EATING DISORDERS IN CHILDREN AND ADOLESCENTS

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Eating disorders (EDs) are serious mental health problems (Klump, Bulik, Kaye, Treasure, & Tyson, 2009). Mortality from anorexia nervosa (AN) is the highest of all mental disorders, with a 50-fold increase in the relative risk of death from suicide (Keel et al., 2003). Common mental health comorbidities include depression, anxiety, and substance abuse; medical complications include cardiovascular and neurological problems, and these disorders are associated with marked impairment in functioning (Klump et al., 2009). Delayed treatment results in poorer prognosis and greater relapse rates (American Psychiatric Association, 2006), underscoring the need for prevention, early identification, and effective intervention of these serious problems in youth.

DIAGNOSING EATING DISORDERS IN YOUTH

New diagnostic criteria for EDs were published in 2013 in the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (*DSM–5*; American Psychiatric Association, 2013). The previous *DSM–IV–TR* (American Psychiatric Association, 2000) recognized only two specific EDs—AN and bulimia nervosa (BN). However, a large number of individuals with disturbing eating problems presenting for care did not meet criteria for these disorders and were assigned the residual or "leftover" diagnostic category of ED not otherwise specified (EDNOS). Indeed, EDNOS, which encompassed a wide spectrum of EDs, including subthreshold AN, subthreshold BN, and binge eating disorder (BED), accounted for the majority of ED diagnoses among youth presenting for treatment (Thomas, Vartanian, & Brownell, 2009). This ambiguity led to questions regarding the clinical meaningfulness of EDNOS, despite research showing that EDNOS was associated with similar levels of psychological and physiological morbidity compared with recognized ED diagnoses (Thomas et al., 2009). The *DSM–5* addressed these issues by broadening the diagnostic criteria for AN and BN, formally recognizing BED, and further clarifying other EDs.

Anorexia Nervosa

The *DSM–5* identifies three core diagnostic features of AN: significantly low body weight (Criterion A); intense fear of gaining weight or becoming fat and/or engaging in behaviors that interfere with weight gain regardless of a low body weight (Criterion B); and disturbance in how one's weight or shape is experienced, self-evaluation overly influenced by weight or shape, or denial of the seriousness of one's low body weight (Criterion C).

Youth with AN often present with extreme weight loss or increasing growth in height without corresponding weight gain. Calculating body mass index (BMI) percentile is useful for determining whether body weight is significantly low (Criterion A), and significantly low body weight is considered less than what would minimally be expected given a child's age, sex, developmental trajectory, and physical health. The Centers for Disease Control and Prevention (CDC) has used BMI-for-age below the 5th percentile as suggestive of underweight;

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however, youth with a BMI above this threshold may be deemed significantly underweight if they fail to maintain their expected growth trajectory (American Psychiatric Association, 2013).

Individuals with AN typically display an intense fear of weight gain or becoming fat (Criterion B), accompanied by general preoccupation with weight, shape, and food (e.g., counting calories). These feelings are usually not alleviated by weight loss and may increase as weight loss progresses. However, some individuals with AN, particularly younger individuals, deny a fear of weight gain. In these cases, persistent engagement in behaviors that prevent weight gain can be used to establish Criterion B, including strict dieting, restriction of whole food groups (e.g., new-onset vegetarianism), and/or excessive physical activity that is engaged in rigidly. Dietary restriction and exercise may be pursued to the exclusion of other activities, and individuals may refuse to eat foods that were once enjoyed or avoid meals with others.

The experience and significance of weight and shape are often distorted among individuals with AN (Criterion C). Many perceive themselves as being globally overweight despite being emaciated. Others may recognize their overall thinness but perceive certain body parts (e.g., abdomen, buttocks, thighs) as "too fat." Furthermore, individuals often engage in a variety of body checking techniques to continually evaluate their shape and weight (e.g., frequent weighing, excessive mirror use), and self-esteem is highly dependent on weight and shape.

Notably, amenorrhea (the loss or lack of onset of the menstrual period) was removed as a diagnostic criteria for AN in the *DSM–5* given that it excluded boys, premenarchal girls, and girls taking contraceptives; however, delayed or interrupted pubertal development is often present among youth with AN (Rosen, 2010). Most individuals with AN also experience their symptoms as ego-syntonic and have pride in their ability to engage in extreme dietary restriction and exercise. Current symptoms, over the past three months, may be described as falling into one of two subtypes: (a) restricting type, whereby the individual does not engage in recurrent episodes of binge eating or purging; or (b) binge-eating/purging type for individuals who have engaged in recurrent binge eating or purging (self-induced vomiting or the misuse of laxatives, diuretics, or enemas).

Bulimia Nervosa

There are three essential features of BN according to the *DSM–5*: recurrent episodes of binge eating (i.e., eating an objectively large amount of food while experiencing loss of control [LOC]; Criterion A), recurrent inappropriate compensatory behaviors to prevent weight gain (e.g., self-induced vomiting; misuse of laxatives, diuretics, or other medications; fasting; excessive exercise; Criterion B), and undue influence of body shape and weight on self-evaluation (Criterion D). The binge eating and compensatory behaviors must occur, on average, at least once per week for three months (Criterion C), and the diagnosis of BN excludes individuals meeting criteria for AN (Criterion E; American Psychiatric Association, 2013).

To be defined as a binge eating episode, the amount of food consumed must be larger than most individuals would eat in a similar period under similar circumstances. Context needs to be considered, as an amount that would be regarded as excessive for a regular meal may not be considered excessive in certain circumstances (e.g., a holiday meal). The food must also be consumed in a discrete period, typically defined as less than 2 hours, and snacking or grazing throughout the day would not be considered a binge. This excessive food consumption must be accompanied by LOC, defined as the inability to refrain from eating or to stop eating once started. Binge eating episodes are followed by a desire to purge, or compensate for the calories consumed, with self-induced vomiting being the most common compensatory behavior among individuals with BN (American Psychiatric Association, 2013). Individuals with BN usually weigh within the normal or high normal range, with lower BMIs associated with a history of AN; however, the percentage of individuals with BN who are overweight or obese has increased in recent years (Bulik, Marcus, Zerwas, Levine, & La Via, 2012).

Binge Eating Disorder

The *DSM–5* is the first edition to formally recognize BED, but past research has established its clinical significance (Wilfley, Wilson, & Agras, 2003).

The *DSM–5* defines BED as recurrent episodes of binge eating (Criterion A) that occur, on average, at least once per week for three months (Criterion D). Additionally, the binge eating must cause marked distress (Criterion C) and include three or more of the following five features: (a) eating much more rapidly than normal; (b) eating until feeling uncomfortably full; (c) eating large amounts when not feeling physically hungry; (d) eating alone because of embarrassment by how much one is eating; and (e) feeling disgusted, depressed, or guilty after binge eating (Criterion B). The distinguishing feature between BED and BN is that binge eating episodes are not accompanied by compensatory behavior in BED, and the diagnosis of BED excludes individuals meeting criteria for AN or BN (Criterion E; American Psychiatric Association, 2013). The guidelines for determining whether an eating episode qualifies as a binge are the same for BN. In terms of weight status, nearly three-quarters of those with BED are overweight or obese (Kessler et al., 2013).

Other Diagnostic Categories

Additional diagnostic categories include other specified feeding or eating disorder (OSFED), avoidant/restrictive food intake disorder (ARFID), and unspecified feeding or eating disorder (UFED). OSFED refers to EDs that cause clinically significant distress or impairment but that do not meet full criteria for AN, BN, or BED. Examples that can be specified using OSFED include atypical AN (i.e., weight within normal range), subthreshold BN (i.e., low frequency and/or limited duration), subthreshold BED (i.e., low frequency and/or limited duration), purging disorder (i.e., recurrent purging in the absence of binge eating), and night eating syndrome (i.e., recurrent episodes of night eating; eating after awakening from sleep or excessive food consumption after the evening meal). ARFID involves avoidance or restriction of food intake that manifests in a failure to meet appropriate nutritional and/or energy needs. It is distinct from AN in that shape and weight concerns do not appear to be the driving force behind the food restriction or avoidance (American Psychiatric Association, 2013). Rather, those behaviors may be driven by sensory characteristics of the food (e.g., textural aversions, extreme sensitivity to color or smell, fear of choking or vomiting). UFED comprises any other ED that causes clinically significant distress or impairment that does not fit into other categories (American Psychiatric Association, 2013).

ASSESSMENT

Relative to assessing adults for EDs, assessing youth is particularly challenging. Certain difficulties are present with adults as well (e.g., reliance on self-report, the ego-syntonic nature of many EDs). However, there are difficulties unique to the assessment of youth: cognitive limitations inherent to normal developmental stage, which may lead to difficulty understanding somewhat abstract concepts like LOC and overvaluation of shape and weight; changing healthy weight targets due to physical maturation; variability in the onset of pubertal indicators (e.g., menarche) that relate to ED diagnostic criteria; lack of insight into the severity of the problem; and motivation to want to actively deny or minimize symptoms to avoid intervention efforts that may be imposed by caretakers to continue ED behaviors (Couturier & Lock, 2006; Loeb, Brown, & Goldstein, 2011). Effective assessment of EDs in youth must accurately measure the ED symptoms, consider information gathered considering normal youth development, and use multiple informants (Lock & Le Grange, 2013; Loeb, Brown, & Goldstein, 2011; Micali & House, 2011). To conduct the most accurate assessment, it is best when the youth and parents are interviewed separately (Lock & Le Grange, 2013).

Interview Measures

In addition to the usual clinical interview, there are several standardized, semi-structured interviews used specifically for evaluating and diagnosing EDs in youth. Semi-structured interviews are considered the gold standard for generating ED diagnoses. Interviewers play an active role in the process and can help define and clarify constructs. See Table 16.1 for an overview.

Self-Report Questionnaires

Although self-report questionnaires cannot replace a clinical or semi-structured interview

TABLE 16.1

Semi-Structured Interviews for Assessing Eating Disorders and Their Psychopathology in Children and Adolescents

Interview	Citation	Description
Eating Disorder Examination	Fairburn, Cooper, and O'Connor, 2008	Assesses the frequency and severity of behavioral and attitudinal symptoms of eating disorders; considered the "gold standard" for assessing eating disorder psychopathology; first developed for use with adults but commonly used for the assessment of adolescents.
Child Version of the EDE	Bryant-Waugh, Cooper, Taylor, and Lask, 1996	Modified from the Eating Disorder Examination with the goal of making the interview more understandable and more accurate for use with youth.
Structured Interview for Anorexic and Bulimic Syndromes for Expert Rating	Fichter, Herpertz, Quadflieg, and Herpertz-Dahlmann, 1998	Used for diagnosing EDs and also for assessing a broad array of psychopathology related to EDs, including body image disturbance, substance abuse, social integration, sexuality, depression, anxiety, and compulsion.
Clinical Eating Disorders Rating Instrument	Palmer, Christie, Cordle, Davies, and Kenrick, 1987	Assesses the behaviors and beliefs associated with anorexia nervosa and bulimia nervosa, as well as features of general psychopathology.

Note. EDE = Eating Disorder Examination; ED = eating disorder.

for making a diagnosis of an ED, they can serve a number of useful purposes: (a) they can serve as a screening instrument to suggest that a clinical interview is warranted; (b) they can provide a numerical indication of symptom severity; (c) given the heterogeneity in symptom presentation, they can inform treatment planning by identifying which issues may be most salient to address; and (d) they can be useful for assessing treatment progress, as they can be administered numerous times (Crowther & Sherwood, 1997). See Table 16.2 for an overview of self-report measures, including those originally designed for adults that have been used with children and adolescents and measures specifically designed for use in youth.

Parental Involvement

Parents are particularly important for assessing youth for an ED. In terms of a clinical interview, the Eating Disorder Examination has been modified for use with parents (Couturier, Lock, Forsberg, Vanderheyden, & Yen, 2007; Loeb, 2008). Research has demonstrated that parent information is particularly important for diagnosing youth with AN or restrictive-type EDs, given their tendency to underreport dietary restraint and weight concerns (Couturier et al., 2007). If possible, it is best to have both parents present for the evaluation, especially when both are involved in the care of the individual; this sets the tone for the involvement of both parents in the health of the individual and provides comprehensive information about the youth and family from multiple perspectives (Lock & Le Grange, 2013). In terms of a self-report measure for parents, the Questionnaire of Eating and Weight Patterns–Parent (Johnson, Grieve, Adams, & Sandy, 1999) can be used to diagnostically assess the presence of BN and BED in youth, and a parent version of the Eating Disorder Examination-Questionnaire has also been developed (Loeb, 2007).

TABLE 16.2

Self-Report Questionnaires for Assessing Eating Disorders and Their Psychopathology in Children and Adolescents

Questionnaire	Citation	Construct assessed	Number of items	Scale	Strengths and weaknesses
Self-report measures originally developed for adults but used with youth					
Bulimia Test—Revised	Thelen, Farmer, Wonderlich, and Smith, 1991	Symptoms of BN	36	5-point scale, with differing anchors	Demonstrated psychometric properties in youth
Eating Attitudes Test—26	Garner, Olmstead, Bohr, and Garfinkel, 1982	Eating disorder attitudes and behaviors	26	6-point scale ranging from *never* to *always*	Score of 20 indicates a probable eating disorder; limited evidence of reliability and validity in youth
Eating Disorder Diagnostic Scale	Stice, Telch, and Rizvi, 2000	Symptoms of AN, BN, and BED to generate *DSM–IV* diagnoses	22	Uses a combination of Likert-type (0 to 6), yes/no, frequency, and write-in response formats	Demonstrated psychometric properties in youth
Eating Disorder Examination-Questionnaire	Fairburn and Beglin, 1994	Disordered eating thoughts and behaviors over the past 28 days; 4 subscales are generated (i.e., eating concern, shape concern, weight concern, and dietary restraint), as well as a global score and frequencies of eating disorder behaviors (e.g., binge eating and purging)	36	Most items assessed on a 0 to 6 scale, with differing anchors, and others use a write-in response format	Self-report measure that was adapted from the gold standard interview, the EDE; support for its use in youth but provides less accurate information than the EDE
Eating Disorder Inventory	Garner, Olmstead, and Polivy, 1983	Psychological and behavioral traits common in AN and BN; 8 subscales (i.e., drive for thinness, bulimia, body dissatisfaction, ineffectiveness, perfectionism, interpersonal distrust, interoceptive awareness, and maturity fears)	64	6-point scale ranging from *never* to *always*	Some evidence for its psychometric properties in youth

(*continues*)

TABLE 16.2 (*Continued*)

Self-Report Questionnaires for Assessing Eating Disorders and Their Psychopathology in Children and Adolescents

Questionnaire	Citation	Construct assessed	Number of items	Scale	Strengths and weaknesses
Eating Pathology Symptoms Inventory	Forbush et al., 2013	Multidimensional measure of eating pathology; 8 subscales (i.e., body dissatisfaction, binge eating, cognitive restraint, purging, restricting, excessive exercise, negative attitudes toward obesity, and muscle building)	45	5-point scale ranging from *never* to *very often*	Psychometric properties not yet demonstrated in youth
SCOFF	Morgan, Reid, and Lacey, 1999	Screening questionnaire that addresses the core features of AN and BN	5	Yes/no	Can be administered orally or in written form; some evidence for its psychometric properties in youth
Self-report measures developed for youth					
Children's Eating Attitudes Test	Maloney, McGuire, and Daniels, 1988	Eating disorder attitudes and behaviors	26	6-point scale ranging from *never* to *always*	May be reliably used for children as young as 8 years
Eating Disorder Inventory for Children	Garner, 1991	Multidimensional symptoms of eating disorders; 11 subscales (i.e., body dissatisfaction, drive for thinness, bulimia, interoceptive awareness, impulse regulation, asceticism, social insecurity, maturity fears, ineffectiveness, perfectionism, and interpersonal distrust)	91	6-point scale ranging from *never* to *always*	Specifically formulated for children and adolescents and demonstrated psychometric properties in youth
Kids' Eating Disorders Survey	Childress, Brewerton, Hodges and Jarrell, 1993	Eating disorder symptoms in children	14	Yes/no/?	Developed specifically to assess eating disorder symptoms in children and demonstrated psychometric properties in youth

TABLE 16.2 (*Continued*)

Self-Report Questionnaires for Assessing Eating Disorders and Their Psychopathology in Children and Adolescents

Questionnaire	Citation	Construct assessed	Number of items	Scale	Strengths and weaknesses
Questionnaire for Eating and Weight Patterns—Adolescent Version	Johnson, Grieve, Adams, and Sandy, 1999	BN and BED in youth	12	Uses a combination of yes/no and 5-point scales	Generates diagnoses of BN and BED and assesses their behavioral and cognitive features; parent version available
Youth Eating Disorder Examination-Questionnaire	Goldschmidt, Doyle, and Wilfley, 2007	Disordered eating thoughts and behaviors over the past 28 days; 4 subscales are generated (i.e., eating concern, shape concern, weight concern, dietary restraint), as well as a global score and frequencies of eating disorder behaviors (e.g., binge eating and purging)	39	Most items assessed on a 0 to 6 scale, with differing anchors, and others use a write-in response format	Adapted for a third-grade reading level and examples and pictures are provided

Note. BN = bulimia nervosa; AN = anorexia nervosa; BED = binge eating disorder; *DSM–IV = Diagnostic and Statistical Manual of Mental Disorders*, *4th edition*; EDE = Eating Disorder Examination.

Other Essential Components of Eating Disorders Assessment in Youth

In addition to conducting a thorough assessment of the ED symptoms, it is also necessary to gain a complete mental health picture of the patient, which can be facilitated by using a semi-structured interview like the Schedule for Affective Disorders and Schizophrenia for School-Age Children–Present and Lifetime Version (Kaufman et al., 1997). This interview has demonstrated psychometric properties, and it integrates parent and child report for making diagnoses and gathering a comprehensive history. It is also recommended that assessment include a family psychiatric history to understand the history of mental health problems, including eating and other disorders.

Additionally, ED assessment in youth should involve a basic medical examination, including a complete physical as well as laboratory tests, as by the time the patient presents for treatment, there may have been a prolonged period of weight loss and/or binge eating and purging, which can have serious medical consequences. Indeed, EDs can affect every organ system, and serious medical complications can occur at any weight (Campbell & Peebles, 2014). Among low-weight patients, a standard initial assessment should include a complete blood count; an electrolyte battery; an electrocardiogram; liver, kidney, and thyroid function tests; and a dual-energy X-ray absorptiometry to measure bone mineral density. Among individuals who purge, an electrolyte battery and a dental evaluation should be included in the standard evaluation (Crow & Swigart, 2007). These examinations help to assess the degree of illness and chronicity and can also

help to rule out organic causes for weight loss, such as thyroid disease or diabetes. Given the severe, possibly life-threatening effects of EDs, physicians should remain involved throughout the course of treatment, and clinicians need to be aware that at any time the need for acute medical hospitalization may arise (Lock & Le Grange, 2013).

Influencing Factors to Consider

There are additional factors that may influence the diagnosis of EDs in youth. First, as noted, age is an influencing factor, as denial of symptoms is more common among younger individuals with EDs (Couturier & Lock, 2006). Second, although EDs do not discriminate and affect youth across all racial and ethnic groups, individuals from racial/ethnic minority backgrounds are significantly less likely than their White counterparts to receive care, a referral for further evaluation, or to even be asked by a doctor about ED symptoms (Becker, Franko, Speck, & Herzog, 2003; Marques et al., 2011). Additionally, racial/ethnic differences in clinical presentation are apparent (e.g., Black and Asian individuals with AN may not present with body image distortion) and may influence the likelihood of an individual being diagnosed with an ED (Gilbert, 2003). Third, gender may influence the likelihood that a child or adolescent receives an ED diagnosis. Indeed, girls are more likely to receive an ED diagnosis, even when their symptoms are identical to those of boys (Currin, Schmidt, & Waller, 2007). Therefore, clinician bias in the form of perceptions that boys or individuals of certain racial/ethnic minority backgrounds do not have EDs, may be an important barrier to access to care.

Differential Diagnosis

Before concluding that disordered eating symptoms should be attributed to an ED diagnosis, general medical conditions and other psychiatric disorders should be considered. Many serious medical illnesses are associated with substantial weight loss as may be seen in AN, but these are relatively uncommon in children and adolescents (e.g., Crohn's disease, brain tumor, Type I diabetes; Walsh & Satir, 2005). However, the intense fear of weight gain, importance of weight and shape to self-evaluation, and reward associated with weight loss are not characteristic of these conditions. Likewise, there are some medical and neurological conditions that are associated with binge eating (e.g., Kleine-Levin syndrome) but would not be accompanied by overconcern with weight and shape (Walsh & Satir, 2005).

Several other mental health disorders merit consideration before making an ED diagnosis. Notably, it is important to distinguish between ARFID and other EDs. ARFID is a particularly important diagnosis for consideration among youth, with one study indicating that nearly 15% of youth presenting for an ED evaluation receive this diagnosis (Ornstein et al., 2013). Other mental disorders (e.g., major depressive disorder) may be associated with weight loss or other disturbances in eating behavior (e.g., overeating). Likewise, some of the psychological symptoms experienced by those with social phobia, obsessive-compulsive disorder (OCD), and body dysmorphic disorder may resemble features seen among those with AN. However, individuals with these other disorders would not display the same intensity of weight/shape concern as typically seen with an ED (Walsh & Satir, 2005).

PREVALENCE, INCIDENCE, AND COURSE

Work examining the lifetime prevalence of EDs in children and adolescents has found rates for AN ranging from 0.3% to 2.0%, 0.8% to 2.6% for BN, 1.4% to 4.1% for BED, and 3.6% to 11.5% for OSFED among girls (Allen, Byrne, Oddy, & Crosby, 2013; Fairweather-Schmidt & Wade, 2014; Smink, van Hoeken, Oldehinkel, & Hoek, 2014; Stice, Marti, & Rohde, 2013). Limited information is available regarding boys, but existing data suggest that the prevalence of any *DSM–5* ED in boys, including OSFED, ranges from 1.2% to 2.9% (Allen et al., 2013; Smink et al., 2014). Boys typically account for roughly 10% of ED cases (Rosen, 2010), but studies have found that young patients with EDs are more likely to be male than older patients with EDs (Peebles, Wilson, & Lock, 2006).

In longitudinal representative population-based studies, incidence of AN for girls ages 15 to 19 years has been found to be 270 per 100,000

(Keski-Rahkonen et al., 2007) and 300 per 100,000 for BN for girls ages 16 to 20 years (Keski-Rahkonen et al., 2009). Regarding boys, Raevuori et al. (2009) found the incidence of AN in boys ages 10 to 24 years to be 16 per 100,000 in a longitudinal representative population-based study. From clinical registry data, the incidence rate of BN in boys ages 10 to 19 years was reported to be 3 per 100,000 (Currin, Schmidt, Treasure, & Jick, 2005). There are few studies reporting on EDNOS specifically, but Lahortiga-Ramos et al. (2005) found the incidence rate of EDNOS in girls 12 to 22 years to be 2,800 per 100,000. At this juncture, information is not available on incidence of EDs using the specific diagnostic criteria in *DSM–5*.

In terms of course, AN typically begins in adolescence or young adulthood. Early work described a bimodal distribution of age at onset for AN, with two peaks at 14 and 18 years (Halmi, Casper, Eckert, Goldberg, & Davis, 1979). More recent work has identified peak age of onset for AN to be between 15 and 19 years (Micali, Hagberg, Petersen, & Treasure, 2013) or 18 and 20 years (Stice et al., 2013; Volpe et al., 2016). Cases of early onset, prior to puberty commencing, have also been identified (Russell, 2013). The course of AN is variable, with some individuals recovering after one episode and others experiencing a chronic course or periods of recovery and relapse (American Psychiatric Association, 2013). A review indicated that less than half (46%) of individuals with AN fully recover and 20% experience a chronic course, but younger age at onset of illness is associated with better outcome (Steinhausen, 2002). AN has a mortality rate of at least 5% to 6% (Steinhausen, 2002)—the highest mortality rate of any psychiatric disorder (Sullivan, 1995).

BN also typically begins in adolescence or young adulthood, with the peak age of onset between 15 and 20 years (Micali et al., 2013; Stice et al., 2013; Volpe et al., 2016). Onset before puberty is uncommon (American Psychiatric Association, 2013). Course may be chronic or intermittent (American Psychiatric Association, 2013), and a review indicated that less than half (45%) of individuals with BN exhibit full recovery (Steinhausen & Weber, 2009). Notably, crossover to other EDs in the course of BN occurs in a minority of cases (10%–32%), with crossover to an unspecified ED most common (Steinhausen & Weber, 2009). Although the mortality rate of BN is lower than that of AN (2%; Fichter & Quadflieg, 2004), the risk of suicide and suicide attempts is higher (Herpertz-Dahlmann, 2009).

BED usually begins in adolescence or young adulthood but is more likely than the other EDs to develop later in life. Notably, recovery rates in natural course and treatment outcome studies are higher for BED than for AN or BN. Fairburn, Cooper, Doll, Norman, and O'Connor (2000) found that only 18% of individuals with BED in the community retained a clinical ED diagnosis at 5-year follow-up. Crossover from BED to other EDs is relatively uncommon (American Psychiatric Association, 2013). Children who experience LOC eating, regardless of amount of food, are more likely to develop full or subthreshold BED; LOC eating is a concerning precursor for the development of this disorder (Tanofsky-Kraff et al., 2011).

COMMON MENTAL HEALTH COMORBIDITIES

Youth with EDs often present with at least one other mental disorder and even more have met criteria for a comorbid mental health disorder at some point in their lives. Indeed, one study found that 55% of adolescents with AN, 88% with BN, and 84% with BED met criteria for at least one other *DSM–IV* disorder (Swanson, Crow, Le Grange, Swendsen, & Merikangas, 2011). More specifically, Swanson et al. (2011) demonstrated that among adolescents with BN or BED, respectively, 50% or 45% had a lifetime mood disorder, 66% or 65% had a lifetime anxiety disorder, 20% or 27% had a lifetime substance abuse or dependence disorder, and 58% or 43% had a lifetime behavioral disorder. Bühren et al. (2014) found that nearly 50% of adolescents with AN met criteria for at least one comorbid psychiatric disorder, with mood and anxiety disorders being the most common comorbidities. The binge–purge subtype was associated with increased rates of psychiatric comorbidity relative to the restricting subtype (Bühren et al., 2014). Similarly, Root et al. (2010) found that substance use disorders were more common among those with the binge–purge vs. the restricting

subtype of AN. EDs with binge and/or purge behaviors may be associated with the highest levels of psychiatric comorbidity. Retrospective studies indicate that many individuals with EDs had an anxiety disorder in childhood prior to the onset of their ED, with OCD and social phobia being most common, supporting the possibility that childhood anxiety may be one vulnerability factor for the development of an ED (Kaye et al., 2004).

A growing body of literature suggests that attention-deficit/hyperactivity disorder (ADHD) is also an important ED comorbidity. Biederman et al. (2007) found that girls with ADHD were 3.6 times more likely to meet criteria for an ED compared with girls without ADHD. Results from a nationally representative sample also suggested that those with clinical ADHD were more likely to experience a clinical ED (Bleck, DeBate, & Olivardia, 2014).

ETIOLOGY

There is general agreement in the field that the etiology of EDs is multifactorial and is influenced by biological, psychological, and social factors. EDs are understood using a biopsychosocial framework (Polivy & Herman, 2002).

In terms of biology, evidence exists that EDs are biologically-based, serious mental health problems (Klump et al., 2009). First, EDs run in families, and twin studies reveal that additive genetic factors account for 40% to 60% of liability to AN, BN, and BED (Trace, Baker, Peñas-Lledó, & Bulik, 2013). Additionally, neurobiological abnormalities are present among those with EDs (e.g., alterations in the dopaminergic and serotonergic systems, disturbances of higher-order circuits related to reward), but it is unclear whether these features contribute to the development of EDs or are their result—whether they are "traits" or "scars" (Kaye, Wierenga, Bailer, Simmons, & Bischoff-Grethe, 2013). Research is also ongoing to identify specific alterations in gene expression that may be involved in ED development (Trace et al., 2013). Temperament is considered biologically based and may contribute to ED risk as well, with harm avoidance and persistence emerging as particularly important facets (Atiye, Miettunen, & Raevuori-Helkamaa, 2015). Finally, gender should be considered an important risk factor given the preponderance of EDs in girls (Jacobi, Hayward, de Zwaan, Kraemer, & Agras, 2004).

Several psychological risk factors have been identified. First, body dissatisfaction or weight concerns has emerged as one of the most consistent and robust risk factor for EDs (Jacobi et al., 2004; Stice, 2002). For example, Killen et al. (1996) found that adolescent girls scoring in the highest quartile on weight concerns had the highest incidence (10%) of EDs over 4 years compared with none of the girls in the lowest quartile. Second, negative emotionality, including tendencies to experience depression or anxiety, negative self-evaluation, and low self-esteem, has also been identified as an important risk factor for EDs (Jacobi et al., 2004; Keel & Forney, 2013; Polivy & Herman, 2002; Stice, 2002). Third, perfectionism, a personality trait typified by striving for flawlessness, is a risk factor for EDs in that it may promote an individual's relentless pursuit of the thin ideal (Stice, 2002). Fourth, dieting may contribute to the onset of an ED in that either the caloric deprivation associated with dieting may trigger binge eating as a way to counteract reduced caloric intake; violating dietary rules may result in disinhibited eating; or dieting may contribute to negative affect, which in turn may contribute to disordered eating (Polivy & Herman, 2002; Stice, 2002). Fifth, thin-ideal internalization or the extent to which an individual "buys into" societal ideals of attractiveness is an important causal risk factor for not only body dissatisfaction but also eating disturbance (Stice, 2002). Sixth, impulsivity may leave an individual vulnerable to episodes of binge eating, and relatedly, substance use has also been found to be a risk factor for development of an ED (Stice, 2002). Finally, other cognitive and personality features may contribute to ED development, including obsessive thoughts and need for control (Polivy & Herman, 2002).

Social factors contribute to ED development. As suggested by data showing an increase in disordered eating after the introduction of television in Fiji, cultural context, including a high emphasis on the thin ideal, may be one contributor to ED development (Becker, Burwell, Gilman, Herzog, & Hamburg, 2002). However, cultural context is not a

specific causal factor as most people in cultures that value thinness do not develop EDs. Family factors, including criticism, may also play a role in ED etiology, but current research refutes the idea that family is an exclusive or even primary causal risk factor (Le Grange, Lock, Loeb, & Nicholls, 2010). Peer influence is an important risk factor as well, with friends' dieting being predictive of use of unhealthy and extreme weight control behaviors and binge eating in girls 5 years later (Eisenberg & Neumark-Sztainer, 2010).

Other factors that have been identified as contributing to ED development include early childhood eating and gastrointestinal problems, sexual abuse and other adverse experiences, general psychiatric morbidity, and elevated BMI (Hilbert et al., 2014; Jacobi et al., 2004; Stice, 2002). In sum, the etiology of EDs should be considered multifactorial, including a combination of genetic, biological, and temperamental vulnerabilities that may interact with psychological, social, and environmental factors to increase risk (Klump et al., 2009).

EVIDENCE-BASED TREATMENTS

Several treatment approaches for children and adolescents with EDs have been investigated, and treatments are categorized as well-established, probably efficacious, possibly efficacious, or experimental based on guidelines used in the most recent review on evidence-based psychosocial treatments for EDs in youth (Lock, 2015). See Table 16.3 for an overview.

Anorexia Nervosa

Although treatment studies of childhood and adolescent EDs remain few in number, treatment for youth with AN is the most studied, and a number of randomized controlled trials (RCTs) have been conducted (i.e., Agras et al., 2014; Eisler et al., 2000; Geist, Heinmaa, Stephens, Davis, & Katzman, 2000; Godart et al., 2012; Gowers et al., 2007; Le Grange, Eisler, Dare, & Russell, 1992; Le Grange et al., 2016; Lock, Agras, Bryson, & Kraemer, 2005; Lock et al., 2010; Madden et al., 2015; Robin et al., 1999; Russell, Szmukler, Dare, & Eisler, 1987). Collectively, these studies indicate that family-based treatment (FBT) is the most well-established treatment for youth with AN (Keel & Haedt, 2008; Lock, 2015).

Family-based treatment. FBT is a well-established treatment for youth with AN (Lock, 2015) and is often referred to as the "Maudsley method" to pay homage to the original development and testing of FBT at the Maudsley Hospital in London. Two early studies indicated its superiority to individual therapy. First, Russell et al. (1987) compared FBT with individual supportive therapy. Although both treatments were efficacious, adolescents with a short duration of AN (i.e., less than 3 years) who received FBT had a significantly higher weight at the end of treatment

TABLE 16.3

Evidence-Based Psychological Treatments for Eating Disorders in Youth

	Anorexia nervosa	Bulimia nervosa	Binge eating disorder
Well-established treatments	Family-based treatment	None	None
Probably efficacious treatments	Systemic family therapy; adolescent-focused therapy	None	None
Possibly efficacious treatments	None	Family-based treatment; cognitive–behavioral therapy guided self-help	Internet-facilitated cognitive–behavioral therapy–self-help
Experimental treatments	Cognitive–behavioral therapy; cognitive remediation therapy	Supportive psychotherapy; cognitive–behavioral therapy	Interpersonal psychotherapy; dialectical behavior therapy

Note. From "An Update on Evidence-Based Psychosocial Treatments for Eating Disorders in Children and Adolescents," by J. Lock, 2015, *Journal of Clinical Child and Adolescent Psychology*, *44*, p. 714. Copyright 2015 by Taylor and Francis. Adapted with permission.

than those randomized to individual supportive therapy (Russell et al., 1987). Second, Robin et al. (1999) compared FBT with individual ego-oriented individual therapy, which included a focus on adolescent self-efficacy, self-awareness, and autonomy. FBT was superior in terms of weight gain and return of menses at the end of treatment and at a 1-year follow-up, but both treatments produced comparably large improvements in eating-related cognitions and more general psychopathology. Initial studies examining family therapy for AN were similar in their approach, but the exact protocol used differed depending on the study (e.g., Eisler et al., 2000; Le Grange et al., 1992; Russell et al., 1987). There is now one treatment manual for FBT that is widely used by clinicians (Lock & Le Grange, 2013).

The basic tenants of FBT include (a) the family is not blamed as the cause of the illness—FBT takes an agnostic stance on ED etiology and externalizes the disorder from the patient; (b) the adolescent is embedded in the family and the parents' involvement in therapy is vitally important for the ultimate success of the treatment; therefore, parents are tasked with taking charge of and facilitating weight gain in their malnourished child; (c) the entire family is an important part of treatment success and recovery from the ED; and (d) normal adolescent development is seen as having been interrupted by AN (Lock & Le Grange, 2013).

FBT is marked by three phases (Lock & Le Grange, 2013). Phase 1 is devoted to weight restoration of the youth; the therapist tasks parents with this responsibility and supports and reinforces their efforts to refeed their child. The transition to Phase 2 occurs when the youth can take back control of eating and his or her weight, with therapist and parental oversight. During this phase, the focus remains on the youth's ED symptoms in addition to other significant family issues. Phase 3 addresses issues related to adolescence (e.g., puberty, appropriate family boundaries, the transition to being given more personal autonomy) with disordered eating symptoms no longer a central topic.

In a study comparing the efficacy of FBT and adolescent-focused therapy (AFT), an individual treatment for adolescents with AN, Lock et al. (2010) found no statistically significant difference in remission rates between the two treatments at the end of treatment. However, FBT was superior to AFT in terms of maintaining remission status at 6- and 12-month follow-ups. More recently, Agras et al. (2014) investigated the relative efficacy of a specific focus on ED symptoms and behaviors as targeted in FBT compared with systemic family therapy, with its more general focus on the family system. Findings supported both forms of family therapy for adolescent AN but highlighted some advantages of FBT: it was rated as more acceptable to parents; it produced more rapid patient weight restoration; and it was associated with reduced use of hospitalization, which inherently lowers the cost of treatment.

Notably, three RCTs have investigated whether the family should be considered a single unit or whether parents should be seen separately from the youth. First, Le Grange et al. (1992) compared conjoint FBT to parents and the youth being seen separately during the therapy session (Le Grange et al., 1992). Both forms of treatment brought about similar benefits. Second, Eisler et al. (2000) also compared conjoint to separated family therapy and found that both worked similarly in terms of nutritional and psychological improvements and global outcome. However, a moderator effect revealed that for patients with high levels of maternal criticism, separated family therapy was more beneficial. Third, Le Grange et al. (2016) evaluated the relative efficacy of FBT and parent-focused treatment (PFT), where the therapist met with the parents only while a nurse monitored the youth. PFT was more efficacious than FBT in precipitating remission; however, differences in remission rates were not apparent at follow-up. Collectively, these studies indicate that treatment for youth with AN that separates parents from the patient may be just as, if not more, efficacious than conjoint treatment.

Systemic family therapy. Systemic family-therapy is considered probably efficacious for the treatment of youth with AN (Agras et al., 2014; Godart et al., 2012; Lock, 2015). Although similar to FBT in its philosophy to involve parents and family members in the treatment of adolescent AN, systemic family therapy differs significantly from FBT in that the

treatment focuses specifically on the family system instead of disordered eating behavior or normalization of weight (although the therapist will help the family address these issues if they so choose). The therapist adopts a neutral stance and facilitates communication among the family. Systemic family therapy assumes difficulties are precipitated not in individuals themselves but in the relationships, interactions, and communication patterns that develop between individuals in a family system. The treatment assumes and highlights existing family strengths and builds on them to aid in recovery and empowerment, as well as to foster problem solving in the context of the family's issues that brought them to therapy (Agras et al., 2014). Godart et al. (2012) compared posthospitalization outcome for adolescents with AN who received treatment as usual or treatment as usual plus a form of systemic family therapy. Among completers, those who received family therapy demonstrated greater rates of good and intermediate outcomes.

Adolescent-focused therapy. AFT, which was originally described by Robin et al. (1999) as ego-oriented individual therapy, is also considered a probably efficacious treatment for adolescent AN (Lock, 2015; Lock et al., 2010; Robin et al., 1999). AFT theorizes that individuals with AN have ego deficits and difficulty clarifying biological needs from self-control (Lock et al., 2010). Patients learn to identify and describe emotions and how to tolerate negative affect rather than escaping it with starvation. Phase 1 is marked by establishing rapport, assessing motivation, and developing the patient formulation. The therapist promotes normal eating by encouraging patients to discontinue dieting and promotes weight gain by setting weight goals. Until the patient is weight restored, weight gain is actively discussed and encouraged. The patient is asked to take responsibility for food-related issues instead of tasking parents with this charge. The therapist encourages patients to explore and interpret their behaviors, emotions, and motives, and helps them distinguish emotions from bodily needs. Phase 2 promotes separation and individuation and seeks to increase tolerance of negative mood. Phase 3 marks the end of treatment and focuses on termination (Lock et al., 2010).

Cognitive–behavioral therapy. Cognitive–behavioral therapy–enhanced (CBT-E) is considered an experimental treatment for youth with AN (Dalle Grave, Calugi, Doll, & Fairburn, 2013; Fairburn, 2008; Lock, 2015). CBT-E was originally developed for adults with EDs but has since been adapted for treating adolescents with AN. CBT-E has three phases and emphasizes the core ED psychopathology of overvaluation of body weight and shape, and routinely involves the patient's parents (Fairburn, 2008). Phase 1 of CBT-E is marked by the adolescent being prompted to explore the current state of their life and the experience of maintaining the ED, followed by the adolescent being gently challenged to consider the advantages and disadvantages of addressing the illness. If the patient is willing and motivated to proceed with treatment, the initiation of Phase 2 begins with emphasis on weight restoration through the promotion of regular eating while continuing to address other ED psychopathology (e.g., body dissatisfaction). Homework is regularly assigned throughout treatment. Phase 3 is entered into when the youth has made good progress and the emphasis can be shifted to maintenance of the changes made. A benchmarking study on CBT-E for youth with AN revealed that CBT-E produced considerable increases in weight and significant reductions in ED psychopathology (Dalle Grave et al., 2013). Further, patients could maintain their treatment progress with little change over the 60-week posttreatment follow-up period.

Cognitive remediation therapy. Cognitive remediation therapy (CRT; Dahlgren, Lask, Landrø, & Rø, 2013; Pretorius et al., 2012; Wood, Al-Khairulla, & Lask, 2011) shows promise and is considered an experimental treatment for youth with AN (Lock, 2015). CRT addresses cognitive processes that are theorized to maintain the rigid thinking (e.g., dysfunctional attention to detail, difficulties with cognitive flexibility, set shifting, central coherence, and general ability to see the "bigger picture") shown to be present in patients with AN (McAnarney et al., 2011), instead of focusing directly on the ED symptoms or psychopathology (Pretorius et al., 2012). Therefore, CRT is an adjunctive treatment with the hope to increase motivation and cognitive

abilities to maximize efficacy of other ED treatments (Baldock & Tchanturia, 2007). CRT uses cognitive exercises with the aim to alter dysfunctional cognitive patterns and strengthen thinking skills (e.g., cognitive flexibility, "bigger picture" thinking strategies). In a pilot study, Pretorius et al. (2012) found a small effect of increased cognitive flexibility at the end of a CRT group. Dahlgren et al. (2013) also examined the effects of CRT in terms of neuropsychological functioning in adolescents with AN. CRT showed significant improvements in weight, depression, visio-spatial memory, perceptual disembedding abilities, and verbal fluency (Dahlgren et al., 2013). More research is needed to better understand the benefits of CBT-E and CRT when treating adolescents with AN.

Bulimia Nervosa

To date, the evidence base for treatment for youth with BN is limited compared with AN, with only three published RCTs examining psychosocial interventions for this patient population. Two possibly efficacious and two experimental treatments have been identified (Lock, 2015).

Family-based treatment. FBT has been identified as a possibly efficacious treatment for youth with BN (Le Grange, Crosby, Rathouz, & Leventhal, 2007; Le Grange, Lock, Agras, Bryson, & Jo, 2015; Lock, 2015). FBT-BN is similar to the FBT treatment for youth with AN, but with a stronger emphasis in Phase 1 on regulating eating and eliminating binge eating and purging as opposed to weight restoration. Further, the adolescent maintains some control over their eating in addition to parental involvement, instead of complete control over eating put in the parents' hands. Compared with supportive psychotherapy for adolescents with BN, Le Grange et al. (2007) found FBT-BN to be superior on abstinence from binge eating and purging at posttreatment and a 6-month follow-up. Further, FBT-BN more rapidly reduced core bulimic symptoms compared with supportive psychotherapy. Additionally, Le Grange et al. (2015) compared FBT-BN and CBT for adolescents (CBT-A) for the treatment of adolescent BN. FBT-BN showed short-term superiority and brought about higher binge eating and purging abstinence rates at the end of treatment and a 6-month follow-up; however, abstinence rates did not differ between treatment groups at a 12-month follow-up.

Cognitive–behavioral therapy guided self-help. CBT guided self-help (CBTgsh) has also been identified as a possibly efficacious treatment for youth with BN (Lock, 2015; Schmidt & Treasure, 1997). CBTgsh is a workbook-based psychosocial intervention that was adapted from a self-help treatment for adult patients with BN (Schmidt & Treasure, 1997). The therapist and patient meet weekly, with the therapist's role being to motivate the patient and guide him or her through the workbook. CBTgsh establishes patient motivation to change in the beginning of treatment and focuses on the function of BN in the patient's life. Thoughts, feelings, and behaviors are self-monitored to illuminate to the patient the patterns that emerge between these constructs and how their ED symptoms are maintained. Patients are tasked with problem solving through behavioral experiments and goal setting to help recognize and intervene in the vicious cycle of binge eating and compensatory behaviors. Homework is regularly assigned throughout treatment, and follow-up sessions occur after the core weekly sessions to give attention to relapse prevention. Schmidt et al. (2007) compared the efficacy and cost-effectiveness of FBT-BN and CBTgsh in adolescents with BN. At the end of treatment, CBTgsh produced significantly greater reductions in binge eating; however, treatment effects were comparable at a 6-month follow-up. No other treatment group differences emerged. One notable advantage of CBTgsh was the lower direct cost compared with FBT-BN.

Supportive psychotherapy. Supportive psychotherapy has been identified as an experimental treatment for youth with BN (Lock, 2015). Supportive psychotherapy was designed as a comparison condition for FBT-BN and was intentionally designed to have no overlap with cognitive–behavioral, interpersonal, or analytic therapy (Le Grange et al., 2007). Phase 1 of this treatment seeks to establish a strong therapeutic alliance, gather personal and family history, and understand the development and course of the ED. The patient is also encouraged to identify underlying issues that might have contributed to the

start and maintenance of the illness. Phase 2 emphasizes emotional problems and encourages the patient to express his or her feelings. To foster independence and empowerment, the patient is responsible for generating topics for discussion during sessions. During Phase 3, important discoveries from the initial phases are reviewed, including underlying issues that maintain disordered eating symptoms. The patient and therapist discuss how these issues continue to impact the patient's journey toward ED recovery and how he or she might address similar problems if they arise in the future. Although Le Grange et al. (2007) found FBT-BN to be superior to supportive psychotherapy, the treatment produced improvements in binge eating and purging episodes and ED psychopathology.

Cognitive–behavioral therapy. CBT is an experimental treatment for youth with BN, with encouraging preliminary results. As previously mentioned, CBT-A was implemented in a recent RCT (Le Grange et al., 2015). CBT-A was derived from the Fairburn and colleagues CBT for adult BN treatment manual (Fairburn, Marcus, & Wilson, 1993) and follows three treatment phases. Significant treatment modifications from CBT for adult BN include an initial focus on therapeutic alliance as demonstrated through increased contact with a therapist; conjoint sessions with parents to provide psychoeducation about BN and foster their support of the treatment; use of concrete examples; and exploration of developmental issues (e.g., autonomy) in the context of BN (Le Grange et al., 2015). Le Grange et al. (2015) found FBT-BN was superior to CBT-A in the short-term, but treatment effects were indistinguishable at a 12-month follow-up. Further, CBT-A precipitated significant reductions in binge eating and purging rates (Le Grange et al., 2015).

Binge Eating Disorder

To date, there is a notable paucity of RCTs and treatment research conducted among youth with BED (Lock, 2015). One possibly efficacious and two experimental treatments have been identified, although more research in this area is warranted.

Internet-facilitated cognitive–behavioral therapy–self-help. Internet-facilitated CBT–self-help has been identified as a possibly efficacious treatment for youth with BED (Jones et al., 2008; Lock, 2015). Jones et al. (2008) investigated an Internet-facilitated CBT–self-help intervention for binge eating and weight maintenance in adolescents. The intervention combined psychoeducation and behavioral interventions, including self-monitoring, goal setting, stimulus control, and appetite awareness, as well as introduced emotion regulation skills. Weekly letters were sent to participants to reinforce participation, and the program included an asynchronous moderated discussion group. Those who received the Internet-facilitated intervention had significantly lower BMI *z* scores and BMI from baseline to follow-up, compared with the waitlist control group. Further, those randomized to the Internet-facilitated intervention had significant reductions in objective binge episodes, subjective binge episodes, and weight and shape concerns from baseline to posttreatment and from baseline to follow-up.

Relatedly, DeBar et al. (2013) conducted a pilot study of an in-person CBT group in a sample of adolescents who reported current binge eating with or without compensatory behaviors. Participants randomized to the CBT group reported significantly fewer binge eating episodes at posttreatment compared with those in the treatment-as-usual/delayed treatment control group. Additional studies regarding the efficacy of in-person CBT for youth with BED are needed.

Interpersonal psychotherapy. Interpersonal psychotherapy (IPT) is an experimental treatment for youth with BED (Lock, 2015; Tanofsky-Kraff et al., 2010, 2014). IPT for the prevention of weight gain (IPT-WG; Tanofsky-Kraff et al., 2010) was adapted from the IPT-Adolescent Skills Training manual for the prevention of depression (Young & Mufson, 2003) and IPT for the treatment of adult BED (Wilfley, MacKenzie, Welch, Ayres, & Weissman, 2000). At the beginning of treatment, the youth's symptoms are conceptualized in one of four problems areas: interpersonal deficits, interpersonal role disputes, role transitions, or grief. IPT-WG consists of three phases. Phase 1 emphasizes psychoeducation, provides the theoretical rationale for the treatment approach, and develops rapport between group

members. Phase 2 is marked by fostering interpersonal skills that can be applied to different relationships within the youth's identified interpersonal problem area, and group members are encouraged to share personal relationship experience and develop improved communication. In Phase 3, group members prepare to terminate and plan to work on future goals. A hallmark feature of the treatment is to continually link episodes of LOC eating and overeating to the maladaptive interpersonal context, which has contributed to and helps maintain symptoms (Tanofsky-Kraff et al., 2010). In a pilot study with adolescent girls at-risk for excess weight gain with and without LOC eating, Tanofsky-Kraff et al. (2010) compared IPT-WG with a standard-of-care health education group. IPT-WG produced significantly greater reductions in LOC eating than the health education group (Tanofsky-Kraff et al., 2010). In a more adequately powered RCT, Tanofsky-Kraff et al. (2014) compared IPT-WG with a health education group among adolescent girls at high risk of obesity and EDs based on BMI and reported LOC eating. Both groups had significant reductions in expected BMI gain, percent of body fat, symptoms of depression and anxiety, and LOC eating frequency over a 12-month follow-up, but IPT-WG was more efficacious than health education at reducing objective binge eating at a 12-month follow-up (Tanofsky-Kraff et al., 2014).

Dialectical behavioral therapy. Safer, Couturier, and Lock (2007) developed an adolescent-specific version of dialectical behavioral therapy (DBT) for the treatment of BED. Results of the case report provide preliminary support that DBT may be a therapeutic option for adolescents with BED, making it an experimental treatment, but it must be systemically studied further. The adapted DBT for adolescent BED was modeled heavily after DBT for BED in adults, with some important modifications (e.g., meeting conjointly with patient and parents in the first part of the initial session). In this adapted treatment, the first half of every session reviews the patient's practice of DBT skills and behavioral chain analysis from the prior week, with the remainder of the session spent focusing on the acquisition of new skills. The behavior chain analysis is a key tool used throughout treatment to thoroughly analyze a problematic eating behavior, examine what triggered the episode, identify factors that made the adolescent especially vulnerable, review the behavioral "steps" (or "links" of the chain) that led to the episode, and generate behaviors the patient could do in the future to replace the problematic eating behavior. If the patient identifies parental interactions as a key link in the behavioral chain, parents are invited to join treatment for a family session. The use and consistency of family sessions depends on the individual adolescent. Skills covered in treatment include distress tolerance, mindfulness, emotion regulation, and interpersonal effectiveness.

Early Treatment for Eating Disorders

Notably, long-term outcome data have consistently illuminated the benefit of early treatment for EDs. Shorter latency between onset and start of treatment is associated with better outcomes, and likewise, longer duration is associated with lower remission rates (Loeb, Craigen, Goldstein, Lock, & Le Grange, 2011). Further, untreated EDs tend to take a more chronic and debilitating course (Lewinsohn, Striegel-Moore, & Seeley, 2000). These findings highlight that seeking treatment early in ED onset is critical. As such, eating pathology in children and adolescents should not go ignored, and these problems should be treated as quickly as possible to ensure the greatest chance at lasting recovery.

PHARMACOLOGICAL INTERVENTIONS FOR EATING DISORDERS

To date, there is a lack of scientific data to document an evidence-based pharmacological treatment for children and adolescents with EDs, and there are currently no FDA-approved pharmacological treatments for youth with these problems (Powers & Cloak, 2012). Treatment guidelines suggest psychosocial and medical interventions should be the first line of treatment for this patient population (van den Heuvel & Jordaan, 2014), and weight restoration should be addressed first in underweight individuals (Reinblatt, Redgrave, & Guarda, 2008). It is recommended that medication only be prescribed prudently and with thorough consideration given

the lack of empirical support in this area (van den Heuvel & Jordaan, 2014).

Research on pharmacological treatment for youth with AN has mostly investigated atypical antipsychotics (e.g., olanzapine, quetiapine) and antidepressants (e.g., fluoxetine; van den Heuvel & Jordaan, 2014). A case series review evaluated the use of atypical antipsychotics in this patient population, and concluded that they generally have beneficial effects on psychopathology (e.g., anxiety and rigidity) with limited negative side effects, but that further research is needed (Mehler-Wex, Romanos, Kirchheiner, & Schulze, 2008). Likewise, in a retrospective naturalistic study of youth with AN, the use of medication (mostly antidepressants) was associated with improvements in ED behaviors, weight, mood, and obsessive symptoms with limited adverse effects (Rossi et al., 2007). However, other studies have found no benefit of adding an antidepressant to psychological treatment for adolescents with AN (Attia, Haiman, Walsh, & Flater, 1998; Holtkamp et al., 2005; Kaye et al., 2001). Currently there is no clear evidence to recommend the addition of medication to psychological interventions in treating youth with AN, except in cases where pharmacotherapy is used to treat comorbid conditions (Aigner, Treasure, Kaye, & Kasper, 2011).

Few studies have formally investigated pharmacotherapy in youth with BN, but one study found that the addition of 60 mg of fluoxetine to supportive psychotherapy in an open trial led to significantly decreased binge eating and purging episodes and was well tolerated (Kotler, Devlin, Davies, & Walsh, 2003). Although fluoxetine is not FDA-approved to treat youth with BN, it is approved for use with adults with BN and is FDA-approved to treat depression and OCD in youth. Despite the dearth of evidence, taken together, these results and the relatively robust evidence for using fluoxetine in the treatment of adult BN (Powers & Cloak, 2012), fluoxetine as part of a multimodal treatment plan in patients with significant comorbid mood symptoms or in psychotherapy nonresponders may be judiciously considered (Mitchell, Roerig, & Steffen, 2013; van den Heuvel & Jordaan, 2014). To date no studies have systematically evaluated pharmacotherapy for BED in children and adolescents (van den Heuvel & Jordaan, 2014).

PREDICTORS AND MODERATORS OF TREATMENT RESPONSE

A few key treatment response predictors have been identified for youth with EDs. First, parental criticism of the youth with AN can adversely affect the family's ability to remain in treatment and overall treatment outcomes (Eisler et al., 2000; Le Grange et al., 1992). High levels of expressed emotion, a marker of parental criticism, in mothers predicted early dropout from family therapy but not from individual treatment (Szmukler, Eisler, Russell, & Dare, 1985). Conversely, parental warmth increased the likelihood of a better treatment outcome for adolescents with AN (Le Grange, Hoste, Lock, & Bryson, 2011). Given these findings, it is of the utmost important to address family criticism during therapy sessions, and therapists should attempt to facilitate family warmth by eliciting empathy from family members. Furthermore, adolescents with AN who come from highly critical families may benefit from separated family therapy (Le Grange et al., 1992). Second, early weight gain in AN treatment may be a critical indicator of short- and long-term treatment outcomes, as rapid response to treatment, indicated by a weight gain of approximately 2kg by Session 4, was a strong predictor of attaining recovery by the end of FBT (Doyle, Le Grange, Loeb, Doyle, & Crosby, 2010). Further, Lock et al. (2013) found that reaching 95% of expected BMI by the end of FBT was a strong predictor of recovery at long-term follow-up. These findings highlight the importance of fostering early change among youth with AN. Third, brief duration of illness and earlier age of onset may be important predictors of treatment response, with Agras et al. (2014) finding that such patients gained more weight in two forms of family treatment.

Several treatment moderators have been identified for youth with AN. Moderators identify which psychosocial intervention works best for whom or under what circumstances (Kraemer, Wilson, Fairburn, & Agras, 2002). Le Grange et al. (2012) found that having higher eating-related

obsessionality or global ED pathology predicted patients benefitting more from FBT rather than AFT, and Agras et al. (2014) found that individuals with greater obsessive-compulsive symptoms gained significantly more weight with systemic family therapy compared with FBT by the end of treatment. Finally, in their recent RCT for youth with AN comparing FBT and PFT, Le Grange et al. (2016) found no moderators for end of treatment outcome. However, dietary restraint, eating concern, shape concern, global ED psychopathology, eating-related obsessive-compulsive features, and duration of illness were moderators of treatment effect at 12-month follow-up. Individuals with elevated ED-related obsessions and compulsions did better in FBT, but those with lower scores on these measures did markedly better in PFT.

Le Grange, Crosby, and Lock (2008) evaluated predictors and moderators of treatment outcome for adolescents with BN who participated in FBT-BN or individual supportive psychotherapy. Participants with less severe eating concerns at baseline were more likely to have remitted after treatment and at follow-up, regardless of treatment received. Adolescents with lower depressive symptoms at baseline were more likely to be partially remitted after treatment. In terms of moderators, participants with less severe global ED psychopathology receiving FBT-BN were more likely to be partially remitted at follow-up, suggesting that FBT-BN may be most helpful for individuals with less severe ED pathology (Le Grange et al., 2008). Furthermore, Le Grange et al.'s (2015) RCT for adolescent BN identified family environment conflict as a treatment effect moderator, such that those with less conflict responded better to FBT-BN compared with CBT-A. This study also found that boys, individuals with lower eating-related obsessionality, and individuals reporting higher family cohesion all showed better ED abstinence rates at the end of treatment (Le Grange et al., 2015).

PREVENTION

ED prevention involves the reduction or elimination of key, modifiable risk factors for EDs and/or the promotion of factors that are protective against EDs and can be done at multiple levels: individual, family, group, institutional, community, or societal (Neumark-Sztainer, 2011). Further, prevention efforts can be divided into two main types: primary prevention, which targets the whole population with the aim to prevent the onset of an ED before any sign of the disorder occurs, and secondary prevention, which targets individuals at high risk of developing an ED who are already starting to show symptoms and includes early identification and intervention to prevent the occurrence of a full-blown ED.

Most prevention programs for youth have been implemented at the school level, which provides easy access to children of diverse backgrounds. Several reviews have been conducted on the effectiveness of ED prevention programming, with findings suggesting that these programs have modest success in decreasing risk factors and increasing protective factors and that further work is needed to improve program effectiveness (e.g., Holt & Ricciardelli, 2008; Pratt & Woolfenden, 2002; Stice, Shaw, & Marti, 2007). Larger effects are found for programs that are secondary (vs. primary) prevention, interactive (vs. didactic), multisession (vs. single session), offered to only girls (vs. co-ed), offered to participants over age 15 (vs. younger participants), and delivered by professional interventionists (vs. endogenous providers; Stice et al., 2007). Furthermore, a recent systematic review indicated that a small number of prevention studies including parents have led to reductions in ED risk factors, suggesting that it may be of value to determine how to creatively and effectively engage parents in future prevention efforts (Hart, Cornell, Damiano, & Paxton, 2015).

Importantly, the availability and use of computers, the Internet, and mobile phones has expanded tremendously in recent years. In 2015, over 90% of teens ages 13 to 17 reported going online daily, including 24% who reported being online "almost constantly" (Lenhart, 2015). There is great potential for the Internet to serve as a vehicle to provide psychological interventions (Kendall, Carper, Khanna, & Harris, 2015), including programs to prevent EDs. Using the Internet for intervention has numerous purported benefits including lack of geographic boundaries, allowing for widespread dissemination and the ability to reach individuals

who may otherwise have limited access to prevention programming; easily accessible from anywhere at any time; cost and time efficient; anonymity; and high user acceptability (Aardoom, Dingemans, Spinhoven, & Van Furth, 2013). Research indicates that Internet-based prevention programs can effectively decrease ED risk factors in youth (e.g., My Body, My Life, [Heinicke, Paxton, McLean, & Wertheim, 2007]; Student Bodies [Abascal, Brown, Winzelberg, Dev, & Taylor, 2004]), and the Internet is increasingly being used for intervention as well. For example, Aardoom et al. (2016) found that a fully automated Internet-based self-monitoring and feedback intervention was effective in reducing ED and comorbid psychopathology among youth 16 years and older with self-reported ED symptoms. The Internet and mobile technology holds great promise for the ED intervention in youth, but a challenge is keeping up with technology and user preferences.

FUTURE DIRECTIONS

In recent decades, the evidence base for understanding and treating youth with EDs has increased dramatically. However, there are still too few treatment studies to provide sufficient understanding. Further, AN has received most of the empirical attention, leaving a plethora of unanswered questions particularly when it comes to treating youth with BN, BED, and other EDs.

Additionally, although it is important to continue to examine and improve interventions for youth with EDs, the next imperative step is to disseminate and implement these evidence-based treatments into community and clinical settings. Indeed, a major barrier to effectively treating youth with EDs is the lack of adoption of evidence-based interventions in settings in which these patients are usually seen (Novins, Green, Legha, & Aarons, 2013). Dissemination and implementation science is a burgeoning field that seeks to distribute materials and information to a clinical practice audience with the goal of increasing the routine use of evidence-based care (Novins et al., 2013). Given the limited nature of the literature on treatments for youth EDs and the relatively new field of dissemination and implementation science, it is unsurprising that there is a dearth of studies in this area. There are preliminary findings to support that it may be possible to disseminate FBT (Couturier, Isserlin, & Lock, 2010; Loeb et al., 2007); however, treatment fidelity has been largely unexplored. The use of online platforms that are widely accessible will be an important strategy both for innovative treatment, as well as a method of training clinicians in empirically supported approaches (Fairburn & Patel, 2014). Moving forward, it will be important to identify barriers to uptake of evidence-based practices and to evaluate effective strategies for training clinicians in these approaches (Lock, 2015).

CONCLUSION

EDs are serious mental health problems with complex etiologies and are associated with high medical and psychiatric comorbidity, poor quality of life, and high mortality. Mortality from AN is the highest of all mental disorders. Effective prevention, early recognition, and treatment is needed to prevent these devastating illnesses, complications, and a chronic course. Family involvement is typically recommended in the assessment and treatment of EDs in children and adolescents, and to date, FBT for AN is the only well-established treatment for any youth ED. Future research is needed to identify other well-established treatments. Further, the development and examination of dissemination and implementation strategies is a critical next step to enhance quality of care for youth with EDs by effectively training usual-care clinicians in evidence-based treatments.

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