

# Mind Over Gut: Psychosocial Management of Pediatric Functional Abdominal Pain

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## ABSTRACT

**Introduction:** Functional abdominal pain (FAP) refers to a common set of symptoms that characterizes abdominal pain for which there is no identifiable organic disease process. FAP is associated with functional disability, but understanding of its pathogenesis is incomplete. The condition appears to stem from an interaction between physical and psychological mechanisms.

**Method:** A literature search was conducted to explore the psychosocial management of FAP and the role of nurse practitioners in treatment.

**Results:** A growing body of evidence supports the efficacy of psychosocial interventions, including cognitive behavioral therapy, hypnotherapy, and multidisciplinary treatment programs. There are no randomized controlled trials at the primary care level to guide management.

**Discussion:** Nurse practitioners can provide the supportive and consistent patient-provider relationship that is integral to the management and treatment of FAP. More research is necessary to understand how best to incorporate behavioral

interventions into primary care practice. *J Pediatr Health Care.* (2016) ■, ■-■.

## KEY WORDS

Functional abdominal pain, recurrent abdominal pain, chronic abdominal pain, psychosocial management, hypnotherapy, cognitive behavioral therapy

A 10-year-old female patient comes to your office for the third time this month with a report of periumbilical abdominal pain. Both the patient and her mother report that the pain has been present almost daily for the past several months; it seems worse in the mornings and occasionally increases when the child is upset or stressed. Specific foods do not trigger the episodes, and she does not have any known allergies. The child states that she likes school and gets along well with her siblings and friends. Her mother adds that she does well academically and is very self-motivated but has recently missed school because of an increase in pain episodes. They deny the occurrence of constipation, diarrhea, vomiting, weight loss, fatigue, unexplained fevers, or a family history of gastrointestinal disease. The physical examination is unremarkable. The mother requests blood work and radiographs. This article will review the results of a literature search on the psychosocial management of pediatric functional abdominal pain (FAP) and the role of nurse practitioners (NPs) in treatment.

## OVERVIEW

FAP is a term used to refer to a common set of symptoms that characterize abdominal pain for which there is no identifiable anatomic abnormality, inflammation,

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or tissue damage (Levy & van Tilburg, 2012). Apley and Naish (1958) provided the first description of this condition, which is also referred to as recurrent abdominal pain. The reported prevalence rate varies, with estimates from 0.3% to 45% (Apley & Naish, 1958; Chiou, How, & Ong, 2013; Levy & van Tilburg, 2012). Chiou et al. (2013) found that FAP accounts for 2% to 4% of visits to primary care offices and up to 50% of visits to pediatric gastroenterologists. This wide variability is consistent throughout the literature and is generally attributed to difficulties with consistency in diagnosis. Despite variations in the prevalence of this condition, FAP is a common pediatric issue that requires attention because of its known tendency to cause functional disability, which manifests as difficulty in school, social settings, and participation in recreational activities. Altered functioning across these domains frequently leads to reports of poorer quality of life and increased utilization of the health care system, both of which have direct implications for the patient and society at large (Odell & Logan, 2013).

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## LITERATURE REVIEW

A search of PubMed, Web of Science, and Google Scholar databases was performed to find articles published between 2007 and 2015 that pertained to the psychosocial management of FAP in the pediatric population. Key words in the search included *functional abdominal pain*, *recurrent abdominal pain*, *chronic abdominal pain*, *functional gastrointestinal disorder*, *pediatrics*, *psychosocial*, *psychosocial management*, *hypnotherapy*, *cognitive behavioral therapy*, *guided imagery*, *behavioral intervention*, and *chronic pain*. The results of this search yielded 72 articles.

Articles met inclusion criteria if they covered the psychosocial management of FAP in the pediatric population. Additional articles were included if they provided relevant background information, including pathophysiology, comorbid conditions and contributing factors, and clinical diagnosis.

## PATHOPHYSIOLOGY OF FAP

Uncertainty about clinical criteria for diagnosis of FAP compounds the ambiguities surrounding its pathogenesis. Several possible explanations have

arisen, including visceral hypersensitivity and hyperalgesia, involvement of the central nervous system (CNS), and repeated activation of the peripheral pain pathway that results in neuroplastic changes that lead to enhanced stress responses and alterations in stress-induced pain modulation systems (Chiou et al., 2013; Clouse et al., 2006; Grover, 2012). The term *brain-gut axis* is used in reference to alterations that might occur as a result of interaction between the CNS and the enteric nervous system in response to emotional disorders and distress (Chiou et al., 2013). There are a number of possible explanations, and further research is necessary; however, the majority of experts agree that an interaction occurs between physiological and psychological factors.

## RISK FACTORS

Research demonstrates that all forms of maltreatment, as well as early life stressors, can have a negative impact on the physiological and psychological health of children and are associated with an increase in unexplained gastrointestinal symptoms (Clouse et al., 2006; van Tilburg et al., 2010). For this reason, experts emphasize the importance of recognizing risk factors for abuse in this clinical picture (van Tilburg et al., 2010). Moreover, all children with abdominal pain should be monitored over time, because these patients have a higher prevalence of mental health problems than is found in the general population (Di Lorenzo et al., 2005; Gieteling, Lisman-van Leeuwen, Passchier, Koes, & Berger, 2012).

Another contributing factor is the impact of parental response to pain on pain-related behavior and disability. Levy and van Tilburg (2012) found that the best predictor of a child's presentation for abdominal pain is maternal distress and child-reported severity of pain. Multiple studies demonstrated that pain catastrophizing is an example of a maladaptive coping pattern that children learn via social modeling and that appears to perpetuate the symptoms and increase functional disability (Hermann, 2011; Levy & van Tilburg, 2012; Welkom, Hwang, & Guite, 2013).

## COMORBID DISORDERS

Studies of FAP and the search for explanations of its origin have revealed commonalities within the population. Anxiety and other mental health problems frequently turn up in the literature, and much research has been devoted to the relationship between FAP and psychopathology. Simons, Sieberg, and Claar (2012) reported that anxiety is a common comorbid condition in youth, with up to 45% of children with abdominal pain displaying clinically elevated anxiety. Similarly, Warner et al. (2011) found 75% of participants who presented with abdominal pain had a comorbid anxiety disorder. Thus children with abdominal pain appear to have heightened physiological anxiety (i.e., concern

about somatic symptoms and physical complaints), higher levels of worrying, and greater social anxiety (Simons et al., 2012).

### CLINICAL DIAGNOSIS OF FAP

The case of the 10-year-old patient that was presented at the beginning of this article offers an example of the common clinical presentation of a child with FAP. She reports recurrent abdominal pain that is transient, and there does not appear to be a specific or immediately identifiable cause for the pain. As with this patient, alarm signs are typically absent, and the child does not appear acutely ill. A child with this clinical presentation poses a diagnostic challenge to NPs, because they must make the important decision to either perform tests to rule out a range of differential diagnoses or recognize and characterize the symptoms as part of a functional disorder.

The Rome III is a set of diagnostic criteria developed by a group of practitioners to define and characterize several gastrointestinal conditions, including childhood FAP and its associated syndrome (see Table 1). A survey study demonstrated that awareness of Rome criteria is suboptimal in primary care providers (PCPs) but adequate in pediatric gastroenterologists. Neither group of clinicians find the criteria helpful in clinical practice (Sood et al., 2011). There is a lack of consensus with regard to evaluation, diagnosis, and treatment of FAP, and very few PCPs endorse feeling knowledgeable about the Rome criteria (Schurman, Kessler, & Friesen, 2014). Fulfillment of the Rome criteria requires the exclusion of organic disease processes, including alarm signs and symptoms that are listed in the Box. Many providers do not feel comfortable making a diagnosis without performing an exhaustive, and at times invasive, series of tests (Gijsbers, Kneepkens, Schweizer, Benninga, & Buller, 2011; Rasquin et al., 2006).

### PSYCHOSOCIAL MANAGEMENT OF FAP

In light of the current knowledge base regarding FAP, many clinicians and researchers have come to rely on a biopsychosocial framework to understand,

### BOX. Alarm signs and symptoms in children with abdominal pain

- Persistent right upper or right lower quadrant pain
- Dysphagia
- Persistent vomiting or diarrhea
- Billious emesis
- Nighttime pain or diarrhea
- Rectal bleeding or disease
- Oral ulcers
- Arthritis
- Unintentional weight loss
- Deceleration of linear growth
- Delayed onset of puberty
- Recurrent, unexplained fever
- Unexplained anemia
- Family history of irritable bowel disease, celiac disease, or peptic ulcer disease

Note. Data from Rasquin et al. (2006), copyright 2006 by the American Gastroenterological Association Institute, and Subcommittee on Chronic Abdominal Pain (2005), copyright 2005 by the American Academy of Pediatrics.

characterize, and treat pediatric patients with chronic abdominal pain. The biopsychosocial model is an approach that acknowledges and emphasizes the interaction between psychological, biological, individual, social, and environmental factors in relation to pain and functional disability (Carter & Threlkeld, 2012). Carter and Threlkeld (2012) proposed that this relationship is dynamic and that certain predisposing factors serve as underlying vulnerabilities and combine with triggering events to result in somatic and emotional symptoms, leading to impairment.

Although a review of literature regarding the clinical treatment of FAP in children yields several approaches, a growing body of evidence supports the efficacy of psychological interventions. This type of care may best be achieved through collaboration from medical and psychological professionals (Cushing, Friesen, & Schurman, 2012). Researchers emphasize that treatment goals should include enhanced coping skills,

**TABLE 1. Diagnostic criteria for Rome III childhood functional abdominal pain conditions**

Rome III disorder	Diagnostic criteria <sup>a</sup>
Childhood functional abdominal pain	Must include <i>all</i> of the following: Episodic or continuous abdominal pain Insufficient criteria for other functional gastrointestinal disorders No evidence of an inflammatory, anatomic, metabolic, or neoplastic process that explains the subject's symptoms
Childhood functional abdominal pain syndrome	Must include childhood functional abdominal pain at least 25% of the time and one or more of the following: Some loss of daily functioning Additional somatic symptoms such as headache, limb pain, or difficulty sleeping

<sup>a</sup>Criteria fulfilled at least once per week for at least 2 months before diagnosis.  
Note. Adapted from Rasquin et al. (2006); copyright 2006 by the American Gastroenterological Association Institute.

resumption and maintenance of activities of daily living, decreased anxiety, and improved quality of life, as opposed to complete or immediate resolution of pain (Chiou & Nurko, 2010; Lynch-Jordan et al., 2014).

Table 2 lists selected studies related to psychosocial management of children with FAP. These methodologies include cognitive behavioral therapy (CBT), multidisciplinary clinics, Internet-based intervention, and hypnotherapy (HT). Many study investigators choose to include patients with FAP, as well as other common childhood pain conditions (Carter & Threlkeld, 2012). The studies included in Table 2 are specific to participants with a diagnosis of FAP or irritable bowel syndrome, both of which are characterized by recurrent abdominal symptoms and lack of evidence of organic disease process.

### COGNITIVE BEHAVIORAL THERAPY

In light of the hypothesized role of stress in children with FAP, CBT is considered an effective management option because it teaches patients an alternative coping method (Rutten, Korterink, Venmans, Benninga, & Tabbers, 2015). The content of CBT programs varies, but it involves some core components, including education about the pain, mastery of cognitive pain coping and stress management skills, and maintenance of these techniques (Hermann, 2011). Exercises include identifying pain triggers, restructuring maladaptive thoughts about pain, relaxation, distraction from somatic symptoms, and increasing self-confidence (Hermann, 2011; Levy et al., 2010). Table 3 provides some examples of CBT resources and programs that may be helpful in children with FAP and their families.

The findings from three randomized controlled trials (RCTs) that utilize CBT collectively demonstrated the value of establishing a supportive therapeutic connection with the affected child and his/her family to validate the pain by addressing the relationship between physical discomfort and psychological symptoms (Gross & Warschburger, 2013; van der Veek, Derkx, Benninga, Boer, & de Haan, 2013; Warner et al., 2011). Although the primary goal of CBT is to control the negative thoughts that perpetuate pain symptoms and lead to functional disability, evidence suggests that CBT can also reduce pain intensity, duration, and frequency (Gross & Warschburger, 2013). Gross and Warschburger (2013) reported a high success rate (81.2%) in their CBT intervention group, which demonstrated that children are able to learn coping strategies that allow for enhanced self-management of the pain experience. The success of this program and others like it supports the notion that skills acquired through CBT can be easily integrated into daily life, resulting in a reduction in pain symptoms and renewed ability

to engage in essential childhood activities (Gross & Warschburger, 2013; Warner et al., 2011).

### MULTIDISCIPLINARY APPROACH

Multidisciplinary treatment programs have been identified as being effective for chronic pain conditions, like FAP, that are associated with functional disabilities across many domains of life (Odell & Logan, 2013). The comprehensive nature of a program like this allows treatments to target multiple areas at once, with an understanding of issues specific to each, but with consideration for the relationship between them all. Multidisciplinary teams generally consist of a variety of specialized practitioners, including NPs. All team members evaluate the patient and work collaboratively to develop a treatment plan to improve quality of life and re-establish normal function (Odell & Logan, 2013). CBT, HT, acceptance and commitment therapy, graduated exercise and activity, increased academic attendance and functioning, and sleep intervention are techniques that have shown beneficial results (Carter & Threlkeld, 2012). Integrated approaches that combine a number of the aforementioned methods are especially effective (Carter & Threlkeld, 2012; Odell & Logan, 2013; Schurman & Friesen, 2010).

When the biopsychosocial aspect of FAP is not well explained by NPs, families often reject psychological attributions, both because they believe the NP does not understand their child's condition and because they feel stigmatized by the suggestion. Schurman and Friesen (2010) conducted a study at a multidisciplinary Abdominal Pain Clinic (APC). The goal of the clinic was to establish the connection between physical and psychological elements from the initial patient contact in order to normalize mental health services as part of the treatment plan for abdominal pain. Survey responses after the APC evaluation process demonstrated that families endorsed a high level of satisfaction, with particular emphasis on the perceived value of the multidisciplinary and holistic approach (Schurman & Friesen, 2010). Schurman and Friesen (2010) also discovered that families evaluated at the APC were more likely to

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**TABLE 2. Selected studies on the psychosocial management of functional abdominal pain**

Source	Sample	Purpose	Study design	Conclusions
Cognitive behavioral therapy Gross and Warschburger (2013)	29 children aged 6-12 years who met Rome III criteria for CAP; gender and ethnicity not specified	To determine if pain-control training will significantly reduce pain symptoms and increase health-related QoL	RCT 6 group sessions of CBT and listen to CD self-exercises Control: WL	CBT programs that help children acquire positive coping strategies and self-management techniques and educating parents about helping their children manage pain experiences are well received by children and their parents and successfully reduce pain intensity ( $p = .001$ ), duration ( $p = .004$ ), and frequency ( $p = .002$ ) and improve QoL ( $p < .001$ )
van der Veek et al. (2013)	104 children aged 7-18 years who fulfilled Rome III criteria for FGIDs; CBT female 71.2%, IMC female 73.1%; CBT 90.4% Dutch nationality, IMC 78.8%	To evaluate the effect of CBT vs. IMC on pain, gastrointestinal complaints, functional disability, anxiety, depression, and QoL	RCT 6 weekly sessions of CBT Control: IMC	CBT and IMC are both effective treatments for reducing abdominal pain in children with FAP ( $p < .001$ ), which speaks to the potential impact of a supportive therapeutic relationship and a greater amount of time spent engaging with a medical professional
Warner et al. (2011)	40 children aged 8-16 years with functional physical complaints and diagnosis of co-occurring anxiety disorders; female $n = 26$ (65%); White 72.5%, Hispanic 15%, other race 10%, and African American 2.5%	To demonstrate that participants in the treatment group (TAPS) would display significant improvement in anxiety and somatic symptoms compared with a WL control group after treatment and at 3-month follow-up	RCT 10-week CBT program called TAPS Control: WL	An integrated intervention approach that validates children's pain, addresses the relationship between physical discomfort and psychological symptoms, improves general functioning, and helps reduce anxiety ( $p \leq .001$ ) may be the most effective model for delivering care to this patient population because 80% of the treatment group responded to the intervention ( $p < .001$ )
Multidisciplinary approach Schurman and Friesen (2010)	298 families with a child aged 8-17 years seen for initial evaluation of chronic abdominal pain; gender and ethnicity not specified	To compare satisfaction with evaluation at a multidisciplinary pediatric APC staffed with gastroenterologists and psychologists vs. a traditional gastroenterology clinic with gastroenterologists only	Anonymous surveys were collected at the conclusion of the clinic visit at both sites over 1 calendar year	Integrative care provided at a multidisciplinary pediatric APC is well accepted by families as demonstrated by high levels of satisfaction ( $p < .001$ ) and intention to initiate treatment recommendations ( $p = .01$ )

(Continued on page 6)

TABLE 2. Continued.

Source	Sample	Purpose	Study design	Conclusions
Internet-based approach Boixadós et al. (2014)	131 pediatricians affiliated with Catalan and Balearic pediatric societies; male 70.2%	To examine the advantages, disadvantages, and barriers to implementing ICTs in the treatment of RAP as perceived by pediatricians	Online survey composed of 33 items, combining open- and closed-ended questions, grouped into 6 areas related to RAP treatments	Pediatricians believe ICT use for RAP would be advantageous and desirable in children with certain characteristics, including mild to moderate pain intensity ( $p < .001$ ), disability ( $p < .001$ ), and chronicity ( $p < .001$ ), and if developed with specific design features
Hypnotherapy Gulewitsch et al. (2013)	38 German children aged 6-12 years who met Rome III criteria for FAP and IBS, and their parents; female $n = 24$ , male $n = 14$	To evaluate the impact of a brief hypnotherapeutic-behavioral intervention program on abdominal pain and pain-related disability	RCT 4 weeks of HT treatment group Control: WCG	Hypnotherapeutic-behavioral interventions are effective in treating pediatric patients with RAP, as demonstrated by a reduction in pain frequency ( $p = .046$ ), intensity ( $p = .007$ ), and duration ( $p = .015$ ), as well as improvement in child and parent reported pain-related disability ( $p = .014$ , $p = .011$ )
van Tilburg et al. (2009b)	34 children aged 6 to 15 years with a physician diagnosis of FAP; female $n = 23$ ; ethnicity not specified	To test a self-directed, at-home, guided imagery treatment protocol using audio and video recordings	RCT Treatment group received 2 months of SMC + self-directed GIM on recorded CDs Control: SMC	Guided imagery plus SMC are more effective than SMC alone at reducing pain ( $p = .02$ ) and disability ( $p = .02$ ) in children with FAP
Vlieger et al. (2007)	53 children aged 8-18 years with FAP or IBS based on Rome II criteria recruited in Amsterdam, the Netherlands; HT female 67%, SMT female 84%; ethnicity not specified	To compare the effect of gut-directed HT with SMT	RCT 6 sessions of HT over 3 months Control: SMT and 6 sessions of supportive therapy	Gut-directed HT is highly effective in treatment of children with long-lasting complaints of IBS or FAP, and decreases pain intensity ( $p < .002$ ) and pain frequency ( $p < .001$ )
Vlieger et al. (2012)	52 children diagnosed with long-lasting FAP or IBS based on Rome II criteria recruited from Amsterdam, the Netherlands; HT female 67%, SMT female 86%; ethnicity not specified	To compare the long-term effects (>4 years) of gut-directed HT with SMT	RCT Patient completion of standardized abdominal pain diary, CSI, and QoL questionnaire	At mean follow-up of 4.8 years, a greater number of patients who received HT remained in clinical remission compared with those who received SMT ( $p = .005$ ), and there was greater reduction in pain intensity and frequency ( $p < .01$ ), as well as somatization ( $p = .04$ ), in the HT group, which indicates that there are beneficial long-term effects of HT, especially compared with SMT

Note. APC, Abdominal Pain Clinic; CAP, chronic abdominal pain; CBT, cognitive behavioral therapy; CSI, Children's Somatization Inventory; FAP, functional abdominal pain; FGID, functional gastrointestinal disorder; GIM, guided imagery; HT, hypnotherapy; IBS, inflammatory bowel syndrome; ICTs, information and communication technologies; IMC, intensified medical care; QoL, quality of life; RAP, recurrent abdominal pain; RCT, randomized controlled trial; SMT, standard medical therapy; TAPS, Treatment of Anxiety and Physical Symptoms; WCG, wait list control group; WL, wait list.

**TABLE 3. Examples of cognitive behavioral therapy resources and interventions for functional abdominal pain**

Name	Source
Stop the Pain with Happy-Pingu	Gross and Warschburger (2013)
Web-MAP: Web-Based Management of Adolescent Pain	Palermo et al. (2009)
Gutstrong	Wassom et al. (2013)
Treatment of Anxiety and Physical Symptoms (TAPS)	Warner et al. (2011)
Children's Health and Illness Recovery Program (CHIRP)	Carter and Threlkeld (2012)
Think Good—Feel Good	Stallard (2002)
Coping Cat Workbook	Kendall and Hedtke (2006)

receive recommendations for mental health and alternative therapies than those seen at a traditional gastroenterology clinic.

### INTERNET-BASED APPROACH

A major barrier to providing psychological treatment to persons with FAP is the lack of availability within health care systems. Internet-based programs represent a promising area of development. Preliminary research showed it is an effective way to deliver CBT and other forms of therapy with children who have recurrent pain disorders (Hermann, 2011). Palermo, Wilson, Peters, Lewandowski, and Somhegyi (2009) identified widespread access, flexibility, real-time updates, live patient communication, and ease of distribution of therapeutic information as advantages of Internet-based treatment compared with delivery through other forms of technology.

Boixadós, Hernández Encuentra, Nieto Luna, Huguet, and Aumatell (2014) explored the use of online interventions, referred to as information and communication technologies (ICT), for the delivery of psychosocial treatment with children with FAP. Participants described the potential for improved accessibility, comfort for the patient and family, and a reduced cost of treatment as the main advantages of ICT. Participants stated that they were most likely to consider ICT for FAP based on several characteristics, including disease/disability severity, family function, personality traits, pain characteristics, and comorbid psychological disorders (Boixadós et al., 2014). ICT was deemed more appropriate for patients with mild to moderate disability versus severe disability, but in-person psychosocial therapy was still believed to be more effective overall (Boixadós et al., 2014). The main disadvantages included perceived depersonalization, difficulty with control, difficulty monitoring use, and distrust of technology (Boixadós et al., 2014). The results of the study

showed that PCPs are among the professionals least likely to use ICT (Boixadós et al., 2014). Ultimately, proof of effectiveness and ease of use are the major factors that determine whether providers choose to use ICT (Boixadós et al., 2014).

### HYPNOTHERAPY

HT is a therapeutic approach that helps children achieve a state of relaxation and focus their attention on self-regulation (Kohen & Kaiser, 2014). HT works by teaching patients how to modulate their experience of and subsequent response to physical and psychological sensory stimuli. Developing self-regulation skills allowed patients to control learned and reflexive responses in order to modify their emotions, thought processes, and psycho-physiological reactivity (Kohen & Kaiser, 2014). HT fit the biopsychosocial model that is central to the current understanding of FAP and is a promising form of therapy.

Four RCTs explored the effectiveness of treating pediatric patients who had FAP with HT and found significant therapeutic benefits, as demonstrated by a decrease in pain intensity, frequency, and duration, reduced somatization, and enhanced achievement and maintenance of clinical remission (Gulewitsch, Muller, Hautzinger, & Schlarb, 2013; van Tilburg et al., 2009b; Vlieger, Menko-Frankenhuis, Wolfkamp, Tromp, & Benninga, 2007; Vlieger, Rutten, Govers, Frankenhuis, & Benninga, 2012). A follow-up study of patients who received gut-directed HT illustrated that the treatment effects persist long term, which is an important finding given the established risk of chronicity in pediatric patients with FAP (Schlarb, Gulewitsch, Bock Genannt Kasten, Enck, & Hautzinger, 2011; Vlieger et al., 2012). van Tilburg et al. (2009b) evaluated the usefulness of HT in treating FAP in a pilot study of 34 subjects through a self-directed, at-home protocol and discovered that when combined with standard medical care, this approach was successful at reducing pain and related disability. With regard to the aforementioned benefits of remotely delivered interventions, this finding illustrated that self-directed programs with audio/visual recordings may increase treatment options for hard-to-reach populations.

### OTHER TARGETS FOR INTERVENTION

#### Patient Coping Style

Coping style is a factor that influences the pain experience and is a target as an area for intervention. Walker, Baber, Garber, and Smith (2008) explored different coping patterns employed by children with FAP, with a goal of learning how coping activity mediated the relationship between pain and health outcomes. Identifying response patterns and gaining knowledge of comorbid symptoms, the level of impairment, perceived self-competence, and available social supports can

help NPs maximize natural strengths and draw upon existing coping mechanisms (Walker et al., 2008).

### Parental Influence

The role of parental response to pain is discussed throughout the literature. Maladaptive responses can perpetuate pain symptoms and put the child at risk for chronicity (van Tilburg, Chitkara, Palsson, Levy, & Whitehead, 2009a; Welkom et al., 2013). van Tilburg and colleagues (2009a) developed a questionnaire to identify and evaluate factors that motivate parental responses to pain. Information gathered can help develop a clinical baseline and provide the opportunity for open and effective discussion regarding parental patterns and coping strategies, while achieving parental change behavior and fostering productive responses to their child's symptoms (van Tilburg et al., 2009a). Gulewitsch and colleagues (2013) noted that encouraging parents to become active participants in their child's treatment might reduce feelings of helplessness and lead to more successful outcomes.

### THE ROLE OF THE NP

Many studies emphasized the importance of a supportive and consistent patient-provider relationship in the management and treatment of FAP (Chiou & Nurko, 2010; Rutten et al., 2015; Schurman & Friesen, 2010). NPs are positioned to take an active role in this relationship. The nursing model exemplifies the biopsychosocial approach to health, encouraging practitioners to treat the whole patient, with understanding of the biological, psychological, and environmental factors at play in every health concern. NPs are poised to work within this framework, which is at the foundation of FAP, and to encourage professional collaboration (Cushing et al., 2012).

Schlarb et al. (2011) found that 30% to 40% of children with FAP are expected to improve if provided with continual counseling and reassurance from their provider. Hermann (2011) noted that children have the potential for chronic pain and development of other issues (e.g., anxiety, depression, and somatic complaints) in adulthood and suggested that treating FAP

is both primary intervention and secondary prevention. With awareness of the mechanisms at play in FAP, NPs can serve as a source of ongoing support. Appointments specifically dedicated to discussion of FAP symptoms offer opportunities to deliver psychosocial intervention and reassurance. NPs should promptly address emotional concerns, encourage positive lifestyle modifications, and promote school attendance (Paul & Candy, 2013). Advocating for support in the school environment can help ensure comfort and success for the child (Paul & Candy, 2013).

### EDUCATION

Knowledge and application of the Rome III criteria among PCPs is inconsistent (Schurman et al., 2014; Sood et al., 2011). Wallis and Fiks (2015) recommended the incorporation of Rome III criteria and the American Academy of Pediatrics (AAP) policy statement on chronic abdominal pain into primary care practice, which may best be accomplished through a quality improvement program to train clinicians and provide decision support (Subcommittee on Chronic Abdominal Pain, 2005).

For NPs to make an accurate diagnosis and avoid needless testing, an enhanced understanding of FAP and its clinical course is needed (Wallis & Fiks, 2015). Clinical assessment tools are available to evaluate many components of the FAP patient profile (see Table 4). NPs should familiarize themselves with these instruments because they can provide valuable information to establish a clinical baseline and identify areas to be targeted during intervention. Wallis and Fiks (2015) emphasized that children should be connected with the evidence-based treatments that are most appropriate for their needs.

A comprehensive history and physical examination should be performed to identify alarm signs in children with abdominal pain. Evidence confirms that laboratory and radiograph testing in the absence of one or more red flags is not indicated (Di Lorenzo et al., 2005; Wallis & Fiks, 2015). When they are performed, these tests rarely change the clinical management of the patient and do not result in a more specific

**TABLE 4. Questionnaires and assessment tools for functional abdominal pain**

Characteristic measured	Assessment tool	Source
Frequency, duration, and intensity of pain episodes	Abdominal Pain Index (API)	Walker et al. (1997)
Functional disability	Functional Disability Inventory	Claar and Walker (2006)
Pain seriousness and coping strategies	Pain Beliefs Questionnaire (PBQ)	Walker et al. (2005)
Gastrointestinal symptoms and worry	Pediatric Quality of Life (PedsQL) Gastrointestinal Symptoms and Worry Scales	Varni et al. (2012)
Diagnostic features of functional gastrointestinal disorders	Questionnaire on Pediatric Gastrointestinal Symptoms—Rome III version (QPGS-RIII) <a href="http://www.romecriteria.org/pdfs/pediatricq.pdf">http://www.romecriteria.org/pdfs/pediatricq.pdf</a>	Caplan et al. (2005)
Parental fears and worries about their children's chronic abdominal pain	Worries and Beliefs about Abdominal Pain (WAP)	van Tilburg et al. (2009a)

diagnosis, strengthening the case against this approach. Testing intended to provide reassurance to parents should be avoided because the results rarely serve this function (Wallis & Fiks, 2015). McFerron and Waseem (2012) emphasized this point by noting that negative test results often increase the parents' fear of an unknown pathologic disease and make it difficult for them to accept the explanation of a functional disorder.

Many experts have identified the importance of introducing the concept of functional pain at the initial point of patient contact (McFerron & Waseem, 2012; Schurman & Friesen, 2010). Education of the family of a child with a suspected diagnosis of FAP is essential to the success of treatment (Di Lorenzo et al., 2005). The AAP recommended that providing a summary of symptoms and explaining that the pain is real, albeit likely not caused by a serious or chronic illness, are crucial components of the patient education process (Di Lorenzo et al., 2005). Providers need to communicate that the main goal of treatment is to return to baseline function, rather than achieve complete resolution of pain (Chiou & Nurko, 2010; Di Lorenzo et al., 2005; Lynch-Jordan et al., 2014).

### FUTURE RESEARCH

Nearly all of the existing research on FAP acknowledges the paucity of evidence-based studies dedicated to the treatment of this pediatric pain condition. As Schurman and colleagues (2014) noted, even less is known about how best to manage FAP in the primary care setting, and there are no randomized controlled trials at this level. FAP is a common childhood condition, and NPs will undoubtedly encounter these patients. Psychosocial interventions represent the most promising treatment approach to date, but most have not been introduced into practice and remain inaccessible to many people (Wallis & Fiks, 2015). Future research should take place in this setting, and study goals should include improved understanding of the clinical presentation of FAP, the variables that lead to diagnosis, and how best to incorporate behavioral treatments (Schurman et al., 2014; Wallis & Fiks, 2015).

Levy and van Tilburg (2012) suggested that future studies would benefit from some key design characteristics, including sample sizes greater than 50 individuals per group, a control condition, measurement of the process and outcome variables, and long-term follow-up of at least 1 year. To ensure that patients' treatments are matched to their particular situation, an increased understanding is needed of which therapies are best suited for which type of patient (Eccleston, Morley, & Williams, 2013).

Programs delivered through the Internet or through self-guided materials sent home represent promising options for increasing access to necessary treatments. More research should be conducted on the barriers to

employing these methods in clinical NP practice (Boixadós et al., 2014). Levy and van Tilburg (2012) also suggested exploration of remote access technology and other alternative treatment delivery methods, such as involvement of a broader range of professionals, including school nurses and counselors.

### IMPLICATIONS FOR CLINICAL PRACTICE

FAP is a frequent reason for primary care visits (Apley & Naish, 1958; Chiou et al., 2013; Levy & van Tilburg, 2012). The Rome III is a validated diagnostic tool, and current research indicates that promising interventions are available for children with FAP. This disorder continues to pose a challenge to the professionals who care for children with abdominal pain. The clinical usefulness of the Rome III diagnostic criteria should be more clearly and systematically explored to understand its perceived limitations and determine how to integrate it into practice (Schurman et al., 2014; Wallis & Fiks, 2015). Future goals should aim to generate evidence to support the development of a standard of care (Chiou & Nurko, 2010). NPs should be consistently educated about risk factors; typical clinical presentation, including expected history and physical examination findings; and the most current evidence regarding treatment.

Taking these steps will help NPs develop an increased sense of confidence and competence in the care of these pediatric patients.

### CONCLUSION

Understanding, validating, and explaining the biopsychosocial mechanisms at play in FAP will be crucial to the foundation of this standard of care. It is the responsibility of NPs to make a case for this relationship and to advocate for its implementation. Psychosocial interventions appear to provide the most effective management and reduce functional disability, an outcome that is an indicator of current and future quality of life.

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