

Prevalence of temporomandibular joint problems in various occupations in western Saudi Arabia region during the pandemic COVID19

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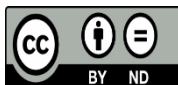


Keywords:

Prevalence, temporomandibular disorders, COVID-19 pandemic.

ABSTRACT

The study aimed to determine the severity and prevalence of temporomandibular disorders (TMDs) in people from different professions in Saudi Arabia's western region to identify which one subjected to more stressful situation. The present cross sectional study was performed using a standard questionnaire-based study with Fonseca Anamnestic Index. The study was performed on adult participants from western area of Saudia Arabia who agreed to participate in the questionnaire between August 2020 and October 2020. The study included 1280 participants. The study sample were divided into six groups according to their professions (health care providers, business, college student, education, engineered and un-employed). Data were statistically analyzed for significance and correlations. The sample included 999 males and 281 females ranging in age from 18 to 65. Mild TMDs symptoms are reported in nearly half the participants. There was non-significant difference between different professions of the participants. The new pandemic COVID-19 may affect the health status among population of the society leading to mild symptoms related to temporomandibular joint regardless to their professions.



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One of the most common source of oro-facial pain in Temporo-mandibular disorder (TMD). TMDs is a disorder affects TMJ, muscles of mastication, or both. It is characterized by articular sounds and impaired jaw movement [1], [2]. TMDs is a multifactorial disorder where the emotional life stress and life style changes are cited as the most common factor among others such as teeth loss, masticatory disorder, occlusal interferences, postural deviation and changes in TMJ structure. These etiologic factors can work either alone or in combination with each other [3], [4].

The psycho-emotional factor considered literally as the most significant impact among others as malocclusion, systemic diseases, trauma or loss of teeth that can cause TMD [5]. In patients that go through psycho-emotional situations including stress, anxiety, depression, fatigue and sleep disorders suffer from TMD more than the others do [6].

The most stressful situation that faced humanity in the new century is the global pandemic COVID-19 [7], [8]. This pandemic affects every aspect in our lives especially with the lack of information concerning mode of transmission, how to prevent or treat this virus [8], [9]. This pandemic had a negative psycho-emotional impact on every society. Although a large section of population can show resiliency upon dealing with stress, fear or loss accompanying this pandemic but still not a lesser section of the population, the virus can affect their psychological health and exacerbating a stress related disorders [10].

Many trials carried out to establish a simple and reliable questionnaire to overcome the difficulties facing investigators to diagnose and identify the etiologic factors of TMD [11], [12]. Many parameters as age, sex and occupation used in many questionnaire that used in many studies which using the power of surveying the population to stand on the epidemiologic factors of TMDs [13- 15].

Fonseca questionnaire is a modified form of Helkimo's indices which was used in many studies to diagnose and grad the severity of TMDs [1], [3] the severity of TMD is classified into light, moderate, severe and non-TMD. It shows many advantages as short time application, fast, low cost, less variability and self-administration [1], [16].

Therefore, this study was designed to evaluate prevalence of TMDs in undiagnosed population a result of Covid-19 stress in western region Saudi Arabia with the help of Fonseca's questionnaire. Also, to investigate correlation between population's professions and prevalence of TMDs.

2. Methods

2.1 Study setting

This cross sectional study was performed on adult participants from western area of Saudia Arabia who agreed to participate in the questionnaire between August 2020 and October 2020. All participants signed an informed consent which located at the beginning of the questionnaire. The study was conducted according to rules of ethics declared by Helsinki, and ethical committee approval was obtained from Vision College of Dentistry and Nursing, Jeddah.

2.2 Participant's inclusion criteria

Participants were included in this study if they are medically free, free from any TMD signs and symptoms, their age range from 18- 40 years old. Dividing the study sample randomly into six groups according to their professions (health care providers, business, college student, education, engineered and un-employed) each group receive the same questionnaire via professional emails.

2.3 Study tools

The degree of TMD in the participants was assessed using a questionnaire developed by Fonseca [2], [3]. The questionnaire consists of ten questions that assess the existence of TMJ pain during rest and activity, parafunctional patterns, mandibular movement limitations, joint clicking, perception of malocclusion, and emotional stress as shown in Table I.

The following scale was used to assess TMD severity: recurrent symptoms (10 points), no symptoms (0 points), and sometimes (5 points). The participants were divided into four groups based on the number of their points: TMD-free (0 to 15 points); mild TMD (20 to 40 points); moderate TMD (45 to 60 points); and extreme TMD (70 to 100).

2.4 Data analysis

SPSS 26.0 was used to conduct the statistical analysis (SPSS Inc., Chicago, IL, USA). In each test, the mean and standard deviation values were determined for each category. The Kolmogorov-Smirnov and Shapiro-Wilk tests were used to check for normality, and the results revealed a non-parametric distribution. In non-related samples, the Kruskal Wallis test was used to compare more than two classes and the Mann Whitney test was used to compare two groups. To compare the frequency of TMD frequency in different groups, the Chi square test was used. P 0.05 was chosen as the significance point.

3. Results

The study sample consisted of 1280 participants (999 males, 281 females, and age range 18–65) who were medically free, and did not have history of sign or symptom of TMD before 2020 from Western region, Saudi Arabia.

I) TMD severity:

Results of this study showed that there was a prevalence of mild TMD among all participants. Statistical analysis of results of TMD severity (Table II), showed that there was no significant difference among all groups where ($P=0.725$). Regardless of profession sector, total results showed 507 (39.6 %) TMD-free, 524 (40.9 %) mild TMD, 201 (15.7 %) moderate TMD and 48 (3.8 %) with severe TMD (Table III).

II) Correlation between TMD severity and different professions

Statistical analysis of the result of all questions showed there was no significant difference among all groups where P - values were 0.692, 0.967, 0.131, 0.983, 0.859, 0.929, 0.374, 0.433, 0.391, and 0.938 for the first question to tenth question respectively (Table IV).

4. Discussion

The new pandemic COVID-19 according to the evidence can cause the individuals to experience symptoms of anxiety, trauma, panic attacks, psychosis and suicidal thoughts [17], [18]. These symptoms were caused by the fear of the unknown as the mode of transmission, high mortality rate and concerns about future can cause anxiety. Therefore, examining psychological status among the population is mandatory [17], [19], [20]. The present study provide prevalence survey using a simple reliable diagnostic tool for temporomandibular joint pain disorders based on valid functional questionnaire.

According to Qiu et al., 2020, COVID-19 has the power of affecting many individuals within the society with deep psychological scar as a result of their sickening or death of their relatives and friends. New social methods were implemented to overcome the severity of COVID-19 including social distancing and isolation which evocate a new methods for thinking about and adapting to this crisis [18].

The Fonseca et al., 1994 questionnaire is a valid and reliable questionnaire that has been used in Brazil and

America. It consists of ten questions about TMDs. The Fonseca questionnaire used in this study aimed to evaluate the prevalence of signs and symptoms of TMD in western region of Saudi Arabia. It is used to ensure the collection of information from a large quantity of participants in short period of time [16]. The most important privilege of using this questionnaire that it has no influence on the investigator and it is easy to understand it [1], [16].

The mild TMD symptoms were the most reported symptoms in this study. The results were similar to studies performed by Dekon et al. 2002 [21], Pedroni et al. 2003 [22], Karthik, et al 2017 [23] and Ryan et al. 2019 [12] through using the Fonseca questionnaire on a sample of college students in Brazil and India.

The prevalence of TMD among the different profession groups was non-significant although all groups show symptoms of mild TMD. These results indicate that the anxiety caused by the new pandemic COVID-19 can lead to some mental health disorders affecting the TMJ [23], [24].

The present study presented the effect of COVID-19 on the psychology and mental health of the population and correlate between the stress induced by COVID-19 and TMDs symptoms. This finding could be beneficial in application to patient care through emphasis on countries that suffer from COVID-19 and show TMDs problems that need further investigations to explore further affection and confirm the patients self-reported symptoms. Precautions should be done to decrease the stress induced by COVID-19.

5. Conclusion

The new pandemic COVID-19 may affect the health status among population of the society leading to mild symptoms related to temporomandibular joint through anxiety regardless to their professions. The countries suffer from COVID-19 may show advanced TMDs problems that need further investigations and treatment.

6. References

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Table I: Fonseca questionnaire

No	Questions	No	Sometimes	Yes
1	Is it hard for you to open your mouth?			
2	Is it hard for you to move your mandible from side to side?			
3	Do you get tired /muscular pain while chewing?			
4	Do you have frequent headaches?			
5	Do you have pain on the nape or stiff neck?			
6	Do you have earaches or pain in craniomandibular joints?			
7	Have you noticed any TMJ clicking while chewing or when you open your mouth?			
8	Do you clench or grind your teeth?			
9	Do your feel your teeth do not articulate well?			
10	Do you consider yourself a tense (nervous) person?			

Table II: The frequencies values of TMD in different groups.

Variables	TMD		
	n	%	p-value
Health			
TMD-Free	126	42.9%	
Mild TMD	100	34%	

care sector (n=294)	Moderate TMD	49	16.7%	<0.001*
	Severe TMD	19	6.5%	
	TMD-Free	80	41.2%	
Business sector (n=194)	Mild TMD	70	36.1%	<0.001*
	Moderate TMD	40	20.6%	
	Severe TMD	4	2.1%	
College sector (n=359)	TMD-Free	127	35.4%	<0.001*
	Mild TMD	166	46.2%	
	Moderate TMD	50	13.9%	
Education sector (n=117)	Severe TMD	16	4.5%	<0.001*
	TMD-Free	49	41.9%	
	Mild TMD	39	33.3%	
Engineer sector (n=106)	Moderate TMD	24	20.5%	<0.001*
	Severe TMD	5	4.3%	
	TMD-Free	43	40.6%	
Un-employed (n=210)	Mild TMD	48	45.3%	<0.001*
	Moderate TMD	13	12.3%	
	Severe TMD	2	1.9%	
Un-employed (n=210)	TMD-Free	82	39%	<0.001*
	Mild TMD	101	48.1%	
	Moderate TMD	25	11.9%	
Severe TMD	2	1%		
p-value		0.725ns		

Table III: The frequencies values of total TMD.

Variables		TMD		p-value
		n	%	
Total	TMD-Free	507	39.6%	<0.001*
(n=1280)	Mild TMD	524	40.9%	

Moderate TMD	201	15.7%
Severe TMD	48	3.8%

*; significant (p<0.05)

Table IV: The frequencies values of different groups regarding each question.

Variables	Health care sector (n=294)		Business sector (n=194)		College student (n=359)		Education sector (n=117)		Engineer sector (n=106)		Un-employed (n=210)		p-value	
	n	%	n	%	n	%	n	%	n	%	n	%		
Q1	Yes	23	7.8%	17	8.8%	17	4.7%	11	9.4%	7	6.6%	6	2.9%	0.69 2ns
	No	238	81%	159	82%	30	84.4%	94	80.3%	8	83%	189	90%	
	Sometimes	33	11.2%	18	9.3%	39	10.9%	12	10.3%	1	10.4%	15	7.1%	
Q2	Yes	42	14.3%	25	12.9%	42	11.7%	16	13.7%	1	10.4%	17	8.1%	0.96 7ns
	No	218	74.1%	144	74.2%	27	76.3%	85	72.6%	8	80.2%	174	82.9%	
	Sometimes	34	11.6%	25	12.9%	43	12%	16	13.7%	1	9.4%	19	9%	
Q3	Yes	54	18.4%	28	14.4%	48	13.4%	23	19.7%	1	14.2%	26	12.4%	0.13 1ns
	No	183	62.2%	124	63.9%	21	59.6%	70	59.8%	6	62.3%	143	68.1%	
	Sometimes	57	19.4%	42	21.6%	97	27%	24	20.5%	2	23.6%	41	19.5%	
Q4	Yes	57	19.4%	43	22.2%	87	24.2%	22	18.8%	2	22.6%	50	23.8%	0.85 9ns
	No	162	55.1%	97	50%	16	46.5%	65	55.6%	4	44.3%	102	48.6%	
	Sometimes	75	25.5%	54	27.8%	10	29.2%	30	25.6%	3	33%	58	27.6%	
Q5	Yes	55	18.7%	34	17.5%	55	15.3%	21	17.9%	1	17.9%	31	14.8%	0.85 9ns
	No	181	61.6%	118	60.8%	23	66.6%	78	66.7%	6	65.1%	137	65.2%	
	Sometimes	58	19.7%	42	21.6%	65	18.1%	18	15.4%	1	17%	42	20%	
Q6	Yes	44	15%	33	17%	44	12.3%	13	11.1%	1	12.3%	25	11.9%	0.92 9ns
	No	211	71.8%	136	70.1%	27	76.3%	90	76.9%	8	79.2%	168	80%	
	Sometimes	39	13.3%	25	12.9%	41	11.4%	14	12%	9	8.5%	17	8.1%	
Q7	Yes	47	16%	27	13.9%	55	15.3%	20	17.1%	9	8.5%	23	11%	0.37

				%		%		%			%	4ns	
	No	221	75.2	147	75.8	25	69.6	85	72.6	9	84.9%	161	76.
			%		%	0	%		%	0			7%
	Someti mes	26	8.8%	20	10.3	54	15%	12	10.3	7	6.6%	26	12.
					%				%				4%
	Yes	84	28.6	53	27.3	87	24.2	32	27.4	2	25.5%	43	20.
			%		%		%		%	7			5%
Q8	No	152	51.7	108	55.7	18	52.4	56	47.9	5	49.1%	125	59.
			%		%	8	%		%	2			5%
	Someti mes	58	19.7	33	17%	84	23.4	29	24.8	2	25.5%	42	20
			%				%		%	7			%
	Yes	73	24.8	41	21.1	66	18.4	32	27.4	2	25.5%	44	21
			%		%		%		%	7			%
Q9	No	186	63.3	131	67.5	24	67.7	64	54.7	6	64.2%	135	64.
			%		%	3	%		%	8			3%
	Someti mes	35	11.9	22	11.3	50	13.9	21	17.9	1	10.4%	31	14.
			%		%		%		%	1			8%
	Yes	91	31%	64	33%	11	32%	40	34.2	3	33%	68	32.
						5			%	5			4%
Q10	No	109	37.1	70	36.1	11	32.6	38	32.5	4	37.7%	66	31.
			%		%	7	%		%	0			4%
	Someti mes	94	32%	60	30.9	12	35.4	39	33.3	3	29.2%	76	36.
					%	7	%		%	1			2%