) participants are having Mild pain, 101 (39.9%) participants have moderate pain and 97 (38.3%) participants suffered from severe pain (Table 2).

Variables	Categories	n (%)
FONSECA	16 - 45 (Mild)	55 (21.7)
	45 - 70 (Moderate)	101 (39.9)
	70 - 100 (Severe)	97 (38.3)
Total		253 (100)

Table 2: The Severity of Pain According to FONSECA

The association between PSS and FONSECA from Chi-Square value, Spearman Correlation, and p-value as shown in Table 3.

Association	Chi-Square Value	Spearman Correlation	p-Value
PSS WITH FONSECA	9.911	-0.016	0.798

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Table 3: Association between PSS and FONSECA

DISCUSSION

This study recognized that grinding of teeth under stress leads to various complication such as craniomandibular joint pain. The percentage of TMJ pain is calculated to be 58.1% percent in university students. The result concludes that the prevalence of TMJ pain among students of university is high. To the researcher's knowledge, this is the first study on this particular topic in Gujrat. The purpose of our study is to determine whether stress could be one of the causes of TMJ pain in students or not. The findings of this study illustrated a strong association between depression and craniomandibular joint pain. Anger issues are a major risk factor for developing a musculoskeletal complication that decreases the quality of everyday living. Nature which includes clenching of the teeth due to stress and anger can cause innumerable problems like muscular tightness, decrease joint ROM, increases muscle rigidity, and causes uneasiness in day-to-day eating and speaking. In our study, it was found that participants who take more stress on minor matters of their lives were most prone to have craniomandibular joint aching. The results of this study indicate that most participants are females and aged between 21-24 years and are students mostly complaining about the difficulty in opening their mouths. Out of 253 subjects, 58.1% of participant's reports discomfort and it is observed in front of the ears. The results of the association between variable TMJ pain and age, gender, headache, psychological history, and stress showed that these are dependent on each other. A Cross-sectional study was conducted by Ahmed LI *et al.*, to demonstrate the occurrence of craniomandibular joint pain in university students of Sudan [16]. The calculated sample size of the study was 357 students but in order to enhance the validity of the results, the researchers increase their sample size. This study consisted of 500 members of which there were 251 males and 249 were females. The Inclusion criteria of the research consist of ages between 17-and 25 years. They were asked about their history of shock or any distress that occurred in the last 6 months of their life. My research was completed with the goal to determine the prevalence of TMJ pain due to stress on 253 students of the University of Chenab. The Patient Health Questionnaire and Fonseca's questionnaire were applied to check the prevalence of TMJ pain among students. A standardized questionnaire was used to collect data and SPSS were used to analyze the research data. The answers of questions in our research were encoded in Statistical Package of Social Sciences software as their research and details of analyzed results are being discussed. This study result is applicable and similar to my research results. This research concluded that because of stress, worry, and nervousness about 77.8% of individuals of the Sudanese university have disorders of muscles of mastication, and snapping of joints is the most common visible illustration. The prevalence of my research is intended to be 58.1% and because of online semesters students are more relaxed and less depressed than the students of Sudanese who attended physical classes [1]. The research was conducted by Soukaina Ryalat et al., on the incidence of problems of muscles of mastication in the university students of Jordan [17]. The sample size of this study was 1103 while my sample size was 253 pupils and the data of their result was collected by using standardized questioners which consist of questions like asking them about the clicking of joints, restrictions in the oral opening, arthralgia in joints, and pain while munching food, etc. while my data was collected by Fonseca's questionnaire. The main purpose was to find an association between the prevalence of craniomandibular joint and anxiety. All the participants were students and has an age limit of 18 to 25 years and the testing parameters included a questionnaire. Both genders were included in the study in which boys were 276 in numbers while girls were in large number is 827. The amount of worry seems to be higher among medical students of Jordan in comparison with the students of other departments. There were 68.6% of undergraduates with warning signs of craniomandibular joint pain while in my study percentage is calculated to be 58.1% percent so there is no vast difference between the results of these two studies. The smaller difference is due to the difference in the sample size of these two studies [2]. Various researches also performed on the similar populace and indicated equivalent results. A study performed by Yuh-Yuan Shiau *et al.*, on 2033 college-going students of Taiwan showed 42.9% prevalence of craniomandibular joint problems due to sadness. Rigorousness and management needs are low [18]. Another study performed by C. R. Pedroni *et al.*, on university-going students of Brazil from the age of 19- 25 years shows 68% prevalence of TMJ pain because of the depression in their studies [19]. The prevalence of reported TMJ noise, TMJ pain and impaired mouth opening in the university students were 41.7, 16.0, and 16.3%, respectively. These values are similar to those of a well-controlled Japanese epidemiological study in Japan [20]. Helkimo found no significant differences in TMD prevalence between males and females in a Lapp society where men and women play similar roles [21].

CONCLUSIONS

It is concluded that stress is a factor that causes TMJ pain in undergraduate university students. This study shows that stress and TMJ pain have direct positive and strong

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correlation between them. Stress not only causes TMJ pain but can also increase the severity of the pain. The percentage of TMJ pain is calculated to be 58.1% percent in university students. The result concludes that the prevalence of TMJ pain among students of university is high.

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