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Improving Diagnostic Strategies for Pediatric Anxiety Disorders: Advice for the Clinician

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Abstract: This review aims to raise awareness about the prevalence and impact of pediatric anxiety, emphasizing the need for clinician education in primary care and mental health settings. Early detection and management of pediatric anxiety can be achieved through the development and implementation of standardized screening protocols. Our goal is to positively improve the outcomes of pediatric patients suffering from anxiety by improving the awareness and knowledge of clinicians in primary and mental health care settings. This review provides evidence-based recommendations to refine clinical approaches, ultimately contributing to healthier, more resilient future generations.

Keywords: mental health, pediatrics, youth, children, adolescent, anxiety, screening

Introduction

Anxiety disorders are some of the most commonly diagnosed mental health disorders in the adult population, with an approximate lifetime prevalence of 34%.[1] Though they are under-recognized and thus under-treated, anxiety disorders typically first appear in the pediatric timeframe. Compared to depressive disorders, anxiety disorders are more prevalent and emerge earlier.[2] The median age of onset of anxiety disorders is six, while that of depression is thirteen.[3] Anxiety disorders may occur as young as age four, although symptoms may manifest earlier.[2] The Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (DSM-5) defines the following specific anxiety disorders: generalized anxiety disorder, social anxiety disorder, separation anxiety disorder, panic disorder, agoraphobia, and specific phobia.[4]

Data suggests that the development of various anxiety disorders differs with age and developmental level. Likewise, the particular anxiety disorder(s) an individual experiences may evolve and change over time as the individual develops. The anxiety disorders most common in pediatric populations listed in order of median age of onset are specific phobia (six years of age,) separation anxiety disorder (eight years of age), social anxiety disorder (twelve years of age), generalized anxiety disorder (post-puberty,) and panic disorder (post-puberty).[2] The prevalence of anxiety disorders increases with age, and almost all anxiety disorders have a higher prevalence in females as compared to males at all ages.[2] The most common anxiety disorder among the pediatric population is social anxiety disorder, impacting roughly 9% of the post-pubertal population.[2]

Untreated pediatric anxiety can significantly interfere with functioning and increase the risk of mood and substance use disorders, academic challenges, behavioral disturbances, and suicide. Thus, early detection and effective intervention are imperative to maximize functioning and prevent these deleterious outcomes. In this review, we provide an overview of the factors contributing to the development of anxiety disorders, considerations for clinical screening and assessment of anxiety disorders in the pediatric population, common differential diagnoses, the important role of screening in the primary care setting, and the necessity of risk assessment in pediatric patients diagnosed with anxiety disorders.

The gap between theoretical knowledge and practical application by expanding clinician awareness and offering targeted education, particularly in primary care and mental health specialties. A summary of evidence-based recommendations with a brief discussion on the role of artificial intelligence and an emphasis on areas that warrant further investigation.

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Factors in the Development of Child and Adolescent Anxiety

A robust genetic link is associated with the onset of anxiety disorders in the pediatric population whose parents have been diagnosed with anxiety disorders.[5] Biological factors such as genetics and structural alterations in the frontal limbic region of the brain are believed to play a role in the development of anxiety.[6] Obtaining a family medical and mental health history provides insight into this population's genetic and biological risks. Depressive symptoms in mothers, parental stress, anxious behaviors, and poor child attachment are affiliated with anxiety in early childhood.[5] Parenting styles such as overprotectiveness can cause this population to experience fear in new and unfamiliar situations, which may precipitate an anxiety disorder.[7] Pediatric patients who experience anxiety early in life are more likely to develop chronic anxiety and other mental health disorders as they progress into adulthood.[8] Research shows that the more adverse childhood experiences (ACEs) the pediatric population experiences, the higher the risk of developing anxiety and other mental health disorders.[8] ACEs include various forms of physical, emotional, and sexual abuse, exposure to domestic violence, parental divorce, and encounters with substance abuse.[8] Additional risk factors include experiencing interpersonal or community violence, facing discrimination, being placed in foster care, or being institutionalized.[7] These adverse experiences can heighten the stress response, making pediatric patients prone to anxiety. The school environment plays a vital role in the development of anxiety through academic pressure, social isolation, bullying, and teacher expectations. All of these factors contribute to increased levels of stress and anxiety.[9] In this population, patients who have trouble making friends may be at a higher risk of developing anxiety. The constant need to perform well in school and fit in with peers can create significant stressors for this population. Additionally, high-achieving and perfectionist children may experience anxiety due to their fear of failure.[9]

Another risk factor in the development of anxiety is a sedentary lifestyle where there is no engagement in any form of exercise.[10] Statistics support that a sedentary lifestyle impairs cognitive functions, such as attention and memory, and contributes to low self-esteem.[11] The physical health consequences have an impact on the well-being of this population since obesity and chronic diseases may develop, thus contributing to anxiety and other mental health disorders.[10] Co-morbidities are common in pediatrics with anxiety disorders, including depression, attention-deficit/hyperactivity disorder (ADHD), and emotional dysregulation difficulty, especially with positive ACEs.[12] These co-morbidities can exacerbate symptoms and complicate the diagnosis and treatment of anxiety. Therefore, a comprehensive evaluation must address all underlying issues and provide appropriate treatment.

Diagnostic Criteria

Active Listening

Active listening is critical in the early identification of anxiety in this population and involves giving full attention to the patient and family, understanding their concerns, and providing appropriate feedback. In the context of diagnosing anxiety in this population, it enables healthcare providers to notice subtle hints that might indicate anxiety. For instance, a patient might talk about fearing separation from their parents, which can be a sign of separation anxiety disorder.[13] Active listening also helps build trust and rapport with the patient and family, making them feel safe and more likely to express their feelings and fears.

Clinical Assessment

A structured interview is vital to the clinical evaluation, ensuring a comprehensive assessment of the patient's mental health status. It encompasses a range of symptoms and behaviors.[13] This standardized process requires all patients to be consistently asked the same questions, providing a reliable framework for evaluation. Adhering to a fixed set of questions minimizes interviewer bias and variability.[13] Thorough and organized documentation is essential for ongoing patient care, treatment planning, and follow-up assessments. Additionally, standardized documentation helps facilitate collaboration among healthcare professionals involved in the patient's care. A structured clinical assessment includes the presenting problem (chief complaint), the history of the present illness, and past medical and psychiatric history.[14] Conducting a Mental Status Exam (MSE) is another essential component of a structured assessment.[14] Clinicians should pay close attention to reports of symptoms from both the patient and the parents, evaluating these within the broader

context of the patient's behavior and environment. The age of onset is critical, as early interventions can lead to better outcomes. Physical symptoms, such as headaches, and behavioral signs, such as isolation, can often indicate anxiety in this population.[15] For example, recurrent gastrointestinal distress occurring before school may suggest anxiety. Similarly, a pediatric patient who becomes withdrawn and isolates themselves from friends and family might be struggling with social anxiety. It is essential to rule out any medical conditions before diagnosing anxiety, as medical illnesses like thyroid dysfunction can present with similar symptoms.[16]

Gathering information about the patient's developmental milestones and any previous medical conditions contributing to anxiety symptoms is also crucial. During this process, valuable insights are gained through active listening and observing the family's and the patient's thoughts, feelings, and behaviors. The clinical evaluation and assessment should be both culturally sensitive and age-appropriate. This helps eliminate any bias clinicians may have toward ethnic groups or subpopulations. Clinicians must recognize and work to eliminate their own professional biases in the assessment and treatment of this population.

Screening Tools

While unstructured interviews provide a relaxed and non-threatening approach, they are linked to higher rates of missed diagnoses than standardized structured interviews.[7] Incorporating structured interview guides into screening may reduce potential bias during the interview. Depending on the screening tool, computerized versions can be completed by the patient before the evaluation, allowing the clinician time to review before the appointment, thus saving time. Identifying the underlying cause of their anxiety is imperative. Standardized screening tools, instruments, and questionnaires (referred to collectively as "screening tools") are essential components of the diagnostic process, offering significant support in the recognition of anxiety in the pediatric population. A few of the anxiety screening tools available to clinicians include the Screen for Child Anxiety-Related Disorders (SCARED),[17–19] the Beck Anxiety Inventory for Youth (BAI-Y),[18,19] Pediatric Symptom Checklist (PSC-17)[18,19] and the Spence Children's Anxiety Scale (SCAS)[18,19] are all specifically designed to assess a range of anxiety symptoms. One of the key advantages of these instruments is their ability to track treatment progress. They can be administered at regular intervals to monitor changes in anxiety symptoms and evaluate the effectiveness of interventions. They are instrumental in detecting co-morbid conditions or underlying factors contributing to pediatric anxiety, thereby informing the development of a comprehensive, customized treatment plan. While they do not establish a diagnosis, they are integral to the decision-making process.

Limitations of Screening Tools

In pediatric patients, evidence-based guidelines do not recommend one screening tool. However, anxiety scales should demonstrate robust internal consistency, test-retest reliability, and concurrent validity.[20] Moreover, these tools must be age-appropriate and culturally sensitive to yield accurate results underpinned by solid validation and reliability. A major limitation is the inability of these tools to capture many different cultural beliefs worldwide. The existing studies that focus on the pediatric population do not include differences in gender, sexual orientation, and ethnicity. There remains a significant gap in the research regarding the most effective screening tools for identifying anxiety disorders within this demographic. In order to achieve optimal outcomes for the pediatric population, clinicians must stay abreast of the latest research and developments in this field.

Differential Diagnosis

The clinician should consider and rule out differential diagnoses that may present with symptoms resembling those of anxiety. Included are the restlessness and focus issues typical of Attention Deficit/Hyperactivity Disorder (ADHD), insomnia and physical manifestations common in depression, the irritability and distractibility found in bipolar disorders, social withdrawal common to autism spectrum disorders, and the educational difficulties characteristic of learning disorders.[2] Likewise, substance use can precipitate anxiety. Although drug testing is not commonly part of assessing anxiety disorders, it may be advisable if substance use is suspected or reported.

Clinicians should review diagnostic lab tests such as thyroid panels, basic metabolic panels, and urinalysis to rule out medical conditions similar to those of anxiety.[7] Specific medical diagnoses with parallel symptoms include hyperthyroidism,

brain injuries, seizures, and migraines.[7] It is wise for the clinician to review the current medication list to identify any medications indicating anxiety as a side effect, such as bronchodilators, steroids, and psychiatric medications.

Primary Care

Primary care clinics serve as the frontline for identifying and addressing mental health concerns, including anxiety disorders and suicide risk in this population. Routine screening for child and adolescent anxiety disorders is critical in promoting early detection and intervention. It is supported by leading organizations such as the American Academy of Pediatrics, yet it is often overlooked or dismissed in busy primary care setting.[21] In addition to solid recommendations from leading healthcare organizations, clinicians may be surprised to learn that parents and caregivers also favor routine mental health screenings in the primary care setting. A 2023 study found that of nearly 1000 parents and caregivers across 19 countries, 93% were interested in their children receiving routine mental health screenings in primary care settings.[22] In this study, over 90% of parents/caregivers agreed that the benefits of mental health screenings at annual in-office visits included early detection of problems, early intervention, learning more about their child, having access to mental health resources, knowing what signs to watch for, the ability to accommodate and or support their child, increased ability to manage symptoms and to prevent future problems.[23]

Integrating early, initial screenings can provide valuable insight for pediatric populations. Validated screening tools can be essential starting points across significant age ranges. This could include an easily integrated screener such as the Pediatric Symptom Checklist (PSC-17) designed and validated for those ages 4–17 years old, which can help identify internalizing diagnoses like anxiety and depression.[21]

Positive scores above the screening cut-off can be more comprehensively assessed through tools that confirm a diagnosis or better formulate a management plan.[21] The use of more specific tools like the patient health questionnaire (PHQ-9) or its adapted version for adolescents ages 11–17 (PHQ-A) can aid in further evaluating depression across the pediatric setting. For the concern of suicide risk, tools like the Columbia Suicide Severity Rating Scale (C-SSRS) can help clinicians effectively refer patients to emergency settings and specialists and formulate a safety plan. Implementing such advanced screening measures allows for a more thorough understanding of the patient's condition and helps guide appropriate interventions while maintaining timeliness, which is critical in busy outpatient settings.

Integrating screening tools into electronic health records (EHRs) can help streamline the screening process, ensuring efficient documentation and follow-up. Built-in options within the EHR system can facilitate quick referrals to mental health professionals when needed or leave accessible comments about why a referral may not be indicated. This integration enhances care coordination, promotes continuity of care, and improves patient outcomes.[22]

Though there may be an initial time commitment to integrate a concrete screening system within the primary care setting, systematic screenings can improve detection rates, and more specific screenings for initial positives can reduce referral and time burdens that may come with false positives.[23,24] The primary care clinician can act as a crucial catalyst in the trajectory of a young person's overall health and physical and mental well-being by adopting a universal screening protocol in the primary care setting.

Risk Assessment

Anxiety disorders are associated with a risk of suicidal thoughts and behaviors; thus, a detailed risk assessment for suicide and self-injurious behaviors should be performed in all pediatric patients diagnosed with an anxiety disorder.[25] Pediatric patients between the ages of twelve and eighteen, 9% reported experiencing suicidal ideation, 6% made suicide attempts, panic and generalized anxiety disorder with comorbid depression carried a more significant risk.[26] Risk assessments are more comprehensive than screenings and are generally performed by a mental health care provider to assess suicide risk and the presence of imminent danger.[14]

A risk assessment should be conducted to identify environmental factors and personal attributes that may predict suicidal risk. Stress arising from the disruption of relationships and social support networks, rejection, and feelings of exclusion may stimulate suicidal urges and future attempts.[27] Loss of personal relationships and experiences of humiliation may decrease the sense of connection, which may be a precursor to thoughts of self-harm.[27] Clinicians

should administer screening tools without the parents present and should choose screening tools that are self-report and clinician-administered.[26]

The Columbia Suicide Severity Rating Scale (C-SSRS) has been validated in adolescents and may predict immediate suicidal behavior in high-risk pediatric patients.[26] This tool rates the severity of ideation and has been identified as a reliable predictor of suicide attempts. The Suicide Assessment Five-Step Evaluation and Triage (SAFE-T) is based on the American Psychiatric Association Practice Guidelines and can be administered to guide clinicians in performing a robust suicide risk assessment. A particular benefit of this screening tool is the inclusion of a pocket card guiding clinicians in which areas clinicians should ask questions, as well as the "Suicide Safe" application available for download to mobile devices.[26]

The Brief Suicide Safety Assessment (BSSA) is recommended for clinicians in a fast-paced environment and can be completed in 15 minutes. Following the patient interview, the clinician should have a session with the patient and parent. The Ask Suicide-Screening Questions (ASQ) is a suicide screening tool from the National Institute of Health and can be utilized in various settings.[26] The BSSA has a worksheet that supplements the ASQ and provides examples of conversing with the parent. The suicidal screenings are needed to identify at-risk individuals who may need tailored strategies as a method for intervention.

Diagnostic Evaluation

Two principal tools, the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5)[4] and the International Classification of Diseases (ICD)[28] are used to diagnose mental health disorders. The DSM-5, published by the American Psychiatric Association, is a standardized manual that categorizes mental health disorders based on symptom clusters, including those related to anxiety.[4] The ICD, the other hand, is a global health information standard for mortality and morbidity statistics, including mental health conditions, managed by the World Health Organization (WHO).[28] Both manuals provide the diagnostic criteria and have their classification system. However, they vary slightly in the classification of anxiety disorders. Understanding these differences is critical for clinicians working with diverse populations and in different regions of the world. For a diagnosis of a generalized anxiety disorder, both the DSM-5 and ICD require that symptoms be present for a certain period and cause significant impairment in their social, academic, and home life, as well as other critical areas of functioning.[4,28] Clinicians use clinical interviews (active listening, observations, and standardized assessments) to gather information about symptoms' nature, frequency, and severity. When using the DSM-5,[4] practitioners follow a structured process that includes assessing the presence of symptoms aligned with those listed for specific anxiety disorders.

There are multiple subclassifications of anxiety disorders, such as Separation Anxiety Disorder and Social Anxiety Disorder, not including specific phobias and panic disorder.[4] The DSM-5 provides explicit criteria, including symptom lists, duration, and notes on exclusionary criteria, such as stipulating that the symptoms are not attributable to substance use or another medical condition.[4] The ICD takes a slightly more general approach, offering broader categories for anxiety disorders that emphasize symptomatology and duration without the extensive exclusion criteria found in the DSM-5.[4,28] Its use is more common in healthcare systems outside the United States and for international epidemiological research.

Additionally, screening tools, self-report measures, rating scales, collection of history, and the clinician's understanding of the clinical development and progression of anxiety disorders are used to diagnose effectively.[28] The interview should be developmentally appropriate and include the parent/guardian, individually or together. Clinicians should be aware of the more commonly observed symptoms in pediatric patients with anxiety, including abdominal pain, fear, excessive worry, avoidance of school or reluctance to attend other activities, tantrums, avoidance, and low self-esteem. [7]

Evidenced Based Recommendations

The recommended age at which routine screening for anxiety disorders should begin in pediatric populations varies depending on the source, but both the United States Preventive Services Task Force (USPSTF) and the American Academy of Pediatrics recommend routine screening throughout childhood.[7,26] The recommendation from the United States Preventive Services Task Force (USPSTF) is to screen for anxiety in pediatrics as young as age eight who do not

already have a diagnosed anxiety disorder or exhibit typical signs or symptoms.[7] The latest guidelines the American Academy of Pediatrics recommend that all children aged eleven and older undergo routine screenings for anxiety disorders during their annual health assessments.[14] While evidence-based guidelines provide a foundation for screening and managing pediatric anxiety disorders, clinicians must account for cultural and regional variations when applying these guidelines. Understanding how anxiety symptoms might manifest differently across various cultures is essential for effective diagnosis and treatment. The most successful strategies for treating childhood anxiety typically involve a collaborative effort that includes the patient, their family, and both primary care and mental health professionals. This comprehensive approach addresses all facets of a child's life affected by anxiety and fosters sustained improvement in managing symptoms.

The Use of Artificial Intelligence in the Practice Setting

The healthcare landscape is rapidly changing with the introduction of Artificial Intelligence (AI). While AI can serve as a resource, limitations and cautions are not lost in the care of patients, particularly in the psychiatric setting, where relationship building, trust, and empathy are pillars of care delivery. If used, AI should be in combination with trained, skilled clinicians, particularly in the care of pediatric populations at risk of severe or complex mental health diagnoses or suicidality.

Clinicians may find AI helpful with adjunct components of care such as increasing management adherence in pediatric cases through AI gamification, AI-based automated appointment or medication reminders, and as a predictive modeling clinical tool that could support a clinician's initial diagnosis or rule in or out differential diagnoses.[29] Interest could also peak for clinicians working to manage pediatric anxiety and depression in conjunction with combined pharmacologic and therapeutic measures. AI-based tools such as chatbots and AI robots could help reduce anxiety in pediatric patients through distraction. A case example in Japan looked at how an AI robot, "Aibo", could reduce anxiety around painful procedures and found that the intervention group that used Aibo could reduce their distress and return to a calmer state faster than the control group.[23] The case could be made for using AI robots in conjunction with therapy to help improve social skills and communication, reduce stress, and return calm when discussing or experiencing complex topics and feelings. There is also a window of opportunity for AI to help understand an individual's risk factors that may increase the likelihood of mental illness. Utilizing AI to develop improved screening tools across populations, creating risk models to aid in individual predisposition, and analyzing data subsets to bring awareness to patterns across populations would be welcomed avenues to explore pediatric mental health nationally and globally.[29]

AI tools, robots, and chatbots will undoubtedly continue to improve in symbiosis with healthcare researchers and providers. Clinicians should be aware the use of AI is not based on evidence, and it is a new technology. The ethics of this technology must be taken into consideration since it has the potential to be misused in patient care. One example would be the use of gaming for anxiety where it increases the patients symptoms instead of improving them. However, it is recommended that the current use of these tools remain a supplement to clinician assessment, diagnosis, and management.

Conclusion

Anxiety disorders are prevalent in the pediatric population and, if left untreated, can result in lifelong negative consequences and impaired functioning well into adulthood. The USPSTF and the American Academy of Pediatrics agree that routine screening for anxiety disorders should occur throughout childhood.[16] However, there is a need for more comprehensive studies is underscored by the growing recognition of anxiety disorders' impact on children worldwide.[30] Further screening and risk assessment are indicated in youth diagnosed with anxiety disorders due to the increased risk of suicide in this population.[26,31] Early detection and effective intervention for youth with anxiety disorders can lead to improved outcomes in both the short and long term. By investing in these areas, the research community can make significant strides toward reducing the burden of anxiety disorders in the pediatric population, fostering healthier, more resilient futures. The time for action is now—our youth cannot afford to wait.

Abbreviations

DSM-5, area under the curve; LS, least squares.

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