Relationship between Early Childhood Oral Health Impact Scale and Preschools' Fear and Behavior during Dental Treatment

Ali Vafaei[1], Ebrahim Najafpour[1], Maryam Derafshi[2], Ali Zarandi[3*]

[1.]Assistant Professor, Department of Pediatric Dentistry, Faculty of Dentistry, Tabriz University of Medical Sciences, Iran

[2.]Doctor of Dental Medicine, Faculty of Dentistry, Tabriz University of Medical Sciences, Iran

[3.]Assistant Professor, Department of Periodontics, Faculty of Dentistry, Tabriz University of Medical Sciences, Tabriz, Iran

ABSTRACT :

This study aimed to investigate the relationship between Early Childhood Oral Health Impact Scale (ECOHIS) and preschoolers' fear and behavior during dental treatment. This cross-sectional study was conducted on 385 children aged 3 to 6 attending the pediatric dentistry department of Tabriz Faculty of Dentistry in their first dental appointment. Oral health related quality of life was measured with ECOHIS questionnaire and dental fear using Children's Fear Survey Schedule (CFSS-DS) questionnaire. Frankle's behavioral scale was also used for the evaluation of behavioral status. Data were analyzed by SPSS version13.0. ECOHIS score was correlated with CFSS-DS score (P<0.01) and Frakle's behavioral scale. There was an association between ECOHIS and CFSS-DS score (B =0.198), and ECOHIS and behavioral status (B=-0.193). According to the results, the poorest oral health related quality of life was associated with high levels of dental anxiety and behavioral disorders. According to the results, there was an association between early childhood oral health related quality of life and the level of dental fear and behavioral status.

Keywords: oral health related quality of life, dental anxiety, dental fear, dental behavior

INTRODUCTION:

Dental fear is a main problem in pediatric dentistry. The goal of the pediatric dentistry is to treat and prevent babies' and children's dental caries. However, stress and fear related problems are experinced in visiting dentists or doing dental procedures [1,2]. Dental fear is a multifactorial phenomenon and is associated with three main causes incluidng: personal characters of children, prior experiences of parents, and factors considered by siblings and dentists. Parents or siblings could naturally transfer their experience of dental fear to childen[3]. Other factors affecting the fear include: view or feel about dental devices, unfavorable dental setting, voidance for going to dental office, prior thoughts about dentistry procedures, feeling anxious with possible threats, socioeconomic factors, culture, rearing of children, and insufficient training for the first dental visit. Regrdless of the feeling of anxiety and fear because of mentioned factors, failing to dentist care oral hygiene neglect as well as pain, abscesses, loss of deciduous and permanent teeth, and occlusion[4]. Low level of fear can also casue irregular dental visit and lack of follow-up[5]. However in broader aspects, it can raise important problems such as sleep sidorders, negative thoughts and feelings, and low self-esteem in daily life [6]. These challenges may continue until adolescence. Some studies have reported that financial problems, childhood dental appointments, and prior experiences could affect dental attendance pattern during the adolescence [7]. These factors which inflence the dental fear should be considered from chilhood to promote the oral health and dental behavior for future. Dental fear and behavior problems during the treatment in children was measured by Frankl rating scale and Dental subscale of Children's Fear Survey Schedule (CFSS-DS) [7]. This study aimed to investigate the relationship between ECOHIS and preschoolers' fear and behavior during the dental treatment.

Methods

This cross-sectional study was conducted on 385 children aged 3 to 6 attending the pediatric dentistry department of Tabriz Faculty of Dentistry. Sample size was determined based on Morgan table. Inclusion criteria were: first visit to the dentist,being aged 3 to 6 years, having physical activity and mental health, requesting routine dental care, and parental consent for participitation in research. Exclusion criteria also included: history of dentistry, major medical treatment, and physical impairment with special needs.

After signing parental consent form, ECOHIS provided by Jokovic and Locker [8] was filled. This questionnaire conisted of 13 questions and each question had 6 response categories (0 = never; 1 = hardly ever; 2 = occasionally; 3 = often; 4 = very often; 5 = don't know). The total score of possible range was from 0 to 52. These questions had neg-

*Corresponding author:
Ali Zarandi
Assistant Professor, Department of Periodontics,
Faculty of Dentistry, Tabriz University of Medical Sciences, Tabriz, Iran.

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ative status and an increased score showed low quality of children`s life.

Measurement of children's dental fear was performed by Children's Fear Survey Schedule (CFSS-DS) [9] which consisted of 15 items of dental treatment. The scores were as follows: 1=Not afraid; 2=a little afraid; 3=fairly afraid; 4=quite afraid; and 5=very afraid. Total scores thus ranged from 15 to 75. The validity and reliability of these questionnaires have been demonstrated in different studies [10-14].

Behavior of the children was assessed according to Frankl scale. Rating sclae was classified into four categories:

1. Definitely negative.(--) Refusal of treatment, forceful crying, fearfulness, or any other overt evidence of extreme negativism.
2. Negative. (-) Reluctance to accept treatment, uncooperative, some evidence of negative attitude but not pronounced (sullen, withdrawn).
3. Positive. (+) Acceptance of treatment; cautious behavior at times; willingness to comply with the dentist, at times with reservation, but patient follows the dentist's directions cooperatively.
4. Definitely positive. (++) Good rapport with the dentist, interest in the dental procedures, laughter and enjoyment.

Analysis of the data was done by Spearman`s correlation coefficient and ANOVA test. SPSS version 13.0 was used for data analysis (P<0.05).

Results and discussion

In this study, 385 children were evaluated from which 43.4% were girls (n = 167) and 56.6% were boys (n= 218). The results are summarized in Tables 1 to 3, and Figures 1 and 2.

Mean (SD) of ECOHIS was 29.49 (7.3)(max = 57, min= 14) and mean (SD) of children dental fear was 36.8(10.25) (max=66, min=15). Cronbach's alpha values were calculated for internal consistency reliability which were 0.82 (for ECOHIS) and 0.94 (for CFSS-DS). Cronbach's alpha values were ≥0.70 that was acceptable for comparison between the groups.

Total score of ECOHIS and CFSS-DS were determined by formula as follows:

Normalized score= (Raw score - min) / (max-min) ×100 = (Raw-1)/4 ×100

Mean (SD) of behavior assessment according to the Frankle's behavioral scale was 30.59 (6.15) definitely negative(n=86), 31.89 (7.94) negative(n=102), 27.97 (7.59) positiv (n=106), and finally 27.51 (6.26) definitely positive(n=91). ANOVA test showed a significant diffrence between the groups (F : 8.55 , P value : 0.000)., The result of Fisher's Least Significant Difference (LSD) test is summarized in Table 3.

According to the linear regression, correlation coefficient(R), coefficient of determination (R^2), and ΔR were 0.19, 0.04, and 0.03, respectively (F= 15.85 , P < 0.01). Standardized Coefficient beta was calculated as 0.19 (P < 0.05), and regression equation was Y= 28.54 + 0.28 X1 (Y: dental fear and X1: ECOHIS score).

Based on Spearman`s correlation coefficient, positive significant correlations were found between children's dental fear and ECOHIS score ( r = 0.198, P < 0.001) and negative significant correlation between children`s beahaviour and ECOHIS (r = 0.193, P < 0.001).

Table 1: frequency of responses to ECOHIS items (N, %)

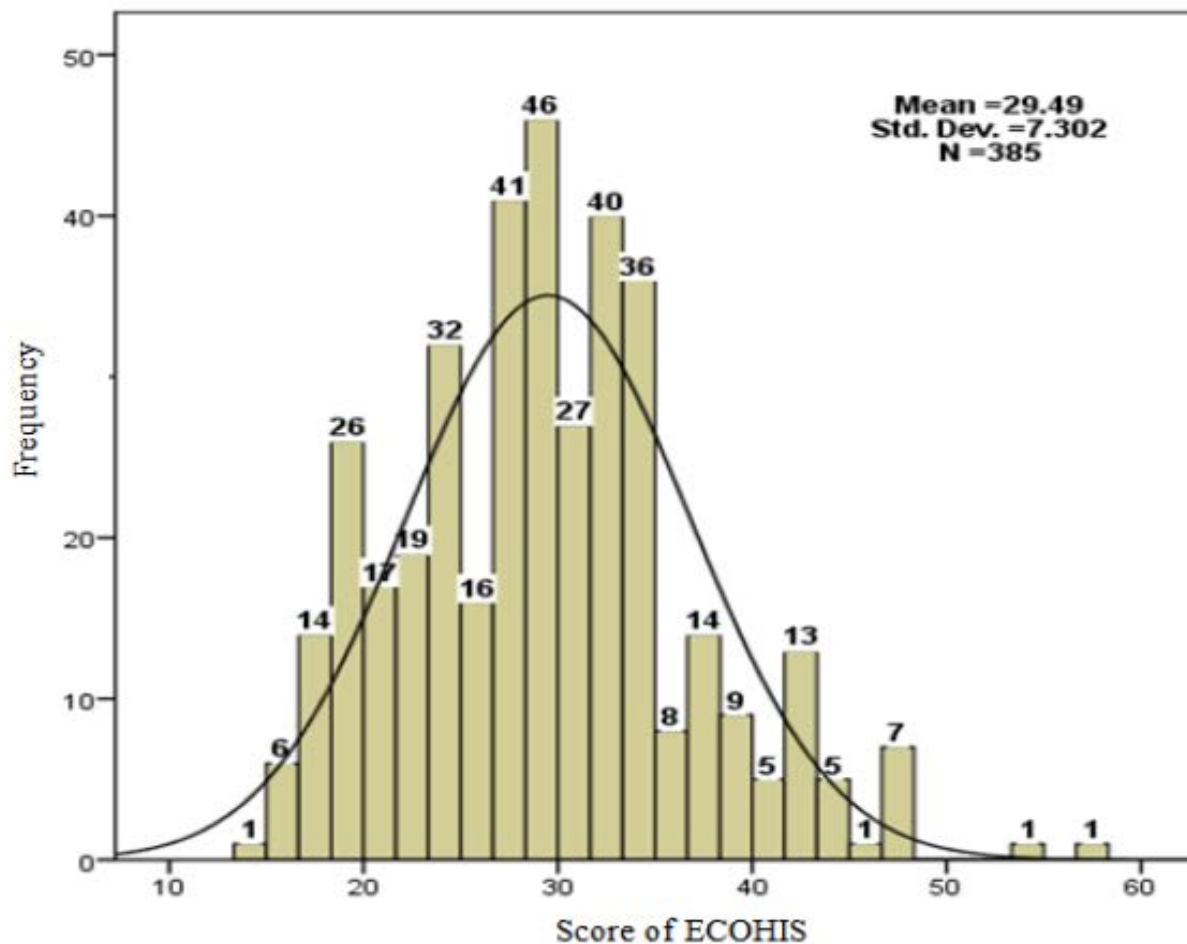|	Don't know	Very often	Often	Occasionally	Hardly ever	Never
Pain	2(0.5%)	24(6.2%)	88(22.9%)	146(37.9%)	100(26%)	25(6.5%)
Drinking	4(1%)	14(3.6%)	40(10.4%)	115(29.9%)	132(34.3%)	80(20.8%)
Eating	2(0.5%)	21(5.5%)	49(12.7%)	139(36.1%)	122(31.7%)	52(13.5%)
Pronouncing	0	2(0.5%)	1(0.3%)	25(6.5%)	107(27.8%)	250(64.9%)
Absence	5(1.3%)	3(0.8%)	9(2.3%)	23(6%)	133(34.5%)	212(55.1%)
Sleeping	0	3(0.8%)	28(7.3%)	79(20.5%)	166(43.1%)	109(28.3%)
Irritation	1(0.3%)	15(3.9%)	35(9.1%)	104(27%)	137(35.6%)	93(24.2%)
Smiling	16(4.2%)	6(1.6%)	18(4.7%)	46(11.9%)	118(30.6%)	181(47%)
Talking	7(1.8%)	3(0.8%)	3(0.8%)	39(10.1%)	110(28.6%)	223(57.9%)
Upset	2(0.5%)	81(21%)	75(19.5%)	82(21.3%)	93(24.2%)	52(13.5%)
Guilty	3(0.8%)	45(11.7%)	70(18.2%)	77(20%)	105(27.3%)	85(22.1%)
Work	0	19(4.9%)	38(9.9%)	87(22.6%)	137(35.6%)	104(27%)
Financial	3 (0.8%)	36(9.4%)	78(20.3%)	97(25.2%)	131(34%)	40(10.4%)

Fig. 1: Distribution of ECOHIS`s score

Table2: Frequency of responses for CFSS-DS (N, %)

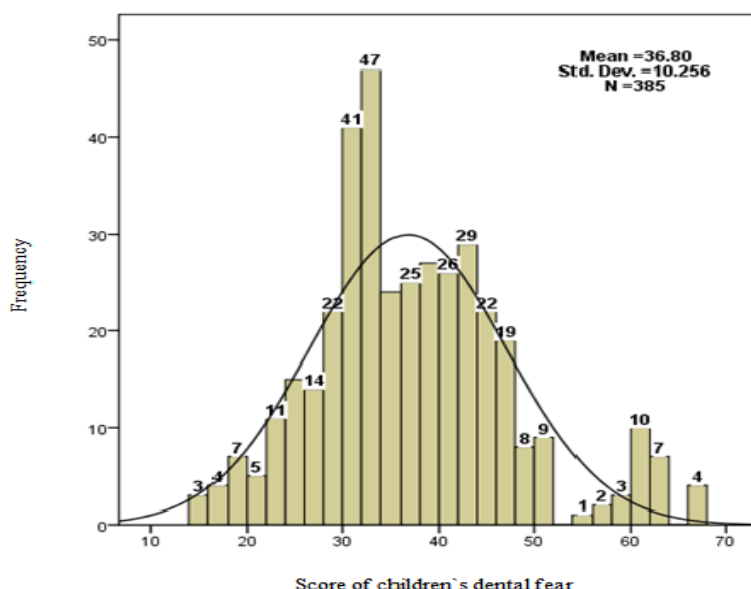|	Very afraid	Quite afraid	Fairly afraid	A little afraid	Not afraid
Dentist	13(3.4%)	108(281%)	126(32.7%)	99(25.7%)	39(10.1%)
Doctor	28(7.3%)	31(8.1%)	82(21.3%)0	148(38.4%)	96(24.9%)
Injections	45(11.7%)	99(25.7%)	126(32.7%)	91(23.6%)	24(6.2%)
Examine the mouth	10(2.6%)	26(6.8%)	70(18.2%)	195(50.6%)	84(21.8%)
having to open the mouth	7(1.8%)	25(6.5%)	55(14.3%)	237(61.6%)	61(15.8%)
Having dentist touch	19(4.9%)	6(1.6%)	100(26%)	201(52.2%)	59(15.3%)
Having dentist look at you	4(1%)	29(7.5%)	64(16.6%)	223(57.9%)	65(16.9%)
Fear of tooth drilling	33(8.6%)	40(10.4%)	113(29.4%)	171(44.4%)	28(7.3%)
Seeing of dental drilling	22(5.7%)	19(4.9%)	117(30.4%)	198(51.4%)	29(7.5%)
Fear of the sound of drilling	25(6.5%)	62(16.1%)	110(28.6%)	168(43.6%)	20(5.2%)
Fear of having instruments in the mouth	3(0.8%)	37(9.6%)	99(25.7%)	209(54.3%)	37(9.6%)
Fear of not being able to breath	3(0.8%)	34(8.8%)	131(34%)	179(46.5%)	38(9.9%)
Having to go to hospital	43(11.2%)	75(19.5%)	131(34%)	115(29.9%)	21(5.5%)
People with white uniform	0	10(2.6%)	33(8.6%)	254(66%)	88(22.9%)
Fear of professional cleaning	0	7(1.8%)	45(11.7%)	285(67%)	75(19.5%)

Fig. 2: Score of children`s dental fear

Table 3 : LSD test for comparison between means of ECOHIS and behaviour score

Confidence interval of 95%		P value	Mean difference	(J)	(I)
Upper	Lower		(I-J)		
0.7433	-3.3416	0.212	-1.29913	-	--
4.6460	.5966	0.011	2.62133*	+	--
5.1747	.9784	0.004	3.07654*		--
5.8555	1.9854	0.000	3.92046*	+	-
6.3874	2.3639	0.000	4.37567*	++	-
2.4490	-1.5386	0.654	0.45521	++	+

In this study, the relationship between early childhood oral health impact scale (ECOHIS) and preschoolers's fear and behavior during the dental treatment was investigated in 385 participants (aged 3-6 years. Approximately 60% of children had pain in the teeth, mouth or jaws during drinking and eating which could affect their daily activities and quality of their sleeping. Pain was one item in the questionnaire that by increasing its score, level of fear also could rise. Lee et al. found out that the CFSS-DS score and clinical anxiety have different predictors, especially maternal dental fear, pain during the first visit and regular visits. Moreover, fear and response during the dental treatment are affected by many factors [15]. Kingberg et al. showed that children's dental fear was related with missing dental visit and dental caries [16]. In another study, children with extraction experiment had high levels of fear than children with conditioning experiments such as filling [17]. Further, children's fear was decreased with the experience of previous dental visit/ filling and children with one case of dental decay had high level of fear than those with no caries [18]. In line with our results, Olivera et al. evaluated anxiety and pain during the dental treatment (age < 5 years old) and found that there was an association between the dental pain, age, family income, and oral health status [19].

In this study, according to the CFSS-DS results, more than 50% of parents had problem to arrange the cost of dental services and regular checkups that cause mental disorders in parents and render children`s fear. It was determined that etiology of dental fear is a multifactorial phenomenon that affects its expression. In addition to age and gender that affects the expression of pain, culture and family income could influence the variability of the expression and measurement of the dental fear [20]. For this reason, family income is one important item in ECOHIS, which could impact the total score of fear. Relation of parent`s upset is another item in ECOHIS that is associated with children`s dental fear and has been discussed in different studies [21-23]. Besides tooth diseases, various problems on talking and pronouncing are created. In this study, children had experienced no problem on these cases, however their parents' anxiety was high. In the Mehrstdt et al study, a low to moderate relationship was found between the pronunciation and bad tasting and dental anxiety [24].

According to the CFSS-DS, many of children had no fear of dentist and a few of them showed no anxiety of injection or going to hospital. Furthermore, none of them had fear of people with white uniform and professional cleaning. However in another study, the highest fear was related

to the injection and drilling sounds [25]. Finally, a positive correlation was found between ECOHIS score and dental fear which was increased by increasing the level of fear score. McGrath et al. used Corah Dental Anxiety Scale (DAS) and oral health-related quality of life instrument (OHQOL), and concluded that dental anxiety was related with the impact of oral health and life quality [26]. Moreover, OHRQOL was determined by Oral Health Impact Profile (OHIP) and a low to moderate relationship between OHRQOL and Dental Anxiety Scale (DAS). And Dental Fear Survey (DFS) was observed [24].

In this study, there was negative correlation between the behavior and ECOHIS score during the dental treatment. Fear of anesthetic injections and negative dentist behavior were determined in two different populations (Americans than Taiwanese) and the results showed that Taiwanese and Americans with high dental anxiety had similar high fear of injections, however similar fears about dental drilling was reported. These results confirmed that cultural differences could affect the characteristics or etiologies of dental fear in dental health care systems [27]. It is worth noticing that financial problems and poor culture of family are motivators in increasing the ECOHIS score. After this status, children showed more inappropriate behavior during the dental treatment. In the present study, significant relationship was observed between the fear and behavior of children and children with negative behavior had more fear in comparison with children with positive and definitely positive behavior. This result of Frankle`s scale was similar to previous researches [18,21].

Conclusion

According to the results, fear and behavior of the children during first visit of dental treatment had significant relationship with ECOHIS score, while for each unit of increase in the fear, ECOHIS score rised about 0.198. Moreover, by decreasing the quality of life, fear and uncooperative behavior could be high in the first dental visit.

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