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DOI: 10.23804/ejpd.2017.18.03.07

## Dental fear among children of foreign background in a multicultural area in Stockholm

### ABSTRACT

**Aim** To investigate the occurrence of dental fear among children of foreign background in the city of Södertälje, Sweden.

**Materials and methods** Design: Prospective, cross sectional study. The participants comprised 231 7-year-old children with appointments for examination at the Södertälje Public Dental Service. The regular examination was performed, and dental fear was measured according to the parental version of the Children's Fear Survey Schedule Dental Subscale (CFSS-DS). Parents were also asked to fill in a questionnaire covering social background and previous experience of dental care. The study group, which consisted of children of foreign background, was compared to a reference group without foreign background.

**Results** High CFSS-DS values were more frequent in children of foreign background. Dental fear was also significantly correlated to having experienced painful treatment. Parental dental fear had an influence on dental fear in the child. Statistics: Ordinal logistic regression analysis was used to calculate the influence

potential predictors on the dependent variable CFSS-DS.

**Conclusions** This study indicates that, in a dental treatment situation, children of foreign background experience more fear than children of Swedish background. More research is needed to clarify this issue.

**Keywords** CFSS-DS; Dental fear; Foreign background.

## Introduction

Dental fear (DF) and behaviour management problems (BMP) are challenges in paediatric dentistry, but little is known about dental fear among children of foreign background.

In a Swedish sample of children, the prevalences of DF and BMP were 6.7% and 10.5% respectively [Klingberg et al., 2006]. Approximately 1.3% of all children aged 3–19 years in Sweden are referred to clinics for paediatric dentistry, mainly due to lack of cooperation with dental treatment [Klingberg et al., 2006]. DF may lead to avoidance of dental treatment, which in the long term can result in deteriorated oral health [Berggren, 1984].

DF and BMP are associated with each other; 27% of children with BMP are afraid of dental treatment. The remaining children exhibiting BMP do so because of reasons other than fear, such as mental disability or attention disorders [Klingberg, 1995]. The aetiology of BMP is complex, and several interacting factors have been suggested. Psychological factors such as immaturity or generalised fear are of importance [Murray et al., 1989; Klingberg et al., 1995]. Temperamental factors such as shyness are associated with DF, while hyperactivity is associated with BMP [Klingberg and Broberg, 1998; Arrrup et al., 2002]. Cognitive ability plays an important role in coping with stress related to dental procedures [Blomqvist et al., 2013]. Poor socioeconomic status has also been found to be related to DF and BMP, with children living in areas with lower socioeconomic status showing higher DF scores than children from better-situated areas [Klingberg, 1995; Raadal et al., 1995]. Poor oral health is of importance in the development of DF; in one study, children with a large number of decayed teeth at 5 years of age were more fearful at the age of 12 years [Raadal, 2002].

A large number of the patients referred to clinics for paediatric dentistry have foreign background [Dahlander et al., 2015], which raises the question of whether these children are more fearful than native children. If so, then the increasing number of inhabitants of foreign background may lead to a higher

proportion of children with special needs for treatment. According to a demographic study, 18% of the population in Sweden have foreign background, with a range from 11% to 41% between counties; foreign background is defined here as meaning that the person was either born abroad, or born in Sweden with both parents born abroad [Statistics Sweden, 2008]. Few studies have focused on BMP and DF among children of foreign background, despite the fact that these children account for an increasing number of patients at the dental clinics.

The main purpose of the present study was to investigate the hypothesis that the frequency of dental fear differs between children of Swedish background and children of foreign background. Another purpose was to identify potential predictors of dental fear.

## Material and methods

### Subjects and procedures

The study was carried out over a sample of 231 7-year-old children who consecutively attended the Södertälje Public Dental Service from March to September 2011 for their regular check-ups. Invitations for check-ups and participation in the study were sent by mail to the children's parents.

Children with known psychiatric diagnoses were not included in the study.

At the appointment for the check-up, parents were asked to fill in a form with questions regarding social background, foreign background, parental education, if parents felt fear for dental treatment, the child's experience of toothache, and the child's experience of traumatic or painful dental treatment. The parental version of the Children's Fear Survey Schedule Dental Subscale (CFSS-DS) was used to assess the children's dental fear. This 15-item instrument uses a 5-point Likert scale for item scores ranging from 1 (not afraid at all) to 5 (very afraid), giving a total range of 15–75. Cut-off value is set at a value of 38 according to [Klingberg, 1994]. The children were asked to fill in a simplified form with figures illustrating degree of DF and discomfort in the dental situation. Item scores ranged from 1 (no fear or discomfort) to 3 (fear and discomfort). All forms were available in Swedish, English, and Arabic [Klingberg, 1994; El-Housseiny et al., 2014].

BMP was assessed by the examiner according to the Frankl behavioural rating scale [Frankl et al., 1962]. Caries was diagnosed clinically and complemented with radiographs when indicated, and was registered as dmfs/DFS. Presence of plaque and gingivitis was recorded visually as "plaque" or "no plaque" and "gingivitis" or "no gingivitis" respectively. At each visit, BMP was assessed by the dentist along with the patient's own assessment of fear and discomfort. Data

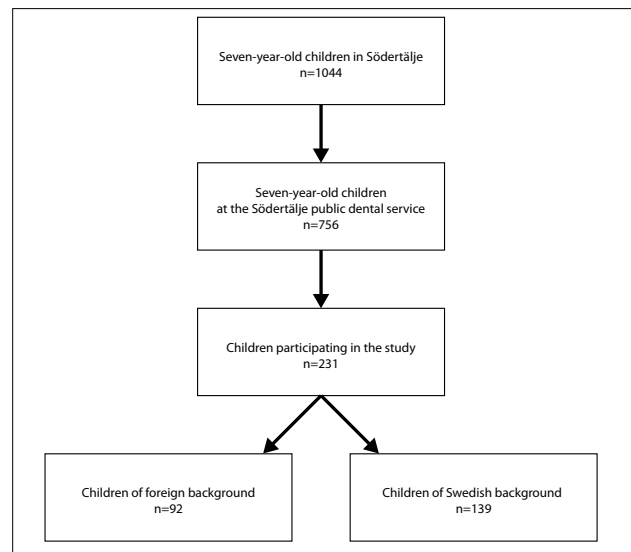


FIG. 1 The sample of children.

concerning BMP, caries, plaque, and gingivitis were collected from the records. Two dentists were assigned to examine the children and to collect the data.

Children of foreign background, defined as having both parents born abroad, were assigned to the study group (n=92), and the remaining children were assigned to the reference group (n=139) (Fig. 1). According to demographic studies, approximately 40% of 7-year-old children in the county of Södertälje had foreign background, and so it had been anticipated that the study group and the reference group would be quite similar in number.

### Statistics

All statistical calculations were performed with a statistical software package (IBM SPSS Statistics 19.0). Spearman's correlation coefficient was used to estimate the association between the independent variables and CFSS-DS, and Wilcoxon's rank sum test was used to compare different groups according to the distributions of DFS and dmfs. Ordinal logistic regression analysis was used to calculate the influence of all potential predictors on the dependent variable CFSS-DS, which was divided into three ordinal levels (15–24, 25–34, 35–45). Results were considered statistically significant at  $p < 0.05$ .

A power calculation with the following assumptions was performed: a power of 0.80, a significance level of 0.05, and a mean difference of 3 scores for CFSS-DS between the two study groups. The calculation showed that at least 90 patients were required in each group.

### Ethical considerations

All participants received both verbal and written information about the study, and participation

Country of birth	Relative frequency (%)
Child and both parents born in Sweden	41
Child and one parent born in Sweden	19
Child born in Sweden, neither parent born in Sweden	29
Neither child nor parents born in Sweden	11

**TABLE 1** Frequency distribution (%) for the children and their parents according to country of birth.

Country of birth	Relative frequency (%)
Sweden	51
European country	13
Asian country*	30
South American country	4
African country	2
*including Turkey	

**TABLE 2** Frequency distribution (%) according to the parent's country of birth.

was voluntary. All data were treated confidentially, and approval from the research ethics committee at Karolinska Institute was obtained prior to data collection (ref: 2011/443-32).

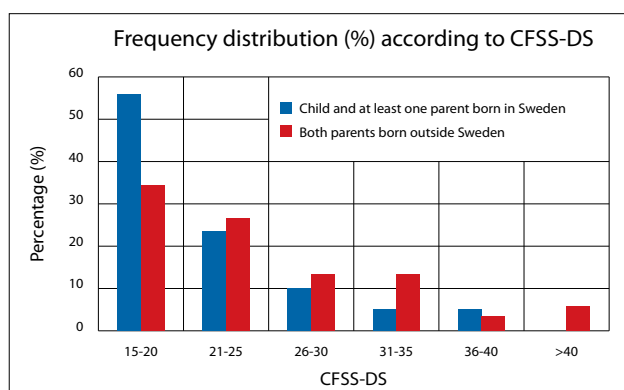
## Results

The participants consisted of 231 7-year-old children (59% boys). Frequency distributions according to the children's and parents' country of birth are presented in Table 1. In 41% of cases, both parents were born in Sweden, and in 11% of cases the child and their parents were born in another country. Of the parents, 51% were born in Sweden and 30% in an Asian country (Table 2), 76% visited dental clinics on a regular basis, and 22% referred to feel fear during dental treatment (Table 3). The parents of foreign background visited dental clinics significantly less frequently (66%,  $p < 0.01$ ). A minority of the children (9%) had experience of toothache or fear during dental treatment (Table 3).

The distribution of CFSS-DS for children with and without foreign background is illustrated in Figure 2. High CFSS-DS values were more frequent for children of foreign background, and the child's DF was significantly more pronounced if both parents were born outside Sweden ( $p = 0.003$ ) (Table 4). In addition, CFSS-DS score was significantly correlated with experience of

Variable	Relative frequency (%)
Parental fear of dental treatment	22
Parents visit dental clinics regularly	76
Child has experience of toothache	9
Child has experience of painful dental treatment	9
Child has experience of discomfort during dental treatment	9
Child has experience of fear during dental treatment	17
Mothers education: elementary school	9
Mother's education: high school	48
Mother's education: university	43
Child has male gender	59

**TABLE 3** Relative frequencies (%) for anamnestic variables.



**FIG. 2** Distribution of fear in the two groups.

Variable	R	P
Neither parent born in Sweden	0.21	0.003
Parental fear of dental treatment	0.19	0.008
Parents visit dental clinics regularly	-0.08	NS
Child has experience of toothache	0.23	0.001
Child has experience of painful dental treatment	0.29	<0.001
Child has experience of discomfort during dental treatment	0.10	NS
Child has experience of fear during dental treatment	0.23	0.001
DFS	-0.02	NS
DMFS	0.23	0.001
Plaque	0.06	NS
Gingivitis	0.01	NS
Mother's education	-0.16	0.033
Child's gender	-0.12	NS

**TABLE 4** Spearman correlations between CFSS-DS and background variables.

Variable	Odds ratio	Confidence Interval	P
Child has experience of painful dental treatment	6.5	(2.3; 17)	<0.001
Parental fear of dental treatment	2.2	(1.1; 4.6)	0.03
Neither parent born in Sweden	2.0	(1.1; 3.8)	0.03

**TABLE 5** Results of ordinal logistic regression with CFSS-DS as dependent variable.

toothache and painful dental treatment, and DF. Dental fear was more frequent in children with extensive caries in the primary teeth (Table 4).

Presence of visible plaque was registered for 14% of the children, gingivitis was present in 11% of cases, 41% of the children had no caries in the permanent teeth, and 71% had no carious primary teeth. Children of foreign background had significantly more tooth surfaces with caries in primary teeth compared to children with both parents born in Sweden ( $p < 0.01$ ).

In the final step of the multiple ordinal regression analysis, the child's experience of painful treatment, foreign background, and the parent's fear of dental treatment were found to significantly increase the magnitude of the child's DF (Table 5).

## Discussion

This study focused on the occurrence and severity of dental fear among children of foreign background in comparison to children of Swedish background. The results show that children of foreign background are more often and more severely afraid of dental treatment than children of Swedish background.

Measurement of DF in this study was performed with the help of the CFSS-DS, which is the most commonly used psychometric scale in the literature [Cuthbert and Melamed, 1982]. It is available in two versions; one is designed to be answered by parents on behalf of their children, and the other is designed for self-rating. In this case, the parental version was used. According to one earlier study, the majority of parents are able to rate their children's dental fear reasonably accurately [Krikken et al., 2013]. On the other hand, Gustafsson et al. found that the validity of parental ratings of their children's DF is questionable, and concluded that self-ratings are preferable [Gustafsson et al., 2010]. Scores equal to or above 38 are considered to indicate high fear of going to the dentist, and this value is used as a cut-off score [Klingberg, 1994]. In the present study, children with high CFSS-DS scores were more frequent for children of foreign background.

Fifty-one percent of the children were Swedish, and 49% had foreign background. A majority of the

children of foreign background originated from Asian countries (Table 2). This could have been due to high levels of immigration from Iraq at the time when the study was carried out. Children who had experienced painful treatment were also more afraid than children with no traumatic experience from treatment.

There is no obvious reason why children of foreign background express more fear than children of Swedish background. According to previous studies, children of foreign background have more caries and more need for treatment [Grindefjord et al., 1993], which results in more treatments that may be painful or uncomfortable. Caries may also lead to toothache, which can in itself be a negative experience. The present study also showed a higher prevalence of caries in the study group than the reference group, and DF was more frequent among children with extensive caries as well as being associated with experience of toothache. Caries in early childhood has been described as a large public health problem in multicultural areas of low socioeconomic status, such as Södertälje [Wennhall et al., 2002]. However, in this material, foreign background and experience of traumatic treatment entailed higher risk for DF, regardless of caries prevalence. There are several other reasons that may cause problems in treatment, such as language difficulties which can lead to misunderstandings between patient and care provider.

Some of the children who participated in the study were war refugees, and came from difficult circumstances. They were, or had been, in the process of applying for asylum in Sweden, which is a demanding life situation. A large proportion of children with a history as refugees (7-17%) show symptoms of post-traumatic stress disorder, which can lead to prolonged suffering over several years [Fazel et al., 2005; Hjern et al., 1998]. This is likely to affect their capability to cope with stressful situations such as dental treatment. Another similar study found no significant difference in assessed DF between the groups [Fägerstad et al., 2015]. The difference between this result and the results of the present study could be because children in our study had a more burdensome background, or because the study populations were of different ages and hence the two studies are not fully comparable.

The current study found no significant difference in levels of CFSS-DS between girls and boys. This is surprising, since earlier investigations have shown that at younger ages, boys are more fearful than girls [Holst and Crossner, 1987].

In this study, the mother's level of education was used as an indicator of socioeconomic status; this was found to be correlated with DF in the child. It has been reported that in children referred because of BMP there is a significant overrepresentation of mothers with low socioeconomic status [Arnrup et al., 2002].

Children's compliance with dental treatment is highly dependent on support from their parents.

Responsive and self-assured parents facilitate children's capability to cope with treatment situations [Venham et al., 1979]. Dental treatment of children of foreign background can be a challenge to their parents, who may be accustomed to dental treatment in other conditions with more focus on emergency treatment. In this material, parents of foreign background visited dental clinics less often on a regular basis than parents with Swedish background. This could be due to their placing a low priority on dental care, which could also be reflected in their attitude to their children's dental care needs. Parental dental fear may also influence the child in a negative way [Klingberg and Berggren, 1992]. This study confirms that parental fear is correlated with the child's fear.

## Conclusion

Children of foreign background are more afraid of dental treatments in comparison to children of Swedish background. Experience of painful treatment and parental dental fear also had an influence on the child's dental fear. There is a need for a new approach to the reception and management of children of foreign background in the dental care system.

## Acknowledgments

This study was supported by the Stockholm County Council Public Dental Service. The authors thank Ayda Masso, Amel Batan, and Britt Marie Johansson for assistance in administrating the material in this study.

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