Children's Fear and Behavior in Private Pediatric Dentistry Practices

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Abstract

Purpose: This study assessed the proportion of children with dental fear, the proportion of children with negative behavior and the relationship of children's dental fear and children's negative behavior in private pediatric dentistry practices in western Washington state.

Methods: A total of 421 children seen in 21 private pediatric dentistry practices in western Washington State participated. The average age of the children was 6.8±2.8 years (range=0.8-12.8 years). An average of 21 children were studied per practice (range=7-25 children). Dental fear was measured using the parents' version of the Dental Subscale of the Child Fear Survey Schedule (CFS). Behavior of the child during treatment was rated using the Frankl scale. Additional data were collected regarding the child's previous experiences and parental fear.

Results: The children's average item score on the 15-item CFS was 2±0.7, corresponding to a total score of 29.6 out of 75, where 75 indicates maximum fear. The proportion of children with dental fear, defined as an average item score of ≥2.5 (corresponding to a total score of ≥38), was 20% (85/421, 95% CI=16.3, 24%). The proportion of children who displayed negative behavior during treatment was 21% (95% CI=17.5, 24%). A prevalence ratio of 2.4 was calculated to describe the relationship between children's behavior during treatment and children's dental fear prior to dental treatment. Multivariate logistical regression analysis showed children with dental fear, younger children, and children exposed to treatment involving local anesthesia have higher odds of displaying negative behavior.

Conclusions: The proportion of children with dental fear in private pediatric dentistry practices was 20%, and the proportion of children with negative behavior during treatment was 21%. Children with negative behavior had greater odds of having dental fear and children with dental fear had greater odds of having negative behavior. Screening for dental fear may allow pediatric dentists to prepare children more adequately for positive treatment experiences. (*Pediatr Dent.* 2004;26:316-321)

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Within the last decade, investigators throughout the world have reported that 6% to 22% of children have dental fear.[1-15] The range of reported prevalence reflects differences in the populations of children studied. In addition, the variation in prevalence results from the use of different questionnaires, and from employing varying definitions (eg, scores on the questionnaires) of fear.

The etiology of dental fear in children is multifactorial.[1-16] Increased dental fear has been related to previous painful dental experiences[4,16]; increased general fears[5,6]; and the influence of dental

fear in the mother.[4-6] Girls[15] and younger children[4-6,15] are most often reported as more fearful than boys or older children.

A recent study on the effectiveness of local anesthesia in private practice pediatric dentistry offices in western Washington state found, by clinical observation, 10% of the children to be fearful. However, interpretation of observations may have been confounded by the behavior management strategies employed by the dental staff and characteristics of the environment.

To date, no study has used clinical observation in conjunction with questionnaires to estimate the level of dental fear in a child population. Therefore, using a written questionnaire filled out by the children's parents/primary caregivers and clinical behavior rating of the children—evaluated by 2 calibrated investigators—this study assessed the:

1. proportion of children with dental fear;
2. proportion of children with negative behavior and the relationship of the children's dental fear and negative behavior in private pediatric dentistry practices in western Washington state.

Methods

Setting

All pediatric dentists in private practice in western Washington state were sent a letter of invitation to participate in this study. After follow-up, 23 of 55 (42%) pediatric dentists in 21 offices agreed to participate. On average, those volunteering had 15 years of experience (range=1-39 years) and had offices in urban and suburban areas and in areas with and without fluoridated water. Those not volunteering were similar. Each practice was studied for a single day.

Subjects

All children up to but not including 13 years of age receiving dental treatment of any kind were invited to participate in the study on the day of the study. A total of 421 children were studied. The average age of the children was 6.8±2.8 years (range=0.8-12.8 years). This age group was chosen because it corresponds to the age of onset of dental fears.[17-19] About half of the children were female (200/421, 48%). An average of 21 children were studied per practice (range=7-25 children). A total of 12 (3%) parents/children refused. No more than 2 parents/children refused to participate in the study in a single practice. The Institutional Review Board of the University of Washington approved this study, and consent of all subjects was obtained.

Measures

Children's dental fear

The parent's version of the Dental Subscale of the Child Fear Survey Schedule (CFS) was used to measure dental fear in the child.[4,5,15,20-25] The parent or primary caregiver for the child completed the scale. The CFS includes 15 items, each with 5 choices ranging from not afraid at all (score=1) to very afraid (score=5) with a maximum score of 75. Children were rated as fearful if their average item score was ≥2.5, corresponding to a total score of 38. The average item score was used to minimize the effect of incomplete questionnaires that resulted from parents of dentally naïve children not being able to answer the questions about injections or drilling: 240 (57%) surveys were complete, and 339 (81%) surveys were as complete as could be for children who had no experience with injections or drilling. Analysis of the responses showed that there were not significant differences in average item score when the data were analyzed using only complete surveys vs including all surveys. Thus, all questionnaires were included in the analysis.

Demographics and parent's/primary caregiver's dental fear

The parent or primary caregiver was surveyed to obtain: (1) the child's age; (2) sex; (3) previous dental experiences; (4) general fears. Parents/primary caregivers also completed the Dental Anxiety Scale (DAS) to obtain parental dental fear.[26] The DAS includes 4 multiple-choice items, each with a possible score between 5 and 20, where a score of ≥15 indicates high dental fear.[27-30] Previous dental experience was assessed by asking if the child had had previous dental appointments and if previous visits had included injections or drilling. General fears were assessed by asking the single question "Does your child have any other fears or phobias?"

Children's behavior during treatment

The Frankl scale was used to rate the child's behavior.[31] The scale has good reliability and was chosen because it has been widely used. The rating was done at each of 16 steps through dental treatment, if each occurred. The Frankl scale consists of 4 behavior categories: (1) definitely negative; (2) negative; (3) positive; and (4) definitely positive.

Definitely negative is defined as refusal of treatment, crying forcefully, fearful, or any other overt evidence of extreme negativism. Negative is defined as reluctance to accept treatment, uncooperative, and some evidence of negative attitude but not pronounced (ie, sullen, withdrawn). Positive is defined as acceptance of treatment, occasional cautious behavior, willingness to comply with the dentist, and occasional reservation but willingness to follow the dentist's directions cooperatively. Definitely positive is defined as good rapport with the dentist, interest in the dental procedures, and laughing and enjoying the situation.[31]

For the analysis, the step with the most negative rating was used to describe the appointment, and the Frankl scale score was dichotomized as either positive or negative behavior. The ratings were done by 1 of 2 investigators who were trained, and whose reliability in rating was assessed by watching 15 videotapes of children not involved in the study receiving dental treatment, before the study, and 6 months after the study. Interobserver

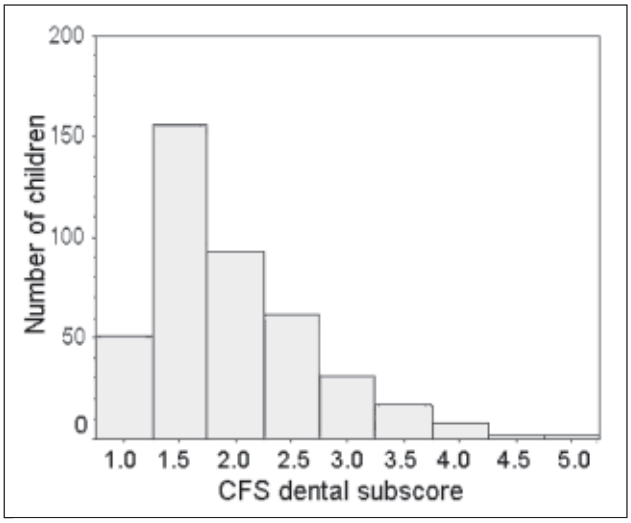

Figure 1. The distribution of CFS dental subscale average item scores for the 421 children studied in private pediatric dentistry offices in western Washington state.

reliability was high (kappa=0.84 before the study, kappa=1.00 after the study).[32]

Results

Children's dental fear

The children's average item score on the CFS was 2±0.7, corresponding to a total score of 29.6. The distribution of the CFS scores is given in Figure 1. The prevalence of children with dental fear, defined as an average item score of ≥2.5, was 20% (85/421, 95% CI=16, 24%).

Characteristics of children with dental fear

Overall, most children (372/418, 89%) had a dental visit within the last year. Some children (30/418, 7%) had never had a dental visit. The remainder (16/418, 4%) had a visit more than 1 year previously. For the majority of children whose parents were able to provide this information, previous dental treatment did not involve local anesthetic (284/367, 77%). Many parents reported that their child had fears or phobias unrelated to dentistry (142/382, 37%). The average parent or primary caregiver score on the DAS was 8 (±3.1). Few parents/primary caregivers (18/421, 4%) had scores indicating high parental dental fear (≥15). Table 1 compares the characteristics of children with high and low dental fear.

Children's behavior during treatment

The proportion of children who displayed negative behavior during treatment rating was 21% (95% CI=17.5, 24%). Most of the children (331/421, 79%) had either a positive (102/421, 24%) or definitely positive (229/421, 54%) Frankl rating. This rating represents the worst behavior score for the entire appointment. In contrast, 90 children had a negative (60/421, 14%) or a definitely negative (30/421, 7%) Frankl rating. Table 1 compares the characteristics of children with high and low dental fear.

Table 1. Relationship Between Children's Dental Fear and Selected Factors

		Children's dental fear		Prevalence ratio of Children's dental fear
		Low	High	
Whether child has fears or phobias unrelated to dentistry	Yes	94(66%)	48(34%)	3.4†
	No	216(90%)	24(10%)	
Parent/primary caregivers' dental fear	High	12(67%)	6(33%)	1.7
	Low	324(80%)	79(19%)	
Sex	Female	151(76%)	49(25%)	1.5*
	Male	185(84%)	36(16%)	
Age	0-6 years	147(75%)	48(25%)	1.5*
	7-12 years	189(84%)	37(16%)	
Whether child had previous dental appointment(s) within last year	No	21(70%)	9(30%)	1.5
	Yes	315(81%)	76(19%)	
Whether child's previous dental treatment included local anesthesia	Yes	62(75%)	21(25%)	1.4
	No	232(82%)	52(18%)	

*P value <.05.
†P value<.01.
Chi-square test.

Table 2. Relationship Between Children's Behavior During Treatment and Children's Dental Fear Prior to Dental Treatment

		Children's behavior during treatment		Prevalence ratio of children's negative behavior during treatment
		Negative	Positive	
Children's dental fear	High	34(40%)	51(60%)	2.4*
	Low	56(17%)	280(83%)	

*P value <.001; chi-square test.

Relationship of children's behavior during treatment and children's dental fear

Table 2 shows the relationship between children's behavior during treatment and children's dental fear prior to dental treatment. Overall, children who are reported as fearful are 2.4 times as likely to behave negatively during dental treatment as children who are not fearful.

Relationship of children's behavior during treatment and other factors

Table 3 summarizes the bivariate relationship between the behavior rating and other factors such as whether children's current or previous dental treatment included local anesthesia, age, whether children had fears or phobias unrelated to dentistry, whether children had a previous dental appointment within last year, and children's parent/primary's dental fear. Children whose current or past treatment involved local anesthesia were 2.8 and 1.7 times, respectively, as likely to behave negatively as children who received treatment not involving anesthesia. Similarly, younger children and those who were reported to have other fears or phobias were 2.7 and 1.6 times, respectively, more likely to behave negatively. Gender and previous treatment experience and parent/primary caregiver's dental fear did not differentiate between the behavior groupings.

Multivariate logistic regression analysis was performed to assess simultaneously the relative importance of these factors to children's behavior during the treatment. The dependent measure in the logistic regression was the dichotomized Frankl rating, and factors that demonstrated a significant bivariate association with children's behavior

Table 3. Relationship Between Children's Behavior During Treatment and Selected Factors

		Children's behavior during treatment		Prevalence ratio of children's negative behavior during treatment
		Negative	Positive	
Current dental treatment included local anesthesia	Yes	43(42%)	60(58%)	2.8*
	No	47(15%)	271(85%)	
Age	0-6 years	63(32%)	132(68%)	2.7*
	7-12 years	27(12%)	199(88%)	
Previous dental treatment included local anesthesia	Yes	26(31%)	57(69%)	1.7†
	No	53(19%)	231(81%)	
Fears or phobias unrelated to dentistry	Yes	38(27%)	104(73%)	1.6*
	No	40(17%)	200(83%)	
Previous dental appointment(s) within last year	No	9(30%)	21(70%)	1.4
	Yes	81(21%)	310(79%)	
Parent/primary caregiver's dental fear	High	5(28%)	13(72%)	1.3
	Low	85(21%)	318(79%)	
Sex	Female	46(23%)	154(77%)	1.2
	Male	44(20%)	177(80%)	

*P value <.05.
†P value<.01.
Chi-square test.

Table 4. Value of Factors in Predicting Negativve Behavior*

		Odds ratio	95% confidence interval
Whether children's present dental treatment included local anesthesia	Yes	9.6	4.6–20
	No	Reference	
Age	0-6 years	5.8	3-11.5
	7-12 years	Reference	
Children's dental fear	High	3.6	1.8-7.4
	Low	Reference	
Whether children have fears or phobias unrelated to dentistry	Yes	1.5	0.7-3
	No	Reference	
Whether children's previous dental treatment included local anesthesia	Yes	1.0	0.5-2.1
	No	Reference	

*N=334; R^2=34%, Nagelkerke test.

were included as independent variables. Given a problem with multicolinearity—due to the high correlation between the use of local anesthesia during the current and previous dental treatments and because use during the current dental treatment showed the strongest association with children's behavior—only anesthesia use during the current dental treatment was used in the logistic analysis. The odds ratio and 95% confidence interval are reported for each factor. Table 4 shows that the odds of negative behavior were 3.6 times greater for children with a high CFS score (95% CI=1.8, 7.4) and 9.6 times greater for children who are exposed to treatment involving local anesthesia (95% CI=4.6, 20). Also, the odds of negative behavior were 5.8 times greater for younger children (95% CI=3, 11.5)

Discussion

Consistent with the literature, this study found that 20% of children had dental fear and 21% behaved negatively during treatment.[1-16] Therefore, most children did not have dental fear and behaved positively during treatment. Nevertheless, this study demonstrates that there are some situations that, in having more information about the child beforehand, the pediatric dentist may plan to spend more time and effort in teaching children to cope. This is in keeping with the most recent Guidelines for Behavior Management of the American Academy of Pediatric Dentistry, which state the goal "to ease fear and anxiety."[33] A questionnaire, completed by parents/primary caregivers, (such as the CFS), may be useful. Children 6 years and younger are more likely to behave negatively, and, thus, are a particularly important group to screen. Certainly, the origins of most adult dental fears arise in childhood and are most likely to be preventable.[7]

There are several limitations to this study. First, this is a cross-sectional study of a convenience sample of pediatric dentists and children from one area of one country. However, the pediatric dentists represented a range of experience, urban and suburban areas, and fluoridated and nonfluoridated areas. In addition, the number of children gave the statistic adequate power. The diversity of the practices enhances the ability to generalize from these findings. Secondly, behavior was measured at various points in time during the appointment, but the authors used the worst behavior score in the analysis. This may have overestimated the prevalence of negative behavior. Some children may have displayed negative behavior at some point in the appointment but may have left displaying positive behavior. However, they were analyzed as displaying negative behavior. Indeed, only 12/421 (3%) of children left their appointment with a negative behavior rating, suggesting that this is true. Third, there are factors such as parenting and pediatric dentistry behavior management styles that influence children's dental fear and behavior, and these factors were not measured. Finally, the practical implication of how the presence or absence of dental fear in children and negative behavior impact their willingness to return for follow-up treatment was not studied.

Conclusions

1. Children who displayed negative behavior had greater odds of having dental fear.
2. Children with dental fear had greater odds of displaying negative behavior.
3. Screening for children's dental fear may allow pediatric dentists to more adequately prepare children for positive treatment experiences.

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