Complementary therapies in paediatric gastroenterology: prevalence, safety and efficacy studies
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Chapter 6

No short term effect of gut-directed hypnotherapy on psychological profiles of children with functional abdominal pain and irritable bowel syndrome

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Martha A. Grootenhuis
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Submitted
Abstract

Objective: Gut-directed hypnotherapy has recently been shown to be highly effective in treating children with functional abdominal pain (FAP) and irritable bowel syndrome (IBS). This study was conducted to determine to what extent this treatment also reduces emotional problems.

Patients and Methods: 50 patients (8-18 years) with FAP (n=28) and IBS (n=22), were randomized to either 12 weeks of standard medical therapy (SMT) or gut-directed hypnotherapy (HT). Behavior and emotional symptoms (Child Behavior Checklist (CBCL) and patients’ self-worth (Self-Perception Profile for Children (SPPC) and Adolescents (SPPA)) were assessed before and after the intervention.

Results: At baseline, children with FAP or IBS, compared to age (4-11 yrs vs. 12-18 yrs) and gender related samples, scored above average on the CBCL in terms of internalizing and somatic problems. Female adolescent patients also had higher scores for withdrawn behavior, anxiety and depression, and attention problems. Feelings of self-worth were comparable to normative samples. No correlation was found between psychological scores at baseline and intensity, frequency and duration of pain. After therapy a significant decline in the somatic problem score was seen in both HT (2.3 points, p=0.01) and SMT patients (1.4 points, p=0.01). No significant change of the other CBCL scale scores or self-worth scores after therapy was found in both groups.

Conclusion: In children with functional abdominal pain or irritable bowel syndrome, clinical success achieved with hypnotherapy is not accompanied by a change in psychological profiles as measured by CBCL, SPPC and SPPA.
Introduction

Recurrent abdominal pain (RAP) is one of the most common reasons for referral to a pediatrician or a pediatric gastroenterologist, and it may affect as many as 1 to 19% of children and adolescents.1,2 Children with recurrent abdominal pain generally have a lower quality of life, are more likely to miss school and are at risk for social isolation.3,4 They also have an increased incidence of emotional and behavioral problems and especially the association with anxiety and depression is well established.4-12 Furthermore, there is some evidence that these children tend to have a lower perceived self-worth, which may predict a poorer outcome of their abdominal pain.13,14

The most frequent causes of RAP are functional abdominal pain (FAP) and irritable bowel syndrome (IBS), two functional gastrointestinal disorders, both characterized by chronic or recurrent abdominal pain and by disturbed defecation in case of IBS. There is no objective evidence of an underlying organic disorder.15 Recently, we have shown that gut-directed hypnotherapy (HT) is effective in the treatment of children with FAP and IBS. After 3 months of therapy, 59% of the patients in the HT group were in clinical remission with another 26% significantly improved. In the control group, receiving standard medical treatment, only 12% was in remission and 32% improved. One year after treatment, 85% of the patients treated with HT was asymptomatic versus 25% of the children who received standard medical treatment.16 Earlier studies have shown that hypnotherapy is an effective treatment in adult IBS patients as well.17-23 Two of these studies have shown that gut-directed hypnotherapy not only improves abdominal pain and bowel movements, but also results in reduction of anxiety and depression scores and improvement in psychological well-being.20,21 We were interested if hypnotherapy in children with FAP and IBS would also be accompanied by a change in their emotional and behavioral profiles as well as in perceived self-worth. Our hypnotherapy protocol contains many ego-strengthening suggestions and anxiety reducing imagery exercises.16 We hypothesized that HT would reduce anxiety and increase self esteem in children with FAP or IBS.

It has been shown in adolescents that the risk for depression increases from 16 to 45% when abdominal pain is daily compared to rare pain,4 but correlations between other psychological problems and the severity and frequency of abdominal pain have not been investigated extensively. Therefore, we also investigated if an association exists between the severity of abdominal pain and psychopathology.
Patients and Methods

Study participants
This study was part of a randomized controlled trial of hypnotherapy versus standard medical care in the treatment of children with FAP and IBS.\(^\text{16}\) Children were recruited from the department of pediatric gastroenterology of the Emma Children’s Hospital / Academic Medical Centre Amsterdam, the Netherlands. All children between 8 and 18 years who were diagnosed with either FAP or IBS according to the Rome II criteria\(^\text{24}\) and with a history of abdominal complaints of at least 12 months were invited to participate. Exclusion criteria were the use of medication influencing gastrointestinal functions; a concomitant organic gastrointestinal disease; functional constipation; treatment by another health care professional for abdominal symptoms; mental retardation; neurological or psychiatric problems and insufficient knowledge of the Dutch language. All patients and/or parents gave written informed consent. The study protocol was approved by the medical ethics committee of the hospital.

Design
Patients were randomly allocated using a computerized random-number generator for concealment to either hypnotherapy or standard medical care. Hypnotherapy was carried out by C.M.F. and consisted of 6 sessions of 50 minutes over a 3-month period. The Manchester protocol of gut-directed hypnotherapy was used, adapted for children.\(^\text{16}\) Patients in the standard medical treatment group received standard care consisting of education, dietary advice, extra fibers and pain medication or proton-pump inhibitors if considered necessary. Moreover they received 6 half hour sessions of supportive therapy over a three month period with M.A.B. or A.M.V. In these sessions symptoms of the previous weeks were discussed with an exploration of possible contributory triggers like dietary products, emotional problems and stressful events.

Outcome measurements
Outcomes were measured at baseline (T\(_0\)) and directly after 12 weeks of therapy (T\(_1\)). The Dutch Child Behavior Check list for parents (CBCL-prf) was used to assess patients’ behavioral-emotional problems as reported by the parents.\(^\text{25}\) The CBCL-prf is a widespread parent-report broadband measure of children’s and adolescents’ behavioral and emotional problems and contains 113 items rated on a 3-point scale from 0 to 2. The items are aggregated to ten syndrome scales: internalizing problems, externalizing problems, withdrawal, somatic complaints, anxiety/depression, social problems, attention problems, aggressive behavior, thought problems and delinquent behavior. The last two scales were not used in the present study because of too low internal consistency (Cronbach’s alpha < 0.6). Higher scores on CBCL scales indicate more emotional or behavioral problems.
Norm data are available from the general Dutch population, adapted for age (4-11 yrs versus 12-18 yrs) and gender. A score higher than the 90th percentile (internalizing, externalizing and total problems) or the 2nd percentile (other scales) is a well-validated cut-off discriminating between non-referred and referred children to mental health centers. It indicates whether a child needs professional help for his problems.

The Self-Perception Profile for Children (SPPC) and Adolescents (SPPA) was used to assess patient’s self-worth. The SPPC, meant for children aged 8-12 years, and the SPPA, meant for adolescents aged 12-18 years, measure several aspects of self-perception: social acceptance, athletic competence, physical appearance, behavioral conduct, global self-worth, close friends (measured in adolescents only) and school competence. The last two scales were not used in the present study because of too low internal consistency (Cronbach’s alpha < 0.6). Higher scores on the scales indicate higher self-perception. Gender-related norm data exist for Dutch children and a score below the 16th percentile indicates whether a child needs professional help for his problems.

Figure 1: Trial profile.
Statistical Analysis

Baseline characteristics of study subjects were analyzed in a descriptive way. Potential differences in baseline characteristics between therapy groups were assessed by Chi-square, Fisher’s exact, Two-sample t-tests, and Mann-Whitney U tests. One-sample t-tests and Chi-square tests were performed to compare the patients’ psychological scores with that of normative samples from the Dutch population. Pearson correlations were calculated to examine the relation between the psychological scale scores and predefined baseline factors (duration of symptoms, pain intensity scores, pain frequency scores).

Changes in psychological scale scores from baseline to 12 weeks were tested for the HT group and SMT separately, using Two sample T-tests. After that, we constructed a difference score ($T_0 - T_1$) per patient and compared these difference scores between the two study groups, again using Two-sample t-tests.

For all statistical analyses, statistical significance was set at the .05 level, and all tests were 2-tailed. Statistical analysis was performed using SPSS version 14.0. This trial is

Table 1. Mean CBCL-prf scale scores in children with FAP or IBS compared to age-and gender matched controls and total number of children with clinical scores

<table>
<thead>
<tr>
<th></th>
<th>Boys &lt; 12 yrs</th>
<th></th>
<th>Girls &lt; 12 yrs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pts (SD) n=6</td>
<td>Controls (SD)</td>
<td>Pts (SD) n=14</td>
<td>Controls (SD)</td>
</tr>
<tr>
<td>Total problems</td>
<td>29.7 (14.1)</td>
<td>22.5 (15.3) #</td>
<td>31.2 (16.0) #</td>
<td>20.0 (16.1)</td>
</tr>
<tr>
<td>Internalizing problems</td>
<td>10.7 (4.8)#</td>
<td>4.8 (4.7)</td>
<td>13.0 (6.3) #</td>
<td>5.4 (5.5)</td>
</tr>
<tr>
<td>Externalizing problems</td>
<td>9.5 (5.3)</td>
<td>8.6 (6.7)</td>
<td>5.8 (4.7)</td>
<td>6.2 (5.9)</td>
</tr>
<tr>
<td>Withdrawal</td>
<td>2.5 (2.7)</td>
<td>1.7 (1.8)</td>
<td>2.4 (3.0)</td>
<td>1.9 (2.1)</td>
</tr>
<tr>
<td>Somatic complaints</td>
<td>5.2(2.6)#</td>
<td>0.8 (1.2)</td>
<td>7.3 (3.1) *</td>
<td>1.0 (1.7)</td>
</tr>
<tr>
<td>Anxiety/depression</td>
<td>3.5 (2.5)</td>
<td>2.5 (3.0)</td>
<td>3.6 (2.7)</td>
<td>2.6 (3.2)</td>
</tr>
<tr>
<td>Social problems</td>
<td>2.3 (2.6)</td>
<td>1.5 (2.0)</td>
<td>1.6 (2.2)</td>
<td>1.3 (1.8)</td>
</tr>
<tr>
<td>Attention problems</td>
<td>4.3 (3.1)</td>
<td>3.5 (3.0)</td>
<td>3.4 (3.4)</td>
<td>2.6 (2.7)</td>
</tr>
<tr>
<td>Aggressive behavior</td>
<td>7.8 (4.7)</td>
<td>7.2 (5.7)</td>
<td>5.0 (4.1)</td>
<td>5.3 (4.8)</td>
</tr>
</tbody>
</table>

# p < 0.05, * p < 0.01 (one sample t-test). Clinical range: score > 90th percentile of normative population for the first three scales and > 98th percentile for the other 6 scales. CBCL = Child Behavior Checklist.

Table 2. SPPC (<12 yrs) and SPPA (>12 yrs) mean scale scores in children with FAP and IBS compared to controls, and total number of children with clinical scores

<table>
<thead>
<tr>
<th></th>
<th>Boys &lt; 12 yrs</th>
<th></th>
<th>Girls &lt; 12 yrs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pts (SD) n=5</td>
<td>Controls (SD)</td>
<td>Pts (SD) n=11</td>
<td>Controls (SD)</td>
</tr>
<tr>
<td>Athletic performance</td>
<td>19.0 (3.5)</td>
<td>18.7 (3.3)</td>
<td>16.5 (4.7)</td>
<td>17.6 (3.2)</td>
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<tr>
<td>Social acceptance</td>
<td>19.2 (4.0)</td>
<td>17.8 (3.8)</td>
<td>18.1 (5.4)</td>
<td>17.5 (3.6)</td>
</tr>
<tr>
<td>Physical appearance</td>
<td>21.0 (3.5)</td>
<td>20.1 (3.6)</td>
<td>18.5 (5.4)</td>
<td>18.9 (4.2)</td>
</tr>
<tr>
<td>Behavioral conduct</td>
<td>16.8 (1.8)</td>
<td>17.0 (2.8)</td>
<td>20.1 (2.8) #</td>
<td>18.0 (2.9)</td>
</tr>
<tr>
<td>Global self-worth</td>
<td>19.6 (1.9)</td>
<td>20.0 (3.0)</td>
<td>20.5 (3.6)</td>
<td>19.4 (3.2)</td>
</tr>
</tbody>
</table>

# p<0.05, * p < 0.01 (one sample t-test). Clinical range: score < 16th percentile normative population. SPPC = Self-Perception Profile for Children; SPPA = Self-Perception Profile for Adolescents.
registered as an International Standard Randomized Clinical Trial, number ISRCTN 26628553. There was no external funding source.

**Results**

A total of fifty-three children fulfilled the ROME II criteria for FAP or IBS and were recruited for the study: 28 patients were allocated to the HT group and 25 to the SMT group (Figure 1). Of the HT group, one patient was lost to follow-up and questionnaires of 2 patients were missing. Therefore, 50 patients (25 in each group) were included in the data analysis prior to therapy. After 3 months of treatment, psychological data were missing of another 5 patients in the hypnotherapy group and 2 in the SMT group. Thus, the effect of therapy on psychological profiles was analyzed in a total of 43 patients.

<table>
<thead>
<tr>
<th>Boys &gt; 12 yrs</th>
<th>Girls &gt; 12 yrs</th>
<th>Clinical range</th>
</tr>
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<tbody>
<tr>
<td>Pts (SD) N=7</td>
<td>Controls (SD)</td>
<td>Pts (SD) n=23</td>
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<td>29.2 (12.1)</td>
<td>20.1 (16.5)</td>
<td>34.7 (21.1) *</td>
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<tr>
<td>11.9 (6.0) #</td>
<td>5.7 (5.7)</td>
<td>15.3 (7.3) *</td>
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<tr>
<td>3.9 (4.0)</td>
<td>7.1 (7.1)</td>
<td>7.4 (7.4)</td>
</tr>
<tr>
<td>2.7 (2.3)</td>
<td>2.2 (2.5)</td>
<td>3.2 (2.3) #</td>
</tr>
<tr>
<td>6.3 (3.3) *</td>
<td>0.9 (1.4)</td>
<td>6.9 (2.6) *</td>
</tr>
<tr>
<td>3.2 (3.3)</td>
<td>2.7 (3.3)</td>
<td>5.9 (4.7) #</td>
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<td>2.4 (1.9)</td>
<td>1.3 (1.8)</td>
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<tr>
<td>3.1 (2.0)</td>
<td>3.8 (3.3)</td>
<td>4.4 (3.4) #</td>
</tr>
<tr>
<td>2.9 (4.1)</td>
<td>5.3 (5.3)</td>
<td>5.1 (5.3)</td>
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<thead>
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<tr>
<td>13.6 (2.6)</td>
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<td>12.3 (4.0)</td>
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<td>16.6 (2.3)</td>
<td>15.3 (2.7)</td>
<td>16.2 (2.8)</td>
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<tr>
<td>14.9 (3.6)</td>
<td>14.7 (3.1)</td>
<td>14.9(4.2) #</td>
</tr>
<tr>
<td>17.9 (2.7)</td>
<td>13.8 (2.8)</td>
<td>17.2(2.5) *</td>
</tr>
<tr>
<td>17.7 (1.8) *</td>
<td>16.0 (2.7)</td>
<td>14.9 (3.7)</td>
</tr>
</tbody>
</table>

No effect of hypnotherapy on psychological profiles

# p < 0.05, * p < 0.01 (one sample t-test). Clinical range: score < 16th percentile normative population.
Psychological profiles at baseline

The whole study group consisted of 20 children <12 years (14 girls) and 30 adolescents (23 girls). Compared with age- and gender-related normative samples, the study group displayed a significant higher total CBCL score as well as more internalizing and somatic problems. Means and standard deviations are presented in Table 1. Adolescent girls also had higher scores for withdrawn behavior, anxiety/ depression, and attention problems. A significant proportion of the children with FAP and IBS had clinically relevant high CBCL scores: 60% on the somatic complaints scores, 52% on the internalizing scores, 36% on the total scores and 8% on the social problem score.

As depicted in Table 2, the Self-Perception Profiles for Children and Adolescents showed some differences with normative samples. Both female children and adolescents were more satisfied with their behavior than the norm. Furthermore, adolescent girls were also more satisfied about their physical appearance. Adolescent boys reported higher global self-worth than the norm. No difference with normative samples was found in the number of children with clinically relevant low scores. No relation was found between CBCL, SPPA or SPPC scores at baseline and duration of symptoms, pain intensity score,
and pain frequency scores (Pearson correlations <0.4; data not shown), except in children with an internalizing score > 90th percentile. They showed a longer duration of symptoms (3.8 vs. 3.0 years, \( P < 0.05 \)).

Demographic characteristics, disease variables and the psychological profiles of both study groups are presented in Table 3, showing that children in the HT group had significant lower scores than children in the SMT group on the CBCL scale for internalizing problems and a trend for lower scores for anxiety/depression, somatic problems and social problems. No significant differences were found between the two treatment groups with respect to their SPPC and SPPA scores (data not shown).

**Effect of treatment on psychological outcomes**

In both study groups there was a significant decrease in the somatic problem score: in the HT group the mean scale score decreased 2.3 points (\( P = 0.01 \)) and in the SMT group 1.4 (\( P = 0.013 \)). The other CBCL scales and the self-worth scales did not change significantly after therapy, in both treatment groups (Table 4). Because of significant baseline differences between the two treatment groups, we compared the difference in scores pre and post treatment (\( T_0 - T_1 \)). These the difference scores were comparable between the two groups for all CBCL, SPPA and SPPC scale scores (Table 4).

**Discussion**

This study examined the psychological profiles of children with functional abdominal pain and irritable bowel syndrome before and after hypnotherapy or standard medical treatment.

In line with previous research, these patients demonstrated at baseline higher total CBCL scores as well as more internalizing and somatic problems than age- and gender-related normative samples.\(^5\)\(^-\)\(^7\)\(^,\)\(^9\)\(^,\)\(^12\) Adolescent girls also had higher scores for withdrawn behavior, anxiety and depression, and attention problems. Similar to Dufton et al,\(^12\) we found only a very small percentage (2%) of children who fell in the clinical range on the anxiety/depression score. This is in contrast to other studies that showed that up to 80% of the children with chronic abdominal pain has an anxiety disorder and almost 40% will meet the criteria for a depressive disorder.\(^4\)\(^,\)\(^5\)\(^,\)\(^8\)\(^,\)\(^10\) The reason for this discrepancy is unknown, but might be caused by a difference in instruments used to evaluate anxiety and depression (CBCL versus more specific instruments like the State Train Anxiety Inventory for Children and the Child’s Depression Inventory). Questions have been raised about the sensitivity of the CBCL to measure clinically relevant anxiety and depression.\(^5\)\(^,\)\(^12\)\(^,\)\(^29\)
Perceived self-worth does not discriminate patients with abdominal pain from healthy peers, but it has been shown that patients with high level symptoms and long-term impairment have a lower perceived self-worth.\textsuperscript{7,13,14} Our group of patients had a mean duration of symptoms of 3.5 years and had been referred by other hospitals after having used extensive other therapies. We therefore anticipated a lower self-worth in our study group in line with previous research, but to our surprise, this was not the case with even higher scores for behavior and physical appearance. The reason for this unexpected finding is unclear, since the same self-worth questionnaires were used as in previous studies.
A large study among adolescents by Youssef et al. has shown that the risk for depression increases significantly if abdominal pain occurs daily compared to rare pain episodes.4 We did not find any relation between CBCL, SPPA or SPPC scores at baseline and duration of symptoms, pain intensity score, and pain frequency scores, except for a longer duration of symptoms in the group of children with clinically relevant internalizing scores. The discrepancy with the findings of Youssef et al. may be caused by the fact that he investigated a nationally representative sample of children versus a highly selective group of patients in our study who almost all had daily abdominal pain with significant school absenteeism.

The most important question of this study was to what extend treatment success of hypnotherapy was accompanied by a reduction in emotional problems, as measured by the CBCL. In contrast to two similar studies performed in adults, 20,21 in which HT resulted in reduction of anxiety and depression scores and improvement in psychological well-being, we found no significant changes in psychological scale scores, except for a decrease in the somatic complaints score. Furthermore, despite a significant difference in the number of children who had an improvement of their abdominal pain after therapy as published earlier, 16 no differences were found in change of CBCL scores between the HT group and the SMT group.

The relation between pain and psychological symptoms is complex. Chronic pain can cause affective disorders like anxiety and depression, affective disorders may cause or increase pain, and both pain and affective disorders can be associated with a true causal variable such as somatization, social stress or ineffective coping style.30 So, it is unclear whether the psychological problems in children with FAP and IBS are cause or effect of chronic abdominal pain. If the last is true, one could hypothesize that in children, responding to gut-directed HT, the CBCL scores may improve after a certain amount of time. In this study, however, the psychological profiles were evaluated soon after finishing therapy. It would be interesting to repeat this study and investigate psychological profiles after a longer period of follow-up. On the other hand, in the two studies done in adults with IBS, reduction of anxiety and depression scores and improvement in psychological well-being were already seen directly after three months of therapy. 20,21

The lack of a significant change in emotional and behavioral profile despite a marked clinical response with a strong decrease in abdominal pain suggests that hypnotherapy does not impact IBS and FAP in children through an effect on psychological factors. However, we cannot exclude the possibility that our results would have been studying other psychological concepts. For example, it has been suggested that hypnosis may improve IBS symptoms primarily by altering the patients focus of attention and/ or by changing his/ her beliefs about the meaning of sensations from the gastrointestinal tract. 20 To investigate
whether this is also true in children with FAP or IBS, a similar study should be done, including instruments to evaluate patients predisposition to notice and report physical symptoms (like the Children’s Somatization Inventory) and questionnaires to investigate cognitions on pain. 31

Part of our HT protocol is aimed at empowerment. We therefore hypothesized that HT would increase self esteem in children with FAP or IBS. Although most children mentioned after their HT sessions an increase in inner strength and courage, no change in scores of perceived self-worth as measured by SPPC or SPPA was found. So, one can argue about the necessity of adding ego-strengthening suggestions to the HT sessions. Our current protocol contains several exercises and we have not evaluated yet which parts of the protocol are most effective. On the other hand, most children already had normal to high scores at baseline, so one might wonder if any improvement due to therapy could have been detected, using the SPPC and SPPA.

Some limitations of our study have to be considered. First, a substantial number of children in the hypnosis group (7/27) did not complete both questionnaires, and this may have influenced the analysis of the effect of therapy on psychological profiles. However, we did not find any differences in baseline CBCL scores of these patients compared to the patients who completed both questionnaires. Therefore, we think that the high number of dropouts did not have a great influence on the results. However, these drop-outs did result in a relatively small sample size, which may have caused limited statistical power and small effects of the intervention may therefore not have been detected. Second, long-term effects of the therapy on emotional and behavioral symptoms have not been investigated in our study. As reported earlier, some patients in this study, especially in the HT group, continued to experience further improvement in symptoms after ending therapy.16 This post treatment effect could have been caused by hypnotic suggestions that benefits of the treatment would persist and become even more effective over time or by the ongoing use of self-hypnosis by the participants. Furthermore, it should be taken into account that it may take time for children who have reduced pain problems to experience less psychological problems. Possible findings of the study could be different a longer time after the interventions. Therefore, future studies on HT in children with FAP and IBS should also address the long-term effects on psychological profiles.

In conclusion, the study confirms that children with FAP and IBS are at risk for emotional and behavioral problems as measured by the CBCL. Self-esteem in these children is comparable to healthy peers. Gut-directed hypnotherapy does not result in a significant improvement of the CBCL and self-worth scores, except for a decrease in the somatic complains score, suggesting that changes in psychological profiles are not necessary for improvement of recurrent abdominal pain to occur.
Reference List


