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Emergency Department Screening for Adolescent Mental Health Disorders: The Who, What, When, Where, Why and How It Could and Should Be Done

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Abstract

Mental health problems are a significant cause of morbidity and mortality among pediatric populations. Screening for these problems can result in earlier identification and increase treatment and improve outcomes for these children and adolescents. The emergency department (ED) is an ideal site for such screening. Pediatric ED patients are known to be at higher risk for mental health problems. For many, an ED visit is one of the few opportunities to identify and intervene with these children and adolescents. A number of brief, efficient screening instruments have been developed for the ED setting. Screening for mental health problems is both feasible and acceptable to ED patients, parents, and caregivers.

Keywords

Emergency department; mental health; screening

Mental health disorders are a major contributor to the global burden of disease. Neuropsychiatric disorders are the most common causes of disability worldwide, accounting for one-third of years lost to disability (YLD).[1] Depression is the single leading cause of YLD for both women and men, contributing 13.4% and 8.3% of total YLD respectively. Depression affects approximately 120 million people worldwide, with fewer than a quarter having access to adequate treatment. In 2008, the estimated economic impact of depression in the U.S. was $58 billion in health care cost,[2] with an additional $193 billion in lost earnings.[3]

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Unfortunately, children and adolescents are not spared these afflictions, and are in fact equally at risk. Studies have shown that pediatric mental health problems are literally epidemic, with 21-23% of children and adolescents in the US having a diagnosable mental health or substance use disorder,[4, 5] with 10% requiring services for their problems.[6] Despite this immense burden of disease, only 36% ever receive mental health services.[7] Among children with severely impairing mental disorders, only 40-50% ever receive care for their mental health problems.[7, 8]

Among children and adolescents, depression is also the most common cause of mental health morbidity. The lifetime prevalence of depression in pediatric populations is 11.7%.[5] Depression is an especially vexing problem, given the high rates of comorbidities such as social dysfunction, school absenteeism and drop-out, and behavior risks such as smoking and alcohol use.[9]

Suicide is another tragic and lethal example. In 2010, suicide was the 4th leading cause of death among adolescents.[10] Data from the 2011 Youth Risk Behavior Surveillance Survey reveals that among high school students, 15.8% seriously considered attempting suicide, 12.8% had made a suicide plan, and 7.8% made one or more suicide attempts in the preceding year. [11] Individuals who commit suicide frequently visit a health care provider in the months preceding their death,[12, 13] and for most, their suicidality is not recognized by their physicians.[14-16] A likely reason is that suicidal patients do not identify themselves as such unless directly asked.[17]

WHY SHOULD WE SCREEN FOR MENTAL HEALTH PROBLEMS IN THE EMERGENCY DEPARTMENT?

Mental Health Problems Are Perfectly Suited To Screening

In 1968, the World Health Organization published guiding principles for which medical conditions ought to be screened and how such screening should be implemented. These guidelines are summarized in Table 1 and are still very much applicable today. Screening should identify people with unrecognized, significant medical conditions, resulting in earlier diagnosis and treatment, decreasing morbidity and mortality due to the disease, and ultimately culminating in a decrease in disease burden in both the individual and society. Given the prevalence and significant medical, psychosocial, and economic burden of mental health disorders, the public health necessity of screening for mental health problems is readily apparent.

Emergency Department Populations Are at High Risk for Mental Health Problems

Both adult and pediatric emergency department (ED) studies have found very high rates of occult mental health problems among patients presenting for non-psychiatric problems. These mental health conditions are frequently unrecognized not only by ED clinicians, but also by the affected children/adolescents and their parents. Up to 45% of adult ED patients screened positive for mental health disorders.[18] Among pediatric emergency departments (PED) patients, 70% screen positive for at least one mental health disorder,[19] 23% meet criteria for 2 or more mental health concerns,[20] 45% have a mental health problems resulting in impaired psychosocial functioning,[20] and 10% of PED adolescents endorse significant levels of psychiatric distress at the time of their PED visit.[21] Studies have shown that ED screening successfully increases detection of adolescents with undiagnosed depression.[22-24] Unfortunately, up to 98% of these patients' mental health problems are not detected by ED physicians,[18] and 86% of PED physicians report screening for mental health problems in 10% or less of their patients.[25]

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Pediatric ED patients are known to be a vulnerable population with higher risk of psychiatric sequelae.[20, 26] Biros et al administered the Beck Depression Inventory II (BDI-II) to 967 medically stable adolescents presenting to a PED for non-psychiatric conditions.[22] The BDI-II is a well validated, self-administered instrument which takes 5-10 minutes to complete. In this sample, 20% were found to meet criteria for moderate to severe depression and 32% endorsed having some degree of suicidal ideation. Among these depressed adolescents, 42% did not recognize their depressive symptoms nor did 50% of the parents. In a similar study, Scott et al also administered the BDI-II to 351 PED adolescents and found comparable, though slightly higher total rates of moderate (11%) and severe (8%) depression.[24] In 2 different studies of PED suicide screening, Horowitz et al found that between 4.1-5.7% of adolescents presenting to a PED for non-psychiatric reasons screened positive for clinically significant suicidal ideation. [27, 28]

Ramsawh et al investigated the incidence of anxiety disorders in 100 PED adolescent-parent dyads.[29] To detect anxiety disorders in the children and adolescents, they administered the parent and child versions of the 5-item Screen for Child Anxiety Related Emotional Disorders to dyads presenting with non-psychiatric conditions. Probable anxiety disorders were identified by 26% and 33% of parent and teen screens respectively. Correlates of positive screens included female gender, presenting complaints of asthma, headaches, or migraines, and histories of school absenteeism and higher use of the medical system. The authors concluded that occult anxiety disorders are more common among adolescent ED patients but are largely untreated.

Children with traffic related injuries may be at high risk for developing significant post-traumatic stress disorder and other mental health problems. Winston et al studied 269 such patients and their parents and found that 16% of children and 15% of parents reported persistent symptoms of post-traumatic stress in the child at follow-up.[30] Among the screen-positive children, the incidence of clinically significant symptoms was 20% for post-traumatic stress disorder, 24% for general anxiety symptoms, and 20% for depression.

The Advantages of the Emergency Department Compared to Other Settings

The ED is uniquely positioned to capture many high risk adolescents, who cannot be captured in other settings. Many teens either do not have a primary care provider or face significant access barriers to care with their primary care provider. For these adolescents the ED is often their only source of medical care.[31, 32] Such adolescents represent a particular high risk group, with higher levels of risk behaviors, histories of physical or sexual abuse, and depression scores.[31] Similarly, homeless adolescents disproportionately access medical care in the ED. [33] Finally, male adolescents may preferentially seek care in EDs, as they are less likely to participate in primary[34] or mental health care.[35]

Another high risk population which frequently receives care in EDs are adolescents who are school dropouts or have high absenteeism rates. School based interventions are a common strategy for identifying and intervening in teen risk behaviors and health problems, but are ineffectual for these adolescents. These teens are known to have increased alcohol,[36, 37] and mental health risks,[19-21] compared to teens who attend school.

BARRIERS TO SCREENING

Pediatric, emergency care, and governmental organizations have advocated for ED mental health screening, including the American Academy of Pediatrics, the American College of Emergency Physicians, the National Association of EMS Physicians, the Emergency Medical Services for Children (Health Resources and Services Administration, Maternal and Child Health Bureau), and the U.S. Preventative Services Task Force.[38-42] However,

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screening for mental health problems is not without controversy,[43] despite evidence that ED screening can improve outcomes ranging from asthma, to alcohol related injuries, to injury prevention.[44-47]

Studies of ED clinicians' attitudes and beliefs have identified numerous problems with and barriers to mental health screening in the ED, including time limitations, inadequate training, insufficient and fragmented mental health resources, poor insurance coverage of mental health conditions, a perceived dearth of appropriate screening tools, acuity of the ED setting and patients, lack of rapport/long-term relationships with ED patients, potential confidentiality problems, as well as concerns about breach of expectations for the ED visit (e.g. "I didn't come to the ED to get treated for depression" or "Parents will not approve of my asking about mental health problems").[25, 39, 40, 48, 49]

In addition to the above concerns, Habis et al's survey of the American Academy of Pediatrics' Section on Emergency Medicine produced other interesting findings.[25] They found that 43% of PED physicians screened for mental health problems only if the presenting complaint was psychiatric, 9% stated that they utilized evidence-based practices for mental health screening, and 88% felt that a validated screening tool would improve their ability to detect pediatric mental health problems.

In a qualitative study of PED clinicians, Cronholm et al utilized semi-structured interviews to assess the views of attendings, fellows, nurses, social workers and psychiatrists toward caring for adolescent depression in the ED setting.[48] All providers were found to have an excellent grasp of the prevalence, complexity, low rate of recognition, and clinical and social impact of the problem. Providers recognized that for many adolescents, an ED visit may represent the only opportunity to identify depressed teens. Establishing good patient rapport, utilizing "down time" during an ED visit, assurance of confidentiality, implementing measures to decrease the stigma of screening positive for depression were all endorsed as important aspects of successful screening. Respondents also expressed significant concerns about the capacity of the current health care system to care for adolescents who screen positive.

IS MENTAL HEALTH SCREENING IN THE ED FEASIBLE AND ACCEPTABLE?

Numerous studies have shown that ED mental health screening can rapidly, efficiently, and accurately identify patients with occult mental health problems. As few as two depression screening questions have been found to be helpful in both adult and pediatric ED settings. Haughey et al demonstrated that their two-question screening tool resulted in a threefold increase in physician recognition of depression in adults.[50] Similarly, Rutman et al determined that a two-question depression screen, based on the CES-D (Center for Epidemiologic Studies Depression Scale) had good sensitivity and specificity for adolescent depression in a PED setting.[23] Horowitz's group has demonstrated that a brief, four-question suicide screen, suitable for non-mental health clinicians, with excellent sensitivity, specificity, and predictive value, can be administered to a wide range of PED patients.[27, 28, 51] Another significant and important finding was that real time assessments of positive suicide screens did not increase those patients' ED length of stay.[27]

Importantly, ED screening for suicide risk and mental health disorders is acceptable to adolescents and their parents. O'Mara and colleagues investigated this specific question with approximately 300 adolescent-parent dyads.[52] Teens and their parents were asked about the importance of screening for mental health problem in the ED, whether such screening should be part of routine ED care, the importance of suicide screening, what ED

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interventions would be helpful for positive screens, their concerns about mental health screening in the ED, and if they would agree to participate in such screening if it were offered during the current ED visit. Both teens and parents reported positive attitudes toward mental health screening during an ED visit, with suicide and drug and alcohol screening rated as more important than other mental health problems. Females, both adolescents and parents, were more positive about screening than male teens and fathers.

Pailler et al conducted semistructured interviews with 60 adolescents and their caregivers, to assess their beliefs about ED depression screening and referrals.[49] Both teens and their caregivers viewed depression screening positively, perceiving it as a sign of caring and concern for the adolescent. They did express concern about stigma, confidentiality, and ED clinician sensitivity, and expressed the belief that routine introduction of the screening early in the ED visit would help reduce stigma. While participants viewed referrals for follow-up care positively, they also identified lack of transportation and insurance, stigma, and patient/ family denial about a teen’s depression as potential barriers to successful mental health follow-up.

Among Horowitz et al’s sample, only 16% of those who completed the screening felt the questions were “weird,” “awkward,” or stressful.[27] Of those who declined to participate, only 8% stated that they objected to the nature of the screening questions. Administration of the suicide screen was acceptable to 60-66% of patients and parents, and 96% of participants agreed that suicide screening should occur in the ED.[27, 28, 53]

Williams et al also investigated this question as part of a larger study of PED mental health screening.[54] After administering a mental health screening instrument to 384 parent-child dyads, parents, patients, ED staff, and research staff rated their reactions to and the difficulty in administering the screen. Most parents (82%) and children (75%) rated the screen as highly acceptable. There was a direct association between the number of mental health problems detected during screening and the likelihood of the child rating the screen as unacceptable. Among parents, the opposite was true, i.e the more mental problems reported on the screen, the more likely the parent found the screening helpful. Among ED clinicians, 99% of physicians and 97% of nurses stated that the screening did not interfere with patient care. Research staff endorsed “no difficulty” in administering the screen to 73% of participants.

Utilizing data from a sample of traffic related injured patients, Winston et al developed a brief screen for PTSD.[30] Four dichotomous questions asked of the child and parent, combined with four dichotomous data points extracted from the medical record, were found to have high sensitivity for predicting PTSD stress (88% for children self report, and 96% for parental report on the child), with excellent negative predictive value (95% for child screens, 99% for parental screening. A positive screen increased the odds for PTSD by 6.5 in children (95% confidence interval [CI]: 1.8-22.8) and 26.6 (95% CI: 3.5-202.1) in parents. Because of its brevity, simple scoring methods, and promising results, the authors posit that their PTSD screen may be ideally suited and a valuable triage tool for the ED, given the time restrictions of the setting.

BRIEF PEDIATRIC ED MENTAL HEALTH SCREENING TOOLS

Many efficient and practical screening tools for mental health conditions have been developed and/or tested in the ED setting. While many remain to be fully validated in general PED populations, they have the potential to be efficient, effective screening tools. One example is the Mini-International Neuropsychiatric Interview, a brief structured, diagnostic interview which has been previously validated in in-patient, out-patient primary care, and research clinic settings. It is designed to be completed and scored within 10

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minutes and can be used to rapidly identify and diagnose 16 psychiatric conditions. It was shown to have promising results in an adult ED study.[18] Among 211 screened adults, an undiagnosed mental health disorder was detected in 45% of patients, with 4% screening positive for suicide risk. Of all the patients who tested positive, only 2% of the mental health diagnoses and none of the positive suicide risk patients were identified by the ED attending.

Recently, the time honored HEADDSSS (**H**ome, **E**ducation/school, **A**ctivities, **D**rugs, **D**epression, **S**exuality, **S**uicide, **S**afety) mnemonic for adolescent psychosocial assessment, was modified specifically for and tested in a PED setting.[55] The HEADS-ED (**H**ome, **E**ducation, **A**ctivities and peers, **D**rugs and alcohol, **S**uicidality, **E**motions and behaviors, **D**ischarge resources) was compared against the Child and Adolescent Needs and Strengths Mental Health Tool and the Children’s Depression Inventory, in 313 PED adolescents presenting with mental health problems.[56] The HEADS-ED demonstrated strong reliability, accuracy, and concurrent predictive validity for the need for psychiatric consultation and hospitalization.

Several studies on PED suicide screening have been published by Horowitz and colleagues.[27, 51, 57] Their most recent study tested multiple logistic regression-derived models of 17 candidate suicide screening questions against the Suicidal Ideation Questionnaire.[28] A four question model was found to have the best sensitivity (97%, 95% CI: 91-99%), specificity 88%, 95% CI: 84-91%), and negative predictive value (99%, 95% CI: 98-99%) for both psychiatric and non-psychiatric patients. The four questions assess current thoughts of being better off dead, current wish to die, current suicidal ideation, and past suicide attempts.

Rutman et al investigated the sensitivity and specificity of both a one- and two-item depression screen in 212 PED adolescents.[23] The two screens were derived from and compared against the full 20-question CES-D. Patients who met the threshold for a positive depression screen (16 on the 20-question CES-D) were further screened with the Suicidal Ideation Questionnaire (SIQ). The abbreviated two-question screen (“During the past month, have you often been bothered by feeling down, depressed, or hopeless?” and “During the past month, have you often been bothered by little interest or pleasure in doing things?”) was found to be superior to the one question screen, with 78% sensitivity (95% CI: 73-84%) and 82% specificity (95% CI: 77-87%). Of the 78 patients who screened positive for depression, 16 (21%) subsequently had positive SIQ screens. Of these 16 patients, 15 (94%) had a positive two-question screen. The same two questions were found to have similar screening properties in an adult ED population. [50]

Newton et al performed a systematic review of the literature on adolescent alcohol and other drug use screening instruments which have been studied in the ED setting.[58] Six studies investigating 11 instruments for universal or targeted substance misuse were identified. In toto, the instruments were best at detecting alcohol and cannabis use disorders. On the basis of these studies, the investigators recommend the following two-question screen for alcohol misuse and one-question screen for cannabis misuse: “In the past year, have you sometimes been under the influence of alcohol in situations where you could have caused an accident or gotten hurt?”, “Have there often been times when you have a lot more to drink than you intended to have?”, and “In the past year, how often have your used cannabis: 0 to 1 time, or greater than 2 times?” Teens who answer yes to one of the alcohol questions are eight times more likely to have an alcohol use disorder. Those who answer “greater than 2 times” to the marijuana screening question have a seven-fold increased risk of having a cannabis use disorder.

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The National Institute on Alcohol Abuse and Alcoholism (NIAAA) has developed their own two-question screen.[59] Empirically based on the extant literature, NIAAA believes the two questions will accurately screen for and detect adolescents at risk for problematic alcohol use. The two questions, which vary according to the age of the patient, ask about the patient's and their friends' experience with alcohol. NIAAA has granted four awards to research the validity and reliability of their two question screen, as well as the screen's ability to detect current and predict future alcohol and other drug use, and other adolescent health risk behaviors (http://grants.nih.gov/grants/guide/rfa-files/RFA-AA-12-008.html; accessed October 15, 2012).

COMPUTERIZED MENTAL HEALTH SCREENING IN THE ED

Computerized screening may be an efficient and advantageous method for ED mental health screening, in that electronic screens require little ED clinician time or effort to administer. They have successfully been utilized in both pediatric and general ED settings for alcohol/ substance use, alcohol and youth violence, injury prevention, general health and mental health screening, and HIV risk behaviors. Choo et al performed a systematic review of technology based behavioral health screening and interventions in the ED.[60] Overall, the included studies showed a high rate of acceptability and feasibility of computerized interventions. Additionally, computerized interventions have a modest clinical effect on targeted outcomes.

Electronic screening methods have successfully been used in numerous adolescent ED studies, including alcohol use,[61-63] interpersonal and intimate partner violence[64, 65], weapons carriage,[66] and injury prevention.[67] In these studies, the screening was done specifically for research purposes, either for epidemiologic data collection, or, in the case of the alcohol intervention studies, to identify adolescent alcohol users, gather patient-specific information, then design and implement a tailored intervention based on the collected information. When teens were asked about the acceptability of computerized ED screening and intervention, not only did they rate such screening as highly acceptable, but there is evidence that teens may prefer such health interventions.[68-70]

PED clinicians however, have mixed opinions on the utility of computerized screening.[48] In a qualitative study of their beliefs about such screening, some felt that electronic tools would help standardize the screening process and that teens would be very comfortable with this modality, viewing it as "more private" and preferable to in-person screening. Others however, felt that such screening may be viewed as impersonal and uncaring, decrease patient-provider engagement, and expressed concern that important non-verbal information is not captured.

Investigators at the Children's Hospital of Philadelphia have successfully developed and tested an electronic tool for universal screening of ED adolescent health risks, including occult mental health problems.[21, 71] Adolescents visiting the PED first view a video which introduces the screen to the teen, discusses the boundaries of confidentiality, and instructs them on how to complete the screen. Audio instructions and headphones are provided, to assist with comprehension and confidentiality. The screen is usually presented to the patient by a nurse or medical technician. After completing the screen, the adolescent's results were printed out and placed in the patient's ED medical record, which were then reviewed by the treating physician(s). Screening resulted in a 68% increase in identification of psychiatric illnesses, which resulted in a 47% increase in mental health assessments by social workers or psychiatrists.

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SUMMARY

Mental health problems in children and adolescents are very common, unfortunately with very high morbidity and mortality, both in the near and long term. Screening for such problems will result in earlier identification of these patients, and may increase treatment of these problems and ultimately result in secondary and tertiary prevention of the sequelae of pediatric mental health disorders. Populations who visit EDs are known to be at high risk for occult mental health disorders. The ED visit may be the only opportunity to identify many of these patients. Numerous screening tools, including automated, electronic tools have been developed, and have been shown to be feasible and acceptable to patients, their families, and ED clinicians. Validation of these tools has been variable. Future studies are needed to further validate and optimize these tools for the ED setting. Electronic screening may be an especially efficient and appealing method to accomplish ED mental health screening. Screening and referral for pediatric mental health problems can be accomplished by a variety of ED personnel, including nurses, nursing assistants, social workers, and mental health clinicians. Mental health screening should be implemented in ED, as part of comprehensive efforts to decease the health and economic burden of these conditions.

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Table 1

WHO principles for early disease detection.[72]

1	The disease is an important health problem.
2	There is treatment for the disease.
3	There are facilities for diagnosis and treatment of the disease.
4	The disease has a latent stage.
5	There is a test or examination for the disease.
6	Testing for the disease is acceptable to the population.
7	The natural history of the disease is adequately understood.
8	There is agreement on whom to treat.
9	The total cost of finding a case of disease is economically balanced with overall medical expenditure.
10	Finding cases of disease is a continuous, surveillance process, not just a one time/point prevalence project.

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Table 2

Brief ED mental health screens

Mental Health Condition	Screening Tool	Number of Screen Items
Depression	Center for Epidemiologic Studies Depression Scale[23]	2
Suicide	Ask Suicide-Screening Questions[28]	4
Substance Abuse	Two Question Alcohol Screen (Alberta)[58]	2
	NIAAA Two Question Alcohol Screen[59]	2
	One Question Marijuana Screen (Alberta)[58]	1
Anxiety	Screen for Child Anxiety Related Emotional Disorders Parent Form (SCARED-P), Child Form (SCARED-C)[29]	5
	Screening Tool for Early Predictors of PTSD (STEPP)[30]	12
General Psychosocial Functioning	HEADS-ED[56]	7