REVIEW

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A pediatrician-friendly review of three common behavioral health screeners in pediatric practice: Findings and recommendations

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ABSTRACT
Behavioral health concerns are surging in pediatric practices. Fortunately, integrated behavioral/medical health clinics are growing and child psychiatrists/psychologists are increasingly embedded in these care settings to help shoulder the clinical load. Routine screening of behavioral health problems in primary care facilities enables early identification and treatment. However, deciding on sound, efficient, and scalable screening measures is sometimes arduous. Accordingly, this article presents a clinician-friendly review of three common instruments useful in screening pediatric behavioral health concerns including anxiety, depression, and conduct problems. Psychometric findings and clinical applications of the Pediatric Symptom Checklist-17 (PSC-17), the Patient Health Questionnaire-9 (PHQ-9), and the Screen for Child Anxiety Related Emotional Disorders (SCARED) are delineated. Finally, clinical implications and recommendations for practicing pediatricians and child psychiatrists are offered.

KEYWORDS
Pediatricians, Behavioral health, Screeners

Introduction

The prevalence rates of anxiety, depression, and conduct problems in young patients is alarming. Recent reports indicate that approximately 7% of young people are diagnosed with either anxiety disorders or conduct problems as well as an additional 3% who are experiencing depression.[1] Research shows that approximately 90% of children visit a pediatrician in any given year.[2] Pediatricians serve at the front-line in identifying and treating behavioral health concerns in young patients.[2-5] Most children with behavioral, developmental, and emotional problems are spotted first by pediatricians.[6] Almost 50% of all pediatric outpatient visits involve a behavioral health concern.[7]

Pediatricians juggle a variety of clinical responsibilities such as evaluating overall physical health, growth and development as well as mental health.[8] Indeed, pediatricians clearly recognize their responsibility for identifying and treating mental health concerns in their patients.[9] Consequently, the high prevalence of behavioral health concerns compel the need for effective and efficient screening instruments.[10] Integrated pediatric behavioral health care likely will facilitate screening efforts.

Integrated pediatric behavioral health care aligns well

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with the Triple Aim in health care.[11] Integrated Primary and Behavioral Health Care (IPBHC) settings emphasize a focus on team-based delivery of care, population health, and stepped care paradigms.[12-15] Integrated medical-behavioral health care practices are associated with a number of propitious results including better access, decreased stigma, patient satisfaction and clinical outcomes.[13-15] Child psychiatrists are increasingly working in integrated general and specialty care pediatric clinics.[14,15]

Regular screening of behavioral health problems in primary care clinics facilitates early identification, access to services, and proper intervention.[14,16-20] Clearly, this practice facilitates early identification, better access to services, and proper intervention.[14,16,17] Additionally, screening measures enable young patients and their families to easily report troubling concerns and monitor their own progress.[19] Continuous quality improvement is also fostered by routine screening for and tracking symptoms.[19-22] Moreover, clinicians' decision making is enhanced by measurement based care.[21,23] Using psychometrically sound self-reports are time efficient without losing clinical sensitivity and accuracy.[21] In particular, the Pediatric Symptom Checklist-17 (PSC-17),[24,25] Patient Health Questionnaire-9 (PHQ-9),[26] and the Screen for Child Anxiety Related Emotional Disorders (SCARED)[27,28] are very promising screening instruments.[3,13] Accordingly, this article presents a pediatrician-friendly review of these common measures useful for screening behavioral health concerns in pediatric patients.

There are a number of behavioral health screeners available for use with children and adolescents.[29-31] A compendium of these measures is beyond the scope of this pediatrician-friendly analysis, but a comprehensive review is available elsewhere.[29-32] Consequently, the present work focuses on the PSC-17, PHQ-9, and SCARED for several reasons. First, all three measures are reviewed and recommended in previous large scale authoritative scholarly articles.[33-36] Second, they all possess sound psychometric properties.[16,26,37-43] Third, the measures are brief, free, and readily available on-line. Fourth, they are easy to complete, score, and interpret. Fifth, each screener is translated into multiple languages. Finally and perhaps most germane to this article, all three screeners are applicable to pediatric settings.[16,24,25,34-38,44-49]

In the following sections, the PSC-17, PHQ-9, and SCARED are discussed. Each instrument's psychometric properties and clinical applications are addressed. Cut-off points for each screener's total scores and separate factors are included in Table 1. The article concludes with actionable recommendations for practicing clinicians.

TABLE 1 Total score and factor score cut-off for the PSC-17, PHQ-9, and SCARED

Scale	Total score cut-offs	Factor score cut-offs
PSC-17	>15	Internalizing >5 Externalizing >7 Attention > 7
PHQ-9	None = 0–4 Mild = 5–9 Moderate = 10–14 Moderately Severe =15–19 Severe = 20–27	
SCARED	>25	Panic/Somatic >7 Generalized anxiety >9 Social anxiety >8 Separation anxiety >5 School avoidance >3

PSC-17, Pediatric Symptom Checklist-17; PHQ-9, Patient Health Questionnaire-9; SCARED, Screen for Child Anxiety Related Emotional Disorders.

PSC-17

The PSC-17 is broad-band screener for behavioral health problems developed specifically for use in pediatric settings.[24,25] Accordingly, the measure assesses several common clinical domains including internalizing (e.g. anxiety, depression, etc.), externalizing (e.g. behavior/conduct), and attention problems. The scale is appropriate for children ages 4–18 years and takes approximately 3–5 minutes for parents/caretakers to complete.[9] Caretakers indicate the frequency of specific behaviors by circling never (0), sometimes (1), and often (2) on the form.

Internal consistency is traditionally measured by Cronbach's alpha. In a large national sample of over 80 000 patients, the PSC-17 yielded a robust alpha coefficient of 0.89.[37] Utilizing an 84 patient subset who completed a second PSC-17 from their large data base, an inter-class correlation coefficient of 0.85 emerged. Thus, the PSC-17 appears to enjoy adequate reliability. A recent investigation examining the PSC-17 in 267 young patients supported the use of the PSC-17 as a behavioral health screener in the primary care setting. Diagnostic classification was excellent as demonstrated by the Receiver Operating Characteristic of 0.90.[38]

Various authors[16,37] report solid findings for the three factor model (Internalizing, Externalizing, Attention). A factor analysis study completed on 983 pediatric primary care patients indicated considerable support for the model (Goodness of Fit Index [GFI] = 0.94, Comparative Fit Index [CFI] = 0.95).[16] Additionally, use of the three factors also seems to facilitate treatment monitoring and quality assurance initiative.[16]

In sum, the PSC-17 is well-supported for use in pediatric primary care.[16,24,25,37,44,45] The measure has been successfully deployed with pediatric patients diagnosed

with various co-morbid medical conditions. For example, the relationship between asthma and behavioral health problems were examined in a pediatric primary care setting.[45] Twenty-one percent of these patients showed a positive PSC-17 screen with males and older youth tending to score higher on the PSC-17.[45]

PHQ-9

In 2009, the Academy of Pediatrics recommended universal depression screening for young patients ages 12–18 years old.[33,46-48] The PHQ-9 is a short 9-item screening tool that can be used in both primary care and pediatric hospital settings for detecting depressive symptomology in adolescents.[26,34,35,49] The brief screener takes about 5 to 10 minutes to complete and it assesses the presence as well as the severity of depressive symptoms. The nine items present symptoms of depression and ask how often young patients experience the symptom (e.g. not at all, more than half of the days, or nearly every day). The score ranges from 0–27 points. Importantly, item 9 assesses suicidality.

The PHQ-9 was evaluated through the Adolescent Health Study.[26] A random selection of 4000 adolescent enrollees in a non-profit healthcare organization serving Washington and Idaho was included. The authors reported that when comparing the PHQ-9 to a structured diagnostic interview, there was high sensitivity (89.5%) and good specificity (78.8%) for detecting major depression. The PHQ-9 demonstrated good test-retest reliability (0.75–0.83) and internal consistency (0.86–0.92).[39] When comparing the PHQ-9 to adult and adolescent populations, the PHQ-9 is highly sensitive so there is less likelihood to miss youth with depression, but the lower specificity means more higher false-positive rates may be generated. Additionally, the PHQ-9 was related to functional impairment indices supporting its construct validity.[26]

A cut-point of 11 or higher is recommended to indicate the need for further evaluation.[26,40] This cut-off score yields a specificity score of 77.5% and a sensitivity score of 89.5%.[40] Compared to the cut-point of 10 for adults, 11 or higher in adolescents reduced the false positive rates, but the adult cut-point could also be utilized for adolescents to ease implementation among providers.[26] The 11 point cut-off appears to balance sensitivity and conservative estimation of illness.[40]

In regards to specific pediatric populations, the PHQ shows promise in identifying depression in adolescent patients diagnosed with Type 1 diabetes.[50] Further, in a study encompassing primary and specialty care clinics, 80% of patients eventually diagnosed with depressive disorders recorded moderate to high scores on the PHQ-9 screener.[51] Screening initiatives employing the PHQ-9 led to an increase in the identification of depressed adolescents, especially when administered in pediatric and primary care settings.[34,35] The health records of 44 342 adolescent visits to primary and mental health care in a large health maintenance organization showed a 14-fold increase in pediatric patients screened with the PHQ-9.[34]

SCARED

The SCARED[27,28] is a 41 item narrow-band measure specifically tapping symptoms of anxiety. The scale yields a total score as well as five factors (panic/somatic, generalized anxiety, social anxiety, separation anxiety, and school refusal scores). The SCARED is translated into ten languages and aligns nicely with the Diagnostic and Statistical Manual of Mental Disorders (DSM) criteria.[41] Additionally, it is widely available and free of charge (https://www.pediatricbipolar.pitt.edu/resources/instruments). The measure is commonly used in pediatric settings.[36,52-57] Finally, a recent 5 item SCARED is now available and is particularly well-suited to the pediatric primary care setting.[58,59] Further, the instrument's brevity, breath, accessibility, and free cost further recommends its use.[41,60] The scale's responsiveness to behavioral intervention is also seen as advantageous.[42]

A comprehensive meta-analysis reported aggregated Cronbach alphas for both parent (0.93) and child report (0.91) versions indicating excellent internal consistency.[41] Further, the measure performed similarly (0.92) with a group of patients diagnosed with CVS.[60] Aggregated test-retest estimates were also quite good (0.83).[41] In a large scale study, both SCARED Total (Parent report = 0.86; Child report = 0.62) and Factor scores (Social-Parent = 0.85, Social-Child = 0.60; generalized anxiety disorder [GAD]-Parent = 0.85, GAD-Child = 0.62; society anxiety disorder [SAD]-Parent = 0.85, SAD-Child = 0.59; Panic-Parent = 0.74, Panic-Child = 0.61; SchoolRef-Parent = 0.79, SchoolRef-Child = 0.60) showed strong test-retest reliability.[43] Solid parent-child agreement was also reported in a recent meta-analysis.[41] The largest report to date concluded that the SCARED enjoys sound validity metrics.[43]

In a major study with children diagnosed with chronic pain, identification of a subthreshold anxious group by the SCARED yielded clinically compelling results.[42] They found that the conventional cut-off score (25 or greater) identified approximately 33% to 47% of patients who may be vulnerable to anxiety. However, distinguishing subclinical patients in the 13–24 point range was also valuable. Remaining alert to these "worriers" catalyzes a more sophisticated treatment approach. The study's authors[42] noted that even modest levels of anxiety exacerbated pediatric pain conditions and needed to be addressed.

Scores on the SCARED were significantly negatively correlated with reports of health-related quality of life ratings in pediatric patients diagnosed with cyclic vomiting syndrome (CVS).[60] Higher anxiety scores were linked

with lower quality of life ratings and it was concluded that selective heightened attention to interoceptive cues exacerbates gastrointestinal distress. The five factor structure was supported in a chronic pediatric pain sample (SCARED-Child CFI = 0.99, SCARED-Parent CFI = 0.98).[53] Finally, the SCARED scores were more aligned with internalizing than externalizing problems.[53]

Clinical recommendations

This section summarizes some salient findings, offers actionable clinical recommendations, and suggestions for the future. The PSC-17, PHQ-9, and SCARED all possess psychometric properties that are promising. These positive qualities notwithstanding, they also have flaws. No screener is perfect. Nonetheless, using screening measures supports measurement-based care and clinical accountability. The PHQ-9, SCARED, and PSC-17 form a foundation upon which various clinical algorithms can be built.[9]

It is important to note that behavioral health screeners commonly yield false positives.[38] "The purpose of a screener is as an "initial gate" into additional clinical inquiry or assessment. The initial gate is more inclusive and additional clinical assessment is more selective.[38]" Over-diagnosis may produce a resultant burden on pediatric health care systems.[3,61] However, a recent report from an integrated pediatric primary care system described an interesting algorithm which could mitigate this caveat.[62] Patients who presented with a negative screen (< 5) were checked for stress levels, social problems, deteriorating school performance, mood changes, and disrupted routines. Patients with scores in the mild range were evaluated for physical illness and stressors as well as given counseling about sleep habits, diet, and stress management. For patients who responded positively to the suicidal item or had scores in the moderate, moderately severe, or severe range, referral to the Consultation, Liaison in Mental and Behavioral Health (CLIMB) team was initiated along with monitoring of possible physical illnesses and psychiatric symptoms. Additionally, risk assessments were conducted. Not surprisingly, patients with higher scores were seen more frequently. This approach triaged patients into appropriate stepped care levels.

Not surprisingly, building a clinical infrastructure for behavioral health screening is an imperative. However, currently little evidence exists that pediatric primary care staff are trained to administer, score, and interpret measures.[63] Nonetheless, addressing behavioral health care concerns represents an additional workload burden for pediatricians. Patients who present with behavioral health care problems require 2.5 times longer appointments than patients without such complaints.[64] Consequently, many pediatricians feel ill-equipped to care for these patients.[7,10] Integrating pediatric primary care offices with behavioral health care services and professionals represents a potential solution.

Routine clinical pathways are fostered by measurement-based care and the use of screening measures.[65] The "Black Box warnings" urge monitoring potential eruption of suicidal ideation in patients with newly prescribed SSRIs.[33] A behavioral health provider who is integrated into pediatric care settings can easily follow-up with patients by tracking their symptoms and suicidal ideation. Further, IPBHC clinics offer "one-stop shopping' treatment options for patients where behavioral health concerns are addressed in the same settings as physical health complaints.[12]

Regrettably, receiving behavioral health care services for psychiatric complaints remains stigmatizing for many young patients and their families. However, obtaining treatment for these complaints in familiar pediatric health settings is destigmatizing.[10,66,67] Patients can be readily identified by others as needing psychiatric care in specialty behavioral health/mental health clinics. Fortunately, this is not the case in an integrated pediatric setting. Furthermore, a common problem after identifying behavioral health concerns in young patients is referral and follow-up appointments. Integrating in-house behavioral health clinicians mitigates this obstacle to continuity of care. Patients and providers enjoy better access and more consistent follow-through when services are integrated.[10,66]

The COVID-19 peri- and post-pandemic period is expected to create a surge in pediatric patients presenting with behavioral health concerns. Consequently, pediatricians working both in primary and specialty care clinics will need to identify, triage, treat, and/or refer patients to appropriate care services. Brief, low cost, and reliable screeners can help pediatricians recognize, intervene, surveil symptoms, and track progress.

In the United States, the Early and Periodic Screening, Diagnostic, and Treatment (EPSDT) statute compels prevention and early intervention efforts. All states are require pediatricians to offer behavioral health screening, but 2003 data revealed that 46% of US States had no recommended screening policy or recommendations.[68] In Massachusetts, financial incentives (e.g. $10.00 US Dollars for a screener, and $25.00 for follow-ups on screeners) facilitated greater compliance with the mandate and resulted in increased training efforts.[68] The higher screening rates yielded greater numbers of young patients being newly identified as at risk for behavioral health conditions.[69] Most importantly, many of these patients were from traditionally under-served and marginalized populations.

Fortunately, the increasing use of screeners in pediatric primary and specialty care clinics is accompanied by favorable perceptions by patients and their caregivers.[70] Young patients and their families view screeners positively if they are directly related to their treatment. Moreover,

patients think screeners can help them discuss sensitive behavioral health concerns with their clinician. Finally, families see screeners as effective ways to link them with necessary behavioral health services.

Behavioral health screening in pediatric clinics provides added opportunities for collaboration between pediatricians, psychiatrists, psychologists, and other behavioral health clinicians.[2] Indeed, these high rates of co-morbidities between common pediatric medical conditions such as headache, gastro-intestinal disorders, asthma, and diabetes with anxiety, depression as well as behavioral problems make collaborations imperative.[71] Increased clinical partnerships can facilitate much needed prevention and early intervention efforts.

The rise of integrated pediatric care settings can promote further development of these behavioral health screeners. Future research could focus on providers' and patients' perceptions of the utility and effectiveness of these tools. Continuing investigations could also study the instruments' value in identifying at-risk populations. Moreover, including more diverse and traditionally marginalized populations in the research is a crucial strategy. In this way, measurement-based care could better serve equity and reduce disparities.

Conclusion

Pediatric primary care offices undeniably represent front-line clinical services for pediatric behavioral health problems. Historically, a large proportion of a pediatrician's daily caseload includes young patients with emotional and behavioral concerns. Currently, the COVID-19 pandemic is expected to accelerate a profound surge in psychiatric complaints in young patients. Pediatricians and child psychiatrists working in integrated settings will be tasked with caring for a skyrocketing number of patients. Behavioral health screeners enhance pediatricians' capacity to care for patient.[68] Accordingly, effective and reliable screening tools are imperative.

This pediatrician-friendly review of behavioral health measures is designed to propel routine emotional and behavioral screening processes. The PSC-17, PHQ-9, and SCARED are all psychometrically sound, accessible, easily administered, completed quickly, and scored simply. Moreover, they are helpful in treatment planning and outcome monitoring. In conclusion, pediatricians and child psychiatrists are encouraged to consider their applications in various clinical contexts.

CONFLICT OF INTEREST

None.

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