

Factors Associated with Eating Disorders in Women

Christina Knowles
Faculty Mentor: Frances Smith

.....
ABSTRACT: Although various factors associated with eating disorders have been studied, no comprehensive source of research findings was identified in this review. The purpose of this study was to identify and synthesize research findings of factors associated with eating disorders in women published from 1992-2008. These findings may be useful to nurses, other professionals, families, and the public to facilitate the prevention, recognition, treatment, and rehabilitation of women with eating disorders.

The factors most closely associated with eating disorders identified through this review were depression, sexual abuse, substance abuse, anxiety disorders, early pubertal onset, and the personality traits of perfectionism and impulsivity. No factor was identified as causal, but sexual abuse and anxiety disorders most commonly preceded the eating disorder. Findings varied among eating disorder subtypes, with sexual abuse and substance abuse more common with bulimic symptomology, while depression and anxiety disorders were commonly associated with both anorexia and bulimia nervosa. Perfectionism was most common in anorexics; in one study, it was identified independent of stress and persisted after recovery.

Limitations noted in the research reviewed included using self-report questionnaires, some small samples, exclusion of some eating disorder subtypes, and a predominant use of cross-sectional and clinical samples. Recommendations for further research included using large epidemiological samples containing multiple subtypes and males, as well as longitudinal studies and methods to determine causal relationships among eating disorders and the associated factors identified. Implications for nursing education, practice, and policy development focused on improving screening during physical examinations and interviews, posing questions to facilitate disclosure, addressing emotions elicited, and suggestions for routine monitoring of patients in clinical settings.

..... *Republication not permitted without written consent of the author.*

INTRODUCTION

Eating disorders are described as habits that are harmful to an individual and may result in death (Alliance for Eating Disorder Awareness, 2005), escalating to extremes when a person experiences severe disturbances in eating behavior (National Institute of Mental Health [NIMH], 2008). These extremes can include severely restricted intake or overeating, with anorexia and bulimia nervosa being the most commonly addressed eating disorders. Characteristics of anorexia nervosa include a relentless pursuit of thinness, an unwillingness to maintain a normal or healthy weight with intense fear of gaining weight, body image distortion and amenorrhea. Bulimia nervosa is characterized by a lack of control over eating with recurrent episodes of binge eating followed by compensatory behavior such as vomiting, use of laxatives or diuretics, fasting, or excessive exercise. A third classification known as “eating disorder not otherwise specified,” includes behaviors similar to anorexia and bulimia, with some variation. Although significant research has been conducted regarding eating disorders, the exact cause—biological, behavioral, or social—remains to be determined. However, these disorders frequently coexist with other psychiatric disorders (NIMH).

Eating disorders affect several million people between the ages of 12 and 35, most commonly women (American Psychiatric Association, 2005). The Renfrew Center Foundation for Eating Disorders (RCFED) estimated that one in five women experience disordered eating (2002). Anorexia nervosa alone has a mortality rate 12 times higher than that of all other causes of death combined for females age 15-24. Women with eating disorders may also experience long-term effects if left untreated. These include sterility, cardiac disorders, osteoporosis, seizures, and anemia (RCFED), as well as heart and kidney problems, which can lead to death (NIMH, 2008).

With increasing prevalence, eating disorders have gained national attention. One of the Healthy People 2010 objectives formulated by the United States Department of Health and Human Services (2005) is to reduce the proportion of adolescents who engage in disordered eating behaviors to control their weight.

Problem

Studies have been conducted in which various factors that may be associated with eating disorders were examined. Associated factors examined included depression, anxiety, sexual abuse, substance abuse, perfectionism, and early

pubertal onset. However, each study identified a limited number of factors, with no comprehensive integration of the findings identified in any of the research reviewed for this study.

Purpose

The purpose of this integrated research review (IRR) was to identify and synthesize factors associated with eating disorders based on findings from current research. This information may be useful to persons across a variety of settings and disciplines to help prevent eating disorders, identify them early, and implement effective treatment and rehabilitation. Indications for research, professional education, and practice are addressed.

METHODS

Research studies included in this IRR examined factors associated with eating disorders in females of varying ages worldwide, published primarily from 2000–2008. Select findings from research published in the 1990s were included when noted in more recent studies or as particularly relevant to this IRR. Congruent with the purpose of this IRR, studies of males were excluded. An interdisciplinary approach was used, including research in nursing, medical and psychology journals from the following databases: PsychINFO, Medline, Cumulative Index of Nursing and Allied Health Literature (CINAHL), and Blackwell Synergy.

RESULTS

Research findings regarding the role of depression, sexual abuse, substance abuse, anxiety disorders, and early pubertal onset in relation to eating disorders are presented. When available, variations in the role of these factors among eating disorder subtypes are presented, as are findings supporting the order in which the onset of these characteristics and comorbidities occurred in relation to eating disorders.

Depression

Eight recent studies focused on the association between eating disorders and depression (Carter, Bewell, Blackmore, & Woodside, 2006; Fornari et al., 1992; Garcia-Alba, 2004; Johnson, Cohen, Kasen, & Brook, 2006; Monteleone et al., 2005; Speranza et al., 2003a; Speranza, Corcos, Atger, Pterniti, & Jeammet, 2003b; Speranza et al., 2005). Both Garcia-Alba and Monteleone et al. suggested that the chemical alterations in the body observed among depressed and eating disorder patients may be associated with malnutrition. Garcia-Alba found that depression occurred more

frequently among anorexics than controls (36% versus 20%), suggesting that depression was associated with alterations in neurotransmitters associated with starvation and significant weight loss.

Monteleone et al. (2005) found that brain-derived neurotrophic factor, thought to have anti-depressant effects, was reduced in underweight anorexics and bulimics, but not in overweight binge-eating disorder patients. Among eating disorder patients 37% of anorexics, 45.8% of bulimics and 16.6% of patients with binge-eating disorder had a comorbid depressive disorder. Since not all patients were depressed, researchers proposed that malnourishment lowered the levels of the brain-derived neurotrophic factor.

Speranza et al. (2003b) found that patients using “purely active weight control strategies” had fewer depressive symptoms (i.e., those who exercised had lower levels than those who binged and/or induced vomiting). Anorexic and bulimic subtypes scored higher than controls on the Beck Depression Inventory and the Depressive Experiences Questionnaire (Speranza et al., 2003a; 2003b), with bulimics or binge/purge anorexics scoring highest (Speranza et al., 2005). Researchers suggested that depression among bulimics might relate more to an inability to identify and describe feelings than to depression. Fornari et al. (1992) found that 75% of anorexics had at least one diagnosis of depression during their lifetime, and bulimic-anorexics showed the most depressive symptoms and major depressive disorder comorbidity. Comorbid depressive disorders occurred among 28.57% of bulimics, 54.17% of anorexics, and 72.22% of bulimic-anorexics. The most significant difference was between bulimics and bulimic-anorexics ($p < .017$).

Johnson et al. (2006) examined personality disorders as a risk factor for eating and weight problems in adulthood. Although depressive personality disorder is not an official psychiatric diagnosis, this study demonstrated a significant correlation between depressive personality disorder and increased risk for recurrent dietary restriction ($p < .05$) and recurrent binge eating during adulthood ($p < .05$). Carter et al. (2006) found that eating disorder participants reporting childhood sexual abuse had higher levels of depression ($p = .008$), anxiety ($p = .000$), low self-esteem ($p = .007$), and interpersonal problems ($p = .003$).

Sexual Abuse

Five studies reported evidence suggesting a relationship

between childhood sexual abuse and eating disorders (Carter et al., 2006; Deep, Lilenfeld, Plotincov, Pollice, & Kaye, 1999; Murray & Waller, 2002; Romans, Gendall, Martin, & Mullen, 2001; van Gerko, Hughes, Hamill, & Waller, 2005), with higher rates of childhood sexual abuse among eating disordered participants than controls. Deep et al. found childhood sexual abuse to be higher among participants with an eating disorder at 23% among anorexics ($p < .03$) and 37% among bulimics without substance dependence ($p < .01$). Bulimics with a comorbid substance abuse disorder demonstrated a significantly higher rate of childhood sexual abuse [65% compared to 7% of controls ($p < .0001$)] (Deep et al.). Among all sub-types, the sexual abuse preceded the eating disorder in a majority of cases.

Romans et al. (2001) studied clients primarily reporting sexual abuse to discover whether they might also have an eating disorder. Higher rates of anorexia and bulimia were found among the 254 women who experienced sexual abuse before the age of 16 compared to the 223 who had not. The group reporting childhood sexual abuse included 84.2% of the anorexics and 73.1% of the bulimics. Childhood sexual abuse clients reported being abused 10 or more times and experienced more intrusive forms of abuse, meaning attempted or completed intercourse (Romans et al.). Congruent with these findings, 48.1% of anorexics in Carter et al.'s (2006) study reported abuse, with 84% abused on more than one occasion. Van Gerko et al. (2005) suggested that a history of childhood sexual abuse, rather than being a direct cause, may play a mediating role in linking other associated factors to the development of eating disorders, but did not identify these links.

Studies by Carter et al. (2006), Deep et al. (1999), Murray and Waller (2002), and van Gerko et al. (2005) supported the hypothesis that childhood sexual abuse is linked to bulimic behaviors and to disturbed body image. While Deep et al. found significantly higher rates of sexual abuse among all subtypes than controls (anorexics $p < .01$; bulimics $p < .03$), rates of childhood sexual abuse among bulimics with a comorbid substance abuse were significantly higher than all other participating groups (control group $p < .0001$; anorexics $p < .01$; bulimics without a comorbid substance abuse $p < .03$).

Van Gerko et al. (2005) found that 33.8% of women with purging behaviors reported childhood sexual abuse ($p = .004$), compared to 17.3% of those not purging. A higher level of bingeing, vomiting, laxative and diuretic

abuse and more reports of greater concern about body shape were observed among participants reporting childhood sexual abuse. Carter et al. (2006) also found a difference in those who purged. Overall, the relationship between childhood sexual abuse and anorexia was significant ($p=.018$). Among purging anorexics, 65% reported sexual abuse, compared to 31% of restrictors (Carter et al.). Restrictors are those who do not regularly engage in binge/purge behaviors during their current episode of anorexia (Chitty et al., 2004).

Murray and Waller (2002) found a significant link between childhood sexual abuse and bulimic behavior test scores (BULIT) ($p<.01$) and Internalized Shame Scale scores ($p<.05$). Also, Internalized Shame Scale scores significantly predicted BULIT scores ($p<.001$), with significant links between any abuse by a family member and bulimic symptomology ($p<.02$) and between abuse by a family member and Internalized Shame Scale scores ($p<.02$). Researchers proposed that the internalized shame might arise from repeated sexual abuse viewed by victims as shameful to themselves as well as to the perpetrator.

Romans et al. (2001) concluded that high paternal over-control increased the risk of developing an eating disorder in women who had experienced childhood sexual abuse. Early menarche was also associated with bulimia in women experiencing childhood sexual abuse [68.4% experienced menarche before age 12 ($p=0.001$)].

Substance Abuse

Nine studies linked eating disorders with comorbid substance abuse (Anderson, Martens, & Cimini, 2005; Bulik et al., 1992; Cance, Ashley, & Penne, 2005; Corcos et al., 2001; Deep et al., 1999; Haug, Heinberg, & Guarda, 2001; Herzog et al., 2006; Stock, Goldberg, Corbett, & Katzman, 2002; von Ranson, Iacono, & McGue, 2002). The chronological onset of the disorders has not been established at this time.

Substance abuse is a diagnosis from the American Psychological Association's official DSM-IV-TR, characterized by a maladaptive, recurrent use with adverse consequences (Trigoboff & Wilson, 2004). Such use may result in an inability to fulfill obligations, using in hazardous situations, and using despite legal and other recurrent problems. Substance use among eating disordered persons includes legal substances such as alcohol, nicotine, caffeine and correct doses of prescribed psychotropics, analgesics, and sedatives as well as illicit

drugs. Corcos et al. (2001) observed a significantly higher rate of psychotropic medication consumption among eating disorder patients compared to the general population ($p<.001$).

Patients with bulimic symptomology demonstrated higher rates of substance abuse than those of the restrictive type (Anderson et al., 2005; Bulik et al., 1992; Cance et al., 2005; Corcos et al., 2001; Herzog et al., 2006; Stock et al., 2002; von Ranson et al., 2002). Bulik et al. found alcohol and cigarette use was also more common among bulimics (52% versus 27% of the general female population). A majority reported that appetite was decreased by smoking and increased by drinking alcohol, leading to binge eating 43% of the time. Bulimics were more likely than anorexics to have used marijuana (45.2% versus 15.4%), cocaine (21.4% versus 3.8%), and amphetamines (30.4 % versus 7.7%). Use of other illicit drugs was sporadic, but more frequent among bulimics. Additionally, Bulik et al. found a higher rate of misuse of laxatives, diuretics and emetics among bulimics, who reported taking up to 200 stimulant laxatives per week.

The findings of Herzog et al. (2006) were congruent with those of Bulik et al. (1992). Cocaine and amphetamines, which suppress appetite, were the most commonly abused illicit drugs. In this study of 42 women, substance abuse was more common in persons with purging (i.e. bulimia) behaviors (17 purging-anorexic and 20 bulimic). Stock et al. (2002) also found greater substance use among those who purged. Restrictors used less alcohol ($p<.0001$), tobacco ($p<.0001$) and marijuana ($p<.006$), whereas those with purging symptoms used these drugs at a rate closer to that of the non-eating disorder comparison group. Participants cited drug use as a means to relax, relieve anger, avoid eating, and escape from problems.

Corcos et al. (2001) also found that restrictive anorexics showed less alcohol abuse and drug consumption than women who purged ($p<.005$ for alcohol consumption and $p<.001$ for drug consumption). Findings showed restrictors self-prescribed or altered the dosage of psychotropics less often than bulimics [12.2% versus nearly 30% of bulimics ($p<.01$)]. Researchers suggested that impulsivity associated with bulimic behaviors might have a role in the difference in consumption patterns among anorexics and bulimics. The rate of smoking among participants with purging behaviors was nearly twice that of the general population (43% compared to 25%) (Haug et al., 2001). Use of psychotropics, marijuana, cigarettes, and alcohol was more prevalent with bulimic symptoms,

and the use of Methylenedioxyamphetamine (Ecstasy) was five times greater (Cance et al., 2005).

Anderson et al. (2005) found purgers (i.e. bulimics) reported more days of drinking, particularly binge drinking, than the comparison group. Fifty-seven percent of purgers reported drinking between 10 and 19 of the last 30 days. The rate of binge drinking was 2.1 ± 2.6 days compared to 0.3 ± 0.5 days ($p < .003$). Purgers also reported more negative consequences of alcohol use, including taking regrettable actions, forgetting where they were or what they did, causing harm to themselves or others, engaging in risky sexual acts, and being the recipient of sexual assault or forced intercourse.

Anxiety Disorders

Seven studies in this review examined anxiety disorders among participants with eating disorders (Carter et al., 2006; Fornari et al., 1992; Godart, Flament, Lecrubier, & Leammet, 2000; Godart et al., 2003; Johnson et al., 2006; Speranza et al., 2001; Thornton & Russell, 1997). Anorexics and bulimics were more likely than controls to have a comorbid anxiety disorder both currently or at some point during their lifetime (Godart et al., 2000; 2003; Johnson et al.). Congruently, Carter et al. found that eating disorder participants reporting childhood sexual abuse had higher levels of anxiety ($p = .000$) and more severe obsessive-compulsive symptoms ($p = .002$). According to Godart et al. (2000), 83% of anorexics and 71% of bulimics had at least one other lifetime anxiety disorder.

Other anxiety disorders often preceded the eating disorder (Godart et al., 2000; Godart et al., 2003; Speranza et al., 2001; Thornton & Russell, 1997). Godart et al. (2000) found that 75% of anorexics and 88% of bulimics with a comorbid anxiety disorder had another anxiety disorder at least one year prior to the onset of the eating disorder. Godart et al. (2003) found childhood separation anxiety was significantly greater ($p < .01$) among women with eating disorders, occurring in half of anorexics and more than half of bulimics (Godart et al., 2000).

Obsessive-compulsive disorder (OCD) was a commonly addressed anxiety disorder in eating disordered patients. Anorexics and bulimics scored higher than controls on diagnostic tests for this disorder; however, five studies demonstrated that anorexics were more likely to present with OCD (Fornari et al., 1992; Godart et al., 2000; 2003; Speranza et al., 2001; Thornton & Russell, 1997). Godart et al. reported a prevalence rate of 21% among

anorexics, compared to no cases among bulimics in their 2003 study. Among 68 inpatients, Thornton and Russell reported comorbid OCD in 37% of anorexics, compared to only 3% of bulimics, with the diagnosis of OCD often preceding the diagnosis of the eating disorder (Thornton & Russell). Speranza et al. also found that OCD preceded the eating disorder in 65% of cases, occurred simultaneously in 17% of cases, and followed the eating disorder in the remaining 18% of cases.

Perfectionism

Seven studies examined the trait of perfectionism in persons with eating disorders (Bastiani, Rao, Weltzin, & Kaye, 1995; Bulik et al., 2003; Castro, Gila, Lahortiga, Saura, & Tro, 2004; Halmi et al., 2000; Romans et al., 2001; Sassaroli & Ruggiero, 2005; Waller & Hartley, 1994). Participants with eating disorders—particularly anorexics—scored higher than controls on multidimensional scales to measure perfectionism (Bastiani et al.; Bulik et al.; Castro et al.; Halmi et al.). Bulik et al. examined the association between perfectionism and psychiatric disorders using the Multidimensional Perfectionism Scale to determine which aspects of perfectionism were associated with ED. The strongest association with eating disorders was “concern over mistakes” ($p < .01$ for anorexics and $p < .0001$ for bulimics). Higher scores on this subscale were also identified as a predictor of eating disorders, but were associated with lower rates of alcohol abuse and dependence ($p < .05$). Bulik et al. also found higher scores on the sub-scale “doubts about actions” to be associated with eating disorders and other anxiety disorders ($p < .001$ in anorexics; $p < .0001$ in bulimics).

Bastiani et al. (1995) found that the trait of perfectionism in anorexics continued after restoration of a healthy weight and suggested it as a contributing factor in resistance to treatment and in relapse. Both Bastiani et al. and Castro et al. (2004) suggested that the perfectionism stems from self-oriented expectations. Bastiani et al. found significantly higher scores among anorexics than controls on the Self-oriented perfectionism sub-scale of the Hewitt Multidimensional Perfectionism Scale (Hewitt MPS) ($p \leq .01$ when comparing underweight anorexics to controls; $p \leq .1$ when comparing weight-restored anorexics to controls). There was no statistically significant difference between anorexics and controls on the Other-Oriented perfectionism sub-scale. Congruently, Castro et al. (2004) found that anorexics scored significantly higher on two sub-scales of the Child and Adolescents Perfectionism Scale. These sub-

scales are “Self-oriented perfectionism” ($p < .001$) and “Perfectionistic self-presentation” ($p < .001$). However, there was no statistically significant difference between the scores of anorexics and control participants on the “Socially-prescribed perfectionism” sub-scale ($p = .292$).

In contrast, Waller and Hartley (1994) suggested a link to the expectations of others in their study of the association between patterns of family functioning and the psychopathology of eating disorders. They found that women with eating disorders reported that their parents had high expectations and were unusually disapproving, with this perception of inevitable disapproval a potential maintaining factor in eating disorders. Romans et al. (2001) found that high paternal over-control increased the risk of developing an eating disorder in women who had experienced childhood sexual abuse, and low maternal care was specifically associated with anorexia.

Sassaroli and Ruggiero (2005) studied the role of stress in eating disorders, in which perfectionism emerged as the primary personality predictor of eating disorders in contrast to other predictors or associated factors. They suggested that this occurs because perfectionism is a deeply rooted characteristic associated with eating disorders, present even when stress was not identified as being a mediating factor.

Early Pubertal Onset

In five studies, researchers examined the relationship between early pubertal onset and eating disorders (Graber, Lewinsohn, Seeley, & Brooks-Gunn, 1997; Hayward et al., 1997; Heebink, Sunday, & Halmi, 1995; Romans et al., 2001; Stice, Presnell, & Bearman, 2001). Graber et al. found that early-maturing girls had higher lifetime rates of all psychiatric disorders, including eating disorders, compared to girls who matured at a more average rate (52.9% versus 37.8%). No specific cause-effect link was noted.

Heebink et al. (1995) found that girls with maturity fears may be at risk for development of eating disorders to avoid physiological changes associated with development during adolescence. Heebink et al. found onset of anorexia nervosa before age 14 to be associated with maturity fears. After controlling for depression, researchers found maturity fears to be significant in patients with primary amenorrhea versus those with secondary amenorrhea ($p = .003$). Results also revealed significantly higher levels of maturity fears when the onset occurred in adolescence rather than adulthood,

proposing that these fears influenced adolescents to diet to avoid normal physiologic changes. Congruently, Hayward et al. (1997) suggested that early pubertal onset may introduce a higher risk for negative body image and weight concerns, and that the concerns over body image and weight may precede or possibly predict the eating disorder. Romans et al. (2001) also found an association between early menarche and bulimia in women who have experienced childhood sexual abuse [68.4% experienced menarche before the age of 12 ($p = 0.001$)].

In contrast to these studies, Stice et al. (2001) did not find a direct significant relationship between early menarche and eating disorders; however, an indirect link was suggested. A strong relationship was found among early onset puberty and emotional disturbance and between early onset puberty and substance abuse. Early-maturing girls were at three times the risk for developing depression or substance abuse, and both a diagnosis of depression and substance abuse showed a significant comorbidity with eating disorders ($p < .0001$ and $p < .05$ respectively).

DISCUSSION

Findings were usually consistent throughout this IRR. Most studies identified a link between eating disorders and the associated factors presented; however, no cause-effect relationships were identified. Even in instances in which a common preceding event or condition was found, those factors were not directly identified as causal in the development of the eating disorder. Rather, common elements and possible mediating links were noted, including emotions and personality traits, particularly perfectionism, impulsivity, and shame. Interrelationships among dependent variables and eating disorders are complex and require careful consideration.

Although anxiety disorders were more common in anorexics and bulimics, the personality trait of perfectionism was more common in anorexics. In anorexics, perfectionism was found to continue even after restoration of a healthy weight (Bastiani et al., 1995) and was identified without a known precipitating stressful event (Sassaroli & Ruggiero, 2005). Perhaps perfectionism is the more likely or specific cause of the eating disorder rather than anxiety, considering that perfectionism is common in other anxiety disorders and eating disorders. Although anxiety disorders preceded the onset of the eating disorder, a perfectionistic personality may contribute to both disorders and the apparent relationship between the two.

Depression was also more associated with anorexia and bulimia than with the other types of eating disorders studied. The perfectionistic personality traits common in anorexic patients might help to explain the association with higher rates of depression in these patients, as unrealistically high expectations may contribute to guilt and a sense of worthlessness that may also occur in depressed patients.

This perfectionistic trait found in anorexics may also be responsible for the considerable weight loss that bulimic women typically do not experience. Being perfectionistic, anorexics may exercise more willpower to meet the ultimate goal of controlling their weight, explaining why these women are able to avoid consuming food instead of bingeing and purging. Conversely, the impulsivity noted in bulimics may lead to consumption of extravagant portions of food followed by purging, which they often view as a “quick fix.”

Impulsivity among bulimics was identified as a possible contributing factor to higher rates of substance abuse, with episodes of binge eating and/or drinking. In addition, substances such as alcohol and marijuana increase appetite, which may increase bingeing, suggesting a possible link between substance abuse and bingeing behavior. Conversely, many substances such as nicotine and cocaine have appetite-suppressing effects, which may be a motivating factor for their use.

Deep et al. (1999) found that bulimics with comorbid substance abuse demonstrated a significantly higher rate of childhood sexual abuse than controls ($p < .0001$). Women who experience sexual abuse may also experience depression and impulsively turn to substances to elevate their mood. However, persons “coming down” from a drug-induced high often feel depressed. Alterations in mood may lead to further misuse of substances to stabilize mood and thus develop into substance abuse.

Carter et al. (2006) found that women who reported a history of sexual abuse demonstrated increased rates of depression, anxiety, and low self-esteem. Sexual abuse and anxiety disorders often preceded the eating disorders, which may be viewed as a mechanism of control. Females who have experienced sexual abuse may feel no control over those events. Therefore, eating disorders may develop as a mechanism of control over their bodies by controlling weight and consumption. Initially, eating disorders may serve to control anxiety, but are ultimately

likely to have a reverse effect, increasing depression and anxiety. Many women are aware of the stigma associated with eating disorders, with feelings of depression or anxiety increasing with efforts to hide the disorder. Bulimics may also become anxious or depressed by the action of bingeing, leading to purging.

Research findings related to the association between early pubertal onset and the occurrence of eating disorders varied. The overall consensus among researchers was that maturity fears among adolescents lead to body image disturbances and dieting to avoid pubescent physiologic changes of maturation (Hayward et al., 1997; Heebink et al., 1995). However, Stice et al. (2001) found only an indirect link associating early onset puberty with depression and substance abuse, which were both associated with eating disorders. Therefore, further research is needed to draw definite conclusions.

Depression may be the common link associated with both disturbed body image and feeling the need to diet to relieve that concern. Individuals who experience early pubertal onset may become anxious about looking different from their peers, leading them to the formation of an eating disorder to control physiological development. Similarly, adolescents who have experienced sexual abuse may fear intimate relationships or pregnancy associated with development, leading to an eating disorder in an attempt to delay development.

IMPLICATIONS

Research

This IRR may serve as a foundation for designing prevention and intervention studies. Building on findings reported here, longitudinal studies and the use of methods designed to determine causal relationships among eating disorders and associated factors are indicated. Studies may be designed to examine the interrelationship among the factors associated with eating disorders identified in this IRR, as well as their contribution to the development of eating disorders in females. Researchers might explore the role of positive mediating factors found among individuals in whom these characteristics have been identified, but who did not develop a subsequent eating disorder.

It would be of benefit for researchers to work with large samples representative of the population, including male and female participants. When gathering self-report data, researchers should use diagnostic criteria or clinical observational instruments to verify client responses when

possible. Other eating disorders should be examined for a relationship to each of the factors found through this IRR to be associated with anorexia and bulimia.

Education and Practice

Practitioners in multiple disciplines, including medical, behavioral, and/or mental health fields need to work as multidisciplinary teams to meet the various needs of this population. All practitioners involved need specific education regarding eating disorders and associated factors to identify, treat, and/or refer individuals with eating disorders early. This includes the physical and psychological symptoms associated with eating disorders, including the personality traits of perfectionism and impulsivity and feelings of shame. Practitioners should be open and responsive to problems identified as being associated with eating disorders, including sexual abuse and substance abuse, where an open channel of communication should be established to help the client feel able to disclose information (Murray & Waller, 2002). Practitioners in a variety of practice settings and programs should know the most pertinent questions to ask, how to phrase them, and how to handle the emotions elicited.

Individuals in practice with children and adolescents should be aware of developmental stages and findings related to the chronological onset of the eating disorders and associated disorders, as these may have important implications for the formation or presence of other disorders and treatment implications. School nurses, psychologists, coaches and counselors who come into contact with children and adolescents should be aware of signs of sexual abuse and eating disorders and know both how to address these concerns initially and where to refer this population for further assistance and treatment. Pediatric nurses should be aware of physical signs of eating disorders to note during physical examination, such as abnormal weight, body mass index, or lab results that could indicate a problem with nutrition and fluid balance. Nurses in drug and psychiatric treatment settings should routinely assess for eating disorders due to the frequent comorbidity of these disorders with substance abuse and other psychiatric disorders.

There are also implications for policy development, especially in adolescent or mental health settings. Questions designed specifically to identify eating disorders should be added to the routine admission process, the physical assessment, and history-taking guidelines for new patients. There should also be policies

regarding parental notification and involvement for minors with eating disorders. Guidelines for treating various levels of severity should be adopted to ensure that patients with eating disorders are referred for treatment appropriately. Patients should also be informed of treatment options, such as inpatient, outpatient, and self-help or support groups locally and nationally. Protocols for patient care in the hospital should include routine weights, a record of food and fluid intake, and urinary and bowel output for all patients. Those individuals who have purged should be monitored following meals and snacks to ensure that they retain all food.

CONCLUSIONS

In this comprehensive review of research, the factors most closely associated with eating disorders in females were identified as: depression, sexual abuse, substance abuse, anxiety disorders, early pubertal onset, and the personality traits of perfectionism and impulsivity. No causal relationships were identified, but sexual abuse and anxiety disorders often preceded the eating disorder. Findings reported in this review indicate the need for further research to determine the interrelationship of these factors to each other and to various eating disorders. Although the rates of all these factors were elevated in both anorexics and bulimics, certain factors were more associated with one sub-type than the other. Sexual abuse and substance abuse were associated with bulimia and purging behaviors. Rates of both substance abuse and depression were higher among girls experiencing early maturation. Anxiety disorders and depression were more common among women with anorexia and bulimia nervosa; however, OCD and perfectionistic personality were more common in anorexics.

Opportunities for application of these findings encompass research, education, and practice in nursing, health, and counseling professions. Identification of these associated factors and current findings about them can inform professional education and policy development in screening, monitoring, and facilitating treatment for eating disorders. Much of this information can also be useful to educate individuals, families, and the public in the early recognition of those in whom these factors may appear to be present. As the development of new eating disorders continues among women worldwide, education is the key to prevention and treatment of these potentially deadly disorders.

REFERENCES

- The Alliance for Eating Disorder Awareness. (2005). *The Alliance for Eating Disorder Awareness*. Retrieved June 2, 2006, from <http://www.eatingdisorderinfo.org>.
- American Psychiatric Association. (2005). *Let's talk facts about eating disorders*. Retrieved January 23, 2008 from <http://www.healthyminds.org/factsheets/LTF-EatingDisorders.pdf>
- Anderson, D. A., Martens, M. P., & Cimini, M. D. (2005, January). Do female college students who purge report greater alcohol use and negative alcohol-related consequences? *International Journal of Eating Disorders*, 37, 65-68. Retrieved May 31, 2006, from CINAHL Plus with Full Text database.
- Bastiani, A. M., Rao, R., Weltzin, T., & Kaye, W. H. (1995). Perfectionism in anorexia nervosa. *International Journal of Eating Disorders*, 17, 147-152.
- Bulik, C. M., Tozzi, F., Anderson, C., Mazzeo, S. E., Aggen, S., & Sullivan, P. F. (2003, February). The relation between eating disorders and components of perfectionism. *American Journal of Psychiatry*, 160, 366-368. Retrieved May 27, 2006, from CINAHL Plus with Full Text database.
- Cance, J. D., Ashley, O. S., & Penne, M. A. (2005, November). Unhealthy weight control behaviors and MDMA (Ecstasy) use among adolescent females. *Journal of Adolescent Health*, 37, 409.e19-25. Retrieved May 30, 2006, from CINAHL Plus with Full Text database.
- Carter, J. C., Bewell, C., Blackmore, E., & Woodside, D. B. (2006, March). The impact of childhood sexual abuse in anorexia nervosa. *Child Abuse & Neglect*, 30, 257-269. Retrieved May 30, 2006, from PsycINFO database.
- Castro, J., Gila, P., Lahortiga, F., Saura, B., & Tro, J. (2004, November). Perfectionism dimensions in children and adolescents with anorexia nervosa. *Journal of Adolescent Health*, 35, 392-398. Retrieved May 30, 2006, from CINAHL Plus with Full Text database.
- Chitty, K. K. (2004). Eating Disorders. In C.R. Kneisl, H.S. Wilson, & E. Trigoboff, (Eds.). *Contemporary psychiatric-mental health nursing* (1st ed., pp. 425-450). Upper Saddle River, New Jersey: Pearson Education.
- Corcos, M., Nezelof, S., Speranza, M., Topa, S., Girardon, N., Taieb, O., et al. (2001). Psychoactive substance consumption in eating disorders. *Eating Behaviors*, 2, 27-38. Retrieved May 27, 2006, from PsycINFO database.
- Deep, A. L., Lilenfeld, L. R., Plotnicov, K. H., Pollice, C., & Kaye, W. (1999, January). Sexual abuse in eating disorder subtypes and control women: The role of comorbid substance dependence in bulimia nervosa. *International Journal of Eating Disorders*, 25, 1-10. Retrieved May 21, 2006, from CINAHL Plus with Full Text database.
- Fornari, V., Kaplan, M., Sandberg, D. E., Matthews, M., Skolnick, N., & Katz, J. L. (1992). Depressive and anxiety disorders in anorexia nervosa and bulimia nervosa. *International Journal of Eating Disorders*, 12, 21-29.
- Garcia-Alba, C. (2004, May). Anorexia and depression: Depressive comorbidity in anorexic adolescents. *Spanish Journal of Psychology*, 7, 40-52. Retrieved May 31, 2006, from CINAHL Plus with Full Text database.
- Godart, N. T., Flamet, M. F., Curt, F., Perdereau, F., Lang, F., Venisse, J., et al. (2003). Anxiety disorders in subjects seeking treatment for eating disorders: A DSM-IV controlled study [Electronic version]. *Psychiatry Research*, 117, 245-258.
- Godart, N. T., Flament, M. F., Lecrubier, Y., & Jeammet, P. (2000). Anxiety disorders in anorexia nervosa and bulimia nervosa: Co-morbidity and chronology of appearance. *European Psychiatry*, 15, 38-45.
- Graber, J. A., Lewinsohn, P. M., Seeley, J. R., & Brooks-Gunn, J. (1997). Is psychopathology associated with the timing of pubertal development? *Journal of the American Academy of Child and Adolescent Psychiatry*, 36, 1768-1769.
- Halmi, K. A., Sunday, S. R., Strober, M., Kaplan, A., Woodside, B., Fichter, M., et al. (2000). Perfectionism in anorexia nervosa: Variation by clinical subtype, obsessiveness, and pathological eating behavior. *American Journal of Psychiatry*, 157, 1799-1805.
- Haug, N. A., Heinberg, L. J., & Guarda, A. S. (2001, September). Cigarette smoking and its relationship to

other substance use among eating disordered inpatients. *Eating and Weight Disorders*, 6, 130-139. Retrieved May 27, 2006, from PsycINFO database.

Hayward, C., Killen, J. D., Wilson, D. M., Hammer, L. D., Litt, I. F., Kraemer, H. C., et al. (1997). Psychiatric risk associated with early puberty in adolescent girls. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36, 255-268.

Heebink, D. M., Sunday, S. R., & Halmi, K. A. (1995). Anorexia nervosa and bulimia nervosa in adolescence: Effects of age and menstrual status on psychological variables. *Journal of the American Academy of Child and Adolescent Psychiatry*, 34, 378-385.

Herzog, D. B., Franko, D. L., Dorner, D. J., Keel, P. K., Jackson, S., & Manzo, M. P. (2006). Drug abuse in women with eating disorders. *International Journal of Eating Disorders*, 39, 364-368.

Johnson, J. G., Cohen, P., Kasen, S., & Brook, J. S. (2006). Personality disorder traits evident by early adulthood and risk for eating and weight problems during middle adulthood [Electronic version]. *International Journal of Eating Disorders*, 39, 184-192.

Monteleone, P., Fabrazzo, M., Martiadis, V., Serritella, C., Pannuto, M., & Maj, M. (2005, June). Circulating brain-derived neurotrophic factor is decreased in women with anorexia and bulimia nervosa but not in women with binge-eating disorder: Relationships to co-morbid depression, psychopathology and hormonal variables. *Psychological Medicine*, 35, 897-905. Retrieved May 31, 2006, from PsycINFO database.

Murray, C., & Waller, G. (2002, September). Reported sexual abuse and bulimic psychopathology among nonclinical women: The mediating role of shame. *International Journal of Eating Disorders*, 32, 186-191. Retrieved May 30, 2006, from CINAHL Plus with Full Text database.

National Institute of Mental Health. (2008). *Eating disorders*. Retrieved January 23, 2008 from the NIMH website <http://www.nimh.nih.gov/health/publications/eating-disorders/summary.shtml>

The Renfrew Center Foundation for Eating Disorders.

(2002, September). *Eating Disorders 101 Guide: A Summary of Issues, Statistics and Resources*. Retrieved June 2, 2006, from http://renfrewcenter.jpplprod.com/uploads/resources/1067338472_1.doc.

Romans, S. E., Gendall, K. A., Martin, J. L., & Mullen, P. E. (2001, May). Child sexual abuse and lateral disordered eating: A New Zealand epidemiological study. *International Journal of Eating Disorders*, 29, 380-392. Retrieved May 26, 2006, from CINAHL Plus with Full Text database.

Sassaroli, S., & Ruggiero, G. M. (2005, March). The role of stress in the association between low self-esteem, perfectionism, and worry, and eating disorders. *International Journal of Eating Disorders*, 37, 135-141. Retrieved May 30, 2006, from PsycINFO database.

Speranza, M., Atger, F., Corcos, M., Loas, M., Guilbaud, O., Stephan, P., et al. (2003a). Depressive psychopathology and adverse childhood experiences in eating disorders. *European Psychiatry*, 18, 377-383. Retrieved May 27, 2006, from PsycINFO database.

Speranza, M., Corcos, M., Atger, F., Paterniti, S., & Jeammet, P. (2003b). Binge eating behaviours, depression, and weight control strategies. *Eating and Weight Disorders*, 8, 201-206.

Speranza, M., Corcos, M., Godart, N., Loas, G., Guilbaud, O., Jeammet, P., et al. (2001). Obsessive compulsive disorders in eating disorders. *Eating Behaviors*, 2, 193-207. Retrieved May 30, 2006, from PsycINFO database.

Speranza, M., Corcos, M., Loas, G., Stephan, P., Guilbaud, O., Perez-Diaz, F., et al. (2005). Depressive personality dimensions and alexithymia in eating disorders. *Psychiatry Research*, 135, 153-163.

Stice, E., Presnell, K., & Bearman, S. K. (2001). Relation of early menarche to depression, eating disorders, substance abuse, and comorbid psychopathology among adolescent girls [Electronic version]. *Developmental Psychology*, 37, 608-619.

Stock, S. L., Goldberg, E., Corbett, S., & Katzman, D. K. (2002). Substance use in female adolescents with eating disorders. *Journal of Adolescent Health*, 31, 176-182.

Thornton, C., & Russell, J. (1997). Obsessive compulsive comorbidity in the dieting disorders. *International Journal of Eating Disorders, 21*, 83-87.

Trigoboff, E., & Wilson, H. S. (2004). Substance-related disorders. In C. R. Kneisl, H.S. Wilson, E. Trigoboff (Eds.), *Contemporary psychiatric-mental health nursing* (1st ed., pp. 260-303). Upper Saddle River, New Jersey: Pearson Education.

United States Department of Health and Human Services. (2005). *Healthy People 2010 midcourse review*. Retrieved June 20, 2006, from Healthy People 2010 website <http://www.healthypeople.gov/>.

van Gerko, K., Hughes, M. L., Hamill, M., & Waller, G. (2005, April). Reported childhood sexual abuse and eating-disordered cognitions and behaviors. *Child Abuse & Neglect, 29*, 375-382. Retrieved May 27, 2006, from PsycINFO database.

von Ranson, K. M., Iacono, W. G., & McGue, M. (2002, May). Disordered eating and substance use in an epidemiological sample: Associations within individuals. *International Journal of Eating Disorders, 31*, 389-403. Retrieved May 31, 2006, from CINAHL Plus with Full Text database.

Waller, G., & Hartley, P. (1994, June). Perceived parental style in eating psychopathology. *European Eating Disorders Review, 2*(2), 76-92. Retrieved May 27, 2006, from PsycINFO database.