

## **Parents and Childhood Functional Abdominal Pain: A Narrative Review of the Literature**

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### **Abstract**

Functional Abdominal Pain Disorders (FAPD) tend to run in families and recent research has suggested that parents play an important role in managing child's pain. The aim of this narrative review is to examine the role of parents in child FAPD. Most research has applied social learning theory, where the child learns how to deal with pain from their parents through either modeling or reinforcement. Parental reinforcement of inappropriate illness behaviors, such as excusing a child from activities, increases pain severity as well as pain disability. A parent may reinforce illness behaviors in order to protect their child as the pain is perceived as a high threat. These parents also tend to catastrophize about their child's pain. Interventions focused on altering parental modeling, protective behaviors, pain threat and catastrophizing have been shown to help improve child pain outcomes. These findings emphasize the importance of intervening on a family level for childhood FAPD disorders.

*Keywords:* Functional Abdominal Pain (FAP), Irritable Bowel Syndrome (IBS), children, parents, social learning theory

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### **Introduction**

Chronic abdominal pain is a common childhood complaint and in most cases of functional nature, meaning no disease or structural abnormality cause the pain (Hyams et al., 2016; Korterink, Diederens, Benninga, & Tabbers, 2015; Perquin et al., 2000). Rather the pain is considered to result from alterations in gut physiology (e.g., immunity, microbiota) interacting with psychological factors and changes in central nervous processing of pain. Children who suffer from Functional Abdominal Pain

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Disorders (FAPD) show increased disability such as school absences and are at risk for lifelong chronic pain and emotional problems (Shelby et al., 2013; Walker, Dengler-Crish, Rippel, & Bruehl, 2010).

Functional Abdominal Pain Disorders (FAPD) tend to run in families (Saito et al., 2010). Although twin studies suggest a genetic predisposition, no single gene has been found to be related to FAPD in adults (child studies are missing) (Saito & Talley, 2008). It has been suggested that FAPD may be a complex genetic disorder (van Tilburg & Whitehead, 2012), but to our knowledge no complex genetic models have been tested. However, there is evidence that shared environment may be more important than genetics in explaining why FAPD run in families. Having a parent with FAPD is a stronger predictor of child abdominal pain, than having a twin sibling with FAPD (Levy et al., 2001). This finding suggests an important role of parents in FAPD.

The aim of this narrative review is to examine the role of parents in child FAPD. Social learning theory is the most common theoretical framework for most of this work, and seminal studies by Whitehead, Levy and Walker and others will be discussed that have driven the understanding of the impact of parental modeling and reinforcement on child illness behaviors. Next, the driving factors of parental reinforcement, also called protectiveness, will be examined including pain threat and catastrophizing. Lastly, this review will discuss evidence from treatment studies that show positive impact of changing parental thoughts and behaviors on child pain outcomes. This narrative review discusses only the most seminal studies available through PubMed, and is not intended to be all inclusive of every study on parental factors in FAPD.

### **Social Learning and FAPD**

When a child is in pain he/she will look to a parent for help and guidance. Parents can shape how children respond to pain, cognitively, emotionally and behaviorally. Social learning theory posits that children learn from others through observation, imitation and modeling (Bandura, 1977). This process can be direct, i.e. by parents encouraging the child to use certain coping strategies when in pain, or indirect, i.e., by observing how parents reacts to their own pain. Parents can model or reinforce appropriate or inappropriate illness behaviors and cognitions in their children. In the case of chronic pain, appropriate illness behaviors are usually focused on wellness behaviors (e.g., going to school or work despite being in pain) rather than protective behaviors (e.g., laying down when in pain). This is because chronic pain is not a signal of bodily harm and hence protective behaviors to reduce harm are not necessary. Rather reducing disability associated with chronic pain - i.e. increasing wellness behaviors - is a major focus of chronic pain treatment.

The first study to find evidence for the role of social learning in pain was performed more than 30 years ago by Whitehead, Winget, Fedoravicius, Wooley,

and Blackwell (1982). They observed that adults with FAPD recalled receiving special attention and gifts from their parents when ill, while people with other gastrointestinal illnesses did not (Whitehead et al., 1982). The authors speculated that the patient's parents - unintentionally - reinforced protective illness behaviors in their children when sick. As adults, they continued to show increased disability and concern when symptomatic. Evidence for the role of social learning has also been found in children. Levy and colleagues (2004) compared symptoms in children of parents with and without IBS. Compared to those without a model, children who had a parent with IBS, reported to be bothered more by gastrointestinal symptoms, and made more clinic visits as well as missed more school (Levy, Whitehead, Von Korff, & Feld, 2000; Levy et al., 2004). In addition, parental attention and concern when the child is in pain, was associated with higher levels of child's pain and disability (Levy et al., 2004). The effect of reinforcement and modeling may not be limited to pain. Children of mothers with IBS showed increased gastrointestinal as well as non-gastrointestinal (cold) symptoms. Through modeling and parental reinforcement when the child is ill, children may learn that all symptoms are important, require their attention and protective behaviors (van Tilburg et al., 2015). Thus, these studies found evidence for the effect of both modeling and reinforcement of protective illness behaviors in children of parents with IBS. Others have replicated the importance of parental reinforcement of child illness behaviors in children with various chronic pain conditions (Claar, Simons, & Logan, 2008; Guite, McCue, Sherker, Sherry, & Rose, 2011; Langer, Romano, Levy, Walker, & Whitehead, 2009; Simons, Claar, & Logan, 2008; Walker, Levy, & Whitehead, 2006). In summary, when parents behave protectively when their child is in pain, these behaviors paradoxically increase pain and disability.

In a landmark study, Walker and colleagues found that parents are aware their protective behaviors increase child's distress. However, this does not dissuade them from acting protectively (Walker, Williams et al., 2006). In a laboratory setting, parents were asked to either attend to or distract their child from abdominal pain induced by a water load test (drinking water until full). Distraction led to a significant reduction in reporting of symptoms in children with FAPD, while giving attention (a protective behavior) to pain was associated with increased symptoms. Both parents and children reported that distraction was more helpful than attention. However, parents were reluctant to use distraction when the child complained of abdominal pain. Showing attention to the child's pain, according to the parents, shows empathy and sympathy for the child, and this was considered important for the child's long-term emotional well-being. Parents did not want to replace a short-term gain (reduced symptoms) with a potential long-term risk (their relationship with their child). Hence, parents may feel that being a 'good parent' involves reacting protectively when their child complains of abdominal pain. Hence, it is important to understand why parents are reluctant to give up acting protectively when their child is in pain.

### **Parental Beliefs about Child Pain: The Role of Pain Threat and Catastrophizing**

Why do parents react protectively when it increases their child distress? Parental protective behaviors may be driven by parental worries and beliefs about the causes and consequences of their child's pain. Parents emphasize their child's pain may signal a yet unrecognized disease, but feel unable to help their child when in pain (van Tilburg et al., 2003). Thus, parents see pain as a threat (potential harm from unrecognized disease) and catastrophize about their child's pain. There is good evidence that these two parental beliefs are associated with protective behaviors and negative outcomes.

The threat value of pain is larger if parents believe the pain signals harm. About half of parents endorse a purely medical explanation of pain (Claar & Walker, 1999) and this is associated with acting more protectively (Guite, Logan, McCue, Sherry, & Rose, 2009) including consulting a doctor for the child's pain (Calvano & Warschburger, 2016) and paying more attention to their child while in pain (Caes, Vervoort, Trost, & Goubert, 2012). Parental protective responses may signal to the child that the pain is serious and should be attended to (Levy et al., 2004). Hence, it increases the child's own perception of threat. In addition, observing a parent acting protectively when they are in pain, was also associated with child's pain threat and pain-related disability (Stone, Bruehl, Smith, Garber, & Walker, 2017). Thus, parent pain threat increases protective behaviors and this in turn can increase child pain threat through both parental modeling and reinforcement.

Pain threat is an aspect of pain catastrophizing: The tendency to overestimate the threat value of pain and feeling helpless to change it. Parent catastrophizing has been associated with negative outcomes in children with chronic pain including disability, depression and quality of life (Chow, Otis, & Simons, 2016; Lynch-Jordan, Kashikar-Zuck, Szabova, & Goldschneider, 2013; Warschburger et al., 2014; Wilson, Moss, Palermo, & Fales, 2014). Originally, catastrophizing was hypothesized to solicit support and empathy from others and there is some evidence of the interpersonal role of catastrophizing in adults with IBS (Lackner & Gurtman, 2004). It may therefore be extrapolated that children catastrophize to solicit help and empathy from their parents. In fact, mother's protective responses are related to the amount of distress the pain elicits from her child (Langer et al., 2017). However, if mom herself catastrophizes, she acts protectively towards her child regardless of her child's level of pain distress (Langer et al., 2017). For parents who catastrophize, child pain always has high threat value. Acting protectively may be focused on reducing parent's own distress/helplessness but increases child's disability (Sieberg, Williams, & Simons, 2011). Thus, acting protectively towards the child may be better at reducing the parent's distress and helplessness than the child's pain.

Since pain is a threat it can trigger the attachment system (Meredith, 2008). A child in pain is looking for the security and support of the parent when in pain. If the

parent-childhood attachment is secure (the child feels safe and can rely on the parent), a child is confident they can deal with the pain. However, if the child-parent attachment is insecure (the child may not feel safe and/or cannot consistently rely on the parent) the child may interpret the pain as more threatening and fail to reach out to the parent for help. In children, there is some evidence that insecure attachment is associated with negative pain outcomes (Laird, Preacher, & Walker, 2015; Tremblay & Sullivan, 2010; Vervoort, Goubert, & Crombez, 2010). These studies have shown that insecure attachment is associated with increased catastrophizing and pain threat, which in turn may affect pain outcomes.

### **Interventions Focused on Parents**

The findings above suggest that intervening with parents may help children with FAPD. In a large study of 200 children with FAPD undergoing Cognitive Behavioral Therapy (CBT), parents were also asked to participate in order to reduce social learning influences on child's pain (Levy et al., 2010). Compared to a control condition (education), those receiving CBT showed larger child improvements in pain, as well as parents' reductions of protective responses and pain threat up to 12 months after treatment (Levy et al., 2010, 2013). In a small study of group CBT for FAPD, similar outcomes were found: Mothers who participated in CBT together with their child, reported decreases in maladaptive reactions to their child's abdominal pain including reductions in pain worry and attention (Calvano, Gross, & Warschburger, 2017). Online CBT for chronic pain similarly reduced parental protectiveness and child pain disability (Palermo et al., 2016). We found that treatment outcomes of CBT on pain were mediated by reductions in both *parental* pain threat and *child* catastrophizing (Levy et al., 2014), which indicates that reduction of parental pain threat improves child's pain. Thus, by intervening with both the parent and the child, important parental factors in child FAPD can be changed.

In a follow-up study, we targeted parents only (not treating the child at all) (Levy et al., 2017). We hypothesized changing parental behaviors would be enough to ameliorate child's pain and disability. As expected, parent-only CBT reduced parental protectiveness, pain threat and catastrophizing. However, these did not reduce child pain. Rather, CBT resulted in lower child disability including health care visits for abdominal pain and school absences. Given that parents can help child manage the pain, but not take away the cause of abdominal pain, it is no surprise that parents may have more influence over the child's pain disability than over pain severity itself.

## Conclusion

Parents play an important role in child FAPD. Both parental modeling and reinforcement of illness behaviors affect the child's pain and disability. Two of the most important factors explaining why parents may model or reinforce pain behaviors, are parental catastrophizing and pain threat. Not only child fear and catastrophizing are important but also parental fear and catastrophizing. Both influence child pain outcomes and both should be the focus for treatment of children with FAPD.

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## **Dolor abdominal funcional en los padres y niños: Revisión narrativa de bibliografía**

### Resumen

El trastorno del dolor abdominal funcional normalmente aparece en familia e investigaciones recientes han sugerido que los padres tienen un papel importante en manejar el dolor de los niños. El objetivo de esta revisión narrativa es examinar el papel de los padres para el trastorno del dolor abdominal funcional de los niños. La mayoría de las investigaciones han aplicado la teoría de aprendizaje social, en la que el niño aprende de los padres cómo tratar el dolor, sea por el enfoque de modelado o reforzamiento. El reforzamiento parental de conductas inapropiadas de enfermedad, como justificar que el niño no participe en la actividad, aumenta la gravedad de dolor y su discapacidad. Los padres pueden reforzar conductas de enfermedad para proteger a su hijo dado que el dolor se percibe como amenaza alta. Estos padres también tienden a catastrofizar sobre el dolor de su hijo. Las intervenciones enfocadas en alternar el modelado parental, conductas protectoras, amenaza de dolor y catastrofizar han demostrado que ayudan a mejorar los resultados del dolor en los niños. Estos hallazgos ponen énfasis en la importancia de intervención a nivel familiar en cuanto a los trastornos del dolor abdominal funcional en los niños.

*Palabras clave:* dolor abdominal funcional y síndrome del intestino irritable, niños, padres, teoría de aprendizaje social

Received: January 7, 2018