Dental fear in children: prevalence, etiology and risk factors

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Citation for published version (APA):

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Abstract
The aim of this study was to assess the relation between parental child rearing behaviour and dental fear in children. The parents of 51 children with high dental fear and of 56 children with low dental fear, of different age groups, completed the Amsterdam version of the Parental Attitude Research Instrument (A-PARI). In addition, parents were asked to rate their own dental fear. Analysis of variance (2 x 2 x 2) only showed a main effect of child dental fear on self-complaints (p=.034). For parental dental fear, main effects were found on overprotection and promotion of autonomy (p<.016). No age effects were found (p>.05). Also, no relation between child dental fear and parental dental fear was found. Based on the present findings, it was concluded that parents might play a more secondary, mediating role in the etiological process of dental fear in children.

1 This chapter has been submitted for publication as: Berge ten, M., Veerkamp, J.S.J., Hoogstraten, J., & Prins, P.J.M. (submitted). Childhood dental fear in relation to parental child rearing behaviour.
Chapter 6

Introduction

The etiology of dental fear is considered to be multifactorial. For example, Rachman (1977) proposed a three-pathway model of acquiring fear: directly via direct conditioning, or indirectly through modelling or negative information. In dental research direct conditioning is often assumed to play an important causal role (Bernstein, Kleinknecht & Alexander, 1979; Liddell, 1990; Milgrom, Mancl, King & Weinstein, 1995; Veerkamp, Gruythuysen, Van Amerongen & Hoogstraten, 1992). Numerous studies also have provided support for the modelling pathway; that is, child dental fear repeatedly has been associated with dental fear in parents (e.g., Holst, Schröder, Ek, Hallonsten & Crossner, 1988; Klingberg & Berggren, 1992; Klingberg, Berggren, Carlsson & Norén, 1995; Milgrom et al., 1995; Townend, Dimigen & Fung, 2000). In addition, parental presence and behaviour have been indicated to be related to children’s ways of coping with and reacting to aversive medical situations (Blount, Davis, Powers & Roberts, 1991; Bush, Melamed, Sheras & Greenbaum, 1986; Jacobsen, Manne, Gorfinkle & Schorr, 1990). For the dental situation, however, research is more limited and results are inconclusive. With respect to parental presence and behaviour during treatment, in general it can be concluded that little effect has been found (Fenlon, Dobbs & Curzon, 1993; Koplik, Lamping & Reznikoff, 1992; Liddell, 1990; Townend et al., 2000; Venham, 1979). As to general child rearing behaviour, Venham, Murray and Gaulin-Kremer (1979) found that coping skills and stress tolerance in children were facilitated when the home environment was structured, mothers were responsive and self-assured, and parents set limits and provided ample rewards and punishments, although others were not able to demonstrate such a relation (Allan & Hodgson, 1968; Sarnat, Peri, Nitzan & Perlberg, 1972). In addition, an extensive review on the role of child rearing practices in the development of (general) anxiety and depression in children reported that in several studies parental control and rejection have been associated with greater anxiety in children (Rapee, 1997). It should be noted, however, that this parent-child relation is more complicated and may be mediated by other factors. That is, it has been suggested that parental influence may be limited to children’s first dental experiences (e.g., Klorman, Ratner, Arata & King, 1978; Koenigsberg & Johnson, 1972) and may eventually be outweighed by the dentists’ influence (Townend et al., 2000). The aim of the present study was therefore threefold. First, since no recent studies have been conducted on the specific relation of dental fear with child rearing behaviour, to examine whether differences in child rearing behaviour exist between parents of children with high- and with low dental fear. Second, given the interactive nature of the parent-child relation, the role of parents’ own dental fear in this child rearing behaviour was also assessed. Third, to verify reported support for Rachman’s modelling pathway, in light of the considerations mentioned above.
Material and methods

Participants
This study was conducted among the parents of a group of 107 children (mostly mothers, n=102). This group of children consisted of 51 children with high dental fear (HFC) treated at a Centre for Special Dental Care (SBT) in Amsterdam, and 56 children with low dental fear (LFC) treated in a private paediatric dentists’ practice. To check for possible age differences two age groups were included in the study: children aged 4-5 years (HFC n=27, LFC n=23) and children aged 8-9 years (HFC n=24, LFC n=33). To exclude dentists’ individual influences as much as possible, the low fearful children were all selected from one paediatric dentist’s practice, with several years of experience in treating (fearful) children and also employed at the Centre for Special Dental Care in Amsterdam. Thus all participating dentists are working along the protocolised standards of the Centre.

Measures

Dental fear
The children’s dental fear was screened using the Dutch parent’s version of the Dental Subscale of the Children’s Fear Survey Schedule (CFSS-DS, Cuthbert & Melamed; 1982; Ten Berge, Hoogstraten, Veerkamp & Prins, 1998). The CFSS-DS is a revised form of the Fear Survey Schedule for Children (FSS-FC) developed to assess dental fear in children (Scherer & Nakamura, 1968). The questionnaire consists of 15 items related to different aspects of dental treatment. The items can be answered on a 5-point scale ranging from 1) “not afraid at all” to 5) “very afraid”. Total scores thus range from 15 to 75. Previous research has shown the scale to have good reliability as well as acceptable validity (see Aartman, Van Everdingen, Hoogstraten & Schuurs, 1998; Cuthbert & Melamed, 1982; Klingberg, 1994; Milgrom, Jie, Yang & Tay, 1994; Milgrom et al., 1995). Normative studies have reported a CFSS-DS score of around 38 to be indicative of high dental fear in children (Klingberg, 1994; Milgrom et al., 1994). Therefore, in the present study a cut-off score of 38 on the CFSS-DS was used to select children for the high fearful group (mean 48.0, SD 7.7). Only children scoring 25 or lower (mean 19.1, SD 3.3) were included in the low fearful group. Since the younger children were unable to answer the questionnaire by themselves, the parent’s version of the scale was used for all children. Research has indicated parents to be well able to assess their child’s level of dental fear (Klingberg, Berggren & Norén, 1994; Milgrom et al., 1994). In addition to the CFSS-DS, all parents were asked to rate their own level of dental fear on a 5-point Likert scale ranging from 1) “not afraid at all” to 5) “very afraid” (Milgrom, Fiset, Melnick & Weinstein, 1988). All parents signed a consent form.
Chapter 6

Child rearing behaviour

The Amsterdam version of the Parental Attitude Research Instrument (A-PARI) was used to assess parental child rearing behaviour. The A-PARI is a shorter, revised, version of the Parental Research Attitude Instrument developed by Schaefer and Bell (1958). This Dutch version of the PARI is a self-report questionnaire, to be answered by the parents. It consists of 15 items related to four different child rearing styles. Previous research yielding Dutch normative data has shown that the scale consists of the following scales: authoritarian control (5 items), promotion of autonomy (2 items), overprotection (4 items) and self-complaints (4 items) (De Leeuw, 1986; Van Veldhuizen & Meijer, 1990). All items can be scored on a 4-point scale ranging from 1) “do not agree at all” to 4) “agree totally”. Example items are: ‘It’s my duty seeing to it that my child does as I tell him/her’ (authoritarian control), ‘Children should learn to be independent as soon as possible’ (autonomy promotion), ‘I have to try preventing my child from getting disappointed’ (overprotection) and ‘My child’s happiness needs a lot of sacrifice from my part’ (self-complaints).

Data analysis

The internal consistency of the scales of the A-PARI scales was assessed with reliability analysis (Cronbach’s alpha). To examine differences in child rearing behaviour between child fear (high vs. low), parental fear (high vs. low) and child age (young vs. older), analysis of variance (2 x 2 x 2) was performed for the four A-PARI scales. To check for possible selection of study samples, child rearing was also compared with scores of a Dutch norm group of the general population (De Leeuw, 1986). To assess the relation between parental and child dental fear, correlation coefficients were calculated and cross-tabulations were made.

Results

Reliability of A-PARI scales

Reliability analysis (Cronbach’s alpha) yielded the following: authoritarian control $\alpha = 0.77$, autonomy promotion $\alpha = 0.57$, overprotection $\alpha = 0.83$ and self-complaints $\alpha = 0.70$.

Child rearing behaviour (A-PARI)

The results of the 2 x 2 x 2 analysis of variance revealed that parents of fearful children only scored significantly higher than parents of low fearful children on self-complaints ($F=4.60$, $p=.034$). Furthermore, fearful parents reported to behave more autonomy promoting ($F=6.06$, $p=.016$) as well as more overprotective ($F=7.24$, $p=.008$) towards their children than
low fearful parents. No main effects were found for age (p>.05); mean A-PARI scores according to fear and age groups are shown in Table 1.

<table>
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<tr>
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<th>HFC</th>
<th>LFC</th>
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<tr>
<td></td>
<td>young mean</td>
<td>young sd</td>
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<tr>
<td>Authoritarian Control</td>
<td>11.89</td>
<td>4.07</td>
</tr>
<tr>
<td>Promotion of Autonomy</td>
<td>3.93</td>
<td>1.86</td>
</tr>
<tr>
<td>Overprotection</td>
<td>8.63</td>
<td>3.67</td>
</tr>
<tr>
<td>Self-complaints</td>
<td>7.78</td>
<td>3.11</td>
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<tr>
<td></td>
<td>11.57</td>
<td>3.26</td>
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<td></td>
<td>3.96</td>
<td>1.40</td>
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<td></td>
<td>8.22</td>
<td>3.95</td>
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<tr>
<td></td>
<td>6.70</td>
<td>2.51</td>
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A small interaction effect between parental fear and age level was found on autonomy promotion (F=4.21, p=.043), indicating particularly fearful parents in the younger age group to behave more autonomy promoting (p<.05). Between the level of dental fear in parents and in children no relation was found (r=-.08, p>.05).

Table 2 shows the mean scores on the A-PARI scales for parents of the high fearful and low fearful children, as well as for the Dutch norm group. Parents of both high fearful and low fearful children scored significantly higher on overprotection than parents in the norm group (Table 2). On the other scales no significant differences were found (p>.05).

**Discussion**

In the present study, no relation between child- and parental dental fear was found. Also, few differences in child rearing behaviour were found between parents of high- and parents of low fearful children, although the parents' own level of dental fear was found to be associated with their child rearing behaviour. Thus the present study has provided no...
support for the associations of child dental fear with parental dental fear and child rearing behaviour reported earlier (Klingberg et al., 1995; Milgrom et al., 1995; Venham et al., 1979). Moreover, the present findings seem to support the notion that the relation between parental and child behaviour may be strongest in dentally inexperienced children and weakens as children have their own experiences to rely on (Klorman et al., 1978; Koenigsberg & Johnson, 1972; see Winer, 1982; Wright & Alpern, 1971), given that in the present study children were selected based on their previous behaviour and in Venham’s study (1979) children’s reactions to their first dental experience were examined. In addition, other studies failing to establish a relation between child dental fear and child rearing were conducted among older children (Allan & Hodgson, 1968; Sarnat et al., 1972). At this later stage, the child’s perception of dental treatment may be influenced more strongly by factors associated with actual dental treatment such as painful procedures or perceived dentists’ behaviour, as also suggested in a recent study on the relative contribution of different factors (Townend et al., 2000). Support for this notion is also provided by a study on common childhood fears asking children retrospectively about their experiences, which indicated that although some of the children reported modelling experiences, none or only a small part of them actually ascribed the onset of their fear to this modelling (Muris, Merckelbach & Collaris, 1997). The authors suggested that modelling might enhance general fearfulfulness in children but that it may play a relatively small role in the acquisition of specific fears.

Thus it might be that parental behaviour may influence a child’s initial (stressful) reaction to the dental situation, while thereafter parents play a more secondary, mediating role. This parental role might be confined to providing support and guidance, but may still be indirectly involved in children’s fear development. That is, parental behaviour may facilitate the acquisition of dental fear or the reinforcement of a child’s negative perception of dental treatment, instead of being a direct cause. In this context, the association between parents’ own level of dental fear and their child rearing behaviour should be noted. Dentally fearful parents reported to behave more overprotective as well as more autonomy promoting towards their children than low fearful parents, suggesting a certain level of ambivalence in these parents. Their dental fear may cause them to be more sensitive to invasive aspects of dental treatment and to feel the need to protect their children, while on the other hand they may essentially prefer to avoid the dental situation. It may be that such parental ambivalence negatively influences these parents’ abilities to support their children, which in turn could have a negative impact on children’s fear development or maintenance of high dental fear in the long run (Barrett, Rapee, Dadds & Ryan, 1996; Chorpita, Albano & Barlow, 1996; Venham et al., 1979).
When interpreting these results, however, some limitations of the present study should be noted. The use of parental self-reports does not provide any information on the children’s perception of parental behaviour, which might differ from the parents’ own perception (Muris, Bögels, Meesters, Van Der Kamp & Van Oosten, 1996). However, given that a part of the children was too young to complete the questionnaire themselves, parental reports are the most reliable source of information. In addition, the higher level of overprotection found in comparison with the Dutch norm group, may indicate that some selection has occurred in the low fearful study sample. This might be related to the fact that visiting a paediatric dentist instead of a general practitioner is still rather uncommon in the Netherlands, and parents preferring their child to be treated by a paediatric dentist may feel more involved or concerned with their child’s dental health or treatment. Also, the reason for selecting a paediatric dentist may originally have been associated with difficulties or fears in the past, either by the children or the parents themselves. Of course, the present study was correlational of nature, implying that no causal conclusions can be made.

To summarise, in the present study no association between child dental fear and parental child rearing was found, nor was a relation established with parental dental fear. Based on these findings, it was therefore concluded that other factors might be more important in the actual acquisition of dental fear in children (Davey, 1989; Liddell, 1990; Townend et al., 2000; Veerkamp et al., 1992). Direct conditioning experiences, such as perceived dentists’ behaviour or painful treatment, and temperamental characteristics should be the focus in future research on the etiological process of dental fear, although this is not to state that the parental influence should be neglected. It was suggested that parental guidance can have an indirect effect on children’s developing coping abilities in the long run, and that parents may play a secondary, mediating role in the recollection of invasive treatment sessions. Finally, since no causal conclusions could be made based on the present findings, research is needed to further examine the origins and the effect of the high level of overprotection found in parents.
Chapter 6

References


Chapter 6


