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RESEARCH ARTICLE

ASSESSING AGREEMENT BETWEEN PARENTS AND THEIR 6-12 YEARS OLD CHILDREN ON DENTAL FEAR RATING USING CHILDREN'S FEAR SURVEY SCHEDULE—DENTAL SUBSCALE

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CFSS-DS: The children's fear survey schedule-dental subscale.

ABSTRACT

Background: It is well known that dental fear is a common phenomenon among children and adolescents. CFSS-DS is the most widely used scale for measuring dental fear in children. **Objectives:** To investigate the agreement between parental rating of dental fear and self-rating of their 6-12-year-old children and to assess the relation of dental fear with child's age and gender. **Methods:** A cross-sectional study was undertaken among primary school children between 6 and 12 years old, in Qassim region, Saudi Arabia. A total number of 536 child/mother pairs were enrolled. The child version of CFSS-DS was filled by students in school setting. While, the parental version of the CFSS-DS was filled at home by child's mother on behalf of them. **Results:** The mean dental anxiety score reported by the children was (29.88 ± 12.49), whereas the parents' assessment of their children was (27.31± 7.77), (P= 0. 001). The intraclass correlation coefficient between the child and parental version of CFSS-DS was 0.25. The mean dental fear score reported by males was (27.21 ± 11.99) and by females (31.65 ± 1349), (P=0.001). Parents of low anxious children overestimated their children's fear, while parents of high anxious children underestimated their children's fear. The most fearful dental items reported by the children and their parents were injections, the dentist drilling and choking. **Conclusions:** Poor agreement in dental fear assessment between parents and their 6-12-years-old children, with a tendency of parents to underestimate their children dental fear. Female children scored significantly higher dental fear than males.

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INTRODUCTION

It is well known that dental fear is a common phenomenon among children and adolescents from different cultures all over the world. Reviewed studies, from 12 populations in Australia, Canada, Europe, and the USA had shown that the combined prevalence of dental fear among children, and adolescents was 9.4 percent (Klinberg, 2007). Dental fear may additionally result in neglect of dental care and consequently represents a problem to both dentists and patients (Bedi *et al*., 1992). Dental practitioners, particularly pediatric dentists face children with dental fear and dental management behavioral problems. Therefore, early recognition of this serious problem is crucial to effective dental treatment. Dental fear is multifactorial in origin and several factors have been identified to its etiology as age, with increase in age dental fear decreases reflecting normal development of child psychology (Klinberg, 2007). In addition, child's temperament, cultural background, and subjective experiences are important factors for development of dental fear (Ten Berge *et al*., 2002a). Furthermore, previous bad invasive and painful dental experience at an early age in a child's dental history, undesirable descriptions by parents, siblings, or even peers and coexisting parental dental anxiety and anticipations of a child's anxiety play a significant role in the acquirement of dental fear (Klein *et al*., 2015). Child's dental anxiety can be assessed with three broad measures including (I) behavioral ratings during dental treatment, (II) physiological responses and (III) psychometric scales through completion of a questionnaire either by accompanying parents as proxy or self-ratings by the child themselves (Koroluk, 2000). In pediatric dentistry research, a psychometric scale: the children's Fear Survey Schedule Dental Subscale (CFSS-DS) is the most broadly used scale for measuring dental fear in children (Cuthbert, 1982;

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Porritt *et al*., 2013). The CFSS-DS has been used in several nations and translated to many languages like Dutch (Ten Berge *et al*., 2002b), Finish (Alvesalo *et al*., 1993), Japanese (Nakai *et al*., 2005), Greek (Arapostathis *et al*., 2008) and Arabic (El-Housseiny *et al*., 2014). It has shown reliability and validity in measurement of dental fear in English (Cuthbert, 1982) and other different languages (Ten Berge *et al*., 2002b; Alvesalo *et al*., 1993; Nakai *et al*., 2005; Arapostathis *et al*., 2008; El-Housseiny *et al*., 2014). CFSS-DS is used in two versions, one to be completed by parents on behalf of their child and one for the children themselves. It remains unclear, if parents can precisely evaluate dental fear on behalf of their child. In some research, children parents were asked to assess their dental fears (Ten Berge *et al*., 2002a; Cuthbert, 1982; Ten Berge *et al*., 2002b; Krikken *et al*., 2013), whereas self-report rating by child in other (Nakai *et al*., 2005; Arapostathis *et al*., 2008). Several studies have been done with regard to parents' ability to predict their children dental fear. Agreement between self-report rating of child's dental fear and their parental report ranged from poor agreement (Krikken *et al*., 2013; Luoto, 2010; El-Housseiny *et al*., 2015; Malhotra *et al*., 2018) to moderate (Klein *et al*., 2015; Folayan *et al*., 2004; Gustafsson *et al*., 2010; Shindova *et al*., 2014). Along these lines, the available information about agreement between parental rating of dental fear and their young child's rating is controversial and therefore not clear particularly in Middle East nations. The purpose behind this study was to investigate the agreement between parental rating of dental fear and self-rating of their 6-12-year-old children and to assess the relation of dental fear with child's age and gender using the Arabic version of CFSS-DS.

MATERIALS AND METHODS

Prior to the beginning of study, required permissions were taken from school board and Ministry of Education, in addition informed consent was taken from children parents to participate in the study, through official letter sent to them through school authority explaining the aims and scope of the study. Furthermore, ethical approval was taken from ethical committee in College of Dentistry, Qassim university, Saudi Arabia. The children included in the study where in the age range from 6-12 years, with good general health and with adequate knowledge of Arab language to understand the purpose of study. Children with appearing learning and physical disorders, inadequate knowledge of Arab language were excluded from the study. After getting all the required consents.

A cross-sectional study was undertaken among primary school children in three major cities (Buraydah, Unaizah and AlRass) in Qassim region, Saudi Arabia. A total number of 536 child/mother pairs were enrolled in the survey. The children were asked to fill out the child version of CFSS-DS in their classrooms under supervision from their teachers and the authors helping young students only in reading, clarifying unclear words, without affecting their own rating of dental behavior. While, the parental version of the CFSS-DS was given out to the children, together with a message querying the mothers of the children to complete the questionnaire on behalf of them, without any assistance of their children. The mothers were requested to return the questionnaire once completed in sealed envelope. Dental fear was measured using the Arabic version of the CFSS-DS (El-Housseiny *et al*., 2014). Separate child and parental versions were used.

Both questionnaires consist of the same 15 questions, covered different aspects of dental treatment, using a5-point Likert scale. The possible item responses ranged from 1 (not afraid at all) to 5 (very afraid), giving a range of possible scores from 15–75.32 score were considered to be the cut-off for dental fear as used in several studies (Klein *et al*., 2015; Ten Berge *et al*., 2002b; Krikken *et al*., 2013; El-Housseiny *et al*., 2015). Statistical analysis was carried out using SPSS version 20. Descriptive statistics, means and standard deviation were calculated. Each child dental fear was calculated by summing the CFSS-DS item scores. The intra class correlation coefficient (ICC) was used as a measure of agreement between the parental and child version of the CFSS-DS. Independent sample t-test was used to compare between child's self-report of dental anxiety and their parents report. Two way analyses of variance (ANOVA) models was used for determination of difference in the mean CFSS-DS scores between children by age and/or gender. Significance value was set at $p < 0.05$.

RESULTS

The study was carried among 536 child/mother pairs. Forty-six mothers were excluded due to incomplete filling of the parental version of CFSS-DS. The Population of the sample consisted of 490 mothers,233 male student and 303 female student can be seen in Table. 1. The mean dental anxiety score reported by the children was (29.88 ± 12.49), whereas the parents' assessment of their children was (27.31± 7.77), there was statistically significant difference, (P= 0. 001). The intraclass correlation coefficient between the child and parental version of CFSS-DS was 0.25, which interpreted as a poor agreement.

In some studies, (4,13,15), children are classified into low and high anxious using cut-off scores. Children who scored 32 or more on the CFSS-DS were categorized as high anxious children, and children scoring less than 32 were categorized as low anxious children can be seen in Table.2. According to the self-reported anxiety by the children, 173 (35.3%)were high anxious children and 317(64.7%) were low anxious children. However, based on parent's reports, 156 (30.0%)were categorized as high anxious children by parents and 334(70.0%)as low anxious children by parents. Only 101 (24%) of parents rated their children in a different category than their child, resulting in a sensitivity of 66%, a specificity of 87%, a positive predictive value of 73%, and a negative predictive value of 82%.

Table 3compares the mean and standard deviation for each item of CFSS-DS rated by children and their parents. The most feared items reported by the children and their parents were injections, the dentist drilling and choking. The least fearful items rated both by children and their parents were people in white uniforms, having to go to the hospital and doctors. The differences between child and mother scores were statistically significant ($P<0.05$) for items approximately related to actual dental procedures (items 2,5,7,9,11,13and 14). Comparison of mean CFSS-DS item scores rated by male and female school children is given in Table. 4. There was statistically significant difference in the mean score between male and female for all questions except for questions 4,5,12 and 14 which were, having somebody examine your mouth, having to open your mouth, choking and people in white uniforms ($P<0.05$). Female students reported higher fear scores than males for all items except choking.

Table 1. Distribution of children age and sex

Age	Male	Female	Total
6-8 years	73	68	141
9-10 years	73	118	191
11-12 years	87	117	204
Total	233	303	536

Table 2. Cross-tabulation between count and percentage of children with high and low dental anxiety scores rated by child /parent pairs

Parent-report	Child –report		
	High anxious child	Low anxious child	Total
High anxious child	114 (23 %)	42 (8.7%)	156 (30.0%)
Low anxious child	59 (15.3%)	275 (56%)	334 (70.0%)
Total	173 (35.3%)	317 (64.7%)	490 (100%)

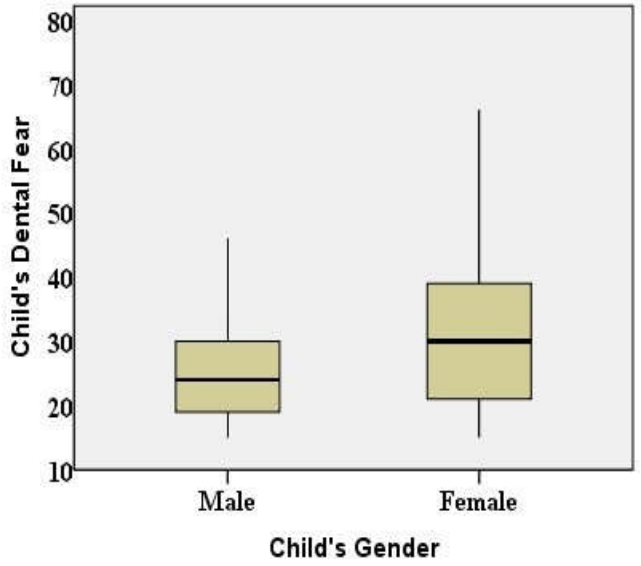

Figure 1. Child dental fear scores by gender

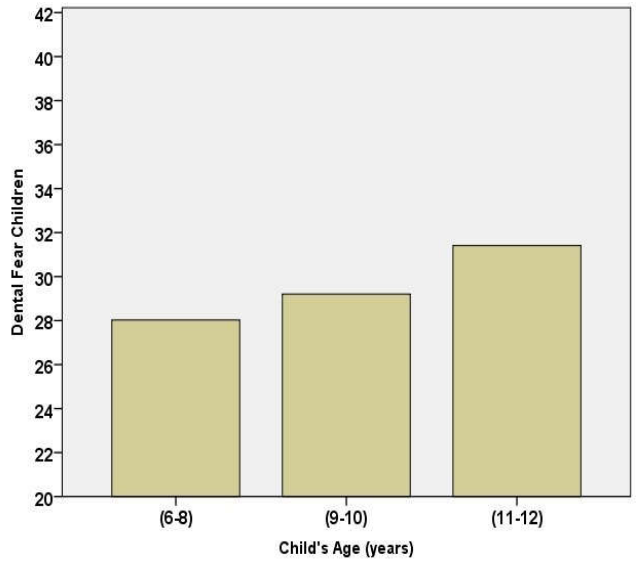

Figure 2. Child dental fear scores by age groups.

Figure 1shows the dental fear scores by gender of the child. The mean dental fear score reported by males was (27.21 ± 11.99) and by females 31.65 ± 1349). The difference was statistically significant, with females reporting, on average, 4.44 points higher than males (P=0.001).

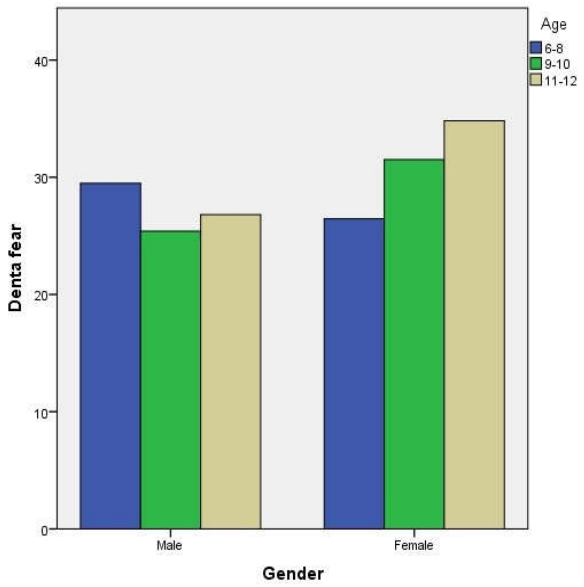

Figure 3. Child dental fear scores by age and gender

Figure 2 displays dental fear scores by age. The reported dental fear scores by age showed higher scores in older age female children but not in males, we found no statistically significant association between reported dental fear scores and the age groups in children (P=0.056). Once gender is considered, a similar pattern was found of higher scores with older age female but not in male. The highest scores were for younger male children and dropped for older age are presented in Figure. 3. Considering age and gender together (two-way ANOVA), we found statistically significant only for gender but not for age.

DISCUSSION

The purpose behind this work was to investigate the agreement between parental rating of dental fear and self-rating of their 6-12-year-old children. The calculated intraclass correlation coefficient was 0.25 indicated a poor agreement between parents and their children in assessment of child's dental fear, lower than the intraclass correlation coefficient found in other research (Klein *et al*., 2015; Krikken *et al*., 2013). A possible explanation could be that someone else other than child's mother may fill the questionnaire as it was filled at home without monitoring also the children filled the questions at school and not in dental environment. Shindova *et al*. found that Parents are reliable reporters of dental fear for their 6-12-years-old children during dental treatment (Shindova *et al*., 2014). Our results do not seem to confirm their observation, in fact that parent were not able to predict their child's dental fear. The primary cause of the discrepancy is due to difference in study design. On the other hand, our data are in agreement with Luoto *et al*. who observed that parents and children cannot be used as reliable proxies for assessing each other's dental fear in 11- to-16-year-old children (Luoto *et al*., 2010). In the current survey, the most remarkable result to emerge from the data is that the parents slightly underestimate their children's dental fear where mean dental anxiety scores reported by children and their parent were 29.88 and 27.31, respectively. Even though these results differ from some published studies (Klein *et al*., 2015; Krikken *et al*., 2013; Malhotra *et al*., 2018), they are consistent with those of Gustafsson *et al*. study (Gustafsson *et al*., 2010), which showed that Self-rating of Children (8–12 years) dental fear

Table 3. Comparison of mean CFSS-DS item scores rated by children and their parents

Item	children N= (490)		Mothers N=(490)		P
	Mean	SD	Mean	SD	
Dentists	1.77	0.98	1.75	1.12	0.765
Doctors	1.35	0.64	1.52	0.98	0.001*
Injections	2.51	1.25	2.57	1.43	0.468
Having somebody examine your mouth	1.40	0.72	1.58	0.99	0.001*
Having to open your mouth	1.43	0.80	1.63	1.02	0.001*
Having a stranger touch you	2.28	1.20	2.42	1.47	0.092
Having somebody look at you	1.64	0.92	1.90	1.26	0.001*
The dentist drilling	2.48	1.25	2.61	1.44	0.088
The sight of the dentist drilling	2.14	1.12	2.37	1.42	0.003*
The noise of the dentist drilling	2.02	1.05	2.11	1.31	0.210
Having somebody put instruments in your mouth	1.92	0.90	2.29	1.43	0.000*
Choking	2.30	1.18	2.43	1.46	0.132
Having to go to the hospital	1.33	0.66	1.63	1.13	0.001*
People in white uniforms	1.13	0.49	1.41	0.93	0.001*
Having the dentist clean your teeth	1.62	0.85	1.67	1.14	0.437

*p < 0.05 Independent sample t-test

Table 4. Comparison of mean CFSS-DS item scores rated by male and female school children

Item	Male N= (233)		female N= (303)		P value
	Mean	SD	Mean	SD	
Dentists	1.60	1.09	1.91	1.23	0.002 *
Doctors	1.39	0.95	1.68	1.08	0.001 *
Injections	2.38	1.31	2.64	1.53	0.036 *
Having somebody examine your mouth	1.55	1.00	1.67	1.13	0.212
Having to open your mouth	1.57	0.96	1.71	1.19	0.125
Having a stranger touch you	1.73	1.10	2.82	1.53	0.000 *
Having somebody look at you	1.57	1.02	2.07	1.33	0.000 *
The dentist drilling	2.43	1.34	2.74	1.52	0.014 *
The sight of the dentist drilling	2.10	1.26	2.52	1.53	0.001 *
The noise of the dentist drilling	1.91	1.25	2.23	1.42	0.005 *
Having somebody put instruments in your mouth	2.10	1.27	2.40	1.52	0.015 *
Choking	2.50	1.42	2.39	1.49	0.409
Having to go to the hospital	1.49	0.99	1.68	1.17	0.038 *
People in white uniforms	1.38	0.91	1.47	1.04	0.299
Having the dentist clean your teeth	1.51	1.04	1.73	1.21	0.023 *

*p < 0.05 Independent sample t-test.

23.2 and Parental rating of child dental fear was 21.1 in their reference group (children visiting ordinary public dental clinics). This result was not expected. However, it is likely that the reason for this is that the mothers don't know the real dental fears of their children and absence of bad previous dental experience for the young students. Despite the underestimation of CFSS-DS scores by parents to their children, we believe the value of our figures compare well to Klein *et al*. study where mean dental anxiety scores for 6-10 years old children and their parents were 30.30 and 33.24, respectively (Klein *et al*., 2015), and higher than El-Housseiny *et al*. study in which scores were23.2 (for 6 to12 -year-old Saudi children) and 25.9 (for parents) (El-Housseiny *et al*., 2015). We found much higher values for CFSS-DS scores with respect to those reported by earlier study carried in dental setting in Saudi Arabia (El-Housseiny *et al*., 2015), a reasonable explanation for higher values of dental fear in our children may be attributed to difference in study design, child's temperament, cultural background, and subjective experiences. In this study, children were most afraid of injections, the dentist drilling and choking which comparable to reports from other studies where injections and the dentist drilling were the most feared dental items (El-Housseiny *et al*., 2014; Krikken *et al*., 2013; El-Housseiny *et al*., 2015; Shindova *et al*., 2014). This implies that fear for specific dental items may be constant amongst several cultures although the total fear score different. The least fearful items rated both by children and their parents are people in white uniforms, having to go to the hospital and doctors similar to results obtained in a number of previous studies where people in white uniform were the least fearful item (El-Housseiny *et al*., 2014; Krikken *et al*., 2013; El-Housseiny *et al*., 2015). Regarding the correlation of dental fear and child's age/gender, it was found that female children scored significantly higher dental fear than males. This data agrees with previous studies (Klein *et al*., 2015; Ten Berge *et al*., 2002b; Arapostathis *et al*., 2008; El-Housseiny *et al*., 2015). This difference in our research may possibly reflect cultural concern by way of boys are classically raised to be brave and are expected to hide their fears, unlike girls (El-Housseiny *et al*., 2015). While others have found no effect of gender on dental fear (Nicolas *et al*., 2010). Considering age and gender together, we found statistically significant relation only with gender but not with age. Based on age alone, there was no statistically significant relation between reported dental fear scores and the age groups in children. We aware that our research may have two limitations related to study design. The first is study was carried in a school setting away from actual dental environment; helping the very young children in reading and clarifying the unclear questions by the researcher and school teachers. The second is parental survey was completed at home; we would not be sure who filled the questionnaire. These limitations could have influenced the way children and their parents rating dental fear. Further future specific research should be performed in the actual dental environment to correlate the CFSS-DS score to the real behavioral observations during dental treatment and to explore the relation between parental dental fear with their child dental fear with a larger sample size.

Conclusion

Based on the study findings. Poor agreement in dental fear assessment between parents and their 6-12-years-old children, parents are unable to predict the dental fear of their children with a tendency to slightly under estimate than their children did. In general, these results suggest that female children score significantly higher dental fear than males, dental fear increase with age in female children but not in males and no statistically significant relation between reported dental fear scores and the age groups in children. The most fearful dental items reported by the children and their parents were injections, the dentist drilling and Choking. So, Pediatric dentists should guide the child's behavior, decrease discomfort associated with needle injection and provide a pain free restorative procedure to make a pleasant dental experience and positive attitude to forthcoming dental treatments.

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