The prevention of eating disorders: A review of the research on risk factors with implications for practice


Subjects: Children & youth, Eating disorders
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Document types: Feature
Source type: Periodical
ISSN/ISBN: 10736077
ProQuest document ID: 54855735
Text Word Count: 8182
Document URL: http://proquest.umi.com/pqdweb/?did=54855735&sid=1&Fmt=4&clientId=52110&RQT=309&VName=PQD

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Abstract (Document Summary)

To present research findings on risk factors for eating disorders that specifically relate to prevention for advanced practice. Identifiable risk factors for eating disorders are found in children as well as adolescents.

Full Text (8182 words)

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[Headnote]

TOPIC. Eating disorders are a significant health problem among children and adolescents. A synthesis of recent research findings on the risk factors for eating disorders describes prevention strategies for practice.

PURPOSE. To present research findings on risk factors for eating disorders that specifically relate to prevention for advanced practice. Current investigations are reviewed and critiqued for biologic, psychological, family, and sociocultural risk factors. A critique of the research and findings from important studies describes strategies for prevention of eating disorders for advanced practice.

RESULTS. Published literature and clinical and research expertise of the author.

CONCLUSIONS. Identifiable risk factors for eating disorders are found in children as well as adolescents. Findings from risk factor research provide the advanced practice nurse strategies for prevention of eating disorders. Few prevention programs exist; even fewer have been tested. An important clinical and research focus for advanced practice nurses is the prevention of eating disorders.

Key words: Children and adolescents, eating disorders, prevention, risk factors

One of the major psychiatric problems that adolescents and children develop is an eating disorder (ED). The highest incidence is found in adolescents. Both anorexia nervosa (AN) and bulimia nervosa (BN) are prevalent in this society and other westernized cultures. The prevalence of EDs among adolescents has been estimated at 0.5% for AN and between 0.5% and 5.8% for BN, depending on the assessment strategy used and whether the

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population studied was clinical or community (Shisslak, Crago, & Estes, 1995). In addition to full-syndrome EDs, it has been reported that 35% to 50% of adolescent girls referred to ED clinics are classified with partial-syndrome ED. Partial syndrome, also referred to as subclinical or subthreshold, has been estimated to be higher than full-syndrome EDs in community samples (Bunnett, Shenker, Nussbaum, Jacobson, & Cooper, 1990). In partial syndrome, young women are concerned about weight and experience psychological distress, but differ from those with full syndrome on the frequency and severity of eating behaviors, such as fasting, self-induced vomiting, and laxative abuse (Kendler et al., 1991).

Prevention of psychiatric disorders is an important role for advanced practice nurses. The literature on risk factors for EDs, especially empiric reports, is overwhelming. Reports on prevention strategies based on risk factor research, however, are scarce in the mental health literature. One speculation for this discrepancy is that the dissemination of findings from these investigations has not reached the practitioners who are positioned, skilled, and knowledgeable to develop prevention programs. The purpose of this article is to synthesize the current research on risk factors for EDs. The few prevention programs that have been tested are examined regarding effectiveness. Based on the research literature, suggestions for the development of prevention strategies and programs are presented. This information is intended to encourage advanced practice psychiatric-mental health nurses engaged in clinical and community work to participate in the development of such programs. At the very least, this article should raise consciousness about the need for ED prevention.

Risk Factor Identification

With the number of reports found on EDs and their risk factors, it was necessary to organize this review within some framework. In most ED research, and in this author's previous reports, risk factors are categorized into four major types: biological, family/parent, psychological/developmental, and sociocultural (White, 1992a, 1992b). Table 1 presents an overview of the major risk factors. Because EDs are considered multidetermined and multifactorial, risk factors within one category might overlap and interrelate with those from another category. Nevertheless, these broad categories provided a solution for organizing the volume of information examined for this review. It is noteworthy that risks may differ from one developmental period to another (Taylor et al., 1998). Therefore, the age or developmental level of the children and adolescents in the reported investigations has been included.

The disorders of AN and BN are considered together in the research on risk factors, because they have overlapping symptoms and etiologies. Many clinicians today consider Ells as dieting-induced disorders because the essential feature of both AN and BN is dysfunctional eating/dieting patterns. Thus, there is a spectrum of eating disturbances (Shisslak et al., 1995). Symptoms are conceptualized on a continuum, with normal eating at one end and the symptoms consistent with an eating disorder on the other end. In between are the symptoms, such as purging and binge-eating, and so called partial-syndrome disorders (Figure 1). Therefore, this review, except where noted, uses this symptom conceptualization, rather than the discreet psychiatric disorders of AN and BN.

The development of intervention programs for the prevention of EDs is in its infancy. The prevention programs reported in this review assess and attempt to change risk factors. A few have been tested, but with limited success. Nevertheless, these will be reviewed because the findings inform us of lessons learned.
Table 1. Overview of Major Risk Factors for Eating Disorders

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Table 1.

Biological Risk Factors

Dieting and obesity are the best-studied biological risk factors that relate to prevention in advanced practice. Recently there have been some interesting, although conflicting, findings related to genetics and the possibility of heredity as a risk factor. Because this field is in its infancy and does not fit with primary prevention in practice, it is not considered in this review. As the research on a genetic predisposition progresses, findings would be important in the future for early detection and secondary prevention. Therefore, genetic counselors would have a significant future role. There is also a wealth of research on neurotransmitters and their role regarding etiology of the EDs and concomitant treatment. Etiology, however, is not synonymous with risk factors that are preventable. Also, these areas are especially important for intervention, rather than prevention. As expected, most of the recent research related to brain imaging, genetic markers, and neurochemistry has been undertaken on adult women already diagnosed with an eating disorder. These findings are especially important for studying the course of the disorders and for prescribing treatments, but to date they have almost no role in prevention strategies for advanced practice nursing.

Figure 1.

Dieting has been considered one of the most important areas for prevention. In the research literature, dieting often is referred to as "dietary restraint." Although not synonymous with dieting, this term captures the notion that restricting food, whether successful or not, is a serious behavior underlying the development of eating disorder symptoms (Pollyv & Herman, 1993). Wanting to restrict and attempting to restrict are as serious as the actual practice of restricting. Restraint has been linked to starvation behaviors, in that dieting and losing weight provide some young women with a sense of control at an age when control and autonomy are important (Streigel-Moore, Silberstein, & Rodin, 1986). This feeling of control, in turn, perpetuates the dieting and, in some instances, leads to starvation. Dietary restraint also has been linked to binge-eating, and binge-eating is the precursor to purging for those with BN. Pollyv and Herman explored this mechanism, hypothesizing that the deprivation of food leads psychologically and physiologically to the binge. This original linking hypothesis has been confirmed in numerous studies over the past three decades. Moreover, many instruments have been developed to measure restraint in clinical and research settings.

Dieting has been linked to brain chemistry in recent studies that relate neuroendocrine and neurotransmitter abnormalities to EDs. Findings from these studies, however, must be viewed with caution. For example, Kaye, Gendall, and Strober (1998) indicated that substantial biologic and genetic vulnerabilities contribute to the pathogenesis of AN and BN. Multiple neurotransmitter and neuroendocrine abnormalities have been documented in
the EDs. For the most part, these researchers noted that these disturbances are state related and tend to normalize after symptom remission, especially following weight restoration. The one exception is altered serotonin activity, which is a trait-related characteristic. Researchers have found elevated concentrations of 5-hydroxyindoleacetic acid in the cerebral spinal fluid of recovered women with EDs. This finding is consistent with the symptoms noted following recovery such as obsessiosity, perfectionism, and harm avoidance (Kaye et al.). However, the biologic risk model that considers genetics and the role of neurotransmitters is the least practical and economic for prevention, especially by advanced practice nurses. Thus, dieting has become in practice the most useful, preventable biologic risk factor, along with obesity. In fact, dieting may precipitate many of the brain chemistry changes—not the other way around (Lauer, Gorzewski, Gerlinghoff, Backmund, & Zihl, 1999; Roser et al., 1999; Smith, Fairburn, & Cowen, 1999). Therefore, the significance of dieting to prevention is underscored.

Dieting in this society has been labeled recently as normative. Girls and women of all ages have a "dieting mentality"—for example, consuming low-calorie foods, or counting fat grams (Koff & Rierdan, 1991). Differentiating this norm from a more serious symptom has been a limitation in risk factor research. Most investigators fail to inquire about the exact nature of the dieting (e.g., how restrictive, how long). Thus, dieting behavior actually might be overreported and overrated in its importance in eating disorder research. Nevertheless, many studies on dieting have demonstrated significant findings.

In this society dieting is practiced regardless of weight status. Girls as young as 8 were found to have dieting awareness, and some actually were dieting (Hill, & Palfin, 1998; Moreno & Thean, 1995). In a survey of 206 sixth graders, a large proportion of girls was found practicing weight loss behaviors, even though the girls did not describe themselves as overweight and reported being satisfied with their appearance (Koff & Rierdan, 1991). In another investigation (Emmons, 1996), findings from a survey of 1,269 high school students in one school district indicated that two thirds of the black females and three quarters of the white females were dieting. The majority of the dieters in this investigation were not overweight; some were underweight. In a large national survey, Fels, Parrillo, Chenier, and Dunn (1996) analyzed weight and dieting attitudes. Of the 10,870 respondents, 25% of the high school students perceived themselves as overweight, and 75% were attempting to lose weight. Given the relationship among dieting (restricting), binge-eating, and purging, these findings on dieting practices are important.

Many studies have addressed the role being overweight plays in unhealthy dieting and the development of EDs. Obesity in this country is increasingly prevalent for both children and adolescents and is an important area for study (Centers for Disease Control and Prevention, 1997; Troiano, Flegal, Kuczmarski, Campbell, & Johnson, 1995). It is even more significant in a society where fear of fat is a prevailing attitude in children and adolescents (Hill, 1993). In fact, most experts in the field have argued that some of the characteristics of AN (e.g., dieting, weight reduction, hyperactivity) are primary features. Therefore, subpopulations in whom weight loss and exercise are encouraged are at particular risk for the development of AN.

Stein and Hedger (1997), in their prospective study of 79 seventh- through ninth-grade girls, divided subjects into two groups: those who saw themselves as fat and out of shape, and those who considered themselves slim and athletic. Among variables such as depression, dieting, competence, appearance, and self-esteem, increased dieting, and depression were related to higher weights, particularly in the fat and out-of-shape group. Other investigators demonstrated that a higher body mass index (BMI) in elementary and middle-school girls was one predictor of weight concerns and dieting. For example, Taylor et al. (1998) collected survey data using a self-report instrument on risk factors that predict weight concern. Factors such as being teased about one's weight, BMI, and parents' comments about weight were evaluated for 103 elementary school-age girls and 420 girls in middle school. A higher BMI was a significant predictor of weight concern, as was peer influence about appearance.

There are limitations in using either BMI or percentage of ideal weight to determine weight status in children and adolescents, especially retrospectively. In most cases, growth spurts and puberty changes are not considered in the equation. Therefore, the validity of the reported frequencies of subjects who actually are overweight is suspect, especially if this information is collected by retrospective recall. Most prospective studies, however, account for growth variables by using questionnaires on pubertal signs. Another finding indicating caution when interpreting study results is that on surveys, adolescents often underreport their weights and overreport their heights. Giacchi, Mattei, and Rossi (1998) demonstrated that among 143 high school males and females, a significant number underestimated their weight and overreported their height. For their sample, this resulted in an 8% underestimation of overweight prevalence. Because height and weight are used to calculate BMI, this finding would translate into higher BMIs than reported. Therefore, an even greater percentage of children and adolescents found to be dieting might be overweight; this would indicate that weight status is a more significant risk factor than previously believed.

Not all children and adolescents who diet develop EDs. Several other risk factors, such as body dissatisfaction and
low self-esteem, have been proposed to provide this linkage.

Psychological/Developmental Issues

In studying psychological risk factors, comorbid conditions, and traits such as weight and shape concerns, body dissatisfaction and low self-esteem have been determined to be significant. Body image and weight concerns begin in girls between the ages of 9 and 11, and appear to increase dramatically during the transition to junior high school (Richards, Casper, & Larson, 1990; Thelen, Powell, Lawrence, & Kunkert, 1992). Some experts have indicated that obesity and being overweight may be negatively related to self-esteem in adolescents, but not in children for whom body image may not be as central to their selfconcept (Friedman & Brownell, 1995). This notion has received little support in the ED risk-factor literature. For example, elementary school girls have been found to have a low self-worth related to weight and weight concerns. From interviews with 176 8-year-old girls and boys, Hill and Pallin (1998) demonstrated that the girls’ views of themselves consisted of a low self worth, which was associated with dieting awareness. Because actual dieting is difficult to measure in this age group, using a fictitious character (Mary Jane) and asking about diet awareness served as part of the data-collection technique. In a meta-analysis of the body-image research, Cash and Deagle (1997) found that there was a significant difference between perception and attitude. For example, attitude toward one’s body (e.g., body dissatisfaction) was a more robust predictor of EDs than was perception (e.g., distortion). However, perceived overweight status in many studies, especially with adolescents, was a correlate of low self-esteem and body dissatisfaction.

The notion that body dissatisfaction and self-esteem issues underlie EDs is not novel. These characteristics are strongly related to each other and often, for many females, to changes occurring at puberty. Among 268 adolescent girls (mean age 16.5) in one descriptive study, those with abnormal eating attitudes were unhappy and had lower self-esteem scores than those who did not have abnormal eating attitudes (Fischer, Schneider, Pegler, & Napolitano, 1991). In a longitudinal study of 11- and 12-year-olds (N = 554), poor self-esteem was predictive of unhealthy eating attitudes when these girls reached ages 15 and 16 (n = 400) (Button, Sonuga-Barke, Davies, & Thompson, 1996). In contrast, findings from other investigations showed that eating attitudes and not self-esteem predicted the later development of eating psychopathology (Wood, Waller, & Gowers,1994). Callam and Waller (1998) supported these findings, concluding that eating characteristics, over time, remain stable compared to psychosocial traits. They demonstrated in their 7-year study of 63 women, following them from ages 12 to 19, that eating characteristics and attitudes in the early teenage years better predicted eating characteristics in early adulthood than did the psychological traits of self-esteem and perfectionism.

Weight concerns and dissatisfaction that can develop into a preoccupation with weight, shape, and size may be the earliest risk factor in the trajectory of the development of a diagnosable ED. Many investigations have supported the relationship between weight concerns and later development of ED symptoms, and in some cases later development of a diagnosable ED (Callam & Waller, 1998; Taylor et al.,1998).

Other researchers have demonstrated that for boys and girls between the ages of 8 and 16, self-esteem was predicted by body esteem or body dissatisfaction (Mendelson, White, & Mendelson, 1995). An interesting finding was that self-esteem was not predicted by actual weight, leading to the conclusion that how children feel about or experience their body, rather than actual weight, is the more critical factor for self-esteem. This is also true of adolescents. Across diverse ethnic and racial groups, body dissatisfaction and perceived overweight are consistent correlates of dieting and binge-eating in adolescent girls. Whatever the ethnic background, those who frequently dieted compared to those who did not diet had increased body dissatisfaction as well as self-induced vomiting (French, Perry, Leon, & Fulker son,1995; Moulton, Moulton, Roach, & Jones,1999).

In addition to these important psychological traits, comorbid psychiatric conditions are thought to be risk factors for EDs in children and adolescents. The most reported comorbid condition for AN is obsessive-compulsive disorder (OCD). In a study of 68 patients with AN and BN (Thornton & Russell, 1997), 37% of those with AN had OCD, and 19% were found to have premorbid OCD. The OCD was diagnosed approximately 5 years (mean age 11) earlier than the AN. On the other hand, only 3% of those with BN had OCD.

Because a large percentage of those who develop BN have had a history of AN, AN is considered a risk factor. In two studies on the development of symptoms for BN, between 28% and 30% of women with BN had been diagnosed previously with AN (Haiman & Devlin,1999; Sullivan, Bulik, Carter, Gendall, & Joyce, 1996). Research findings in this area are inconclusive; investigations have not determined how these two disorders are related. One hypothesis is that those with AN never really change their attitudes and behaviors about food and continue to restrict, even though clinically they are considered "weight recovered" (Trocki, Theodoras, & Shepard, 1998). These experts have speculated that the way in which recovery is determined does not assess cell nourishment,
therefore, many anorexics would not be "recovered" when using 85% of ideal weight as the determinant; instead, they suggest using total body potassium as a more valid measure.

Childhood sexual abuse, while not a comorbid disorder, has been related to EDs. The focus on primary prevention of EDs is not related to sexual abuse. Nevertheless, this is an important area to assess in treating adolescents with an ED and may hold some import for the early detection of symptoms. It is worth noting that the development of many other psychiatric disorders has also been related to childhood sexual abuse.

Studies have found conflicting findings supporting a relationship between childhood sexual abuse and the development of BN. However, many investigations have supported the notion that childhood sexual abuse, while seen in a larger proportion of women with BN than in the general population, may not be more significant than the proportion found in women with other psychiatric disorders (Kenardy & Ball, 1998; Perkins & Luster, 1999; Wonderlich, Brewerton, Jocic, Dansky, & Abbott, 199. In clinical (psychiatric inpatient) samples, there is a strong relationship of childhood sexual abuse to the development of EDs-especially BN (Zlotnick et al., 1996). In both community samples and clinical samples, however, other comorbid conditions are usually present, such as borderline personality disorder, substance abuse disorder, post-traumatic stress disorder, and affective disorders (Casper & Lyubomorsky, 1997; Dansky, Brewerton, Kilpatrick, & O'Neill, 1997; Waller, 1994).

What must be considered in light of these findings is that when a relationship between sexual abuse and EDs is demonstrated, several other factors must be taken into account to clarify the nature of the relationship. For example, it is important to collect data on the age at the time of the abuse and the sequencing of symptoms of the comorbid conditions and ED symptoms in order to substantiate a clear and direct relationship between sexual abuse and the development of an ED. Some studies reviewed focused on identifying those with BN who had a history of sexual abuse, irrespective of another comorbid condition. Other studies addressed the presence of another comorbid condition in women with BN with a history of sexual abuse but the sequencing of symptom development was not considered. While this relationship might not be relevant for primary prevention, research linking ED symptoms to childhood sexual abuse, especially in psychiatric populations, provides clinicians with important information for treatment.

The Influence of Family

Since publication of the earliest and rather simplistic description of dysfunctional family patterns as risk factors for both BN and AN, a significant body of research has evolved. It is no longer useful simply to view the family of the anorexic as overprotective with rigid rules, or the family of the bulimic as chaotic with few boundaries and rules (Minuchin, Rossman, & Baker, 1978). For EDs, parental attitudes have become the focus of family research. Investigators, for example, have determined that attitudes differ in the degree that they are influential according to both gender and developmental level. There has been little support for the hypothesis that genetics play a significant role in the transmission of EDs. Rather, throughout various stages of development, parental attitudes, whether overt or subtle, have been determined to be the more likely path of transmission of eating attitudes and behaviors. A few empirical reports address eating attitudes of mothers and the effect their own ED has had on infants and toddlers. In one observational study, compared to controls, mothers with EDs and their infants were more intrusive during both eating and play (Stein, Wooley, Cooper, & Fairburn, 1994). In a prospective design investigation (Agras, Hammer, & McNichols, 1999), 41 mothers with an ED and their children (from birth to 5 years) were observed. Compared to controls, the mothers with EDs used food for nonnutritive purposes more often (such as to calm children), had less organized schedules for feeding, and had greater expressed concern about their children's weight, especially their daughters.

In another study, Hill and Pallin (1998) asked the 176 8-year-old girls and boys in their investigation about parents' dieting. They found the girls were aware of the reasons their mothers dieted and were drawn to weight control for the same reason--usually to improve selfworth. Streigel-Moore and Keamy-Cooke (1994), in a survey design study, demonstrated a strong relationship between parental dieting efforts and encouraging daughters to diet. A noteworthy finding in this study was that even though sons had higher BMIs, daughters were perceived by both parents (n = 1,276) to be heavier when compared to the parents' assessments of their sons' weights. In a recent study (Smolak, Levine, & SCHERMEN, 1999), when parents (n = 220) of fourth- and fifthgrade girls and boys were studied by interview and self report, investigators found that parental comments, especially by the mothers, were a more powerful influence than parental modeling of weight concerns and behaviors. These comments influenced children's, especially girls', body dissatisfaction, fears about being fat, and weight-loss attempts. In a retrospective study of undergraduate students using 114 male and 139 female subjects (Schwartz, Phares, Tantleff Dunn, & Thompson, 1999), fathers' comments on daughters' appearance, especially teasing when children, more than mothers' comments were strongly related to the students' present body dissatisfaction. Throughout the research

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reviewed, parental attitudes have been demonstrated to significantly affect body dissatisfaction and weight concerns, especially for girls.

Sociocultural Risk Factors

It is not surprising that prevention and risk factor research has included such societal influences as all forms of media, peer-group pressure, and participation in certain at-risk groups or activities such as gymnastics. For different age groups, different forms of media have been influential on dieting, weight concerns, and body dissatisfaction.

Taylor et al. (1998), in a prospective study on predictions of weight concerns described earlier, found that weight concerns (one characteristic thought to be the earliest onset symptom for EDs) were predicted, in both elementary-age girls and girls in middle school by such factors as BMI. However, the most significant predictor was the importance that peers placed on weight and eating. The second significant predictor of weight concerns differed: elementary school girls wanted to look like girls on television; girls in middle school wanted to look like models in magazines.

Another noteworthy study (‘Tiggermann & Pickering, 1996) related two major traits of EDs to watching television. Body dissatisfaction and the drive for thinness. Whereas the overall amount of time watching television was not significant for 15-year-old girls, the time watching certain types of programs was correlated with these ED traits. For example, watching soap operas and movies predicted body dissatisfaction, and the amount of time watching music videos was related to a drive for thinness. The researchers were surprised by their finding regarding music videos because there is no "role" in this type of video with which to identify as there is in the soaps. They explained that comparing oneself to others is a trait a woman with AN displays; drive for thinness, a central feature of AN, was thus correlated because girls with this trait were simply comparing their bodies to those of the performers.

Experts in the field of EDs have indicated that toys such as Barbie dolls influence children's body dissatisfaction. Noteworthy is the report on the idealistic and unattainable nature of such bodily proportions of these dolls and, therefore, how they distort reality for children. Brownell and Napolitano (1985), using average standard measures for a healthy adult woman, determined that in order to attain the same body proportions as Barbie, women would have to increase their height by 24", increase their chest by 5", increase their neck length by 3.2", and decrease their waist by 6". Recently, many opinion-type newspaper articles have appeared that are critical of the deleterious effect of such dolls on young girls' attitudes about their bodies. Parents have been advocating for more realistic-looking dolls for children. There are also risk factors related to certain athletes such as runners and skaters. Low energy intake, weight concerns, body dissatisfaction, low BMIs, and amenorrhea continue to be found in these groups of professional athletes (SundgotBorgen, 1994; Ziegler et al., 1998). In a recent investigation of high school students, eating behaviors and personality characteristics were no different when male and female athletes (n = 318) were compared to nonathletes (n = 360) (Kulkoskey, Keel, Leon, & Dorn, 1999). One related speculation was that athletes might not be at risk for the development of ED symptoms until they train for one particular sport in a highly competitive environment. Also, specific sports in which a slender physique is important, such as long-distance running and gymnastics, are thought to be more influential on symptom development.

Critique of Research on Risk Factors

In summary, research has supported the relationship of specific risk factors to ED symptoms. Dieting, obesity, body dissatisfaction, parental attitudes, and media and peer influences have been identified as significant, affecting both the development of ED symptoms and diagnostic disorders. In this review there were only five studies that used a prospective design. This is a limitation, given the need to draw conclusions that particular risk factors actually predict ED symptom development. Whereas only studies with statistically significant results were included, many studies cited were surveys. However, surveys of large samples followed over time are the usual method for research on risk factors. Many investigations cited used smaller samples with comparative or control groups. These also add important findings to the body of knowledge on risk factors. The four categories of risk factors support the need to develop risk models for prevention. It is clear from the review that nonsymptom behaviors such as dieting, the environmental issues such as the role of the media, and psychological issues such as body dissatisfaction are the most practical for prevention research. Risk factor research requires large-scale screening of nonclinical populations in settings such as high schools. This allows researchers to focus on behavioral vulnerability markers such as dieting, which characterize a broad spectrum of ED patients, are easier to measure, and more economical to use. The pure biologic risk model approach is uneconomical because it often involves urine or blood samples and costly laboratory assays. These intrusive testing procedures preclude group screening and make it difficult to recruit participants (Leung, Geller, & Katzman, 1998).
Factors that increase the likelihood of dieting and negative self-evaluation are the most important for research into prevention. These environmental factors make a greater contribution than genetic factors to the development of overvalued ideas, which trigger the development of EDs. Work needs to be undertaken on the so-called protective factors that might mitigate the effect of risk factors on the development of an ED.

Research on Prevention Programs

Although there are many programs for the prevention of EDs, very few empirical studies on their effectiveness have been reported. Schools are generally the setting for such programs and related research. Experts have suggested that risk factors for EDs be incorporated into curricula that address dieting problems and their risks-for instance programs on other risky behaviors such as smoking and alcohol abuse (Huon, Braganza, Brown, Ritchie, & Roncolto, 1998). This suggestion implies that education, or knowledge acquisition, would be an effective area for changing eating behaviors and preventing EDs. In the few published studies, however, education has not been demonstrated to be effective in changing eating behaviors.

As in the published investigations on change for other health behaviors, an increase in knowledge following an education program is one expected outcome. A change in a particular behavior may not necessarily follow an increase in knowledge. Changes in behavior and attitudes, although predicted, have not been outcomes in the reviewed research on ED prevention programs. Even though the programs were developed to change unhealthy dieting, educate about the nature and consequences of EDs, and provide skills training to resist peer pressure, behavioral change did not occur. Carter, Stewart, Dunn, and Fairburn (1998) added a cognitive-behavioral feature to their education program in an attempt to restructure thinking about food and body image and to change behaviors, such as dietary restraint practices. Unfortunately, while the program demonstrated effectiveness at the end of the intervention, compared to baseline, dietary restraint actually increased above baseline scores at the 6-month follow-up. Cautioning against education programs, Huon and colleagues indicated that clinicians must be aware of such resulting problems from lessons learned in early drug education programs. These substance-abuse programs in some cases were found to unwittingly teach young people the very skills that the programs intended to prevent.

In addition to dieting, body dissatisfaction and negative body image are major risk factors targeted by prevention programs. Although these interventions were used with a college-age sample, they are noteworthy because of their encouraging results. Winzelberg et al. (1998) demonstrated effectiveness, although in the modest range, of a computer-based program that women could use individually to improve body image and decrease body dissatisfaction. The researchers speculated that the findings might have been more significant if there had been more adherence; subjects completed only 50% of the software program.

Recently, Springer, Winzelberg, Perkins, and Taylor (1999) reported the success of an academic course on body image on a university campus. The content covered the biological, historical, and developmental perspectives of this construct; it did not focus on personal change. Significant pretest/posttest results were reported: the program reduced attitudes and behavioral ED risk factors without changing BMI or self-esteem. The authors explained their findings as the result of their decision to purposely exclude any information on nutrition and weight content. This may have helped to avoid unwittingly teaching dieting, a finding from other prevention studies.

Another promising area for research has been on the so-called protective factors—factors that seem to prevent the development of a diagnosable partial or full-symptom ED, even when risk factors have been identified. For example, Taylor et al. (1998) included both elementary and middle school girls in studies, and found that self-confidence appeared to play a role in determining whether those with risk factors developed ED symptoms. They conjectured there might be other so-called protective factors that have not been identified. In a descriptive study in which male and female high school athletes were compared to nonathletes (Fulkerson et al., 1999), the researchers did not find higher levels of eating problems in the athletes. They explained this finding by noting that high self-efficacy scores and a positive outlook on life (both measured in this study) accounted for this. These might also be so-called protective factors. However, this study was not longitudinal in design, so it is difficult to conclude that these traits mediated between risk factors and the actual development of ED symptoms. Nevertheless, the investigators speculated that playing sports might serve as a way to improve self-efficacy, thus preventing the development of ED symptoms.

An interesting informal national prevention program developed by the Department of Health and Human Services (DHHS) is a Web site for girls (www.health.org/power). This site, "Girl Power," was created to help girls form healthy attitudes about their selves and bodies—a goal of primary prevention for EDs. While not formally tested, this program has had widespread notoriety.
In summary, only a few prevention programs have been evaluated. Of those tested, education interventions, especially when focused on dieting and dietary restraint, have proved to be counterproductive. The development of programs that address body image from a conceptual and developmental perspective has shown the most promise, but such programs have yet to be tested on children and adolescents, the more at-risk groups. A promising area for further study is the so-called protective factors that might play a role in preventing the development of EDs.

Strategies for Prevention in Practice

In many settings, advanced practice nurses work with children, adolescents, and their families, individually or in groups. More clinicians are needed to respond to the needs and requests of communities for prevention programs. For example, school-health literature has emphasized the need for prevention in the area of mental illness; for some children and adolescents, the school might be the only avenue for primary prevention programs (Taylor & Adelman, 1996). Parent organizations and directors of such at-risk groups as gymnasts or ballet dancers often request educational programs and consultations. These requests usually are for information on ED detection rather than prevention. However, prevention strategies can be suggested and initiated by clinicians once they have their foot in the door in these opportune settings. While not an exhaustive presentation, some suggestions for prevention strategies follow.

Risk Factor Assessment

Risk factor assessment is a first step in both clinical and community settings before developing programs. Assessment instruments provide the clinician and researcher with instant tools to determine the need and focus of an intervention program. In order to identify those at risk, large-scale assessments may need to be undertaken, such as in schools and school districts. There are numerous tools to measure different risk factors. The McKnight Risk Factor Survey (IV) is an excellent comprehensive screening instrument for elementary, middle, and high school children and adolescents (Shisslak et al., 1999). This instrument identifies those at risk as well as protective factors such as self-confidence.

Parent Programs

The most significant programs that need to be developed are for parents. The research findings on the deleterious effects of parental attitudes and comments, specifically on girls' appearance, are significant, especially as predictors of body image disturbance and psychological functioning. Often, it is the subtle comments or unwitting modeling of behaviors that are harmful and overlooked. These comments increase anxiety for girls as their bodies begin to change. Many women's organizations, professional or volunteer, often want speakers especially on health topics. This is one venue, for example, that can be used to promote healthy attitudes about children's appearance and eating, and to discuss the effect attitudes have on risk factor development. Parents also need accurate information about ideal weights. As noted earlier, parents often labeled girls as overweight when they were not, and on the other hand did not label boys who had higher BMIs as overweight.

Adolescent Programs

Partnering and collaborating with school-health nurses and school counselors to identify those with risk factors such as body dissatisfaction can provide the first step in developing classes on body image. Some of the body image material in obesity treatment manuals developed for children and adolescents contains appropriate content on which to build a course or curriculum on body image.

School health nurses and nurse practitioners have asked frequently for materials and manuals to be developed by PMHNs that would outline how to identify girls at risk. In addition, they are in need of guidelines for content they might incorporate into health classes and discussions. Some of this content might be included in broad-based curricula on risky behaviors. This is an important focus for child and adolescent advanced practice PMHNs.

In addressing the biological risk factors for EDs, the focus must be on obesity and dieting. Because children and adolescents who are overweight are at risk for EDs, risk factor programs that target healthy weight loss behaviors are needed for parents and their children. Because exercise has been demonstrated to be the most important factor in intervention for overweight and obesity, especially for successful weight maintenance, more exercise/activity programs for these children need to be established in school and after school. This may serve as an intervention for decreasing TV watching, a correlate of both obesity and ED risk factors. With respect to the protective factors described earlier, participating in sports/activities may have the added effect of promoting such
protective factors as self-confidence and self-efficacy, and serve as a prevention strategy.

It is important to identify and follow those children with OCD. Given the high rate of this pre-morbid condition, especially for the development of AN, closer assessment must be made of eating behavior such as obsessively dieting, omitting certain foods, and so forth. Young adolescents who have had AN, even if treated and weight recovered, must be followed for risk factors and possible symptoms of BN.

Interventions for sociocultural risk factors may seem daunting, but ED advocacy groups have been successful in having deleterious advertisements altered or removed from magazines that appeal to young girls (e.g., Eating Disorders Awareness and Prevention, Inc., Seattle, WA). Many colleges across the United States have an "ED Awareness" week once a year, during which screening and consciousness raising takes place. Working with advocacy groups is a beneficial way to initiate awareness programs for elementary and high school students. The dissemination of the DHHS's Web site for girls' self-esteem is an attempt to change harmful norms regarding the ideal body. More such esteem-building programs need to be developed for young girls.

Conclusion

Eating disorders are significant mental health problems for female children and adolescents, and important for child and adolescent psychiatric nurses. The development of both partial- and full-syndrome AN and BN is preceded by identifiable risk factors. Important findings from numerous investigations on risk factors provide the foundation for developing prevention strategies in clinical and community settings. Most significant are the findings on the role of body dissatisfaction, self-esteem, dieting, and sociocultural ideals and pressures play in the development of these disorders. Certified advanced practice nurses (CAPNs) are positioned, educated, and skilled to develop and test strategies and programs for the prevention of EDs. CAPNs also are ideal clinicians to participate in the important, ED risk factor and prevention research.

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