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RESEARCH ARTICLE

Is There Association between Temporomandibular Dysfunctions, Sleep Quality, Parafunctional Habits, Anxiety and Depressive Symptoms in Patients with Chronic Kidney Disease Undergoing Hemodialysis? - Pilot Study

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Abstract:

There is a high prevalence of anxiety, depression, and stress in patients with chronic kidney disease (CKD) and these factors associated with psychotropic medications can lead to temporomandibular disorders (TMD). However, the association between these variables and TMD is still unclear. Objective: To associate TMD with anxiety, depression symptons, stress, sleep quality, use of psychotropic drugs and parafunctional habits (PH) in patients with CKD undergoing hemodialysis (HD). Methods: Cross-sectional study, approved by CEP (CAAE: 63054822.5.0000.5350) carried out with 28 patients. Patients with scores greater than 19 points on the Mini Mental State Examination questionnaire and at least one positive response on the American Academy of Orofacial Pain TMD screening questionnaire and who underwent hemodialysis for more than 3 months were included. Those who were in isolation or hospitalized at the time of data collection were excluded. After analyzing the screening results, the patients were submitted to the research protocol, which consisted of the following instruments: application of the questionnaire to collect clinical and sociodemographic data; Fonseca anamnestic index; Parafunctional Habits (PFH) assessment questionnaire; Hamilton Anxiety Scale – HAM, Beck Depression Inventory and Pittsburgh Sleep Quality Index – PSQI.

Results: It was found that 60.71% of the patients had some degree of TMD and 92.86% had PH, the most cited being the habit of chewing gum/candy and sleeping on one side. Still, 82.17%of the patients slept more than 6 hours a day, even though they did not have a good quality of sleep. 42.8% of patients reported the presence of depression and 42.85% used psychotropic medications. Conclusion: Most patients with CKD on hemodialysis have TMD and there is a statistically significant association of TMD degrees with the PFH of grinding teeth awake, clenching teeth awake, resting the hand on the jaw, biting nails and chewing on one side alone and with the use of antidepressant medication. This is an indication that TMD should be evaluated and treated in these patients with the potential to improve their quality of life.

Keywords: Chronic kidney disease, Hemodialysis, Temporomandibular disorders

Introduction

Chronic kidney disease (CKD) is considered a worldwide public health problem and constitutes one of the chronic conditions with high rates of depression, anxiety and stress, due to the numerous psychological pressures and limitations in the quality of life imposed by the disease [1]. In addition, inadequate renal function affects the oral cavity in approximately 90% of patients, leading to discomfort in the orofacial region [2,3,4].

Patients with CKD undergoing hemodialysis are more sensitive to discomfort in the orofacial region and the high prevalence of depression, anxiety and stress associated with psychotropic medications can lead to temporomandibular disorders (TMD), significantly affecting quality of life and coping with the disease [5,6,7,8].

Only two published studies [6,9] found in the literature, assess the prevalence of TMD in patients with CKD, which was 41.5% in patients on HD, showing that these patients are more sensitive to TMD, sleep bruxism and oral health problems. However, the understanding of the association between the presence of TMD and anxiety, depression, stress, sleep quality, use of psychotropic drugs and parafunctional habits in patients with CKD undergoing hemodialysis is still not very well established, as most studies seek this association with other publics and diseases [10,11,12,13,14].

Physiotherapy plays an important role in maintaining the quality of life of patients with CKD, and being aware of how much problems in the oral region can affect this quality of life becomes very relevant, especially for deepening this topic. Given the above, this study aimed to associate TMD with anxiety, depression symptons, stress, sleep quality, use of psychotropic medications and parafunctional habits in patients with CKD undergoing hemodialysis.

Methods

Study design and ethical aspects

Cross-sectional, analytical and descriptive study, approved by the Unijuí Research Ethics Committee (CAAE: 63054822.5.0000.5350 - Appendix A), carried out at the Jorge Bandarra Westphalen Corrêa Renal Therapy Unit of the São Vicente de Paulo Hospital, located in the city of Cruz Alta/RS. All patients were informed of the purpose and procedures of the study, as well as signed the Informed Consent Form (Appendix B). The data collection period took place in November and December 2022.

The preparation of the research followed the recommendations of the STROBE Statement - checklist of items that should be included in reports of observational studies[15].

Participants

The study population was made up of patients who regularly underwent three four-hour HD sessions in the renal treatment unit. All patients were invited to participate in the research screening by answering the Mini Mental State Examination - MMSE and the American Academy of Orofacial Pain - AAOP TMD Screening Questionnaire. Patients with a score greater than 19 points on the Mini-Mental State Examination questionnaire and at least one positive response on the American Academy of Orofacial Pain TMD screening questionnaire and who were on hemodialysis for more than 3 months were included in the study, Those patients who did not want to participate in the study, patients who did not reach the minimum scores in the screening and patients who were in isolation or hospitalized at the time of data collection were not included in the study.

Data collection procedures

Patients were approached during hemodialysis, when the project was explained and asked if they would like to participate. In the case of acceptance, they signed the TCLE and answered the Mini Mental State Examination - MMSE, DTM Screening Questionnaire of the American Academy of Orofacial Pain - AAOP and determined the level of discomfort of the referred symptom, in the Visual Analog Scale - VAS. After analyzing the results of the screening, based on the inclusion criteria for the study, the individuals were submitted to the research protocol. All questionnaires were applied by a trained examiner. The screening procedures and research protocol are described below:

Mini Mental State Examination - MMSE: It is a test used to assess cognitive function and track cognitive decline. The maximum score is 30 points and may be influenced by the individual's education. For illiterates, the standard cutoff score is 13 points, for individuals with low/medium education it is 19 points and for those with high education it is 26 points. The items evaluated by the MMSE are: Orientation; Immediate Memory; Attention and Calculation; Evocation Memory and Language [16].

TMD Screening Questionnaire: It is an initial TMD screening questionnaire from the American Academy of Orofacial Pain – AAOP for potential patients with orofacial pain and TMD. It presents ten specific questions related to TMD, namely: 1) Do you have difficulty, pain or both when opening your mouth, for example,

when yawning? 2) Is your jaw "stuck", "locked" or out of place? 3) Do you have difficulty, pain, or both when chewing, speaking, or using your jaws? 4) Do you notice noises in the articulation of your jaws? 5) Do your jaws get tight, tight or tired regularly? 6) Do you have pain in or around your ears, temples and cheeks? 7) Do you often have headaches, neck pain or teeth pain? 8) Have you had any recent head, neck, or jaw trauma? 9) Have you noticed any recent changes in your bite? 10) Have you had recent treatment for an unexplained problem with your jaw joint? The patient responding positively to one of these questions suggests possible TMD problems, being able to follow the research protocol [17].

Visual Analog Scale - VAS: The Scale consists of helping to measure the intensity of pain/discomfort in the patient. The scale was presented, after the patient answered the TMD screening questionnaire, to signal the degree of pain/discomfort of the referred symptoms, with 0 meaning total absence of pain/discomfort and 10 the maximum level of pain/discomfort bearable by the patient [18].

Questionnaire for collecting clinical and sociodemographic data: The sociodemographic and clinical questionnaire included two parts, the first part to outline the general profile of the patient, with identification data, such as gender, age, address, income, occupation, education, state civil and drugs in use. In the second part, health conditions and TMD symptomatology were questioned.

Fonseca Anamnestic Index - IAF: Evaluates the signs and symptoms of TMD and allows you characterize the severity of TMD. It consists of a questionnaire composed of 10 questions that verify the presence of pain in the temporomandibular joint, in the back of the neck, parafunctional habits, perception of malocclusion and feeling of emotional stress. Allowing three types of answers, yes (10 points), sometimes (5 points) and no (0 points). Through the sum of the points, the index classifies the participants in a category of symptoms, such as Absence of TMD (0 to 15 points), Mild TMD (20 to 40 points), Moderate TMD (from 45 to 65 points) and Severe TMD (70 points). to 100 points) [17].

Parafunctional Habits (PFH) assessment questionnaire: A multiple-choice questionnaire was applied to verify the presence of parafunctional habits. The participants were informed that they could tick more than one option, among those presented: clenching teeth awake (waking bruxism), grinding teeth awake (waking bruxism), biting objects, biting cheeks, biting nails chewing gum, chewing on one side only, sleeping on one side only, resting the hand on the mandible (chin) and sucking the finger [19,20].

Beck Depression Inventory - BDI: Used to assess the presence and intensity of depressive symptoms. It is a self-assessment measure, being classified according to depressive symptoms into: Absence of Depression (0-9), Mild Depression (10-18), Moderate Depression (19-29), Severe Depression (30-63) and Very Severe Depression (Above 64). The original scale consists of 21 items, including symptoms and attitudes, whose intensity varies from 0 to 3 points. The items refer to sadness, pessimism, feelings of failure, lack of satisfaction, feelings of guilt, feelings of punishment, self-deprecation, self-accusations, suicidal thoughts, crying spells, irritability, social withdrawal, indecision, body image distortion, inhibition for work, sleep disturbance, fatigue, loss of appetite, weight loss, somatic preoccupation, decreased libido [21].

Hamilton Anxiety Scale – HAM: Used to assess the presence and level of anxiety.The scale is made up of 14 items graded from 0 to 4, therefore ranging from 0 to 56 and is used to assess the degree of anxiety intensity (somatic and psychic), helping to improve quality and refinement of diagnostic or follow-up assessments

of patients in clinical research, classified as: Absence of anxiety (0), Mild Anxiety (1 - 17), Moderate Anxiety (18 - 24) and Severe Anxiety (25 - 56) [22,23].

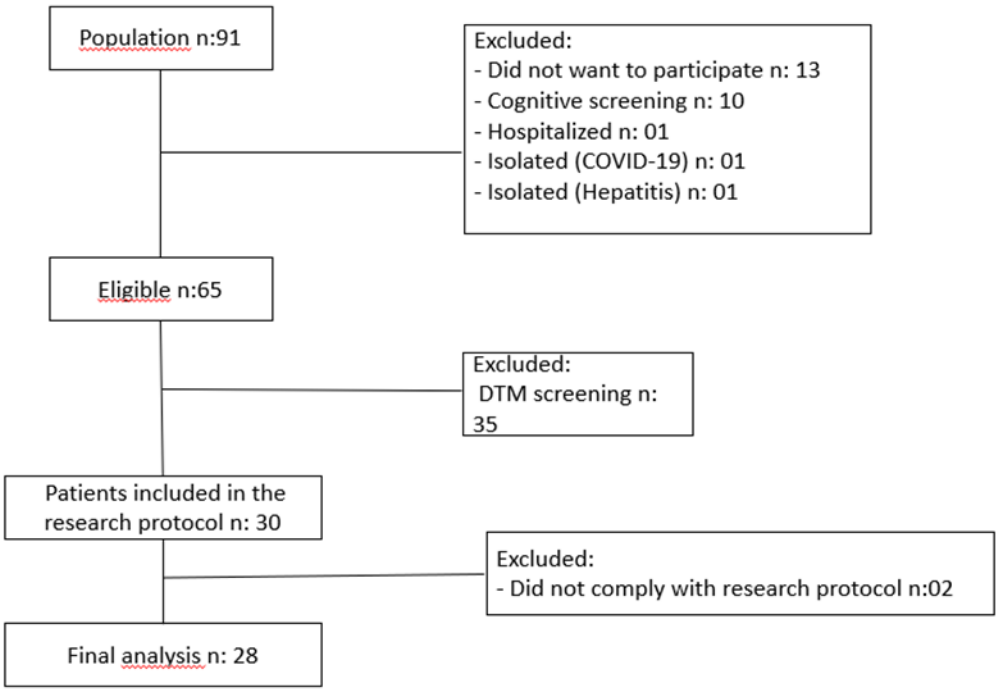
Pittsburgh Sleep Quality Index – PSQI: Evaluates sleep quality and disturbances. This index contains nine questions, from 1 to 4 with open-type answers, and from five to nine with objective answers. Questions five and nine have space for recording comments by the interviewee, if necessary. The PSQI questions comprise seven components, which were analyzed based on instructions for scoring each of these, ranging from zero to three points. The sum of the maximum score of this instrument is 21 points, with scores greater than five points indicating poor quality in the sleep pattern. The specific evaluation of the PSQI components occurred as follows: the first refers to the subjective quality of sleep, that is, the individual perception of sleep quality; the second demonstrates sleep latency, corresponding to the time needed to initiate sleep; the third assesses sleep duration, that is, how long you remain asleep; the fourth indicates the usual sleep efficiency, obtained through the ratio between the number of hours slept and the number of hours spent in bed, not necessarily sleeping; the fifth refers to sleep disorders, that is, the presence of situations that compromise sleep hours; the sixth component analyzes the use of sleeping medication; the seventh is inherent to daytime sleepiness and disturbances during the day, referring to changes in disposition and enthusiasm for carrying out routine activities. Being classified according to sleep quality in: Good (0-4), Bad (5-10) and Sleep Disturbance ($>$ 10) [24].

Statistical analysis

Data was analyzed using SPSS software version 22.0. Categorical variables were described in frequency and percentage, and continuous variables in mean $\pm$ standard deviation. For the associations proposed in the study, Fisher's Exact Test was performed with a statistical significance of 5%.

Results

91 patients were part of the HD service and after applying the exclusion criteria, 65 were eligible to follow the screening protocol. After applying the TMD screening questionnaire, 35 patients were excluded because they did not have symptoms, therefore, 30 patients with TMD symptoms were included in the research protocol. During data collection, 2 patients did not complete the research protocol, therefore, 28 patients were included for the final analysis of the study (Figure 1).



Source: Author

Table 1 presents the characterization of the sample. We observed that the patients had a mean age of 57.53±14.94 years, 71.42% were male and 71.42% had associated diseases, such as systemic arterial hypertension (85%) diabetes mellitus (35%) and cardiac insufficiency (15%).

Table 1. Clinical and demographic characteristics of patients (n=28).

VARIABLES	Mean ± SD
Age, years	57,53±14,94
Dry weight, Kg	73,24±12,23
BMI	22,30±4,53
Height, m	1,62±0,11
Hemodialysis time, years	4,57±4,93
MMSE	25,32±2,98
TMD screening	1,60±1,06
VAS	4,42±3,27
Gender, n%	
Male	20 (71,42)
Comorbidities, n%	20 (71,42)
Systemic Arterial Hypertension	17 (85,00)
Diabetes Mellitus	7 (35,00)
Cardiac insufficiency	3 (15,00)

SD: Standard deviation; BMI: Body Mass Index; Kg: Kilogram; m: meter; %: Percentage; TMD: Temporomandibular disorder; MMSE: Mini Mental State Examination; VAS: Visual Analog Scale

Table 2 presents the presence of TMD, PFH and sleep quality of the patients included in the study. In the assessment using the Fonseca Anamnestic Index, it was observed that 60.71% of the patients had some degree of TMD. PFH were observed in 92.86% of the sample, the most cited being chewing gum/candy by 100% of the sample and sleeping on one side only by 38.46%. 82.17% of the patients in the sample sleep more than 6 hours a day and in the assessment of the quality of restorative sleep with physical and mental rest, using the Pittsburgh Sleep Quality Index - PSQI, it was shown that 64.30% of the patients patients did not have a good quality of sleep.

Table 2. TMD, PFH and sleep quality in included patients (n=28).

VARIABLES	n (%)
IAF	
Absence of TMD (0 to 15 points)	11 (39,29)
Mild DTM (20 to 40 points)	10 (35,71)
Moderate TMD (45 to 65 points)	6 (21,43)
Severe TMD (70 to 100 points)	1 (3,57)
PFH presence	26 (92,86)
Teeth grinding awake (waking bruxism)	2 (7,69)
Clenching teeth awake (waking bruxism)	3 (11,53)
Bite your nails	3 (11,53)
Chewing gum/candy	26 (100)
Bite objects	1 (3,84)
Bite cheek	1 (3,84)
Chew on one side	5 (19,23)
Sleep on one side	10 (38,46)
Sleep on your stomach	3 (11,53)
Support the hand on the jaw	5 (19,23)
Hours of sleep	
Less than 6 hours	5 (17,85)
6 to 8 hours	17 (60,71)
More than 8 hours	6 (21,42)
PSQI	
Good (0-4)	10 (35,70)
Bad (5-10)	9 (32,15)
Sleep disturbance (> 10)	9 (32,15)

%: Percentage; IAF: Fonseca anamnestic index; BV: Awake Bruxism; PFH: Parafunctional habits; PSQI: Pittsburgh Sleep Quality Index.

Table 3 shows the levels of depression symptons, anxiety and the use of psychotropic medications. It was noticed after evaluation by the BDI that 42.8% of patients had degrees of depression and by evaluation with the HAM that 96.4% had some degree of anxiety. In the sample, 42.85% used psychotropic medications, such as anxiolytics (33.33%), antidepressants (50.01%) and anticonvulsants (16.66%). We also observed that 96.4% of patients had anxiety symptoms.

Table 3. Levels of depression, anxiety and use of psychotropic medications in the included patients (n=28).

VARIABLES	n (%)
BDI	
Absence of depressio (0-9)	16 (57,2)
Mild depression (10-18)	11 (39,2)
Moderate depression (19-29)	1 (3,6)
Severe depression (30-63)	0 (00)
Very severe depression (Acima de 64)	0 (00)
HAM	
Absence of anxiety (0)	1 (3,6)
Mild anxiety (1 - 17)	24 (85,7)
Moderate anxiety (18 - 24)	3 (10,7)
Severe anxiety (25 - 56)	0 (00)
Use psychotropic medications	
Yes	12 (42,85)
Psychotropic medications	
Anxiolytics	4 (33,33)
Antidepressants	6 (50,01)
Anticonvulsant	2 (16,66)

%: Percentage; BDI: Beck Depression Inventory; HAM: Hamilton Anxiety Scale.

Table 4. Association of TMD with anxiety, depression, sleep quality, use of psychotropic drugs and PH in the included patients (n=28).

	TMD				p
VARIABLES	Absence	Mild	Moderate	Severe	
	n (%)	n (%)	n (%)	n (%)	
PFH presence					
Grinding teeth awake - (waking bruxism)	0 (00,0)	0 (00,0)	1 (50,0)	1 (50,0)	0,016 †*
Clenching teeth awake - (waking bruxism)	0 (00,0)	0 (00,0)	2 (66,7)	1 (33,3)	0,005 †*
Bite your nails	0 (00,0)	2 (40,0)	2 (40,0)	1 (20,0)	0,017 †*
Chewing gum/candy	9 (81,8)	10 (100,0)	6 (100,0)	1 (100,0)	0,376 †
Bite objects	0 (00,0)	0 (00,0)	1 (16,7)	0 (00,0)	0,250 †
Bite cheek	0 (00,0)	0 (00,0)	1 (16,7)	0 (00,0)	0,250 †

Chew on one side	0 (00,0)	2 (20,0)	2 (33,3)	1 (100,0)	0,027 †*
Sleep on one side	2 (18,2)	4 (40,0)	3 (50,0)	1 (100,0)	0,257 †
Sleep on your stomach	1 (9,1)	1 (10,0)	1 (16,7)	0 (00,0)	0,999 †
Support the hand on the jaw	0 (00,0)	2 (20,0)	3 (50,0)	0 (00,0)	0,005 †*
PSQI					0,843 †
Good	5 (50,0)	4 (40,0)	1 (10,0)	0 (00,0)	
Bad	3 (33,3)	3 (33,3)	3 (33,3)	0 (00,0)	
Sleep disorder	3 (33,3)	3 (33,3)	2 (22,3)	1 (11,1)	
BDI					0,719 †
Absence of depression	7 (43,8)	6 (37,5)	3 (18,8)	0 (00,0)	
Mild depression	3 (27,3)	4 (36,4)	3 (27,3)	1 (9,1)	
HAM					0,999 †
Absence of anxiety	1 (100,0)	0 (00,0)	0 (00,0)	0 (00,0)	
Mild anxiety	9 (37,5)	9 (37,5)	5 (20,8)	1 (4,2)	
Moderate anxiety	1 (33,3)	1 (33,3)	1 (33,3)	0 (00,0)	
Anxiolytic Medication	1 (16,7)	2 (33,3)	2 (33,3)	1 (16,7)	0,184 †
Antidepressant Medication	0 (00,0)	2 (40,0)	3 (60,00)	0 (00,0)	0,005 †*

%: Percentage; LAI: Fonseca anamnestic index; BV: Awake Bruxism; PFH: Parafunctional habits; PSQI: Pittsburgh Sleep Quality Index; BDI: Beck Depression Inventory; HAM: Hamilton Anxiety Scale; *: p≤0.05, statistically significant; †: Fisher's exact test with a statistical significance of 5%.

Discussion

We highlight in our study that: 1) Most patients had some degree of TMD; 2) HP were observed in almost the entire sample, the most mentioned being chewing gum/candy and sleeping on one side only; 3) More than half of the patients do not have a good quality of sleep; 4) Most patients have depression symptons and used psychotropic medications; 5) Almost all patients had anxiety symptoms; 6) TMD had a statistically significant association with the HP of grinding teeth awake, clenching teeth awake, resting the hand on the jaw, biting nails and chewing on one side only and with the use of antidepressant medication.

Of the patients eligible for this research (n=65), 60.71% (n=28) had some degree of TMD, which characterizes 26.1% of TMD prevalence. There are only two studies

6,9 published so far in the literature that study TMD in CKD, in one it is observed that patients on HD are more likely to develop TMD and oral health problems and the other adds as a result a prevalence of 41.5% of TMD in patients with CKD.

PFH were observed in almost all our sample (92.86%), the most cited being the habit of chewing gum/candy (100%) and sleeping on one side only (38.46%). PFH are statistically higher in patients with CKD on HD, about 45.65% of patients may have the habit of chewing gum/candy, 23.5% the habit of chewing ice and 7.4% the habit of biting things and 55.15% the habit of clenching or grinding their teeth (bruxism), bruxism being more prevalent due to the long hours of dialysis, the high state of emotional stress of the HD process and the high prevalence of sleep disorders [6].

In addition, the habit of clenching or grinding the teeth (bruxism) may be related to psychological, morphological and neurological disorders[25]. Xerostomia is common in HD patients due to limited fluid intake and the habit of chewing gum increases production of saliva, alleviating the symptoms of xerostomia and reducing thirst [26,27,28]. The habit of biting hard objects may be associated with reduced quality of life and increased anxiety, and this situation may increase the risk of TMD [29,30].

In our study, we observed that 82.17% of patients sleep more than 6 hours a day, but 60.71% do not have good sleep quality, as assessed by the Pittsburgh Sleep Quality Index. The American Academy of Sleep Medicine [31] describes that sufficient sleep duration varies from person to person, but the recommendation for sleep duration in adulthood is 7 to 8 hours [32,33]. To maintain well-being and health in general, sleep requires sufficient quantity and quality[34,35]. Sleep disorders are present in patients with CKD, altering their physical and life quality, and in more advanced stages, sleep quality becomes even more impaired [36,37,38], as poor sleep quality and short duration are associated with proteinuria, decline in GFR and progression in CKD [39,40]. Changes in sleep lead to sympatho-vagal imbalance, with hyperactivity of the sympathetic nervous system and decreased vagal tonus, leading to losses in the physiological reduction of blood pressure during sleep in these patients, which may represent an important factor in the progression of CKD [41].

In our study, we observed that 42.8% of the patients had symptoms of depression according to the Beck Depression Inventory, and 42.85% used psychotropic medications, 50.01% of which used antidepressants, and 96.4% of those had symptoms. of anxiety. There is a high prevalence of anxiety and depression levels in patients with CKD, from the moment of discovery of the disease and over time due to comorbidities and complications, the prevalence of depression can reach 78% [7,38,42,43,44,45] . Due to the impact of depression and anxiety on the lives of renal patients, they sometimes use psychotropic medications to control symptoms, as adaptation to treatment and dependence on the dialysis machine are stressful factors for the patient, however, some antidepressants can worsen or induce primary sleep disorders such as bruxism [46,47,48].

In our study, TMD had a statistically significant association with the PFH of grinding teeth awake (waking bruxism) , clenching teeth awake (waking bruxism), resting the hand on the jaw, biting nails and chewing on one side only and with the use of medication antidepressant, these associations are not found in the literature in patients with CKD, but are strongly presented in studies with other populations [10,11,12,13,14,19,24,49,50]. The presence of HP increases the probability of causing alterations in the muscular system and in the TMJ, since the structures of the masticatory system tolerate a certain amount of force

generated by hyperactivity and, after this level, tissue collapse can occur, the patient is more prone to developing TMD [51].

As for the PFH of waking bruxism, this can vary from 22.1% to 31% in the adult population, a fact associated with higher levels of anxiety and depression and signs and symptoms of TMD [14,52,53,54,55,56,57]. Bruxism is a stereotyped and unconscious movement disorder characterized by teeth grinding or clenching, which can be caused by three types of factors: biological, psychological and exogenous, reinforcing the coexistence of bruxism, stress and psycho-emotional disorders [58].

Bruxism is a PFH that causes joint overload leading to TMD, being observed in a statistically significant way in 55.1% of patients on hemodialysis, a fact that may be due to the long hours of HD, the high state of emotional stress of the process and the high prevalence of sleep disorders [6,58,59]. In a study 59 with 172 participants, 74.4% of those evaluated reported bruxism during the day, night or a combination of both, in another study 60 with 108 participants, it was observed that 55.6% had TMD symptoms and the most prevalent PFH was bruxism (16.34%) being one of the important predictors for the presence of symptoms.

As for the PFH of placing the hand on the mandible, the literature demonstrates a significant association with TMD, which may be prevalent in up to 76.6% to 78.7% of patients [19,29,61]. In a study with students 62 aged between 14 and 25 years, it was observed that 81.9% of the participants had some degree of TMD and the most predisposing parafunctional habit was placing the hand on the mandible. The TMJ is a bilateral joint, in which both sides work together and is represented by the connection between the mandibular fossa of the temporal bone and the head (or condyle) of the mandible [63]. The TMJs guarantee the maintenance of mandibular dynamics with regular movements, without steps and within physiological limits, moreover, in this condition of muscle and joint balance, the mandible is positioned in a perfect vertical axis in relation to the cervical spine and the skull [64]. When an external force is applied on one side, as in the the case of resting the hand on the mandible, causes a misalignment in the TMJ biomechanics, because from this static position of ideal rest, all functional joint movements begin [51].

As for the PFH of nail biting, a study with 30 physiotherapy students observed a prevalence of 100% of TMD, and the PFH of nail biting were present and were associated as one of the triggering factors of dysfunction [29]. A study with 3,475 students observed a prevalence of PFH of nail biting of 17.6% among university students and 29.2% among secondary school students [65]. In another study with a sample of 270 adolescents who had signs and symptoms of TMD, the PFH of nail biting was predominant in 15.5% of the participants [53]. The PFH of biting nails causes repeated and prolonged force causing a protrusion of the mandible that ends up causing muscle hyperactivity, which causes an overload on the TMJ and associated structures, which can lead to TMD [51].

As for the PFH of chewing on one side, the literature shows that unilateral chewing is associated with the presence of signs and symptoms of TMD 66,67. In a study with 754 students, the overall prevalence of TMD was 31.7%, and this result was associated with a high prevalence of unilateral chewing, which is one of the strongest risk factors for causing TMD symptoms [68]. Patients with TMD present less movement stability when chewing, in order to avoid increasing chewing forces, probably to reduce muscle pain induced by the act 69, leading to deliberate unilateral chewing, as it is more stable than free chewing [70,71,72].

Antidepressant medications are strongly associated with bruxism and signs and symptoms of temporomandibular disorders [49,73]. Selective serotonin reuptake inhibitors (SSRIs) have a strong influence on the development of bruxism, drugs

such as duloxetine, paroxetine, venlafaxine, barbiturates and methylphenidate may be associated, worsening or inducing tooth clenching and consequently TMD [47,49,73,74,75,76]. A systematic review 77 reinforces that bruxism associated with antidepressants can occur in pediatric and adult patients, more commonly among female patients, where symptoms may begin within 3 to 4 weeks after starting the medication and may disappear within 3 to 4 weeks after drug discontinuation.

Based on the analysis of our results, we can verify the importance of this study for the clinical practice of physiotherapists in this area, since the study reinforces the look at the signs and symptoms of TMD in patients with CKD, in view of the limited number of studies with this theme. However, the study has some limitations, among which we can highlight: 1) the study did not have a comparative control group of healthy people paired by sex and age, which makes the results weak in terms of scientific evidence; 2) the sample is small and was recruited in a single center, which weakens the generalization of the results, and 3) The study is cross-sectional, analytical and descriptive, which reduces the strength of the results, considering that to analyze the factors associated with an outcome, it is suggested to carry out a longitudinal study.

Conclusion

We conclude that patients with CKD undergoing HD show signs and symptoms of TMD and there is a statistically significant association of TMD degrees with the PFH of grinding teeth awake, clenching teeth awake, resting the hand on the jaw, biting nails and chewing one side only and with the use of antidepressant medication. This is an indication that TMD should be evaluated and treated in these patients in the constant search for a better quality of life. As there are not enough studies on this subject in the literature, further studies in large groups of patients are needed in the future.

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