

ASSESSMENT OF PATIENT ANXIETY BEFORE DENTAL TREATMENT

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ABSTRACT

Aim of the study was to identify the prevalence of patient anxiety before treatment and to determine patients' perception of the dental treatment risks. **Material and methods.** The cross-sectional study was conducted in 210 patients (69 males and 141 females) aged 11-70 years in northeastern Romania, who completed Corah's Dental Anxiety Scale, Revised (DAS-R), Modified Dental Anxiety Scale (MDAS) and Dental Concerns Assessment, Revised (DCA-R). **Results.** The overall scores of DAS-R indicated high anxiety in 4.3% of patients and severe anxiety or phobia in 2.9% of patients. Overall scores of the MDAS questionnaire indicated 5.2% of very anxious patients and 2.3% of highly anxious or phobic patients with dental treatments. DCA-R indicated high anxiety for injection and extraction. We found statistically significant differences between anxiety levels and age ranges as well as patients' environmental areas ($p < 0.05$). **Conclusions.** Anxiety to dental practice can affect the quality of treatment and is a serious reason to avoid the dentist office.

Keywords: dental anxiety, dental phobia, questionnaire.

INTRODUCTION

Anxiety as the human emotion experienced by all people at one point is a normal and fleeting state. When this anxiety degenerates into panic attacks, feelings of fear and anxiety accompanied by palpitations, stress and sweating, anxiety is already an emotional disorder. Phobia is an irrational fear that causes a person to avoid certain objects, events and situations that are not a

real danger (1).

Dental anxiety is a strong negative feeling associated with dental treatments, with consequences on oral health-related quality of life and avoidance of dental treatment (2). Dental fear is related to dental anxiety and is described as a normal emotional reaction to danger in a clinical dental situation (3). Dental anxiety and dental fear are early signs of dental phobia, which is described as

excessive or unreasonable fear or anxiety with regard to the challenge or threat of dental examination and treatment (4).

Several psychometric tests have been developed to differentiate people with/without dental anxiety. Corah's Dental Anxiety Scale (DAS) (5), the Modified Dental Anxiety Scale (MDAS) (6) and Dental Fear Survey (DFS) (7) are the most commonly used in epidemiological studies and although all have certain limits, have proven to be reliable and valid in many languages.

Dental anxiety is a global public health problem, spread around the world and has been extensively studied. The prevalence of high dental anxiety varies from 2% to 30% worldwide depending on the study population, the methods applied, and the scores used (8,9). It is estimated that about 3-16% of adults suffer from dental phobia (10).

The purpose of our study was to determine the prevalence of dental anxiety before treatment, and to assess the perception of the risks to dental treatment according to socio-demographic characteristics.

MATERIAL AND METHODS

This analytical cross-sectional study was conducted by a team of specialists from the Faculty of Dental Medicine from the "Grigore T. Popa" University of Medicine and Pharmacy Iasi Romania during March - December 2018 period, on 210 patients randomly selected, 69 (32.9%) males and 141 (67.1%) females aged between 11-70 years old (mean age 26.57 ± 13.378 years) from northeastern of Romania, who asked for dental treatment in a private dental office in Iasi. The study included patients on their first visit to the dental office and without any dental treatments already begun. Patients with ongoing dental treatments and those who refused informed consent were excluded. After obtaining informed consent from all

patients or their parents, the study was conducted in accordance with the Declaration of Helsinki of 1975, revised in 2000.

The subjects completed three multiple-answers questionnaires during the time they spent in the waiting room, in order to measure their anxiety caused by their visit to dental office.

1) Corah's Dental Anxiety Scale, Revised (DAS-R) has 4 items with 5 possible answers. Each answer has a score, and the total score (possible 4-20) evaluated moderate (score 9-12), high (score 13-14) and severe anxiety or phobia (score 15-20) (5,11,12).

2) MDAS is today the most used. It used the Corah's DAS as base and has 5 items with 5 possible answers. Each answer has a score, and the total score (possible 5-25) evaluated severe anxiety or phobia (score ≥ 19) (6,13).

3) Dental Concerns Assessment (DCA) or anxiety over the dental procedures, Revised (DCA-R) has 26 items with 4 possible answers, for the patient to assess their levels of concern: low, medium, high or don't know (6,14,15).

The statistical analysis was performed using the SPSS 16.0 package (Chicago, Illinois, SUA) for Windows. The overall scores which totaled the answers to the specific items of the questionnaires DAS-R and MDAS and answers frequency of questionnaire DCA-R were calculated. We used the Pearson chi-square test (χ^2) to compare the scores and levels of anxiety of DAS-R and MDAS with socio-demographic variables (genders, age intervals, environment area of origin, level of education and economic status of family) and with answers of questionnaire DCA-R. We considered the $p \leq 0.05$ value as statistically significant.

RESULTS

The socio-demographic characteristics of the sample are: 145 (69%) patients are from the age range of 11-30 years, 59 (28.1%)

patients aged 31-55 years and 6 (2.9%) patients aged 56-70 years; 155 (73.8%) patients were from urban area and 55 (26.2%) patients in rural area; 29 (13.8%) patients with primary school, 71 (33.8%) patients with high school, 29 (13.8%) patients with bachelor's degree and 81 (38.6%) patients

with postgraduate degree; 11 (5.2%) patients have a low family economic status, 113 (53.8%) patients with middle economic status and 86 (41%) patients with high economic status. We found statistically significant differences between age groups and the level of education of patients ($p=0.000$) (tab. I).

Table I. Baseline characteristics of the sample

Variables	Age intervals								χ^2	p value
	11-30 years (n=145)		31-55 years (n=59)		56-70 years (n=6)		Total (n=210)			
	n	%	n	%	n	%	n	%		
Gender									0.285	0.867
male	46	21.9	21	10.0	2	1.0	69	32.9		
female	99	47.1	38	18.1	4	1.9	141	67.1		
Environment area									1.530	0.465
urban	104	49.5	47	22.4	4	1.9	155	73.8		
rural	41	19.5	12	5.7	2	1.0	55	26.2		
Level of education									52.194	0.000*
primary school	29	13.8	0	0.0	0	0.0	29	13.8		
secondary school	61	29.0	8	3.8	2	1.0	71	33.8		
high school	8	3.8	20	9.5	1	0.5	29	13.8		
bachelor degree	47	22.4	31	14.8	3	1.4	81	38.6		
Economic status									2.613	0.625
low	7	3.3	4	1.9	0	0.0	11	5.2		
middle	82	39.0	27	12.9	4	1.9	113	53.8		
high	56	26.7	28	13.3	2	1.0	86	41.0		
*statistically significant differences when $p<0.05$										

The overall scores of the DAS-R questionnaire indicated moderate anxiety in 195 (92.9%) of patients, high anxiety in 9 (4.3%) of patients and severe anxiety or phobia in 6 (2.9%) of patients. The overall scores of the MDAS questionnaire indicated 13 (6.2%) patients not at all anxious, 119 (56.7%) patients slightly anxious, 62 (29.5%) patients fairly anxious, 11 (5.2%) patients very anxious and 5 (2.3%) patients extremely anxious or possibly dentally phobic. DCA-R indicated high anxiety for injection (82 – 39% answers) and extraction (101 – 51.9% answers) and moderate anxiety for sound or

vibration of the drill (109 – 39% answers), that will not be enough anesthetized (87 – 41.4% answers), probing to assess periodontal disease (71 – 33.8% answers) and for root canal treatment (75 – 35.7% answers).

We found statistically significant differences between level of anxiety and age ranges ($p=0.001$) and environment area ($p=0.016$) of patients (tab. II). 14 items shows the statistically significant differences between answers DCA-R and scores and levels anxiety of DAS-R and MDAS (tab. III).

Table II. Correlations between scores and levels of anxiety DAS-R and MDAS with socio-

demographic variables

Survey	Variables									
	Gender		Age intervals		Environment area		Level of education		Economic status	
	χ^2	<i>p</i>	χ^2	<i>p</i>	χ^2	<i>p</i>	χ^2	<i>p</i>	χ^2	<i>p</i>
Corah's Dental Anxiety Scale, Revised (DAS-R)										
Item 1	5.204	0.267	15.330	0.053	5.691	0.223	23.374	0.025*	1.827	0.986
Item 2	5.257	0.154	18.530	0.005*	3.523	0.318	6.452	0.694	9.720	0.137
Item 3	1.703	0.790	18.371	0.019*	1.225	0.874	9.105	0.694	7.878	0.445
Item 4	5.237	0.264	22.249	0.004*	13.136	0.011*	17.243	0.141	18.246	0.019*
Score	9.154	0.761	48.497	0.005*	23.122	0.040*	31.015	0.815	31.683	0.204
Anxiety	0.734	0.693	19.580	0.001*	8.279	0.016*	5.735	0.454	3.280	0.512
The Modified Dental Anxiety Scale (MDAS)										
Item 1	3.905	0.419	20.420	0.009*	6.599	0.161	5.197	0.951	2.296	0.971
Item 2	2.710	0.607	17.638	0.000*	3.518	0.475	12.102	0.438	5.696	0.681
Item 3	1.209	0.877	15.030	0.059	6.764	0.149	13.685	0.321	8.479	0.388
Item 4	0.743	0.946	23.973	0.002*	10.164	0.038*	18.100	0.113	13.246	0.104
Item 5	4.101	0.392	13.522	0.095	9.439	0.051	17.696	0.125	7.149	0.521
Score	29.060	0.034*	62.081	0.002*	20.799	0.236	37.636	0.918	21.943	0.945
Anxiety	7.868	0.097	19.762	0.011*	11.366	0.023*	14.354	0.279	7.682	0.465
*statistically significant differences when $p < 0.05$										

DISCUSSIONS

In this study, we identified the prevalence of dental anxiety and its motives in a group of patients before treatment. Using three questionnaires (DAS-R, MDAS and DCA-R) we compared scores and levels of anxiety with socio-demographic characteristics and the concerns of future patients in order to determine patients' perception of the dental treatment risks.

In our group, high dental anxiety and phobia of dental patients had a low prevalence, following the total scores of DAS-R (≥ 13) and MDAS (≥ 19). Most patients had moderate anxiety over certain dental stress-specific stress factors that could be discussed and managed with the dentist. Anxiety levels were significantly different depending on age ranges and the environment area of patients. Previous studies reported higher prevalence of dental anxiety with our study, values varying according to the studied population. Thus, Drakiev *et al.* reported a

prevalence of dental anxiety of 13.7% in a Russian population (16), Biggs *et al.* 9.56% in a Texan population (1) and Jain *et al.* 8% to an Indian population (17). Also, significant differences between anxiety levels and socio-demographic characteristics were specific to the studied groups. Thus, some authors found differences between genders (1,16,18-20), age ranges (19,20), environment area (16,21), or educational levels (16), and other authors did not find no statistically significant correlation (17,22-24).

In our study, the most common concerns of patients were with regard to injection and dental extraction. Previous studies recommended the use of a local anesthetic (20% benzocaine) at the injection site (25) or a preoperative dental extraction video (26) to reduce the anxiety of these patients.

Levels of concern of our patients were significantly different depending on the reasons: sound or vibration of the drill; injection; the sound or feel of scraping during

teeth cleaning; panic attacks; the inability to stop the dentist; smells in the dental office; need a lot of dental treatment; the number of appointments and the time that will be

required for necessary appointments and treatment; time away from work, or the need for childcare or transportation; feeling confined or not in control.

Table III. Correlations between answers of DCA-R and scores and levels of anxiety of DAS-R and MDAS

Dental Concerns Assessment	DAS-R				MDAS			
	Overall score		Anxiety scale		Overall score		Anxiety scale	
	χ^2	<i>p</i>	χ^2	<i>p</i>	χ^2	<i>p</i>	χ^2	<i>p</i>
Item 1	55.116	0.084	21.375	0.011*	84.277	0.005*	48.721	0.000*
Item 2	55.079	0.697	11.832	0.459	67.496	0.628	26.401	0.333
Item 3	59.473	0.039*	10.754	0.293	88.187	0.094	33.391	0.096
Item 4	40.743	0.526	7.012	0.636	95.564	0.033*	45.030	0.006*
Item 5	59.302	0.256	18.072	0.114	93.585	0.045*	29.614	0.198
Item 6	94.376	0.028*	22.560	0.094	97.713	0.024*	42.992	0.010*
Item 7	46.393	0.296	5.078	0.827	73.863	0.417	20.975	0.640
Item 8	26.309	0.972	3.047	0.962	71.406	0.498	11.980	0.980
Item 9	54.933	0.515	8.893	0.712	48.994	0.983	22.433	0.553
Item 10	43.202	0.420	4.391	0.884	37.207	0.960	13.936	0.733
Item 11	43.726	0.884	18.220	0.109	66.639	0.656	15.814	0.895
Item 12	27.929	0.953	9.497	0.393	98.974	0.721	19.517	0.989
Item 13	46.935	0.277	15.857	0.070	196.322	0.000*	41.377	0.498
Item 14	54.458	0.094	13.476	0.142	97.910	0.271	36.724	0.185
Item 15	58.346	0.048*	9.328	0.408	65.716	0.686	28.265	0.249
Item 16	86.292	0.000*	20.715	0.014*	137.778	0.000*	48.645	0.002*
Item 17	111.279	0.000*	54.709	0.000*	168.460	0.000*	65.657	0.000*
Item 18	63.768	0.222	3.202	0.994	94.518	0.039*	20.080	0.692
Item 19	25.245	0.981	12.515	0.186	47.814	0.988	8.555	0.998
Item 20	37.410	0.672	3.764	0.929	77.651	0.019*	15.358	0.637
Item 21	118.684	0.000*	44.600	0.000*	97.098	0.000*	33.206	0.016*
Item 22	55.936	0.074	14.989	0.091	71.994	0.051	33.155	0.016*
Item 23	50.539	0.172	16.217	0.062	84.771	0.636	17.877	0.960
Item 24	45.356	0.334	18.106	0.034*	69.911	0.548	21.617	0.602
Item 25	49.089	0.210	12.194	0.203	65.471	0.136	24.255	0.147
Item 26	60.229	0.325	27.020	0.008*	124.514	0.000*	34.860	0.070
*statistically significant differences when $p < 0.05$								

Bolla *et al.* have reported the highest anxiety scores for teeth extractions, cost of the procedures, sound and vibration of drilling procedures on teeth and root canal treatments (27), and Caltabiano *et al.* for local anaesthesia and tooth drilled (28).

Moderate dental anxiety can be reduced by a pleasant dental cabinet environment, a

calm atmosphere and a patient's support attitude by medical staff, a trust relationship established through good communication between the patient and the doctor (28). Certain information about the treatment procedures received from the practitioner would anticipate the sensation the patient might expect and see his preferences (1,29).

Also, initiating rest breaks at the patient's request during the therapeutic procedures would increase his confidence that he has control (19,20,30).

In children, high dental anxiety or phobia occurs due to fear of the unknown, and in adults it can be activated by the fear stimulus from the past negative experiences of dental office situations (31). To manage these situations during treatment, the authors recommend interventions and cognitive behavioral psychotherapy (psychological education, therapy and relaxing modeling technique) and pharmacological sedation interventions (1,10,22,32-35).

Anxiety of patients to dental practice is an unpleasant emotion that can affect the quality of treatment. Knowing the patient's anxiety before treatment can be an aid to the

dentist. He can become aware of what to expect from the patient, and he can take the necessary measures to decrease the patient's anxiety.

CONCLUSIONS

In our study, we found a high dental anxiety in 4.3% of patients, severe anxiety in 2.9% of patients and phobia in 2.3% of patients for injection and dental extraction, being significantly different depending on age range and environment area.

Dental anxiety and phobia in dental practice is a significant problem for both the patient and the dentist. These patients need to be identified and their concerns should be addressed at the earliest, so as not to prejudice dental treatment subsequently applied.

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