An Investigation of Health Anxiety in Families Where Children Have Recurrent Abdominal Pain

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Objectives To explore health anxiety in children with recurrent abdominal pain (RAP) using a symbolic play assessment. Methods Children with RAP and two control groups (with asthma and well children) were recruited. Eighty-four families completed play and questionnaire assessments of health anxiety and psychological functioning. Results Children with RAP demonstrated less use of psychological descriptions for feelings than control children, and were more likely to represent serious outcomes to health scenarios than well children, but not children with asthma. Mothers of children with RAP had higher levels of health anxiety, and rated their children as having more physical symptoms and anxiety. Conclusions The symbolic play paradigm provided discriminating insights into health anxiety in children. The findings suggest that childhood RAP may be associated with higher levels of parental health anxiety. These aspects of family functioning might usefully be explored in families where a child has RAP.

Key words anxiety; parental health; recurrent abdominal pain; symbolic play assessment.

Introduction

Recurrent abdominal pain (RAP) is one of the commonest complaints of childhood, affecting ~10% of children at any one time (Chitkara, Rawat, & Talley, 2005). It frequently persists and is associated with adverse adult outcomes, including abdominal pain (Walker, Garber, Van Slyke, & Greene, 1995) and psychological problems (Hotopf, Carr, Mayou, Wadsworth, & Wessely, 1998). RAP has been commonly defined as three or more episodes of pain occurring over a period of at least 3 months, with pain sufficient to cause some impairment of function (Apley, 1976). This definition encompasses a range of presentations, with a number of potential contributing etiologies including physiological functioning, the child’s psychological state, and family and environmental factors (Garralda, 1996; McOmber & Shulman, 2007; Scharff, 1997).

A number of studies have highlighted associations between RAP and child and family psychological functioning. These have found raised rates of child psychiatric disorder and in particular, anxiety (Apley, 1976; Campo et al., 2004; Garber, Zeman, & Walker, 1990; Ramchandani, Hotopf, Sandhu, & Stein, 2005; Walker, Garber, & Greene, 1993). In addition, studies consistently report higher rates of abdominal pain and anxiety in the parents of children with RAP (Apley, 1976; Campo et al., 2007; Hotopf et al., 1998; Ramchandani, Stein, Hotopf, & Wiles, 2006; Walker and Greene, 1989). In this it shares a number of similarities with other functional symptoms, such as chronic pain and fatigue. Fewer studies have moved beyond this to investigate the potential processes that may link parental and child symptoms. Walker and colleagues have explored parental responses to children’s symptoms, and shown that parents of children with RAP respond selectively to gastrointestinal symptoms in their children (Walker et al., 1993). Parental attributions for their child’s pain may be influential in affecting the
course of symptoms, and a study in Ireland found that children whose parents held psychological attributions for their RAP had better outcomes (Crushell et al., 2003).

The importance of the parental role is also illustrated in studies of parents with functional symptoms. A study of mothers with somatization disorder in London, UK, found that their children were more likely to present with health complaints, raising the possibility that parental health role may be important (Craig, Cox, & Klein, 2002). Mothers with this disorder also interacted differently with their children in play, preferentially responding to “medical” related play over other themes (Craig, Bialas, Hodson, & Cox, 2004). Caution must be exercised in the interpretation of these studies as a number of possible explanations for these associations exists. Nonetheless, they point to the possibility that parental attributions and responses to symptoms may have a role in the etiology of RAP, at least in some cases. If parental influence of this kind does occur, it is likely that there are several mechanisms operating, including genetic transmission. Potential psychological mechanisms of transmission are likely to include effects of parental responses to a child symptoms, and also children modeling or changing their own behavior in the light of their experience of pain and its consequences. Further studies are needed to help further elucidate these processes.

One further potential process that has been explored in adults, but not to any great extent in children, is the concept of alexithymia (Sifneos, 1996). This is a lack of words or expressions for feelings, which has been hypothesized to lead to the expression of distress or unhappiness in somatic terms. Following this it could be hypothesized that children with RAP and their families may express fewer emotions and use more concrete or physically orientated language to describe feeling states. Some research findings lend a degree of support to this possibility, including the study of Crushell and colleagues described above. One study comparing children with abdominal pain of organic origin with those of uncertain origin found that the parents in the organic group had a greater awareness of psychological elements in illness (Sawyer, Davidson, Goodwin, & Crettenden, 1987).

The research to date leaves a number of questions unanswered. First, the role of parental anxiety is still unclear despite a consistent finding of its association with RAP. More detailed study of the form of the parental anxiety, including whether it has a specific focus on health concerns could be informative. Similarly, the place of child anxiety and the degree to which it is health orientated, is worthy of further exploration.

Second, most previous research into RAP in young children has relied on parental report. This limits investigation of intergenerational transmission of risk, since single-informant bias may lead to overestimation of correlations between parental and child outcomes. Nevertheless, there are real difficulties in directly assessing children’s beliefs and attitudes. Questionnaire measures can be of limited reliability with younger children (Marshall, Jones, Ramchandani, Stein, & Bass, 2007). This is particularly so when assessing complex concepts such as health beliefs and attitudes. Although these have been examined in adolescents (Eminson, Benjamin, Shortall, & Woods, 1996), there are no validated tools for their assessment in younger children. Recently, a child version of the Illness Attitude Scales has been developed for use with children as young as 8 years, but it requires validation (Wright & Asmundson, 2005).

Symbolic Play Assessment is one method of investigating the beliefs and attitudes of younger children that has proved fruitful. It presents the child with a familiar form of expression (play) and has a long therapeutic and research tradition of effective use. Systematically presented and evaluated forms of play assessment can be particularly effective, and the past 20 years has seen the development of structured research tools to investigate children’s representations of the world using doll play, where the dolls are taken to represent people in the child’s real world. Two particular tools that have been developed to explore children’s representations of their relationships are the Macarthur Story Stem Battery (Bretherton, Prentiss, & Ridgeway, 1990) and the Separation Anxiety Test (Shouldice & Stevenson-Hinde, 1992). These have been further developed as the Dolls Houses Play assessment tool for use in investigations of other aspects of parent–child interaction, and outcomes from these assessments have shown associations with independent measures of parent–child interaction, and child adjustment (Murray, Woolgar, Briers, & Hipwell, 1999). However, these methodological developments are yet to be used in conditions such as RAP in children, where greater understanding of the child’s viewpoint may be particularly informative.

The present study was designed to test two specific sets of hypotheses: First, in a Symbolic Play Assessment, children with RAP would show higher levels of anxiety and serious outcomes, and less use of psychological language to describe distress, compared with control children. Second, children with RAP, and their families, would have higher levels of anxiety on standard questionnaire measures, and specifically anxiety related to health.
Methods
Participants
Three groups of children and their parents were recruited—a group with RAP, a group with asthma, and a well group. Initially, a case-control design was preferred, with children matched on age, gender, and, to provide a reasonable proxy match for socioeconomic status (SES), by general practice (local primary healthcare provider).

Setting
In order to obtain a representative sample, participants were recruited from eight general practices (i.e., from primary healthcare) in Milton Keynes, Aylesbury, and Oxford, UK.

Inclusion and Exclusion Criteria
RAP group children had to meet Apley’s criteria (Apley, 1976), namely, (1) three or more episodes of abdominal pain sufficient to impair functioning in 3 months, and (2) to have experienced the pain within the past 3 months. They had all consulted their primary healthcare physician for the pain, and received medical assessment. Children with a clear organic cause for their abdominal pain were excluded, as were those admitted to hospital more than once in the past year.

Two control groups were used. The first comprised children without any physical or psychological illness (the well group). They were selected consecutively from general practice lists of children who had not attended the primary care physician in the past 6 months (in the UK, all health attendances, including hospital attendances are recorded in primary care records). A second control group (the asthma group) was selected to control for those factors that were general to a child having an illness. Asthma was selected as it is a relatively common illness which, while having a multifactorial etiology, does have demonstrable biomedical features. Children with asthma of at least moderate severity, requiring regular medication, were identified from primary care lists. Those with more than one hospital admission in the last year were excluded.

Children were in the age range of 6–9 years (age of peak prevalence of RAP; Apley & Naish, 1958). Children with moderate or severe learning disabilities were excluded as were those with other severe or life-threatening illness requiring regular hospital admission. Children with a history of both RAP and asthma were excluded.

Sample Composition
Parents of potential participants were sent a letter and information sheet about the study by the general practice. This included details of the study aims and the assessments (including questionnaires and video-recorded play) that were planned. Totally 465 letters were sent, and a total of 125 responses received (27%). Fifty-two potential participants with RAP agreed to participate and were telephoned. Sixteen did not meet criteria, and four did not respond/moved away; thus, 32 children with RAP participated.

Thirty-nine responses were received from children identified from records as “well.” Of these, three did not meet criteria, and one was unavailable. Of the remaining 35, the first 32 matching RAP children on gender, age, and general practice, were selected to participate.

Thirty-four responses were received from parents of children identified with asthma. Fourteen did not meet criteria; the remaining 20 participated in the study, but were not individually matched to children in the other groups.

Demographic characteristics were similar across groups. For RAP, well, and asthma groups, respectively, boys made up 31.3, 31.3, and 40% ($\chi^2 = .025$, $p = .875$); and ages were 7.62, 7.75, and 7.75 years (RAP vs. Well, $p = .626$; RAP vs. Asthma, $p = .660$); the proportion of single-parent families was similar in each group (28.9% overall).

Measures
Assessments were conducted in the families’ homes, where the primary caregiver—usually the mother—completed questionnaires, and the child completed a Symbolic Play Assessment with the researcher.

Symbolic Play Assessment of Health and Illness
The Symbolic Play Assessment (adapted from Murray et al., 1999) was developed from the Dolls House Play method devised by Murray and colleagues (Murray et al., 1999), and was also informed by the Macarthur Story Stem Battery (Bretherton et al., 1990; Oppenheim, Emde, & Warren, 1997). The Dolls House Play method is distinctive in that the child’s own home and family members are depicted, and it allows the child to lead the play (see details below). Such methods allow play to be more naturalistic, with the child becoming emotionally engaged with the story, so revealing those aspects of family functioning that are most salient to him or her. Outcomes from this assessment have shown associations with independent measures of parent–child interaction, and children’s early experience and adjustment (Murray et al., 1999; Woolgar & Murray, 2010).

In the present study we used this technique to investigate themes of particular pertinence to child and family ill-health. We focused on the parent’s response to child
physical symptoms (including the language used; Craig et al., 2004) and anxiety (Apley & Naish, 1958; Walker et al., 1993). To cover this range of parental responses, normative scenarios from everyday life were selected, each presenting the child with a potentially challenging situation. The five scenarios were:

1. Child develops abdominal pain in the morning before school
2. Child’s friend falls and cuts their knee whilst playing at the child’s house after school
3. Child is woken by a noise in the night
4. Child’s mother has to go to bed as she is feeling unwell
5. A happy time

Three different “illness” scenarios (1, 2, and 4) were developed to allow for a range of illness-related situations. The settings for these scenarios were all within the family home, and were amenable to a range of interpretations in terms of severity. Scenario 3 (woken by a noise in the night) was included as a comparison scenario not involving health, but involving a potentially anxiety-inducing situation. Scenario 5 (a happy time) was included after initial piloting, so that the assessment ended positively, away from the theme of illness. It was not specifically coded.

Assessments were administered by a trained researcher. Each child was presented with an open-construction wooden dolls house. They were given a set of furniture and encouraged to furnish the house so that it was “like their house that they lived in.” They were given a range of dolls and asked to choose some to represent themselves and their immediate resident family. The child was then invited to play through the five scenarios. A series of scripted prompts was used by the interviewer. The play was video recorded. For further details, please see the supplementary material online. Additional information regarding the administration, and coding manuals, are available from the authors.

The videos were coded by two psychology graduate researchers who were blind to child group status. Variables were grouped a priori, to reflect the focus of the research questions. Children’s play and language were coded on five dimensions selected to be of particular pertinence to functional symptoms. These were (1) parental anxiety, (2) parental response, (3) child anxiety, (4) serious outcomes from health-related scenarios, and (5) use of psychological versus physical language to describe the experience. Most aspects of play were identified as either present or absent at key points during each of the four coded scenarios, and binary coded. For example, if a child expressed anxiety in language or behavior at one point during a scenario, then a score of 1 was entered for each of these. Absence of anxiety was coded 0, so for each scenario a child could score between 0 and 2 for anxiety. Scores were then summed across the relevant scenarios (see supplementary material online for further detail). The parental anxiety dimension was dropped from further analyses as it was identified in the play of very few children (median score of 0). The ranges and median scores for the remaining scales were: parental concern (range 0–4; median score 2; inter-quartile range [IQR] 0–4), child anxiety (range 0–8; median score 2; IQR 0–2), serious outcomes (range 0–6; median 2; IQR 0–3), and psychological language use (range 0–6; median 2; IQR 1–3).

<table>
<thead>
<tr>
<th>Parental Response</th>
<th>Child Anxiety</th>
<th>Serious Outcomes</th>
<th>Psychological vs. Physical Language</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parental response</td>
<td>.07</td>
<td>.04</td>
<td>.11</td>
</tr>
<tr>
<td>Child anxiety</td>
<td>.07</td>
<td>.21*</td>
<td>.17</td>
</tr>
<tr>
<td>Serious outcomes</td>
<td>.04</td>
<td>21*</td>
<td>.25**</td>
</tr>
<tr>
<td>Psychological vs.</td>
<td>–.11</td>
<td>17</td>
<td>–.25**</td>
</tr>
<tr>
<td>physical language</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .1. **p < .05.

Correlations between items comprising each variable were moderate (alphas ranged from .40–.63 across the five variables). For details of the variable construction please see supplementary material online. Coding reliability was assessed using a sample of 10 videos coded by both coders. A high level of inter-rater agreement was achieved across all categories (overall inter-rater agreement = 87.5%).

Correlations between the different scales of the Symbolic Play Assessment are shown in Table I. There were few clear correlations between Symbolic Play Assessment scales, and the questionnaire measures used in the study, suggesting that they do represent different domains. The exceptions to this were: Child anxiety in the play correlating with the Generalized Anxiety Scale (GAD) scale of the Screen for Child Anxiety and Related Emotional Disorders (SCARED) questionnaire (r = .30; p = .007); serious outcomes in the play assessment correlating negatively with the prosocial behavior scale of the Strength and Difficulties Questionnaire (SDQ; r = −.30; p = .009); and parental response in the play correlating with the emotional scale of the SDQ (r = .26, p = .04). All of these were in the expected direction, although they should be interpreted cautiously in the light of multiple tests of correlation.
Questionnaire Measures of Maternal Functioning

General Health Questionnaire (28-item version; GHQ-28; Goldberg & Hillier, 1979). This is a widely used screening questionnaire for psychopathology in adults includes four subscales: somatic symptoms, anxiety, social dysfunction, and depression. It had a high level of internal consistency in this study (Cronbach’s $\alpha = .91$). Higher scores indicate higher levels of symptoms.

Illness Attitude Scales (Kellner, Abbott, Winslow, & Pathak, 1987). These comprise two subscales: Health Anxiety and Illness Behavior, based on 29 statements about disease and its impact, with a 5-point response scale for most statements. The scales are reliable (Cronbach’s $\alpha = .87$ in this study), and have been extensively used in investigations of functional symptoms. Higher scores indicate higher levels of health anxiety or illness behavior, respectively.

Health Anxiety Inventory (Salkovskis, Rimes, Warwick, & Clark, 2002). The Health Anxiety Inventory was devised for the investigation of specific cognitions related to clinical hypochondriasis. The short 18-item version of this questionnaire was used (Cronbach’s $\alpha = .74$ in this study). Higher scores indicate greater health anxiety.

Questionnaire Measures of Child Functioning (Parent Completed)

Screen for Child Anxiety and Related Emotional Disorders (SCARED; Birmaher et al., 1997). This is a 41-item questionnaire assessing child anxiety symptoms. It had good consistency in this study (Cronbach’s $\alpha = .87$). It has five subscales: panic/somatic symptoms, generalized anxiety, separation anxiety, social phobia, and school anxiety, discriminating the anxiety disorders. Higher scores indicate greater levels of anxiety.

Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997). This is a widely used screening questionnaire consisting of 25 questions that divide into five subscales: emotional problems, hyperactivity, conduct problems, peer problems, and a prosocial score. The first four subscales combine to give a total difficulties score, with higher scores indicating a higher level of problems in this scale.

Child Somatization Inventory (CSI; Walker et al., 1989) This checklist has been used in previous studies of children with RAP. Questions address 36 symptoms derived principally from the somatization questions of the Hopkins Symptom Checklist. Scores are summed across the whole questionnaire with higher scores indicating more symptoms. The internal consistency in this study (alpha) was .94.

Data Analysis

The children in the Well and RAP groups were individually matched. The original aim was to also have an adequately matched control group of children with asthma; however, recruitment difficulties meant that this was not possible and, as matching would have led to a substantial reduction in the available sample of Well children in the comparisons between Well and Asthma children, unmatched analyses were used in these comparisons (Hennekens & Buring, 1987; Thompson, Kelsey, & Walter, 1982). Hence, the Well and Asthma control groups were compared to the index RAP group using different statistical methods of analysis (i.e., matched and non-matched analyses, respectively). Most variables were not normally distributed and so appropriate non-parametric tests were used (Wilcoxon tests [matched] were used in the case of all comparisons of the RAP and Well groups, and Mann–Whitney tests [unmatched] were used in the case of all comparisons of the RAP and asthma groups). No adjustments were made for multiple testing, but findings were interpreted conservatively taking into account that a number of statistical tests were conducted. All tests were two-tailed comparisons. Results are reported primarily in terms of median scores; however, mean differences between the groups, along with 95% confidence intervals (CIs) and effect-size estimates, are reported for key findings, for illustration. These should be interpreted cautiously as the data were not normally distributed in all cases.

Ethical Approval

Ethical approval was obtained from the Oxfordshire Psychiatric Research Ethics Committee (OPREC no. O02.054), and from Aylesbury Vale and Milton Keynes Research Ethics Committees. Parents gave written informed consent. Child verbal assent was sought and given in all cases.

Results

Symbolic Play Assessment

Children with RAP represented more serious outcomes in health-related scenarios (median 2.0 [IQR 1.0–4.0]) than children in the Well group (1.0 [1.0–2.0]; $p = .041$; $d = 0.48$). However, the RAP group did not differ from the Asthma group on this measure. These more serious outcomes included the child representing someone needing to go to hospital, needing a doctor or medicine or, occasionally, someone dying. There was also evidence of less use of psychological language to describe feelings in the RAP group compared with both control groups (RAP
Table II. Main Outcome Measures from the Symbolic Play Assessment

<table>
<thead>
<tr>
<th>Scale</th>
<th>RAP Group Median (IQR) (N = 32)</th>
<th>Well Group Median (IQR) (N = 32)</th>
<th>Asthma Group Median (IQR) (N = 18)</th>
<th>RAP vs. Well p-value (Wilcoxon test)</th>
<th>RAP vs. Asthma p-value (Mann–Whitney U)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Child anxiety</td>
<td>0.5 (0.0–1.0)</td>
<td>0.5 (0.0–1.75)</td>
<td>1.00 (0.0–2.0)</td>
<td>.283</td>
<td>266.5; .642</td>
</tr>
<tr>
<td>(health scen.)</td>
<td>Mean = 0.94</td>
<td>Mean = 0.81</td>
<td>Mean = 0.94</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Child anxiety</td>
<td>1.0 (1.0–1.0)</td>
<td>1.0 (0.0–1.0)</td>
<td>1.0 (1.0–2.0)</td>
<td>.122</td>
<td>199.0; 163</td>
</tr>
<tr>
<td>(non-health)</td>
<td>Mean = 0.97</td>
<td>Mean = 0.72</td>
<td>Mean = 1.27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Parental response</td>
<td>2.0 (1.75–2.0)</td>
<td>1.0 (1.0–2.0)</td>
<td>2.0 (1.0–2.5)</td>
<td>.667</td>
<td>127.5; .566</td>
</tr>
<tr>
<td></td>
<td>Mean = 1.90</td>
<td>Mean = 1.66</td>
<td>Mean = 1.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Serious outcome</td>
<td>2.0 (1.0–4.0)</td>
<td>1.0 (1.0–2.0)</td>
<td>2.0 (0.0–4.0)</td>
<td>.041**</td>
<td>249.0; 624</td>
</tr>
<tr>
<td></td>
<td>Mean = 3.32</td>
<td>Mean = 1.44</td>
<td>Mean = 2.27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Psychological vs.</td>
<td>2.0 (1.0–2.0)</td>
<td>3.0 (2.0–4.0)</td>
<td>3.0 (2.0–4.0)</td>
<td>.002**</td>
<td>173.0; .049**</td>
</tr>
<tr>
<td>physical response</td>
<td>Mean = 1.83</td>
<td>Mean = 2.94</td>
<td>Mean = 2.73</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Non-parametric tests were used, and so median and inter-quartile ranges are given as the principal measures of distribution. Mean values are given to ease interpretation of the findings. Higher scores on the individual scales indicate; (a and b) increased child anxiety expressed, (c) greater parental response to symptoms, (d) a more serious outcome to the health problem encountered, and (e) more psychological language used to express how the child is feeling.

**p < .05.

Table III. Maternal Scores on the Illness Attitude Scales, Health Anxiety Inventory and General Health Questionnaire (GHQ-28) in the Three Groups

<table>
<thead>
<tr>
<th>Scale</th>
<th>RAP Group Median (IQR) (N = 32)</th>
<th>Well Group Median (IQR) (N = 32)</th>
<th>Asthma Group Median (IQR) (N = 20)</th>
<th>RAP vs. Well p-value Z-score; p-value</th>
<th>RAP vs. Asthma Mann-Whitney U; p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health anxiety</td>
<td>10.5 (7.0–16.25)</td>
<td>7.5 (3.25–11.0)</td>
<td>6.0 (3.0–9.0)</td>
<td>−2.053; .040**</td>
<td>156.0; .021**</td>
</tr>
<tr>
<td>(Illness Attitude Scales)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Illness behavior (IAS)</td>
<td>7.0 (3.75–11.0)</td>
<td>4.0 (2.0–6.0)</td>
<td>6.0 (4.0–8.0)</td>
<td>−2.830; .005**</td>
<td>230.0; .706</td>
</tr>
<tr>
<td>Health Anxiety</td>
<td>9.0 (7.0–14.0)</td>
<td>8.0 (6.0–11.75)</td>
<td>9.0 (6.0–14.0)</td>
<td>−0.789; .430</td>
<td>242.5; .991</td>
</tr>
<tr>
<td>Inventory (total)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GHQ somatic</td>
<td>5.0 (2.0–7.0)</td>
<td>3.0 (1.0–5.0)</td>
<td>3.0 (1.0–6.0)</td>
<td>−1.771; .076</td>
<td>183.0; .259</td>
</tr>
<tr>
<td>GHQ anxiety</td>
<td>4.0 (4.0–9.0)</td>
<td>2.0 (2.0–4.0)</td>
<td>4.0 (0.5–6.0)</td>
<td>−2.467; .014**</td>
<td>158.5; .193</td>
</tr>
<tr>
<td>GHQ soc. dysf.</td>
<td>7.0 (6.75–7.0)</td>
<td>7.0 (7.0–7.0)</td>
<td>7.0 (5.5–7.0)</td>
<td>−1.258; .208</td>
<td>181.5; .238</td>
</tr>
<tr>
<td>GHQ depression</td>
<td>0.0 (0.0–4.0)</td>
<td>0.0 (0.0–1.0)</td>
<td>0.0 (0.0–1.5)</td>
<td>−1.421; .153</td>
<td>211.5; .546</td>
</tr>
<tr>
<td>GHQ total</td>
<td>17.0 (12.25–28.75)</td>
<td>12.0 (9.25–15.75)</td>
<td>13.0 (7.0–21.0)</td>
<td>−2.144; .032**</td>
<td>143.5; .247</td>
</tr>
</tbody>
</table>

**p < .05.

median 2.0 [1.0–2.0]; Well group 3.0 [2.0–3.0]; Asthma group 3.0 [2.0–4.0]. RAP vs. Well, p = .002, mean difference 1.11 [95% CI 0.41, 1.81], d = 0.83; RAP vs. Asthma, p = .049, mean difference 0.89 [95% CI 0.003, 1.79], d = 0.59. No differences were found between the RAP and Well groups on the scales of parental response to symptoms or child anxiety. These results can be seen in Table II. Girls scored higher than boys on two of the scales (more serious outcomes and use of psychological language for feelings); however, as the groups were matched for gender this did not affect the group differences found.

Measures of Maternal Functioning

The maternal scores on the Illness Attitude Scales and the Health Anxiety Inventory are shown in Table III. Mothers of children with RAP had significantly higher scores than both other groups on the Health Anxiety subscale of the Illness Attitude Scales (RAP vs. Well, mean difference 3.58 [95% CI 0.24, 7.13] d = 0.51; RAP vs. asthma, mean difference 4.9 [95% CI 0.54, 9.33], d = 0.60). They also had higher scores than the Well group on the Illness Behavior subscale (mean difference 2.50 [95% CI 0.80, 4.20], d = 0.83). There were no differences on the Health Anxiety Inventory. Mothers of children with RAP had significantly higher scores on the anxiety subscale of the GHQ, and higher total scores than mothers of well children (mean difference 5.29 [95% CI 1.03, 9.54], Cohen’s d = 0.69). No differences were found between RAP and Asthma groups on the GHQ.

Measures of Child Functioning

Mothers’ scores on the SCARED questionnaire are shown in Table IV. The RAP group scored higher than both control groups on the general anxiety and school avoidance scales. The RAP group also scored higher than the Well
group (but not the Asthma group) on the panic-somatic and separation anxiety scales.

The scores on the Strength and Difficulties Questionnaire are shown in Table V. Children with RAP were scored significantly higher than well children on the emotional and hyperactivity subscales and the total problems scale by their mothers. The higher score on emotional symptoms remained even when the question about stomach and headaches was removed (adjusted emotional subscale). Children with RAP also had higher scores on the emotional symptoms subscale than the children in the Asthma group.

Children with RAP (median 17.0 [12.0, 27.0]), were also scored significantly higher by their mothers on the Children’s Somatization Inventory (CSI) than well children (median 4.0 [2.0, 7.75]; Z-score −4.640; p < .001, d = 1.00), or children with asthma (median 9.0 [5.5, 19.5]; Mann–Whitney U score 179.0, p = .016, d = 0.41).

**Discussion**

This study used a Symbolic Play Assessment to investigate children’s representations of their families in situations of health and illness. Children with RAP were more likely to anticipate serious outcomes in relation to health scenarios than the well children. This may reflect higher levels of health anxiety. The children with RAP had similar scores to children with asthma. Children with RAP also demonstrated less use of psychological language and more use of physical descriptions for feelings than either of the control groups. In contrast, no group differences were found for representation of child anxiety. In the domains where differences were found, effect sizes ranged from 0.48 to 0.83, representing moderate to large effects.

On questionnaire measures, mothers of children with RAP had higher scores for health anxiety than mothers of both children with asthma and well children. When compared with mothers of well children, mothers of children with RAP also scored significantly higher on a measure of illness behavior, and they had higher scores on the anxiety and total score scales of the GHQ.

Compared with both other groups, mothers of children with RAP rated their children as having more anxiety (on the SCARED questionnaire), higher levels of emotional problems (on the Strengths and Difficulties Questionnaire [SDQ]), and as having more physical symptoms (using the Children’s Symptom Inventory). The consistency of these findings appears to support the findings of the symbolic play-assessment paradigm.

**Strengths and Limitations**

This is the first study to systematically investigate the child’s view of health behavior in younger children with RAP using symbolic play. A reliable coding schedule was developed and used, with coding undertaken by
independent raters blind to group status. In addition, well-validated questionnaire measures of maternal and child outcomes were used, including specific measures of maternal health anxiety. The relative consistency of the findings between observational and questionnaire outcomes lends some confidence to their veracity. The inclusion of two control groups, including one with a physical illness (asthma), allowed for comparison of specific illness-related effects. Finally, this study recruited children from primary care, making the findings more generalizable to the general population of children who experience RAP.

There are several limitations. First, the sample size is relatively modest. Although comparable with a number of previous studies, the potential lack of statistical power may have been particularly important for some variables. Second, the Symbolic Play Assessment was a novel way of investigating child functional symptoms, and may require further development. One particular limitation of the Symbolic Play Assessment was the low scoring on the child and parental anxiety variables, reducing the ability of the scales to discriminate on these variables. The play assessment was coded blind to group; however, those conducting the at-home assessments were not always blind to group. It is possible that expectancies of the assessors may have introduced some bias into the conducting of the assessment; however, this was minimized by the use of a guide script for the assessments. Third, the Apel criteria for RAP, used here, have been superseded in clinical practice in many countries. However, they have been widely used in research, and newer criteria such as the ROME criteria have not yet demonstrated better predictive validity (Rasquin Weber et al., 1999). In addition, the diagnosis was based on recordings of medical records, which may reflect different standards of examination in different primary care practices. Fourth, there remains the possibility of some selection bias, particularly given the modest response rate to the initial study-invitation letter. Finally, the cross-sectional design of the study means that assumptions cannot be made that any associations found are causal.

Clinical Implications

The finding that the children with RAP were more likely to represent serious outcomes in relation to health scenarios in their play than the well children suggests that there may be higher rates of health anxiety in their families. It is of interest that in their play the children were predominantly representing the actions of their parents, who tended to be the “decision-makers” in the play scenarios, and so this may represent either raised health anxiety in the children themselves, or reflect more anxious health behavior of their parents. Health anxiety has not been extensively studied in children of this age before; however, one study of adolescents (Eminson et al., 1996) found that those with more somatic symptoms had more abnormal illness beliefs.

The possibility of the children’s representations reflecting more anxious health behavior of their parents is consistent with previous research suggesting higher anxiety in parents of children with RAP (Ramchandani et al., 2006; Walker et al., 1993), and with the finding from the questionnaire measures in the present study that mothers of children with RAP had higher rates of health anxiety than mothers in either of the control groups. No previous research has specifically explored health-related anxiety in parents of children with RAP in this way. Taken together, these findings raise the possibility that parental health anxiety may be relatively specific to functional symptoms such as RAP, rather than being a general response to a child’s illness, although this was not consistent across all measures. If this is the case, then a key question relates to the possible mechanisms underlying such an association. There may be a variety of potential mechanisms. First, parents with high levels of health anxiety may model anxious behavior when they have symptoms themselves, and this behavior may be copied by their children. Similarly, heightened levels of health anxiety in parents may also lead to more frequent consultation with health professionals, with the child learning to consider such responses as normal. Second, it is possible that parents may reinforce the occurrence of symptoms in their children. Parents with elevated health anxiety may respond differently (including in more dramatic or anxious ways) to their child’s symptoms. In addition to potentially reinforcing symptom complaints, this may also lead to increased anxiety in the child and so to more symptoms. Third, there may be a genetic component to somatic complaints, both in a generalized susceptibility to anxiety and also to heightened sensitivity to bodily symptoms (Kendler et al., 1995). It is also possible that any association between parental and children’s symptoms is due to reverse causality, that is, that the RAP in the child may lead to increased anxiety in both child and family. It is conceivable that the lack of a clear biomedical cause for these recurrent abdominal symptoms may causes parents greater anxiety than that seen in families with children having a more clearly explained or understood condition. Specifically in terms of the symbolic play, it may also be that children who have been exposed to more healthcare use (such as the children in the RAP and asthma groups) are more likely to represent events like a doctor visiting the home, or hospital attendance in their play. Finally, it is possible that the findings are related to some other factor affecting both parent and child, or
through other aspects of family functioning. One of these may be through language and family discourse and expression about illness. The finding from the symbolic play that children with RAP use fewer psychological and more physical explanations to describe their feelings is intriguing in this regard. It connects with a previous literature on alexithymia (Sifneos, 1996). This is the concept of “no words for feelings,” where people (or families) who lack adequate language for describing their feelings are hypothesized to be a greater risk for somatoform complaints, as feelings become expressed more through physical symptoms than “the language of feelings or emotions.” There is a growing body of literature on the concept of alexithymia, but a limited literature on the importance of language use in the context of childhood illness. Although one should be cautious in interpreting findings from any single study, the area of language use is one that would appear to warrant further study. This is both in terms of how language is used to describe symptoms within families, and also with regard to how language is used, or not used, to describe emotional experiences within families. It is worth noting that this was a predominantly white, British-born population, and different concepts may emerge in studies of children from other ethnic or cultural backgrounds. Further investigation is clearly required in this area.

Conclusions

The findings of this study indicate that mothers of children with RAP have higher levels of health anxiety compared with mothers of both well children and children with asthma, and that this may also be evident in the play representations of the children themselves (at least in terms of the comparison between children with RAP and those who are well). Further research is required to confirm these findings in other samples and to more clearly elucidate the important elements of parental health anxiety. Caution must be exercised in drawing conclusions about causality from a cross-sectional study such as this one, and further investigation is needed. However, the findings of the present study do raise the possibility that parental health anxiety may play a role in the etiology and/or the maintenance of symptoms of recurrent abdominal pain in children, and consideration should be given to exploring the area of parental health anxiety and health beliefs when children present to clinicians in this way. Given the prevalence of functional symptoms and their impact on children’s and their families functioning, this may represent an opportunity for intervention.

Supplementary Data

Supplementary data can be found at: http://www.jpepsy.oxfordjournals.org/.

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References


