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Screening for Depression in Pediatric Primary Care

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Abstract
Purpose of Review To review the clinical practice guideline landscape for depression screening in pediatric primary care and to identify current gaps in knowledge.
Recent Findings Various organizations have recommendations that support screening for depression in pediatric primary care, although some differ based on the age of the child. To date, guidelines have been made based on indirect evidence of efficacy. For example, indirect evidence shows that several screening tools exist for use in primary care, and various primary care-administered or referred treatments for childhood depression have some evidence of efficacy (particularly among adolescents). In addition to determining the applicability of this evidence to younger children, more research is needed on the direct net benefits of screening and to identify factors that facilitate its effective implementation.
Summary Indirect evidence supports the benefits of screening for depression in pediatric primary care; most organizations that publish screening guidelines recommend its use.

Keywords Depression · Screening · Preventative care · Children · Adolescents · Primary care

Introduction

Childhood depression is a significant public health problem. The prevalence of childhood depression increases throughout child development, from about 3% prior to age 13 [1] to about 8% during adolescence [2, 3]. The associated burden of depression is high during childhood, with high rates of recurrence and elevated risk of suicide, poor social and school functioning, relationship problems, obesity, and comorbid mental health problems that can last throughout the lifespan [3–5]. Despite evidence that there are several effective treatments for depression, only 40.9% of adolescents with major depression in 2016 received depression treatment [3].

The potential long-term emotional, social, and economic burden underscores the critical need for depression screening to ensure timely identification, subsequent diagnosis, and treatment engagement. A recent study found that adolescents who screen positive for even mild levels of depression have increased healthcare utilization and costs in the 12 months post-screening [6•]. Primary care providers are in an important position to screen and help identify depression among their pediatric patients. In addition to establishing long-standing relationships with their patients, primary care providers may be able to gather additional information about their patients' mental health functioning by querying their caregivers who accompany them to their appointments. Primary care providers also may be able to detect depression at its early stages by following up on complaints frequently stated as presenting problems in primary care (for example, patients may experience frequent physical complaints). Depressed children and adolescents commonly present with problems with school performance or attendance, increased outburst and frequent arguments or fighting, unexplained medical or somatic symptoms, substance abuse, withdrawal from friends and family, self-injury, and suicidal thoughts or behaviors.

Studies have continued to identify some correlates and risk factors that make the creation and administration of targeted depression programs more effective (see Table 1). In recent years, however, various organizations charged with child mental health have recommended universal screening of depression as well. In general, these recommendations assert that

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Table 1 Risk factors/correlates of child and adolescent depression

Prior history of depression or suicidality
Current or prior mental health problems (e.g., anxiety, substance use problems)
Chronic health problems (asthma, diabetes, epilepsy)
Exposure to adverse life events, loss, trauma, or maltreatment
Medications
Female gender
Older age
Family history of depression, suicidality, or other mental and substance use problems
Family or peer relationship problems
Negative cognition/attributional style

the benefits of screening all pediatric patients outweigh the potential harms of screening those even without known characteristics that place them at high risk for developing depression, at least when systems are in place to provide adequate follow-up assessment and care. To date, guidelines have been made based on systematic review findings that generally have focused on indirect evidence of efficacy because of the lack of studies that have directly examined the outcomes of screening interventions. Indirect evidence has primarily resulted from determining if screening tools to identify children with depression exist, and whether children who screen positive can receive proper follow-up assessment and treatment deemed to be efficacious.

A number of feasible screening tools for use in pediatric primary care settings exist (see Table 2 for those most commonly used, all freely accessible except where otherwise noted). Providers are encouraged to select and use the tool that best suits the culture of their practices. In addition to several types of screening tools that can be administered, several types of interventions can be delivered within or referred out of primary care settings have proven efficacy with little associated harms [24]. Although it has been reported that primary care providers generally believe that screening for depression is accepted by patients and parents alike [25], they report lack of training and confidence in depression assessment and management, time during appointments, lack of comprehensive systems that allow referral of patients identified as possibly having depression for follow-up care, and the Food and Drug Administration (FDA)'s black box warning issued in 2004 about potential increased suicidality as a result of the use of selective serotonin reuptake inhibitor (SSRI) antidepressants among youth, as barriers to screening and subsequent management [26]. These factors inhibit widespread adoption and implementation of screening for depression [27].

As a consequence, critically important chances to identify and initiate depression treatment are often missed [28••, 29]. As such, several organizations have made recommendations regarding various types of screening for childhood depression, including those applicable to primary care settings, and several corresponding quality improvement processes for implementation have been initiated [30••]. The purpose of this review is to present a summary of key clinical practice guidelines for screening for depression in pediatric primary care (with more recent guidelines summarized first) and to identify current gaps in knowledge.

Current Recommendations

Several organizations publish recommendations specifically regarding pediatric depression in primary care. A few of the most widely used guidelines that present specific recommendations regarding screening are presented herein.

2018 Guidelines for Adolescent Depression in Primary Care (GLAD-PC) [31••, 32••]

Overview and Content The GLAD-PC guidelines include recommendations for the primary care identification and additional care of youth with depression. First published in 2007, an update was published in 2018. Endorsed by the American Academy of Pediatrics, the guideline focused on five topic areas: (1) identification and assessment, (2) initial management, (3) safety planning (preparation for suicidal ideation and behaviors), (4) treatment, and (5) ongoing management of youth depression, with an additional review focused on practice preparation for treating pediatric depression in primacy care. An accompanying tool kit is intended to help inform and guide primary care providers who want to improve the identification, assessment, and treatment of pediatric depression in their practices.

Basis of Guidelines Guidelines were created following a series of systematic reviews of the available research on depression among children and young adults aged 10 to 21, consensus from expert researchers and clinicians from the USA and Canada (including American Academy of Pediatrics [AAP] and the Canadian Pediatric Society and other psychiatric associations from both countries), and input from youth and families with lived experience.

Population The guidelines focus on major depressive disorder (MDD), although authors mention that the recommendations can be applied to other types of depression such as persistent depressive disorder (PDD) and premenstrual dysphoric disorder as well. In addition, some parts of the recommendations differ for those with mild, moderate, and severe forms of MDD.

Screening Recommendations The GLAD-PC guidelines endorse universal primary care screening for depression in children aged 12 and older. Although the guidelines conclude that

Table 2 Screening tools for depression among children and adolescents

Screening Tool	Number of items	Time to complete	Appropriate ages	Sensitivity/ specificity
Beck Depression Inventory (BDI)*$ [7]	21	5–10 min	14 years and older	Sensitivity: 84.0% Specificity: 81.0%
Center for Epidemiological Studies Depression Scale (CES-D)* [8, 9]	20	5–10 min	14 years and older	Sensitivity: 84.0% Specificity: 75.0%
Center for Epidemiological Studies Depression Scale for Children (CES-DC) [10, 11]	20	5–10 min	12–18 years	Sensitivity: 85.2% Specificity: 75.6%
Children's Depression Inventory-Short Version (CDI:S) $ [12, 13]	10	5 min	7–17 years	Sensitivity: 93.3% Specificity: 70.7%
Children' s Depression Screener (ChilD-S) [14]	22	5–10 min	9–12 years	Sensitivity: 91.0% Specificity: 89.0%
Depression Screener for Teenagers (DesTeen) [15]	13	5 min	13–16 years	Sensitivity: 90.0% Specificity: 80.0%
Mood and Feelings Questionnaire (MFQ)# [16]	13	5 min	8–18 years	Sensitivity: 78.0% Specificity: 78.0%
Patient Health Questionnaire-Adolescent Version (PHQ-2) [15]	2	5 min	12–18 years	Sensitivity: 89.5% Specificity: 77.5%
Patient Health Questionnaire-Adolescent Version (PHQ-A) [17]	9	2–10 min	12–18 years	Sensitivity: 89.5% Specificity: 77.5%
Pediatric Symptom Checklist briefer parent and youth forms (PSC-17) [18]	17ccr	5–10 min	11–18 years	Sensitivity: 85.0% Specificity: 88.0%
Pediatric Symptom Checklist Original (PSC) [19]	35	5–10 min	6–18 years	Sensitivity: 95.0% Specificity: 68.0%
Pediatric Symptom Checklist Youth Self-Report (PSC-Y) [20]	35	5–10 min	11–18 years	Sensitivity: 94.0% Specificity: 88.0%
Reynolds Adolescent Depression Scale-Second Edition (RADS-2) $ [21]	30	5–10 min	11–18 years	Sensitivity: 84.0% Specificity: 92.0%
Reynolds Child Depression Scale (RCDS) $ [22]	30	5–10 min	7–13 years	Sensitivity: 73.0% Specificity: 97.0%

Reprinted from Forman-Hoffman et al. 2016 [23••]

* Newer versions have replaced these instruments that currently are more frequently used in child and adolescent samples

Free to use, with permission (information available at http://devepi.duhs.duke.edu/mfq.html)

$ Payment required to use screener

there is not enough evidence to recommend one screening tool over another, they recommend that an appropriate screening tool be used as part of routine wellness visits for this patient population. In addition, the guidelines call for pediatricians to be especially vigilant for signs of depression among their teen patients with known risk factors (e.g., those with a family history of depression, substance use, or traumatic life events).

In addition to providing recommendations for clinicians to use, the GLAD-PC guidelines underscore the critical need to adequately prepare the practice or clinic to implement the screening, assessment, suicidality assessment and creation of a safety plan, initial management, and treatment, referral to specialty care as needed, or ongoing monitoring activities. They recommend training personnel and ensuring community partnerships are in place before implementing additional parts of the initiative.

Other Recommendations The guidelines also include details on the assessment, initial management, safety planning, treatment, and ongoing management of youth depression. The guidelines recommend the use of a standardized depression tool for assessment of depression according to DSM or ICD criteria and interviewing both the youth (alone) as well as families/ caregiver(s) about symptoms and functional impairment across different domains. The review determined a paucity of information from RCTs about the efficacy of initial management strategies but recommend educating and counseling patients and families about treatment options, discussing confidentiality standards, and developing an initial treatment plan. Although the authors note a paucity of RCTs evaluating the benefits and harms of creating safety plans in the case of associated suicidality with the incident depression, the guidelines recommend removal of lethal means of suicide from the home (e.g.,

firearms), teaching family members how to monitor for risk factors of suicide, engaging a concerned third party, and providing the youth with an emergency communication plan to use in the event of become actively suicidal. Treatment recommendations for youth identified as having mild levels of depression are to provide active support and monitoring for 6 to 8 weeks. Primary care providers are recommended to refer youth with moderate to severe depression, those with mild depression who do not improve with initial active support and monitoring, and those with comorbid issues such as substance use disorders to a mental health specialist. The guideline advocates for the use of psychotherapies (such as cognitive behavioral therapy [CBT] or interpersonal therapy [IPT]), selective serotonin reuptake inhibitors (SSRIs), or both.

Bottom Line

- The guideline was the first major guideline to recommend universal screening for depression among those aged 12 and over and to be extra vigilant when encountering a teen patient with known risk factors. The guideline incorporates recommendation to prepare the practice or clinic for implementation of guideline.
- The guideline includes a recommendation to assess suicidality and establish a safety plan among those who screen positive.

2016 US Preventive Services Task Force (USPSTF) [33••, 34••]

Overview and Content In 2016, the USPSTF, an independent, volunteer group of national prevention and evidence-based medicine experts, updated its guidelines for screening for MDD in primary care settings.

Basis of Guideline The recommendation made by members of the USPSTF was done by consensus after reviewing the evidence base from a systematic review and strength of evidence grading of included studies.

Population The guidelines focus on screening for major depressive disorder among children and adolescents in primary care settings.

Screening Recommendations In the absence of any studies that met inclusion criteria that directly tested the effects of screening on patient outcomes, the Task Force recommended screening for MDD when adequate resources are in place to ensure accurate diagnosis, effective treatment, and appropriate follow-up for adolescents aged 12 or older (Grade B). That is, the Task Force determined that sufficient indirect evidence existed for accurate screening instruments feasible for use in primary care settings and that efficacious treatments do exist that can be administered or accessed via a referral from primary care setting for adolescents aged 12 and older. For children younger than 12 years, however, the evidence was not as robust, which precluded the Task Force from making a formal recommendation for this age group receiving pediatric primary care.

Other Recommendations The systematic review completed to guide the recommendation evaluated several accuracy studies of potential MDD screeners as well as the efficacy of different treatments feasible for use in primary care of referable from primary care. Findings indicated that several accurate screening tools for MDD exist for adolescents aged 12 and older that are feasible for use in primary care settings. The systematic review completed to guide the recommendations identified several types of psychological (e.g., CBT), pharmacotherapy (e.g., SSRIs) and collaborative care efficacious interventions for adolescents with MDD with no evidence of associated harms. Several types of intervention trials also met the inclusion criteria for the evidence review, with some efficacy in patient-level outcomes (e.g., decrease in depressive symptoms, remission, loss of MDD diagnosis) demonstrated among intervention groups randomized to fluoxetine, fluoxetine plus cognitive behavioral therapy (CBT), escitalopram, and collaborative care (as compared to placebo or usual care groups), with no evidence of associated harms.

Bottom Line

- The task force recommended screening for MDD among adolescents in primary care when adequate systems are in place after weighing benefits and harms of available treatments and reliability and feasibility of screening tools (Grade B—high certainty that net benefit is moderate or moderate certainty that net benefit is moderate to substantial)
- The task force found insufficient evidence to make a recommendation about screening for MDD among younger primary care patients (Grade I—current evidence is insufficient to assess the balance of benefits and harms of the service; evidence is lacking, or poor quality, or conflicting, and balance of benefits and harms cannot be determined)
- No direct evidence exists from clinical trials testing the impact of screening for MDD in primary care on patient outcomes.

2015 National Institute for Health and Care Excellence (NICE) [35••]

Overview and Content The National Institute for Health and Care Excellence is an independent public body of the UK's

Department of Health that provides guidance and advice to improve health and social care. NICE published a guidance summary for the diagnosis and management of depression in children and young people in 2015.

Basis of the Guideline The guidance summary was made after conducting systematic reviews of best available evidence as well as explicitly considering overall cost effectiveness.

Population The recommendations focus on children and adolescents with unspecified types of depression.

Screening Recommendations The guidance summary recommends having primary care, school, and other community members receive training to understand how to detect depression and assess which children are at high risk for depression by determining a patient's psychosocial profile, existence of comorbid conditions and family history of related conditions, knowledge of various recent events and other life factors, and assessment of quality of family and peer relationships. The panel advocates for providers to ask children (in private preferred) and their parents about being bullied or abused, substance use, propensity for self-harm and having suicidal thoughts and behaviors so that immediate management can begin if needed.

Other Recommendations NICE provides guidance about initial management techniques feasible for the primary care provider to carry out, when additional resources and capacity are necessary, and when referral to specialty care is recommended. The guideline also includes recommendations regarding the management of comorbid conditions and issues with social and academic functioning via consultation with additional resources across other sectors of care, as well as how to deal with parents who might need mental health care of their own. In the UK, the diagnosis of depression is typically made by professionals who work for Child and Adolescent Mental Health Services (CAMHS), so the guidelines also contain recommendations for ongoing diagnostic training for CAMHS professionals.

With respect to treatment effectiveness, the panel had two main recommendations: (1) there is little clear evidence of superiority of one psychological treatment over another (although psychological therapies should include at least 3 months duration) and (2) an option for adolescents with depression of at least moderate severity includes starting both psychological and pharmacological therapy at the same time rather than only initiating antidepressant therapy after trying a course of psychological treatment. The recommendations call for provision of these specialized services by trained child and adolescent mental healthcare professionals. Antidepressant drugs are not recommended as initial treatment of mild depression in youth, nor are they recommended without concurrent psychological therapy for those with moderate to severe depression. When drugs are administered, the guidelines call for vigilant, active monitoring for adverse drug reactions.

Bottom Line Both patients and parents should be queried about comorbid conditions and other negative precursors or sequelae of depression

- Primary care, school, and community care providers should receive training on the assessment and appropriate follow-up of children and adolescents with depression.
- Recommended treatment may depend, at least in part, on severity of depression.

2007 American Academy of Child and Adolescent Psychiatry (AACAP) [36]

Overview and Content AACAP last published a practice parameter focused on the assessment and treatment of children and adolescents with depression disorders in 2007 and is currently in development of its clinical practice guidelines for childhood depression. The practice parameter includes nine recommendations, the second of which focuses on screening in general (i.e., not solely focused on primary care settings).

Basis of the Guideline The practice parameter states that recommendations were made after rigorous review of empirical evidence or clinical consensus.

Population The practice parameter focuses on unspecified child and adolescent depressive disorders.

Screening Recommendations The screening recommendation is for clinicians to use a checklist derived from the DSM or ICD criteria for depressive disorders, self-reports of the youth or a parent, or clinician-based instruments to screen for symptoms of depression, including sad mood, anhedonia, and irritability. A positive screen should be followed up with questions about the frequency and duration of the symptoms and the extent of accompanying impairment to put the symptom experience into context.

Other Recommendations The practice parameter includes numerous other recommendations. The first focuses on maintaining a confidential relationship with the young patient while developing "collaborative relationships" with parents, medical providers, other mental health professionals, and school personnel. The parameter recommends that the provider defines what types of information can be communicated between all parties (young patient, parents, and other involved parties), as the child's right to a confidential relationship with

their provider with respect to issues of child abuse and risk of violence and suicidal ideation varies by state law. The other recommendations suggest that positive screens should be followed up with a thorough examination to determine comorbid psychiatric and medical disorders, an evaluation of potential harm to self or others, and assessment of adverse life events, family environment, and family history of psychiatric problems. With respect to treatment, the parameters recommend treatment includes an acute and continuation phase as well as a plan for maintenance treatment if needed, and that treatment contains comprehensive psychoeducation, supportive management, and family and school involvement. The recommendation suggests that brief, uncomplicated, or depression with mild impairment likely can be treated with education, support, and case management, but non-response to these initial strategies or those with complicated or depression accompanied by moderate to severe impairment should be followed by a trial of psychotherapy or antidepressants. Finally, the last several recommendations suggest that treatment should be continued for 6–12 months and, to prevent recurrence, longer if possible for some youth who might have a history of relapse/recurrence after treatment, chronic or severe types of depression, or long prior periods of recovery.

Bottom Line

- Confidentiality should be communicated before initiating screening and assessment activities
- After identifying children and adolescents at high risk for depressive disorders, providers should screen those determined to have high risk for depressive disorders using a symptom-based checklist
- Updated guidelines are in process

Research Gaps and Next Steps

Direct Evidence of Screening Efficacy with Long-Term Outcome Assessment

Studies investigating the direct link between screening and patient health outcomes are lacking. To date, a majority of the evidence examining the impact of screening on patient outcomes has come from indirect evidence that accurate, feasible screening tools exist and, when depression is identified, efficacious treatments are available. The indirect chain of evidence does not account for the steps that have to occur between administering a screener and initiating treatment. For example, a positive screen often is followed-up with a longer screening tool or a clinical assessment tool to make a diagnosis. The primary care provider then needs to perform steps for initial management of depression, including gathering additional information about the severity of the depression, suicide risk, and treatment options for each patient. In many instances, the primary care provider will need to decide whether he or she can care for the patient either right away or after a period of watchful waiting, or whether referral to specialty psychiatric care is preferred and feasible for the patient. Reliance on an indirect evidence pathway assumes that interim steps in assessment, referral, and treatment occur in a consistent and effective manner; further, it overlooks attrition along the screening to treatment pathway. These gaps suggest the need for studies evaluating the direct benefit and harms of screening, including assessment of long-term outcomes, which youth depression trials typically do not include. Longitudinal studies of screening on the development and functioning of children as they mature into adulthood are needed to boost the evidence base to inform clinical practice.

Implementation and the Integration of Behavioral Health Care

Few studies have investigated how to implement youth depression screening programs in practice. A recent review of trials testing strategies to improve the mental health care of children and adolescents included only three trials done in a primary care setting, none of which focused on depression [37•]. One study investigated a multidisciplinary implementation strategy of Dutch depression guidelines for youth to identify factors associated with successful uptake of the guideline recommendations for screening, diagnosis, severity assessment, and stepped-care treatment, and monitoring [38•]. This study, however, focused on implementation within a specialty mental healthcare setting rather than a primary care setting, where uptake of the guideline recommendations was influenced by provider availability, time, skills, and attitudes, as well as clinical systems in place such as electronic tools and reminders. These gaps in the evidence point to a critical need to investigate how to implement screening programs and effectively treat or refer identified patients in primary care settings to receive care.

Research on strategies to integrate behavioral health into primary care settings has been growing for the past decade. A recent systematic review of integrated care strategies such as coordinated care (primary care providers working with behavioral health specialists), co-located care (housing primary care and behavioral health specialists in the same setting to enable easier referral, communication, and patient access), and integrated care (primary care and behavioral health specialists create shared treatment plans for each patient) found surprisingly few trials that have tested these strategies on depressed children and adolescents with depression [39•]. The review identified two coordinated care and four integrated care trials of depression [24, 40–44], a majority of which were

associated with significantly better improvements in depression outcomes than comparator groups [24, 41, 42, 44]. In addition, one study testing an integrated care strategy for adolescents with depression found a net cost effectiveness of integrated care compared with usual care [45••]. Each of these trials, however, was conducted among adolescents at least 12 years of age, so research on these types of strategies on younger children are needed. Building on the finding of the integration of behavioral health into primary care among adolescents additionally informed by the adult literature, the authors suggest next steps of examining the feasibility and efficacy of brief interventions administered by primary care providers shown to be efficacious among adult populations, increased use of technological strategies, including web-based applications, to increase access to psychotherapy in primary care. Another recent review article on clinical preventive services for adolescents and young adults also suggests that new strategies to improve the delivery of screening and assessment tools would be particularly helpful, especially when integrated into electronic medical record systems and incorporating emerging technology such as gaming, mobile phone, and wearable device platforms to increase the ability of clinicians to detect and monitor known patient issues, especially for those with less access to care [46•]. Additional testing of these types of strategies could bolster evidence that once depression is identified, effective strategies exist to manage depressed youth in primary care.

Translation to Real-World

In addition to further research on implementation, a basic understanding of current screening practices being utilized and a comprehensive evaluation of these procedures and impact on clinic functioning, staff support required, and overall burden to patients and their families is needed. Determining the impact of training primary care providers to initially manage or refer patients with depression to outside services (and whether patients can access those referral services) also would advance the field. One recent study tested a screening program for primary care providers on the screening, assessment, and treatment of adolescent depression (SAT-D) and found significant increases in screening among providers who participated in the program (49% at pre-training to 74% at 18–24 months post training) [28••]. Another recent study evaluated a computerized, self-administered screener for adolescents, the Dart Screener, and found that primary care providers and adolescent patients who participated in the screener had in increase in the discussion of mental health topics after completing the screen [47••].

A systematic review of symptom screening scales for detecting MDD in youth concluded that some commonly used depression symptom scales had good reliability but that using a clinical cutoff score to identify cases of MDD resulted in many false positives [48••]. Another systematic review conducted by Wissow and colleagues concluded that published studies on this topic infrequently include details about how the screeners were administered, including the mode of administration and involvement of parents to provide input, resulting confidentiality issues, barriers to engaging providers, clinic staff, and patients themselves in screening, and how clinicians can best use the results of screening practices via follow-up diagnostic procedures, initiation of treatment strategies, and, when needed, referral to outside care [49]. Factors associated with patient willingness to go through additional diagnostic procedures and ultimately engage in treatment are needed to improve current practices.

School-Based Clinics in the Absence of a Regular Source of Primary Care

Other settings such as schools or other community settings have been proposed as ways to engage a greater proportion of youth in need, because not all youth have a regular source of primary care. Some barriers in primary care (e.g., time, lack of comprehensive treatment and referral systems) also apply to these other settings; however, the evidence base for screening programs in these alternative settings is still in its infancy. Limited evidence suggests that screening in schools yields a substantial number of referrals. One recently published study of a retrospective chart review of depression screening outcomes among adolescents who accessed school-based pediatric primary care clinics found that 56.3% of adolescents seen had documentation of depression screening, with 12.5% of those screening positive and 83.3% of those referred for additional mental health care [30••].

Dissemination of Harms Data for Antidepressants

Primary care providers commonly cite their belief that pharmacological treatments can increase suicide risk as a barrier that reduces their willingness to prescribe medications with known efficacy. After the FDA advisories on suicidality associated with the use of paroxetine in patients under the age of 18 in 2003 and on suicidality associated with all antidepressant use in patients under the age of 18 in 2004, as noted above, evidence suggests a shift away from prescribing SSRIs and towards other drugs [26, 50–52]. The decrease in prescribing SSRIs by approximately 22% was associated with an increase in suicide rates in children and adolescents by 14% between 2003 and 2004, which is the largest year-to-year change in suicide rates in this population since the Centers for Disease Control and Prevention began systematically collecting suicide data in 1979 [53]. Thus, additional studies are needed to quantify the harms of not identifying and

treating depression among youth, as are studies demonstrating how to disseminate such information among care providers.

Screening Differences for Younger Children and Other Patient Subgroups

Finally, additional studies are needed to examine screening among younger children. The bulk of the research conducted has been with adolescents aged 12 or older, which is the typical age of onset of clinically significant MDD. The benefits versus the burden of screening for depression among younger children are virtually unknown, even via indirect evidence. In addition to the feasibility of screening tools in younger patients, the role of parent acceptability of screening, diagnostic assessment, and engagement in treatment are also not well-understood. In addition, to broaden the potential reach of youth depression screening programs, trials are needed that recruit patients from school or community health care primary care settings. Other research gaps include analyzing differences in efficacy in different demographic subgroups (males and females, older and younger children, different race and ethnicity groups) and those with co-occurring mental health, substance use, somatic, or chronic physical conditions, studies that develop and test risk stratification tools to identify youth at high risk for depression that would benefit most from screening, and exploring how often and the best conditions for screening to improve the likelihood of appropriate diagnostic follow-up and treatment engagement.

Conclusions

Indirect evidence supports the benefits of screening for depression in pediatric primary care; most organizations that publish screening guidelines recommend its use. In addition to determining the applicability of evidence gathered to younger children, more research is needed on the direct net benefits of screening and to identify factors that facilitate the effective implementation of screening in real world clinical settings.

Compliance with Ethical Standards

Conflict of Interest Valerie L. Forman-Hoffman and Meera Viswanathan each have a contract from AHRQ to RTI International to conduct a topic refinement and possibly a systematic review on treatments for pediatric depression to inform the creation of AACAP's updated guidelines on the topic.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

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- •• Of major Importance

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