Emotional contagion of dental fear to children: the fathers’ mediating role in parental transfer of fear

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Background. Dental fear is considered to be one of the most frequent problems in paediatric dentistry. According to literature, parents’ levels of dental fear play a key role in the development of child’s dental anxiety.

Hypothesis or Aim. We have tried to identify the presence of emotional transmission of dental fear among family members and to analyse the different roles that mothers and fathers might play concerning the contagion of dental fear to children. We have hypothesized a key role of the father in the transfer of dental fear from mother to child.

Design. A questionnaire-based survey (Children’s Fear Survey Schedule-Dental Subscale) has been distributed among 183 schoolchildren and their parents in Madrid (Spain). Inferential statistical analyses, i.e. correlation and hierarchical multiple regression, were carried out and possible mediating effects between variables have been tested.

Results. Our results support the hypothesis that family members’ levels of dental fear are significantly correlated, and they also allow us to affirm that fathers’ dental fear is a mediating variable in the relationship between mothers and children’s fear scores.

Conclusions. Together with the presence of emotional transmission of dental fear among family members, we identified the relevant role that fathers play as regards the transfer of dental fear from parents to children.

Introduction

Referral of children to a specialized paediatric dentist is an increasingly accepted practice1. Children’s fear or anxiety is relatively usual in dental settings, and it contributes to the referral of a child to a specialist clinic in paediatric dentistry1. Other frequent difficulties are related to children’s behaviour management problems, involving negative attitudes towards dentists and treatments, and disruptive conducts during visits to the dentist’s office. Behaviour management problems sometimes are confused with dental fear and anxiety, and although these concepts are not synonymous they overlap2.

Dental fear may cause frequent and serious problems for both dentists and patients, and it often gives rise to a number of harmful effects3 which could aggravate dental situations because of fear reactions such as avoidance, late cancellations, refusals, crying and anger4. To this respect, dental anxiety has been indicated as a potential predictor of dental caries incidence5. In general, dental fear is a child’s normal reaction to an unknown situation. Mild fear and anxiety are expected experiences, consistent with normal development, but they may become a concern and may need treatment when that fear or anxiety is disproportional to the actual threat6.

Several studies1,2,4,6,7 have proved that dental fear is often mentioned as being multifactorial as it may reflect general predisposition towards anxiety in the affected child (trait-anxiety), or other factors related to the personal characteristics of the child, such as behavioural avoidance, attention biases, and negative emotions towards possible threats.

Previous experiences of painful dental treatment strongly predict negative reactions and behavioural management problems4. Furthermore, issues related to socio-economical factors, culture, family relationships, child-
rearing, and parental dental anxiety should also be recognized as influencing child behaviour during dental treatment. Among other factors, it has been well documented that parental dental fear strongly correlates with dental fear in their child and it seems to predispose for fear reactions. In spite of the fact that some researches question the role of parental anxiety as a factor in children’s reactions to dental treatment, in general, it is widely accepted that parents’ anxiety has some influence on their child’s ability to face dental treatment. Versloot et al. suggested that the child’s ability to cope with dental treatment was not only dependent on the child’s degree of psychological and cognitive development but also on the absence of parental anxiety.

Moreover, the existence of interpersonal processes and mechanisms related to the transfer of emotions, including fear, has been extensively reviewed in the psychological literature. In this context, our study’s aim is twofold: first, to try to confirm the association between parents’ and children’s levels of dental fear; and second, to analyse the different roles that mothers and fathers might play concerning the transmission of dental fear to their children. Based on these points, we have formulated our first hypothesis:

**Hypothesis 1:** Dental fear levels are expected to be positively correlated among family members; that is, the higher dental fear is for one of the family members, the higher it will also be for the rest of family members.

According to the literature reviewed by Themesl-Huber et al., several studies have confirmed the existence of a significant relationship between parental and child dental fear. Further evidence is, however, needed to support that parents play an important role in the aetiology of child dental fear.

From a broader field of research, Bögels and Phares reviewed literature focused on the father’s role in the aetiology of child anxiety and reached the conclusion that fathers would play a relevant role – different from the mother’s – in childhood anxiety. According to these authors, children seem to put higher weight on father’s responses than on mother’s responses in the face of possible threats, to decide whether the situation is dangerous or should be avoided, which is related to the development of subsequent anxiety. Drawing from these results and points, we have established a second hypothesis in which fathers are assumed to play a key role in the levels of dental fear experienced by children.

**Hypothesis 2:** Fathers will play a different role from mothers as regards child dental fear. To be more precise, we expect that children will take their fathers as a key source of information to decide whether a dentistry related event may be dangerous or not; and thus fathers’ dental fear level will be a mediator variable in the relationship between mothers and children’s dental fear levels (Fig. 1).

**Material and methods**

**Sample and procedure**

Participants were 183 children (51.4% male, 48.6% female) and their parents. Their average age was 9.38 years (SD = 1.34), ranging from 7 to 12 years. These schoolchildren were recruited for the research at two state schools located in the south area of the Community of Madrid (Spain). Collaborating teaching staff distributed in their classrooms envelopes containing questionnaires for children and their parents, detailed instructions for filling it in (e.g. emphasizing that questionnaires had to be individually completed, encouraging honest responses, etc.), attestation of guarantee concerning the anonymous treatment of data, and parents’ informed consent form.

![Fig. 1. Mediating role of fathers on the relationship between mothers and children’s dental fear.](image-url)
Once the questionnaires were completed, they were returned in a closed envelope to the research team via the collaborating schools. Data were collected between January–February 2010. Response rate was 83.94%.

Ethical approval from the Rey Juan Carlos University committee for ethics in research as well as parents’ informed consent and permissions from the schools’ teaching staff were obtained.

**Measures**

*Children and parents’ dental fear.* We used a Spanish translation of the *Children’s Fear Survey Schedule-Dental Subscale* (CFSS-DS)\(^{15}\). This questionnaire comprises 15 items in which respondents assess their fear levels when facing aspects of dentistry consultation/treatment (e.g. the dentist, injections, drilling, etc.) as well as other medical issues (e.g. going to the hospital, white uniforms, etc.) by using a 5-point Likert scale (1, not afraid at all; 5, very afraid). Total scorings may range from 15 to 75 points. Cronbach’s alpha reliability was 0.87 for this scale.

Parents filled in a version of the same scale adapted to adults. Items’ contents, response format, and scoring procedure were the same as for children. Cronbach’s alpha reliability was 0.88 for mothers and 0.89 for fathers.

Participants were considered to present a high level of dental fear if their total score was equal to or above 45 points.

The adaptation of the original scale to Spanish language was done by following a procedure of forward and back translation.

**Statistics**

We calculated basic descriptive statistics (mean scores and standard deviations) on the prevalence of dental fear among children and parents from our sample. Parametric inferential tests require data normally distributed. Dental fear values, which presented an asymmetric distribution, were log-transformed to guarantee this requirement. Paired samples \(t\)-tests were used to determine whether the differences on dental fear levels between fathers, mothers, and children were statistically significant. Assumptions for using paired samples \(t\)-test (i.e. data normally distributed, interval level of measurement) were previously checked. Besides, we made a comparison of mean values between schoolboys and schoolgirls’ fear levels (independent samples \(t\)-test) to add evidence to the commonly obtained result of a higher incidence of dental fear among girls. These possible differences in dental fear prevalence would support the use of this variable–gender as a control variable for subsequent analysis. Levene’s test \((F = 1.10, P > 0.05)\) confirmed that the assumption of homogeneity of variances, required for using an independent samples \(t\)-test, was met.

To test our first hypothesis concerning the emotional transfer of dental fear between parents and children, we calculated the Pearson’s correlation between fathers, mothers and children’s scores.

Finally, we tested our second hypothesis by performing a hierarchical multiple regression, following the procedure described by Baron and Kenny\(^{16}\) for the analysis of mediating effects between variables. As said before, gender is known to have an influence on children’s fear levels – and our results confirmed this point – so this variable was controlled when carrying out regression analysis. Baron and Kenny’s\(^{16}\) procedure involves to carry out several regression analyses. First, the outcome variable (children’s dental fear) is regressed on the independent variable (mothers’ dental fear). Second, the mediator (fathers’ dental fear) is regressed on the independent variable (mothers’ dental fear). Third, the outcome variable (children’s dental fear) is regressed on the independent (mothers’ dental fear) and mediator (children’s dental fear) variables. Evidence for a complete mediation effect requires that the independent variable (mothers’ dental fear) loses its significant effect on the outcome variable (children’s dental fear) when the mediator variable (fathers’ dental fear) is included in the final regression model. Therefore, to confirm our hypothesis concerning a mediating effect, three results should be obtained. First, the mother’s fear level should be a significant
predictor of the child’s and the father’s dental
fear levels. Secondly, the father’s dental fear
should be a significant predictor of the child’s
fear, too. Third, support for a full mediating
effect of the father’s dental fear level is
obtained if the mother’s dental fear level is
not a significant predictor of the child’s fear
when we introduce the father’s fear level in
the regression model, while the father’s den-
tal fear remains as a significant predictor of
the child’s fear.

Results

The mothers in our sample reported higher
levels of dental fear ($M = 31.19$; $SD = 10.46$)
than the fathers ($M = 28.70$; $SD = 9.84$) and
the children ($M = 27.42$; $SD = 9.46$). Paired
samples $t$-tests showed the statistical signifi-
cance of these differences of means between
mother–child ($t = 4.15$; $P < 0.01$; d.f. = 182)
and mother–father ($t = 3.13$; $P < 0.01$; d.f. = 182).
Although the fathers’ dental fear scorings were also higher than their chil-
dren’s, these differences were not statistically
significant ($t = 1.45$; $P > 0.05$; d.f. = 182). If
we consider a total scoring of 45 as a cut-
point for dental fear, in our sample, 12.6% of
the mothers, 8.2% of the fathers, and 4.9%
of the children presented high levels of dental
fear.

Coherent with previous literature, our
results also showed differences between
schoolboys ($M = 24.58$, $SD = 7.98$) and
schoolgirls ($M = 30.41$, $SD = 10.01$) as regards
their levels of dental fear, being girls’ DFSS-
DS scores significantly higher ($t = 4.48$;
$P < 0.01$; d.f. = 181). As expected, children’s
gender is a significant predictor of their levels
of dental fear ($\beta = -0.31$, $P < 0.01$).

Table 1 shows the correlation coefficients
between father’s, mother’s, and children’s
dental fear levels. As one can see, we
obtained significant positive correlations
between father’s and mother’s fear levels, as
well as between parents’ and children’s dental
fear scores. Thus, our first hypothesis was
supported.

According to this result, we confirmed that
– after controlling for the effects of gender on
dental fear – the mother’s fear scores were a
significant predictor of the children’s
($\beta = 0.20$, $P < 0.01$) and the father’s
($\beta = 0.44$, $P < 0.01$) dental fear scores. The
father’s dental fear level was also a significant
predictor of the child’s fear scores ($\beta = 0.25$,
$P < 0.01$). Table 2 presents the output of the
multiple regression analyses carried out to
test a mediating effect between variables. As
expected in our second hypothesis, when we
introduced in the same regression model the
scores of the mothers and the fathers, only
the later remained a significant predictor of the
children’s dental fear levels. Therefore, our second hypothesis was also confirmed,
highlighting a mediating role of the father in
the transmission of dental fear from the
mother to the child.

Discussion

This study was designed to analyse the possi-
ble emotional transfer of dental fear among
family members and to help to determine its
transmission mechanisms. Two work hypotheses were set for the analysis: the first one was approached so as to determine whether there is a connection between dental fear levels of the mother, the father, and the child. In particular, it was expected that the more dental fearful the mother, the father, or the child is, the more dental fearful the other two members of this triad would be. The second one referred to the differential role between fathers and mothers in terms of transfer of dental fear to their children.

In line with previous published studies, our analysis confirmed that there is a direct and significant relationship among the different levels of dental fear reported by the family members. This result suggests the presence of an emotional transfer of dental fear levels between parents and children. Other authors, however, have not found any connection between the levels of dental fear and the family members. To this respect, Themessl-Huber concluded that the differences may refer to the various methods for data collection.

Most of the previous studies have analysed the behaviour of young children in dental situation in comparison with the level of manifest anxiety in just one of their parents (commonly the mother), whereas other works have studied both parents’ fear levels. The most relevant contribution of our study is that we separately analyse the levels of dental fear for mothers and fathers. Fathers will play a different role to mothers as regards child’s dental fear. Concretely, according to the obtained results, we expect that children will take their fathers as a key source of information to decide whether a dentistry related event may be dangerous or not, and thus, fathers’ dental fear level will be a mediator variable in the relationship between mothers and children’s dental fear levels. As our regression analyses series have pointed out, the mothers’ dental fear significantly predicts the levels of dental fear of fathers and children. Fathers’ dental fear predicts the children’s dental fear, too. Finally, when the levels of fear of mothers and fathers are jointly included in a regression model, only the fathers’ dental fear remains as a significant predictor of the children’s fear. According to Baron and Kenny’s procedure, these results provide with support for a mediating role of the fathers’ dental fear on the relationship between mothers’ and children’s dental fear.

Just a few articles have included a separate perspective of dental fear levels for mothers and fathers. Our results are in line with the conclusions found in those studies.

To this respect, and coherently with our results, Rantavuori concludes that for children under the age of 12, fathers’ dental fear is one of the best indicators of potential dental fear in children. This author reports that for 9-year-old children – a similar age to our study sample – fathers’ dental fear is the best predictor of children’s ‘Fear of dental treatment in general’ and ‘Fear of dental decay’. This study suggests that both fathers and mothers play different roles in the onset of dental anxiety and fear in children according to children’s age.

Gender is also a key predictor for determining the level of children’s dental fear, although we do not focus specifically on this variable during our analysis. Our results are coherent with other articles published to this respect, pointing out a higher incidence of dental fear among girls.

With regard to the prevalence of dental fear in children, only 4.9% of children presented significant levels of dental fear, which confirms a low prevalence. Furthermore, this result is in line with previous literature in this field that reported prevalence figures varying from 5% to 20%, with a mean of 11%. Although this might be considered as a limitation of our results, the type of analysis that was carried out (step-by-step hierarchical multiple regression) depends on the amount of variability of the dependant variable (child’s fear) that can be explained by the influence of the independent (mother’s fear) and mediating (father’s fear) variables, and it is not related to the proportion of children suffering from dental fear.

We must admit, however, that the study was limited by the use of a convenience (not representative) sample – composed of students of two schools that voluntarily...
participated in the study. We should also consider as study’s limitations that our data were self-reported by participants together with the possible ‘social desirability’ of their responses (as for example in the case of children trying to hide their fears). Finally, although it can be assumed that individuals in our sample come from a homogeneous mid-class social stratum, the possible influence of socio-economic factors was not controlled in analyses.

According to both our results and the above cited study by Rantavuori²⁰, and concerning dental fear, we should question whether the role that fathers play in the age range considered in our study remains stable at different ages and in particular whether the father’s role is still relevant with younger children and decreases its relevance for children older than the ones included in our sample. Besides, more research would be needed on the specific role played by mothers at different stages of children’s growth. These developmental issues remain an interesting topic for future research.

The results of our study may provide further information for both dental surgeons and, especially, dental paediatricians to anticipate and prevent dental fear reactions of children during consultation. If they are aware of the fear levels experienced by parents, they will be able to anticipate to their children’s levels of fear. Our conclusions allow us to identify also the father’s role as a key point for dental fear transmission, or in reverse for interruption of emotional contagion among family members. Thus, interventions aiming to reduce fathers’ dental fear levels (e.g. providing them with accurate information on dental treatments, simple relaxation techniques, or changing their possible negative thoughts and expectancies) may help to mitigate or neutralize the spreading of dental fear to children. When fathers display calm or other positive emotions (e.g. joy) or verbalize positive thoughts (e.g. self-efficacy) at the dentist, it could be useful that professionals encourage fearful children to pay attention to their fathers’ behaviour. By doing this, children would be exposed to a positive modelling and receive reassuring clues on how to interpret dental situations.

**What this paper adds**
- Empirical evidence on the presence of emotional contagion of dental fear among family members.
- An approach to the mechanisms by means of which dental fear is spread from parents to children.
- Support for the hypothesis of a key role of the father in the transmission of dental fear from mothers to children.

**Why this paper is important to paediatric dentists**
- It points out how dental fear is spread into the family, offering possible ways to short-circuit the transmission of dental fear from parents to children.
- By knowing parent’s dental fear levels, paediatric dentists can anticipate and prevent child’s possible fear or misbehaviour in dental consultation.
- It provides further information about the role played by fathers and mothers as regards to the presence of dental fear in children.

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**Conflict of interest**
The authors declare no conflict of interest.

**References**


