Chapter 16
Eating Disorders

C. Barr Taylor, Ellen E. Fitzsimmons-Craft, Arielle C. Smith, and Andrea K. Graham

16.1 Definition/Diagnostic Criteria

Eating disorders (EDs) are common and serious behavioral health disorders associated with high morbidity and mortality, marked impairment, and poor quality of life (American Psychiatric Association, 2013; van Hoeken & Hoek, 2020). EDs include a number of diagnostic categories as described below, with the three main clinical diagnoses being anorexia nervosa (AN), bulimia nervosa (BN), and binge eating disorder (BED). In a meta-analysis of 36 quantitative studies, Arcelus et al. (2011) reported that the weighted mortality rates (i.e., deaths per 1000 person-years) were 5.1 for AN, 1.7 for BN, and 3.3 for ED not otherwise specified (EDNOS), a categorization updated in the DSM-5 to Other Specified Feeding and Eating Disorder (OSFED), that included disorders of clinical severity other than AN, BN, and BED. The standardized mortality ratios (i.e., ratios of observed to expected deaths) were 5.86 for AN, 1.93 for BN, and 1.92 for EDNOS. They noted that one in five individuals with AN had died by suicide (Arcelus et al., 2011). Mortality associated with AN is considered to be one of the highest mortality rates of any behavioral

C. B. Taylor (✉)
Department of Psychiatry and Behavioral Sciences, Stanford University and Center for m2 Health, Palo Alto University, Palo Alto, CA, USA
e-mail: btaylor@stanford.edu

E. E. Fitzsimmons-Craft · A. C. Smith
Department of Psychiatry, Washington University School of Medicine, St. Louis, MO, USA
e-mail: fitzsimmonse@wustl.edu; arielle.smith@wustl.edu

A. K. Graham
Department of Preventive Medicine, Northwestern University, Evanston, IL, USA
e-mail: andrea.graham@northwestern.edu

W. O'Donohue, M. Zimmermann (eds.), *Handbook of Evidence-Based Prevention of Behavioral Disorders in Integrated Care*,
https://doi.org/10.1007/978-3-030-83469-2_16

health disorder (Arcelus et al., 2011). Other work has found a standardized mortality ratio of 1.50 specifically for BED (Fichter & Quadflieg, 2016).

ED diagnoses are based, for the most part, on self-reported symptoms. The Diagnostic and Statistical Manual (DSM) of the American Psychiatric Association is the standard source for definitions (American Psychiatric Association, 2013). The definitions for the most common disorders, based on the current version of the DSM (DSM-5), in adults are as follows:

16.1.1 Anorexia Nervosa (AN)

There are three key diagnostic criteria for AN: (1) restriction of energy intake relative to requirements, leading to a significantly low body weight (of note, individuals with body mass indices (BMIs) below 17 kg/m^2 are considered to have moderate to severe AN); (2) intense fear of gaining weight or of becoming fat; and (3) a disturbance in the way body weight/shape is experienced with an overevaluation of weight and shape. AN is further characterized as the restricting type if individuals have not recently engaged in bingeing or purging or as the binge eating/purging type if they have.

Historically, AN has been diagnosed in individuals with very low body weights relative to that expected for their sex/age. However, some researchers have identified individuals with "normal or high weights" who have undergone significant weight loss and who exhibit the other characteristics of AN, as well as unstable vital signs such as very low heart rates and arrhythmias indicating medical instability (Whitelaw et al., 2018). These individuals are labeled as having atypical AN (AAN), which is included under the OSFED diagnosis in DSM-5. Practitioners should thus be aware that recent, significant weight loss may be indicative of AAN in normal or overweight individuals if they have all the other features of AN.

16.1.2 Bulimia Nervosa (BN)

BN is characterized by both the presence of bingeing and "compensatory" behaviors meant to prevent weight gain, such as vomiting, misuse of laxatives, diuretics, or diet pills, fasting, and/or excessive exercise. Binge eating is defined as eating more food in a short period of time than most individuals would eat in a similar period of time under similar circumstances, and a feeling of loss of control over the eating episode (e.g., a feeling that one cannot stop eating). The binge eating and inappropriate compensatory behaviors both occur, on average, at least once a week for 3 months. Individuals with BN also unduly base their self-esteem on body shape and weight.

16.1.3 Binge Eating Disorder (BED)

BED, the third major eating disorder, is characterized by binge eating, on average, at least once a week for 3 months but without regular engagement in associated compensatory behaviors. The binge eating episodes are associated with three or more of the following: eating more rapidly than normal, eating until feeling uncomfortably full, eating large amounts of food when not hungry, eating alone out of embarrassment for what or how much one is eating, or negative emotions (e.g., disgust, guilt, depression) after overeating.

16.1.4 Purging Disorder (PD)

PD is not formally recognized in DSM-5 (it is noted as an example of OSFED), but since health-care professionals may encounter this condition in practice and see patients suffering the consequences of excessive purging, it is worth a description. (Also, some ED screening measures identify possible cases, e.g., the Stanford-Washington University Eating Disorder Screen [SWED] (Graham et al., 2019)). PD is characterized by high rates of vomiting and/or the use of diuretics or laxatives to control weight and shape in the absence of bingeing episodes.

16.1.5 Other Specified Feeding or Eating Disorder (OSFED)

In addition to AAN and PD, OSFED includes individuals with symptoms and behaviors like those of AN, BN, and BED but who do not meet the full diagnostic criteria. Much less is known about the risk factors for these disorders or how to intervene, and they will not be discussed further in this chapter.

16.2 Prevalence and Age of Onset

EDs are very common. In a recent study, the highest estimated mean annual prevalence of EDs occurred at approximately 21 years for both males (7.4%; 95% UI, 3.5%–11.5%) and females (10.3%; 95% UI, 7.0%–14.2%), with lifetime mean prevalence estimates increasing to 14.3% (95% UI, 9.7%–19.0%) for males and 19.7% (95% UI, 15.8%–23.9%) for females by 40 years. Ninety-five percent of first-time cases occurred by 25 years (Ward et al., 2019). Striegel-Moore et al. (2003) found that for White women, AN begins as early as age nine and continues to occur throughout adolescence; BN and BED typically begin somewhat later (Striegel-Moore et al., 2003). Consistent with Ward et al. (2019), they found that

relatively few cases occurred after age 24. In one large US national sample, the adjusted odds ratios (AORs) for lifetime, but not 12-month, BED diagnosis was significantly lower for non-Hispanic Black respondents relative to that of non-Hispanic White respondents; AORs of BED for Hispanic and non-Hispanic White respondents did not differ significantly (Udo & Grilo, 2018). Much less is known about rates of EDs among Asians (Ning et al., 2021).

Once EDs become established, they are more difficult to treat, at least in the case of AN (Guarda, 2008), and the longer the disorder lasts, the more likely it is to have adverse effects. Proponents of prevention argue, then, that it is important both to reduce the prevalence of risk factors and to keep EDs from emerging and that, given the prevalence of disordered eating attitudes and behaviors in young women, this is of major public health importance.

16.3 Risk Factors

In recent years, a number of prospective studies have been conducted to help identify risk factors for EDs. These prospective studies, along with an even larger literature on retrospective, cross-sectional, and clinical studies, have identified a number of risk factors (Jacobi et al., 2004; Stice & Shaw, 2004; Taylor, 2017). In the ED prevention literature, the risk factors of interest have been shown to be "causative" of the disorder in that they can be reduced, with reduction associated with lower rates of onset. Across many studies, elevated perceived pressure to be thin from family, peers, and the media, internalization of the thin ideal espoused for women by Western culture, BMI, and body dissatisfaction have predicted future eating pathology (Taylor, 2017; Taylor et al., 2017). The role of dieting as a risk factor is less clear, and the results have been inconsistent, perhaps because of problems associated with measurement and/or because it so common as to be nonspecific.

In addition to the specific risk factors mentioned above, there are additional nonspecific risk factors to consider. For example, a history of adverse childhood experiences (including sexual abuse) appears to be a risk factor for the development of a number of mental health problems, including EDs (Jacobi et al., 2004; Pike et al., 2008; Sanci et al., 2008; Speranza et al., 2003). As such, prevention of adverse childhood experiences would likely reduce the onset of EDs (and other mental health problems) but is a goal beyond ED prevention. EDs are much more common in women, and, as noted previously, often begin early. These data suggest that preventive programs should begin by at least age 12, if not earlier, and that preventive programs are relevant at least into the mid-20s.

There has been some interest as to whether or not acculturation to Western society may trigger EDs. However, both greater and lesser acculturation have been identified as risk factors for the development of an ED, and this varies depending on the group studied as well as how acculturation and culture change are conceptualized and measured (Doris et al., 2015). Studies have yet to show how a change in culture may affect ED onset rates, except as applied to very contained environments.

Genetic and biological studies may eventually identify populations at particular risk and in need of targeted prevention efforts (Bulik et al., 2016;). Finally, there are a number of high-risk settings and activities that are associated with increased risk for EDs, including gymnastics and some other sports (Flatt & Taylor, 2018), classical ballet (Ringham et al., 2006), and modeling, to name a few.

While the general importance of weight and shape concerns as risk factors is well-known, it is not known if just having high weight and shape concerns is sufficient to cause an ED or if the presence of other factors is necessary for an ED to develop (Jacobi et al., 2004). Further, in a secondary analysis of a study which selected participants based on high weight concerns (Jacobi et al., 2011; Taylor et al., 2006), the most potent risk factors were comments by a coach or teacher about the participant's eating and a history of depression (Jacobi et al., 2011). This has implications for medical professionals as comments about weight, shape, and eating might have adverse consequences.

Most of the studies on weight and shape concerns have focused on young women, and much less is known about how weight/shape concerns affect young men. A study by Calzo et al. (2012) suggests that there may be important gender differences, e.g., thin young men may want to gain rather than lose weight to improve appearance. There is also less information available on weight and shape concerns as risk factors for EDs for many minority populations, e.g., the LGBTQ community. A recent systematic review found higher rates of bingeing and purging and lower body dissatisfaction, but also lower drive for thinness, in sexual minority women compared with heterosexual peers (Meneguzzo et al., 2018). Another recent study involving a very large national sample of college students found that students who identified as bisexual or other sexual orientation reported significantly greater odds of a probable ED diagnosis and greater elevations in weight and shape concerns compared to heterosexual students. Cisgender female students and gender minority students reported significantly greater odds of a probable ED diagnosis and greater elevations in weight and shape concerns compared to cisgender male students (Calzo et al., 2017).

A major, important controversy in the ED prevention field is the impact of health-care provider recommendations to lose weight for those with overweight or obesity. ED prevention experts have argued that public health attempts to encourage young men and women with "overweight" to lose weight may increase weight and shape concerns and foster unhealthy weight regulation practices, although this has not been definitively demonstrated (National Task Force on the Prevention and Treatment of Obesity, 2000). Later, we discuss how health-care professionals might discuss risk and intervention and treatment options with patients at risk for, or with early EDs, as well as overweight or obesity.

It should be noted, while many have been posited, no risk factors have been identified for AN in prospective studies, in part because of the relatively low rate of onset for AN. However, as part of a prevention study, Jacobi et al. (2018) used three characteristics to identify young girls at putative risk for AN: (1) high drive for thinness, (2) low weight or significant weight loss, and (3) high levels of perfectionism, amenorrhea, excessive exercise, or a family history of an ED. In a large sample of

German girls, ages 11 to 17, 12.1% (447/3941) were identified as at risk for AN on the basis of these risk factors (Jacobi et al., 2018).

16.4 Effective Screening

Screens can be used to identify those at possible risk for and/or with clinical disorders. (The limitations of screens are discussed elsewhere in this volume). In terms of assessing for ED risk, the Weight Concerns Scale (WCS) is one of the most widely used and studied measures (Taylor, 2017). The WCS was derived from a principal component analysis of an extensive list of self-reported ED attitudes and behaviors (Killen et al., 1993). The goal was to create a relatively brief, but psychometrically sound, instrument that did not overlap with other dimensions of EDs like purging, restraint, physical activity, and bulimia. The scale was found to have excellent stability ($r = 0.71$ for a 7-month interval (Killen et al., 1994) and $r = 0.74$ for a 12-month interval (Killen et al., 1996)) and to be sensitive to treatment differences (Taylor et al., 2006). Because the items were derived from different scales, with the items scored differently, each of the five items is adjusted to equal a maximum score of 20 (see Table 16.1), for a maximum total scale score of 100. Because the score adjustments make the WCS difficult to quickly score in clinical practice, in a sample of 4882 young women, we used a receiver operating characteristic (ROC) analysis to determine the score on items that might capture the same risk as the entire WCS. We found that a response >2 on the question, "How afraid are you of gaining 3 pounds?" (see item two in Table 16.1) had a sensitivity of 85.7% and a specificity of 78.8% for identifying individuals at high risk for an ED, based on the full WCS scale (score of 47 or greater). This one question could be added with a short screen that identifies possible EDs (e.g., the SCOFF, see Table 16.2, below) to identify individuals at risk for or with EDs.

For identifying possible EDs in clinical practice, the SCOFF is the most widely used scale (see Table 16.1). The name is a mnemonic of its five items. The SCOFF, which was developed by British researchers (hence the "one stone" criterion—a stone equals 14 pounds) consists of five items scored as yes or no (Morgan et al., 1999). A score of yes on two or more items indicates a likely case of AN or BN. In an analysis of 25 studies, the SCOFF had a pooled sensitivity of 0.86 (95% CI, 0.78–0.91) and specificity of 0.83 (95% CI, 0.77–0.88) for identifying AN and/or BN compared to a clinical interview (Kutz et al., 2020). Important to note though, the SCOFF does not identify risk, distinguish between full clinical and subclinical disorders, and may not identify BED.

If a practitioner wants to use the SCOFF to quickly and easily assess for EDs and wants to measure risk, as mentioned, the WCS may not be a viable alternative as the scoring is complicated. However, the WCS item two noted above could be added to the SCOFF, and the combined questions could identify those at risk for or with a possible ED. However, practitioners should keep in mind that item two from the

Table 16.1 Weight concerns scale

For all questions below, circle only one number				
1. How much more or less do you feel you worry about your weight and body shape than other women your age?				
1. I worry a lot less than other women				
2. I worry a little less than other women				
3. I worry about the same as other women				
4. I worry a little more than other women				
5. I worry a lot more than other women				
2. How afraid are you of gaining 3 pounds?				
(1) Not afraid	(2) Slightly afraid	(3) Moderately afraid	(4) Very afraid	(5) Terrified
3. When was the last time you went on a diet?				
1. I've never been on a diet				
2. I was on a diet about one year ago				
3. I was on a diet about 6 months ago				
4. I was on a diet about 3 months ago				
5. I was on a diet about 1 month ago				
6. I was on a diet less than 1 month ago				
7. I'm now on a diet				
4. Compared to other things in your life, how important is your weight to you?				
1. My weight is not important compared to other things in my life				
2. My weight is a little more important than some other things				
3. My weight is more important than most, but not all, things in my life				
4. My weight is the most important thing in my life				
5. Do you feel fat?				
(1) Never	(2) Rarely	(3) Sometimes	(4) Often	(5) Always

Scoring:
[100×(Q1 response-1)/4 + 100×(Q1 response-1)/4 + 100×(Q1 response-1)/6 + 100×(Q1 response-1)/3 +100×(Q1 response-1)/4]/5

WCS has not undergone the same level of extensive testing as an independent screener than has been done with the full WCS.

Several years ago, as part of a long-term ED prevention research study, we developed a short instrument that can measure both risk for and possible presence of an ED (Graham et al., 2019). The instrument includes both the WCS and items assessing clinical features of EDs based on DSM-5 criteria. Compared to a diagnostic interview, screen sensitivity ranged from 0.90 (for AN) to 0.55 (for PD) and specificity ranged from 0.99 (for AN) to 0.78 (for subthreshold BED). The final screen was programmed to be interactive so that it takes only 5–7 min to complete. The screen has since been slightly expanded to include assessment of a broader range of EDs and deployed by the National Eating Disorders Association (NEDA), the largest non-profit dedicated to EDs in the USA, as way to provide feedback to interested individuals on possible ED risk or clinical status (Fitzsimmons-Craft et al., 2019).

Table 16.2 SCOFF questions

1. Do you make yourself **S**ick because you feel uncomfortably full?
2. Do you worry that you have lost **C**ontrol over how much you eat?
3. Have you recently lost more than **O**ne stone (14 lb) in a 3-month period?
4. Do you believe yourself to be **F**at when others say you are too thin?
5. Would you say that **F**ood dominates your life?

One point for every "yes"; a score of ≥2 indicates a likely case of anorexia nervosa or bulimia

The screen is now being completed by more than 200,000 respondents per year. However, a limitation is that the algorithm is complex, and the measure cannot be easily scored by hand.

A few instruments have been developed to identify individuals with BED or subclinical BED, including those developed by pharmaceutical companies hoping to identify individuals who might then be prescribed pharmacological intervention. For example, the 7-item Binge-Eating Disorder Screener (BEDS-7) has been shown to have 100% sensitivity and 38.7% specificity for identifying cases of BED (Herman et al., 2016). Stice et al. (2004) have also developed an ED diagnostic scale based on DSM-IV.

16.5 Review of Evidence

16.5.1 Universal Prevention: Application to Health-Care Settings

Given the ubiquity of poor body image and internalization of the thin body ideal, coupled with the fact that ED risk factors begin early and that the peak onset of EDs is during adolescence, universal prevention programs would seem to be ideal to introduce in school settings. Further, if demonstrated effective, the materials might be used as psychoeducational tools in health-care settings. Early review of classroom-based interventions designed to improve body image and reduce ED attitudes and behaviors found little benefit (Pratt & Woolfenden, 2002). A more recent review suggested that more current programs could be of benefit, at least to young women, but the quality of evidence was rated as low (Chua et al., 2020), and there was little evidence that these programs resulted in meaningful reduction in ED onset. As a resource, we made one of these programs, StayingFit (Jones et al., 2014), freely available via a massive open online course (MOOC) so that it could be available for free for anyone who is interested (available at www.edx.org/course/staying-fit). The course provides basic information about body image and healthy weight regulation skills. There is some evidence that the program may support healthy weight regulation, improve weight/shape concerns among participants with EDs risk, and increase physical activity, at least in high school students (Jones et al., 2014).

Perhaps the most important role health-care providers and other authority figures (e.g., teachers) can play is to avoid messages that may stigmatize EDs, eating behaviors, overweight, or obesity, since they may inadvertently increase ED behaviors. In one of our studies, we have shown that a comment from a coach or teacher about eating was associated with increased ED risk (Jacobi et al., 2011).

16.5.2 Targeted or Selective Prevention Interventions

Preventive approaches often distinguish between universal, targeted/selective (i.e., intended for individuals at high risk for the disorder), and indicated prevention, with the latter appropriate for individuals at very high risk and exhibiting low levels of ED behaviors, including bingeing and/or compensatory behaviors. In the ED field, the distinctions between targeted/selective and indicated interventions are often arbitrary as there is a continuum of ED attitudes and behaviors. The same interventions used for targeted/selective are appropriate for those where indicated intervention is appropriate (Taylor et al., 2006). However, individuals with very high weight and shape concerns and some bingeing and/or compensatory behaviors would also be appropriate for clinical interventions. For a stepped-care approach, we recommend simply following individuals in the targeted/selective/indicated group and then moving to next-level interventions if symptoms begin or worsen.

Extensive work in the past decade has resulted in three effective targeted/selective preventive approaches at least for older adolescents and college-age women, with several programs evidencing a significant reduction in ED onset among high-risk women (Harrer et al., 2020; Martinsen et al., 2014; Stice et al., 2006, 2008; Taylor et al., 2006, 2017; Wade & Wilksch, 2018). These three programs are based on social learning theory/cognitive behavior therapy (CBT), cognitive dissonance, and media literacy/advocacy, respectively, as discussed below. Of note, psychoeducation approaches alone, particularly those with limited interactions with participants (e.g., didactic programs) and delivered to individuals at low-risk for ED onset, have limited effectiveness (Stice et al., 2007). Harrer et al. (2020) recently reported on the results of a meta-analysis of 27 studies, mostly using either social learning theory/CBT or cognitive dissonance. The relative risk of developing a subthreshold or full-threshold ED in intervention versus control was incidence rate ratio = 0.62 (95% CI [0.44, 0.87]), indicating a 38% decrease in incidence in the intervention group compared to control. Small to moderate between-group effects at posttest were found on ED symptoms (g = 0.35, 95% CI [0.24, 0.46], NNT = 5.10, n_c = 26), dieting (g = 0.43, 95% CI [0.29, 0.57], NNT = 4.17, n_c = 21), body dissatisfaction (g = 0.40, 95% CI [0.27, 0.53], NNT = 4.48, n_c = 25), drive for thinness (g = 0.43, 95% CI [0.27, 0.59], NNT = 4.23, n_c = 12), weight concerns (g = 0.33, 95% CI [0.10, 0.57], NNT = 5.35, n_c = 13), and affective symptoms (g = 0.27, 95% CI [0.15, 0.38], NNT = 6.70, n_c = 18). The effects on BN symptoms were not significant. Heterogeneity was moderate across comparisons. In the following, we briefly discuss the theoretical models on which the effective targeted/selective preventive ED interventions are based.

16.5.3 Social Learning Theory/Cognitive Behavioral Therapy (CBT)

Social learning theory assumes that behavior is affected by both external and internal processes (Bandura & National Institute of Mental Health, 1986), and following from this, disordered eating is thought to result from several processes (e.g., pressure to be thin from family members and peers, exposure to maternal and peer weight and shape concerns, the individual's internalization of the thin ideal, history of disordered eating attitudes and behaviors, history of depression and anxiety). Thus, from a social learning theory perspective, four factors are particularly important in influencing attitudes and behaviors and need to be addressed in preventive interventions: (1) modeling, (2) information, (3) instructions/persuasion from authorities, and (4) previous experience. Effective interventions incorporate each of these components. Beintner et al. (2012) reviewed ten trials of the Student Bodies intervention, based on this theoretical approach, from the USA and Germany. They reported average effect sizes on weight and shape concerns for the intervention compared to waitlist controls of 0.77 in the USA and 0.33 in Germany. Selective intervention effect sizes were 0.67 compared to 0.28 for universal, and there were no differences in effects between the two countries.

16.5.4 Dissonance Theory

Stice and colleagues (2000, 2008, 2009, 2011) have developed interventions (i.e., the Body Project) rooted in the theory that individuals become motivated to change their attitudes and behaviors, such as unhealthy expectations about weight and appearance and disordered eating behaviors, when faced with messages that contradict these very attitudes and behaviors. Thus, dissonance-based programs focus on providing participants with skills to counteract the abundant weight- and appearance-related messages prevalent in adolescents' daily lives. Programs typically involve at least two 1-h sessions and more often three or four sessions, using trained program leaders. For instance, in one session, participants are asked to write a letter to a teenage girl to encourage them not to get invested in the current, Western appearance ideal (i.e., thin ideal). Participants are then encouraged to read the letter out loud. Having written this letter, the participant experiences "cognitive dissonance" if they then follow the thin body ideal themselves. A number of studies have shown the intervention to be effective in reducing risk factors and even in reducing onset of EDs (e.g., see Harrer et al., 2020).

16.5.5 Media Literacy and Advocacy

Media literacy and advocacy interventions are based on the theory that the mass media plays a major role in perpetuating ED risk and that gaining both an understanding of this risk and developing strategies to resist media messages will reduce risk factors. The focus of these programs is to develop or enhance skills to resist social persuasion (i.e., messages about thinness), with the goal of reducing internalization of media messages about thinness and appearance. As noted above, media literacy has been shown to be an effective preventive strategy although it has not, unlike the other two effective programs discussed above, been shown to reduce case onset. For example, Wilksch and Wade (2009) studied the effects of their media literacy program on reducing ED attitudes and behaviors on high-risk female adolescents (>15 years of age). The long-term (30-month) controlled effect sizes for the media literacy program were weight concerns, ES = 0.29; dieting, ES = 0.26; and body dissatisfaction, ES = 0.20. Of note, both the social learning theory/CBT and cognitive dissonance programs include components of media literacy and advocacy.

16.5.6 Preventing AN

Given its early onset and seriousness, a number of interventions have been developed to try to prevent AN. The universal/targeted/indicated interventions described above have provided evidence mostly for reduction in non-AN EDs onset (i.e., binge/purge-type EDs). There have been some attempts to provide indicated prevention for AN. As mentioned above, in Germany, Jacobi et al. (2018) screened 3941 students, 447 of whom were considered at risk for AN, and evaluated a parent-based, online guided self-help intervention. Of these, only 256 families could be contacted and only 66 agreed to be randomized to the study. At 12-month follow-up, girls' expected body weight (EBW) percentage was significantly greater for intervention participants compared with control participants, but drop-out rates were high (66% in the treatment condition). However, no other significant effects were found on risk factors and attitudes of disturbed eating. The authors' sobering conclusion was that, given the small effects on only one outcome and the few parents who were willing to enroll and engage in the study, it might be necessary for the children's symptoms to worsen before parents are willing to engage. Given the seriousness of AN and this finding, which has been found in other studies, it may be best for individuals with AN or possible AN to receive a face-to-face intervention that involves the whole family (e.g., evidence-based family-based treatment (Lock & Le Grange, 2019)).

16.5.7 Is Prevention Harmful?

There has also been some concern that asking young adolescents about "ED behaviors" might be harmful in that it would expose adolescents to attitudes or behaviors they had previously not considered or would heighten their focus on weight and shape issues. In response to this concern, Celio et al. (2003) compared results from 115 sixth-grade girls who responded to questions on risky weight control behaviors and attitudes at baseline and at 12-month follow-up with the responses of 107 girls who had not been part of the baseline assessment. There were no differences in scores between the two groups on the follow-up assessment, and rates of unhealthy weight regulation behaviors decreased over time in the group assessed on two occasions. Further, and of critical importance to countering these concerns, the many large prevention trials conducted using older adolescents and college students have largely reduced EDs risk factors rather than increased them.

16.6 Stepped-Care Prevention/Intervention Model: Role of Primary Care Providers (PCPs) and Behavioral Health-Care Providers (BHCPs)

In the following, we discuss various options for stepped-care prevention/intervention for EDs, managed by PCPs and BHCPs.

The prevention/intervention process begins with the use of an evidence-based screen. As discussed above, the only evidence-based screen that categorizes individuals by risk and possible clinical status is the SWED. The SWED is designed to be interactive (using skip-out questions), but we have created a self-report pencil version for clinical practice available at www.m2health.paloaltou.edu/resources, or it can be programmed into an online survey hosting site like Qualtrics or SurveyMonkey. The alternative is to use the SCOFF and WCS item two, as discussed above. Either option will allow practitioners to sort patients into risk/diagnostic categories and associated prevention/intervention approaches as seen in Fig. 16.1. An alternative that practitioners might consider is to refer individuals who screen positive on the SCOFF and WCS item two to NEDA to complete the SWED, available at www.nationaleatingdisorders.org/screening-tool. Once they have completed the screen at NEDA, respondents will be given a number of referral options (many of them included below), including recommendation for therapy or medical assessment. However, practitioners would need to follow-up to assess patients' actual engagement in services.

It is important to note that screens provide "possible" rather than definitive diagnoses, and individuals with concerning symptoms could be missed. Further, practitioners who identify individuals as having frequent bingeing and/or purging or low weight should evaluate these patients for medical stability and the need for immediate therapy.

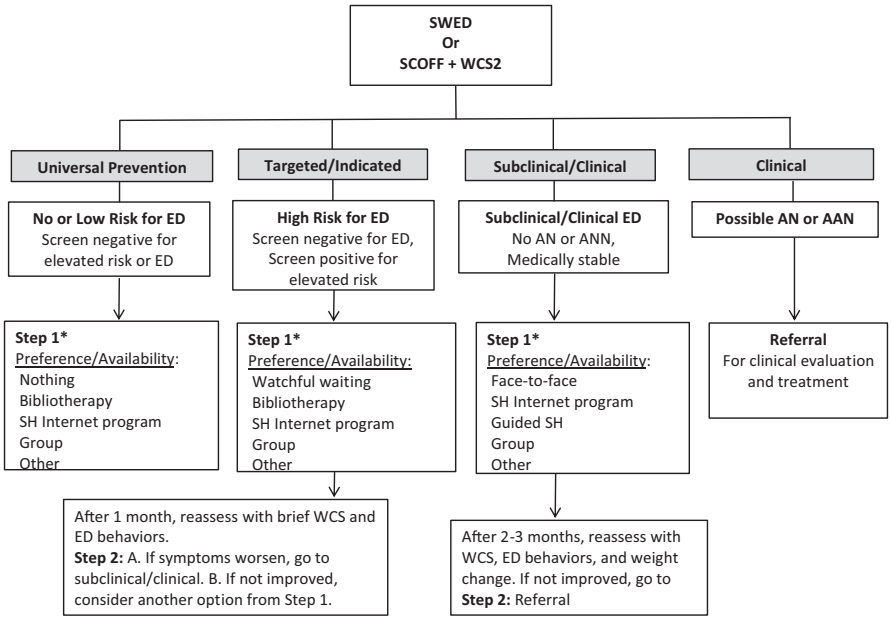

Fig. 16.1 A model of stepped-care for preventing/treating EDs in clinical practices

Although the SWED assesses BMI, the SCOFF does not. EDs, particularly BN and BED, are highly comorbid with overweight/obesity, and individuals may be interested in working on both of these issues. Interventions that combine approaches for addressing both EDs and weight loss are being evaluated, but there are none that we can currently recommend until more evidence on their efficacy, risks, and benefits is available. We note that behavioral weight loss, delivered face-to-face, has resulted in modest improvements in weight and binge eating (Grilo, 2017); however, this intervention has not been evaluated for ED prevention nor is easily scalable to large numbers of individuals. The issue of addressing weight loss in ED interventions is also complicated since food restriction/avoidance and over-exercise are significant problems in EDs, but many weight loss interventions, including widely available apps, may promote food restriction and an increased focus on exercise. If prescribed for weight loss, the clinician needs to carefully monitor their clients' use of apps for potential negative effects and in general consider how they are helping/hindering ED treatment. For example, Honary et al. (2019) interviewed people, age 18–25 and mostly males with body image concerns, to determine the potential impact of weight loss/fitness apps on maladaptive behaviors and attitudes. The most common problems reported by the sample were becoming obsessed about counting behaviors, experiencing guilt about food restriction, reducing time available for social activities, and failing to meet goals. Several respondents perceived that the app use was making their ED worse. In closing, given the large number of individuals with EDs who also want to lose weight (and for whom this may be

appropriate, given their overweight/obesity, if they so desire), how health-care practitioners might discuss this issue with patients is discussed below.

Another important issue in a stepped-care model is to determine when and how individuals should be reassessed. In our studies, we have developed some simple instruments for assessing patients' progress. As a guideline, we simplified these measures to help guide professionals as to how they might consider moving individuals from step to step within a stepped-care model. (For a detailed discussion of the specific use of digital interventions for preventing/treating EDs and the potential for incorporating these in a stepped-care model, see Taylor et al. (2020)). Following a presentation of the overall model, we discuss how PCPs and BHCPs might make decisions about when to recommend individuals move up a step.

The reader should note that the model we describe has never been tested in an actual practice setting, and the recommendations should be considered guidelines/options rather than definitive practice.

16.6.1 Health Professional Messages

How health-care professionals provide feedback to individuals with potential EDs to help them decide what course of action to take before or after screening may be one of the most important factors in what paths their patients follow. We also note that people with EDs may be more likely to contact health professionals for weight reduction assistance than they are to seek treatment for their ED symptoms, which is important for practitioners to keep in mind. Several general principles include avoiding stigmatizing patients about weight or EDs, noting that restriction/dieting rarely works in the long run and may have many negative consequences, noting that healthy weight regulation strategies can be effective both for losing weight and maintaining weight loss, and explaining that many of the strategies used to address ED symptoms are consistent with healthful approaches to weight maintenance/loss (e.g., regular eating) (Kass et al., 2015). It is also likely that patients being assessed for EDs are likely to already be using one of the widely available and popular apps and programs promoted for weight loss/calorie counting (e.g., My Fitness Pal). The health-care professional should address the costs/benefits of use of such programs. The Australian National Eating Disorders Collaboration (NEDC) has developed some excellent recommendations around discussing weight-related issues with patients. For example, messages should focus on health, not weight, and have a holistic perspective which includes social, emotional, and physical aspects of health. Practitioners are also encouraged to use a collaborative approach that addresses weight stigma and promotes healthy eating practices without encouraging dieting or weight preoccupation. For more information, see www.nedc.com.au/assets/NEDC-Resources/NEDC-Resource-GPs.pdf (National Eating Disorders Collaboration, 2015). Other excellent resources for discussing these issues include: https://pediatrics.aappublications.org/content/pediatrics/111/1/204.full.pdf (American Academy of Pediatrics Committee on Adolescence, 2003) and www.nationaleatingdisorders.

org/sites/default/files/ResourceHandouts/PhysiciansRoleinEatingDisordersPrevention.pdf (National Eating Disorders Association, 2012).

The stepped-care model we provide focuses on older adolescents (where they can seek care independent of their parents) and adults, and we do not recommend this approach for children or young adolescents where a different model of care is indicated. The NEDC resource cited above discusses issues of EDs with children and adolescents.

16.6.2 Universal Prevention

As seen in Fig. 16.1, universal prevention would be appropriate for individuals at low or no risk for an ED. Many individuals who fall into this category are appropriate for basic psychoeducation, bibliotherapy, and for self-help programs, though we noted the limitations of those approaches earlier. We developed a program called StayingFit focused on exercise and healthy weight regulation. As mentioned, in a small randomized trial, the intervention was shown to reduce weight/shape concerns and increase physical activity in high school students (Jones et al., 2014). The program is available for free at www.edx.org/course/staying-fit.

16.6.3 Targeted/Selective/Indicated Prevention

Many of the prevention studies reviewed above have included individuals with low levels of ED symptoms who could be considered appropriate for indicated interventions. Here, we will review options for this group.

16.6.3.1 Watchful Waiting

Watchful waiting is an option for this group. The most important issue to monitor is an increase in bingeing and/or purging and excessive weight loss. However, what constitutes excessive in the ED field is controversial. Many argue that any sustained weight loss among individuals with BMIs in the non-overweight or obese range is excessive. Whitelaw et al. (2018) have found that in adolescents with >90% median BMI (roughly equivalent to the normal weight range or above in adults) and who had lost at least 10% of their body weight in the past 6 months or so experienced high rates of potentially serious medical problems. Of course, the reasons for the weight loss need to be determined and perhaps, systems employing a stepped-care model would consider significant weight loss as indicating medical evaluation and then consider next steps. If either bingeing or purging increase, the individual should be advised to move to the next step. Except for BMI (relevant to AN), decisions need to be based on self-report measures. Presenting the need for follow-up

assessment in a non-judgmental, caring way is likely to help improve the accuracy of self-report measures.

16.6.3.2 Psychoeducation

Psychoeducation by itself has not been shown to be of much benefit for this group and is not recommended (Stice & Shaw, 2004). However, there are some resources listed in Table 16.3, which we have found helpful in incorporating/referring to, as part of other approaches.

16.6.3.3 Biblio-Prevention

A number of self-help books are available to improve body image and reduce symptoms. *Overcoming Binge Eating* (Fairburn, 2013) is a widely used self-help book for overcoming problems with binge eating and/or purging. It can also be used effectively as part of a guided self-help approach (Traviss-Turner et al., 2017). *The Body Image Workbook* (Cash, 2008) has also been widely used.

16.6.3.4 Unguided e-Health Prevention Tools

Recovery Record (www.recoveryrecord.com) is an app designed with input from ED experts to support treatment of EDs. The Recovery Record app allows self-monitoring of meals, thoughts, and feelings and provides customized meal plans

Table 16.3 Examples of resources for targeted/selective/indicated prevention

Approach	Targeted/selective/indicated
Psychoeducation	National Eating Disorders Association website (www.nationaleatingdisorders.org) NIMH Brochure (National Institute of Health, 2018) (www.nimh.nih.gov/health/publications/eating-disorders/eatingdisorders_148810.pdf)
Biblio-prevention	*Overcoming Binge Eating* (Fairburn, 2013) *The Body Image Workbook* (Cash, 2008)
Unguided e-Self-Help	Media Smart (https://mediasmart.flinders.edu.au/) (research study) Recovery Record (www.recoveryrecord.com) Jourvie (www.jourvie.com) Rise Up + Recover (www.recoverywarriers.com/app/) Student Bodies (www.m2health.paloaltou.edu)
Guided Self-Help	Recovery Record (www.recoveryrecord.com) if associated with a therapist
Individual Therapy or Group Therapy	Contact the National Eating Disorders Association helpline for help locating a provider (https://www.nationaleatingdisorders.org/help-support/contact-helpline)

and coping tactics. The program can also be linked with a treatment provider, so that a client's therapist can have access to their data. The program has been widely downloaded (Tregarthen et al., 2015) and has demonstrated high acceptability (Kim et al., 2018). A controlled trial has been conducted but not yet published. In 2019, Recovery Record has a credibility rating of 2.86/5 on PsyberGuide, a freely available online resource that evaluates available mobile mental health apps (see more information later in this chapter), a user experience rating of 2.90/5, and transparency rated as unacceptable. We are aware of two other publicly available apps that can be used as self-help for EDs, Jourvie (www.jourvie.com) and Rise Up + Recover (www.recoverywarriors.com/app/). We could find no empirical studies on their use and have not used them ourselves.

16.6.3.5 Guided Self-Help

Guided self-help has been shown to be effective in preventing EDs (Harrer et al., 2020; Taylor et al., 2017, 2020). Guided self-help should be the first choice for individuals who exhibit any bingeing or purging, which is in line with the National Institute for Health and Care Excellence guidelines from the UK www.nice.org.uk/guidance/ng69 (National Institute for Health and Care Excellence, 2017); however, the availability of such programs is limited. Options include training mental health experts or others in guiding a program like Recovery Record or the patient's use of a self-help book, such as *Overcoming Binge Eating* (Fairburn, 2013). Indeed, non-specialists can make excellent guides for these programs, and one study found that nurses were very helpful in providing guided self-help to patients with BN (Walsh et al., 2004). Graham et al. (2020) found that a program that used bachelor's-level lay therapists, trained to help patients select and use apps from a mental health app platform, was effective in reducing anxiety and depression, suggesting that a broad range of individuals may be effective in coaching/moderating evidence-based programs. A CBT-guided self-help program for EDs our team developed and tested (Fitzsimmons-Craft et al., 2020) has been made available on the SilverCloud Health platform, which is widely used by many health-care systems (e.g., Kaiser in the USA, National Health Service in the UK).

16.6.3.6 Groups

Groups (face-to-face, Internet, asynchronous, synchronous) are widely available. As mentioned, the Body Project, which is group-based, has been shown to be very effective in reducing eating disorder risk and even onset. Some evidence suggests that online communities or connections with individuals with EDs can be detrimental (Saffran et al., 2016). In the USA, a wide range of groups are offered through NEDA, the National Association of Anorexia Nervosa and Associated Disorders (ANAD), and many other resources. Practitioners wanting to recommend groups

are encouraged to carefully check them out for potential harm/benefit (Taylor et al., 2020). Of note, cognitive dissonance-based prevention programs, offered as a group-based intervention, are able to be accessed through NEDA (www.nationaleatingdisorders.org/get-involved/the-body-project).

16.6.3.7 Individual Therapy

Individual therapy can be useful in helping individuals with body image problems and at risk for EDs.

16.6.4 Subclinical/Clinical BN/BED-Type EDs

The most important issues to monitor are bingeing, purging, and weight. If bingeing or purging increase, the individual should be advised to move to the next step. Some experts have also suggested that individuals who have >90% median BMI, lost at least 10% of body weight, and are exhibiting features of AN should be evaluated for possible atypical AN, which may require medical management (Whitelaw et al., 2018).

In our online guided self-help studies for individuals with EDs except AN (e.g., Fitzsimmons-Craft et al. (2020)), we have also included the expectation that individuals demonstrate a large reduction (e.g., 50%) in symptoms by about mid-point in treatment and if not, they are recommended to move on to the next step (while continuing use of the online program), which for us, has been referral to face-to-face therapy.

16.6.4.1 Watchful Waiting

Watchful waiting is probably not an option for this group. However, if an individual does not want to engage in therapy, then the practitioner should consider asking permission to recontact them in the near future to reassess their symptoms and interest in treatment.

16.6.4.2 Psychoeducation

As with those in the previous category, we do not recommend psychoeducation alone. However, if the practitioner feels the patient would benefit from knowing more about EDs, a referral to NEDA's content or other psychoeducational resources would be appropriate.

16.6.4.3 Biblio-Prevention

As mentioned, a number of self-help books are available to improve body image and reduce symptoms, for example, Fairburn (2013) and Cash (2008). However, used by themselves they are unlikely to have a significant impact. See targeted/selective for recommendations.

16.6.4.4 Unguided e-Health Prevention Tools

The same options listed for targeted/selective/indicated could be used for individuals with indicated/clinical programs. However, there are few data on their effectiveness.

16.6.4.5 Guided Self-Help

Guided self-help should be considered the first choice for individuals with clinical disorders who do not want groups or face-to-face therapy or have barriers to care for such options (e.g., limited availability in their area, concerns about cost or stigma). Guided self-help has been shown to be effective in treating EDs (Taylor et al., 2020) and can be delivered effectively by a wide variety of providers. We recently completed a large-scale randomized controlled trial (RCT) evaluating the efficacy of our team's digital CBT-guided self-help program for EDs. In this study, 690 college women with EDs from 27 universities were randomized to the intervention or a control group (i.e., referral to usual care at the college counseling/health center). For the primary outcome of ED psychopathology (measured by the Eating Disorder Examination-Questionnaire (EDE-Q) Global Score), there was a significantly greater reduction in the intervention compared to control at post-intervention and follow-up (Fitzsimmons-Craft et al., 2020). The intervention was also associated with significantly greater reductions than control in binge eating, compensatory behaviors, depression, and clinical impairment at post-intervention, with these gains sustained through follow-up for all outcomes except binge eating. (How to make this program available is discussed under targeted/indicated, above).

16.6.4.6 Groups

Group therapy is effective for a number of problems and is often used to provide evidence-based treatments such as CBT, so it is likely to be useful for treating eating disorders as well. In a meta-analysis, Grenon et al. (2017) identified 27 RCTs that provide direct comparisons with a total of 1853 participants included. Group psychotherapy was significantly more effective than waitlist controls at achieving

reductions in and abstinence rates of binge eating and/or purging compared to the control groups. The authors note that the studies mostly involved small samples.

16.6.4.7 Individual Therapy

Individual therapy can be useful in helping individuals with body image problems and EDs. Many studies have shown that CBT, interpersonal psychotherapy (IPT), and other modalities are very effective for treating EDs (Kass et al., 2013).

16.6.5 Selecting the First Step

There are no guidelines in the ED field suggesting how individuals and health-care systems might order steps for universal or targeted/selective/indicated prevention. Presumably, such decisions are made in health-care practices based on considerations such as available resources, costs, evidence-base, and consumer preference. For universal prevention, watchful waiting or psychoeducation would seem to be reasonable first choices. For the targeted/selective group, any of the activities listed as a first step would seem appropriate, but those who fall into the indicated group on the basis of some bingeing/purging should be carefully monitored for increases in symptoms (e.g., every other month or so). For subclinical/clinical, self-help should be considered only if guided self-help, group, or face-to-face are not available. The most important issue for health-care providers to consider, as mentioned, is available resources and how monitoring/follow-up can occur.

16.6.6 When to Move to the Next Step

There is no empirical evidence as to when individuals should move to the next step in a universal/targeted-selective-indicated prevention/clinical intervention model for EDs. In general, we favor reassessment, though practically, it may not be realistic (or even necessary) to reassess those in the universal prevention group. In our studies of guided self-help, we routinely follow a two-step model, based on regular assessment, in which referral to face-to-face is recommended for those who are not responding (Fitzsimmons-Craft et al., 2020). The assessment consists of these items: (1) In the past week, how many times have you binged? (2) In the last week, how many times have you purged (including self-induced vomiting or use of laxatives, diuretics, or diet pills)? (3) How much did concerns about your weight/shape interfere with your life and/or cause you distress (never, rarely, sometimes, often)? Our trials usually involve asking these questions on a weekly basis. In clinical practice, it would be appropriate to change the time frame to "in the past month" and to add a question about any change in weight over that same period.

For universal, anyone who exhibits the onset of ED symptoms or excessive weight loss should be moved to self-help, guided self-help, group, or face-to-face. For targeted/selective, anyone who exhibits onset of ED symptoms or excessive weight loss should move to at least guided self-help, face-to-face, or group. As we mentioned, in our clinical trials using guided or moderated self-help for indicated, subclinical, or clinical eating disorders, we refer people to face-to-face therapy if they have not shown a 50% improvement in presenting symptoms after about 6–8 weeks (Fitzsimmons-Craft et al., 2020). We imagine that the final algorithm will need to be developed depending on the resources, standards, and interests of the providing health-care system.

16.7 Lessons Learned and Implementation

There has been considerable progress in the development of evidence-based screens and interventions to prevent and treat eating disorders. Many of the preventive and clinical interventions can be delivered by PCPs and BHCPs. While there are many barriers and issues related to introducing a stepped-care model into health-care practice and providing screening, assessment, and preventive and clinical intervention, doing so would positively improve the physical and behavioral health of many.

Acknowledgments This research was supported by R01 MH100455, K01 DK116925, and K08 MH120341 from the National Institutes of Health and NHMRC Centre of Research Excellence APP1170937 from Australia's National Health and Medical Research Council.

References

American Academy of Pediatrics Committee on Adolescence. (2003). Identifying and treating eating disorders. *Pediatrics, 111*(1) https://pediatrics.aappublications.org/content/pediatrics/111/1/204.full.pdf

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). American Psychiatric Association.

Arcelus, J., Mitchell, A. J., Wales, J., & Nielsen, S. (2011). Mortality rates in patients with anorexia nervosa and other eating disorders: A meta-analysis of 36 studies. *Archives of General Psychiatry*. https://doi.org/10.1001/archgenpsychiatry.2011.74

Bandura, A., & National Institute of Mental Health. (1986). *Social foundations of thought and action: A social cognitive theory* (Prentice-Hall series in social learning theory). Prentice-Hall.

Beintner, I., Jacobi, C., & Taylor, C. B. (2012). Effects of an internet-based prevention programme for eating disorders in the USA and Germany – A meta-analytic review. *European Eating Disorders Review*. https://doi.org/10.1002/erv.1130

Bulik, C. M., Kleiman, S. C., & Yilmaz, Z. (2016). Genetic epidemiology of eating disorders. *Current Opinion in Psychiatry, 29*(6), 383–388. https://doi.org/10.1097/YCO.0000000000000275

Calzo, J. P., Blashill, A. J., Brown, T. A., & Argenal, R. L. (2017). Eating disorders and disordered weight and shape control behaviors in sexual minority populations. *Current Psychiatry Reports*. https://doi.org/10.1007/s11920-017-0801-y

Calzo, J. P., Sonneville, K. R., Haines, J., Blood, E. A., Field, A. E., & Austin, S. B. (2012). The development of associations among body mass index, body dissatisfaction, and weight and shape concern in adolescent boys and girls. *Journal of Adolescent Health*. https://doi.org/10.1016/j.jadohealth.2012.02.021

Cash, T. F. (2008). *The body image workbook: An eight-step program for learning to like your looks* (2nd ed.). New Harbinger Publications.

Celio, A. A., Bryson, S., Killen, J. D., & Taylor, C. B. (2003). Are adolescents harmed when asked risky weight control behavior and attitude questions? Implications for consent procedures. *International Journal of Eating Disorders*. https://doi.org/10.1002/eat.10188

Chua, J. Y. X., Tam, W., & Shorey, S. (2020). Research review: Effectiveness of universal eating disorder prevention interventions in improving body image among children: A systematic review and meta-analysis. *Journal of Child Psychology and Psychiatry and Allied Disciplines*. https://doi.org/10.1111/jcpp.13164

Doris, E., Shekriladze, I., Javakhishvili, N., Jones, R., Treasure, J., & Tchanturia, K. (2015). Is cultural change associated with eating disorders? A systematic review of the literature. *Eating and Weight Disorders*. https://doi.org/10.1007/s40519-015-0189-9

Fairburn, C. G. (2013). *Overcoming binge eating* (2nd ed.). Guilford Press.

Fichter, M. M., & Quadflieg, N. (2016). Mortality in eating disorders – Results of a large prospective clinical longitudinal study. *International Journal of Eating Disorders*. https://doi.org/10.1002/eat.22501

Fitzsimmons-Craft, E. E., Balantekin, K. N., Graham, A. K., Smolar, L., Park, D., Mysko, C., Funk, B., Taylor, C. B., & Wilfley, D. E. (2019). Results of disseminating an online screen for eating disorders across the U.S.: Reach, respondent characteristics, and unmet treatment need. *International Journal of Eating Disorders, 52*(6), 721–729. https://doi.org/10.1002/eat.23043

Fitzsimmons-Craft, E. E., Taylor, C. B., Graham, A. K., Sadeh-Sharvit, S., Balantekin, K. N., Eichen, D. M., Monterubio, G. E., Goel, N. J., Flatt, R. E., Karam, A. M., Firebaugh, M. L., Jacobi, C., Jo, B., Trockel, M. T., & Wilfley, D. E. (2020). Effectiveness of a digital cognitive behavior therapy-guided self-help intervention for eating disorders in college women: A cluster randomized clinical trial. *JAMA Network Open*. https://doi.org/10.1001/jamanetworkopen.2020.15633

Flatt, R. E., & Taylor, C. B. (2018). Adapting a technology-based eating disorder model for athletes. *Journal of Clinical Sport Psychology, 12*(4), 699–717. https://doi.org/10.1123/jcsp.2018-0015

Graham, A. K., Greene, C. J., Kwasny, M. J., Kaiser, S. M., Lieponis, P., Powell, T., & Mohr, D. C. (2020). Coached mobile app platform for the treatment of depression and anxiety among primary care patients: A randomized clinical trial. *JAMA Psychiatry*. https://doi.org/10.1001/jamapsychiatry.2020.1011

Graham, A. K., Trockel, M., Weisman, H., Fitzsimmons-Craft, E. E., Balantekin, K. N., Wilfley, D. E., & Taylor, C. B. (2019). A screening tool for detecting eating disorder risk and diagnostic symptoms among college-age women. *Journal of American College Health, 67*(4), 357–366. https://doi.org/10.1080/07448481.2018.1483936

Grenon, R., Schwartze, D., Hammond, N., Ivanova, I., Mcquaid, N., Proulx, G., & Tasca, G. A. (2017). Group psychotherapy for eating disorders: A meta-analysis. *International Journal of Eating Disorders*. https://doi.org/10.1002/eat.22744

Grilo, C. M. (2017). Psychological and behavioral treatments for binge-eating disorder. *Journal of Clinical Psychiatry*. https://doi.org/10.4088/JCP.sh16003su1c.04

Guarda, A. S. (2008). Treatment of anorexia nervosa: Insights and obstacles. *Physiology and Behavior*. https://doi.org/10.1016/j.physbeh.2007.11.020

Harrer, M., Adam, S. H., Messner, E. M., Baumeister, H., Cuijpers, P., Bruffaerts, R., Auerbach, R. P., Kessler, R. C., Jacobi, C., Taylor, C. B., & Ebert, D. D. (2020). Prevention of eating disorders at universities: A systematic review and meta-analysis. *International Journal of Eating Disorders*. https://doi.org/10.1002/eat.23224

Herman, B. K., Deal, L. S., Dibenedetti, D. B., Nelson, L., Fehnel, S. E., & Brown, TM. (2016). Development of the 7-item binge-eating disorder screener (BEDS-7). *Primary Care Companion to the Journal of Clinical Psychiatry*. https://doi.org/10.4088/PCC.15m01896

Honary, M., Bell, B. T., Clinch, S., Wild, S. E., & McNaney, R. (2019). Understanding the role of healthy eating and fitness mobile apps in the formation of maladaptive eating and exercise behaviors in young people. *Journal of Medical Internet Research*. https://doi.org/10.2196/14239

Jacobi, C., Fittig, E., Bryson, S. W., Wilfley, D., Kraemer, H. C., & Taylor, C. B. (2011). Who is really at risk? Identifying risk factors for subthreshold and full syndrome eating disorders in a high-risk sample. *Psychological Medicine*. https://doi.org/10.1017/S0033291710002631

Jacobi, C., Hayward, C., De Zwaan, M., Kraemer, H. C., & Agras, W. S. (2004). Coming to terms with risk factors for eating disorders: Application of risk terminology and suggestions for a general taxonomy. *Psychological Bulletin, 130*(1), 19–65. https://doi.org/10.1037/0033-2909.130.1.19

Jacobi, C., Hütter, K., Völker, U., Möbius, K., Richter, R., Trockel, M., Bell, M. J., Lock, J., & Taylor, C. B. (2018). Efficacy of a parent-based, indicated prevention for anorexia nervosa: Randomized controlled trial. *Journal of Medical Internet Research*. https://doi.org/10.2196/jmir.9464

Jones, M., Lynch, K. T., Kass, A. E., Burrows, A., Williams, J., Wilfley, D. E., & Taylor, C. B. (2014). Healthy weight regulation and eating disorder prevention in high school students: A universal and targeted web-based intervention. *Journal of Medical Internet Research*. https://doi.org/10.2196/jmir.2995

Kass, A. E., Kolko, R. P., & Wilfley, D. E. (2013). Psychological treatments for eating disorders. *Current Opinion in Psychiatry*. https://doi.org/10.1097/YCO.0b013e328365a30e

Kass, A. E., Wang, A. Z., Kolko, R. P., Holland, J. C., Altman, M., Trockel, M., Taylor, C. B., & Wilfley, D. E. (2015). Identification as overweight by medical professionals: Relation to eating disorder diagnosis and risk. *Eating Behaviors*. https://doi.org/10.1016/j.eatbeh.2014.12.013

Killen, J. D., Hayward, C., Wilson, D. M., Taylor, C. B., Hammer, L. D., Litt, I., Simmonds, B., & Haydel, F. (1994). Factors associated with eating disorder symptoms in a community sample of 6th and 7th grade girls. *International Journal of Eating Disorders*. https://doi.org/10.1002/eat.2260150406

Killen, J. D., Taylor, C. B., Hammer, L. D., Litt, I., Wilson, D. M., Rich, T., Hayward, C., Simmonds, B., Kraemer, H., & Varady, A. (1993). An attempt to modify unhealthful eating attitudes and weight regulation practices of young adolescent girls. *International Journal of Eating Disorders*. https://doi.org/10.1002/1098-108X(199305)13:4<369::AID-EAT2260130405>3.0.CO;2-0

Killen, J. D., Taylor, C. B., Hayward, C., Parish Haydel, K., Wilson, D. M., Hammer, L., Kraemer, H., Blair-Greiner, A., & Strachowski, D. (1996). Weight concerns influence the development of eating disorders: A 4-year prospective study. *Journal of Consulting and Clinical Psychology*. https://doi.org/10.1037/0022-006X.64.5.936

Kim, J. P., Sadeh-Sharvit, S., Darcy, A. M., Neri, E., Vierhile, M., Robinson, A., Tregarthen, J., & Lock, J. D. (2018). The utility and acceptability of a self-help smartphone application for eating disorder behaviors. *Journal of Technology in Behavioral Science*. https://doi.org/10.1007/s41347-018-0048-4

Kutz, A. M., Marsh, A. G., Gunderson, C. G., Maguen, S., & Masheb, R. M. (2020). Eating disorder screening: A systematic review and meta-analysis of diagnostic test characteristics of the SCOFF. *Journal of General Internal Medicine*. https://doi.org/10.1007/s11606-019-05478-6

Lock, J., & Le Grange, D. (2019). Family-based treatment: Where are we and where should we be going to improve recovery in child and adolescent eating disorders. *International Journal of Eating Disorders*. https://doi.org/10.1002/eat.22980

Martinsen, M., Bahr, R., Børresen, R., Holme, I., Pensgaard, A. M., & Sundgot-Borgen, J. (2014). Preventing eating disorders among young elite athletes: A randomized controlled trial. *Medicine and Science in Sports and Exercise*. https://doi.org/10.1249/MSS.0b013e3182a702fc

Meneguzzo, P., Collantoni, E., Gallicchio, D., Busetto, P., Solmi, M., Santonastaso, P., & Favaro, A. (2018). Eating disorders symptoms in sexual minority women: A systematic review. *European Eating Disorders Review*. https://doi.org/10.1002/erv.2601

Morgan, J. F., Reid, F., & Lacey, J. H. (1999). The SCOFF questionnaire: Assessment of a new screening tool for eating disorders. *British Medical Journal*. https://doi.org/10.1136/bmj.319.7223.1467

National Eating Disorders Association. (2012). *The physician's role in eating disorders prevention*. https://www.nationaleatingdisorders.org/sites/default/files/ResourceHandouts/PhysiciansRoleinEatingDisordersPrevention.pdf

National Eating Disorders Collaboration. (2015). *Eating disorders: A professional resource for general practitioners* (2nd ed.). https://nedc.com.au/assets/NEDC-Resources/NEDC-Resource-GPs.pdf

National Institute for Health and Care Excellence. (2017). *Eating disorders: Recognition and treatment*. https://www.nice.org.uk/guidance/ng69

National Institute of Mental Health. (2018). *Eating disorders: About more than food*. https://www.nimh.nih.gov/health/publications/eating-disorders/eatingdisorders_148810.pdf

National Task Force on the Prevention and Treatment of Obesity. (2000). Overweight, obesity, and health risk. *Archives of Internal Medicine*. https://doi.org/10.1001/archinte.160.7.898

Ning, S. K., Fitzsimmons-Craft, E. E., Austin, B. S., Wilfley, D. E., & Taylor, C. B. (2021). Estimated prevalence of eating disorders in Singapore. *International Journal of Eating Disorders, 54*(1), 7–18. https://doi.org/10.1002/eat.23440.

Pike, K. M., Hilbert, A., Wilfley, D. E., Fairburn, C. G., Dohm, F. A., Walsh, B. T., & Striegel-Moore, R. (2008). Toward an understanding of risk factors for anorexia nervosa: A case-control study. *Psychological Medicine*. https://doi.org/10.1017/S0033291707002310

Pratt, B. M., & Woolfenden, S. (2002). Interventions for preventing eating disorders in children and adolescents. *Cochrane Database of Systematic Reviews*. https://doi.org/10.1002/14651858.cd002891

Ringham, R., Klump, K., Kaye, W., Stone, D., Libman, S., Stowe, S., & Marcus, M. (2006). Eating disorder symptomatology among ballet dancers. *International Journal of Eating Disorders*. https://doi.org/10.1002/eat.20299

Saffran, K., Fitzsimmons-Craft, E. E., Kass, A. E., Wilfley, D. E., Taylor, C. B., & Trockel, M. (2016). Facebook usage among those who have received treatment for an eating disorder in a group setting. *International Journal of Eating Disorders*. https://doi.org/10.1002/eat.22567

Sanci, L., Coffey, C., Olsson, C., Reid, S., Carlin, J. B., & Patton, G. (2008). Childhood sexual abuse and eating disorders in females: Findings from the Victorian Adolescent Health Cohort Study. *Archives of Pediatrics and Adolescent Medicine*. https://doi.org/10.1001/archpediatrics.2007.58

Speranza, M., Atger, F., Corcos, M., Loas, G., Guilbaud, O., Stéphan, P., Perez-Diaz, F., Halfon, O., Venisse, J. L., Bizouard, P., Lang, F., Flament, M., & Jeammet, P. (2003). Depressive psychopathology and adverse childhood experiences in eating disorders. *European Psychiatry*. https://doi.org/10.1016/j.eurpsy.2003.04.001

Stice, E., Fisher, M., & Martinez, E. (2004). Eating disorder diagnostic scale: Additional evidence of reliability and validity. *Psychological Assessment*. https://doi.org/10.1037/1040-3590.16.1.60

Stice, E., Marti, C. N., Spoor, S., Presnell, K., & Shaw, H. (2008). Dissonance and healthy weight eating disorder prevention programs: Long-term effects from a randomized efficacy trial. *Journal of Consulting and Clinical Psychology*. https://doi.org/10.1037/0022-006X.76.2.329

Stice, E., Mazotti, L., Weibel, D., & Agras, W. S. (2000). Dissonance prevention program decreases thin-ideal internalization, body dissatisfaction, dieting, negative affect, and bulimic symptoms: A preliminary experiment. *International Journal of Eating Disorders*. https://doi.org/10.1002/(SICI)1098-108X(200003)27:2<206::AID-EAT9>3.0.CO;2-D

Stice, E., Presnell, K., Gau, J., & Shaw, H. (2007). Testing mediators of intervention effects in randomized controlled trials: An evaluation of two eating disorder prevention programs. *Journal of Consulting and Clinical Psychology*. https://doi.org/10.1037/0022-006X.75.1.20

Stice, E., Rohde, P., Gau, J., & Shaw, H. (2009). An effectiveness trial of a dissonance-based eating disorder prevention program for high-risk adolescent girls. *Journal of Consulting and Clinical Psychology*. https://doi.org/10.1037/a0016132

Stice, E., Rohde, P., Shaw, H., & Gau, J. (2011). An effectiveness trial of a selected dissonance-based eating disorder prevention program for female high school students: Long-term effects. *Journal of Consulting and Clinical Psychology*. https://doi.org/10.1037/a0024351

Stice, E., & Shaw, H. (2004). Eating disorder prevention programs: A meta-analytic review. *Psychological Bulletin*. https://doi.org/10.1037/0033-2909.130.2.206

Stice, E., Shaw, H., Burton, E., & Wade, E. (2006). Dissonance and healthy weight eating disorder prevention programs: A randomized efficacy trial. *Journal of Consulting and Clinical Psychology*. https://doi.org/10.1037/0022-006X.74.2.263

Striegel-Moore, R. H., Dohm, F. A., Kraemer, H. C., Taylor, C. B., Daniels, S., Crawford, P. B., & Schreiber, G. B. (2003). Eating disorders in white and black women. *American Journal of Psychiatry*. https://doi.org/10.1176/appi.ajp.160.7.1326

Taylor, C. B. (2017). Weight and shape concern and body image as risk factors for eating disorders. In T. Wade (Ed.), *Encyclopedia of feeding and eating disorders* (pp. 889–893). Springer.

Taylor, C. B., Bryson, S., Luce, K. H., Cunning, D., Doyle, A. C., Abascal, L. B., Rockwell, R., Dev, P., Winzelberg, A. J., & Wilfley, D. E. (2006). Prevention of eating disorders in at-risk college-age women. *Archives of General Psychiatry*. https://doi.org/10.1001/archpsyc.63.8.881

Taylor, C. B., Fitzsimmons-Craft, E. E., & Goel, N. J. (2017). Prevention: Current status and underlying theory. In W. S. Agras & A. Robinson (Eds.), *Oxford handbook of eating disorders* (pp. 247–270). Oxford University Press.

Taylor, C. B., Sadeh-Sharvit, S., Fitzsimmons-Craft, E. E., Topooco, N., Rojas-Ashe, E., & Wilfley, D. E. (2020). Utilization of technologies to support patients with eating disorders. In G. M. Reger (Ed.), *Technology and mental health: A Clinician's guide to improving outcomes* (pp. 149–170). Routledge.

Traviss-Turner, G. D., West, R. M., & Hill, A. J. (2017). Guided self-help for eating disorders: A systematic review and metaregression. *European Eating Disorders Review*. https://doi.org/10.1002/erv.2507

Tregarthen, J. P., Lock, J., & Darcy, A. M. (2015). Development of a smartphone application for eating disorder self-monitoring. *International Journal of Eating Disorders*. https://doi.org/10.1002/eat.22386

Udo, T., & Grilo, C. M. (2018). Prevalence and correlates of DSM-5–defined eating disorders in a nationally representative sample of U.S. adults. *Biological Psychiatry*. https://doi.org/10.1016/j.biopsych.2018.03.014

van Hoeken, D., & Hoek, H. W. (2020). Review of the burden of eating disorders: Mortality, disability, costs, quality of life, and family burden. *Current Opinion in Psychiatry*. https://doi.org/10.1097/YCO.0000000000000641

Wade, T. D., & Wilksch, S. M. (2018). Internet eating disorder prevention. *Current Opinion in Psychiatry*. https://doi.org/10.1097/YCO.0000000000000450

Walsh, B. T., Fairburn, C. G., Mickley, D., Sysko, R., & Parides, M. K. (2004). Treatment of bulimia nervosa in a primary care setting. *American Journal of Psychiatry*. https://doi.org/10.1176/appi.ajp.161.3.556

Ward, Z. J., Rodriguez, P., Wright, D. R., Austin, S. B., & Long, M. W. (2019). Estimation of eating disorders prevalence by age and associations with mortality in a simulated nationally representative US cohort. *JAMA Network Open*. https://doi.org/10.1001/jamanetworkopen.2019.12925

Whitelaw, M., Lee, K. J., Gilbertson, H., & Sawyer, S. M. (2018). Predictors of complications in anorexia nervosa and atypical anorexia nervosa: Degree of underweight or extent and recency of weight loss? *Journal of Adolescent Health*. https://doi.org/10.1016/j.jadohealth.2018.08.019

Wilksch, S. M., & Wade, T. D. (2009). Reduction of shape and weight concern in young adolescents: A 30-month controlled evaluation of a media literacy program. *Journal of the American Academy of Child and Adolescent Psychiatry*. https://doi.org/10.1097/CHI.0b013e3181a1f559