

# Levels of Stress among General Practitioners, Students and Specialists In Pediatric Dentistry during Dental Treatment

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**Objective:** To assess self-reported stress during the performance of different procedures in pediatric dentistry, according to the professional experience of the dentists. **Study design:** During the years 2010 to 2011, an anonymous survey was administered by means of an internet link, and by distribution at professional meetings of dentists. **Results:** No statistically significant differences in stress were reported for maxilla and mandibular procedures. Placement of a rubber dam was rated as the most stressful procedure among dental students. For general practitioners and specialists, injection of local anesthesia to an anxious child was the most stressful procedure, regardless of age, sex, or years of professional experience. A negative correlation was found between years of experience and level of stress for all the procedures surveyed, but not for the use of nitrous oxide. No differences were found between male and female dentists in stress scores for any of the procedures. **Conclusion:** Higher rates of stress during operative procedures were reported among dental students than among experienced dentists. Anxiety of the pediatric patients, but not the location of the procedure: maxillary or mandibular, affected the dentists' reported level of stress.

**Key words:** stress, dental students, local anesthesia, rubber dam, maxilla, mandibular, children

## INTRODUCTION

Dentistry is considered a stressful profession. Stress is defined as a state of mental or emotional strain or tension resulting from adverse or demanding circumstances (Oxforddictionaries.com). A survey of health professionals revealed high levels of work-related stress among dentists<sup>1</sup>. Nearly 60% of private dentists surveyed in Denmark perceived dentistry as more stressful than other professions<sup>2</sup>. Job related factors have been attributed almost half of the overall stress of a dentist's life<sup>3</sup>. Dental residents in clinical programs reported significantly higher levels of perceived stress than did those in non-clinical programs<sup>4</sup>. Common

stressors reported by dentists include time related pressures, heavy workloads, financial concerns, anxious-uncooperative patients, the causing and managing of pain to patients, staff problems, equipment breakdown, defective material, poor working conditions, medical emergencies and the routine nature of the job. Some stressors appear to be linked to the type of system in which dentists work and in the way they are remunerated<sup>5,6</sup>. Personality traits common to those who choose to practice dentistry may also play a role<sup>7</sup>.

Though high levels of stress have been well documented among dentists and dental students, differences in degrees of stress according to dental procedure have been less investigated. Therefore, we conducted a survey to evaluate self-reported levels of stress of dentists during different procedures in pediatric dentistry, and to examine associations with the levels of professional experience and training of the dentists.

## MATERIALS AND METHOD

The survey was conducted during the years 2010 - 2011 after approval of the Institutional Review Board of the Hadassah School of Dental Medicine in Jerusalem. An anonymous questionnaire was administered by a number of means. For one, a website was built to enable an electronic questionnaire. Potential participants were contacted by email according to a list of graduates provided by the secretary of student affairs of the Hadassah Faculty of Dental Medicine, and referred to a link on the website. In addition, participants of the annual meetings of the Israeli Dental Association and of the Israeli Society of Dentistry for Children, and students in their last year before graduation at the Hadassah School of Dental Medicine were asked to fill a printed form of the survey.

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The questionnaire included demographic data: gender, years of professional experience, and dental specialty. The participants were asked to rate on a scale from 0 (none) to 10 (high), separately for maxilla and mandibular procedures, the stress that they feel when performing the following procedures on a child: injection of local anesthesia to a cooperative child; injection of local anesthesia to an anxious child; placing a rubber dam; cavity preparation for class II restoration; crown preparation in a primary tooth; root canal treatment in a primary tooth; simple primary tooth extraction; and the use of nitrous oxide.

For analysis, the participants were divided in three groups: (1) students, (2) general practitioners and specialists in any field excluding pediatric dentistry, and (3) specialists in pediatric dentistry.

**Statistical Analysis**

Levels of reported stress according to gender were compared among the 3 subgroups using the “Chi square test”; medians, means, standard deviations and ranges were calculated. Differences in levels of reported stress among the three groups were compared and analyzed by the ANOVA (Analysis of Variance) and Bonferroni multiple comparison test (subgroups ≥ 2).

The Pearson correlation factor was used to analyze the correlation between years of professional experience and stress. All statistical tests were analyzed to a significance level of 0.05.

**RESULTS**

Response to the internet site was very low; only 20% of the dentists who received the link by email filled the questionnaire. Sixty percent of the participants at the annual meeting of the Israeli Dental Association, 80% of the participants at the annual meeting of the Israeli Society of Dentistry for Children and 85% of the students in their last year in Hadassah’s Dental School in 2010 and 2011 agreed to participate. Since there was no statistically significant difference in responses among the questionnaires that were filled at the website and those that were filled in the print form, they were analyzed together.

No statistically significant difference was found in any of the studied parameters regarding maxilla and mandibular procedures; therefore the results are presented together. No statistically significant differences were observed between specialists in pediatric dentistry and between general practitioners and specialists in fields other than pediatric dentistry regarding reported levels of stress for any of the procedures surveyed (Table 1). Compared to general practitioners and specialists, dental students reported a lower level of stress during the injection of anesthesia, both for cooperative and anxious children; yet a higher level of stress for the performance of all other procedures (Table 1). Most of the students rated injection of local anesthesia to a cooperative child as “0” stress. The most stressful procedure among the students was the placement of a rubber dam. The most stressful procedure among the specialists in pediatric dentistry, and also among the general practitioners and specialists in other fields was the delivery of local anesthesia to an anxious child.

Correlation factors were calculated to the years of professional experience in dentistry. A negative correlation was found between years of experience and level of stress for all the procedures surveyed: injection of local anesthesia to a cooperative child (r= -0.19, p=0.001), injection of local anesthesia to an anxious child (r= -0.18 p=0.002), placing a rubber dam (r= -0.12, p=0.05), cavity preparation for class II restoration (r= -0.15, p=0.01), crown

**Table 1. Stress scores for dental procedures according to the 3 study groups**

Study group Procedure	Students N = 61	(2) General practitioners and specialists other than pediatric dentists N = 273	Specialists in pediatric dentistry N = 30	p
<b>Local anesthesia to a cooperative child</b>				
Respondents	61	273	30	a: 0.0001**
Median	0.00	4.00	4.00	b: 0.0001**
Mean±SD	0.75±1.06	4.30±2.33	4.00±2.60	c: 0.0001**
Range	[0-5]	[0-10]	[0-10]	d: 1.0000
<b>Local anesthesia to an anxious child</b>				
Respondents	61	272	30	a: 0.0001**
Median	4.00	6.00	6.00	b: 0.0001**
Mean±SD	4.72±2.00	6.31±2.65	5.70±2.71	c: 0.5260
Range	[2-9]	[0-10]	[1-10]	d: 1.0000
<b>Placing a rubber dam</b>				
Respondents	61	232	28	a: 0.0001**
Median	6.00	3.00	2.00	b: 0.0001**
Mean±SD	6.66±2.23	3.45±2.36	2.93±3.02	c: 0.0001**
Range	[3-10]	[0-10]	[0-10]	d: 1.0000
<b>Cavity preparation for class II restoration</b>				
Respondents	61	273	30	a: 0.0001**
Median	5.00	2.00	2.00	b: 0.0001**
Mean±SD	4.95±2.58	2.52±1.81	2.50±2.93	c: 0.0001**
Range	[0-9]	[0-10]	[0-10]	d: 1.0000
<b>Crown preparation in a primary tooth</b>				
Respondents	61	268	30	a: 0.0001**
Median	4.00	3.00	2.00	b: 0.0010**
Mean±SD	4.03±1.86	2.94±1.95	2.53±2.78	c: 0.0050**
Range	[0-8]	[0-10]	[0-10]	d: 1.0000
<b>Root canal treatment in children</b>				
Respondents	61	257	28	a: 0.0001**
Median	4.00	3.00	2.00	b: 0.0001**
Mean±SD	4.34±1.65	3.11±2.08	2.50±2.38	c: 0.0010**
Range	[2-9]	[0-10]	[0-9]	d: 0.7830
<b>Simple tooth extractions</b>				
Respondents	61	270	30	a: 0.0001**
Median	3.00	1.00	1.00	b: 0.0001**
Mean±SD	3.89±1.97	1.39±1.40	1.97±2.54	c: 0.0001*
Range	[1-9]	[0-5]	[0-10]	d: 0.4110
<b>Usage of nitrous oxide</b>				
Respondents	Not relevant	107	24	d: 1.000
Median		2.00	2.00	
Mean±SD		2.47±1.93	2.79±3.04	
Range		[0-7]	[0-10]	

\*\*p≤0.01 Significant \*\*p≤0.05 Significant NS p >0.05 Not significant

a: group (1) vs group (2) vs group (3); b: group (1) vs group (2);

c: group (1) vs group (3); d: group (2) vs group (3)

preparation in a primary tooth ( $r=-0.23$ ,  $p=0.0002$ ), root canal treatment in children ( $r= -0.19$ ,  $p=0.002$ ), simple tooth extractions ( $r= -0.15$ ,  $p=0.01$ ); but not for the use of nitrous oxide.

No differences were found between male and female dentists in stress scores for any of the procedures in any of the three groups.

## DISCUSSION

This study shows higher reported rates of stress during operative procedures among dental students than among experienced dentists. These findings concur with other studies<sup>8-11</sup> that reported more stress by students, some of which was due to the criticism of their supervisors. Evidently, experience and training play an important role in the stress felt by dentists during clinical procedures.

While dental students reported placing a rubber dam as the most stressful procedure, experienced dentists rated it as less stressful, and less stressful than the injection of local anesthesia. Two randomised controlled trials showed the use of a rubber dam to be less stressful than the use of cotton rolls, both for patients, as assessed by breathing rate and skin resistance, and for dentists, as assessed by pulse rate<sup>12,13</sup>.

The experienced dentists in this survey, both the general practitioners and the specialists, rated injection of local anesthesia to an anxious child as the most stressful procedure. The injection of local anesthesia to a non-anxious child was rated second, though the level of stress reported was considerably less. No differences were observed in these findings, according to age or sex of the dentists, or years of experience. The act of administering local anesthesia has been overlooked as a major stressor for dentists, though a few studies<sup>14,15</sup> have reported an adverse effect on dentists during the anticipatory and actual stages of administering local anesthesia. Both physical and psychological effects have been identified that can produce short and long term personal problems in susceptible dentists. Simon reported that 19% of the respondents to his survey felt enough distress during the administration of local anesthesia to lead them to reconsider dentistry as a career<sup>5</sup>. The causing of pain, particularly to children, has been identified as a concern to dentists<sup>16</sup>.

Surprisingly, dental students did not report stress for the delivery of local anesthesia to either an anxious or a non-anxious child. This may be due to a sense of confidence they felt when under the supervision of a senior dentist who can help and finish the procedure in case of failure of the behavior management method. In addition, it is important to emphasize that our students treat only cooperative children and that they do not have experience in treating anxious children.

Professional stress is reported to start from dental school. Stress amongst dental students has emerged as a major concern for dental educators. Such stress has a number of sources and can negatively affect performance<sup>11</sup>. A systematic review identified 5 major factors of stress in dental students: living accommodations, personal, educational environment, academic, and clinical. Among the clinical factors, the major one was fear of failure to complete clinical requirements. Other factors included criticism by supervisors, patient contact, bearing the responsibility for comprehensive patient care, the atmosphere created by clinical faculty, and differences in opinions among staff<sup>11</sup>. In that study the stress produced by different procedures was not evaluated.

In the current study, reports of stress to the operator did not differ between maxillary infiltration and mandibular block. Rather, the behavior of the child (anxious vs not-anxious) was the factor that more determined the practitioners' stress. In contrast, Rassmusen *et al*<sup>16</sup> found that administering mandibular block to preschool children was perceived as the most stressful pain control method.

No statistically significant difference was found between general practitioners and specialists in pediatric dentistry, in the stress reported for any of the procedures examined. The referral by general practitioners to specialists, of children who may be less cooperative and cases that are more complicated, may explain this finding. The lack of difference between male and female dentists in levels of reported stress concurs with the findings of others<sup>4</sup>.

Various factors that may affect perceptions of stress among dentists are described in the literature, such as career satisfaction, personal health, and marital or other social psychological matters. Both dental practice-related stress and general life stress were predicted by baseline occupational stress, by feelings of lack of respect for practicing dentistry, and by dissatisfaction with the amount of professional time available to improve clinical skills<sup>17,18</sup>. Moore and Brodsgaard<sup>2</sup> found that psychological aspects of a dental practice may have a considerable and often adverse association with dentists' perception of anxious patients. Some dentists appear to require more knowledge about dental anxiety and managing their own stress. Promoting training and reorganization into larger practices may positively affect dentists' knowledge, attitude, and management of procedural dental pain in children. The investigation of the effect of personality variables on stress perceptions among dentists and dental students, and the effect of interventions were not within the scope of the current study.

The low participation rate for the internet version of the questionnaire implemented in this study suggests that surveys through the internet may not be an efficient research tool, and that people may prefer to participate in studies when handed written questionnaires. Similarly, in their randomized study of internet vs. paper-and-pencil versions of a questionnaire, Kongsved *et al*<sup>19</sup> reported a lower response rate for the internet version, yet greater completeness of data. In contrast, Kaplowitz<sup>20</sup> found the same rates of participation in their study between those offered questionnaires by mail and by internet. We presume that the professionals in our study felt more obligated to participate in the study when the questionnaire was offered to them face-to face rather than through the internet.

## CONCLUSION

The main findings of the current survey were the high level of stress reported by dentists delivering local anesthesia to anxious children, regardless of the years of experience, specialty in pediatric dentistry, age or sex of the dentist: the higher levels of stress reported by dental students compared with experienced dentists, particularly for use of the rubber dam, and the lack of difference in reported stress between maxilla and mandibular procedures.

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