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Assessment of dental fear in turkish children with the frankl behavior rating Scale (FS) and the sound-eye-Motor (SEM) scale

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ÖZET

Türk çocuklarında dişhekimliği işlemlerine karşı duyulan korkunun frankl davranış derecelendirme ölçeği (fs) ve ses-göz-motor ölçeği (sem) ile değerlendirilmesi

Bu çalışmanın amacı, ilk kez diş hekimine gelen ve diş hekimi korkusu olan çocuklarda "anlat-göster-uygula" tekniğinin etkinliğinin, Frankl Davranış Değerlendirme Ölçeği (FS) ve Ses-Göz-Motor Ölçeği (SEM) vasıtasıyla değerlendirilmesidir. Çalışmaya Çocuk Diş Hekimliği Kliniği'ne başvuran 88 çocuk (44 erkek, 44 kız) dahil edilmiştir. İlk kez diş hekimine gelen bu çocukların davranışları FS kullanarak değerlendirilmiştir. Tedavi sırasındaki hasta davranışları ise SEM kullanılarak incelenmiştir. Tüm diş tedavileri ve "anlat-göster-uygula" tekniği aynı araştırmacı tarafından uygulanmıştır. FS ve SEM verilerinin kaydı ise bir başka kalibre araştırmacı tarafından yapılmıştır. "Anlat-göster-uygula" tekniğinin etkinliğini değerlendirmek ve iki grubu karşılaştırmak amacıyla ki-kare testinden yararlanılmıştır. Tüm istatistiksel analizler ve hesaplamalar için SPSS Windows (SPSS, Ver. 17,0, Chicago, IL., ABD) kullanılmıştır. FS ve SEM puanlarında istatistiksel olarak anlamlı farklılığa rastlanmıştır ($p < 0.05$). Sonuç olarak "anlat-göster-uygula" tekniğinin Türk çocuklarında diş korkusunun azaltılması amacıyla farmakolojik girişimlere bir alternatif olarak uygulanabilir bir yöntem olduğu değerlendirilmiştir.

Anahtar Kelimeler: *Diş hekimi korkusu, Frankl Davranış Derecelendirme Ölçeği, Ses-Göz-Motor Ölçeği*

SUMMARY

The aim of this study is to compare dental fear in Turkish children to whom the "tell-show-do" technique was applied with those to whom it was not. The degrees of dental fear of the children were measured by Frankl Behavior Rating (FS) and Sound-Eye-Motor (SEM) scales during their first appointment with a dentist. Eighty-eight children (44 male, 44 female) admitted to the Department of Pediatric Dentistry were the participants in this study. The assessment of the behavior of each child was made using the FS and by taking physiological measures during their first appointment with a dentist. Patients' behavior during each treatment was evaluated using the SEM scale. All dental treatments and "tell-show-do" techniques were applied by the same certified examiner, with the FS and SEM scales being applied by a second, independently certified examiner. Chi-square tests were used to compare the two groups of children based on exposure to the "tell-show-do" technique. All statistical analyses and calculations were performed using SPSS Statistics for Windows (SPSS, Ver. 17.0, Chicago, IL., USA). There were significant group differences in both FS and SEM scale scores ($p < 0.05$). The "tell-show-do" technique is a viable alternative to pharmacological interventions with respect to reducing dental fear in Turkish children.

Key words: *Dental fear, Frankl Behavior Rating Scale, Sound-Eye-Motor scale*

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Introduction

Fear is defined as a psychological response to a real or subjective stimulus. Negative expectations due to previous painful treatment experiences, negative attitudes within the family, and fear of pain or failing have been reported as being the most important factors in the development of dental fear (1). Degree of fear is frequently associated with age and gender (2) where girls and younger children are more fearful than are boys and older children (3,4). The prevalence rate for childhood dental fear is 3–4%, where precise rates differ across populations due to methodological and cultural variables (4,5). Dental fear in children is commonly assessed in four ways, as follows: behavioral ratings acquired during dental visits (e.g., via the Frankl Behavior Rating scale (FS)); physiological measures (e.g., pulse rate, basal skin response, muscle tension); projective techniques (e.g., children's dental fear picture tests); and psychometric scales (e.g., the Children's Fear Survey Schedule) (6, 7).

The "tell-show-do" technique provides a means for behavioral modification (8). The objectives of "tell-show-do" are to teach the patient about important aspects of the dental visit and to familiarize him or her with the dental setting, thereby modifying responses to dental procedures through desensitization and well-described expectations (9). The "tell-show-do" technique may be used with any patient, and involves providing verbal explanations of procedures in phrases appropriate to the developmental level of the patient (tell); demonstrations to the patient of the visual, auditory, olfactory, and tactile aspects of the procedure in a carefully defined, nonthreatening setting (show); and finally, without deviating from the explanation and demonstration, completion of the procedure (do) (10,11).

The aim of the present cross-sectional study was to compare dental fear in children to whom the "tell-show-do" technique was applied with that of children to whom it was not applied via the FS and Sound-Eye-Motor scale (SEM) during their first appointment with a dentist. The following hypotheses were tested: (a) children to whom the "tell-show-do" technique was not applied will exhibit higher levels of dental fear than will those to whom the "tell-show-do" technique was applied; (b) there will be no difference in the measured magnitude of dental fear between the two scales.

Materials And Methods

Subjects

This study was approved by the *Ethical Committee of the Gülhane Medical Faculty* (Protocol number: 13/103). In this study 532 subjects admitted to and examined in the Department

of Pediatric Dentistry of the Gülhane Medical Faculty were investigated. All 532 subjects were available, but 224 subjects were excluded because they had a history of compromised physical or mental health history (e.g., mental retardation, psychotic disorders, and severe sensory motor impairment) or because they differed substantially in age. Two hundred and twenty-one children with toothache (pulpitis or pericoronitis) who had received dental treatment previously were excluded from the study. Therefore, 88 children (44 male, 44 female) matched the inclusion criteria and thus were included in the study. Informed consent was obtained from the parents or guardians of all children.

Table 1. Frankl Scale

Rating 1	Definitely negative	Refusal of treatment; crying forcefully, fearful, or any other evidence of extreme negativism
Rating 2	Negative	Reluctance to accept treatment; uncooperative; some evidence of negative attitude but not pronounced, i.e., sudden withdrawal
Rating 3	Positive	Acceptance of treatment; at time of cautious; willingness to comply with the dentist, at time with reservation, but patient follows the dentist's directions cooperatively
Rating 4	Definitely positive	Good rapport with dentist; interested in the dental procedures; laughing and enjoying the situation

Survey Instrument

Assessment of each child's behavior was made via the FS scale in addition to a scale concerned with physiological measures during the children's first dental appointment. The FS scale discerns four types of behavior for dental treatment, as follows: 1 = definitely negative; 2 = negative; 3 = positive; and 4 = definitely positive (Table 1). Children exhibiting positive and definitely positive behavior were considered "cooperative"; children exhibiting negative and definitely negative behavior were considered "uncooperative." Patients' behavior during each treatment was also evaluated according to the SEM scale, as previously described by Wright (12) (Table 2).

Dental Examination

The dental treatments and "tell-show-do" technique were applied by a certified examiner, while the FS and SEM scales were applied by a second, independently certified examiner. All subjects received restorative therapy following local anesthesia, which was administered in the first therapeutic session.

Statistical Analysis

Chi-square testing was employed to examine the differences between the two groups based on exposure to the "tell-show-do" technique in terms of their ratings (strongly negative, negative, positive and strictly positive behavior) on the 4-point Likert scale of the FS, noted previously. All statistical analyses and calculations were performed using SPSS Statistics for Windows (SPSS, Ver. 17.0, Chicago, IL., USA). A $p < 0.05$ was considered indicative of statistical significance.

Results

The chi-square test was used to evaluate group differences in terms of age, of which no significant difference was present (Table 3) ($\chi^2 = 5.062$; $p = 0.536$). Chi-square was also used to evaluate group differences in terms of gender, of which again no significant difference was present (Table 4) ($\chi^2 = 0.00$; $p = 1.00$).

As shown in Table 5, there were group differences in terms of FS ratings. Forty percent of the children not exposed to the "tell-show-do" technique (Group I) reported "definitely negative" behavior following treatment in comparison to the 2% of children in the group exposed to the "tell-show-do" technique (Group II). Similarly, 40% of the Group II "certainly positive" behavior compared to the 4% of the Group I. Chi-square testing revealed that these differences were significant ($\chi^2 = 36.708$, $p = 0.000$).

For the SEM scale, 28% of the children Group I exhibited post-treatment pain, while only 4% of the Group II did. Chi-square testing revealed that these differences were significant ($\chi^2 = 36.367$, $p = 0.000$) (Table 6).

The percentage of "uncooperative" children, as measured by the FS, was 10% in Group II, while it was 62% in the Group I. As such, 90% of the children Group II were rated as "cooperative."

Table 2. Sounds, Eyes, Motor Scale

Observations	1 Comfort	2 Mild discomfort	3 Moderately Painful	4 Painful
Sounds	No sounds indicating pain	Non-specific sounds; possible pain indications	Specific verbal complaints "OW" raises voice	Verbal complaint indicates intense pain, e.g. Scream, sobbing.
Eyes	No eye signs of discomfort	Eyes wide, show of concern, no tears	Watery eyes, eyes fllinching	Crying, tears running down face
Motor	Hands relaxed no apparent body tenseness	Hands show some distress or tension; grasps chair due to discomfort, muscular tension	Random movement of arms or body without aggressive intention of physical contact, grimace, twitch	Movement of hands to make aggressive contact, e.g. Punching, pulling head away

Table 3. Age * Group Crosstable

			Groups Group I	Group II	Total
Age	4	n	5	3	8
		% within Group	10,0%	6,0%	8,0%
	5	n	11	8	19
		% within Group	22,0%	16,0%	19,0%
	6	n	13	16	29
		% within Group	26,0%	32,0%	29,0%
	7	n	14	10	24
		% within Group	28,0%	20,0%	24,0%
	8	n	2	7	9
		% within Group	4,0%	14,0%	9,0%
	9	n	4	4	8
		% within Group	8,0%	8,0%	8,0%
	10	N	1	2	3
		% within Group	2,0%	4,0%	3,0%
	Total	n	50	50	100
		% within Group	100,0%	100,0%	100,0%

Table 4. Gender * Group Crosstable

			Group Group I	Group II	Total
Gender	M	n	25	25	50
		% within Group	50,0%	50,0%	50,0%
	F	n	25	25	50
		% within Group	50,0%	50,0%	50,0%
	Total	n	50	50	100
		% within Group	100,0%	100,0%	100,0%

Table 5. Comparison of groups according to Frankl scale.

			Group Group I	Group II	Total
Frankl scale	Definitely negative	n	20	1	21
		% within Group	40,0%	2,0%	21,0%
	Negative	n	11	4	15
		% within Group	22,0%	8,0%	15,0%
	Positive	n	17	25	42
		% within Group	34,0%	50,0%	42,0%
	Definitely positive	n	2	20	22
		% within Group	4,0%	40,0%	22,0%
	Total	n	50	50	100
		% within Group	100,0%	100,0%	100,0%

Table 6. SEM scale * Grups Crosstable

			Groups Group I	Group 2	Total
SEM scale	Comfort	n	2	22	24
		% within Group	4,0%	44,0%	24,0%
	Mild discomfort	n	17	23	40
		% within Group	34,0%	46,0%	40,0%
	Moderately Painful	n	17	3	20
		% within Group	34,0%	6,0%	20,0%
	Painful	n	14	2	16
		% within Group	28,0%	4,0%	16,0%
	Total	n	50	50	100
		% within Group	100,0%	100,0%	100,0%

Table 7. Cooperation * Groups Crosstable

			Groups Group I	Group II	Total
Cooperation	(-)	n	31	5	36
		% within Group	62,0%	10,0%	36,0%
	(+)	n	19	45	64
		% within Group	38,0%	90,0%	64,0%
Total		n	50	50	100
		% within Group	100,0%	100,0%	100,0%

Chi-square testing again revealed that group differences were significant (χ^2= 29.34, p = 0.000) (Table 7).

Discussion

The main determinant of negative behavior in children in the dental clinic is fear. Willershausen et al.(13) reported that noise and vibrations emanating from the drill, in addition to the sight of the injection needle and the act of sitting in the dental chair, are particularly fear provoking. Dentists have an important role in developing an understanding of how children come to fear going to the dentist. For this reason, the dentist should attempt to identify children with high dental anxiety and assist in the evaluation and combating of these fears.

Several techniques aimed at managing children's behavior in dental offices have been developed. Behavioral management is widely believed to be a key factor for care of children in the context of pediatric dentistry. At the conference of the American Academy of Pediatric Dentistry in 2003 general principles were established gauging the validity of behavior management techniques; Effectiveness—the potential of the technique to manage children's behavior in the dentist's office, Social validity—acceptance of the technique by parents as well as public perception of the technique, risk associated with the technique, cost—time spend practicing the technique and cost of any materials and equipment used (14). Ramos et al. (15) and Lawerence et al. (16) have reported that one of the behavioral management techniques "tell-show-do" was accepted by most parents. Also, this techique can reduce prevalence of negative behavior (17). "Tell-show-do'' technique allows the child to understand dental procedures that minimizes anxiety. It can be used with patients facing dentistry for the first time (18). In our study, it was found that "Tell-show-do'' technique was effective in reducing child's fear and anxiety. Most of the children in our study were showing cooperative behavior after the technique.

Behaviour ratings are very crucial to development of effective strategy treatment. The Frankl scale is probably the most commonly favored behaviour rating scale (19). Frankl et al. (20) classified child behavior into four groups according to the child's attitude and cooperation or lack of cooperation during dental treatment. In the present study, the most frequent classification of behavior based on the Frankl Behavior Rating Scale in group I was level 1, followed by levels 3, 2 and 1. This result was not identical to other research (21, 22). For example, Tanabe et al. (22) reported that level 3 was the most frequent classification, followed by levels 4, 1 and 2. These possible confounding variables may associate with the difference of age range of the children and the clinical setting. However, the most frequent classification of behavior based on the Frankl Behavior Rating Scale in group II was level 3, followed by levels 4, 2 and 1 and this result was almost identical to other research (21, 22).

Sound eye-motor scale is an observational scale use of which is justified due to existing observational scales are not feasible for measuring pain in a dental procedure (22). In this study the most frequent classification of behavior based on the Sound eye-motor scale in group I was level 2 and 3 , followed by levels 4, and 1. In group II, after applying "tell-show-do" technique it was level 2, followed by levels 1, 3 and 4.

In our study, we aimed to evaluate the effect of the "tell-show-do" technique via two measurement scales in Turkish children. Eighty-eight children (44 male, 44 female) matched the inclusion criteria and participated in the study. Our results demonstrated that the "tell-show-do" technique effectively reduces fear in Turkish children who are visiting the dentist for the first time. Two scales were used to measure dental fear in children, and similar results were seen in both. Our results accord with the results of Watson et al. (2), Havelka et al. (18), and Luis de León J et al. (23), all of which demonstrated that behavioral management techniques are useful tools for the resolution of dental fear in children.

Conclusion

Facilitation of dental fear of the child during the dental treatment is very important. Behaviour management is indispensable to dental procedure in pediatric dentistry. The "tell-show-do" technique is a viable alternative to pharmacological interventions with respect to reducing dental fear in Turkish children.

References

1. Erten H, Akarslan ZZ, Bodrumlu E. Dental fear and anxiety levels of patients attending a dental clinic. Quintessence Int 2006; 37: 304-310.
2. Watson AT, Visram A. Children's preoperative anxiety and postoperative behaviour. Paediatr Anaesth 2003; 13: 188-204.
3. Baier K, Milgrom P, Russell S, Mancl L, Yo-shida T. Children's fear and behavior in pri-vate pediatric dentistry practices. Pediatr Dent 2004; 26: 316-321.
4. ten Berge M, Veerkamp JSJ, Hoogstraten J, Prins PJM. Childhood dental fear in the Netherlands: prevalence and normative data. Community Dent Oral Epidemiol 2002; 30: 11-17.
5. Oba AA, Dülgergil ÇT, Sönmez IŞ. Prevalence of Dental Anxiety in 7- to 11-Year-Old Children and Its Relationship to Dental Caries. Med Princ Pract 2009; 18: 453-457.
6. Yamada MK, Tanabe Y, Sano T, Noda T. Co-operation during dental treatment: the Children's Fear Survey Schedule in Japanese children. Int J Paediatr Dent 2002; 12: 404-409.
7. Nakai Y, Hirakawa T, Milgrom P, et al. The Children's Fear Survey Schedule-Dental Subscale in Japan. Community Dent Oral Epidemiol 2005; 33: 196-204.
8. Addelston HK. Child patient training. Fortnightly Review of the ChicagoDental Society, 1959; 38: 7-9.
9. AAPD Clinical Affairs Committee-Behavior Management SubcommitteeGuideline on Behavior Guidance for the Pediatric Dental Patient. AAPD Reference Manual 2011; 34: 170-182.
10. Law CS, Blain S. Approaching the pediatric dental patient: A review of nonpharmacologic behavior management strategies. J Calif Dent Assoc 2003; 31: 703-713.
11. Feigal RJ. Guiding and managing the child dental patient: A fresh look at old pedagogy. J Dent Educ 2001; 65: 1369-1377
12. Wright GZ, Weinberger SJ, Marti R, Plotzke O. The

effectiveness of infiltration anesthesia in the mandibular primary molar region. Ped Dent 1991; 13: 278-282.

13. Willershausen B, Azrak A, Wilms S. Fear of dental treatment and its possible effects on oral health. Eur J Med Res 1999; 4: 72-77.
14. Adair SM. Behavior management conference panel I report— rational for behavior management techniques in pediatric dentistry. Pediatr Dent 2004; 26: 167-70.
15. Ramos MM, Carrara CF, Gomide MR. Parental acceptance of behavior management techniques for children with clefts. J Dent Child (Chic) 2005; 72: 74-77.
16. Lawrence SM, McTigue DJ, Wilson S, Odom JG, Waggoner WF, Fields HW Jr. Parental attitudes toward behavior management techniques used in pediatric dentistry. Pediatr Dent 1991; 13: 151-155.
17. Klinberg G. Dental anxiety and behaviour management problems in paediatric dentistry--a review of background factors and diagnostics. Eur Arch Paediatr Dent 2008; 9: 11-15.
18. Havelka C, McTigue D, Wilson S, Odom J. The influence of social status and prior explanation on parental attitudes toward behavior management techniques. Pediatr Dent 1992; 14: 376-381.
19. Leyda AM, Llena C. Comparation of the eutectic mixture of lidocaine/prilocain versus benzocaine gel in children. Open J Stomatol 2011; 1: 84-91.
20. Frankl SN, Shiere FR, Fogels HR. Should the parent remain with the child in the dental operatory? J Dent Child 1962: 29; 150-163.
21. Colares V, Richman L. Factors associated with uncooperative behavior by Brazilian preschool children in the dental office. ASDC J Dent Child 2002; 69: 87-91.
22. Tanabe Y, Sano T, Taguchi Y, Noda T. Relationship between dental fear and experience of dental injection in cooperative and uncooperative child patients - CFSS-DS in Japanese children. Shoni Shikagaku Zasshi 2002; 40: 667-674.
23. Luis de León J, Guinot Jimeno F, Bellet Dalmau LJ. Acceptance by Spanish parents of behaviour-management techniques used in paediatric dentistry. Eur Arch Paediatr Dent 2010; 11: 175-178.