Revista de Ciencias Médicas de Pinar del Río

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2023; 27(S2): e6209

ARTICLE REVIEW

Influence of stress on the development of temporomandibular joint disorders

Influencia del estrés en el desarrollo de trastornos de la articulación temporomandibular

Yaima Rodríguez-Cuellar[1], Lester Wong-Vázquez[1], Jerson Andrés Verdezoto-Sancho[1]

[1]Universidad Regional Autónoma de Los Andes. Ambato, Ecuador.

Received: July 16, 2023
Accepted: September 30, 2023
Published: November 15, 2023

Citado como: Rodríguez-Cuellar Y, Wong-Vázquez L, Verdezoto-Sancho JA. Influencia del estrés en el desarrollo de trastornos de la articulación temporomandibular. Rev Ciencias Médicas [Internet]. 2023 [citado Fecha de acceso]; 27(S2): e6209. Disponible en: https://revcmpinar.sld.cu/index.php/publicaciones/article/view/6209

ABSTRACT

Introduction: temporomandibular disorders include a group of problems involving the temporomandibular joint, masticatory tendons and nearby structures. These disorders are related to dental and medical variations, such as psychological alterations.
Objective: to describe the association between stress and the development of temporomandibular disorders in adults.
Methods: a literature review was performed following PRISMA principles. Research published from 2017 onwards was taken into account, in journals indexed in PubMed/MedLine, ScienceDirect and LILACS databases, employing a search formula using keywords combined with each other by Boolean terms.
Results: a total of 930 articles were obtained, of which 15 were selected for the study, the rest were excluded after the screening process. It was found that there is a relationship between stress and temporomandibular disorders, where factors such as anxiety and depression intervened.
Conclusions: considering the existence of a relationship between stress and temporomandibular disorders, it is important to develop joint diagnosis and treatment strategies to provide comprehensive patient care.

Keywords: Temporomandibular Joint; Adult; Anxiety; Depression.

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2023; 27(S2): e6209

RESUMEN

Introducción: los trastornos temporomandibulares incluyen un grupo de problemas que implican a la articulación temporomandibular, los tendones masticatorios y estructuras próximas. Estos trastornos están relacionados con variaciones dentales y médicas, como las alteraciones psicológicas.
Objetivo: describir la asociación entre el estrés y el desarrollo de trastornos temporomandibulares en adultos.
Métodos: se realizó una revisión de la literatura siguiendo los principios PRISMA. Se tomaron en cuenta investigaciones publicadas a partir del 2017, en revistas indexadas en las bases de datos PubMed/MedLine, ScienceDirect y LILACS, empleando una fórmula de búsqueda usando palabras clave combinadas entres si por términos booleanos.
Resultados: sSe obtuvo un total de 930 artículos de los cuales se seleccionaron 15 para el estudio, el resto fueron excluidos tras el proceso de cribado. Se encontró que existe una relación entre el estrés y los trastornos temporomandibulares, donde intervinieron factores como la ansiedad y depresión.
Conclusiones: considerando la existencia de una relación entre el estrés y los trastornos temporomandibulares, es importante desarrollar estrategias conjuntas de diagnóstico y tratamiento para dar una atención integral al paciente.

Palabras clave: Articulación Temporomandibular; Adulto; Ansiedad; Depresión.

INTRODUCTION

The anatomofunctional unit of the oral cavity is the stomatognathic system (OS). With respect to the temporomandibular joint (TMJ) a group of signs and symptoms can be found that restrict the motor control and operability of this system.[1] It is currently known as temporomandibular disorder (TMD), determined by the American Academy of Pain as a condition that encompasses a group of problems involving the TMJ or masticatory tendons and surrounding structures.[2]

Early identification of TMD, accompanied by the initiation of specialized treatment, plays an important role in preventing chronicity and minimizing the negative impact of this disorder.[3] In order to diagnose TMD, tools are needed to guide the dentist through the extensive range of differential diagnostic processes. One of the most typical pathognomonic symptoms is myofascial pain, which is a clear indicator in the diagnosis.[4]

There is no clearly defined etiology of TMD; it is multifactorial and possible initiating, predisposing and perpetuating factors are identified.[5] TMDs are related to dental and medical variations such as trauma, occlusal disorders, parafunctional actions, psychological alterations, orthodontic procedure, oddities in the anatomy of the temporomandibular disc and colligate musculature, in addition to genetic factors, age and gender.[6]

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2023; 27(S2): e6209

Regarding the degree of involvement of TMD, worldwide it affects 10 to 30 %; but only in 15 % of the cases, people appreciate that they require treatment.[7] Regarding gender, it affects mostly the female gender (70 % or more). In addition, female patients exhibit more frequent and more severe symptomatology, as well as a high propensity for chronicity.[8]

A risk factor is "...any trait, characteristic or exposure of a person that increases his or her probability of suffering a disease or injury...". Among these factors is stress, which is caused by all those physical, psychological or environmental stimuli that release neuroendocrine self-regulating elements in the body that serve to preserve internal energetic and emotional harmony.[9]

Although the allostatic compensatory neuroendocrine mechanisms restore homeostasis acutely, they also cause negative effects when they are kept active for constant and prolonged periods of time.[10,11] Currently, the association between stress and diseases such as arterial hypertension, osteoporosis, atherosclerosis, diabetes, anxiety, immunosuppression, temporomandibular disorder, depression and even in the origin of certain variants of cancer has been identified.[6] With respect to TMDs and stress, the involvement of psychological factors such as the presence of anxiety, depression and vulnerability is highlighted.[12]

Given the relevance of TMD, as well as the high incidence of situations that cause stress, and due to the dispersion of information related to this subject, the present study was carried out with the aim of describing the association between stress and the development of temporomandibular disorders in adults.

METHODS

A systematic review of the literature was conducted at the Universidad Regionál Autónoma de Los Andes between April and May 2023 on the association between stress and the development of temporomandibular disorders in adults. The recommendations of the PRISMA,[13] guidelines for the publication of systematic reviews were followed for the study.

A search for information was carried out in the LILACS, PubMed/MedLine and ScienceDirect databases for articles on stress and its relationship with temporomandibular joint disorders. Language (Spanish, English and Portuguese), publication period (2017-2023), knowledge area (Dentistry/Estomatology and Medicine) and study design (clinical trials and randomized controlled trials) were used as filters.

An advanced search formula was used to retrieve the records, using the terms "temporomandibular disorders", "Adult" AND and "Stress", related using Boolean operators (AND and OR). The strategy was adapted according to the search syntax of each database.

The advanced search obtained a total of 930 initial articles; the screening process (Figure 1) resulted in the selection of 15 articles for the development of the present study.

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2023; 27(S2): e6209

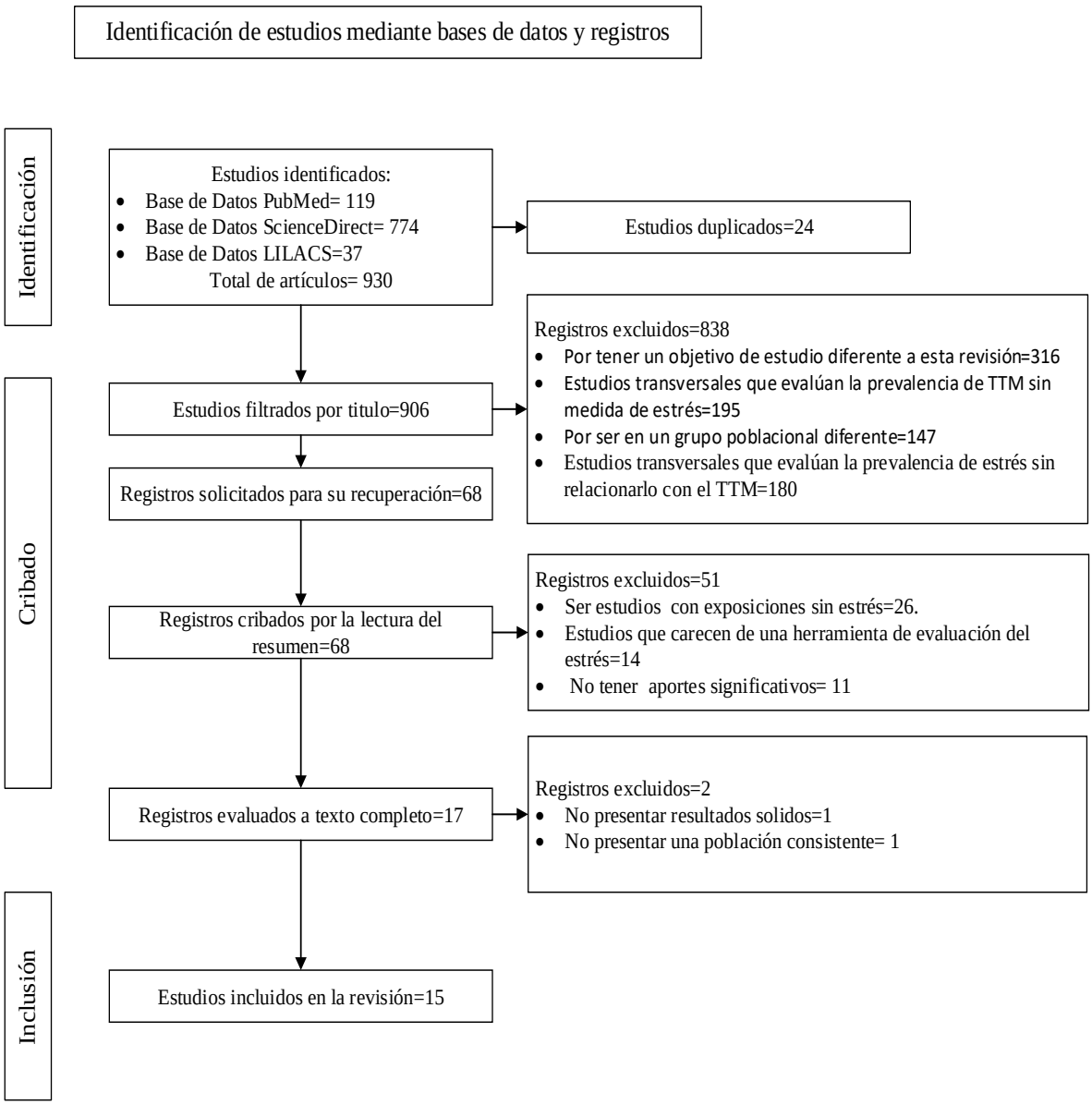

Fig. 1 Diagram of item selection

RESULTS

The most relevant information from the scientific articles selected for the present study can be seen in Table 1.

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2023; 27(S2): e6209

Table 1. Synthesis of the characteristics and main results of the selected

No.	Autor	Objetivo	Población	Factores de Riesgo	Cuestionario Aplicado	Presencia de Estrés	Resultado	Conclusiones
1	Resende et al.[14], (2019)	To evaluate the predisposition to TMD in patients with low quality of life and anxiety.	120 patients (60 TMD/60 non-TMD) average age 33.29 years.120 patients (60 TMD/60 non-TMD) average age 33.29 years.	60% were women, 65.1% were single and 71.4% were employed.	Anxiety (Beck Anxiety Inventory [BAI]; the State-Trait Anxiety Inventory [STAI-S and -T]; the Anxiety Inventory and Depression Scale [HADS]) TMD (Research Diagnostic Criteria for Temporomandibular Disorders-RDC/TMD)	Presence of anxiety	The majority of patients with anxiety had TMD, according to HADS, 75 % ($p < 0.001$); STAI-S, 55.6 % ($p = 0.035$); STAI-T, 54.9 % ($p = 0.011$); and BAI, 63.9% ($p = 0.002$).	Existe una relación entre los aspectos sociodemográficos, la ansiedad y TTM. Los pacientes con TMD tienen mayores niveles de ansiedad y CV más bajos, y esto puede interferir con el tratamiento
2	Mendiburu et al.[15], (2021)	Relating sleep quality, perceived stress, and painful temporomandibular disorders in young adults.	552 young adult subjects (average age 27 years)	Poor sleep quality in more than 55 % of the study population Pittsburgh	Sleep Quality Index (PSQI), Cohen Perceived Stress Scale (CPS) and Gonzalez Painful Temporomandibular Disorders Testing Instrument (TMDTDI).	More than 74 % of the population presented stress.	Neither the level of perceived stress, sex or age were risk factors for the development of painful DTM.	Tener una calidad de sueño pobre aumenta 4 veces más la posibilidad de tener un DTM doloroso
3	Ton et al.[16], (2020)	Having a poor quality of sleep increases 4 times more the chance of having a painful DTM.	714 estudiantes universitarios con edades entre 18 to 60 años.	714 university students aged 18 to 60 years. The prevalence of TMD was 68.63 % and 46.9 % had mild TMD. 67.51 % were women, 94.68 % were single	Fonseca Amnesia Index, Trait-State Anxiety Inventory (IDATE) and LIPP. The Stress Symptom Inventory (LIPP) was applied.	The 93.14 % presented stress, 56.30 % had high levels of anxiety.	Among the volunteers diagnosed with TMD, a significant number were diagnosed without stress, but there was a statistically significant association between those diagnosed with stress and mild TMD, anxiety and TMD, (state: moderate anxiety and DTM - 50%; trait: moderate and severe anxiety and mild DTM - 49.3 % and 49.87 %, respectively)	Los TTM leves fueron más significativos, y la ansiedad y el estrés estuvieron significativamente presentes entre los estudiantes universitarios con signos y síntomas de TTM.
4	Cezeriloet al.[17], (2020)	To investigate the association between stress and temporomandibular in university students.	2,089 university students	82 were classified with presence of temporomandibular dysfunction of which 63 were female	Perceived Stress Scale (PSS)	35 participants presented severe stress (PSS=22-40)	Adjusted logistic regression shows that the probability of presenting temporomandibular dysfunction was higher (OR=2.43; 95%CI=1.04-5.65) when the level of stress increased	El estrés se asoció con individuos con una mayor prevalencia de disfunción temporo-mandibular.
5	Vásconez et a.[12], (2017)	To determine the most relevant associated factor for temporomandibular disorders.	316 patients, 239 women and 77 men distributed in two ranges 20 to 40 years old and from 41 years old onwards	208 (65.8 %) patients presented TMD.	Diagnosis of temporomandibular disorders (CD/TTM) Depression Anxiety and Stress Scale (DASS 21) to detect emotional stress	138 (43.7%) participants presented stress (presence of muscle fatigue, prolonged	The prevalence of disorders in the regression analysis with the variable emotional stress presented an Oddsratio of	La prevalencia de los trastornos temporo-mandibulares en la muestra recolectada fue representativa y su relación con

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2023; 27(S2): e6209

						tension and psychological distress levels)	17. 96 (95%CI 8.59 - 37.56), for the age group OR=1.72 (95%CI: 1.057 - 2.798) and for the male sex an OR = 0.994 (95%CI 0.872 - 1.134).	el factor estrés emocional tiene relevancia significativa. El factor sexo y edad no tienen correlación significativa con los TTM.
6	Wagner et al.[18], (2019)	To evaluate the presence of bruxism and anxiety in military firefighters with frequent episodic tension headache and painful temporomandibular disorders (TMD).	100 university students with an average age of 19 years	84 participants were female, 26 had bruxism during sleep, 59 had bruxism during awakening.	International Classification of Headache Disorders-III. The Research Diagnostic Criteria for Temporomandibular Disorders questionnaire. Anxiety was classified by means of the Beck Anxiety Inventory.	143 presented moderate anxiety (0-15)	Associations were found between painful TMD, awake bruxism and anxiety ($p < 0.0005$). Sleep bruxism was not a risk factor ($p = 0.119$) except when associated with awake bruxism ($p = 0.011$).	La ansiedad y el bruxismo despierto fueron factores de riesgo independientes para el desarrollo de cefalea tensional episódica frecuente asociada con DTM dolorosos
7	Soares et al.[19], (2020)	To evaluate the correlation between anxiety and depression symptoms and the existence of symptoms associated with temporomandibular disorders in university students.	100 university students with an average age of 19 years old	79 participants were female, 47 participants had clicking when chewing, 52 had a habit of grinding their teeth.	Axis II Questionnaires and the Hospital Anxiety and Depression Scale	All participants had the presence of anxiety and depression (thoughts of, feeling lonely, sad, feeling "something stuck in the throat, feeling discouraged about the future)	The following associations were observed: general health, state and depression; anxiety and face pain/chattering; teeth grinding/clenching habit when sleeping and affirmative response to anxiety; discomfort with teeth and depression.	La presencia de síntomas relacionados con la ansiedad y la depresión interfieren con los síntomas dolorosos de los trastornos temporomandibulares en la población abordada.
8	Rocha et al.[20], (2021)	To evaluate the influence of COVID-19 pandemic on anxiety, stress and orofacial pain levels in people with and without TMD.	20 participants were divided into two groups (n=10, each) experimental group (EG) patients with TMD and control group (CG), without TMD	All participants were female	Beck Anxiety Scale (BAI), the Perceived Stress Scale (PSS) and the Oral Analogue Scale	The experimental group showed higher levels of stress (BAI=16; PSS=18)	The association was statistically significant ($p \leq 0.05$) for BAI and PSS with DTM.	Aunque la pandemia de COVID 19 ha tenido un impacto psicológico en la población general, los pacientes con TTM presentan niveles de ansiedad y estrés más altos que el grupo control.
9	Falla et al.[21], (2021)	To understand the impact of COVID-19 distress on psychological state, central sensitization characteristics, and severity of facial pain in people with temporomandibular disorders (TMD).	45 adults (19 chronic, 26 acute/subacute with TMD)	10 participants had a temporomandibular joint disorder, 12 had masticatory muscle disorders, and 23 had a mixed disorder.	COVID Stress Scales (CSS)	COVID-related distress, poor quality of sleep	CSS were significantly higher in those with chronic TMD compared to those with acute/subacute TMD ($p<0.05$). In persons with chronic TMD, variation in anxiety and depression from baseline to follow-up correlated significantly with CSS scores ($r=0.72$, $p=0.002$).	These findings reinforce the role of stress as a possible amplifier of central sensitization, anxiety, depression, chronic pain, and pain-related disability in people with TMD.

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2023; 27(S2): e6209

10	Mortimer et al.[22], (2019)	To investigate the association between anxiety and temporomandibular-related symptoms in nursing students and the effect on quality of life.	281 nursing students	91.7% were women, 53.4% were single.	Oral Health Impact Profile TTM Questionnaire (OHIP-TTM)	Presence of Anxiety (PROMIS= 10.8)	General linear model analysis revealed that increased anxiety was significantly associated with high levels of impaired oral physical function and elevated psychosocial distress.	Strategies should be implemented to mitigate students' anxiety levels throughout their nursing careers.
11	Yap et al.[23], (2021)	To investigate the presence of different numbers and types of temporomandibular disorder (TMD) symptoms, their association with psychological distress, and their impact on oral health-related quality of life (OHRQoL).	814 participants with TMD and 147 control subjects.	Pain in the jaw and painful pain in the mouth (OHIP-TTM 1.6	Patient-Reported Outcome Measurement Information System (PROMIS) Short Form Questionnaire	Presence of anxiety (DASS=26.99 in participants with 2 TMD symptoms).	Participants with more and all types of TMD symptoms generally exhibited significantly higher levels of psychosocial distress and worse OHRQoL (p <.001)	Individuals with more and all types of TMD symptoms related to pain with/without intra-articular features had greater psychological distress and impaired OHRQoL
12	Namvar et al.[24] (2021)	To assess the association between depression and anxiety with TMD in dental students.	60 students	79.2 % of the participants were female; 38.9 % had 2 symptoms of TMD.	Diagnostic Criteria for Temporomandibular Disorders Symptom Questionnaire; the Depression, Anxiety and Stress Scale-21; and the Oral Health Impact Profile Temporomandibular Disorders.	43.33 % presented intense stress and 25 % medium depression.	Stress, anxiety, and depression had a significant effect on TMD (p <.2). Stress was identified as the most effective factor in TTM (significance level in this model is less than 0.05).	According to the findings, while there was a significant relationship between stress, depression, and anxiety with TMD symptoms, stress alone was identified as the most effective factor in the development of TMD
13	Knibbe et al.[25], (2022)	To investigate the associations between PTSD and TMD post-traumatic stress symptoms.	673 participants	54.0% were women, 191 patients (28.4 %) reported painful TMD.	They were assessed (pretreatment) for painful temporomandibular disorder (TMD pain test), PTSD symptoms (Physician Administered PTSD Scale) and type of traumatic events (CAPS-5) (Life Events Checklist).	All patients had severe post-traumatic stress disorder (PTSD) (CAPS=41.9).	Painful TMD was more prevalent among patients with PTSD (28.4 %, 48.3 %, and 40.1 %, respectively) than in the general population (8.0 %, 31.0 %, and 15.3 %, respectively; all p < 0.001).	Patients with severe PTSD are more likely to experience painful TMD.
14	Tay et al.[26], (2019)	To determine the prevalence of TMD symptoms and the impact of type and quantity of TMD symptoms on OHRQoL and psychological states among Asian military personnel.	2043 staff members, aged between 18 and 65 years old	1998 were men, 36.32 % (n = 742) reported at least one symptom of TMD.	Self-administered questionnaire that included demographic data, a DC/TMD symptom questionnaire, OHIP-14 and DASS-21.	All participants had symptoms of stress and anxiety.	Significant differences in OHIP-14 summary, depression, anxiety, and stress scores were observed between subjects with and without TMD symptoms. Associations between the number of TMD symptoms, quality of life, depression, anxiety and stress were significant but	TMD symptoms were prevalent among the Asian military population. Significant differences in OHRQoL and psychological states were observed between subjects with and without TMD symptoms.

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2023; 27(S2): e6209

							weak (r = 0.19-0.40).	
15	Han et al.[27], (2018)	To investigate the association between work-related factors and temporomandibular disorders (TMD) among Asian military personnel.	1,612 women	207 of the women (12.8 %) had TMD.	Korea National Health and Nutrition Examination Survey IV (2007-2009).	941 patients had low stress and 464 had high stress.	The prevalence of TMD was 12.8 % in this study population.	

Source: Own elaboration

DISCUSSION

Many scientific studies have analyzed the relationship between stress and the development of temporomandibular disorders (TMD). In most of these articles it was found that there is an association between stress and TMD.[12,16,17,20,21,24,25,27] However, in some of them, there was little certainty about this association.[15,26]

In the studies analyzed, among the main instruments to identify the presence of stress are the Cohen Perceived Stress Scale (CPS) questionnaire,[15,17,20] and the Depression Anxiety and Stress Scale (DASS 21).[12,23,24,26] On the other hand, the TMD questionnaires (Research Diagnostic Criteria for Temporomandibular Disorders - RDC/TMD) were used to determine the presence of TMD.[12,14,18,23,24,26]

It has been identified that health problems derived from stress such as anxiety are also likely to influence the development of TMD, as demonstrated by Resende et al.,[14] who identified that patients with TMD have higher levels of anxiety. Similarly Ton et al.,[16] Wagner et al.,[18] and Mortimer et al.,[22] found that anxiety is a risk factor for the development of signs and symptoms of TMD in adults.

Similarly, some studies,[21,26] also showed that there is a relationship between another stress-related health problem, such as depression, and the development of TMD. Soares et al. in their research found that psychological problems such as depression interfere with the painful symptoms of temporomandibular disorders;[19] however, and contrary to this, Namvar et al.,[24] determined that anxiety is not a factor of great relevance in the development of TMD.

In addition, Knibbe et al.,[25] concluded that post-traumatic stress is also a risk factor in the development of TMD, mainly severe temporomadibular pain. On the other hand, Han et al.,[27] identified that high work schedules and work-related stress are significantly associated with the development of TMD.

Although generic, common or everyday life stress is a condition highly related to the development of TMDs,[12,16,17,20,21,24,25,27] the relationship between work stress and TMDs have not been investigated to a large extent. Therefore, future research in the area of temporomandibular disorders should study characteristics or domains of particular types of stress, such as occupational stress.

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2023; 27(S2): e6209

CONCLUSIONS

There was a relationship between stress and temporomandibular disorders, identifying that other factors derived from stress - anxiety and depression - have a high prevalence in patients with temporomandibular disorders. Health professionals, physicians and dentists have to work together to treat patients affected by these disorders, from a multidisciplinary approach that addresses hygiene and mental health.

Conflict of interest
The authors declare that there is no conflict of interest.

Authors' contribution
All authors participated in the conceptualization, formal analysis, project management, writing - original draft, writing - revision, editing and approval of the final manuscript.

Funding
The authors did not receive funding for the development of this research.

BIBLIOGRAPHIC REFERENCES

1. Cortese S, Mondello A, Galarza R, Biondi A. Postural alterations as a risk factor for temporomandibular disorders. Acta Odontol Latinoam [Internet]. 2017 [citado 12/08/2023]; 30(2):57–61. Disponible en: https://pubmed.ncbi.nlm.nih.gov/29248939/

2. López Paños R, Ortiz-Gutiérrez RM, Chana Valero P, Felipe Concepción E. Assessment of postural control and balance in persons with temporomandibular disorders: A systematic review. Rehabilitacion [Internet]. 2018 [citado 12/08/2023]; 53(1):28–42. Disponible en: https://europepmc.org/article/med/30929830

3. Larenas-Calderón C, Saavedra-Layera L, Vergara-Núñez C, Spano-Perez N. Prevalencia de signos y síntomas de trastornos temporomandibulares previo a tratamiento de ortodoncia en una población de Santiago, Chile. Rev clínica periodoncia, Implantol y Rehabil Oral [Internet]. 2018 [citado 12/08/2023]; 11(3):160–3. Disponible en: https://www.scielo.cl/scielo.php?pid=S0719-01072018000300160&script=sci_arttext

4. Lövgren A, Parvaneh H, Lobbezoo F, Häggman-Henrikson B, Wänman A, Visscher CM. Diagnostic accuracy of three screening questions (3Q/TMD) in relation to the DC/TMD in a specialized orofacial pain clinic. Acta Odontol Scand [Internet]. 2018 [citado 12/08/2023]; 76(6):380–6. Disponible en: https://www.tandfonline.com/doi/abs/10.1080/00016357.2018.1439528

5. Ortiz-Culca F, Cisneros-Del Aguila M, Vasquez-Segura M, Gonzales-Vilchez R. Implementation of TMD pain screening questionnaire in peruvian dental students. Acta Odontol Latinoam [Internet]. 2019 [citado 12/08/2023]; 32(2):65–70. Disponible en: https://pubmed.ncbi.nlm.nih.gov/31664295/

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2023; 27(S2): e6209

6. González-Chávez SA, Pacheco-Tena C, Campos Torres RM, Quiñonez-Flores CM, Reyes-Cordero G, Caraveo Frescas T de J. Alteraciones temporomandibulares y odontológicas en pacientes con artritis reumatoide. Reumatol Clínica [Internet]. 2020 [citado 12/08/2023]; 16(4):262–71. Disponible en: https://www.sciencedirect.com/science/article/pii/S1699258X18301372

7. Soto-Goñi X, Viñals AC, Pérez-González F, Sánchez-Labrador L, Domínguez-Gordillo A, Sánchez-Sánchez T, et al. Estilos de afrontamiento al estrés, ansiedad y neuroticismo en estudiantes universitarios con mialgia temporomandibularun estudio de casos y controles Rev Psicol la Salud [Internet]. 2021 [citado 12/08/2023]; 9(1):34–49. Disponible en: https://dialnet.unirioja.es/servlet/articulo?codigo=8015741

8. Guerrero L, Coronado L, Maulén M, Meeder W, Henríquez C, Lovera M. Prevalencia de trastornos temporomandibulares en la población adulta beneficiaria de atención primaria en salud del servicio de Salud Valparaíso, San Antonio. Av Odontoestomatol [Internet]. 2017 [citado 12/08/2023]; 33(3):113–20. Disponible en: https://scielo.isciii.es/scielo.php?script=sci_abstract&pid=S0213-12852017000300003

9. Martinez P, Gloger S, Medina D, Gonzales A, Carrasco M, Vohringer M. Tratamiento de la depresión en adultos con estrés adverso temprano: revisión sistemática de su efecto en síntomas relacionados a trauma, ansiedad, desajuste social y calidad de vida. Rev Med Chile [Internet]. 2021 [citado 12/08/2023]; 149(12):1473–84. Disponible en: https://www.scielo.cl/scielo.php?pid=S0034-98872021001001473&script=sci_arttext&tlng=pt

10. Cugat Bertomeu R. Fútbol Y Lesiones De Los Meniscos. REAL ACADEMIA EUROPEA DE DOCTORES. Harvard Med Sch [Internet]; 2016 [citado 12/08/2023]. 23–52. Disponible en: https://raed.academy/wp-content/uploads/2016/06/RAED_Cugat_39WEBOK.pdf

11. Herrera-Covarrubias D, Coria-Avila GA, Muñoz-Zavaleta DA, Graillet-Mora O, Aranda-Abreu GE, Rojas-Durán F, et al. Impacto del estrés psicosocial en la salud. eNeurobiologia [Internet]. 2017 [citado 12/08/2023]; 8(17):1–23. Disponible en: https://eneurobiologia.uv.mx/index.php/eneurobiologia/article/view/2523/0

12. Vásconez M, Bravo W, Villavicencio E. Factores asociados a los trastornos temporomandibulares en adultos de Cuenca, Ecuador. Rev Estomatológica Hered [Internet]. 2017 [citado 12/08/2023]; 27(1):5. Disponible en: https://revistas.upch.edu.pe/index.php/REH/article/view/3097

13. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. Declaración PRISMA 2020: una guía actualizada para la publicación de revisiones sistemáticas. Rev Española Cardiol [Internet]. 2021 [citado 12/08/2023]; 74(9):790–9. Disponible en: https://www.sciencedirect.com/science/article/pii/S0300893221002748

14. Resende C, Rocha LG, Paiva R, Cavalcanti C, Almeida E, Roncalli A, et al. Relationship between anxiety, quality of life, and sociodemographic characteristics and temporomandibular disorder. Oral Surg Oral Med Oral Pathol Oral Radiol [Internet]. 2020 [citado 12/08/2023]; 129(2):125–32. Disponible en: https://www.sciencedirect.com/science/article/pii/S2212440319315391

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2023; 27(S2): e6209

15. Mendiburu-Zavala CE, Pérez-Pérez C, Lugo-Ancona P, Peñaloza-Cuevas R, Pérez-Martínez E. Calidad del Sueño, Estrés Percibido y Desórdenes Temporomandibulares Dolorosos en Adultos Jóvenes de Dos Comunidades Mexicanas. Int J Odontostomatol [Internet]. 2021 [citado 12/08/2023]; 15(4):915–21. Disponible en: https://www.scielo.cl/scielo.php?pid=S0718-381X2021000400915&script=sci_arttext&tlng=en

16. Ton L, Mota I, De Paula J, Martins A. Prevalence of temporomandibular disorder and its association with stress and anxiety among university students. Brazilian Dent Sci [Internet]. 2020 [citado 12/08/2023]; 23(1):1–9. Disponible en: https://ojs.ict.unesp.br/index.php/cob/article/view/1810

17. Cezerilo C, Alexandre L, Collares K, Dalmolin C. Are Stress Associated with Temporomandibular Dysfunction ? A Cross-Sectional Study. J Heal Scie [Internet]. 2022 [citado 12/08/2023]; 24(3):195–200. Disponible en: https://journalhealthscience.pgsskroton.com.br/article/view/10208

18. Wagner B, Moreira P, Bernardo V. Association of bruxism and anxiety symptoms among military firefighters with frequent episodic tension type headache and temporomandibular disorders. Arq Neuro-psiquiatr [Internet]. 2019 [citado 12/08/2023]; 77(7):478–84. Disponible en: https://www.scielo.br/j/anp/a/LWrP93C9JznQTyTZWxWzhyP/?format=html&lang=en

19. Soares L, Coelho L, Moreno A, Almeida D, Haddad M. Anxiety and depression associated with pain and discomfort of temporomandibular disorders. BrJP [Internet]. 2020 [citado 12/08/2023]; 3(2):147–52. Disponible en: https://www.scielo.br/j/brjp/a/fLDVYmXwGnFRgpTcFtrgmWP/?lang=en&format=html

20. Rocha T, De Oliveira W, De Paula Â, Oliveira D, Rode S. Psychological Factors in Temporomandibular Disorders Patients during COVID-19 Pandemic: A Cross-Sectional Study. Pesqui Bras Odontopediatria Clin Integr [Internet]. 2022 [citado 12/08/2023]; 22: e200246. Disponible en: https://www.scielo.br/j/pboci/a/m7HGgYXBJpwsNnqNr8t7rNd/?format=pdf&lang=en

21. Falla D, Asquini G, Bianchi AE, Borromeo G, Locatelli M. The impact of Covid-19-related distress on general health, oral behaviour, psychosocial features, disability and pain intensity in a cohort of Italian patients with temporomandibular disorders. PLoS One [Internet]. 2021 [citado 12/08/2023]; 16(2): e0245999. Disponible en: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0245999

22. Mortimer S, Stomski N, Cope V, Maurice L, Théroux J. Association between temporomandibular symptoms, anxiety and quality of life among nursing students. Collegian [Internet]. 2019 [citado 12/08/2023]; 26(3):373–7. Disponible en: https://www.sciencedirect.com/science/article/pii/S1322769618302348

23. Yap A, Cao Y, Zhang MJ, Lei J, Fu KY. Number and type of temporomandibular disorder symptoms: their associations with psychological distress and oral health-related quality of life. Oral Surg Oral Med Oral Pathol Oral Radiol [Internet]. 2021 [citado 12/08/2023]; 132(3):288–96. Disponible en: https://www.sciencedirect.com/science/article/pii/S2212440321004284

24. Namvar M, Afkari B, Chamanneh M, Mansoori K, Dadashi M. The Relationship between Depression and Anxiety with Temporomandibular Disorder Symptoms in Dental Students. Maedica (Bucur) [Internet]. 2021 [citado 12/08/2023]; 16(4):590–4. Disponible en: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8897781/

ISSN: 1561-3194 **RNPS:** 1877
Rev Ciencias Médicas. 2023; 27(S2): e6209

25. Knibbe W, Lobbezoo F, Voorendonk EM, Visscher CM, de Jongh A. Prevalence of painful temporomandibular disorders, awake bruxism and sleep bruxism among patients with severe post-traumatic stress disorder. J Oral Rehabil [Internet]. 2022 [citado 12/08/2023]; 49(11):1031–40. Disponible en: https://onlinelibrary.wiley.com/doi/abs/10.1111/joor.13367

26. Tay K, Yap A, Wong J, Tan K, Allen P. Associations between symptoms of temporomandibular disorders, quality of life and psychological states in Asian Military Personnel. J Oral Rehabil [Internet]. 2019 [citado 12/08/2023]; 46(4):330–9. Disponible en: https://onlinelibrary.wiley.com/doi/abs/10.1111/joor.12751

27. Han W, Kwon SC, Lee YJ, Park C, Jang EC. The associations between work-related factors and temporomandibular disorders among female full-time employees: Findings from the Fourth Korea National Health and Nutrition Examination Survey IV (2007-2009). Ann Occup Environ Med [Internet]. 2018 [citado 12/08/2023]; 30:42. Disponible en: https://link.springer.com/article/10.1186/s40557-018-0253-9