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ORIGINAL

Characterization of temporomandibular disorders in climacteric women

Caracterización de trastornos temporomandibular en mujeres climatéricas

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ABSTRACT

Introduction: Temporomandibular Disorders (TMD) affect the function of the stomatognathic system, especially in climacteric women, who present a high susceptibility due to hormonal and psychological factors. This study sought to characterize TMD in climacteric women, identifying signs, symptoms and levels of dysfunction.
Method: an observational, descriptive and cross-sectional study was carried out between September 2022 and January 2023 in office 6 of the Policlínico Docente Universitario Hermanos Ruiz Aboy, in Cu-ba. A total of 100 women aged 40 to 59 years were included. The participants were evaluated using the Helkimo test, including clinical and psychosocial variables such as muscle pain, joint noises, limi-tation of mandibular movements and pain perception.
Results: 72 % of the women presented some degree of TMD, with a higher prevalence in the 45-49 years age range. Joint and muscle pain, together with joint noises, were the most frequent signs. Fif-ty-six percent of the participants perceived the pain as moderate, while only 6 % considered it se-vere. Most sought professional help, evidencing the need for attention for these disorders.
Conclusions: TMDs were highly prevalent in climacteric women, especially in those between 40 and 49 years of age. Pain and functional limitations stood out as the main symptoms. This study reinforces the importance of preventive and educational strategies to improve the quality of life of affected women.

Keywords: Temporomandibular Disorders; Menopause; Joint Pain; Women's Health; Helkimo.

RESUMEN

Introducción: los Trastornos Temporomandibulares (TTM) afectan la función del sistema estomatog-nático, especialmente en mujeres climatéricas, quienes presentan una alta susceptibilidad debido a factores hormonales y psicológicos. Este estudio buscó caracterizar los TTM en mujeres climatéricas, identificando signos, síntomas y niveles de disfunción.
Método: se realizó un estudio observacional, descriptivo y de corte transversal entre septiembre de 2022 y enero de 2023 en el consultorio 6 del Policlínico Docente Universitario Hermanos Ruiz Aboy, en Cuba. Se incluyeron 100 mujeres de 40 a 59 años. Las participantes fueron evaluadas mediante el test de Helkimo, incluyendo variables clínicas y psicosociales como dolor muscular, ruidos articulares, li-mitación de movimientos mandibulares y percepción del dolor.
Resultados: el 72 % de las mujeres presentó algún grado de TTM, con mayor prevalencia en el rango de edad de 45-49 años. El dolor articular y muscular, junto con los ruidos articulares, fueron los sig-nos más frecuentes. Un 56 % de las participantes percibió el dolor como moderado, mientras que solo el 6 % lo consideró severo. La mayoría buscó ayuda profesional, evidenciando la necesidad de aten-ción para estos trastornos.
Conclusiones: los TTM fueron altamente prevalentes en mujeres climatéricas, especialmente en aquellas entre 40 y 49 años. El dolor y las limitaciones funcionales destacaron como los principales síntomas. Este estudio refuerza la importancia de estrategias preventivas y educativas para mejorar la calidad de vida de las mujeres afectadas.

Palabras clave: Trastornos Temporomandibulares; Menopausia; Dolor Articular; Salud Femenina; Helkimo.

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INTRODUCTION

This study aimed to characterize temporomandibular disorders (TMD) in menopausal women, a problem of growing interest in the field of public health. TMD, a set of functional disorders affecting the stomatognathic system, is recognized for its significant impact on a patient's quality of life due to symptoms such as muscle and joint pain and limited jaw movement.[1,2,3,4,5,6,7] In women in the climacteric stage, these conditions take on a particular dimension, as hormonal, psychological, and social factors enhance their incidence and severity.[8,9]

The climacteric, which encompasses the transition period from the reproductive to the non-reproductive stage, is associated with numerous physical and emotional changes. Among these, stress, anxiety, and hormonal changes have been identified as predisposing factors for TMD, increasing the risk of joint and muscle dysfunction.[10,11,12,13]

This context is especially relevant in vulnerable populations, such as menopausal women, who face multiple challenges in accessing timely diagnosis and treatment. Understanding the factors associated with TMD at this stage is essential for designing effective intervention strategies.[14,15]

In this regard, the study focused on a population of women aged 40 to 59 years old treated at the Hermanos Ruiz Aboy polyclinic in San Miguel del Padrón. The methodology included an observational, descriptive, and cross-sectional approach, with the application of diagnostic tools such as the Helkimo[15,16] anamnestic and clinical index and the numerical pain scale.[17,18] These tools made it possible to assess the presence, severity, and characteristics of MSDs and explore the relationship between psychosocial, occupational, and clinical variables.[19,20]

The inclusion and exclusion criteria ensured the validity of the analysis by excluding factors such as a history of facial trauma or systemic diseases that could bias the results.[20,21,22] The cross-sectional design provided a broad overview of the prevalence and distribution of MTMs, highlighting specific patterns according to age, occupation, and marital status. Data collection was based on standardized clinical techniques, including measuring jaw movements, muscle palpation, and detecting joint noises, which provided an accurate and reproducible diagnosis.

This approach identified a high prevalence of TMD in menopausal women, with a predominance in the 40-49 age group. Factors such as stress, occupation, and marital status were also found to be directly related to the onset and severity of TMD. The results underscore the need to integrate a multidisciplinary approach to care for this population, combining dental, psychological, and medical interventions to address the needs of patients comprehensively.

In conclusion, this study seeks to highlight the problem of TMD in menopausal women and provide evidence for implementing preventive and therapeutic strategies that improve the quality of life of this population group.

Objective

To characterize temporomandibular disorders in menopausal women.

METHOD

A cross-sectional, descriptive observational study was conducted between September 2022 and January 2023 at medical office 6 of the Hermanos Ruiz Aboy polyclinic in San Miguel del Padrón.

Study

One hundred women of climacteric age from the clinic (climacteric age was considered between 40 and 59 years of age) who responded positively to participate in the research and presented temporomandibular disorders were selected for the study. The entire universe was included, complying with inclusion and exclusion criteria.

Inclusion criteria

- All menopausal women between 40 and 59 who wish to participate in the study by signing the informed consent form. Menopausal patients who do not present this temporomandibular dysfunction were included. The Helkimo test (Appendix 4) will be used to determine the frequency of temporomandibular dysfunction, and patients will be considered affected if classified as having a mild disorder.

Exclusion criteria

- History of facial and/or TMJ trauma.
- Diagnosed systemic and/or joint diseases.
- Treatment with analgesic and/or anti-inflammatory drugs.

To fulfill objective 1, the following will be used psychosocial variables.

Occupation: according to work performed in the social sphere.

Marital status: married and living with a spouse or single with no partner.

To fulfill objective 2, variables will be used to measure signs of temporomandibular dysfunction.

Symptoms: organic manifestation of an alteration in a tissue, organ, or system or its function reported by the patient during questioning.

Table 1. Operationalization of variables

Variable	Type	Classification scale	Description
Age (range)	Quantitative	40-44	According to the age of the person.
Occupation	Qualitative	45-49	According to the work performed
Marital status	Nominal Polytomous	50-54	Woman living with her husband Woman without a partner
Muscle pain	Qualitative Nominal Dichotomous	55-59	Does not report
Difficulty opening and closing	Qualitative Nominal Dichotomous	Employed	Reports spontaneous discomfort in the masticatory muscles and
Joint pain	Qualitative Nominal Dichotomous		associated
Variable	Qualitative	Absent Present	Does not report
			sensation of spontaneous discomfort in
Joint noise	Qualitative Nominal Dichotomous	Absent	the region
Reduction of mouth opening	Qualitative Nominal Dichotomous	Present	Not detected on questioning or clinical examination
Reduction of	Qualitative Nominal Dichotomous	Absent Present	There is an audible sound on opening and closing movements
Deviation of the jaw upon opening	Qualitative Nominal Dichotomous	Absent Present	Not detected in clinical examination When there is mandibular deviation upon opening of 2 mm or more.
Symptomatic temporomandibular dysfunction	Qualitative Ordinal	Asymptomatic	People who
Clinical temporomandibular dysfunction	Qualitative Ordinal	Mild dysfunction	answer “no” to all
Perception of pain	Qualitative Ordinal	Mild Moderate Severe	According to the numerical pain scale
Seeking professional help	Qualitative Dichotomous	Yes No	As reported by the patient
Clinical diagnosis	Qualitative Nominal Dichotomous	With temporomandibular disorders	According to the presence or absence of the disease

Muscle pain: spontaneous discomfort refers to the masticatory muscles and associated muscles during the medical History, on palpation or movement.

Difficulty opening and closing: the patient reported difficulty opening and closing the mouth.

Joint pain: spontaneous discomfort in the region described by the person during questioning. Organic manifestation of an alteration in tissue, organ, or system detected during physical examination.

Joint noise: joint sound is described as a clicking or crackling noise depending on its characteristics and intensity.

Reduced mouth opening: limitation when attempting to open the mouth.

Reduction in lateral and propulsive movements: limitation of these movements.

Deviation of the jaw upon opening: when the jaw deviates to one side.

To comply with objective 3 using the Helkimo test (symptomatic and clinical), the following variables will be used:

Symptomatic temporomandibular dysfunction:

Asymptomatic: people who answer all questions negatively:

Mild dysfunction: people who answer questions 1 to 4 positively.

Severe dysfunction: people who answer questions 5 to 7 positively.

Clinical temporomandibular dysfunction: this index covers five aspects, each with possible answers based on the signs and symptoms of the people examined. The answers are scored 0, 1, or 5 depending on the severity of the sign or symptom detected and then added together. All these points are classified according to the clinical rating level:

Asymptomatic (0)

Mild dysfunction (1 to 4 points) is considered to be that which may exist with a maximum of 1 alteration with a value of 4 points and the rest 0, resulting in a range of 4, with different combinations or variations within the range.

Moderate dysfunction (5 to 9 points) is considered to be that which may exist as a maximum of one alteration of 5 points and the

remaining four alterations of 1 point each, adding up to a maximum of 9, with different combinations or variations within the range.

Severe dysfunction (10 to 25 points) will be considered to be when there is a maximum of 5 categories with a value of 5 points, totaling 25, a minimum of 2 categories with five, and the rest with 0 points, totaling 10, with different combinations and variations within the range.

For objective 4, the following variable will be used:

Pain perception: as reported by the patient according to the numerical pain scale.

Seeking professional help: as reported by the patient having sought professional consultation for guidance or treatment.

Ethical considerations

Women of menopausal age visited the clinic and were explained the study, its objectives, the expected benefits, and other aspects that would enable them to decide whether or not to participate in the research. Written informed consent was obtained, explaining that the data obtained would be completely confidential and that they were free to withdraw from the study at any time. Approval from the institution's ethics committee was sought.

Technique for obtaining information

Menopausal women attended the consultation, where they were interviewed and underwent a clinical examination. The data collection form was completed, which included the Helkimo test indicated for the screening and diagnosis of temporomandibular dysfunction.

The clinical manifestations to be evaluated in examining the musculomandibular complex will be muscle pain, difficulty opening and closing the mouth, joint pain, joint noises, reduced joint movement, reduced mandibular opening movement, and mandibular deviation. Pain will be assessed according to the numerical pain scale.

The clinical examination will follow the following methodology:[22,23,24,25,26]

To measure mouth opening movement in subjects with natural teeth, the patient is asked to close their mouth, bringing the upper and lower arches into maximum intercuspation. Considering the vertical overlap, a horizontal line is drawn on the vestibular surface of the lower incisors.

The patient is asked to open their mouth as wide as possible, and the distance between the line drawn and the free edge of the upper incisors is measured with a millimeter ruler. In the case of partially or edentulous subjects with prostheses that meet the conditions of retention, support, and stability, the procedure is the same as for subjects with natural teeth. In the case of partially or edentulous subjects wearing prostheses that do not meet the requirements of retention, support, and stability or who do not wear prostheses, the vertical dimension is measured in the resting position of the jaw using the Willis compass, taking the edge of the chin and the base of the nose as reference points. Subtract 4 mm from the measurement obtained, corresponding to the sum of the interocclusal space and the tooth overjet, and call this point D0. Then, ask the patient to open their mouth as wide as possible and measure this distance with the Willis compass. Subtract D0 from the distance obtained to obtain the maximum opening.[27,28] To measure mandibular lateral movement in dentate subjects, extend the upper midline with a stylus to the mandibular homologs, marking the mesial angle of the lower central incisor. The subject is instructed to move their jaw as far as possible to one side and then to the other from the centric occlusion position, and the distance that the mark moves from the midline is measured, which indicates the distance that the jaw moved in each direction. Joint noises are recorded if reported by the patient or detected during the physical examination by auscultation using a stethoscope, with the active part placed 11 to 13 mm in front of the tragus. The patient is instructed to open and close their mouth.

The upper inter-incisive midline is extended with a stylus to the mandibular to examine mandibular deviation in subjects with natural teeth homologs. The operator aligns a ruler with the midline already drawn on the lower teeth during the ruler's mandibular movement. In partially or edentulous subjects who do not wear dentures, the midline of the face is traced on the residual mandibular ridge from the centric relation position in the same way as for natural dentition.[29,30]

Muscle palpation is always performed with firm, short pressure without causing pain to the patient and is carried out as follows:

Temporal muscle: this is divided into three functional areas.

Bimanual palpation is performed with the index fingers in the anterior area above the zygomatic arch, in front of the temporomandibular joint, and in the posterior area above and behind the ear. If possible, the subject is asked to repeatedly open and close their mouth to palpate the muscle fibers in function.

Masseter muscle: perform bimanual palpation at its upper and lower insertion points; place the fingers on the portion of the masseter inserted into the zygomatic arch, then move the fingers toward the lower insertion point at the lower edge of the jaw.

Temporomandibular joint: perform bimanual palpation of both joints on the lateral portion of the mandibular condyle, palpating with the fingertips of the index fingers in front of the tragus approximately 11 or 13 mm, and the posterior portion of the condyle through the external auditory canal. This maneuver will be performed with the patient's mouth open, closed, and in motion; joint pain will be recorded if palpation causes an avoidance reflex on the part of the subject. Spontaneous pain in mandibular movement will be recorded when the subject reports pain after instructing the subject to perform opening, closing, lateral, and propulsive movements.

Information processing technique.

Absolute frequencies and percentages were used as summary measures.

RESULTS

Table 2. Distribution of the population by age. Medical office 6. Hermanos Ruiz Aboy Polyclinic. San Miguel del Padrón. 2022–2023

Age	No.	%
40-44	10	10
45-49	46	46
50-54	25	25
55-59	19	19
Total	100	100

Table 2 shows that, out of 100 patients studied, there is a predominance of patients aged 45-49 years (46 %) and a smaller number aged 40-44 years (10 %). Ramírez Carballo MM et al. argue that the predominant age range for temporomandibular disorders is from the fourth decade of life onwards, which is precisely the age group that most frequently seeks care due to the limitations caused by TMD, which affects their social development.

Table 3. Distribution of the population by occupation and age. Medical office 6. Hermanos Ruiz Aboy Polyclinic. San Miguel del Padrón. 2022–2023

Age	Occupation							
	Working woman		Housewife		Retired		Total	
	No.	%	No.	%	No.	%	No.	%
40-44	-	-	10	10	-	-	10	10
45-49	32	32	14	14	-	-	46	46
50-54	15	15	10	10	-	-	25	25
55-59	9	9	10	10	-	-	19	19
Total	56	56	44	44	-	-	100	100

Table 3 shows the level of professional occupation among the patients in the study. The highest occupational percentage is in the 45-49 age range, with 32 % of female workers and only 14 % engaged in housework. As the age range increases, occupation decreases. Moreno Diéguez, in his study of 150 patients, shows a directly proportional relationship to the study in question, stating that the higher the degree of employment, the higher the incidence of temporomandibular disorders, and vice versa.

Table 4. Distribution of the population according to marital status by age. Medical office 6. Hermanos Ruiz Aboy Polyclinic. San Miguel del Padrón. 2022–2023

Age	Marital status					
	Single		Married		Total	
	No	%	No	%	No	%
40-44	-	-	10	10	10	10
45-49	20	20	26	26	46	46
50-54	-	-	25	25	25	25
55-59	-	-	19	19	19	19
Total	20	20	80	80	100	100

Table 5. Distribution of the population according to temporomandibular dysfunction by age. Medical office 6. Hermanos Ruiz Aboy Polyclinic. San Miguel del Padrón. 2022–2023

Age	Those affected		Not affected		Total	
	No	%	No	%	No	%
40-44	9	9	1	1	10	10
45-49	32	9	14	14	46	46
50-54	20	20	5	5	25	25
55-59	11	11	8	8	19	19
Total	72	72	28	28	100	100

Table 4 shows the marital status by age of the patients, with a considerable range of married patients (80 %) compared to single patients (20 %), where the age ranges of 45-49 and 50-54 show greater consolidation in marriage.

Table 5 shows the degree of temporomandibular dysfunction according to age range, with the 45-49 and 40-44 age groups being the most affected, at 32 % and 20 %, without excluding the other groups, as most of them present notable symptoms, meaning that 72 % of the patients examined are affected. Only 28 % are not affected by temporomandibular dysfunction. Castro Gutiérrez, when reviewing his patients, reports similarities to the current study, with the highest incidence in the 45-49 and 50-54 age groups. During the characterization of his population, Nogueras Planas found a higher frequency of temporomandibular dysfunction in the 45-49 age group, similar to the current findings.

Table 6. Distribution of patients according to signs and symptoms and age group of temporomandibular disorders. Medical office 6. Hermanos Ruiz Aboy Polyclinic. San Miguel del Padrón. 2022–2023

Signs and symptoms	Age groups									
	40-44	%	45-49	%	50-54	%	55-59	%	Total	%
	8	8	21	21	11	11	8	8	48	48
Muscle	8	8	21	21	9	9	11	11	49	49
Noise in	9	9	10	10	12	12	8	8	39	39
ATM	2	2	6	6	9	9	8	8	25	25
Decreased mouth opening	2	2	-	-	-	-	-	-	2	2
Mouth	8	8	16	16	9	9	10	10	43	43
deviation	5	5	9	9	6	6	6	6	26	26

Table 6 shows the high prevalence of TMJ and muscle pain in 49 % and 48 % of cases, respectively, with lateral movement limitation in 43 %, forming a triad of symptoms related to MTM. Corona Carpio reports in his research a higher frequency of muscle and joint pain with noises and limited movement in the 45-49 age group, associated with other clinical manifestations such as difficulty in opening the mouth to a lesser degree, similar to the results of the current study.

Table 7. Distribution of the population according to Helkimo's anamnestic and clinical dysfunction index. Medical office 6. Hermanos Ruiz Aboy Polyclinic. San Miguel del Padrón. 2022–2023

Index	Levels of dysfunction	No	%
Anamnestic	Asymptomatic	20	20
	Mild dysfunction	58	58
	Severe dysfunction	22	22
	Total	100	100
Clinical	Asymptomatic	10	10
	Mild dysfunction	29	29
	Moderate dysfunction	32	32
	Severe dysfunction	29	29
	Total	100	100

Table 7 shows the two stages according to the Helkimo test, where anamnestic values are lower than those clinically evidenced, indicating a high prevalence of mild and severe dysfunction in the population. After applying Helkimo's anamnestic and clinical index, a higher frequency of mild dysfunction was found in the anamnestic test, with 58 %, and moderate dysfunction in the clinical test, with 32 %. This result is similar to those found by Arias Molina, Moreno Diéguez, and Nogueras Planas, as well as Prendes Rodríguez and Castro Gutiérrez.

Table 8. Distribution of the population according to the perception of pain caused by temporomandibular dysfunction. Medical office 6. Hermanos Ruiz Aboy Polyclinic. San Miguel del Padrón. 2022–2023

Pain perception	No.	%
Mild	10	10
Moderate	56	56
Severe	6	6
Total	72	72

Table 8 shows the degree of pain perception caused by temporomandibular dysfunction, where 56 % of all affected patients

report moderate pain with a direct effect on TMJ dysfunction. There is therefore a significant difference between perceived pain and actual pain, which is due to the subjectivity of patients when assessing their own pain.

Table 9. Seeking professional help. Medical office 6. Hermanos Ruiz Aboy Polyclinic. San Miguel del Padrón. 2022–2023

Seeking professional help	No.	%
No	16	16
Si	84	84
Total	100	100

Table 9 shows that of all patients examined in consultation, only 16 had received professional help at some point in the past.

DISCUSSION

Castro Gutiérrez I et al.[30] when examining their patients, report similarities to the current study, with greater involvement in the age group of menopausal women aged 40 to 44 and 45 to 49 years, Nogueras Planas M et al.[33] found a higher frequency of TMD in the 45 to 49 age group during the characterization of their respective populations. Previous results similar to those reported in the current study identified a higher incidence of TMD in the 40 to 44 and 45 to 49 age groups, similar to the results of Moreno Diéguez O et al.[34] and Corona Carpio MH et al.[35]

Ramírez Carballo MM et al.[31] argue that the predominant age range for temporomandibular disorders is from the fourth decade of life onwards, which is precisely the age group that most frequently seeks care due to the limitations caused by TMD, which interferes with their social development.

In the research, after applying Helkimo's anamnestic and clinical dysfunction index, a higher frequency of mild dysfunction was found in the anamnestic index and moderate dysfunction in the clinical index, results that show similarity with those found by Arias Molina Y et al.[32] Moreno Diéguez O et al.[34] and Noqueras Planas M et al.[33] and Prendes Rodríguez and Castro Gutiérrez I et al.[36]

Stress is a psychophysiological phenomenon with psychosocial causes that plays a vital role in the cause of TMD by increasing muscle tone, according to García Cubillas MC et al.[38] where the response to this situation is mediated by the context in which it occurs, social life, refracted by personality, intelligence, and psychological individuality. About the above ideas, Chisnoiu AM et al.[39] reveal in their scientific article that the main risk factors are stress and anxiety, factors that alter the occlusal pattern of the masticatory cycle as a trigger for TMD.

Stress was the predominant risk factor in the research, with results that are consistent with those reported by Moreno Diéguez O et al.[34] Nogueras Planas M et al.[33] and Carballo Ramírez MM et al.[31], who demonstrated that patients examined with stress were more likely to suffer from TMD.

Cabo García R et al.[40] conclude that, given the diversity of risk factors for TMD, a detailed analysis of each case should be carried out to assess the possible concomitance of several of them. This would give greater weight to the possible etiological factor and pay attention to factors that prove to be long-lasting or aggravating.

Ros Santana M et al.[41], in the protocol for the diagnosis and treatment of temporomandibular disc disorders, state that joint noises, including clicking with associated joint and muscle pain, are the most frequent and characteristic signs and symptoms of TMD that compel patients to seek professional help, similar results to those found in the current study.[42]

Corona Carpio MH et al.[35] in Santiago de Cuba report in their research a higher frequency of muscle and joint pain with joint noises and movement limitations in the patients examined, which was associated with other clinical manifestations such as limited mouth opening, results similar to those of the current research.

CONCLUSIONS

More than half of the menopausal women studied had TMD. The characterization of temporomandibular disorders in the menopausal women studied showed a high prevalence of temporomandibular disorders, which were predominant in the 40-44 and 45-49 age groups. The main signs and symptoms were identified and determined in the study sample, with a close relationship to TMD, such as muscle pain, TMJ pain, joint noises in the TMJ, and movement limitations, which were highest in patients affected by some degree of temporomandibular dysfunction.

The perception of pain caused by temporomandibular dysfunction was identified, with 56 percent of the study sample reporting moderate pain and only 6 percent reporting severe pain.

We therefore conclude that our study revealed a predominance of women affected by temporomandibular dysfunction compared to those not affected. The study population perceives pain associated with temporomandibular dysfunction as moderate, with a directly proportional relationship to the search for professional help.

FINANCING

None.

CONFLICT OF INTEREST

Authors declare that there is no conflict of interest.

AUTHORSHIP CONTRIBUTION

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