Parental child-rearing attitudes are associated with functional constipation in childhood

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Abstract

Objective: Parenting factors are assumed to play a role in the development and maintenance of childhood constipation. Knowledge about the association between parenting factors and childhood constipation is however limited. This study investigates the association between parental child-rearing attitudes and prominent symptoms of functional constipation and assesses the strength of the associations.

Patients and methods: Children with functional constipation aged 4-18 years referred to the gastrointestinal outpatient clinic at the Emma Children’s Hospital were eligible for enrolment. Baseline data of 133 children participating in a randomized controlled trial evaluating the clinical effectiveness of behavioral therapy compared with conventional treatment were used. Parental child-rearing attitudes were assessed by the Amsterdam version of the Parental Attitude Research Instrument (A-PARI). Negative binomial and logistic regression models were used to test the association between child-rearing attitudes and symptoms of constipation.

Results: Parental child-rearing attitudes are associated with defecation and fecal incontinence frequency. Both high and low autonomy attitudes were found to decrease defecation frequency, and increase fecal incontinence episodes. A high overprotection and high self-pity attitude increased fecal incontinence. The associations between parental child-rearing attitudes and functional constipation were specifically found for older children (aged ≥ 6 years).

Conclusion: Parental child-rearing attitudes are associated with functional constipation in children. Parenting issues should be incorporated in the treatment of children with constipation. Referral to mental health services is needed when parenting issues are hindering successful outcome or when the parent-child relationship is at risk.
Introduction

Childhood constipation often constitutes a major problem for the child and his family and is characterized by painful infrequent bowel movements often in combination with fecal incontinence (1). The pathophysiological mechanisms underlying childhood constipation are multifactorial and not well understood. In 90% of all patients, no specific organic cause can be found (2). Stool-withholding is probably the major cause for development and persistence of childhood constipation (3-9). Children with functional constipation are primarily treated with oral laxatives in combination with toilet training in pediatric settings (10). Education and demystification are the first steps in treating functional constipation to change negative parental attitudes (11).

Early literature on constipation and fecal incontinence has always highlighted the role of family interaction patterns and the personality of the parents (12;12-14). Nowadays, parenting factors are still assumed to play a role in the development and maintenance of childhood constipation (15-19). Recently, a large study showed a difference in personality between mothers of children with and without functional constipation (20). The mothers of children with FC were described as forceful, restrictive and orderly which is suggested to result in resistance responses of the child. Parental child-rearing attitudes and parent-child interaction have long been recognized as major contributors to a child’s behavioral, emotional, and cognitive development (21-26). Moreover, parental attitudes have been related to negative psychological outcomes in adulthood (27). However, knowledge about the association between parenting factors and childhood constipation is limited.

This study aimed to investigate whether an association exists between parental child-rearing attitudes and three prominent symptoms of functional constipation (defecation frequency, fecal incontinence frequency, and large amount of stool), and to assess the strength of the associations.

Methods

Participants and procedure

Between November 2002 and August 2004, children with functional constipation aged 4-18 years referred by general practitioners, school doctors, and pediatricians to a tertiary outpatient clinic in the Netherlands were eligible for enrolment. All children included, participated in a randomized controlled trial evaluating the clinical effectiveness of behavioral therapy compared with conventional treatment (28). The current study used the baseline data from this trial.

At entry patients had to meet at least two of four criteria of pediatric constipation: defecation frequency < 3/week, fecal incontinence frequency ≥ 2/week, passage of large amounts of stool at least once every 7–30 days (large enough to clog the toilet), or a palpable abdominal or rectal fecal mass (29). Children were excluded from the study if they had received a comprehensive behavioral treatment carried out by a psychologist or psychiatrist in the previous 12 months. Furthermore, children using drugs influencing gastrointestinal function other than laxatives and children with organic causes for defecation disorders such as Hirschsprung’s disease, spina bifida occulta, hypothyroidism or other metabolic or renal abnormalities were excluded. For all participants informed consent was given by the parents.

The medical ethics committee of Academic Medical Center of Amsterdam approved the study protocol. All patients and/or parents gave written informed consent.
Measures

A-PARI

Parental attitudes toward child rearing styles were assessed by the Amsterdam version of the Parental Attitude Research Instrument (A-PARI) (30). The A-PARI is a shortened Dutch version of the popular Parental Attitude Research Instrument (PARI) originally developed by Schaefer and Bell (31). The reliability and validity of this instrument are well investigated, especially compared with other existing parental attitude instruments (21). The reliability and validity are indicated to be acceptable (31).

Parental child-rearing attitudes are cognitions of parents concerning their agreement with various child-rearing styles. Cognitions guide parental behavior and thereby influence the parent-child relationship (21). The A-PARI yields scores for four subscales. The Autocratic scale (5 items) measures the degree to which parents believe their child needs authority and strictness (e.g., “A child will thank you later for the strict upbringing that you have given”). The Autonomy scale (6 items) refers to the importance for parents to encourage independence in their child (e.g., “Children need to learn as soon as possible to do everything by itself”). The Overprotection scale (4 items) assesses the degree to which parents are concerned about prevention of disappointment and problems for the child and need to know what’s going on inside the child (e.g., “I must try to prevent all small disappointments that may occur in a child’s life”). The Self-pity scale (5 items) refers to irritability and frustration with respect to the upbringing of the child which is indicative of the degree of rejection of the child (e.g., “Children make you always feel disappointed”). Agreement with an attitudinal statement was rated on a four-point Likert scale ranging from 4=completely agree to 1=completely disagree. Higher scores reflect higher agreement with the child-rearing attitude involved. The subscales show neither relation to gender, age, and marital status of the parents, nor to the number of children in the family (30).

Clinical characteristics of childhood constipation

Using our standardized defecation questionnaire (29) information was collected about clinical characteristics, such as; duration of treatment before intake at our outpatient clinic, age at onset of the constipation, family history of constipation, frequency of defecation and fecal incontinence, size of stool and associated clinical characteristics such as abdominal pain and painful defecation.

Statistical analysis

All data analyses were performed using STATA version 11.1. In three individual cases on separate A-PARI scales a single item was found missing. For these cases the average value of the remaining corresponding scale items was imputed. To investigate the strength of relationships between the individual A-PARI scales Spearman rank correlations were calculated.

We used regression models to examine the association between parental child-rearing attitudes and functional constipation outcomes. Because defecation frequency and fecal incontinence frequency were counted during a period of one week, count models were used to model these measures. Separate negative binomial regression models were fitted with the four A-PARI scales divided into three categories (partitions made at -1SD (16th percentile)- and +1SD (84th percentile) labeled as: low, average and high) as predicting factors and defecation frequency and fecal incontinence frequency dependent variables. A logistic regression model
was fitted with having large amounts of stools as outcome measure. For all three regression models, gender and age were included to adjust for these sociodemographic factors and the average category (-1SD - +1SD) was used as reference group.

To control for the influence of the child’s age on parental attitude, identical but separate regression analyses were made for two age groups (< 6 years and ≥ 6 years). No additional analyses were made for having large amount of stools, because only two-third of the children in this study demonstrated large amount of stools. Incidence rate ratios (IRR) were calculated as measure of association between the predictor variables and the outcome measures in the negative binomial regression analyses, while odds ratios (ORs) were calculated as measure of association in the logistic regression analysis. In all regression analyses, the robust or sandwich estimator of variance was used to derive standard errors. A p-value < 0.05 was considered statistically significant.

Results

Characteristics of the study sample
A total of 134 patients participated in the study. One A-PARI questionnaire was not filled out by the parents; therefore baseline data of 133 children (children < 6 years: n= 64) were used for analysis. Table 1 shows the study sample.

Table 1. Sample Description of 133 Children With Constipation

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographics</td>
<td></td>
</tr>
<tr>
<td>Age at intake, mean ± SD, y</td>
<td>6.7 ± 2.3</td>
</tr>
<tr>
<td>Boys, n (%)</td>
<td>75/133 (56.4)</td>
</tr>
<tr>
<td>History</td>
<td></td>
</tr>
<tr>
<td>Age of onset of constipation, mean ± SD, y</td>
<td>2.9 ± 1.9</td>
</tr>
<tr>
<td>Duration of treatment, mean ± SD, mo</td>
<td>18.1 ± 20.5</td>
</tr>
<tr>
<td>Parental constipation, n (%)</td>
<td>37/132 (28.0)</td>
</tr>
<tr>
<td>Clinical symptoms</td>
<td></td>
</tr>
<tr>
<td>Defecation frequency per week, median (IQR)</td>
<td>1.0 (0.0–2.5)</td>
</tr>
<tr>
<td>Fecal incontinence frequency per week, median (IQR)</td>
<td>10.0 (3.5–25.3)</td>
</tr>
<tr>
<td>Large amount of stool, n (%)</td>
<td>91/133 (68.4)</td>
</tr>
<tr>
<td>Painful defecation, n (%)</td>
<td>66/124 (53.2)</td>
</tr>
<tr>
<td>Abdominal pain, n (%)</td>
<td>91/132 (68.9)</td>
</tr>
<tr>
<td>Physical examination, n (%)</td>
<td></td>
</tr>
<tr>
<td>Abdominal scybalus</td>
<td>44/126 (34.9)</td>
</tr>
<tr>
<td>Rectal scybalus</td>
<td>65/120 (54.2)</td>
</tr>
</tbody>
</table>

IQR indicates interquartile range.
* Missing characteristics were unknown to 5 parents.
* Missing characteristic was unknown to 1 parent.
* Missing characteristics were unknown to parents.
* Missing physical examination because the child was too frightened to perform examination.
Table 2. The effect of parental child-rearing attitude on defecation frequency, fecal incontinence frequency, and having large amount of stools (n = 133)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
<th>Defecation Frequency</th>
<th></th>
<th>Fecal incontinence Frequency</th>
<th></th>
<th>Large amount of stool</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>(%)</td>
<td>IRR</td>
<td>(95% CI)</td>
<td>P</td>
<td>IRR</td>
</tr>
<tr>
<td>Autocratic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>23</td>
<td>(17.3)</td>
<td>1.1</td>
<td>(0.7 – 1.7)</td>
<td>.642</td>
<td>0.6</td>
</tr>
<tr>
<td>Average</td>
<td>87</td>
<td>(65.4)</td>
<td>Ref</td>
<td>Ref</td>
<td>Ref</td>
<td>Ref</td>
</tr>
<tr>
<td>High</td>
<td>23</td>
<td>(17.3)</td>
<td>1.2</td>
<td>(0.6 – 2.5)</td>
<td>.573</td>
<td>1.0</td>
</tr>
<tr>
<td>Autonomy</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>23</td>
<td>(17.3)</td>
<td>0.5</td>
<td>(0.3 - 0.8)</td>
<td>.004</td>
<td>1.6</td>
</tr>
<tr>
<td>Average</td>
<td>83</td>
<td>(62.4)</td>
<td>Ref</td>
<td>Ref</td>
<td>Ref</td>
<td>Ref</td>
</tr>
<tr>
<td>High</td>
<td>27</td>
<td>(20.3)</td>
<td>0.6</td>
<td>(0.3 - 0.9)</td>
<td>.028</td>
<td>1.7</td>
</tr>
<tr>
<td>Overprotection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>23</td>
<td>(17.3)</td>
<td>1.8</td>
<td>(0.9 – 3.5)</td>
<td>.088</td>
<td>1.3</td>
</tr>
<tr>
<td>Average</td>
<td>77</td>
<td>(57.9)</td>
<td>Ref</td>
<td>Ref</td>
<td>Ref</td>
<td>Ref</td>
</tr>
<tr>
<td>High</td>
<td>33</td>
<td>(24.8)</td>
<td>1.1</td>
<td>(0.6 - 2.2)</td>
<td>.696</td>
<td>1.7</td>
</tr>
<tr>
<td>Self-pity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>29</td>
<td>(21.8)</td>
<td>0.7</td>
<td>(0.5 - 1.1)</td>
<td>.096</td>
<td>1.1</td>
</tr>
<tr>
<td>Average</td>
<td>70</td>
<td>(52.6)</td>
<td>Ref</td>
<td>Ref</td>
<td>Ref</td>
<td>Ref</td>
</tr>
<tr>
<td>High</td>
<td>34</td>
<td>(25.6)</td>
<td>1.0</td>
<td>(0.6 – 1.7)</td>
<td>.976</td>
<td>1.5</td>
</tr>
</tbody>
</table>

Note. IRR, Incidence Rate Ratio, derived from negative binomial regression models with gender (not show), APARI child-rearing attitude scales as factors, and age (not shown) as covariate included in the model; Ref = reference; Low = -1SD and lower; Average = between -1SD and +1SD; High = +1SD and higher.
Relationships between the A-PARI scales
The autocratic scale was found associated with the other A-PARI scales (autonomy: $r = 0.41$, $p < .001$; overprotection: $r = 0.38$, $p < .001$; self-pity: $r = 0.38$, $p < .001$). The self-pity scale was found associated with the autonomy and overprotection scales (respectively: $r = 0.20$, $p = .019$; $r = 0.30$, $p < .001$).

Regression models
Results of the regression analyses are shown in Table 2.

Defecation frequency
The autonomy scale was significantly associated with defecation frequency ($\chi^2 = 51.197; p = .002$). Children with parents having low or high autonomy scores had about half the defecation frequency compared with children with parents scoring in the reference group (respectively: IRR: 0.5 [95% CI: 0.3 – 0.8]; $p = .004$; IRR: 0.6 [95% CI: 0.3 – 0.9]; $p = .028$). Age was significantly associated with defecation frequency, elevating the defecation rate with about 17% for each year increment in age (IRR: 1.2 [95% CI: 1.1 – 1.3]; $p = .001$).

In the regression model including only the younger children, none of the sociodemographic and parental attitude variables proved significant (all $p > .052$). However, for the older children the autonomy scale was significantly associated with defecation frequency ($\chi^2 = 14.467; p < .001$). Children with parents having high autonomy scores had approximately a third of the defecation frequency compared with children with parents scoring in the reference group (IRR: 0.3 [95% CI: 0.2 – 0.6]; $p < .001$). The self-pity scale showed a significant relationship with defecation frequency ($\chi^2 = 7.532; p = .023$). Children with parents having a low self-pity score were found to have half the defecation frequency compared with those children with parents in the reference group (IRR: 0.5 [95% CI: 0.3 – 0.8]; $p = .010$). Furthermore, age was found associated with defecation frequency (IRR: 1.2 [95% CI: 1.1 – 1.4]; $p < .001$).

Fecal incontinence frequency
The autonomy scale was significantly associated with fecal incontinence frequency ($\chi^2 = 11.338; p = .004$). Fecal incontinence frequency in children with parents having low attitude scores was approximately one-and-a-half the rate of those with parents in the reference group (respectively 17.3 vs 10.8 times per week; IRR: 1.6 [95% CI: 1.1 – 2.4]; $p = .019$). Children of parents having high scores on the autonomy scale also showed higher rates on fecal incontinence frequency with on average 18.2 vs 10.8 times per week (respectively IRR: 1.7 [95% CI: 1.2 - 2.4]; $p = .004$). The association between the overprotective scale and fecal incontinence frequency also reached significance ($\chi^2 = 7.767; p = .021$). Children of parents scoring within the high overprotection category demonstrated about twice the rate of children with parents in the reference group (IRR: 1.7 [95% CI: 1.2 - 2.6]; $p = .007$). Children with parents having a high self-pity score were found to have one-and-a-half the fecal incontinence frequency compared with those children with parents in the reference group (IRR: 1.5 [95% CI: 1.1 – 2.1]; $p = .022$). Being a girl and increasing age were both found to decrease fecal incontinence frequency (respectively: IRR: 0.6 [95% CI: 0.4 – 0.8]; $p < .001$; IRR: 0.9 [95% CI: 0.8 – 0.9]; $p < .001$).

For younger children, fecal incontinence frequency was only found associated with having low autonomy scores. Children with parents having low scores on the autonomy scale had about twice the fecal incontinence frequency than of those with parents in the reference group.
(respectively 26.5 vs 14.5 times per week; IRR: 1.8 [95% CI: 1.1 – 2.9]; p = .012). Older children with parents having high scores on the autonomy scale had about twice the fecal incontinence frequency than of those with parents scoring within the average range (IRR: 2.3 [95% CI: 1.4 – 3.6]; p < .001). In addition, children with parents having high scores on the overprotection scale had about twice the fecal incontinence frequency (IRR: 2.0 [95% CI: 1.2 – 3.4]; p = .008). Girls had lower fecal incontinence rates than boys in both younger and older children (IRR: 0.5 [95% CI: 0.3 – 0.8]; all p < .005). With each year increase in age fecal incontinence frequency decreases with about 12% for the older children (IRR: 0.9 [95% CI: 0.8 – 1.0]; p = .026).

**Large amount of stool**

Parental attitude was not found statistically significant associated with having large amount of stools.

**Discussion**

This is the first study investigating the relation between parental child-rearing attitudes and functional constipation in childhood. Our study showed that parental child-rearing attitudes are associated with defecation and fecal incontinence frequency. The associations between parental child-rearing attitudes and functional constipation were specifically found for older children (aged ≥ 6 years).

Our results suggest that for the autonomy attitude that a deviation from the average results in less defecation and more fecal incontinence. The strong magnitudes of effect on this scale are not surprising as developmental theories emphasize the relationship between gaining autonomy, toileting issues/bodily functions, and the importance of parents to meet the developmental needs and adapt to the temperament of the child (32). Previous research showed that parenting constipated children may be even more challenging because of more stubbornness (33) and difficult temperament (18;34;35) in these children. However, other studies showed evidence that the development of problematic behavior in a child depends on the child’s interaction with its parents (36;37). In line with this goodness-of-fit theory, we suggest that the quality of fit between parent and child characteristics contributes to the development and maintenance of chronic constipation.

It was found that a high overprotective child-rearing attitude worsens fecal incontinence. Higher levels of overprotection were found in parents of children with cancer, asthma (38;39) and atopic dermatitis (40) suggesting a useful coping strategy to adjust to the chronic disease of the child. However, extreme overprotection may lead to intrusive and psychologically controlling parenting that is guilt-inducing and criticizing child rearing with little regard for the autonomy and individuality of the child. This parenting style has been related to negative (psychosocial) outcomes for the child (41-43) which may explain our results.

Finally, a high self-pity attitude, referring to a high level of irritability and frustration with respect to the upbringing of the child, was related to more episodes of fecal incontinence. For parents with a chronically constipated child, with most children having fecal accidents, over-reactivity may arise around toileting (16;44). On the other hand, a tendency to have negative attributions about children’s behavior may lower the threshold for hostile reactions towards a child resulting in power struggles between parent and child about toileting and subsequent
fecal accidents (45). However, previous studies found weak relationships between parenting stress (46) and irritability (18) with the development of toileting problems in children. A mutual interdependency of child-rearing attitudes and functional constipation was specifically found in older children (aged ≥ 6 years). We suggest that at older age more dysfunctional parent-child interaction pattern occur. The older children are likely the children with a long history of defecation problems. It remains a question this results in dysfunctional parenting attitudes or is the consequence of these attitudes. Because parental child-rearing attitudes are assumed to be considerable stable over time (47;48), we hypothesize parents may have an age inappropriate child-rearing attitude or that they have not adjusted their attitude to the specific needs of their ill child.

Some limitations of this study need to be addressed. We would like to emphasize that this study measured child-rearing attitudes of parents which is one of many factors that determine actual child rearing behavior (21;49). The relation between parental attitudes and actual parenting practices is generally moderate (21;24;25). Observing parental behavior and multiple informants such as the child can be helpful in assessing rearing behavior. Still, attitude measurement has an advantage over observing parenting behavior because attitudes are generally more stable over time (49). While the total sample size may be considered quite large, in some instances the numbers of observations per category were rather low. This may have lead to the inability to demonstrate statistical significance (type I error). Finally, given the cross-sectional nature of this study causality cannot be determined and therefore we are unable to state whether specific child-rearing attitudes are pre-existing risk factors for developing constipation in the child.

Because of high prevalence rates of emotional and behavior problems, we previously suggested adding a behavioral screening to the diagnostic work-up of children with constipation (15). The current study showed an association between parental child-rearing attitudes and childhood constipation. Although, future studies are needed to further explicate the role of parents and parent-child interaction patterns, our findings constitute a substantial contribution to our understanding of the multiple factors that are involved in functional constipation in childhood. With the clinician working with parents collaboratively in the management of constipation, parenting issues should be incorporated in the treatment. Referral to mental health services is needed when parenting issues are hindering treatment to be successful or when the parent-child relationship is at risk.
References


30. de Leeuw ED. Standardization of the Amsterdam version of the Parental Attitude Research Instrument (A-PARI) [in Dutch]. Amsterdam: Faculty of Pedagogical and Educational Sciences, University of Amsterdam, 1986.


