Burden of Anxiety Disorders in Pediatric Medical Settings

Prevalence, Phenomenology, and a Research Agenda

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The current review describes the phenomenology of several common anxiety disorders in children and adolescents as they present in medical settings. Anxiety disorders and associated features in children are described, along with epidemiology, functional impairment, common somatic complaints, medical comorbidity, health care utilization, and presentation in general and in specialty pediatric medical settings. Recommendations for clinical management in pediatric settings are presented, and evidence-based interventions and emerging treatments for pediatric anxiety disorders are described. The review concludes with a discussion of future research directions that may lead to increased recognition and improved management of anxiety disorders in pediatric medical settings.


Roughly 1 in 4 Americans will meet lifetime criteria for an anxiety disorder. Anxiety disorders are among the earliest psychiatric conditions to manifest, with a median age at onset of 11 years. General population prevalence rates among children younger than 18 years are estimated to be between 5.7% and 12.8%. As such, anxiety disorders are more prevalent in children than either mood disorders or attention-deficit/hyperactivity disorder, although they often co-occur with these conditions as well as with other anxiety disorders. Left untreated, anxiety disorders tend to have a chronic and unremitting course. Childhood anxiety disorders also increase risk for adult psychiatric disorders, including depression and substance use disorders.

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Anxiety disorders are associated with considerable functional impairment and economic costs related to lost productivity and treatment. In children, anxiety disorders can be associated with school absenteeism or school refusal, poor academic performance, or grades that are lower than would be expected based on the child's abilities. Despite the significant public health burden associated with anxiety disorders, most afflicted individuals do not receive specialty mental health treatment and are instead managed in the general health sector. To some extent, this may be due to the prominent somatic complaints that often accompany anxiety disorders, particularly in children, and because medical comorbidity is often associated with these diagnoses. Ambiguity regarding the cause of physical symptoms in these patients could conceivably lead to unnecessary medical visits and medical testing as well as incomplete resolution of symptoms. In children with verified medical illness, their psychiatric symptoms may go untreated in medical settings, leading to increased distress and loss of productivity. Increased recognition of anxiety disorders and awareness of recommended treatment approaches may lead to improved management in pediatric medical settings.

The primary objectives of the current review are as follows. First, we aim to increase recognition among pediatric medical care providers of the signs and symptoms of common childhood anxiety disorders, particularly those diagnoses that may come to their attention owing to an association with somatic complaints and medical comorbidity. As there are spe-
KEY FEATURES OF PEDIATRIC ANXIETY DISORDERS

Although there are common features among the anxiety disorders, they are differentiated by the focus of the child’s fears. In separation anxiety disorder, children’s fears center on anticipated or actual separation from their parent(s)/caregiver. Children with separation anxiety disorder are often clingy, have difficulty sleeping alone, may have school refusal, and may also exhibit or report somatic symptoms prior to or on separation. Children with generalized anxiety disorder may also express fears about harming or losing family members, but this is not the primary focus of their concern—they also experience excessive and uncontrollable worry about a number of other domains (eg, being on time, academic performance, friendships). The more worry domains that are present, the more likely is the diagnosis of generalized anxiety disorder. Children with social anxiety disorder (also known as social phobia) may present as shy and in severe cases may refuse to speak to unfamiliar people, particularly adults. They may be overly anxious about a number of social situations in which they feel awkward or uncomfortable or in which they worry about negative evaluation by others. These children may attempt to avoid situations in which social fears arise (eg, school). Panic disorder is characterized by unexpected panic attacks (not triggered by an identifiable stimulus) and typically onsets in prepubertal children and adolescents. Panic attacks typically feature a sudden onset of various somatic sensations including tachycardia, sweating, tremors, difficulty breathing, and other symptoms. Panic symptoms often result in frequent trips to their pediatrician’s office, emergency department (ED), and even specialty settings such as cardiology where pediatric patients with anxiety disorders may present. Finally, we aim to acquaint clinicians with recommended approaches for managing anxiety disorders in clinical practice. The review concludes with suggestions for future research.

DISTINGUISHING ANXIETY DISORDERS FROM NORMAL, AGE-APPROPRIATE WORRIES AND FEARS

Many children have transient worries and fears, particularly at certain developmental stages, which should not be viewed as pathological. Anxiety disorders are characterized by greater persistence and severity and by clinically significant impairment or distress. Derived from information in the Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV) diagnostic criteria18 and the collective clinical experience of the authors, Table 1 presents considerations for distinguishing normal, developmentally appropriate fears and worries from those that may indicate a need for further screening.

SOMATIC COMPLAINTS ASSOCIATED WITH ANXIETY DISORDERS

Panic attacks typically feature a sudden onset of various somatic sensations including palpitations, sweating, tremors, difficulty breathing, and other symptoms. Panic symptoms often result in frequent trips to their pediatrician’s office, emergency department (ED), and even specialty settings such as cardiology or neurology for evaluation. Children with panic disorder may avoid, or endure with considerable distress, situations in which panic symptoms have occurred or are feared, such as the classroom, driving, or enclosed spaces; in these cases, the diagnosis of panic disorder with agoraphobia is warranted. Obsessive-compulsive disorder is characterized by obsessions and/or compulsions. Obsessions are thoughts, images, or impulses that tend to “pop up” unbidden in the child’s mind and are experienced as unwanted and difficult to get rid of. Common obsessions include thoughts about contamination; doubts about completion of an activity (eg, locking the front door); aggressive or violent impulses; religious or sexual thoughts or images; a desire for symmetry; and nonsensical thoughts related to certain numbers, letters, songs, or phrases. The child will typically engage in mental or behavioral rituals, known as compulsions, in order to reduce or suppress obsessions. Common compulsions include frequent hand washing, checking, ordering, and counting. A specific phobia refers to a particular stimulus that almost invariably triggers a strong fear response; common phobias in children include fears of animals (eg, dogs, insects), blood-injection-injury (ie, “needle phobia”), darkness, and thunderstorms.
79% were found to meet criteria for 1 or more anxiety disorders. Separation anxiety disorder (43%), generalized anxiety disorder (31%), and social phobia (21%) were the most common anxiety disorder diagnoses in the sample. Although other RAP studies have yielded somewhat lower estimates of anxiety disorders, in the range of 42% to 67%, these rates were still significantly higher than in control groups and higher than the prevalence of other psychiatric disorders in the samples. Pediatric RAP has also been associated with increased risk of anxiety and other psychiatric disorders in adulthood.

### ANXIETY DISORDERS AND MEDICAL COMORBIDITY

Anxiety disorders and medical conditions often co-occur, and while the precise nature of the temporal relationship is currently unclear, it is likely bidirectional. For example, the presence of asthma or gastrointestinal illness could conceivably lead to increased anxiety and catastrophic thoughts about physiological sensations, or fears about suffering a medical emergency when separated from parents, in a vulnerable child or adolescent. Conversely, it is possible that anxiety and stress contribute directly—for instance, through decreased immune function—or indirectly (by way of maladaptive health behaviors like poor sleep habits, alcohol or substance use, and decreased compliance with a medical treatment regimen) to increase susceptibility to certain medical conditions. Anxiety and medical disorders may also share certain environmental (eg, parental smoking, low socioeconomic status, or childhood adversity) and biological (eg, shared neural pathways) risk factors.

Common medical conditions reported in individuals with anxiety disorders include migraine, gastrointestinal disorders, and especially asthma and other atopic conditions like allergic rhinitis, atopic dermatitis, and urticaria. One recent study by Chavira et al found that approximately half of the children in their sample with anxiety disorders had a comorbid medical disorder, with
Allergies or asthma being the most common physical ailment; in comparison, approximately 1 in 4 children without anxiety disorders had a medical illness.

Comorbid anxiety and medical disorders appear to interact synergistically, producing greater impairment in children than would be expected for either disorder alone. In one study of adolescents with asthma, those with comorbid anxiety or depressive disorders reported significantly more days with asthma symptoms relative to adolescents without this psychiatric comorbidity (mean, 5.4 vs 3.5 days, respectively) in the last 2 weeks, even after adjusting for asthma severity.

**HEALTH CARE UTILIZATION**

Individuals with anxiety disorders have increased rates of health care service use. Across multiple studies and settings, anxiety disorders in adults are associated with frequent medical visits. The findings for pediatric studies on anxiety disorders and health care utilization are less definitive. Few such studies in children have been conducted to date. Those that have been conducted often feature small sample sizes and jointly examine child anxiety and depressive disorders, making it difficult to discern any independent association of anxiety disorders and health care use. Nonetheless, overall the extant literature suggests that individuals with anxiety disorders have increased rates of health care utilization, particularly when they occur in the context of comorbid medical conditions.

**PEDIATRIC ANXIETY DISORDERS IN MEDICAL SETTINGS**

**Pediatric Primary Care Settings**

While the adult literature suggests that anxiety disorders are more common in primary care settings than in the general population, data from pediatric studies are just beginning to emerge. Earlier studies generally produce lower estimates, but a more recent investigation that used DSM-IV criteria and semistructured diagnostic interviews with parents suggests that at least 17% of pediatric patients meet criteria for 1 or more anxiety disorder diagnoses. In addition, up to 4 in 5 pediatric patients who meet strict criteria for RAP have an anxiety disorder diagnosis. Recurrent abdominal pain accounts for 2% to 4% of pediatric primary care visits annually.

**Pediatric Medical Specialty Settings**

Anxiety disorders may be overrepresented in pediatric specialty settings such as gastroenterology, cardiology, and pulmonaryology clinics. Higher prevalence of anxiety disorders in these settings might be expected given the types of somatic complaints (eg, abdominal pain, chest pain) and medical comorbidity (eg, asthma) commonly associated with pediatric anxiety disorders. In one study of consecutive pediatric patients receiving services at an inner-city asthma clinic, approximately 1 in 4 were found to have an anxiety disorder diagnosis. While overall estimates of anxiety disorders in specialty settings are lacking, several investigations have focused on patients who present to clinics with specific symptoms for which no medical etiology has been found. For example, in a small study of patients with noncardiac chest pain (ie, chest pain with no established cardiac etiology) in a pediatric cardiology practice, it was determined that 59% of these children had a psychiatric disorder; all but 1 of these patients met criteria for an anxiety disorder.

**Pediatric ED Settings**

With EDs increasingly serving as de facto primary care clinics for many patients, particularly those without health insurance or with inadequate access to health care, ED patients may also be at high risk for anxiety and other mental health difficulties. The available data do indicate high rates of anxiety disorders in acute care settings—up to 23% of adult ED patients screen positive for anxiety disorders. However, we could find only 1 investigation of anxiety disorders in pediatric ED settings. In this study, 45% of 411 randomly selected “nonacute” pediatric ED patients had a probable mental disorder by parent report. Although it is unclear what the prevalence of anxiety disorders would be if the sample were not limited to nonacute visits, this investigation suggests that anxiety disorders may be a fairly common occurrence in pediatric ED settings.

**SCREENING AND MANAGEMENT BY THE PEDIATRIC CARE PROVIDER**

Medical care providers may be reluctant to discuss with parents the possibility of a psychiatric or emotional component to their child's physical symptoms for several reasons, including time constraints associated with work in a busy clinical practice, discomfort with diagnosing and managing psychiatric disorders, belief that psychiatric issues are outside of their purview, or concerns that the child will be stigmatized or parents will not be amenable to such a conversation. However, parents may be more receptive if they perceive that their child's symptoms are not simply being dismissed as “in his or her head.” A discussion of the association between stress and symptoms is not simply being dismissed as “in his or her head.”

When anxiety disorder is suspected, further screening should be undertaken with both the child and parent to assess for the presence of anxiety symptoms. Assessment may be aided by the use of brief validated screening measures such as the 10-item Multidimensional Anxiety Scale for Children or the 5-item Screen for Child Anxiety Related Emotional Disorders (SCARED) (Table 2 and Table 3). These self-report questionnaires are brief and have child and parent ver-
Either more severe symptoms or an unclear diagnostic picture, referral to a child psychiatrist or another behavioral health specialist may be appropriate for further assessment and discussion of treatment options (see the next section on evidence-based approaches). In some instances, often after consultation with a child psychiatrist, the pediatrician may assume primary responsibility for pharmacotherapeutic management (eg, with antidepressants).

**TREATMENT OF PEDIATRIC ANXIETY DISORDERS**

**Evidence-Based Approaches**

Recommended first-line treatments for pediatric anxiety disorders include cognitive behavioral therapy (CBT) and, especially in more severe cases, pharmacotherapy; these may be used as monotherapies or in combination. Cognitive behavioral therapy is a set of techniques involving psychoeducation, changing maladaptive thought patterns, and gradual exposure to anxiety-provoking situations. It is thought that more realistic cognitions (and thus reduced anxiety) about feared situations are cultivated by learning effective thought-challenging techniques as well as via the exposure component of CBT. For example, in exposure therapy, a child with separation anxiety disorder may be guided through an individually tailored set of exposure exercises starting with easier tasks (eg, sleeping in her own bed with the bedroom door open and hallway light on) and progressing to more anxiety-provoking situations (eg, sleeping in her own bed with the bedroom door closed and without the hallway light on). Through this process, the child learns that her worst

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**Table 2. Five-Item Screen for Child Anxiety Related Emotional Disorders, Child Version**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Not True or Hardly Ever True</th>
<th>Somewhat True or Sometimes True</th>
<th>Very True or Often True</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am afraid to be alone in the house.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>People tell me that I worry too much.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>I am scared to go to school.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>I get really frightened for no reason at all.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>I am afraid to be alone in the house.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Abbreviation: SCARED, Screen for Child Anxiety Related Emotional Disorders.

a The SCARED was developed by Boris Birmaher, MD, Suneeta Khetarpal, MD, Marlene Cully, MEd, David Brent, MD, and Sandra McKenzie, PhD, Western Psychiatric Institute and Clinic, University of Pittsburgh, Pittsburgh, Pennsylvania, in October 1995 and is reprinted with permission from Dr Birmaher.

**Table 3. Five-Item Screen for Child Anxiety Related Emotional Disorders, Parent Version**

<table>
<thead>
<tr>
<th>Statement</th>
<th>Not True or Hardly Ever True</th>
<th>Somewhat True or Sometimes True</th>
<th>Very True or Often True</th>
</tr>
</thead>
<tbody>
<tr>
<td>My child is shy.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>People tell me that my child worries too much.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>My child is scared to go to school.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>My child gets really frightened for no reason at all.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>My child is afraid to be alone in the house.</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
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fears (eg, that she will be kidnapped if she sleeps in her own bed instead of with her parents) are disconfirmed, and she thereby gradually habituates to sleeping alone. Cognitive behavioral therapy typically takes place over 10 to 15 sixty- to ninety-minute outpatient sessions and also includes at-home practice of newly acquired skills. Shorter or longer treatment regimens may be recommended depending on the severity of the child’s anxiety, the presence of comorbid conditions, and other factors.

Research suggests that both CBT and selective serotonin-reuptake inhibitors are effective in treatment of pediatric anxiety disorders. Some recent studies suggest that CBT and selective serotonin-reuptake inhibitors are equally efficacious for children with anxiety disorders, although one of these studies found CBT to be superior to pharmacotherapy on some indices. Combination treatment may be more efficacious than either treatment alone—a recent randomized controlled trial found that 81% of children with anxiety disorders receiving both sertraline hydrochloride and CBT were classified as responders, vs 60% for CBT alone, 55% for sertraline alone, and 23% for pill placebo. For a more comprehensive discussion of the treatment outcome literature, interested readers are referred to recent reviews on this topic.

Emerging Treatments

There are several emerging pharmacological and behavioral treatment approaches that may be particularly suited for anxiety disorders in pediatric medical settings. In a 12-week, flexible-dose, open-label trial of citalopram hydrobromide for 25 children aged 7 to 18 years with functional RAP, 21 (84%) were classified as treatment responders and evidenced significant improvement on both pain ratings and anxiety symptoms throughout the course of the study. In another development, 7 youths recruited from a gastroenterology clinic with anxiety disorders and abdominal pain or discomfort were treated with a 12-week modified CBT intervention that targeted both anxiety symptoms and physical symptoms. Following treatment, all participants were classified as treatment responders, with significant reductions in both anxiety and physical discomfort ratings. Brief, evidence-based behavioral interventions targeting pediatric anxiety are also being transported directly into the primary care setting. One treatment currently being developed by our group is based on a collaborative care model whereby pediatricians are trained to identify and refer children with anxiety disorders and mental health professionals deliver the behavioral intervention in the primary care clinic or by telephone. Another treatment model being tested involves brief CBT targeting pediatric anxiety and depression in primary care settings carried out in-house by master’s-level clinicians (ie, nurse practitioner, clinical social worker). Provision of mental health services in pediatric medical settings may enhance both the feasibility and dissemination of evidence-based interventions.

RECOMMENDATIONS FOR FUTURE RESEARCH

Investigation of anxiety disorders in pediatric medical settings is currently in the early stages and often features small sample sizes but would benefit from several future research directions. First and foremost, further investigation of the overall prevalence and correlates of anxiety disorders in pediatric medical settings, including specialty settings such as cardiology, gastroenterology, and EDs, is warranted to elucidate the burden associated with pediatric anxiety disorders on the health care system. This is imperative given that most children with anxiety disorders are not treated in mental health specialty settings, those seen in medical settings typically do not receive adequate mental health care, and mental health variables contribute to frequent, costly, and in some cases unnecessary health care visits. Second, future health service research efforts should make use of validated screening measures for assessment of anxiety disorders as opposed to sole reliance on chart review, as clinicians in busy clinical practices routinely miss these diagnoses. Third, screening tools appropriate for pediatric medical settings should be developed. The utility of a 5-item version of the SCARED has recently been demonstrated in pediatric primary care settings. Fourth, future research efforts should focus on designing interventions that can be deployed in-house to effectively identify and treat youths with anxiety disorders; those that do not rely on extensive, specialized training are particularly desirable. One large treatment study of anxiety disorders in adult primary care settings in which patients are given a choice of medication, computer-assisted CBT with master’s-level clinicians, or combination treatment (compared with treatment as usual) via a stepped care model has shown considerable promise. Similar treatment innovations should be developed for pediatric patients to improve access to evidence-based care for anxiety disorders.

KEY POINTS

- Anxiety disorders are common in pediatric medical settings and can be associated with significant functional impairment for the child and family.
- Pediatric anxiety disorders often feature somatic complaints such as abdominal pain, chest pain or discomfort, headaches, nausea, or vomiting.
- Pediatric anxiety disorders are often comorbid with medical conditions such as asthma and other atopic disorders.
- Particularly in the case of RAP, practitioners should consider the possibility of an anxiety disorder diagnosis if organic causes have been ruled out.
- Evidence-based treatments for anxiety disorders include CBT and/or selective serotonin-reuptake inhibitors. Combination treatment may offer the best chance of symptom resolution.
- While milder cases may be managed with encouragement and support, in the case of more severe symptoms or an unclear diagnostic picture, a referral to a specialist should be considered.

ONLINE RESOURCES

For further information, refer to the Anxiety Disorders Association of America (http://www.adaa.org), the American Academy of Child and Adolescent Psychiatry (http://www.aacap.org), and the American Academy of Pediatrics (http://www.aap.org).
REFERENCES


