

## PSYCHO-EMOTIONAL FACTORS AND CRANIOMANDIBULAR DISORDER SEVERITY

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PSYCHO-EMOTIONAL FACTORS AND CRANIOMANDIBULAR DISORDER SEVERITY (Abstract): Craniomandibular disorders (CMD) are a series of clinical dysfunctions on the level of masticatory muscles, temporomandibular joint (TMJ) or both. The symptomatology is represented by: muscle pain in the head and neck region, noise and pain in the temporomandibular joint, limitation of the mandibular mobility. This study aims to analyze the interrelation between psycho-emotional status and the severity of craniomandibular disorder (CMD) in patients from NE Romania. **Materials and methods:** We conducted a cross-sectional study in a cohort of 106 consecutive volunteer patients who attended private praxis in Iasi during an eight-month period (October 2023- March 2024). Before the clinical evaluation, patients were required to answer a personalized merged version of the Temporomandibular Disorder-Pain Screener (TMD-Pain Screener) (ver. October 11, 2013) and Fonseca Anamnestic Index questionnaire used for screening of CMD. After this step the patients filled in the Patient Health Questionnaire-9 (PHQ-9) (ver. May 12, 2013), which consists of 9 closed-ended questions and is designed for screening, diagnosing, monitoring, measuring the severity of depression. This questionnaire is completed by the patient and can also be administered repeatedly, to reflect improvement or worsening of depression in response to treatment. **Results:** The analysis of the scores recorded by patients on the PHQ-9 questionnaire, revealed that most of subjects (85.9%) have minimal (43 subjects) or mild levels of depression (48 subjects), in almost equal proportions ( $p=0.183$ ). Only 11.3% of patients were registered with moderate depression, while 2.8% of patients (3 cases) were classified as having moderately-to-severe depression. We noticed that the severity of depression increases among subjects with a demanding profession (economist, commerce, IT). **Conclusions:** The severity of CMDs is more common in women and at the young age. Stress has been established as one of the most significant risk factor for TMJ disorders apart from parafunctional habits (clenching and grinding) and pathologic occlusion. **Keywords:** CRANIOMANDIBULAR DISORDER, PSYCHOSOCIAL FACTORS, TEMPOROMANDIBULAR JOINT, STRESS.

Craniomandibular disorders (CMD) are a series of clinical dysfunctions on the level of masticatory muscles, temporomandibular joint (TMJ) or both; there is an important influence for other muscle-articular structures of the head and neck and for the postural stance (1, 2).

The symptomatology of CMD is widespread in adult population and an average value of 44% against 30% of the latter (1), but they are not just found in adult life, but also in children and teenagers.

The main symptomatology is muscle pain in the head and neck region, noise and pain in the temporomandibular joint, limitation of the mandibular mobility; and also, symptoms like: headache, facial and posterior neck pain, dental pain, tinnitus dysgeusia are present.

CMD has multifactorial etiology. The pain is determined by a complex interaction between mechanical, biological, cognitive, and psycho-emotional factors, also there are predisposing, instigating and perpetuating factors (3, 4).

The predisposing factors include 3 main categories: morpho-structural alterations (anatomical alterations), psycho-emotional alterations (stress, anxiety) and pathophysiological alterations (parafunctions).

The instigating factors include micro-traumas and macro-traumas. Perpetuating factors are represented by the psycho-emotional dimension of the patient (emotional and social factors) (3-5).

This study aims to analyze the interrelation between psycho-emotional status and the severity of cranio-mandibular disorder (CMD) in patients from NE Romania.

### **MATERIALS AND METHODS**

We conducted a cross-sectional study in

a cohort of 106 consecutive volunteer patients who attended private praxis in Iasi during an eight-month period (October 2023- March 2024). Before the clinical evaluation, patients were required to answer a personalized merged version of the Temporomandibular Disorder-Pain Screener (TMD-Pain Screener) (ver. October 11, 2013) and Fonseca Anamnestic Index questionnaire used for screening of CMD. Since the TMD-Pain Screener contains only 4 items, we decided to attach the rest of the items from the Fonseca Anamnestic Index to obtain statistically relevant results. After this step the patients filled in the Patient Health Questionnaire-9 (PHQ-9) (ver. May 12, 2013), which consists of 9 closed-ended questions and is designed for screening, diagnosing, monitoring, measuring the severity of depression. This questionnaire is completed by the patient and can also be administered repeatedly, to reflect improvement or worsening of depression in response to treatment.

Volunteers were fully informed on the research objectives, experimental procedures, potential risks, and benefits, and were instructed to select only one response for each item. They were also told that they could take as much time as needed to complete the questionnaire.

The study was approved by the Ethics Committee Board of "Grigore T. Popa" University of Medicine and Pharmacy of Iasi (Nr. 271/14.02.2023), and all subjects provided written informed consent before enrollment.

Subjects who had been previously diagnosed with CMD or were currently receiving CMD treatment were excluded from the study. The inclusion and exclusion criteria are presented in second table.

TABLE I.  
PHQ-9 Questionnaire (6)

Q.I Abrev		N.A	S.D	M.H.D	N.E.D
Q I.1	Little interest or pleasure in doing things				
Q I.2	Feeling down, depressed, or hopeless				
Q I.3	Trouble falling or staying asleep, or sleeping too much				
Q I.4	Feeling tired or having little energy				
Q I.5	Poor appetite or overeating				
Q I.6	Feeling bad about yourself or that you are a failure or have let yourself or your family down				
Q I.7	Trouble concentrating on things, such as reading the newspaper or watching television				
Q I.8	Moving or speaking so slowly that other people could have noticed. Or the opposite being so fidgety or restless that you have been moving around a lot more than usual				
Q I.9	Thoughts that you would be better off dead, or of hurting yourself				
Interpretation of Total Score		Depression Severity			
1-4		Minimal depression			
5-9		Mild depression			
10-14		Moderate depression			
15-19		Moderately severe depression			
20-27		Severe depression			
N.A- Not at all; S.D- Several days; M.H.D- More than half the days; N.E.D- Nearly every day.					

TABLE II.  
Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
<ul style="list-style-type: none"> <li>patients who are at least 18 years old</li> <li>patients who have provided completed informed consent forms</li> <li>patients who have completed the questionnaire PHQ-9</li> </ul>	<ul style="list-style-type: none"> <li>patients who refused to participate in the study.</li> <li>uncooperative patients</li> <li>patients with systemic joint disorders</li> <li>patients with neurological diseases</li> <li>patients with psychiatric diseases</li> <li>patients with cervical spine alterations</li> <li>patients with facial paralysis</li> <li>patients with previously diagnosed temporomandibular joint (TMJ) pathology</li> </ul>

**Data analysis**

The data were centralized in *SPSS 24* databases and processed with suitable statistical function. Both descriptive and ana-

lytical methods were used.

The analysis of the results entailed assessing the frequency distribution of responses to the questionnaire. We compared

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average percentages between various genders and severity levels using the Pearson Chi-squared test, with a significance level of error set at 95%.

The Mann-Whitney Test is parametric statistical test used to compare two samples or groups with low numbers of individuals in each group which are not normally distributed, and where the data are continuous.

The Kruskal-Wallis test is a nonparametric test in which we compared three or more frequency distributions intergroupally.

### RESULTS

We investigated a sample of 106 pa-

tients, mainly women (70.8%), generally of young age - with an average age of  $39.51 \pm 12.324$  years; women are about 8 years older than men, with an average of  $41.80 \pm 11.856$  years compared to  $33.97 \pm 11.834$  years - the observed difference being statistically significant. The youngest patients were 18 years old, and the oldest is a 75-year-old man (tab. III).

We also made a division of patients by age groups of approximative 10 years; the majority of patients are of adult age, between 26 – 55 years (72.7%), the percentage of young people between 18-25 years being 18.9%, and that of adults over 55 years being of only 8.5% (tab. IV).

TABLE III.

**The age of the investigated patients – descriptive statistics  
(global sample and comparatively by gender)**

Gender	n	Age Average	Std. error of the mean	Std. deviation	Min	Max	Median	Mann-Whitney test
F	75	41.80	1.369	11.856	21	65	43.00	U = 699.500
M	31	33.97	2.125	11.834	18	75	29.00	p = 0.001**
Total	106	39.51	1.197	12.324	18	75	39.00	

TABLE IV.

**The structure of the investigated sample by age groups**

		n	%
<b>Age group</b>	18-25 yrs.	20	18.9
	26-35 yrs.	23	21.7
	36-45 yrs.	25	23.6
	46-55 yrs.	29	27.4
	over 55 yrs.	9	8.5
	Total	106	100.0

The sample's structure by occupations is quite heterogeneous: 40% of the inter-

viewed patients are economists, to which is added a percentage of people working in

commerce (17.0%) or IT (10.4%) and also other categories of occupations occur in a percentage of almost 10% students; the relatively isolated cases (tab. V).

**TABLE V.**  
**The structure of the investigated sample by occupations**

		n	%
<b>Occupation</b>	Commerce	18	17.0
	Economist	42	39.6
	Civil servant	7	6.6
	Engineer	4	3.8
	IT	11	10.4
	Mechanic	1	0.9
	Doctor	3	2.8
	Dentist	6	5.7
	Optician	1	0.9
	Retired	2	1.9
	Policeman	1	0.9
	Student	10	9.4
	Total	106	100.0

Patients were given a questionnaire consisting of 9 items, to which they had 4 options of answer, namely “not at all”, “several days”, “more than half the days” and “nearly every day”. The global analysis of patients' responses to the questionnaire reveals that most responses (over 75%) fall

into the “not at all” and “several days” categories. It can also be noted that none of the patients reported severe signs of depression, all responding with “not at all” to the item targeting them (Q I.9 – “Thinking that you would be better off dead or of hurting yourself in some way”) (tab. VI).

**TABLE VI.**  
**Structure of patients' responses to the questionnaire – global characterization**

	<b>N.A</b>		<b>S.D</b>		<b>M.H.D</b>		<b>N.E.D</b>		<b>Total</b>	
	n	%	n	%	n	%	n	%	n	%
Q I.1.	37	34.9	60	56.6	9	8.5			106	100.0
Q I.2.	51	48.1	48	45.3	7	6.6			106	100.0
Q I.3.	38	35.8	48	45.3	17	16.0	3	2.8	106	100.0
Q I.4.	20	18.9	58	54.7	24	22.6	4	3.8	106	100.0
Q I.5.	42	39.6	48	45.3	14	13.2	2	1.9	106	100.0
Q I.6.	69	65.1	27	25.5	10	9.4			106	100.0
Q I.7.	46	43.4	46	43.4	11	10.4	3	2.8	106	100.0
Q I.8.	64	60.4	33	31.1	8	7.5	1	0.9	106	100.0
Q I.9.	106	100.0							106	100.0

N.A- Not at all; S.D- Several days; M.H.D- More than half the days; N.E.D- Nearly every day.

Consequently, based on the analysis of the scores recorded by patients on the questionnaire, it is found that most of them (85.9%) have minimal or mild levels of

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depression, in almost equal proportions. Only 11.3% of patients were registered with moderate depression, while 2.8% of patients (3 cases) were classified as having moderately-to-severe depression (tab. VII).

We also analyzed comparatively by genders and age groups the patients' re-

sponses to the questionnaire.

The comparative study by genders reveals that generally, no statistically significant differences were found between women and men regarding their responses, with one exception, namely item Q I.4. (tab. VIII).

TABLE VII.

**The structure of the investigated sample according to the degrees of depression identified by the questionnaire**

		n	%
<b>Interpretation</b>	minimal depression	43	40.6
	mild depression	48	45.3
	moderate depression	12	11.3
	moderate-to-severe depression	3	2.8
	Total	106	100.0

TABLE VIII.

**The questionnaire's responses comparatively study on genders**

		Gender				Pearson Chi-squared test
		M		F		
		N	%	N	%	
Q I.1.	N.A	7	22.6%	30	40.0%	Chi <sup>2</sup> = 2.940 p = 0.230
	S.D	21	67.7%	39	52.0%	
	M.H.D	3	9.7%	6	8.0%	
Q I.2.	N.A	13	41.9%	38	50.7%	Chi <sup>2</sup> = 1.068 p = 0.586
	S.D	15	48.4%	33	44.0%	
	M.H.D	3	9.7%	4	5.3%	
Q I.3.	N.A	8	25.8%	30	40.0%	Chi <sup>2</sup> = 1.945 p = 0.584
	S.D	16	51.6%	32	42.7%	
	M.H.D	6	19.4%	11	14.7%	
	N.E.D	1	3.2%	2	2.7%	
Q I.4.	N.A	4	12.9%	16	21.3%	Chi <sup>2</sup> = 10.414 p = 0.015*
	S.D	14	45.2%	44	58.7%	
	M.H.D	13	41.9%	11	14.7%	
	N.E.D			4	5.3%	
Q I.5.	N.A	12	38.7%	30	40.0%	Chi <sup>2</sup> = 0.817 p = 0.845
	S.D	13	41.9%	35	46.7%	
	M.H.D	5	16.1%	9	12.0%	
	N.E.D	1	3.2%	1	1.3%	

		Gender				Pearson Chi-squared test
		M		F		
		N	%	N	%	
Q I.6.	N.A	19	61.3%	50	66.7%	Chi <sup>2</sup> = 3.612
	S.D	11	35.5%	16	21.3%	p = 0.164
	M.H.D	1	3.2%	9	12.0%	
Q I.7.	N.A	15	48.4%	31	41.3%	Chi <sup>2</sup> = 0.948
	S.D	13	41.9%	33	44.0%	p = 0.814
	M.H.D	2	6.5%	9	12.0%	
	N.E.D	1	3.2%	2	2.7%	
Q I.8.	N.A	19	61.3%	45	60.0%	Chi <sup>2</sup> = 0.507
	S.D	10	32.3%	23	30.7%	p = 0.917
	M.H.D	2	6.5%	6	8.0%	
	N.E.D			1	1.3%	
Q I.9.	N.A	31	100.0%	75	100.0%	-
<b>Total</b>		<b>31</b>	<b>100.0%</b>	<b>75</b>	<b>100.0%</b>	

N.A- Not at all; S.D- Several days; M.H.D- More than half the days; N.E.D- Nearly every day.

The overall degree of depression assessed by the questionnaire is also different between genders. It can be noted that a percentage almost double of women compared to the similar percentage of men have a minimal degree of depression (45.3% vs. 29.0%); on the other hand, a significantly higher percentage of men compared to

women have mild depression (61.3% vs. 38.7%) and again a double percentage of women compared to men have moderate depression (13.3% vs. 6.5%). Of the 3 patients with moderate-to-severe depression, one is male and two are female, corresponding to 3.2% of men and 2.7% of women, respectively (tab. IX).

TABLE IX.  
The structure of the investigated sample according to the degrees of depression identified by questionnaire – comparatively by genders

		Gender				Pearson Chi-squared test
		M		F		
		N	%	N	%	
Interpretation	minimal depression	9	29.0%	34	45.3%	Chi <sup>2</sup> = 4.858
	mild depression	19	61.3%	29	38.7%	p = 0.183
	moderate depression	2	6.5%	10	13.3%	
	moderate-to-severe depression	1	3.2%	2	2.7%	
Total		31	100.0%	75	100.0%	

The comparative study by age groups reveals, in turn, the following (tab. X): generally, no statistically significant differ-

ences were found between the 5 identified age groups in terms of recorded responses, except for items Q I.1, Q I.6 and Q I.8.

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**TABLE X.**  
**The questionnaire's responses comparatively study on age groups**

		Age group										Pearson Chi-squared test
		18-25 yrs.		26-35 yrs.		36-45 yrs.		46-55 yrs.		over 55 yrs.		
		n	%	n	%	n	%	n	%	n	%	
Q I.1.	N.A	2	10.0%	12	52.2%	6	24.0%	12	41.4%	5	55.6%	Chi <sup>2</sup> = 26.683
	S.D	13	65.0%	7	30.4%	19	76.0%	17	58.6%	4	44.4%	p < 0.001**
	M.H.D	5	25.0%	4	17.4%							
Q I.2.	N.A	5	25.0%	12	52.2%	15	60.0%	15	51.7%	4	44.4%	Chi <sup>2</sup> = 11.742
	S.D	12	60.0%	8	34.8%	9	36.0%	14	48.3%	5	55.6%	p = 0.163
	M.H.D	3	15.0%	3	13.0%	1	4.0%					
Q I.3.	N.A	8	40.0%	8	34.8%	7	28.0%	11	37.9%	4	44.4%	Chi <sup>2</sup> = 15.481
	S.D	8	40.0%	8	34.8%	16	64.0%	11	37.9%	5	55.6%	p = 0.216
	M.H.D	2	10.0%	7	30.4%	2	8.0%	6	20.7%			
	N.E.D	2	10.0%					1	3.4%			
Q I.4.	N.A	1	5.0%	4	17.4%	7	28.0%	7	24.1%	1	11.1%	Chi <sup>2</sup> = 7.386
	S.D	12	60.0%	12	52.2%	11	44.0%	16	55.2%	7	77.8%	p = 0.831
	M.H.D	6	30.0%	6	26.1%	6	24.0%	5	17.2%	1	11.1%	
	N.E.D	1	5.0%	1	4.3%	1	4.0%	1	3.4%			
Q I.5.	N.A	7	35.0%	8	34.8%	13	52.0%	11	37.9%	3	33.3%	Chi <sup>2</sup> = 5.991
	S.D	9	45.0%	12	52.2%	9	36.0%	14	48.3%	4	44.4%	p = 0.917
	M.H.D	3	15.0%	3	13.0%	2	8.0%	4	13.8%	2	22.2%	
	N.E.D	1	5.0%			1	4.0%					
Q I.6.	N.A	7	35.0%	15	65.2%	19	76.0%	24	82.8%	4	44.4%	Chi <sup>2</sup> = 17.883
	S.D	11	55.0%	5	21.7%	4	16.0%	4	13.8%	3	33.3%	p = 0.022*
	M.H.D	2	10.0%	3	13.0%	2	8.0%	1	3.4%	2	22.2%	
Q I.7.	N.A	5	25.0%	11	47.8%	12	48.0%	13	44.8%	5	55.6%	Chi <sup>2</sup> = 13.258
	S.D	11	55.0%	8	34.8%	13	52.0%	11	37.9%	3	33.3%	p = 0.351
	M.H.D	3	15.0%	2	8.7%			5	17.2%	1	11.1%	
	N.E.D	1	5.0%	2	8.7%							
Q I.8.	N.A	6	30.0%	16	69.6%	18	72.0%	17	58.6%	7	77.8%	Chi <sup>2</sup> = 20.609
	S.D	13	65.0%	4	17.4%	7	28.0%	8	27.6%	1	11.1%	p = 0.056
	M.H.D	1	5.0%	3	13.0%			3	10.3%	1	11.1%	
	N.E.D							1	3.4%			
Q I.9.	N.A	20	100.0%	23	100.0%	25	100.0%	29	100.0%	9	100.0%	-
<b>Total</b>		20	100.0%	23	100.0%	25	100.0%	29	100.0%	9	100.0%	

N.A- Not at all; S.D- Several days; M.H.D- More than half the days; N.E.D- Nearly every day.



There are no statistically significant differences between age groups in which concerns the distribution of patients by degrees of depression (tab. XI). It can be noted, however, that the lowest percentage of cases with minimal depression (15.0%) was

reported in the age group 18-25 years (while it tends to 50% in the other age groups), but also the highest percentages of cases with mild (60.0%), moderate (20.0%) and moderate-to-severe (5.0%) depression were reported again here.

**TABLE XI.**  
**The structure of the investigated group according to the degrees of depression identified by questionnaire – comparatively by age groups**

		Age group										Pearson Chi-squared test
		18-25 yrs.		26-35 yrs.		36-45 yrs.		46-55 yrs.		over 55 yrs.		
		n	%	n	%	n	%	n	%	n	%	
Interpretation	minimal depression	3	15.0%	10	43.5%	12	48.0%	14	48.3%	4	44.4%	Chi <sup>2</sup> = 9.727 p = 0.640
	mild depression	12	60.0%	9	39.1%	12	48.0%	11	37.9%	4	44.4%	
	moderate depression	4	20.0%	3	13.0%	1	4.0%	3	10.3%	1	11.1%	
	moderate-to-severe depression	1	5.0%	1	4.3%			1	3.4%			
Total		20	100.0%	23	100.0%	25	100.0%	29	100.0%	9	100.0%	

A numerical depression score was also calculated based on the questionnaire's responses. Men have a slightly higher score than women, with an average of 6.16 ± 3,407 versus 5.53 ± 3,923, and the highest

depression score was recorded in patients between 18-25 years, with an average of 7.70 ± 3,827, while the lowest score was observed in the age group 36-45 years, with an average of 4.80 ± 3,149 (tab. XII).

**TABLE XII.**  
**The depression score calculated by the questionnaire – descriptive statistics, overall and comparatively by genders and age groups**

		n	Average	Std. error of the mean	Std. deviation	Min	Max	Median	Mann-Whitney / Kruskal-Wallis test
<b>Final score</b>	total	106	5.72	0.367	3.774	0	18	5.00	
	M	31	6.16	0.612	3.407	0	15	6.00	U = 976.000
	F	75	5.53	0.453	3.923	0	18	5.00	p = 0.193
	18-25 yrs.	20	7.70	0.856	3.827	3	18	7.00	H = 7.726
	26-35 yrs.	23	5.83	0.864	4.141	0	15	5.00	p = 0.102
	36-45 yrs.	25	4.80	0.630	3.149	0	12	5.00	
	46-55 yrs.	29	5.24	0.717	3.861	0	16	5.00	
	over 55 yrs.	9	5.11	1.020	3.060	2	11	5.00	

## DISCUSSION

Depressive and anxiety disorders are the two most common mental disorders, affecting 280 and 301 million people around the world, respectively (7).

Over the decades, many studies have demonstrated positive correlations between CMD and symptoms of anxiety and depression. In the systematic review of De La Torre Canales *et al.*, a high prevalence of moderate-to-severe depression was observed to range from 21.4 to 60.1% in patients diagnosed with CMD (8).

The results of the current study suggest that the developed questionnaire is useful for the initial assessment of the psycho-emotional state of CMD patients and obtained information, can be an invaluable addition to the diagnosis of CMD patients and may constitute a critical element for effective treatment of the disorder. The results are significant and suggest that patients with CMD suffer from psycho-emotional problems and require more frequent consultation than healthy individuals (9). Sleep is paramount for managing depression, in line with medication and professional psychological support. Pop *et al.* claims in a study that sleep-related problems and stress were also considered a problem among medical students. Studies showed that medical students have more sleep-related problems compared to non-medical students (10), and in our opinion this could open a way for specifically applying our questionnaires to this category of subjects.

It can be observed in our study that exists a correlation between static style of life (Economists, IT worker), active style of life (Engineer, Mechanic) and the risk of TMJ diseases. Patients with static occupations are more likely to develop cranio-

mandibular dysfunction. A special category for evaluation is represented by healthcare professionals. Iorga *et al.* affirmed that apart from burnout, depression is one of the most important psychological problems experienced by adults during their working time. Identifying and providing knowledge about depression and burnout among healthcare professionals is an important aspect of medical education (11).

We also analyzed comparatively by genders and age group the patients' responses to the questionnaire (tab. VIII). The only item for which statistically significant differences between genders were found is, as already mentioned, item Q I.4, which refers to the feeling of fatigue and lack of energy. The perceptions differ between genders, even if it is not possible to detect a systematic association between them and the patients' gender. Almost a quarter of women (21.3%) said they did not feel at all tired or having little energy, compared to only 12.9% of men. On the other hand, a higher percentage of women than the corresponding percentage of men report this feeling "several days" (58.7% compared to 45.2%), while a percentage almost 3 times higher of men than the corresponding percentage of women report this feeling "more than half the days" (41.9% compared to 14.3%); none of the men, however, find themselves feeling tired or lacking energy "nearly every day".

A significantly higher amount of men (67.7%) compared to the equivalent amount of women (52.0%) stated that "several days" they have little interest or pleasure in doing things (item I.1); also, the percentage of men claiming to have such feelings "more than half the days" is slightly higher than the similar percentage of women (9.7% vs. 8.0%).

Regarding the feeling of depression and hopelessness (item I.2), the percentages of women and men who report it “several days” are relatively close, although it can be seen in this case that men who have such feelings “more than half the days” are almost double in percentage compared to women (9.7% compared to 5.3%).

A percentage 40.0% of women said they have no sleep disturbances at all (neither insomnia nor tendency to sleep too much – item I.3), compared to only 25.8% of men. Of these, on the other hand, 51.6% complain about the presence of sleep disorders “several days” compared to 42.7% of women and 19.4% say they have such problems “more than half the days” compared to 14.7% of women.

In the case of appetite disorders (item I.5) the differences between genders are even smaller than in other items. A slightly higher percentage of women compared to the corresponding percentage of men report this feeling “several days” (46.7% vs. 41.9%), while a slightly higher percentage of men compared to the corresponding percentage of women report this feeling “more than half the days” (16.1% vs. 12.0%).

The negative feelings towards oneself, the feeling of failure and being disappointed (item I.6), are more acute in women than in men. Thus, although a higher percentage of men compared to the similar percentage of women accuse such feelings “several days” (35.5% compared to 21.3%), yet a percentage almost 4 times higher of women compared to the similar one of men accuse such feelings “more than half the days” (12.0% compared to 3.2%).

A relatively similar situation is observed in the case of difficulties of concentration on things (item I.7): the percentage

of men who think that they do not have such a problem is higher than the similar percentage of women (48.4% compared to 41.3%), while the percentages of women who consider that they have this problem “several days”, as well as “more than half the days” are higher than the similar percentages of men. There were 1 man and 2 women who said they had such difficulty of concentration “nearly every day”.

The behavior disorders as hyperactivity or its opposite, slowness in reactions (item I.8), are reported in their intense forms slightly more frequently in women than in men. Thus, 8.0% of women compared to 6.5% of men said they had such problems “more than half the days”, and in addition one woman (and no men) said they had this problem “nearly every day”.

The comparative study by age groups reveals, in turn (tab. X), that none of the patients over 35 years of age complained of lack of interest or pleasure in doing things (item Q I.1), except at most “several days”, all patients who complained of this feeling “more than half the days” belonging to the young age, between 18-35 years. Among patients under 25 years old, 65.0% complain of this feeling “several days” and 25.0% accuse it “more than half the days”, a situation that improves significantly in the next age group. Thus, of patients between 26-35 years, half (52.2%) do not have this problem at all, 30.4% accuse it “several days” and only 17.4% accuse it “more than half the days”. With advancing in age, the presence of this feeling is reported less and less – being reported only “several days”, by 76.0% of patients between 36-45 years, 58.6% of those between 46-55 years and only 44.4% of those over 55 years.

Negative feelings towards oneself, feel-

ing of failure and being disappointed (item Q I.6), are instead significantly associated with the age of patients. They seem to be characteristic in both young ages and adults over 55 years old. Of the 18-25 age group, only 35.0% do not experience such feelings, with 55.0% reporting them “several days” and 10.0% reporting them “more than half the days”. Among patients over 55, 33.3% report such feelings “several days” and another 22.2% report them “more than half the days”. In the other age groups, although there are percentages of patients who complain about these feelings “more than half the days” ranging between 3 and 13%, the amount of those who do not experience such feelings increases over 65%.

Hyperactivity or slow reaction disorders (item Q I.8) are also most associated with young patients, with ages between 18-25 years, of whom 65.0% report them “several days” and another 5.0% report them “more than half the days”. Their percentage decreases to about 30% in the age groups 26-35 years and 36-45 years, then increases to 41.4% in the age group 46-55 years, after which it decreases to 22.2% of those over 55 years. The level of significance associated with this item is 0.056, very close to the statistical significance threshold.

In their cross-sectional analysis, Fredricson *et al.* demonstrated a strong association between the occurrence of mental and behavioral disorders and CMD. Pain, the most common symptom of CMD, was associated with anxiety and stress-related disorders, which are modified in CMD (12).

Several studies emphasize the importance the assessment of psycho-emotional state performed by dentists and developing tools to refer patients for spe-

cialized consultation. Although the etiology of TMD is complex and still not clearly understood, it is generally believed to comprise of biological, psychological, and social factors, it is important to also consider the psychological symptoms during diagnosis of the disease (13).

In Romania many patients have confidence in the pharmacist opinion and ask for advice regarding suitable medication formulations for specific conditions (14). Probably this has to do with a reduced number of visits to dentists and or medical physicians compared to other Western EU countries (15), as a consequence of lower average income. We have to state that dental procedures are partially supported by the National Health Insurance House in Romania, and this can contribute to a lower addressability for the Romanian patient, who has to bear the remainder cost.

According to a Eurostat study conducted in 2019, Romania is the country with the lowest percentage of chronic depression at European level. The average is 1.5%, with an incidence of 1% among men and 2% among women (16). In our study the highest depression score was recorded in patients between 18-25 years, while the lowest score was observed in the age group 36-45 years, the results obtained are in line with the previously mentioned studies.

In other study, Seweryn *et al.* discovered a correlation between the intensity of pain associated with CMD and the quality of life and sleep. These parameters are influential in modifying CMD management (17).

The results of the study suggest that the questionnaire PHQ-9 can be used as a supplement to the examination for CMD diagnosis, so we find ourselves in agreement with similar studies (18, 19). Also, it

can help dentists in identifying potential psycho-emotional issues in patients and recommending therapeutic management (20, 21).

The implication of stress in CMD is apparently not enough researched at the present moment due to a scariness of result in PubMed Database. I am aware it is a difficult task to initiate type of study in EU country with the smallest occurrence of depression.

### CONCLUSIONS

Based on the findings of this research, it can be noted, that the lowest percentage of cases with minimal depression was reported in the age group 18-25 years.

According to the results of this study, the severity of CMDs is more common in women and at the young age. Stress has been established as a significant risk factor for TMJ disorders apart from parafunctional habits (grinding, thumb sucking, or tongue thrusting) and pathologic occlusion.

Our study, aligned to the other studies with the same topic, demonstrated again that exist an interrelation between CMDs and psycho-emotional factors.

We can conclude that craniomandibular disorders (CMDs) is a significant concern

that should be deemed a matter of significant importance in dental medicine and addressed accordingly.

The study advocates for an increased awareness in the medical community for the relationship between temporomandibular joint (TMJ) screening and the role of psycho-emotional factors.

### CONFLICT OF INTEREST AND FUNDING

The authors declare that there is no conflict of interest. This study received no funding. This study is part of the first author's research program at the Doctoral School.

### INSTITUTIONAL REVIEW BOARD STATEMENT

The study was conducted in accordance with the Declaration of Helsinki and approved by the Ethics Committee of "Grigore T. Popa" University of Medicine and Pharmacy of Iasi (271/14.02.2023)" for studies involving humans.

### INFORMED CONSENT STATEMENT

Informed consent was obtained from all subjects involved in the study.

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