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CLINICAL RESEARCH:

Prevalence of Symptoms Related to Temporomandibular Disorders in Costa Rica

Presencia de síntomas de desórdenes temporomandibulares en Costa Rica

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ABSTRACT: To determine the prevalence of temporomandibular disorders symptoms in Costa Rican adults during the year 2024. The Diagnostic Criteria for Temporomandibular Disorders (DC/TMD) and triage were applied to a convenience sample consisting of 80 people per state (n=400). Data were collected from five of the seven states of the country: San José, Alajuela, Cartago, Heredia, and Limón. Adult patients aged 18-75 years were included. Of those surveyed, 64.9% reported experiencing some type of pain in the jaw, temple, or ear, 42.7% had headaches, 64.7% reported joint noises, 21% had closed mandibular blocks, and 7.2% had open blocks in the jaws within the last 30 days. The symptoms, according to sex, were more prevalent in women and according to the state, Heredia and San José report more patients with symptoms. In the examined Costa Rican sample, there is a high prevalence of symptoms of temporomandibular disorders, with pain and headaches being the most common. Women, residents of the states of Heredia and San José, and individuals aged 26-35 and 46-60 years showed a higher prevalence of symptoms. The instrument showed moderate reliability, suggesting the need for its combined use with a temporomandibular clinical examination in future research.

KEYWORDS: Temporomandibular joint disorders; Facial pain; TMD; Orofacial pain; TMJD.

RESUMEN: Determinar la prevalencia de síntomas de trastornos temporomandibulares en adultos costarricenses durante el año 2024. Se aplicaron los Criterios Diagnósticos para Trastornos Temporomandibulares (DC/TMD) y el triaje a una muestra a conveniencia compuesta por 80 personas por provincia (n=400). Los datos se recolectaron en cinco de las siete provincias del país: San José, Alajuela,

Cartago, Heredia y Limón. Se incluyeron pacientes adultos entre 18 y 75 años. De los encuestados, el 64,9% reportó haber experimentado algún tipo de dolor en la mandíbula, sien u oído; el 42,7% presentó cefaleas; el 64,7% refirió ruidos articulares; el 21% tuvo bloqueos mandibulares cerrados y el 7,2% bloqueos abiertos en la mandíbula en los últimos 30 días. En cuanto al sexo, los síntomas fueron más prevalentes en mujeres, en cuanto a la provincia, Heredia y San José lideraron las estadísticas siendo las provincias que reportaron más pacientes con síntomas asociados. En la muestra costarricense analizada, existe una alta prevalencia de síntomas de trastornos temporomandibulares, siendo el dolor y las cefaleas los más frecuentes. Las mujeres, los residentes de las provincias de Heredia y San José, así como las personas de 26-35 y 46-60 años, mostraron mayor prevalencia de síntomas. El instrumento presentó una fiabilidad moderada, lo que sugiere la necesidad de su uso combinado con un examen clínico temporomandibular en futuras investigaciones.

PALABRAS CLAVE: Desórdenes temporomandibulares; Dolor facial; ATM; Dolor orofacial; Trastornos de la articulación temporomandibular; Cefalea.

INTRODUCTION

Temporomandibular disorders (TMD) comprise a group of more than 30 conditions that cause pain and dysfunction in the jaw joint and the muscles responsible for its movement. Some TMD are short-term conditions that may resolve on their own. However, if the underlying cause persists and additional contributing factors are present, they may progress into a chronic or long-term disorder. Additionally, TMD can manifest as an isolated condition or coexist as a comorbid disorder alongside other complex medical conditions (1). Although the exact trigger or underlying cause of TMD remains unclear, recent research suggests that a combination of genetic factors, emotional stressors, changes in daily routine, and an individual's perception or expectation of pain may influence the onset and duration of TMD (1). From an epidemiological perspective, TMDs are the most common cause of non-odontogenic facial pain (2). It is estimated that approximately 10% of the general population over the age of 18 experiences pain-related symptoms associated with TMD. In adults aged 30-31 years, the prevalence exceeds 23% (3). TMDs are also twice as common in women, particularly between the ages of 35 and 44. According to the National Institute of Dental and Craniofacial Research (NIDCR), TMDs are the second most common cause of chronic skeletal muscle pain, following back pain, affecting between 5% and 12% of the population in the United States (1). Furthermore, findings from Orofacial Pain: Prospective Evaluation and Risk Assessment (OPPERA) studies suggest that TMD prevalence is disproportionately higher among individuals with poor overall health and comorbidities such as poor sleep quality and smoking habits (3,4).

Despite the apparent prevalence and clinical impact of chronic pain symptoms related to TMD, limited data are available regarding its prevalence, particularly in the Central American region, where data remain scarce. Regarding Costa Rica and Latin America, no studies have been identified that comprehensively address the prevalence of symptoms related to TMD (5). Considering the unique socioeconomic context of the region and the well-established association between chronic pain and low economic income (6), it is essential to conduct well-designed studies to analyze the prevalence of TMD-related symptoms in Central American countries. Such research would provide a basis for proposing targeted public health policies

for this population. Thus, the aim of this study was to assess the prevalence of symptoms related to TMD in a representative, multi-geographical sample in Costa Rica, utilizing the DC/TMD screening tools.

METHODOLOGY

The present study was supervised and approved by the Institutional Scientific Ethical Committee of the University of Costa Rica under the code CEC-592-2024. The study was descriptive, using the independent variables of interest: age ranges and sex. Three DC/TMD questionnaires from the Axis I assessment were utilized: the Demographic Data Questionnaire, the Painful Temporomandibular Disorders Triage (TMMD), and the Symptom Questionnaire. These questionnaires were administered through a digital platform to a convenience sample of 80 individuals from five of the seven Costa Rican provinces (four provinces from the central metropolitan area and one from the Atlantic region), aiming to recruit a final sample of 400 participants. However, in order to compensate possible sample losses, a final number of 420 participants (pus 5% of the sample) was considered. Potential participants were contacted in person in different specific areas of the country. These regions include rural and urban areas. The study was applied to the participants during the months of September and October of the year 2024. The questions were answered virtually through electronic devices (self-report), only the informed consents were obtained in printed form. The version of the questionnaire applied was previously translated, validated, and internationally recognized by the International Network for the Methodology of Orofacial Pain and Related Disorders (INFORM) which was then analyzed and adapted with local terms for the Costa Rican context. Psychometric measures were applied to verify the agreement, reliability, and validity of the instrument due to its adaptation with local Costa Rican terms. People who met the inclusion criteria (people living in Costa Rica ages between 18-75 years old) were asked to sign the inform consent, and then the questionnaires were applied and analyzed. Exclusion criteria for this study excluded people with neurodegenerative conditions, chronic orofacial pain conditions of neuropathic or neurovascular nature.

RESULTS

A total recruitment of 420 people was performed, divided into a minimum of 80 participants per included province. The response rate was 96.42%, allowing a final sample of 405 participants. This sample included different age groups; of which 33.6% correspond to the male sex and 66.4% to the female sex, as shown in Table 1.

Table 1. Sociodemographic distribution of the studied population (n=405).

	Characteristics of interest	Number of people	Percentage distribution
Sex	Male	136	33,6
	Female	269	66,4
Age group	18-25	108	26,7
	26-35	92	22,7
	35-45	76	18,8
	45-60	100	24,7
	60 or more	29	7,2
State	San José	79	19,5
	Alajuela	82	20,2
	Cartago	81	20,0
	Heredia	81	20,0
	Limón	82	20,2
	Total	405	100

A proportion of 64.9% persons have experienced some type of pain in the jaw, temple, and ear. Additionally, 42.7% reported headaches, 64.7% presented with joint noises, 21% closed jaw locks, and 7.2% presented with open locks in the last 30 days.

From the women who answered the questionnaire, 69.9% reported experiencing some form of temporomandibular pain, 50.6% reported headaches, 8.2% experienced open lock, 24.1% experienced closed lock, and 40.9% indicated the presence of joint noise. Regarding to male participants, 55.1% have experienced temporomandibular pain at some point, 27.2% reported headaches, 5.1% experienced open lock, 15.4% experienced closed lock, and 34.4% reported some type of joint noises (Figure 1).

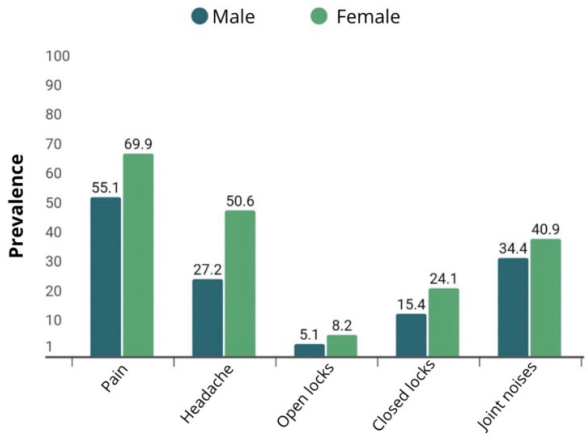

Figure 1. Symptoms distribution according to gender.

Among participants aged 18-25 years (n=108), 61.1% experienced some type of pain (jaw, temple, or ear), 42.6% reported headaches, 8.3% experienced an open lock, 24.1% a closed lock, and 37% reported joint noises. In the 26-35 age group (n=92), 66.3% reported pain, 42.4% had headaches, 6.5% experienced an open lock, 23.9% a closed lock, and 43.5% reported joint noises.

Among individuals aged 36-45 years (n=76), 67.1% reported pain, 40.8% had headaches, 6.6% experienced an open lock, 13.2% a closed lock, and 34.2% reported joint noises. For the 46-60 age group (n=100), 69% experienced pain, 45% reported headaches, 8% had an open lock, 23% a closed lock, and 39% reported joint noises. Finally, among participants over 61 years old (n=29), 55.2% reported pain, 41.4% had headaches, 3.4% experienced an open lock, 17.2% a closed lock, and 31% reported joint noises in the temporomandibular area (Figure 2).

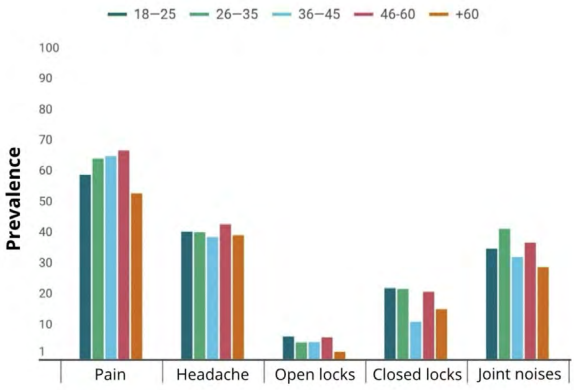

Figure 2. Prevalence of the presence of the symptoms according to age group.

DISCUSSION

Although the adequate diagnosis of TMD considers evaluating both Axis I (physical diagnosis) and Axis II (psychosocial status), the present study focused solely on the self-reported presence of symptoms, as a thorough interview is essential for assessing psychosocial status. Among the most frequent physical symptoms recognized by Schiffman for Axis I evaluation are pain in the chewing muscles and/or TMJ (the most common symptom), joint noises, jaw locking or limitation in jaw opening and closing; and headaches (7).

Headaches were one of the most frequently reported symptoms in our study, the International Classification of Headache Disorders (ICHD) recognizes over 200 headache disorders and divides them into three groups, which are primary, secondary, and painful cranial neuropathies (8). Primary headache disorders and TMD are conditions of different etiologies and pathophysiologies that share trigeminal sensorial related mechanisms, and both conditions are highly prevalent in the population and cause considerable burden (9). In the USA, headache is the fifth most common

complaint in the emergency department (10). Both acute and chronic headaches are most prevalent between the teenage years and the fifth decade (8). Different types of headaches such as migraine, chronic daily headache, tension-type headache, and cervicogenic headache can be present with TMDs (9). Their presence has additive effects that increase the facilitation of sensitization and therefore the exacerbation of the overall pain experience that may render management more challenging (9). Headaches (especially those related to stress) and TMD are comorbidities; the presence of one in a patient increases the prevalence of the other. Regarding temporomandibular pain (which is the primary symptom in patients with TMD), its causes are multifactorial, involving structural, functional, and psychological factors. Pain related to TMD is frequent, often affecting the ears, eyes, and/or throat, leading to neck pain, facial pain, and headaches. Various risk factors contribute to TMD pain, such as stress, anxiety, degenerative arthritis, and bruxism. Additionally, initiating and perpetuating factors, including functional overload, acute trauma, joint laxity, increased joint friction, and osteoarthritis, can lead to disc displacement and temporomandibular-condylar incoordination (11).

Regarding the gender distribution of the participants, the results coincide with the behavior reported in international studies, with a higher prevalence for where women over men (12,13, 15,). The Oppera study estimates from the National Health Interview in the U.S. population, that the prevalence of symptoms in women was twice that of men (13). This gender disparity could be attributed to biological factors, such as hormonal differences, particularly the role of estrogen, which influences pain perception and the functionality of the musculoskeletal system. Estrogens play a key role in the neuroexcitability, structure, and function of these brain regions, which could explain why women are more prone to headaches than men. The presence of sex hormone receptors in the trigemino-vascular system indicates that trigeminal neurons are responsive to hormonal fluctuations (14). Additionally, it has been suggested that women tend to report chronic pain symptoms more frequently, which may contribute to the higher diagnosis of TMD in this population (15). Finally, it is well-known that headache frequency in women follows a distinct pattern: it increases sharply during puberty, peaks in the reproductive years, and decreases after menopause, highlighting the significant impact of sex hormones (14).

The age of the participants was also analyzed. Pain related to TMD and headaches were more common in the 45-60 age group, joint noises and jaw locking were more prevalent in the 26-35 age group. These differences were not statistically significant across the different age groups, regardless of the symptom observed. However, this lack of significance may be due to the unequal representation of age groups rather than the absence of true differences between the ages. Currently, there is limited information in Costa Rica about the age groups with a higher or lower prevalence of TMD symptoms, as well as their preventive approach. However, international research has revealed that between 40% and 50% of the general population suffers from some form of temporomandibular disorder. The first signs and symptoms typically manifest in the second stage of life, and both the prevalence and intensity of perceived symptoms tend to increase with age (16), which is consistent with the results of this study. Similarly, several studies showed that TMD symptoms tend to decrease with age in older adults. Some researchers suggest that this may be due to older adults gradually adapting to the oral changes associated with aging. Additionally, since many older adults are no longer professionally active, they are presumed to be less exposed to stress, a factor that predisposes young adults to the development of TMD symptoms (17). In a series of previous studies analyzing groups of individuals with and without headaches, one study found a higher prevalence between the ages of 20 and 40, with a subse-

quent trend toward a decrease after the age of 30. However, two higher peaks were also observed- one between the ages of 16 and 25, and another between 40 and 60 years (18), which is consistent with the findings of this study. It is important to recall that the absence of intense symptoms might cause patients to underestimate the severity of functional issues, which only become evident in a chronic stage, thus justifying the second peak of symptoms in the 40 to 60 age group (18).

Similarly, our results showed that the groups most prone to symptoms associated with jaw locking were those aged 18 to 25 years. In a similar study, a pattern of prevalence in women was identified, showing two peaks throughout life: one at the end of the twenties and another at age 60. The study also found that, in both men and women, the highest incidence of jaw locking occurs between the ages of 20 and 30, remaining stable over the 8 years of the study. Moreover, no significant variations in the prevalence of jaw locking were recorded between 2010 and 2017 (19).

Even when the literature suggests that TMD affect between 10% and 15% of adults; only about 5% of those affected seek medical attention for treatment (20). In the few cases where pain occurs, it is typically mild, with varying intensity, and worsens with activities such as chewing or other mandibular functions. In such cases, it is likely that the symptoms will resolve over time due to the natural and benign progression of the disorders. For symptomatic cases, the first treatment option is conservative and non-surgical, which has been shown to be effective in relieving pain and improving jaw mobility (21).

While most patients with acute TMD may not have a significant psychiatric disorder, psychological factors can certainly worsen the pain. Clinicians should take into account factors such as anxiety, sleep issues, depression, secondary gain, somatization, and hypochondriasis. Psychosocial factors can not only predispose individuals to developing TMD but can also contribute to the persistence of the condition once symptoms are present. Therefore, a thorough assessment of psychosocial factors is essential in the evaluation and treatment, particularly for patients with chronic TMD (22)

Despite presenting certain limitations in the study, mostly related to the collecting of data, and that the main source of information is based on self-report, this study shows a high prevalence of symptoms associated with TMD. From a public health point of view, these results emphasize the important of this data to develop health policies for the Costa Rican population. Also, further research analyzing specific variables such as education level, socioeconomic context and labor status should be considered.

CONCLUSION

In the examined population of Costa Rica, pain and headaches were the most prevalent, where women showed a higher prevalence of symptoms. The relation between age range and pain prevalence was not statistically significant different.

AUTHOR CONTRIBUTION STATEMENT: All authors contributed equally to the conception, development, analysis and writing of this study.

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