

## The Level of Dental Anxiety and Dental Status in Adult Patients

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### Abstract:

**Background:** The present study aimed to assess potential correlation between dental anxiety and overall dental status in adult patients, in consideration of the frequency of dental appointments and individual dental hygiene practices.

**Materials and Methods:** Individual dental anxiety levels were assessed with the aid of the Corah's dental anxiety scale (DAS). The study embraced 112 patients of the University Dental Clinic, Kraków. Following clinical and X-ray exams, respectively, decayed, missing and filled teeth (DMFT) index and dental treatment index (DTI) were computed for each study subject.

**Results:** Mean DAS among the 112 subjects under study was 9.41 standard deviation (SD = 3.36). Mean DMFT value was 15.86 (SD = 7.00), whereas DTI value was 0.76 (SD = 0.27). The number of decayed teeth and an individual dental anxiety level were found to be correlated ( $r = 0.26$ ). Higher dental anxiety correlated with lower DTI value ( $r = -0.22$ ) and lesser frequency of dental appointments ( $r = 0.22$ ).

**Conclusions:** Individual dental anxiety level appears to impact overall dental status, frequency of dental appointments and everyday oral health practices. Every conceivable effort should therefore be undertaken with a view to effectively diminishing dental anxiety levels in the patients.

**Key Words:** Dental anxiety, dental status, dental visits

### Introduction

An individual sense of anxiety is quite common in anyone contemplating a visit in a doctor's surgery, or especially when already there. There are many definitions of such an anxiety, though in general, it tends to consist of a diversity of emotions triggered off either by some external stimuli, or those originating within a patient's body itself.<sup>1</sup> Anxiety regarding forthcoming dental treatment may originate in one's own past traumatic experiences, or in the negative perceptions of

dental treatment experiences based on the narratives offered by others.<sup>2,3</sup>

The very extent of dental anxiety may also appreciably affect the actual outcome of the treatment itself.<sup>1,2,4</sup> Anxiety, fear, or a powerful sense of apprehension prior to dental treatment not only may have psychological manifestations, but also the somatic ones.<sup>5,6</sup> Kochańska *et al.* in their study have reported sudden shifts in diastolic and systolic blood pressure, pulse rate and oxygen saturation in the blood during a treatment of dental caries.<sup>6</sup> Recognition of a patient's dental anxiety provides vital information for a dental surgeon, being by the same token directly instrumental in shaping up a patient-dentist relationship.

Dental anxiety may exert a negative impact on the therapeutic management, as well as lead to avoidance, or to giving up altogether any pending dental appointments<sup>1,4,7-10</sup> which consequently contributes to overall deterioration of individual oral health status. This eventually becomes a veritable vicious circle, that is dental anxiety leads to avoidance of dental appointments, increased dental problems, and consequently any actually applied dental treatment must out of necessity be a symptom-oriented one, which only further compounds patient's anxiety.<sup>10,11</sup>

Poor individual dental status and attendant discomfort may also contribute to appreciably diminish social interaction. In line with the data yielded by the Nationwide Dental Health Monitoring Program 2010, the decayed, missing and filled teeth (DMFT) mean within the 35-44 age range was 16.9 (D = 3.0 M = 4.7 F = 9.3), whereas the dental treatment index (DTI) mean was 0.75.<sup>12</sup> Despite improved dental health over the last two decades and a steadily increasing expenditure on dental treatment, overall dental status in the Polish population is deemed to be rather poor. One of the causes may well be attributed to dental anxiety.

### Materials and Methods

The present study covered 112 patients, residents of the Małopolska Region, regularly reporting to the Outpatient Clinic of Conservative Dentistry with Endodontics, University Dental Clinic, Kraków, in the period spanning September 2012-June 2013. All patients were advised on its aim and duly granted their written consent to participation. The study population comprised 63 women and 49 men (age range: 18-70; mean age 40 years).

Initially, all patients were asked to fill in a questionnaire and then underwent a clinical examination.

Corah's dental anxiety scale (DAS) was used as the questionnaire of choice, as by far the most popular in this regard<sup>13-15</sup> and it comprised of four questions addressing specific circumstances during a dental appointment. Patient's feelings about the forthcoming visit on the day before, while in the dentist's waiting room, while on the dental chair immediately prior to the commencement of the treatment, and finally, while the dentist is getting his instruments ready.<sup>16</sup> The responses are scored on a 1-5 scale; maximum score 20 points, minimum 4 points. Depending of the actual number of points scored, three ratings of dental anxiety are distinguished, that is 4-8 low, 9-12 moderate, 13-20 high.<sup>16</sup> The self-designed questions addressed the frequency of dental appointments (multiple choice answers: every 3, 6 or 12 months, or in the event of toothache only). In the question on the frequency of teeth brushing, the following options were offered by the multiple choice answers: Three times a day or more, twice a day, once a day, or every few days.

Clinical examination of every patient's dentition was carried out by two dental surgeons. It was done in the lighting provided by a dental unit, with the aid of a dental mirror and probe, following prior drying of the teeth with a three-in-one syringe.

Digital orthopantomograms were made in the X-ray unit, University Dental Clinic, with the aid of ProMax X-ray unit with Dimax3 (f. Planmeca, Finland) and subsequently assessed by the attending dental surgeons.

Based on the above, the current status of patient's dentition was defined in consideration of the following categories:

1. Number of missing teeth (M)
2. Number of decayed teeth (D)
3. Number of filled-in teeth (F).

Third permanent molars and the retained teeth were disregarded in the assessment.

The data allowed to have the modified DMFT index computed, in due consideration of the digital orthopantomograms.<sup>17</sup> It was determined during an interview whether the missing teeth had been lost due to tooth decay and attendant complications, or for other reasons. Assessment of past dental treatment was completed through DTI.<sup>18</sup>

Statistical analysis made use of the Pearson correlation coefficient, Fisher test and Student's *t*-test, assuming  $P < 0.05$  as the level of statistical significance. MS Excel was used as the analytical software package of choice.

The study protocol was duly endorsed by the Jagiellonian University Bioethics Review Committee (KBNET/260/B/2012).

## Results

Mean dental anxiety level among the 112 subjects under study was 9.41, as assessed by DAS standard deviation (SD = 3.36), proving higher in women 9.73 (SD = 3.19) than in men 7.02 (SD = 3.54), even though it failed to reach statistical significance ( $P > 0.05$ ). Fifty-three subjects experienced low anxiety, 37 - moderate, 22 - high (Table 1). Mean DMFT value was 15.86 (SD = 7.00), whereas DTI value was 0.76 (SD = 0.27). The difference between the mean DMFT and DTI values for the respective sexes was statistically insignificant ( $P > 0.05$ ).

It was determined through the linear correlation that the number of decayed teeth tended to increase with higher dental anxiety ( $r = 0.26$ ). Higher dental anxiety correlated with the lower DTI value ( $r = -0.22$ ) and lesser frequency of dental appointments ( $r = 0.22$ ). No correlation was found between dental anxiety and sex and age of the subjects.

## Discussion

In recent years, overall level of dental care in Poland has relatively improved. This is clearly attributable to an increased expenditure on public health and a steady growth of a private medical services sector. Technologically advanced dental equipment and techniques, steadily increasing number of patient-friendly dental practices making use of pain-free surgical procedures might well give grounds to believe that patients would naturally be more inclined to make more frequent dental appointments, as these would now cause much lower anxiety level. The present study, however, reveals dental anxiety to remain still one of the principal reasons for avoiding dental appointments and consequently appreciable deterioration in individual dental health. Olszewska *et al.* in their study of 2000 (focused on Kraków's residents) found DAS to be around the 10.5 mark as compared to the present one of 9.41; a negligible difference indeed.<sup>19</sup> Mean DAS in the population under study closely approaches the values reported by many foreign investigators.

The mean DAS yielded in Astrom's study of Norwegian 25-year olds was 8.7. In the study pursued by Gisler *et al.* (Swiss population of the over 50s) in nearly 80% of the subjects DAS was 10.4.<sup>9,20</sup> There was a significant difference between the mean DMFT value (7.89), as yielded by the study of Turkish population, and the results yielded by the present study, with negligible difference for mean DAS (8.38).<sup>21</sup> Likewise,

Table 1: Mean DMFT values against DAS.

DAS	n	DMFT		D		M		F		DTI	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
4-8	53	15.15	7.45	2.06	2.52	4.17	6.17	8.92	5.30	0.80	0.23
9-12	37	16.59	6.62	2.35	3.08	4.62	6.22	9.62	5.30	0.77	0.29
13-20	22	16.32	6.16	3.91	5.43	3.95	6.23	8.45	5.31	0.67	0.32

DAS: Dental anxiety scale, DMFT: Decayed, missing and filled teeth, DTI: Dental treatment index, SD: Standard deviation

Schuller *et al.* did not reveal any differences between mean DMFT in the group of subjects with low and high dental anxiety; although, she did encounter more decayed teeth in the high anxiety subjects, which only corroborates the findings of the present study.<sup>7</sup> Furthermore, Kaczmarek *et al.*, while focusing on 18-year-old group, noticed that higher anxiety level corresponded to much worse dental health.<sup>22</sup>

Schuller *et al.* and Sohn and Ismail very much like the present authors, demonstrated that high anxiety level was the underlying cause for the avoidance of dental appointments, or for making such appointments for emergency reasons only.<sup>7,8</sup> Another direct consequence of high anxiety level consists in appreciably worse dental hygiene practices. The study revealed that the high anxiety subjects also tended to brush their teeth much less often. This is consistent with the findings of DeDonno, who found much worse dental hygiene in his 77 student subjects who admitted to high dental anxiety.<sup>23</sup> Samorodnitzky and Levin in their study of dental anxiety, dental hygiene and dental health-promoting practices in a group of military personnel (18-21 year olds) reported that around one-third of his subjects admitted to brushing their teeth once a day, or never even bothered at all.<sup>24</sup>

In the military personnel population, the DMFT value was 6.2 and was over 50% lower than the one yielded by the present study, which might well be attributable to the subjects' age. On the other hand, within the study population of the Małopolska region, over 50% of the subjects claimed to brush their teeth twice a day, which failed to reflect in overall condition of their dentition, though.

### Conclusions

The results yielded by the present study imply that the actual level of dental anxiety does impact overall condition of a patient's dentition, frequency of dental appointments and pursuit of routine dental hygiene practices. A dental surgeon should therefore take under consideration an individual level of anxiety as one of the key contributive factors in poor dentition. Recognizing a patient troubled with dental anxiety effectively furnishes a dental surgeon with invaluable information, which may well be used to a patient's benefit during the actual course of treatment. Adequately mapped out treatment may prove tangibly instrumental in diminishing a patient's sense of undue anxiety, consequently, encourage him to keep regular dental appointments, and eventually contribute to an appreciable improvement in individual dental hygiene. It is therefore postulated that every conceivable effort be undertaken, with a view to effectively diminishing anxiety levels in dental patients.

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