DENTAL ANXIETY IN ADULTS IN BULGARIA

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ABSTRACT

The anxiety experienced by some patients before or during dental visits poses a problem for patients and the dental practitioners alike. Some people consider them a stressful experience which manifests itself as anxiety, fear and even phobia and results in avoidance of proper dental care. The dental anxiety, dental fear and dental phobia stand out against the background of general anxiety.

The aim of the present study was to investigate dental anxiety in Bulgaria by means of a self-assessment scale.

Material and Methods: The self-assessment Dental Anxiety Scale (DAS), developed by N. Corah, was used in the form of a questionnaire containing questions about the gender, age, education and occupation of respondents. Subjects were 746 adults aged 18-82 years living in urban areas. Individual and group interviews were conducted directly with them.

Results: The respondents with moderate dental anxiety were the most of all subjects (35.5%, DAS score: 9-12 points), followed by the anxiety-free subjects (34.6%, 4-8 points). The third most numerous group was the high anxiety group (18.2%, 13-14 points), followed by the subjects with severe anxiety (11.7%, 15-20 points). The mean score was 10.26±0.14. We found a statistically significant correlation between anxiety, age (P<0.05), education (P<0.05) and type of labour (manual or mental labour) (P<0.01). No significant difference was found between anxiety and sex (P>0.05).

Conclusions: The percentage of people scoring high on dental anxiety (DAS 13-20) in Bulgaria (29.9%) is considerably higher than that in some European and North American countries. The present study is the first in Bulgaria on dental anxiety. Further studies are needed to reveal other factors related to dental anxiety.

Keywords: dental anxiety, dental fear, scales of dental anxiety

INTRODUCTION

Patients’ anxiety prior to and during a visit to a dental practice is a problem for patients and dentists alike. A dental visit is felt by some people as stressful experience manifesting itself as anxiety, fear or phobia making people avoid adequate oral health care.1 The dental anxiety, dental fear, and dental phobia are clearly distinguished forms of general anxiety.2 The factors of significance for the development of dental anxiety can generally be categorized into dentist surgery-related and other factors related to the social and psychological status, age, health and demographic characteristics of patients.3

Dental anxiety is a measureable entity. There are many questionnaires, tests and scales designed specifically to assess it psychologically and psychometrically. The scales can gauge different aspects of dental anxiety providing methodological basis for a research into its etiology and treatment.

There are tests for evaluation of basic (general) fears and anxiety, as well as for evaluation of dental anxiety. The instruments developed for evaluation of dental anxiety are divided into tests for children and those for adults because of the specificity of children’s perceptions and psyche. The most widely used tool, designed for adults, is Dental Anxiety Scale (DAS) designed by N. Corah in 1969.4 This tool subsequently was modified to include one more question (the fifth question), concerning the application of oral injections (MDAS). DAS and MDAS have a high level of internal consistency, provide acceptable sensitivity, specificity and negative predictive value.5,6 The level of anxiety and fear of dental treatment in the population has been studied in many countries. In France, Nicolas E et al.7 studied the prevalence, severity and associations of dental anxiety in the adult population. The mean age of the included
subjects (275) was 47 years. The study used a French version of DAS. The findings revealed high dental anxiety in 6.2%, severe anxiety in 7.3%, and moderate in 13.5% of subjects. In Australia, a similar study was conducted by Armfeld JM and associates. He conducted telephone interviews with 7312 individuals. Strong dental fear was established in 16.1%, with women being more fearful. The high level of fear prevailed in the age range of 40-64 years. In a study of Ilguy D et al., out of 294 randomly selected patients high dental anxiety prevailed in 9.9% when measured by DAS scale and in 8.8% when MDAS was used. Similar studies have been conducted in Turkey by Firat D et al. and Tunk EP et al. They confirm the results of the aforementioned authors about women experiencing higher anxiety and fear, and about the inverse proportional relationship between anxiety and level of education. Other countries where studies of dental anxiety have been performed are Finland, Sri Lanka, England, Saudi Arabia, Denmark, Hungary.

Good knowledge of dental anxiety and the possible ways of managing it are important factors in providing good dental care. The lack of research data in this field in our country provoked us to set as an objective for this study the investigation of the problem of dental anxiety among adults in Bulgaria using a self-assessment tool.

MATERIAL AND METHODS

Objects of the study were 746 adults living in urban areas. To achieve the goal random direct individual and group interviews were held in the cities of Plovdiv, Smolyan, Zlatograd, Varna and Dulovo. The study took place in the period September 2007 - April 2009. We used the Norman Corah-Dental Anxiety Scale (DAS), which is validated and widely popular in the relevant literature. It was validated in the country using the alpha Cronbach coefficient ($\alpha_1 = 0.82, \alpha_2 = 0.95$). Preference was given to this instrument because of its brevity, feasibility and understandability. It was used in the form of an anonymous questionnaire providing also data on gender, age, education and profession. The instrument consisted of four questions with five possible answers. The number of points given for each answer corresponded to its consecutive number with the maximum score being 20. The measurement of anxiety was determined by the total number of points: absence of anxiety - a score $\leq$ 8 points, moderate anxiety - from 9 to 12 points, high anxiety - 13 to 14 points, and 15 to 20 points - severe anxiety, on the threshold level of phobia. People with a total score of 13 points or greater were considered highly anxious.

In the statistical data processing we used parametric analyses (descriptive analyses, Student’s $t$-test, Pearson’s correlation coefficient), nonparametric analyses (chi-square test, Kruskal-Wallis test, Mann-Whitney rank criteria) and the statistical software SPSS v.17.0 as well as Microsoft Excel 2003 for the graphical presentation of results. In testing the null hypothesis a two-sided $p$ value of 0.05 was considered significant.

RESULTS

Dental anxiety is known to be a result of many different factors. In this study the focus was on the dental anxiety in the country as a general trend as well as on its correlation with age, gender, education and occupation. The study is the first of its kind in Bulgaria.

The main characteristics of the study participants are presented in Table 1 as well as distributions by age, gender, education and occupation. The mean age was $42.55 \pm 0.53$ years (from 18 to 82 years.)

306 (41%) of the respondents were male and 440 (59%) were female. The distribution by gender and age groups is shown on Fig. 1. The level of education of 23 (3.08%) was primary, in 234 (31.37%) - secondary, 258 (34.58%) of the interviewed had secondary - vocational or college

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Age (years) $\tau \pm Sx$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>306 41.02 1.80</td>
</tr>
<tr>
<td>Female</td>
<td>440 58.98 1.80</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>23 3.08 0.63</td>
</tr>
<tr>
<td>Secondary - comprehensive</td>
<td>234 31.37 1.70</td>
</tr>
<tr>
<td>Secondary - vocational</td>
<td>258 34.58 1.74</td>
</tr>
<tr>
<td>Higher</td>
<td>231 30.97 1.69</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
</tr>
<tr>
<td>Manual labour</td>
<td>347 46.51 1.83</td>
</tr>
<tr>
<td>Mental labour</td>
<td>399 53.49 1.83</td>
</tr>
<tr>
<td>Total</td>
<td>746 100 -</td>
</tr>
</tbody>
</table>
education and 231 (30.97%) graduated university. Referring to the occupation, 347 (46.51%) performed mainly manual labour and 399 (53.49%) had a predominantly intellectual occupations. Data of dental anxiety by DAS, as a relative share is presented in Fig. 2.

The mean score was 10.26 ± 0.14. The majority, 35.5% of the studied population, reported moderate anxiety (9-12) followed by a group of participants not experiencing dental anxiety - 34.6% (4-8 points). The other two groups include a substantial share of respondents who experienced strong negative emotions - high anxiety in 18.2% (13-14 points) and in 11.7% (15-20 points) - very high with a tendency to distress and phobia of dental treatment. The demographic characteristics such as age, gender, education and type of occupation had different relation to dental anxiety. In the different age groups there was different attitude towards the problem as shown in Fig. 3. Table 2 presents the mean score of anxiety of different ages.

Highest frequency of moderate anxiety was established in the groups 18-20 years (46.7%) with mean score of 11 ± 0.62 and in 41-50 years (42.9%) - mean score 10.46 ± 0.27. High anxiety (13-14 points) prevailed in the groups 51-60 years - 27.1% (mean score 10.59 ± 0.30) and 18-20 years - 20.0% (mean score 11 ± 0.62), very high (15-20 points) - in 16.3% of the people 21-30 years of age (mean score 10.13 ± 0.31). Anxiety decreased drastically in the ages above 70 years - 5.9 % (mean score 7.94 ± 0.83). The survey results indicate that age has a statistically significant effect on dental anxiety - $\chi^2 = 32.94$, df = 18, P < 0.05, confirmed by Kruskal-Wallis Test - 13.67, P < 0.05. The influence of gender on the distribution of responses is as follows (Table 3).

As presented in Table 3 in the group of male respondents two extreme states prevail - lack of
anxiety in 37.9% (4-8 points) and severe anxiety in 13.1% (15-20). In women, higher frequencies are in the columns of moderate and high anxiety. Overall high anxiety in women is greater than in men, but the difference is not significant (P > 0.05). This is confirmed by the mean scores in the two groups, which were 10.18 ± 0.23 for men, and 10.31 ± 0.17 for the women (Mann-Whitney U Test-1.14, P > 0.05). The relationship between education and dental anxiety is presented in

Table 2. Mean anxiety score in age groups

<table>
<thead>
<tr>
<th>Age groups</th>
<th>N</th>
<th>( \bar{x} \pm S_x )</th>
<th>min</th>
<th>max</th>
<th>Kruskal-Wallis Test</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 20</td>
<td>30</td>
<td>11 ± 0.62</td>
<td>4</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21 - 30 yrs.</td>
<td>172</td>
<td>10.13 ± 0.31</td>
<td>4</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31 - 40</td>
<td>146</td>
<td>9.85 ± 0.31</td>
<td>4</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41 - 50</td>
<td>163</td>
<td>10.46 ± 0.27</td>
<td>4</td>
<td>20</td>
<td>13.67</td>
<td>&lt; 0.05</td>
</tr>
<tr>
<td>51 - 60</td>
<td>140</td>
<td>10.59 ± 0.30</td>
<td>4</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>61 - 70</td>
<td>78</td>
<td>10.49 ± 0.47</td>
<td>4</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over 70</td>
<td>17</td>
<td>7.94 ± 0.83</td>
<td>4</td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>746</td>
<td>10.26 ± 0.14</td>
<td>4</td>
<td>20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Cross tabulated distribution by gender and degree of anxiety

<table>
<thead>
<tr>
<th>Anxiety</th>
<th>No anxiety</th>
<th>Moderate</th>
<th>Strong</th>
<th>Very strong</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>116</td>
<td>37.9</td>
<td>106</td>
<td>34.6</td>
<td>44</td>
</tr>
<tr>
<td>Female</td>
<td>142</td>
<td>32.3</td>
<td>159</td>
<td>36.1</td>
<td>92</td>
</tr>
<tr>
<td>Total</td>
<td>258</td>
<td>34.6</td>
<td>265</td>
<td>35.5</td>
<td>136</td>
</tr>
</tbody>
</table>

\( \chi^2 = 6.88, \ P > 0.05 \)
Fig. 4. In the subgroup of respondents without anxiety, the biggest share had higher education (39.8%) and smallest in number were those with primary education (30.4%). Further on, the higher the level of anxiety the higher the percentage of people with lower education levels.

The differences in the highest level of dental anxiety (score of 15-20 points) are great - 21.7% of respondents with primary education, while in those with higher level of education - 7.8%. Education proved to have statistically significant relation to experience of dental anxiety: $\chi^2 = 24.57$, df = 9, $P < 0.01$.

In terms of the type of occupation, manual or mental, the data showed significant differences in all levels of anxiety by DAS ($\chi^2 = 11.87$, df = 3, $P < 0.01$), confirmed by the difference in the mean assessment in points (Table 4).

Higher anxiety was established in the participants performing mainly physical labor - 125 (36%) while in those with intellectual occupations - 98 (24.6%). As shown on Fig. 5 difference in strong anxiety levels (13-14 points) was the greatest - 22.2% in those involved in physical labor and 14.8% in the group with intellectual occupations.

DISCUSSION

For the first time in Bulgaria research on dental treatment anxiety has been carried out. Based on literature review we expected to confirm the
hypothesis that in Bulgaria, too, women are more anxious than men, young people - more susceptible to fear of dental treatment, and that there would be a negative correlation between level of education and dental anxiety. As mentioned before when using DAS patients with score equal to or greater than 13 are defined as highly anxious. Our results for this indicator (29.9%) significantly exceed the ones mentioned in most of the publications. A study of Nicolas E et al.7 point out 13.5% in France, Moore R et al.16 - 10.2% in Denmark, Locker D et al., 16.4% in Canada, Shon W and Ismail AJ19 of Michigan (USA) - 12%. Only the results of 44% reported by of Ekanayake L and Dhamawardena D13 in Sri Lanka exceed our results. This difference is confirmed also for the subgroups with high (13-14 points) and very high (15 - 20 points) anxiety. Our result of 11.7% in the last group is close only to that of Ilguy D and colleagues9 in Turkey - 9.9%. With regard to the other indicator of comparability, namely the mean score in points by DAS, the result of our respondents was 10.26 ± 0.14. It is comparable to the results in Canada 10.918, Northwest England 9.114, lower than that in Hungary 12.517 and greater than the mean score of 8.76 in Turkey20.

The influence of age on dental anxiety is demonstrated by the analyses of high anxiety (13 -20 pts) in different age groups. A tendency of increased values was established in the youngest age group. This coincides with the tendency discussed in published studies, but differences in values remain. In Bulgaria they were significantly higher: 18-20 years - 30% and in 21-30 years old - 31.4%. Locker D and colleagues18 report 16.5% in people between 18 and 26 years of age. They explained this fact with diverse and intensive psychological impact of various factors in this age period, generating fear and dental anxiety. In the next age group 31-40 years we observed a sharp decrease in the number of highly anxious individuals in the country - 23.3%. This fact does not match the evidence from some authors who have found the greatest anxiety in the group 35-44 years and that dental fear decreased gradually with age (13:31). In our country in the groups of 51-60 and 61-70 years the frequency of high anxiety increased again - 37.8% and 30.7% (13 - 20 pts.) with mean score in points, respectively - 10.59 ± 0.30 and 10.49 ± 0.47. These measurements are considerably higher than the values found in a study of Bedi R, and Mc Grath C21, indicating 13% and mean score of 8.4 points. We attribute these to the influence of various psychological, social and emotional factors in the first years after retirement and to the accumulated stress until that period. In the ages over 70 years there was a sharp decrease of high anxiety -11.8% and the mean score was 7.94 ± 0.83, which tend to comply completely with the data from other publications.22

The results from our survey on the impact of gender on the dental treatment anxiety proved to be comparable with other studies14 in which authors give data revealing women as experiencing more anxiety - 31.6% (13 - 20 pts.) than men - 27.5%. This difference, however, was not statistically significant (P > 0.05) but is still consistent with the trend found by the aforementioned author.

Regarding the level of education, we found that it had positive influence on reducing dental anxiety and was inversely related to the degree of anxiety. The data revealed, with statistical significance (P < 0.05), high degree of anxiety (13 - 20 pts) in individuals with primary education -56.5%, as opposed to those with higher education - 20.4%. This coincides with studies of Erten H and colleagues20 in Turkey and Perez B and Mersel A22 in Israel. Education is a factor that directly affects and predisposes, to some extent, the type of occupation - physical or intellectual labour. Since the less educated and the unskilled perform primarily manual work in our cases - 36%, there was significant difference (P < 0.01) to those who had mainly intellectual occupations - 24.6%. Similar data is reported in France by Nicolas E and colleagues7 form a survey of farmers and low paid workers.

CONCLUSIONS

The presented survey of dental anxiety is performed for the first time in the country. The results obtained give us grounds for the following conclusions:

1. The share of individuals with strong anxiety (20 to 13 p. by DAS) was significantly greater (29.9%) than in other countries.

2. The significant correlation between dental anxiety, age, education and type of occupation, established by other authors, was confirmed.

3. Dental anxiety in women and men was approximately equal.

4. We attribute the established greater level of dental anxiety in the ages 61-70 years to the greater influence of some psychological and social factors in the early years of retirement as a result of the economic reforms in the country.

5. Individuals with high dental anxiety need medication and non-drug treatment to reduce anxiety.
Ethnic and social factors were not taken into consideration in the current study but remain subject of future research.

Acknowledgements: This study is accomplished with the financial support by the Medical University-Plovdiv (by grant N2/2007)

REFERENCE

ИССЛЕДОВАНИЕ ДЕНТАЛЬНОЙ ТРЕВОЖНОСТИ СРЕДИ СОВЕРШЕННОЛЕТНИХ ЛИЦ В БОЛГАРИИ

Д. Кирова, Д. Атанасов, Х. Лалабонова, С. Яневска

РЕЗЮМЕ

Тревожность пациентов до и во время визита в дентальной практике является проблемой как для пациента, так и для врача. Для некоторых людей посещение врача представляет стресс, выражающийся в тревоге, страхе, даже в фобии, приводящей к отказу от адекватного ухода за оральным здоровьем. На фоне общей тревожности выделяются: т. н. тревожность от зуболечения (dental anxiety), страх от зуболечения (dental fear), фобия от зуболечения (dental phobia).

ЦЕЛЬ: Работа ставит себе цель исследовать состояние проблемы тревожности от зуболечения среди населения Болгарии с помощью шкалы самооценки.

МАТЕРИАЛ И МЕТОДЫ: Шкала самооценки N. Corah – dental Anxiety Scale (DAS) применена в виде анкеты, содержащей данные о поле, возрасте, образовании и о виде труда. Анкетировано 746 лиц (индивидуально и группово) в возрасте от 18 до 82 лет, живущих в городских условиях.

РЕЗУЛЬТАТЫ: Самый высокий процент - 35.5% - составляют анкетированные, показывающие умеренную дентальную тревожность (9 -12 п.), за ними следуют лица, у которых тревожность отсутствует – 34.6% (4 -8 п.). Сильная тревожность наблюдается среди 18.2% анкетированных (13 – 14 п.), а очень сильная – среди 11.7% (15 – 20 п.). Средняя оценка в пунктах (score) – 10.26 ± 0.14. Установлена статистически достоверная зависимость между тревожностью и: возрастом (Р < 0.05), образованием (Р < 0.05) и видом труда (физический или умственный) (Р < 0.01). Способствующая разница между тревожностью и полом не отмечена (Р < 0.05).

ЗАКЛЮЧЕНИЕ: Результаты исследования показывают, что процент высокотревожных индивидов (13 – 20 п.) в стране значительно более высокий (29.9%) по сравнению с процентом лиц в некоторых европейских и североамериканских странах. Настоящее исследование является первым в нашей стране. Будущие исследования смогли бы показать влияние и других факторов в связи с дентальной тревожностью.