Psychiatric Considerations in Pediatric Chronic Pain

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Introduction

The International Association for the Study of Pain defines pain as “an unpleasant sensory and emotional experience,” which recognizes both the physiological and psychological aspects of pain. According to the Biobehavioral Model of Pediatric Pain (Varni 1989), biological factors (e.g., temperament, age, gender, cognitive development), family factors, cognitive perceptions, coping styles, and perception of social support work together to influence the experience of pain. Each of these cognitive, emotional, and physiological variables can have an exacerbating or ameliorating effect on pain management; therefore, each is a potential target for intervention. The psychological aspects of chronic pain have received increased attention due to concerns about the many potentially negative consequences related to pediatric chronic pain such as missed school, restrictions in daily activities and emotional and behavioral problems (Varni 1989). In pediatric populations, the impact of chronic pain is not limited to the patient, but also affects, and is affected by, the family as well. Parents, especially, play an important role in how children and adolescents cope with pain.

The purpose of this chapter is to provide an overview of psychiatric considerations in pediatric chronic pain including the psychological factors that influence perceptions and management of chronic pain in children and adolescents, and associated psychiatric problems. In particular, there will be an exploration of the cognitive and behavioral aspects that mediate the pain experience and coping, review of psychiatric problems such as anxiety, depression, and somatoform disorders as they relate to pediatric pain, and the impact of chronic pain on school functioning.

Psychological Factors that Influence Pain Perception and Maintenance

Psychological aspects of chronic pain such as cognitive and environmental variables can shape perception and maintenance of pain-related behaviors in children and adolescents. Cognitive components include what children
and adolescents pay attention to, and how they interpret information. Environmental aspects include how external factors including parental behavior and changes in day-to-day functioning impact children and adolescents dealing with chronic pain.

**Cognitive Aspects of Pain Perception and Maintenance in Pediatric Populations**

**Attention**

Several models have considered the role of attention on pain perception and management (Compas and Boyer 2001; Walker 1999; Zeltzer et al. 1997). Zeltzer et al. (1997) proposed that difficulty shifting attention away from pain may be an important component for children with chronic pain. Walker (1999) suggested that children’s greater attention to pain exacerbates their anxiety and fear, which then intensifies their perception of pain. Some children with chronic pain exhibit other attentional patterns as well. Boyer et al. (2006) found that children with abdominal pain in their study showed attentional biases for words (presented at a subliminal level) related to social threat as well as pain. In addition to exacerbating the perception of pain, greater attention to pain-related stimuli may also take away from learning and utilizing more constructive strategies for coping with pain (Compas and Boyer 2001).

**Cognitive Appraisals**

The accuracy of pain-related perceptions is another important cognitive aspect of pain. More “catastrophic thinking about pain” (Vlaeyen and Linton 2000) has been associated with children’s perceptions of greater pain intensity, reduced pain tolerance (Piira et al. 2002), and increased impairment of functioning (Crombez et al. 2003; Vervoort et al. 2006; Lynch et al. 2006). Catastrophizing has also been shown to affect emotional functioning, with increased catastrophic thinking linked with greater anxiety and depression (Eccleston et al. 2004).

For children with chronic pain, negative thinking overall is associated with psychological distress (Gil et al. 1991, 2001), as well as, greater report of pain intensity (Thomsen et al. 2002). Children’s negative appraisals of their coping (e.g., confidence in ability to change or adapt to stress) has also been linked to decreased likelihood of utilizing more adaptive coping strategies (Walker et al. 2007).

**Environmental Aspects of Chronic Pain in Pediatric Populations**

**Parental Attention**

Attention related to pain can be a powerful source of reinforcement (Fordyce 1989). For all children and adolescents, including those struggling with chronic pain, parental attention is an important force that helps shape behaviors. Parents can have a positive influence when they encourage adaptive coping and functional behaviors (Chambers et al. 2002). However, research has shown that greater parental attention to pain, especially solicitous attention, is associated with maintenance of pain in pediatric patients (Gidron et al. 1995). Parental reinforcement of children’s pain has also been associated with greater functional disability independent of other factors contributing to pain coping including reports of stress (Whitehead et al. 1994) and perceptions of pain severity (Gidron et al. 1995). Even negative reinforcement from parents (e.g., parental frustration) has been shown to help prolong somatic symptoms in children with recurrent abdominal pain (Walker et al. 2002).

**Reduction in Daily Demands**

In addition to attention, changes in daily responsibilities can also impact children and adolescents’ pain-related behaviors. The pain relief associated with behaviors, such as lying down, taking medication, and missing school, can reinforce these behaviors. Respite from daily tasks that may be a potential source of distress or dislike, such as schoolwork or chores, can also inadvertently reinforce pain behaviors (Allen and Mathews 1998).

Walker et al. (2002) provided a developmental perspective to the reduction in daily demands related to chronic pain and symptom maintenance in children with recurrent abdominal pain. The researchers found that limitations in daily activities and responsibilities predicted symptom maintenance in children with lower reported global self-worth and academic competence (Walker et al. 2002).
Psychiatric Comorbidity and Pediatric Chronic Pain

Research has shown the interplay between chronic pain in children and adolescents and psychiatric disorder (Konijnenberg et al. 2006; Vaalamo et al. 2002). In particular, anxiety and depression are two common psychiatric problems seen in pediatric chronic pain populations (Campo et al. 2004; Dorn et al. 2003; Martin-Herz et al. 1999). In a study of children and adolescents with abdominal pain, Mulvaney et al. (2006) found that patients who had long-term problems with pain (no symptom improvement at 5-year follow up) had greater reports of anxiety and depressive symptoms at baseline. Depression and anxiety can impact the onset and maintenance of pain in children (Martin-Herz et al. 1999) and, conversely, chronic pain can also lead to emotional distress in the form of anxiety and depression. Varni et al. (1996) identified perception of pain intensity, in particular, was associated with depressive and anxiety symptoms in their study of children and adolescents with rheumatologic diseases.

Anxiety

The association between anxiety and chronic pain has been seen in clinical (Garber et al. 1990; Hodges et al. 1985) and community-based (Egger et al. 1999; Hyams et al. 1996) samples of children and adolescents. Hodges et al. (1985) found children with recurrent abdominal pain endorsed similar levels of anxiety as children with psychiatric diagnoses. Dorn et al. (2003) found that children with recurrent abdominal pain exhibited physiological markers of stress that were more similar to a cohort of children diagnosed with an anxiety disorder than healthy controls. In children and adolescents with noncardiac chest pain, Lipsitz et al. (2004) found that youth with noncardiac chest pain exhibited higher levels of anxiety sensitivity compared to their cohorts with benign heart murmurs (Lipsitz, Masia-Warner, Apfel, Marans, Hellstern, Forand, Levenbraun, & Fyer 2004).

While the precise mechanism of how anxiety and chronic pain are related is not yet fully understood, studies have demonstrated associations between aspects of anxiety and chronic pain. Specifically, attentional bias toward internal and/or external threats (Boyer et al. 2006) and catastrophizing (Crombez et al. 2003; Vervoort et al. 2006), which are common characteristics of anxiety, are also shown to affect pediatric chronic pain. Merikangas and Stevens (1997) proposed two ways in which the link between anxiety and pain (migraine) can be considered – unidirectional (pain causing anxiety or vice versa) or shared vulnerability (anxiety and pain share common risk factors).

Depression

Many children and adolescents with chronic pain are vulnerable to depressive symptoms (Garber et al. 1990; Kashikar-Zuck et al. 2001; Mulvaney et al. 2006; Varni et al. 1996). In a heterogeneous group of children presenting in an outpatient pain clinic with diverse pain complaints (e.g., back pain, abdominal pain, limb pain, neuropathic pain, etc.), Kashikar-Zuck et al. (2001) found that most of the children in their sample endorsed mild to moderate levels of depression, and 15% of patients endorsed severe levels of depression. Specifically, maladaptive coping such as internalizing and catastrophizing in this sample of children was associated with depression (Kashikar-Zuck et al. 2001).

Risk for depression may come both from difficulties coping adaptively with chronic pain, as well as, challenges in managing the disruptions to daily life that are a result of persistent pain. Less adaptive coping with chronic pain has been associated with greater disability in children (Schanberg et al. 1996). Also, managing the interruptions to everyday events, such as, school and social activities is a common problem for pediatric management of chronic pain (Kashikar-Zuck et al. 2001). This disturbance in daily activities has been linked to depressive symptoms (Kashikar-Zuck et al. 2001). Compared to their healthy counterparts, children with chronic abdominal pain experience greater difficulties in the areas of school, home,
and social functioning (Walker and Greene 1989). Interestingly, Lewandowski et al. (2006) found that functional disability was associated with depressive symptoms in their sample of children with headaches, but not adolescents. This suggests the importance of examining developmental differences between children and adolescents in relation to chronic pain and depression.

Somatoform Disorders

Somatoform disorders are a class of diagnoses that are characterized by “the presence of physical symptoms that suggest a general medical condition … and are not fully explained by a general medical condition, by the direct effects of a substance, or by another mental disorder…” (DSM-IV-TR). Two pain-specific diagnoses within somatoform disorders include Pain Disorder Associated With Psychological Factors and Pain Disorder Associated With Both Psychological Factors and a General Medical Condition. The prominent features of pain disorders include (a) severity of pain that warrants clinical attention; (b) pain that causes significant functional distress or impairment; (c) psychological factors that contribute to the onset, severity, or maintenance of pain; (d) pain not intentionally produced to maintain a “sick role” (Factitious Disorder) or for secondary gain (Malingering); and (e) pain symptoms are not better accounted for by other psychiatric disorders (DSM-IV-TR). Pain Disorder Associated With a General Medical Condition, which is not a psychiatric disorder, describes a condition when the general medical condition is the primary component of the pain presentation, and if there are psychological factors, these factors are not deemed to have a significant role on the onset, severity, or maintenance of pain (DSM-IV-TR).

Conversion Disorder and Somatoform Disorder Not Otherwise Specified, are characterized by (a) the unintentional (subconscious) manifestations of somatic symptoms without a clear medical cause (after full evaluation), not related to the effects of substances and not better accounted for as a common practice within a specific culture; (b) symptoms cause significant functional distress or impairment; and (c) psychological factors contribute to the onset, severity, or maintenance of pain symptoms (DSM-IV-TR). Conversion Disorder involves sensory or motor symptoms suggestive of a neurologic or other general medical condition (e.g., problems with walking, swallowing, seizure-like episodes, etc.) while Somatoform Disorder Not Otherwise Specified involves more general physical complaints (e.g., fatigue, gastrointestinal complaints, appetite changes, etc.).

Kozlowska et al. (2007) found that separation/loss (e.g., separation from a parent, death of a loved one) and family conflict/violence were the most commonly reported life stressors among their sample of children and adolescents with Conversion Disorder. Although there is no clear etiology for somatoform disorders, oftentimes, an emotional conflict or stressor is thought to be related to the onset and maintenance of somatic symptoms.

Given that physical complaints, and/or pain specifically, are key components of somatoform disorders, children and teenagers with somatoform disorders often present initially to their primary care physician or medical subspecialists. The complicated relationship between psychological and physical factors can make the diagnosis and treatment of somatoform disorders challenging for health professionals within and outside of mental health.

Treatment

Psychological interventions can target several different aspects of chronic pain in pediatric populations. Cognitive and behavioral skills are often used together to encourage adaptive coping with pain. Cognitive-behavioral therapies have been shown to help reduce pain in children with recurrent abdominal pain (Sanders et al. 1994), fibromyalgia (Degotardi et al. 2006), and rheumatoid arthritis (Walco et al. 1992). Distraction has many forms and can help divert attention
away from pain. Children and adolescents can engage in passive (e.g., being read a book by a parent) or active distraction (e.g., playing a video game) that help take their thoughts away from pain. Guided imagery can also serve as a distraction tool that can direct attention away from pain, or channel it toward adaptive management. Walco and colleagues (Walco et al. 1992) used imagery, both thinking of pleasant scenes and images focused specifically on pain reduction or elimination (e.g., “pain switches”), which combined with progressive muscle relaxation, and meditative breathing helped with pain reduction in children with juvenile rheumatoid arthritis. Biofeedback, which encourages increased awareness and control of physiological variables (e.g., heart rate, temperature, muscle tension, etc.) can be directed toward greater relaxation (Holden et al. 1998; Lavigne et al. 1992) or targeting specific areas/functions that may be contributing to pain (Gauthier et al. 1996).

Gil and colleagues (Gil et al. 1997, 2001) found calming self-statements combined with various relaxation techniques (deep breathing, imagery, and counting relaxation), led to immediate reduction in negative thinking and pain reports in children with sickle cell disease during a laboratory pain task. Similarly, Sanders and colleagues showed that encouraging self-statements, along with relaxation and distraction were successful in pain reduction for children with recurrent abdominal pain, compared to children on a wait-list (Sanders et al. 1989) and children receiving standard pediatric care (continued follow-up with a gastroenterologist who provided reassurance of a lack of serious medical cause and encouraged parents to permit children to return to full activities) (Sanders et al. 1994).

Another focus of treatment may include addressing any underlying psychological factors contributing to the maintenance of the somatic presentation, for example, parent–child relationship, concerns about school re-entry, etc. Behavioral interventions such as differential attention and providing reinforcement of functional behaviors encourage use of adaptive coping while minimizing secondary gains.

While there are no controlled outcome studies of somatoform disorders in pediatrics, there is a literature of case reports or case series that link successful outcomes to a rehabilitative approach to treatment (Brazier and Venning 1997). Depending on the nature and severity of the pain difficulties, a combination of physical and psychological rehabilitation may be recommended. With regard to psychological interventions, behavioral techniques (Campo and Negrini 2000), relaxation skills, and family therapy (Lock and Giammona 1999) have been identified as important components of successful treatment of somatoform disorders. The level of therapy and pharmacological intervention necessary will vary according to the degree of functional impairment, parental abilities, and existence of any comorbid psychiatric diagnoses. Partial psychiatric hospitalization (day treatment) or intensive inpatient or outpatient rehabilitation programs may be recommended in cases where significant functional impairments persist beyond what can appropriately be addressed with general outpatient care.

Given the interplay between physiological and psychological symptoms, medical providers play an important role in working with families of children and adolescents with somatoform disorders. Clear feedback and recommendations with an emphasis on the link between psychological and physiological components (versus exclusive focus on one or the other) are helpful (Brazier and Venning 1997; Gooch et al. 1997; Palermo and Scher 2001). If more intensive psychiatric or rehabilitative services are necessary, the involvement of the medical clinicians in supporting the plan is beneficial in making such a recommendation more acceptable to families.

Impact of Chronic Pain on School

Difficulties managing chronic pain in pediatric populations can lead to significant impairments in school functioning. Chronic pain can be disruptive to school attendance, academic performance, and ability to cope with classroom demands (Allen et al. 1999; Palermo 2000). Children with chronic pain have been shown to experience high
rates of school absences (Newacheck and Taylor 1992), especially for children with headaches (Stang and Osterhaus 1993; Carlsson et al. 1996), abdominal pain (Walker et al. 1998), and musculoskeletal pain (Mikkelsson, Salminen, & Kauiainen, 1997).

For school staff, managing a student with chronic pain can be a difficult task. One large challenge for school personnel is limited understanding of pediatric chronic pain (Power et al. 1999). Additional barriers to successful management in the classroom include collaboration between parents and school staff, and teachers’ difficulties in balancing school policies and classroom requirements while accommodating students’ individual needs (Logan and Curran 2005). With regard to areas of improvement, a study by Logan and Curran (2005) found that school personnel highlighted the need for more overall collaboration with medical teams, schools, and families. From the medical teams in particular, school staff wanted more information about the specific medical diagnoses and guidance on how symptoms should be managed at school (Logan and Curran 2005).

Conclusion

Chronic pain in pediatrics is multifaceted and understanding its many dimensions is essential to effective treatment. The psychological aspects of chronic pain play a critical role to the onset and maintenance in children and adolescents. Identification and effective treatment of the psychological components related to chronic pain, as well as, any possible comorbid psychiatric disorders is important as cognitive, emotional, behavioral, and social factors can facilitate adaptive management or exacerbate poor coping and functional impairments. Early intervention is also important because pediatric chronic pain increases the risk for adult chronic pain (Campo et al. 1999; Walker et al. 1995). Additionally, a multisystemic approach that includes collaboration with parents, medical providers, and schools is essential to target the many areas that are affected by pediatric chronic pain.

References


