ORIGINAL ARTICLE

SURVEY ON PREVALENCE OF TEMPOROMANDIBULAR JOINT DYSFUNCTION AND ITS ASSOCIATION WITH NECK PAIN AMONG UNIVERSITY STUDENTS

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ABSTRACT

Introduction: Temporomandibular Joint (TMJ) dysfunction is second most frequent cause of orofacial pain after dental pain. TMJ dysfunction and disorders of cervical region greatly affect the routine activities and lifestyle and lower the person's ability to interact socially and work independently. The objective of current study was to determine the prevalence of TMJ dysfunction and its association with neck pain among university students.

Material & Methods: Participants from different universities in Faisalabad were selected using convenient sampling. Out of 1513 students, 1338 who met inclusion criteria were included in this study. The participants were asked to respond to a self-structured questionnaire that contained the Fonseca's Anamnestic Index (FAI) and Neck Disability Index (NDI). SPSS version 21 was used for data analysis.

Results: A total of 58% of the subjects were having mild to moderate level of temporomandibular dysfunction while 41% of the student's reported absence of neck pain. Study revealed that the headache was most common problem (61.5%) among university students and least common problem (16.5%) was moving jaw to the sides. Moderate and severe TMJ dysfunction were associated with severe and complete levels of NDI with $p<0.001$.

Conclusion: The results of this study showed that most of the students had mild to moderate TMJ dysfunction, and there was a significant association between TMJ dysfunction and neck pain.

Key Words: neck pain, students, temporomandibular joint, university

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INTRODUCTION

Temporomandibular Joint (TMJ) dysfunction pertains to facial disorder, causing temporomandibular jaw distress in association with orthodontic and neurological conditions. It is often associated with dental treatment, habits such as clenching, grinding, nail biting, non-nutritive sucking, bruxism, trauma and disk structure pathologies. Age, sex, genetic and psychosocial are also causative factors of TMJ dysfunction.[1] It refers to a collective condition which is known to be related with all the complications of TMJ and relevant musculoskeletal anatomy.[2]

Classic complaints of TMJ dysfunction include pain, decreased range of jaw movement and closure, sounds in joint, mandibular abnormality and masticating inability. These complains may occur alone or collectively.[1] Patients complains included pain in head, neck, face and ear.[3] TMJ dysfunction is usually associated with pain on touch or palpation in the muscles of jaw and joints and protrusion of

mandible, locking of joint, and joint sounds such as crepitus and cracking sounds when mouth is opened and closed. Pain in muscle on palpation is the mostly occurring sign.[4,5] Pain in muscle is the most commonly found symptom in TMJ dysfunction.[5,6]

Neck discomfort is one of the major problems in neck region occurring after acute trauma (like in whiplash injury to cervical spine) or due to minor trauma which is chronic in nature (as in case of leisure and faulty work) lesions of joints or periarticular structures.[7] Associations are illustrated about occurrence of neck problems and pain in patients with TMJ dysfunction. Along with the pain in neck, pain in facial area can also occur. If considered all these factors, it may be concluded that it was multifaceted in nature. Individuals that work and require prolonged sitting in a same posture get more affected by neck pain issues. Examples include movement of upper limb in forward direction and upper extremity bending.[8,9]

Association of TMJ dysfunction is common with other conditions related to region of head and neck, comprising of cervical spine dysfunctions and pain in the head region. Neck discomfort existence has been linked with TMJ dysfunction in almost 70% of the population in life time.[10] Literature shows that pain complaints in and around the neck region might be due to the probable linkage present between neck and jaw due to close proximity of the two structures. In the multifaceted factors, pain in the muscle around neck and TMJ on palpation or pressure is among the important factors that could lead to extended level of disorders in patients with TMJ dysfunction in the region of jaw or neck. Dysfunction of TMJ and disorders of cervical region have association with societal, sex and psychosocial factors. According to some researches pain in muscle on palpation were present more in women than men those who have complaints of TMJ Dysfunction.[11-14] In the comparison of subjects with and without TMJ dysfunction and its association with neck pain, an individual with a grade IV TMJ dysfunction had shown a rise of about nineteen points in the NDI.[15] Disability which is linked to pain of TMJ and cervical spine effects greatly activities of routine [11,16] and can adversely interfere with lifestyle of people affected by it that lowers the person's ability to interact socially and work independently without any limitation. The causation of TMJ dysfunction is mixed including trauma, bruxism, joint hypermobility, and psychosocial factors more commonly.[16,17]

The prevalence of signs and symptoms is inconstant and TMJ dysfunction is always evaluated by related complains of patients and history presenting complaint. Many researches done on the existence of complains of TMJ disorder on patient and non-patient populations.[18,19] It is generally believed that 40% population was generally affected by TMJ dysfunction.[20] Studies concluded that one individual out of around 60%–75% of the subjects will manifest one TMJ dysfunction sign and symptoms of TMJ dysfunction were evaluated to be 35%. At some moment in life TMJ dysfunction issues is present in 50-70% of total percentage, whereas 35% are mildly affected.[18,19,21]

TMJ dysfunction complains are more common among the working population compared to general population and it was believed to be related to mental issues exacerbation caused by work load duties , atmosphere changes of work place and the other environmental factors, inter-personal relations, and an achievement oriented climate influencing psychological behaviour disturbances.[22] TMJ dysfunction comes second after dental pain in frequently causing pain in orofacial region as evident from the literature. When TMJ dysfunction is accompanied by the neck pain, it can be disabling for the individual and it can also affect the quality of life because of the chronicity of the pathology and challenging management. This study was aimed to report the prevalence of TMJ dysfunction and its association with neck pain among university students

MATERIAL AND METHODS

This study used a cross-sectional survey design. The needed sample was obtained via non-probability convenience sampling. The ethical approval was taken from Riphah International University. Students of Riphah International University (RIUF), Government College University (GCUF), and University of Agriculture Faisalabad provided data (UAF) and permission were obtained from all universities before data collection. We included

1338 participants who met our inclusion criteria, including both genders, permanent dentition, no orthodontic treatment history, TMJ and/or masticatory muscle discomfort complaints, and volunteers. Those with stomatognathic system impairment, clinically confirmed TMJ dysfunction, receiving TMJ therapy, gross ear pathology, bone pathology linked with RA, frequent medication usage (analgesics, antianxiety medicines, antidepressants), and molar abnormalities were excluded from the study.

The self-structured questionnaire was used to find prevalence and severity of temporomandibular disorders in students of three universities of Faisalabad. The questionnaire consisted of three parts, first part was related to demographic information of students specially related to temporomandibular disorders and neck pain, second part was related to signs and symptoms of temporomandibular Dysfunction and third part contained questions related to neck pain.

Fonseca Anamnestic Index (FAI) was used which is valid and reliable tool to measure the prevalence of TMJ dysfunction along with signs and symptoms of TMJ dysfunction. It consists of 10 interlinked questions whose answers are obtained on a three-point scale format (0 = no, 5 = sometimes and 10 = yes).[23]

In addition, Neck disability Index questionnaire was used which is designed to give information about how neck pain affects the ability of the subject to manage their everyday life.[24,25] The NDI includes 10 items; 7 items are associated with activities of daily living, 2 are linked to pain, and 1 is related to concentration. Each item is scored from 0 (no pain or disability) to 5 (severe pain and disability), and the total score is expressed as a percentage (total possible score = 100%), with higher scores corresponding to greater disability. Depending on the score, the subjects were classified as having neck disability or not (0–4 = no disability; 5–14 = mild disability; 15–24 = moderate disability; 25–34 = severe disability; >35 = complete disability).[24,25] The NDI is a valid and reliable questionnaire for measuring neck disability and allowing its use as a guide for clinical-decision making. [25,26]

The frequencies of demographic information were presented in tabular form to examine the characteristics of individuals. Chi-square test was conducted to find out association between Neck Disability Index and Temporomandibular Dysfunction. Data was analysed while using SPSS version 21.

RESULTS

A total of 1338 students were selected through convenient sampling. Out the total, 637(47.6%) were male and 701(52.4%) were female. The age of most of the students (69.2%) was >20 years. About 50% students belonged to Government College University, Faisalabad and one third students belonged to Riphah International University, Faisalabad and 13% belonged to Agriculture University, Faisalabad (Table 1).

The headache was most common problem (61.5%) among university students, followed by neck pain or stiff neck in (55.3%) while third most common problem (53.2%) was tension among the university students and least common problem was moving jaw to the sides in 16.5% students, 2nd least common problem in 16.8% students was opening mouth wide (Table 2). The finding of our shows that the pain intensity score among (M=0.49, Max. =5) the students was very low because it is out of 5 scores. The highest score was related to headaches (M=1.22, Max=5) (Table 3), students with moderate TMJ dysfunction and Severe TMJ dysfunction were associated with severe and complete levels of NDI with $p<0.001$ (Figure 1).

DISCUSSION

In the present study present study Fonseca Anamnestic Index (FAI) was used to find out the prevalence of TMJ dysfunction among the university students. FAI is proven to be a valid and reliable tool that can be used for this purpose. A systematic review conducted by the Brazilian authors by searching the literature in Medline, PubMed, Lilacs and BBO databases from 1990 to 2012 included seventeen studies, highlighted that in 35% of the studies, FAI was used to make the clinical diagnosis for the TMJ dysfunction.[27]

Current study revealed that headache remained the most common problem (61.5%) among university students, followed by neck pain or stiff neck in (55.3%) and the least common problem (16.5%) was moving jaw to the sides, second least common problem (16.8%) was opening mouth wide. These results were obtained using FAI. A study conducted by

Ryalat et al. in Jordan regarding the prevalence of temporomandibular symptoms among university students showed that pain in and around the ears was the most common symptom following by the joint clicking.[28] Another study reported clicking to be the most prevalent symptom among the student population when queried about the temporomandibular Dysfunction.[29]

In the current study, only 24% of the participants reported about the presence of clicking sounds. These findings are contrary to a book written on the management of TMJ dysfunction in which the author labelled the clicking sounds of TMJ as the symptom to be rated as first.[30] Ebrahimi et al. in Iran found that clicking joint sounds followed by muscle tenderness around the joint and TMJ tenderness were the most reported symptoms.[31] Similarly another study reported clicking sounds to be most prevalent symptom (25.4%).[32] The results of study by Nomura et al. conducted among Brazilian students also support the findings of the current study. The results of their study revealed that 76.2% of the students said 'yes' to the question about whether they consider themselves tense or not?[23] Few studies have established that there is an increased prevalence of symptoms in people who described themselves as being tense.[33]

The present study investigated the prevalence of TMJ dysfunction among the university students. Around 41% respondents were not having any of the symptoms inquired by using the structured questionnaire. Majority of the students (58%) were having mild to moderate level of TMJ dysfunction and few reported the presence of severe form of TMJ dysfunction (0.8%). The results are in favour of another study conducted by Chandak who reported high prevalence of TMJ dysfunction (69%); mild to moderate category TMJ dysfunction.[34] Similarly, high prevalence was reported by study conducted by Pedroni et al. and Bavilaqua et al. [35,36] Study carried out by Modi et al. in India reported that 43.2% of the study population had mild to moderate TMJ dysfunction.[37] Santis et al. conducted a cross sectional survey among the children enrolled at school setting in Brazil. The researchers submitted the participants for the clinical examination of the TMJ joint. Along with the anthropometric measurements of these children were recorded. After that, comparison was made between BMI. The results of the study depicted that TMJ dysfunction was highly prevalent among this population.[38]

Current study showed statistically significant association between NDI and TMJ dysfunction. Chi-square test was conducted to find the association between NDI and TMJ dysfunction. Moderate TMJ dysfunction and severe TMJ dysfunction were associated with severe and complete levels of NDI with $p<0.001$. Similar results were reported by the study conducted by Olivo et al. in 2010. The authors stated that jaw disability was strongly associated with neck disability. However, the authors used Jaw Function Scale to assess the TMJ and used NDI for the assessment of neck disability. According to authors the persons having high level of jaw disability were prone to have increased disability in the neck region. These studies supports the results of the current study.[15,18] Studies by Weber et al. and Silveria et al. reported similar relationship between cervical problems and TMJ joint disorder. [26,39] The findings of the study published by Matheus et al are in contrast to our findings as they reported no association between cervical posture and TMJ dysfunction.[40]

It is pertinent to mention that the current cross-sectional research was conducted in one city and therefore, the results cannot be generalized to the entire population of the country. In the future, longitudinal studies should be conducted. While taking another study, students should be screened for risk factors associated with TMJ and neck pain, and prevention, early diagnosis, treatment, rehabilitation, and counselling should be provided. Researchers should study how common TMJ dysfunction is in other professions, such as paramedics, dentists, physical Therapist and surgeons. Additionally, awareness campaigns regarding these complaints should be conducted via pamphlets and other media. In addition, the results can be used by the government to fund further research and to educate students about the signs and symptoms of TMJ Dysfunction and its association with neck pain.

CONCLUSION

The results of this study showed that most of the students had mild to moderate TMJ dysfunction, and there was a significant

association between TMJ dysfunction and neck pain. Further, headaches ranked highest on the FAI, followed by neck pain.

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Table 1: Demographic information of the participants

Variables	Frequency	Percentage
Gender		
Male	637	47.6
Female	701	52.4
Marital Status		
Married	33	2.5
Single	1305	97.5
Age(years)		
≤20	412	30.8
>20	926	69.2
Job Status		
Unemployed	1259	94.1
Employed	79	5.9
Handedness		
Right	1273	95.1
Left	65	4.9
Type of institute		
Private	449	33.6
Government	744	55.6
Semi government	145	10.8
Name of University		
Riphah International University	479	35.8
Government College University	676	50.5
University of Agriculture	183	13.7
Extra-curricular activities		
Yes	407	30.4
No	931	69.6
Family Setup		
Nuclear	839	62.7
Joint	468	35
Extended	31	2.3
Lifestyle of Participants		
Sedentary	265	19.8
Active	1073	80.2

Table 2: Response of the participants on individual questions of Fonseca Anamnestic Index

Questions		Response		
		No (%)	Somewhat(%)	Yes(%)
1	Do you have difficulty opening your mouth wide?	83.3	13.1	3.7
2	Do you have difficulty moving your jaw to the sides?	83.5	13.3	3.2
3	Do you feel fatigue or muscle pain when you chew?	64.3	28.5	7.2
4	Do you have headaches?	38.5	41.6	19.9
5	Do you have neck pain or a stiff neck?	44.7	30	25.3

6	Do you have ear aches or pain in that area (temporomandibular joint)?	78	14	8.1
7	Have you ever noticed any noise in your TMJ while chewing or opening your mouth?	77.8	17.3	4.9
8	Do you have any habits such as clenching or grinding your teeth?	72.6	20.2	7.2
9	Do you feel that your teeth do not come together well?	77.6	12.3	10.1
10	Do you consider yourself a tense (nervous) person?	46.8	27.8	25.4

Table 3: Responses about Study Variables related to Neck Disability Index

*Variables	0 I can do as much work as I want to do	1 I can only do my usual work, but no more	2 I can do most of my usual work, but no more	3 I cannot do my usual work	4 I can hardly do any work at all	5 I can't do any work at all
Pain Intensity	68.2	23.4	4.3	2.8	0.7	0.7
Personal Care (Washing, Dressing, etc.)	72.5	16.5	4.8	3.6	1.9	0.7
Lifting	69.7	18.2	4.6	3.4	3.5	0.7
Reading	42.7	24.6	20.4	7.2	3.7	1.3
Headaches	40.9	26	16.3	8.8	5.4	2.6
Concentration	52	22.2	15.3	5.8	3.5	1.2
Work	53.2	28.2	12.3	3.7	1.9	0.7
Driving	65	19.7	5.5	2.4	2.1	5.3
Sleeping	61.2	23.1	8.8	3.6	1.3	2
Recreation	58	17.2	15.2	5.5	3	1.2

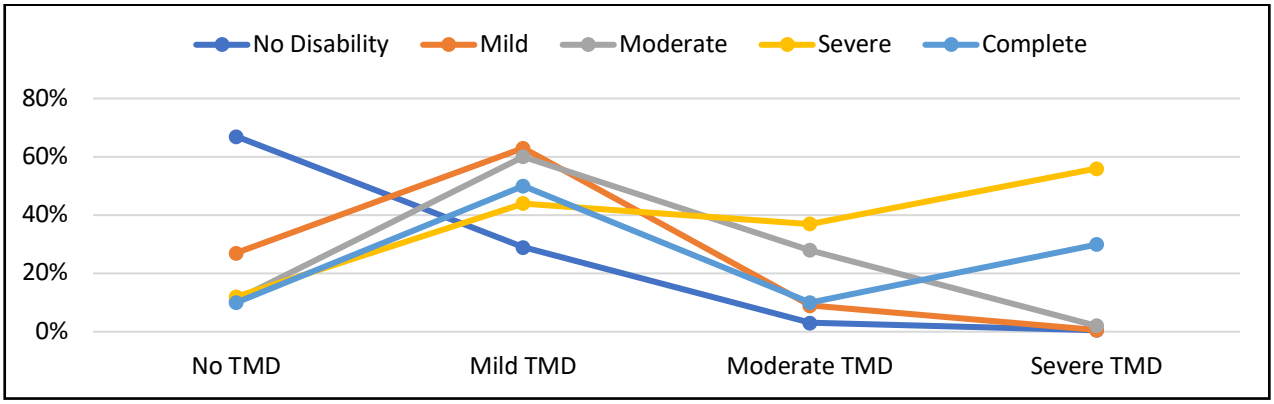

Figure 1: Association between Neck Disability Index and Temporomandibular dysfunction