

## Depression and TMD in the elderly: A pilot study

### Depressão e DTM em idosos: Estudo piloto

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#### ABSTRACT

Temporomandibular dysfunction (TMD) is a painful syndrome that affects orofacial region, with deleterious effects in patients' quality of life. Several aspects of TMD in the elderly are still controversial in the literature. The aim of this paper is to verify the prevalence of TMD among the elderly people in Taubaté – Brazil, and its possible association with other co-morbidities. Sixty-eight elderly individuals, presenting an average age of 69.5 years (SD 8.5), participated in this study, 37 of which were women. The Research Diagnostic Criteria for Temporomandibular Dysfunction (RDC/TMD) was used to verify TMD and its possible association with other co-morbidities. The studied sample presented a low prevalence of TMD according to RDC/TMD (10.3%). Women presented more non-specific physical symptoms – pain items included – than men (pain items included,  $p=0.016$ ,  $\chi^2$  test). Depression and non-specific physical symptoms – pain items excluded – did not correlate with patients' gender. Associations were found among depression and characteristic pain intensity ( $p=0.027$ , ANOVA), non-specific physical symptoms - pain items included ( $p<0.001$ ), non-specific physical symptoms – pain items excluded ( $p=0.001$ ) and chronic pain grade ( $p=0.004$ ), whereas the more depressed the patients, the higher were their pain scores. One can conclude that psychological factors, such as depression, were associated with TMD prevalence, thus reinforcing the need for a multidisciplinary approach for TMD treatment.

#### KEYWORDS:

Clinical assessment; depression; elderly; research diagnostic criteria for temporomandibular disorders; temporomandibular disorder.

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#### INTRODUCTION

Temporomandibular dysfunction is a painful syndrome that affects the orofacial region, involving a myriad of symptoms, as otalgia, headache, and facial myalgia, among others. This symptoms usually impairs patients' quality of life [1] but the etiology of temporomandibular dysfunction (TMD) is still unclear [2,3]. However, the belief in intraoral features (as biting interferences) have become increasingly weak while general health

factors have gained more importance [2,4,5]. Due to this, associated to the subjective nature of pain, psychological factors may be considered part of the clinical expression of TMD [6].

Previous studies [7-9] have used different methodologies to evaluate TMD signs and symptoms in the elderly. However, there was a claim for a standardized diagnostic on TMD research [7] and a multidisciplinary approach could be helpful to verify the prevalence of TMD. The Research Diagnostic Criteria for

Temporomandibular Disorders (RDC/TMD) was suggested to achieve a standardized evaluation of TMD [6,10-12]. This diagnostic tool also seems to provide reliable and valid indicators of depression and somatization [10]. However, RDC/TMD presents some limitations that may affect the findings (such as the lack of RDC/TMD ability to differentiate between patients with TMD pain and patients with oro-facial pain complaints of non-TMD origin [13], palpation reliability and the absence of a cross-correlation between RDC/TMD findings [14]). Furthermore, to the best of our knowledge, there are few reports regarding the use of RDC/TMD in the elderly.

The prevalence of reported TMD decreases with age [2,7,8] however TMD alterations present a significant association with several general health and psychosomatic factors [2] and could be related to a lower self-perception of oral health [7]. As depression is a prevalent psychosomatic factor in elderly populations [15] and RDC/TMD presents an extensive evaluation of this item, it seems adequate to evaluate the relationship of depression and TMD in the elderly. The aim of this paper is to verify the prevalence of TMD among an elderly sample in Taubaté – Brazil, using the RDC/TMD tool. Possible associations with depression as verified on RDC/TMD will also be verified. Considering earlier reports [2,7,8], the hypotheses were that the incidence of TMD in the studied population would be low and that there would be an association between TMD and depression.

## MATERIAL AND METHODS

### Participants

The sample was composed of 68 individuals recruited among community-dwelling elderly in Taubaté, Brazil. A total of 120 community-dwelling elderly were asked to participate in the study, but 52 refused (mainly because of RDC/TMD length). The achieved sample presents a sample power of 0.54 on representing the city elderly population. The inclusion criteria were: being 60 years old or over, being community-dwelling, and agreeing to participate in the study. The study was previously approved by the institutional review board for Ethics in Research (protocol number CEP/UNITAU 0468/07). All the patients signed an informed consent.

### TMD evaluation

All patients underwent an assessment in accordance with the RDC/TMD guidelines (Axis I and II) [11], where all the interviews and clinical examinations were conducted by a single, pre-calibrated examiner. A validated Portuguese version of the questionnaire was used [16], which is available at <http://www.rdc-tmdinternational.org/>.

The RDC/TMD allows the possibility of multiple diagnoses for the same individual. The diagnoses could be classified in three groups, which are explained in Table 1.

**TABLE 1 – THREE MAIN GROUPS AND SUBGROUPS ASSESSED WITH THE RDC/TMD DIAGNOSIS**

Group	Subgroups	
I – Muscle disorders	a	Mmyofascial pain
	b	Myofascial pain with limitation in mouth opening
II – Disc displacements	a	Disc displacement with reduction
	b	Disc displacement without reduction with limited opening
	c	Disc displacement without reduction without limited opening
III – Other joint conditions	a	Arthralgia
	b	Osteoarthritis
	c	Osteoarthrosis

### Statistics

The collected data were tabulated using Excel (Microsoft Inc.) software and the descriptive statistics was performed. Chi-square and Fischer exact tests were used to verify if there was a possible association between gender and depression, and to compare depression with other variables. The two ratios equality test and ANOVA one-way test were used to verify a possible relationship of depression with pain items. An alpha level of .05 was adopted for all the tests applied in the study.

### RESULTS

The average age among the participants was 69.5 years old ( $SD=8.5$ , ranging from 60 to 98 years) of which 31 were men (45.6%). According to the clinical physical examinations,

the presence of myofascial pain with or without jaw limitation, disc displacement with or without reduction and/or jaw limitation, and pain were not prevalent (Table 2). The average characteristic pain intensity (CPI) was 2.9 ( $SD=13.7$ , ranging from 0 to 93.3).

**TABLE 2 – RESULTS FROM RDC/TMD AXIS I (CLINICAL PHYSICAL EXAMINATION) AND II (BIOBEHAVIORAL QUESTIONNAIRES)**

		No		Yes		
		n	%	n	%	
Group I Ib	Ia	67	98.5	1	1.5	
		66	97.1	2	2.9	
Group II	Left ATM	Iia – Left	61	89.7	7	10.3
		Iib – Left	68	100	0	0
		Iic – Left	68	100	0	0
	Right ATM	Iia – Right	65	95.6	3	4.4
		Iib – Right	68	100	0	0
		Iic – Right	68	100	0	0
Group III	Left ATM	IIIa – Left	64	94.1	4	5.9
		IIIb – Left	65	95.6	3	4.4
		IIIc – Left	62	91.2	6	8.8
	Right ATM	IIIa – Right	66	97.1	2	2.9
		IIIb – Right	68	100	0	0
		IIIc – Right	68	100	0	0
	TMD Pain Reported (Axis II)		61	89.7	7	10.3

A total of 42 (61.8%) patients experienced moderate (30.9%) and severe (30.9%) depressive symptoms, 32 (47.1%) and 34 (50.0%) experienced nonspecific physical symptoms when pain items were

included and excluded, respectively. The majority of the sample (89.7%) did not present TMD pain within the previous 6 months (Table 3).

**TABLE 3 – RESULTS FROM CHRONIC PAIN GRADE CLASSIFICATION (GRADE 0: NO TMD PAIN REPORT IN PREVIOUS 6 MONTHS, GRADE I: LOW INTENSITY PAIN, GRADE II: HIGH INTENSITY PAIN, GRADE III: MODERATELY LIMITING PAIN, GRADE IV: SEVERELY LIMITING PAIN)**

Chronic Pain Grade	n	%
Grade 0	61	89.7
Grade I	2	2.9
Grade II	4	5.9
Grade III	1	1.5

No relationship between age and classification for Axis I (clinical physical examination), nor between age and depression, non specific physical symptoms, and chronic pain grade classification was found (ANOVA). When the Fischer exact test was used, no association between gender and Axis I (clinical physical examination) was found. Depression and non-specific physical symptoms – pain items excluded – also did not were associated with patients' gender.

However there was an association between gender and non-specific physical symptoms – pain items included – ( $p=0.016$ ,  $\chi^2$  test), and women received more often a “severe” classification (Table 4).

**TABLE 4 – ASSOCIATION BETWEEN GENDER AND NON-SPECIFIC PHYSICAL SYMPTOMS (PAIN ITEMS INCLUDED)**

		Female		Male		Total		p-value
		n	%	n	%	N	%	
Non-specific physical symptoms – pain items included	Severe	10	27	1	3	11	16	0.016*
	Moderate	12	32	9	29	21	31	
	Mild	15	41	21	68	36	53	

The asterisk (\*) indicates association.

There was also a relationship ( $p=0.027$ , ANOVA) between depression and characteristic pain intensity, whereas the more depressed the patients, the higher was their characteristic pain intensity score. Depression was also associated ( $\chi^2$  test, Table 5) with non-specific physical symptoms ( $p<0.001$ ; pain items included); non-specific physical symptoms – pain items excluded ( $p=0.001$ ) and chronic pain grade ( $p=0.004$ ).

**TABLE 5 – ASSOCIATION BETWEEN DEPRESSION WITH PAIN ITEMS SCORES AND CHRONIC PAIN GRADE**

Depression		Severe depression		Moderate depression		No depression		Total		<i>p</i> -value
		n	%	n	%	n	%	n	%	
Pain Items Included	Severe	9	43	1	5	1	4	11	16	<0.001*
	Moderate	8	38	7	33	6	23	21	31	
	Mild	4	19	13	62	19	73	36	53	
Pain Items Excluded	Severe	13	62	4	19	2	8	19	28	0.001*
	Moderate	3	14	5	24	7	27	15	22	
	Mild	5	24	11	52	17	65	34	49	
Chronic Pain Grade	Grade 0	15	71	20	95	26	100	61	90	0.004*
	Others	6	29	1	5	0	0	7	10	

The asterisk (\*) indicates association.

## DISCUSSION

The tested hypotheses that the incidence of TMD in this sample would be low and that there is an association among TMD and depression were confirmed, corroborating previous findings [2,6-8].

Despite the low incidence of TMD in elderly populations [2,7,8] a high prevalence of depression in this studied sample was observed. Depression in elderly is a serious problem [17] since it may trigger or exacerbate pre-existing conditions and is usually accompanied by pain, physical discomfort, weakness and fatigue, and sleep and appetite disorders. In addition to poor functioning, depression increases the perception of poor health, the utilization of medical services, and health care costs [18]. Depression is often ignored, misdiagnosed, and inadequately treated in the elderly population [19], which may result in unnecessary morbidity and mortality.

Previous studies [2,8] observed a strong relationship between the number of TMD symptoms and several psychosomatic complaints, which is also in agreement with our findings. Some authors argue that the comorbidity of TMD symptoms, psychological factors and pain in other areas of the body are part of a multi-symptomatic situation [2,8]. It is known that TMD patients with depressive symptoms and chronic pain tend to have less predictable outcomes than those not associated with depression [6]. However, the prevalence of depression seems not to be linked with pain only in elderly patients, as a recent study showed that comorbidity between facial pain, widespread pain and depressive symptoms are exhibited also in young adults [20]. Nevertheless, considering the high prevalence of depression in the elderly [15] it could be more often related to painful disorders in this age group.

The use of RDC/TMD to evaluate TMD on this paper should be discussed, since there is a controversy in the literature about the RDC/TMD reliability. Some previous works [21] advocate that RDC/TMD limitations are considered to be low and that it is the preferred way to characterize temporomandibular disorders [12,21]. In the other hand, other researchers criticize RDC/TMD pointing out some limitations such as the lack of RDC/TMD ability to differentiate between patients with TMD pain and patients with oro-facial pain complaints of non-TMD origin [13], palpation reliability and the absence of a cross-correlation between RDC/TMD findings [14].

Since the literature reports that another limitation of the RDC/TMD is the fact that there is an unbalance in the number of muscular and articular palpation sites (which may lead to an overrepresentation of muscular Group I) [14], an interesting finding of this study is that Group III (articular pain conditions) presented a higher prevalence when compared to Group I (muscular group).

Another possible limitation of this study relates to the small sample size, which may not be representative of the population as a whole. To overcome these limitations, future studies using larger samples and RDC/TMD associated to other different approaches to diagnose TMD should be conducted among the elderly population.

## CONCLUSION

Within the limitations of this study, it is possible to conclude that psychological factors, such as depression, are associated with TMD prevalence, increasing the need for a multidisciplinary approach for TMD treatment.

## RESUMO

A disfunção temporomandibular (DTM) é uma síndrome dolorosa que afeta a região orofacial, com efeitos deletérios na qualidade de vida dos pacientes. Diversos aspectos à respeito da DTM em idosos são controversos na literatura. O objetivo neste estudo foi verificar a prevalência de DTM em idosos da cidade de Taubaté – Brasil, e as possíveis associações com outras co-morbidades. Sessenta e oito indivíduos, apresentando idade média de 69,5 anos (DP 8,5), participaram neste estudo, sendo 37 mulheres. O Research Diagnostic Criteria for Temporomandibular Dysfunction (RDC/TMD) foi usado para verificar DTM e as possíveis associações com outras co-morbidades. A população estudada apresentou baixa prevalência de DTM de acordo com o RDC/TMD (10,3%). Mulheres apresentaram mais sintomas não específicos – itens de dor incluídos – que homens (itens de dor excluídos,  $p=0.016$ ,  $\chi^2$  test). Depressão e sintomas físicos não específicos – itens de dor excluídos – não correlacionaram com o sexo do paciente. Associações foram encontradas entre depressão e a intensidade das características de dor ( $p=0.027$ , ANOVA), sintomas físicos não específicos – itens de dor incluídos ( $p<0.001$ ), sintomas físicos não específicos – itens de dor excluídos ( $p=0.001$ ) e a escala de dor crônica ( $p=0.004$ ), sendo que paciente mais deprimidos apresentaram maiores escores para dor. Pode-se concluir que os fatores psicológicos, como a depressão, foram associados com a prevalência de DTM, reforçando assim a necessidade de uma abordagem multidisciplinar para o seu tratamento.

## PALAVRAS-CHAVE

Avaliação clínica; idosos; RDC/TMD; disfunção temporomandibular.

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