# IS DENTAL FEAR RELATED TO CLINICAL CONSEQUENCES OF UNTREATED DENTAL CARIES IN CHILDREN?

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### ABSTRACT

**Purpose:** To explore correlation between dental fear and consequences of untreated dental caries in children.

**Methods:** Assessments of dental fear using Children's Fear Survey Schedule-Dental Sub-scale, dental caries using decayed, missed and filled teeth index and consequences of untreated dental caries using pufa/PUFA index. Children (n= 250) were selected from clinics of Pediatric Dentistry and Dental Public Health Department, Cairo University.

**Results:** Prevalence of pufa/PUFA>0 was 84.8% and 11.2% respectively. Mean score of pufa/PUFA was 3.83 and 0.20 respectively. Positive significant correlation between fear and dmft (primary dentition) was noted (*P*=0.003). Whereas, a negative significant correlation between fear (CSFSS-DS) and PUFA (permanent dentition) was revealed (*P*=0.021). On the other hand, no significant correlations between fear and pufa (primary dentition) (*P*=0.073) as well as DMFT (permanent dentition) were found (*P*=0.919). No significant association was noted between fear scores, gender and age.

**Conclusion:** fear may have an impact on scores of caries and its consequences.

**KEYWORDS:** Consequences of untreated dental caries, dental fear in children, DMFT, PUFA.

## INTRODUCTION

Untreated dental caries among children in developing and undeveloped countries is not a rare condition. Reduced utilization of dental treatment may be caused by numerous factors. Patients related factors as; negative attitude towards dentistry or unawareness, neglect in oral hygiene, cost of dental care and dental fear or anxiety may adversely affect seeking dental treatment. Dentists related factors -as manpower and training- as well as factors related to the community -as insufficient oral health care facilities- may also constitute reasons for non-use of dental services. [1] Researches worldwide have reported that nearly 6 % to 22% of children have experienced dental fear. These figures differ from population to another [2].

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Some individuals experience fear due to inception of some stimuli before or during dental treatment. Sight of a syringe, noise of hand-piece drilling and other dental armamentarium may trigger emotional feelings of uneasiness [3]. Since the initial response to a fearful situation is its avoidance, this uncomfortable sensation often represents an obstacle to strive for dental care [4]. It is expected that children may encounter some degree of fear when visiting the dental clinic especially on the first dental appointment. Such feeling is perhaps due to possible patient-parent separation, or other factors related to child psychological development [5].

As a result, it is mandatory to detect fear and its possible sources in children at an early stage. Consequently, various categories of fear measuring scales have been exploited. A wide variety of measures are available to assess the level of dental anxiety. Most of these measures display suitable levels of consistency, validity, and reliability. Physiological measures are not commonly used in dental clinics because they are time consuming and require monitoring team [6].

A psychometric method, named Children's Fear Survey Schedule-Dental Sub-scale (CFSS-DS), was developed by Cuthbert & Melamed in 1982 to assess fear [7]. The CFSS-DS is a revised form of the Fear Survey Schedule for Children (FSS-FC). Since its launch, this scale has been seconded as a reliable and valid tool in assessing dental fear [5].

The costs of untreated dental caries are extreme. Such costs may inflict delirious effects on children's overall health; creating the potential to affect child's speech and communication, nutrition and physical development -especially in height/weight- besides being distracted in daily activities whether learning or even playing. Furthermore, financial burdens of untreated dental caries are equally out-sized, as treatment may require extensive restorative services. Treatment often includes placement of stainless steel crowns to restore function of decayed primary molars [8]. Besides, indirect costs of untreated

dental caries may be measured using factors like; work loss days, school loss days, reduced activity days and bed disability days. Although, the loss could be relatively small on an individual basis, it becomes significant when the population as a whole is considered [9].

Consequently, the current study aimed to correlate the index of clinical consequences of untreated dental Caries (pufa/PUFA) to dental fear in children utilizing CFSS-DS among a group of Egyptian children.

## SUBJECTS AND METHODS

### Settings

The current study was carried out on state here how many children selected from outpatients attending Pediatric Dentistry and Dental Public Health Department, Cairo University where CFSS-DS, dmft/DMFT and pufa/PUFA were all investigated.

### Subjects

Children were recruited in the study after ethics committee approval, explaining to parents/ caregivers the aim of carrying out this investigation and obtaining an informed consent. Participation in the study was voluntary, thereby, only children of parents/caregivers who decided to contribute in the study were included according to the following inclusion criteria: 1-Medically free children. 2- Aged six to 12 years old. 3- No previous dental history. 4- No previous history of hospitalization. 5- No previous history of experiencing major accidents. Whereas exclusion criteria were as follows: 1- Mentally disabled children. 2- Children with neuropsychiatric disorders. 3- Children requiring emergency dental treatment. 4- Children reported by dental pain.

Sample size was calculated based on a previous study, and by using Med Calc statistical software. Assuming area under ROC to be 0.80, an alpha of 0.05 and power of study 90.0%. A minimum sample

size comprising 250 patients was required for this study. Research randomizer software (https://www.randomizer.org/) freely available online was used to specify the selected patients per day.

As an average, it was estimated that the minimum number of patients attending the clinics of Pediatric Dentistry and Dental Public Health Department, Cairo University was around 150 daily. It is worthy to note that all patients attending the clinics are registered and given a sequential number/code according to their attendance. Therefore, using the research randomizer, the answer to the available question regarding the total number of the set chosen was 50, from a range of one-150 patients. Accordingly, the software chose randomly the numbers/codes of the 50 patients to be included in the study for this day. The selected numbers/codes were highlighted in the list, so that the researcher can identify the patients randomly selected in order to carry out the assessment before commencement of dental treatment. This process was repeated till the total sample size was obtained.

**Methods:**

The total sample size was examined for assessment of fear, caries and its consequences using the relevant indices. As the study conducted was observational per se, tell show do technique was quite enough to complete the examination.

*Children's Dental Fear*

Children's Fear Survey Schedule-Dental Subscale was used to measure dental fear in the child. The CFSS-DS assesses 15 fear promoting factors. It includes questions to assess children's fear from dentists, doctors in general, white coat phobia, strangers, fear from injections and other possible procedures encountered during dental treatment. Factors were rated by scores from one to five representing the degree of fear from not afraid at all to very afraid, thus scores had a minimum of fifteen and a maximum of 75 [10]. Questions in the

CFSS-DS were translated in Arabic verbally to children who participated in the study. The questionnaire had been validated beforehand through backward and backward translation in order to ensure that children can comprehend questions without any misinterpretation or deviation from what was intended to be questioned. An Arabic translation was added -for the sake of standardization- to ensure using the exact wording on repetition. Afterwards, one of the researchers -who had addressed the study to the patients and caregivers- marked the score for each item and calculated final scores.

*Assessment of Caries Index and Consequences of Untreated Dental Caries Index*

Oral examinations were performed by one of the researchers to ensure consistency of the results. This was performed on the dental chair while children were lying in the supine position. Sterile sets of mirrors and probes were used as diagnostic examination tools to score caries and its consequences according to procedures described by World Health Organization (WHO) [11] and Monse et al. [12] to record dmft/DMFT and pufa/PUFA indices respectively. Both scores for permanent and primary teeth were reported separately utilizing the studied indices [12]. The acronym -PUFA- refers to presence of pulp involvement, ulceration of oral mucosa, fistula and abscess respectively.

**Statistical Analysis:**

Data was collected and entered into the personal computer. Statistical analysis was done using Statistical Package for Social Sciences (SPSS/version 20) software. The statistical tests used were as follows: Arithmetic means, standard deviation, Chi square test for categorized parameters, t-test was used for parametric data (two groups) and ANOVA test for three groups. Correlation between the two variables was done by Spearman correlation coefficient. The level of significant was set to 0.05.

## RESULTS

Table 1 shows distribution of studied group regarding age and gender together with CFSS-DS scores. Mean age in the study sample was 8.3 years. No statistical significant difference was noted comparing males and females ($P=0.065$). Meanwhile, CFSS-DS scores showed no statistical significant difference irrespective of age and gender ($P=0.264$).

Figure 1 illustrates the mean dmft/DMFT and pufa/PUFA scores in the current study. Patients showed higher burden of consequences of untreated dental caries in primary dentition compared to permanent dentition.

Figure 2 illustrates correlation between dental fear score, pufa/PUFA and dmft/DMFT scores in primary and permanent dentition. A positive significant correlation between fear (CFSS-DS) and dmft in primary dentition was noted ($P=0.003$). Whereas, a negative significant correlation between

fear (CSFSS-DS) and PUFA in permanent dentition was revealed ($P=0.021$). On the other hand, no significant correlations between fear (CFSS-DS) and pufa in primary dentition ($P=0.073$) as well as DMFT in permanent dentition ($P=0.919$) were found.
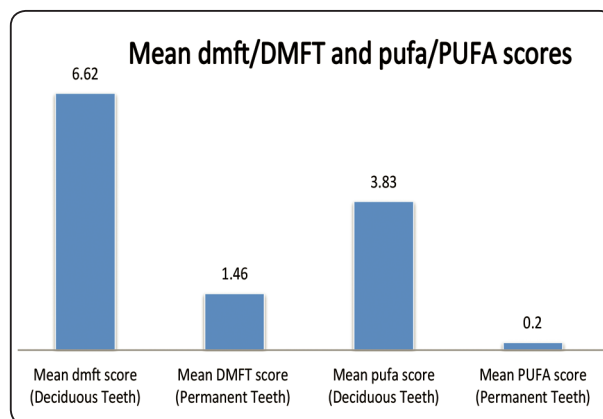


Fig. (1) Mean dmf/DMF and pufa/PUFA scores in the study.

TABLE (1) Relation between age, gender and fear scores (CFSS-DS).

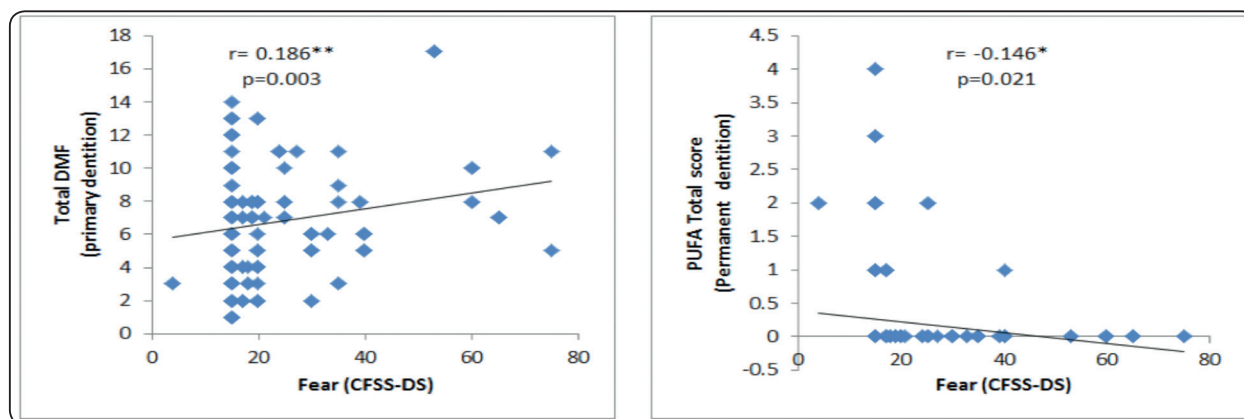| | Age | | | | | | Total | Test p |
|---|---|---|---|---|---|---|---|---|
| | 6-7 years (n=85) | | 8-9 years (n=114) | | 10-12 years (n=51) | | | |
| **Gender** | | | | | | | | X² = 5.48 P=0.065 |
| Females | 49 | 38.3 | 60 | 46.9 | 19 | 14.8 | 128 | |
| Males | 36 | 29.5 | 54 | 44.3 | 32 | 26.2 | 122 | |
| **Fear (CFSS-DS)** | | | | | | | | |
| Range of scores Mean±S.D. | 15-75 22.29±13.25 | | 15-65 20.77±11.77 | | 4-40 18.88±11.84 | | 4-75 20.9±11.84 | F=1.34 P=0.264 |



Fig. (2) Correlation between fear score, pufa/PUFA and dmf/DMF scores in primary & permanent dentition.

## DISCUSSION

The current study aimed to assess the correlation between pufa/PUFA indices and dental fear in children using CFSS-DS. This scale showed good reliability and validity compared to other fear scales and assessments [13].

Patients who participated in the current study were selected from the outpatients seeking treatment at Pediatric Dentistry and Dental Public Health Department - Faculty of Dentistry , Cairo University. Therefore, the current cross-sectional study recruited a convenience sample of patients but the number of patients assessed gave the statistic adequate power. It is worth mentioning that, this study sample could not speculate a generalized reflection of the whole Egyptian population because besides the usual dental caries-related indicators which vary from an individual to another, the socio-economic status of this study sample should be taken into consideration as it represented patients in a particular stratum who depend on dental treatments and services provided with subsidized fees. Such patients often attend the clinics of the department when there is a chief complaint or an emergency, though some patients attend for follow up visits and to complete a previously planned line of treatment after management of the chief complaint dealt with at the first visit. In light of this fact, the researchers aimed to investigate fear as a factor to abandon dental treatment.

The study sample had recruited patients six to 12 years old in order to weigh the burden of untreated dental caries in both deciduous and permanent dentitions after a considerable life span after eruption of teeth.

Fear was measured before commencement of the treatment; this may have overestimated the patients' fear. Other fear alleviating or promoting factors such as parenting and behavior management techniques that may impact patients' behavior and/ or fear were not measured. The practical influence of dental fear in patients who participated in the study and their willingness for follow-up treatment was not studied. Such factors may be considered as limitations in this study.

Regarding the mean scores of pufa/PUFA index, in the current study, the mean score of pufa was 3.83 in primary dentition and the mean score of PUFA was 0.20 in permanent dentition. This was similar to results revealed by Moheb et al. [14] among patients in the mixed dentition stage, where the mean score of pufa was 2.80 in primary dentition and the mean score of PUFA was 0.27 in permanent dentition. This could be due to enrolling similar study samples and thereby social, economic and educational levels comprise the same stratum of the population.

The results of the current study showed higher mean scores compared to Baginska and Stokowska [15] study which revealed mean pufa of 0.85 in children six to eight years old. Whereas a study by Monse et al. [12] when compared to the present study, it showed less mean pufa score (1.2) for primary teeth and higher mean for PUFA (3.5) in permanent teeth among six to 12 years old children in Philippines. This difference could be due to differences in populations enrolled in different studies.

Several studies were carried out to correlate dental caries to dental fear. Some studies revealed a positive correlation between dental fear and dental caries[16,17] whereas others have revealed negative association correlating dental fear and dental caries[18,19].

Yet, as far as the available researches present and to the best of our knowledge, studies assessing the correlation between dental fear and the resultant odontogenic liability resulting from advanced untreated dental caries using pufa/PUFA index in the Egyptian population are scarce, making direct comparison for the results of the current study unattainable.

In the current study, the results showed that there was a positive significant correlation between fear using CFSS-DS and dmft scores in primary dentition whereas, no significant correlation was noted between fear using CFSS-DS and pufa scores in primary dentition. On the other hand, a negative significant correlation was noted between fear using CSFSS-DS and PUFA scores in permanent dentition whereas, no significant correlation between fear using CFSS-DS and DMFT in permanent dentition. This could be explained by the fact that the burden of dental neglect is more pronounced -and thus reflected by a positive correlation- in primary dentition when compared to permanent dentition as the mean age in the study sample was 8.3 years which could not reveal great impact on permanent dentition in terms of the components of pufa/PUFA index.

Results on gender differences in dental fear are controversial. The current study, no difference was noted correlating dental fear to gender. Such results were consistent to results of studies encountered by Majstorovic et al. [20] and Pohjola et al. [21]. However, other studies reported that girls are more fearful than boys [22, 23].

Regarding effect of age on dental fear, the current study showed no significant association between fear and age. This was in accordance to studies performed by Oktay et al.[24] and Arslan et al.[25] In contrast to the results of the current study, other studies reported that age was strongly associated with dental anxiety and younger subjects were more anxious than older ones [26]. This could be explained by different age groups enrolled in the study with dissimilar previous dental histories.

## CONCLUSION

Based on the results of the current study, it was concluded that fear may have an impact on intensifying consequences of untreated dental caries. Neither gender nor age showed association with dental fear.

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