Self-Assessed Dental Status, Oral Behavior, 
DMF, and Dental Anxiety

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Abstract: The purpose of this study was to evaluate the relation between self-assessed dental status, oral behavior, dental anxiety, and DMF scores. The study was conducted among young army personnel (eighteen to twenty-one years old) who arrived at a single military dental clinic for dental screening. A questionnaire was used to collect the data anonymously. The questionnaire included self-assessment of dental status and behavior, as well as the Dental Anxiety Scale (DAS). Dental caries status was evaluated using the World Health Organization (WHO) caries diagnostic criteria for decayed, missing, and filled teeth (DMFT). A total of 393 young adults were examined (98.3 percent response rate). Approximately one-third brushed their teeth once a day or not at all. Of the participants, 10.7 percent assessed their dental status as “Poor” and 46.3 percent as “Fair.” Furthermore, 25.5 percent assessed their dental treatment needs as high. The average DAS score was 7.14. The average DMF score was 6.2. There was a correlation between self-reported tooth status, participants’ assessment of their dental treatment needs, and DMF score (p<0.0001). Anxious participants assessed their dental treatment needs as higher (p=0.05). The dental practitioner could ask patients to assess their dental status prior to treatment or appointment. These findings will help the practitioner to accomplish more effective time and patient management.

Dental caries is a prevalent pathology that affects almost everyone throughout his or her life. Annual examinations in the dental clinic can be expensive, invasive, and uncomfortable for many individuals. Recently, medico-legal and ethical obstacles further complicated these procedures. Consequently, the use of questionnaires and interviews (self-perceived assessments) became a common method for collecting diagnostic data and performing oral health surveys. 

In 2001, it was reported that dental diseases account for 5 to 10 percent of total health care expenditures, exceeding the cost of treating cardiovascular disease, cancer, and osteoporosis in industrialized countries. In low-income countries, the cost of traditional restorative treatment of dental disease probably exceeds the available resources for health care. Dental health promotion and preventive strategies are clearly more affordable and sustainable. Although not life-threatening, dental diseases are detrimental to the quality of life during childhood through old age and can have an impact on self-esteem, eating ability, nutrition, and health. Oral diseases are associated with considerable pain, anxiety, and impaired social functioning. Dental decay results in tooth loss, which reduces the ability to eat a nutritious diet, the enjoyment of food, the confidence to socialize, and the quality of life.

Dental anxiety is a common fear. Approximately 6-15 percent of the population suffers from high dental fear and avoidance worldwide. The onset of dental anxiety is thought to originate in childhood, peak in early adulthood, and decline with age. The World Health Organization (WHO) caries diagnostic criteria for decayed, missing, and filled teeth (DMFT) are the simplest and most commonly used in epidemiologic surveys of dental caries, since it quantifies dental health status based on the number of carious, missing, and filled teeth. Dental disease, as measured by DMF scores or their components, is related to oral health behavior. Self-reports were found to be ineffective in the assessment of dental caries. However, there is a need to further develop self-reported oral health measures that will be valid for large population studies. Such self-reported measures are cost- and time-effective.
People tend to underestimate their dental treatment needs, mainly in periodontology.\textsuperscript{20} With regard to dental caries, Robinson et al.\textsuperscript{2} compared questionnaire and clinical assessments and found sensitivity and positive predictive values of 58 percent and specificity and negative predictive values of 71 percent. Nevertheless, they suggest that the use of questionnaires should be further investigated with reference to community rather than individual aspects.

The aim of this study was to evaluate the relation among self-assessed dental status, oral behavior, dental anxiety, and DMF scores.

### Materials and Methods

The study population consisted of young army personnel (eighteen to twenty-one years old) who arrived at a single military dental clinic for dental screening between January and April 2005. The population had no common background regarding place of birth, education, and socioeconomic setting. The study was voluntary and approved by the Ethics Committee of the Medical Corps. The survey was based on a questionnaire provided and designed by the authors (found in the Appendix) and completed by the participants. To ensure anonymity, names were not recorded on the questionnaire.

The questionnaire consisted of questions regarding self-assessment of dental status and oral behavior (i.e., daily dental hygiene regimen), as well as the Corah Dental Anxiety Scale questionnaire (DAS) used to measure dental anxiety.\textsuperscript{21} This is a common, well-known, and accepted tool. The scale ranges from 4 to 20. Population normative mean scores have been reported as 8-9, and a DAS score of 13 or higher indicates high dental anxiety.\textsuperscript{21,22} The scale is simple to complete, reliable, and valid for evaluating dental anxiety.\textsuperscript{23,24}

The WHO caries diagnostic criteria for decayed, missing, and filled teeth and surfaces\textsuperscript{15} (DMFT) was used to evaluate dental caries status. One dental clinician (GRS) carried out all clinical examinations under artificial light, using a flat-surface mouth mirror, gauze, sponges, and compressed air.

Data were collected and analyzed by SPSS 10.0 (SPSS, Inc., Chicago, IL, USA) using descriptive statistics, as well as the t-test and Pearson’s chi-square test. A p value of <0.05 was considered statistically significant.

### Results

A total of 393 (out of 400; 98.3 percent response rate) young adults (84 percent males, 16 percent females) were examined. Table 1 presents the distribution of participants’ answers. Over 10 percent reported their last visit to the dental clinic was more than three years ago. Approximately one-third brushed their teeth once a day or not at all. Participants assessed their dental status as “Good” (43 percent), “Poor” (10.7 percent), and “Fair” (46.3 percent). Of all participants, 25.3 percent assessed their dental treatment needs as high and 40 percent as moderate, while 34.7 percent reported no dental treatment needs at all.

The average DAS score was 7.14. A DAS score of 13 or higher indicates high dental anxiety. This was observed in only 4 percent of the participants. Higher levels of dental fear (p=0.002) were reported by females. The average DMFT score was 6.2 (D=2.06, F=3.9). There was a statistically significant correlation among self-reported dental status, participants’ assessment of their dental treatment needs, and DMFT score (p<0.0001) (Table 2). Anxious participants assessed their dental treatment needs as higher (p=0.05). Smokers had higher D and M levels than nonsmokers (p<0.0001).

### Table 1. Self-assessed dental status and oral behavior

<table>
<thead>
<tr>
<th></th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>121 (30.8)</td>
</tr>
<tr>
<td>No</td>
<td>272 (69.2)</td>
</tr>
<tr>
<td>Last dental visit</td>
<td></td>
</tr>
<tr>
<td>&lt;1 year</td>
<td>159 (40.6)</td>
</tr>
<tr>
<td>1-3 years</td>
<td>191 (48.7)</td>
</tr>
<tr>
<td>&gt;3 years</td>
<td>42 (10.7)</td>
</tr>
<tr>
<td>Self-assessed dental status</td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td>169 (43)</td>
</tr>
<tr>
<td>Fair</td>
<td>182 (46.3)</td>
</tr>
<tr>
<td>Poor</td>
<td>42 (10.7)</td>
</tr>
<tr>
<td>Self-assessed treatment necessity</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>99 (25.3)</td>
</tr>
<tr>
<td>Moderate</td>
<td>157 (40)</td>
</tr>
<tr>
<td>No need</td>
<td>136 (34.7)</td>
</tr>
<tr>
<td>Frequency of tooth brushing</td>
<td></td>
</tr>
<tr>
<td>Once a day</td>
<td>116 (29.5)</td>
</tr>
<tr>
<td>Twice a day</td>
<td>264 (67.2)</td>
</tr>
<tr>
<td>&gt;3 times a day</td>
<td>13 (3.3)</td>
</tr>
<tr>
<td>Oral hygiene interface</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>329 (83.7)</td>
</tr>
<tr>
<td>No</td>
<td>64 (16.3)</td>
</tr>
</tbody>
</table>
Discussion

Several attempts have been made to develop self-assessed indices for evaluating dental status. However, the correlation between epidemiologic index registrations and self-perceived oral health is weak.2-4,17,18 According to the results of this study, simply asking straightforward questions regarding dental status may predict the results of the clinical examination in terms of caries presence.

The relatively low DAS score was slightly lower than scores reported by others regarding adolescents in Israel (DAS of 9.5).34 Generally, females report higher levels of dental fear than do males.34-37 In the present study, most of the young population were male, which could have affected the results. However, the high response rate increased the validity of the results.

A review of previous epidemiologic data obtained from DMFT surveys25-28 conducted on army recruits in Israel reveals a steady, almost linear trend of increased caries severity that peaked in 1986, arrested, and then appeared to decline. In our study the decrease in DMFT indicated a clear decline in caries severity compared to previous studies.

Although the present cohort consisted of mainly males, no gender differences have been found in the epidemiologic index registrations.29 It would be of interest to conduct a similar study for females and to compare the results.

Less than one-half (40 percent) of the participants reported regular dental examinations, once every six months. Dental clinicians should focus more on educating patients regarding the importance of follow-up and periodic examinations.

Extensive epidemiologic research has shown that smoking is related to periodontal disease30 and to other oral complications.31 The present study showed that smoking was associated with high caries levels, which supports previous reports35,32 and may indicate a lower health care awareness and attitude among smokers.

Dental anxiety, a problem for many adults and children, acts as a barrier to treatment, by avoiding and/or attending treatment irregularly or for visiting a dentist for emergencies only. Patient anxiety poses major management problems for the dental team, such as additional time required for treatment, missed appointments, and raised pain thresholds. The management of patient anxiety is a major cause of stress for clinicians. In our study, anxious participants assessed their dental treatment needs as higher, which may result in further avoidance and treatment postponements.

Our findings showed that the use of patient self-assessment was a good predictor of patient dental status. The information presented in this study could serve as a tool for public and preventive dentistry, as well as to help the dental practitioner in managing patients according to their complaints and self-assessment. Dental practitioners could ask patients to assess their dental status prior to treatment or appointment. This will help the practitioner to accomplish more effective time and patient management. Furthermore, the use of patient self-assessment should be a part of dental training. Students should be urged to ask their patients questions regarding their dental status during the first interview and anamnesis.

Conclusions

In this study population, a correlation was found between self-reported tooth status, participants’ assessment of their dental treatment needs, and DMFT score. Simply asking the patient straightforward questions regarding their dental status may predict the clinical examination results. Patients tend to be familiar with their dental status. This could help the dental practitioner to accomplish more effective time and patient management.

Table 2. Self-assessed dental status, patients’ assessment of their dental treatment needs, and DMFT score

<table>
<thead>
<tr>
<th>Self-assessed dental status</th>
<th>DMFT Score</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>4.33</td>
<td>p&lt;0.0001</td>
</tr>
<tr>
<td>Fair</td>
<td>7.05</td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td>10.02</td>
<td></td>
</tr>
<tr>
<td>Patients’ assessment of treatment needs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No need</td>
<td>3.74</td>
<td>p&lt;0.0001</td>
</tr>
<tr>
<td>Few treatments</td>
<td>6.48</td>
<td></td>
</tr>
<tr>
<td>Numerous treatments</td>
<td>9.18</td>
<td></td>
</tr>
</tbody>
</table>
Acknowledgments

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REFERENCES

APPENDIX: Dental questionnaire given to the participants.

1. Age: __________

2. Gender: Male/Female

3. Number of siblings (not including yourself): ________

4. Smoking:
   a. Yes
   b. No

5. When was your last visit in a dental clinic?
   a. Less than 1 year
   b. 1-3 years
   c. More than 3 years

6. How would you describe your dental status?
   a. Good
   b. Fair
   c. Bad

7. As for today, in your opinion, how many treatments do you need?
   a. A lot
   b. Some
   c. Not at all

8. Have you had an oral hygiene interface meeting?
   a. Yes
   b. No

9. How many times a day do you brush your teeth?
   a. Once
   b. Twice
   c. Three times
   d. More than three times

Corah’s Dental Anxiety Scale (DAS).
(Points were assigned for the subject’s choices, with one point for an “a” choice to 5 points for an “e” choice.)

1. If you had to go to the dentist tomorrow, how would you feel about it?
   a) I would look forward to it as a reasonably enjoyable experience.
   b) I wouldn’t care one way or the other.
   c) I would be a little uneasy about it.
   d) I would be afraid that it would be unpleasant and painful.
   e) I would be very frightened of what the dentist might do.

2. When you are waiting in the dentist’s office for your turn in the chair, how do you feel?
   a) Relaxed.
   b) A little uneasy.
   c) Tense.
   d) Anxious.
   e) So anxious that I sometimes break out in a sweat or almost feel physically sick.

3. When you are in the dentist’s chair waiting while he gets his drill ready to begin working on your teeth, how do you feel?
   a) Relaxed.
   b) A little uneasy.
   c) Tense.
   d) Anxious.
   e) So anxious that I sometimes break out in a sweat or almost feel physically sick.

4. You are in the dentist’s chair to have your teeth cleaned. While you are waiting and the dentist is getting out the instruments that he will use to scrape your teeth around the gums, how do you feel?
   a) Relaxed.
   b) A little uneasy.
   c) Tense.
   d) Anxious.
   e) So anxious that I sometimes break out in a sweat or almost feel physically sick.