Eating Behaviors 9 (2008) 408–414

Contents lists available at ScienceDirect

Eating Behaviors

Problematic eating behaviors in adolescents with low self-esteem and elevated depressive symptoms

Elizabeth A. Courtney [a,*], Julie Gamboz [a], Jeffrey G. Johnson [a,b]

[a] New York State Psychiatric Institute, United States
[b] Columbia University College of Physicians and Surgeons, United States

ARTICLE INFO

Article history:
Received 25 November 2007
Received in revised form 28 April 2008
Accepted 4 June 2008

Keywords:
Depression
Self-esteem
Adolescence
Eating behaviors

ABSTRACT

Previous research has indicated that low self-esteem may be an important risk factor for the development of eating disorders. Few longitudinal studies have examined the relationships between low self-esteem, depressive symptoms, and eating disorders in adolescents. The present study investigated whether low self-esteem was associated with depressive symptoms and problematic eating behaviors. Measures of low self-esteem and problematic eating behaviors were administered to a sample of 197 adolescent primary-care patients. Depressive symptoms and problematic eating behaviors were assessed ten months later. Youths with low self-esteem were at greater risk for high levels of depressive symptoms and eating disorder symptoms. In addition, depressive symptoms mediated the association of low self-esteem with problematic eating behaviors.

There has been evidence of an increase in the incidence of eating disorders (Nielsen, 2001; Hoek & van Hoeken, 2003). Research suggests that middle to late adolescence is most likely the period of greatest vulnerability for the onset of eating disorders (Lewinsohn, Striegel-Moore, & Seeley, 2000; Stice, Killen, Hayward, & Taylor, 1998). Further, several studies have investigated possible precursors to the development of eating disorders, suggesting associations between certain personality traits and problematic eating behaviors (Lilenfeld, Wonderlich, Riso, Crosby, & Mitchell, 2006; Cassin & von Ranson, 2005). Research on personality and eating disorders supports that self-esteem (Frederick & Grow, 1996), perfectionism (Ashby, Kottman, & Schoen, 1998), and OCD-like symptoms (Rogers & Petrie, 2001), are associated with eating pathology.

Possible etiological models of eating disorders suggest that adolescence is a period of identity formation and when one's sense of identity is disturbed, adolescents are left with a great amount of instability about feelings of the self (Fairburn & Wilson, 1993). This disruption in self-identity often results in low self-esteem. Fairburn and Wilson (1993) suggest that adolescents with low self-esteem become more self-conscious and increasingly self-critical, possibly making them more susceptible to developing eating disorders. For example, in a study of 17–26 year old undergraduates, subjects identified as having bulimia nervosa reported greater identity confusion and disturbance in their concept of the self compared to non-eating disordered subjects and binge eaters (Schupak-Neuberg & Nemeroff, 1993). The authors postulate that subjects with disordered eating are focusing on the physical body (i.e. obsession with controlling weight and shape) as a way of coping with the internal difficulties with the self. Furthermore, eating disorder research in adolescent samples has suggested that personal appearance plays an important role in self-esteem during adolescence (Geller, Srikameswaran, Cockell, & Zaitsoff, 2000; Tomori & Rus-Makovec, 2000). Some research has even suggested that chronic low self-esteem is a prerequisite for the development of eating disorders (Silverstone, 1992).

Several empirical studies suggest an association between low self-esteem and eating pathology (French et al., 2001; Fryer, Waller, & Kroese, 1997; Wade, Treloar, & Martin, 2001; Mintz & Betz, 1988). Findings from other studies suggest that low self-esteem is an important vulnerability factor for eating disorders (Button, Sonuga-Barke, Davies, & Thompson, 1996; Button, Loan,

* Corresponding author. 1051 Riverside Drive, New York, NY 10069, United States. Tel.: +1 609 618 7615.
E-mail address: eac2153@columbia.edu (E.A. Courtney).

1471-0153/$ – see front matter © 2008 Elsevier Ltd. All rights reserved.
doi:10.1016/j.eatbeh.2008.06.001

Davies, & Sonuga-Barke, 1997; Fairburn, Cooper, Doll, & Welch, 1999; Fairburn, Welch, Doll, Davies, & O'Connor, 1998). For example, in a study comparing healthy controls, psychiatric controls, subjects with bulimia nervosa and subjects with anorexia nervosa, both pre-morbid negative self-evaluation and perfectionism were common risk factors for the onset of anorexia nervosa (Fairburn et al., 1999). In a different study, low self-esteem was associated with body dissatisfaction and pathologic eating behaviors in a sample of 4700 high school students (Tomori & Rus-Makovec, 2000). Patients with eating disorders possess traits associated with low self-esteem, such as problems with self-image and excessive concern over weight and body shape (Button et al., 1997). This research suggests that low self-esteem is associated with eating pathology in both clinical and non-clinical samples.

The co-occurrence of eating disorders with other pathologies has been thoroughly investigated. Eating pathology has been associated with depression, substance abuse, and anxiety disorders (Johnson, Cohen, Kasen, & Brook, 2002; Stice & Shaw, 2003; Stice, Burton, & Shaw, 2004; Lewinsohn et al., 2000). The co-morbidity between depression and eating disorders has been well-established (Lewinsohn et al., 2000; Johnson, Cohen et al., 2002, Johnson, Harris et al., 2002; Fairburn, Cooper, Doll, Norman, & O'Connor, 2000). Elevated depressive symptoms have been shown to predict the future onset of other pathology, including eating pathology (Stice et al., 2004; Stice, Presnell, & Spangler, 2002; Spoor et al., 2006). An earlier epidemiological study (Zaider, Johnson, & Cockell, 2000), using the same adolescent sample from the present study, found that chronic or early onset depressive symptoms were associated with the development of eating disorders.

The current study seeks to further examine the etiology of eating disorders by investigating the relationship between low self-esteem with depressive symptoms and problematic eating behaviors in adolescent primary-care patients. It is hypothesized that low self-esteem will be associated with elevated depressive symptoms and problematic eating behaviors at the follow-up period. Additionally, it is predicted that elevated depressive symptoms will mediate the association of low self-esteem with problematic eating behaviors.

1. Method

1.1. Sample and procedure

The participants in this study were 197 adolescent primary care patients (21.3% male, 78.7% female) between 14 and 19 years of age ($M = 16.31$, SD = 1.074), recruited from consecutive admissions to the following primary care offices and clinics in New York, New Jersey and Ohio: The Columbia Presbyterian Medical Center Adolescent Medical Clinic in New York ($N = 15$), the Staten Island New York Hospital Adolescent Medical Clinic ($N = 53$), the Monmouth County New Jersey Medical Center ($N = 2$), a primary care physician's office in Monmouth, New Jersey ($N = 3$), and the school nurse's offices at Keyport High School in Keyport, New Jersey ($N = 56$), Green High School in Green, Ohio ($N = 55$), the First Care Family Health and Immediate Care Center in Akron, Ohio ($N = 4$), and St. Mary's Regional High School in South Amboy, New Jersey ($N = 9$). The composition of this sample was 71.6% Caucasian, 7.6% African-American, 14.7% Hispanic, 2.5% Asian or Pacific Islander, 3.5% Other. The majority of respondents in the present sample reported visiting their physician or nurse for minor physical health problems (e.g., cold, flu, headaches, digestive problems) ($N = 130$, 66%), a medical examination, or medical tests (e.g., pregnancy tests) ($N = 139$, 70.6%). Twenty-one respondents (10.7%) reported seeking medical attention for major physical health problems (e.g., diabetes, lung problems), or help for emotional problems (e.g., anxiety, depression, problems with alcohol or drugs) ($N = 13$, 6.6%). The adolescents who were recruited from medical clinics reported seeing their doctor for medical examination or testing (χ^2 (1, $N = 197$) = 6.88; $p < .05$), major physical problems ($\chi^2(1, N = 197) = 5.10$; $p < .05$), minor physical problems (χ^2 (1, $N = 197$) = 4.19; $p < .05$), more frequently than did those who were recruited from high schools.

The participants in the present study were a subset of an initial group of 403 adolescents who had participated in an earlier epidemiological study conducted to examine the prevalence of Axis I and Axis II psychiatric disorders and their comorbidity (Zaider et al., 2000). This wave of data will be referred to as T1 in the remainder of this report. Questionnaire packets and informed consent forms were mailed to each respondent approximately 10 months after their participation in the epidemiological study. One hundred and ninety-seven participants completed these measures and returned them by mail to the research team. These 197 participants did not differ significantly from the original sample with regard to age, gender, ethnicity, or socioeconomic status, the baseline prevalence of eating disorder symptoms, or the baseline prevalence of Axis I or Axis II diagnoses. This wave of data will be referred to as T2 in the remainder of this report. The respondents and their parents provided written informed consent, after being provided with a written explanation of study procedures. A check for twenty-five dollars was mailed to the respondents who returned the completed questionnaire packet and signed consent forms.

The study procedures were approved by the Columbia University College of Physicians and Surgeons Institutional Review Board and the New York State Psychiatric Institute Institutional Review Board. A National Institute of Mental Health Certificate of Confidentiality has been obtained for these data.

1.2. Measures

1.2.1. Assessment of eating behaviors

A history of problematic eating behavior was assessed using *The Patient Health Questionnaire for Adolescents* (PHQ-A). The PHQ-A is a self-report version of the Primary Care Evaluation of Mental Disorders (PRIME-MD; Spitzer et al., 1994), a structured diagnostic interview that assesses Axis I disorders that are commonly encountered in primary care settings. Research has supported the reliability and validity of the PHQ-A. The PHQ-A has demonstrated satisfactory levels of diagnostic agreement with

Table 1
Descriptive statistics ($N = 197$)

	N	%
Elevated depressive symptoms (T2)	58	29.4
Low self-esteem (T1)	84	42.6
Problematic eating behaviors present (T1)	21	10.7
Problematic eating behaviors present (T2)	15	7.6
	Mean	SD
Age at T1	16.31	1.07
Age at T2	17.13	1.07

semi-structured clinical interviews administered by mental health professionals (Harris & Johnson, 1997; Johnson, Harris, Spitzer, & Williams, 2002). Bulimia Nervosa (BN) and symptoms of Binge Eating Disorder (a DSM-IV criterion set in the Appendix of DSM-IV, classified as EDNOS), but not Anorexia Nervosa (AN), were assessed.

1.2.2. Assessment of self-esteem

A history of low self-esteem was assessed using 3 items from *The Structured Clinical Interview for DSM-IV Personality Disorders* (SCID-II: First, Spitzer, Gibbons, & Williams, 1995), which most directly assessed self-esteem. The Structured Clinical Interview for DSM-IV Personality Disorders is a two-stage diagnostic system that assesses the 12 DSM-IV personality disorders (PDs). The SCID-II screening questionnaire, with a yes/no format, is completed prior to completion of the SCID-II interview. During the SCID-II interview, clinicians ask follow-up questions to determine whether affirmative responses on the questionnaire indicate that PD symptoms are present. The following SCID-II items were included to assess self-esteem: (1) Do you believe that you are basically an inadequate person and often feel not good about yourself?" (item 34); (2) Do you often put yourself down? (item 35); (3) Do you often feel guilty about things you have or haven't done? (item 40). The items were reverse coded so that low scores on the SCID equaled high self-esteem and high scores on the SCID items equaled low self-esteem. The inter-item reliability in the present study was acceptable (Cronbach's alpha, $\alpha = 0.656$).

1.2.3. The Beck Depression Inventory-ii (BDI)

Depression was measured with the BDI-II (Beck & Steer, 1987), a widely-used questionnaire that assesses all of the principal affective, psychomotor, and physiological components of depression which contribute to the diagnosis of depressive disorders. On the BDI, subjects provide severity ratings for each of 21 statements that describe depression symptoms during "the past week, including today," on a four-point scale, ranging from 0 (e.g., "I don't feel disappointed in myself") to 3 (e.g., "I hate myself"). Twenty-five years of research have yielded strong support for the validity and reliability of the BDI (Beck, Steer, & Garbin, 1988). The inter-item reliability in the present study for the total BDI score was acceptable (Cronbach's alpha, $\alpha = 0.877$).

1.3. Data analyses

Correlational analyses were conducted to investigate the bivariate associations between total self-esteem scores, BDI, and eating disorder scores.[1] Multiple regression analyses were used to explore whether depressive symptoms mediated the association of low self-esteem with problematic eating behaviors. BDI scores were dichotomized in order to determine whether problematic levels of depressive symptoms were associated with problematic eating behaviors. A BDI cutoff score of 10 was used to identity significantly elevated depression scores. Self-esteem scores were dichotomized using a median split in order to determine whether problems with low self-esteem were associated with problematic eating behaviors.

Analysis of contingency tables and logistic regression analyses were conducted with dichotomized variables in order to explore whether depressive symptoms mediated the association of low self-esteem with problematic eating behaviors. Three conditions are required for depressive symptoms to mediate the association of low self-esteem with problematic eating behaviors (Kenny, Kashy, & Bolger, 1998; Holmbeck, 2002). First, low self-esteem (T1) must predict problematic eating behaviors (T2). Second, low self-esteem (T1) must be significantly associated with depressive symptoms (T2). Third, depressive symptoms (T2) must predict problematic eating behaviors (T2) after low self-esteem (T1) is controlled statistically. In all mediational analyses, problematic eating behaviors at T1 were also controlled.

2. Results

2.1. Descriptive and correlational statistics

Means, standard deviations, and frequencies for the study variables are presented in Table 1. Correlations among the variables are presented in Table 2. Low self-esteem was significantly associated with depressive symptoms and problematic eating behaviors.

[1] The same pattern of findings were obtained when we eliminated six items when computing the total BDI score. Two items assessed eating problems and the other four items were directly related to self-esteem.

Table 2
Correlations between low self-esteem, depressive symptoms, and problematic eating behaviors at T1 and T2

	Problematic eating behaviors (T1)	BDI scores (T2)	Problematic eating behaviors (T2)
Low self-esteem scores (T1)	.234*	.202**	.232*
Problematic eating behaviors (T2)	.273*	.266*	
BDI scores (T2)	.194**		

* $p<.001$.
** $p<.05$.

2.2. Association of self-esteem with depressive symptoms and eating problems

Analyses of contingency tables are presented in Table 3. Adolescents with low self-esteem were more likely than those without low self-esteem to have elevated depressive symptoms and problematic eating behaviors at the follow-up period.

2.3. Depressive symptoms as a mediator of risk for eating problems:

Depressive symptoms partially mediated the association of low self-esteem (T1) with risk for problematic eating behaviors (T2). All of the statistical criteria for mediation were met (Kenny et al., 1998; Holmbeck, 2002). As reported above, low self-esteem was significantly associated with depressive symptoms (T2) and problematic eating behaviors (T2). Depressive symptoms (T2) were associated with problematic eating behaviors (T2) after controlling for low self-esteem and problematic eating behaviors at T1 ($r_p=.262$, $p<.001$). The association of low self-esteem (T1) with problematic eating behaviors (T2) did not remain significant after controlling for depressive symptoms, indicating that depressive symptoms were a significant mediator of the association between low self-esteem and problematic eating behaviors (T2). Also, the association of problematic eating behaviors at T1 with problematic eating behaviors at T2 was significant after controlling for depressive symptoms and low self-esteem, ($r_p=.209$ $p<.001$).

The same patterns of findings were obtained with dichotomized variables (Fig. 1). Logistic regression analyses were conducted, with dichotomized variables, to explore whether depressive symptoms (T2) mediated the associations of low self-esteem (T1) with problematic eating behaviors (T2) and problematic eating behaviors at baseline (T1) with problematic eating behaviors at the follow-up period (T2). The association of low self-esteem (T1) with problematic eating behaviors (T2) did not remain significant after controlling for depressive symptoms (T2) and problematic eating behaviors at T1. Depressive symptoms partially mediated the association of low self-esteem (T1) with problematic eating behaviors (T2), accounting for 48.3% of the variance in the association between low self-esteem (T1) and problematic eating behaviors (T2).

3. Discussion

The results from the present study add to the large body of research on adolescent eating disorders. This study specifically identifies low self-esteem as a possible precursor to the onset of problematic eating behaviors that are indicative of eating pathology. Further, depressive symptoms mediated the relationship between low self-esteem and problematic eating behaviors even after baseline eating problems were controlled. These findings suggest that adolescents with low self-esteem may be more susceptible to developing eating problems. Moreover, depressive symptoms may mediate the relationship between low self-esteem and eating pathology.

Table 3
Contingency table

Risk factor[a]	Outcome[b]	% (*n*) with outcome among those without risk factor	% (*n*) with outcome among those with risk factor	OR	CI	AOR	CI
Problematic eating behaviors (T1)	Problematic eating behaviors (T2)	5.1% (9)	28.6% (6)	7.42	2.33–23.68	3.83	1.05–13.96
Low self-esteem (T1)	Problematic eating behaviors (T2)	3.5% (4)	13.1% (11)	4.12	1.26–13.39	2.32	0.64–8.35
Depression (T2)	Problematic eating behaviors (T2)	2.2% (3)	20.7% (12)	11.83	3.20–43.78	8.25	2.13–31.96
Problematic eating behaviors (T1)	Depression (T2)	26.1%(46)	57.1% (12)	3.77	1.49–9.53	3.22	1.25–8.30
Low self-esteem (T1)	Depression (T2)	22.1% (25)	39.3% (33)	2.28	1.22–4.25	2.04	1.07–3.86
Low self-esteem (T1)	Problematic eating behaviors (T1)	6.2% (7)	16.7% (14)	3.03	1.16–7.88		
Problematic eating behaviors (T1)	Low self-esteem (T1)	39.8% (70)	66.7% (14)	3.03	1.16–7.88		

[a] This was a predictor variable in the analysis of contingency tables.
[b] This was a criterion variable in the analyses of contingency tables.

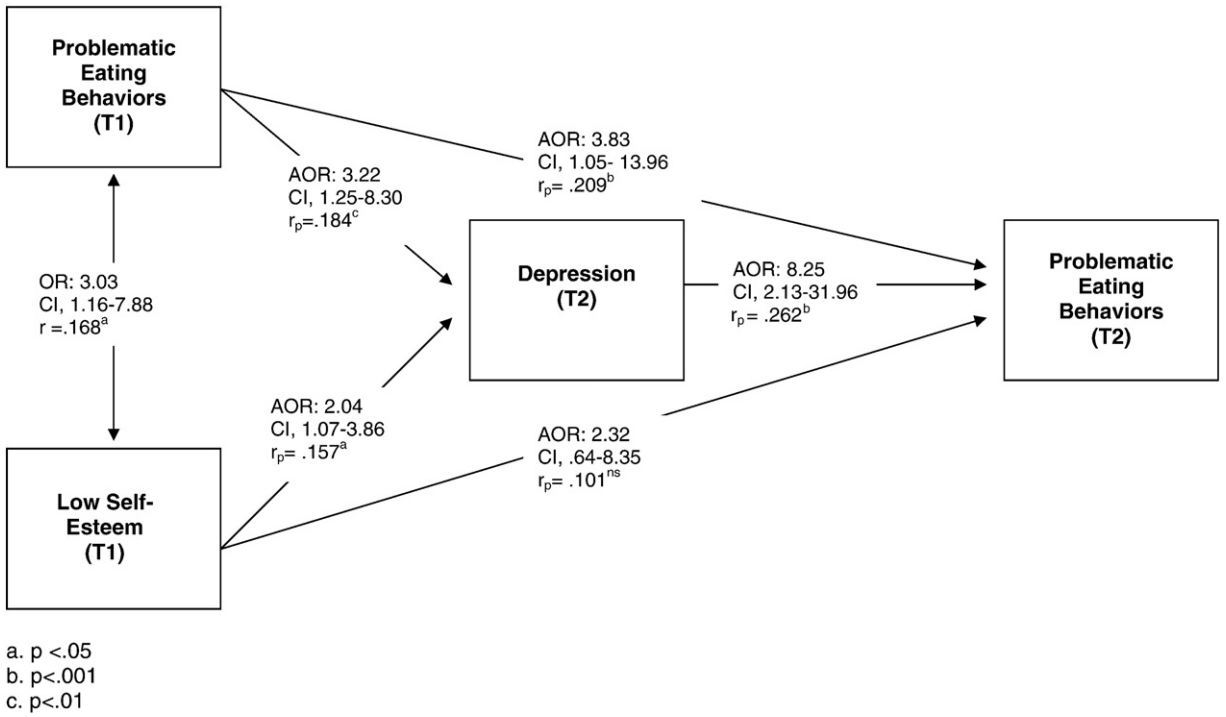

Fig. 1. Low self-esteem, depressive symptoms, and problematic eating behaviors. Note: OR = Odds ratios, AOR = Adjusted odds ratios. T2 depression was identified as being present if the BDI-II score was ≥ 10.

In our findings, depressive symptoms significantly mediated the association between low self-esteem and problematic eating behaviors. This finding is consistent with previous research suggesting that low self-esteem during adolescence may contribute to a vulnerability to depression (Lewinsohn et al., 2000; Johnson et al., 2002), and a vulnerability to eating disorders (Fairburn, Peveler, Jones, Hope, & Doll, 1993; French et al., 2001; Fryer et al., 1997). However, depressive symptoms only partially mediated this association accounting for approximately half of the variance in the association, between low self-esteem and problematic eating behaviors. This finding is somewhat consistent with other research that suggested that low self-esteem may occur in eating disordered patients without depression (Silverstone, 1990). It will be important for future studies to further examine the effect of low self-esteem on eating behaviors and the possible mediating role of depressive symptoms.

There are several clinical implications that should be considered. Adolescents experiencing low self-esteem and high levels of depressive symptoms may benefit from interventions aimed at restoring self-esteem and alleviating depressive symptoms. Cognitive therapy may be a useful tool in treating adolescents with low self-esteem and depression (Beck, 1976; Beck, Rush, Shaw & Emery, 1979). Our findings suggest that adolescents who have low self-esteem may be particularly at risk for developing depressive symptoms and eating pathology. It may be helpful for eating disorder prevention programs to focus on identifying adolescents with low self-esteem. Self-concept components that are characteristic of low self-esteem are insecurity, negative mood and depression, poor body image, feelings of inadequacy, social and personal withdrawal, poor adaptation skills, and unrealistically high aspirations (Steinhausen & Voltrath, 1993). Programs identifying all characteristics of low self-esteem may be more effective in targeting youths who are at risk for developing eating problems. Empirical research suggests that positive self-esteem may be an important protective factor for eating disorders (Croll, Neumark-Sztainer, Story, & Ireland, 2002). Therefore, it may be helpful for eating disorder prevention programs to focus on bolstering self-esteem in adolescents. Research has also suggested that eating disordered patients who have low self-esteem have a worse response to treatment (Fairburn et al., 1993). Therefore therapeutic techniques, such as cognitive therapy, that are used to evaluate self-esteem and increase self-esteem may be helpful in treating eating disordered patients.

The limitations of the present research should be considered. In the present study our hypotheses were tested using categorical measures. It would be of interest for future studies to use dimensional measures, which may be a more powerful means of statistical analysis, to examine the relationships between low self-esteem, depressive symptoms, and eating problems. However, it should be noted that because the PHQ-A is not a continuous measure of eating problems; we were limited with a dichotomous outcome variable. Also, the PHQ-A items do not measure anorexia nervosa and therefore future research should examine its association with low self-esteem and depressive symptoms. Another methodological limitation was that our measure of self-esteem was based on only three items from the SCID-II. Although these items are found in a standard measure in which the items from the questionnaire have been validated and the three self-esteem items used had strong inter-item reliability, it would be of interest for future studies to use other widely used measures of self-esteem such as the *Rosenberg Self-Esteem Scale* (Rosenberg,

1989). Lastly, the present study only looked at the mediating effects of depressive symptoms. It would be interesting for future studies to explore whether other factors, such as stressful life events, mediate the association between low self-esteem and eating disorder symptomatology.

In spite of the limitations mentioned, the findings from this study support previous research on the critical role personality may have in the development of symptoms of eating disorders (Lilenfeld et al., 2006). The present findings are also of interest because depressive symptoms mediated the association of low self-esteem and problematic eating behaviors in adolescent primary-care patients. These results suggest that developing depressive symptoms may be an important step in predicting problematic eating behaviors in adolescents with low-self esteem. It would be important for future studies to further examine other aspects of personality such as perfectionism, poor interoceptive awareness, and obsessive-compulsive traits that may also predispose adolescents to developing problematic eating behaviors.

Acknowledgments

This research was supported by a grant from the Aaron Diamond Foundation (Principle Investigator, Jeffrey G. Johnson, Ph.D.).

References

Ashby, J. S., Kottman, T., & Schoen, E. (1998). Perfectionism and eating disorders reconsidered. *Journal of Mental Health Counseling*, *20*, 261–271.
Beck, A. T. (1976). *Cognitive therapy and the emotional disorders.* New York: International Universities Press.
Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1979). *Cognitive Therapy of Depression.* New York: The Guilford Press.
Beck, A. T., & Steer, R. A. (1987). *Manual for the Beck Depression Inventory.* San Antonio, TX: Psychological Corporation.
Beck, A. T., Steer, R. A., & Garbin, M. G. (1988). Psychometric properties of the Beck Depression Inventory: twenty-five years of evaluation. *Clinical Psychology Review*, *8*(1), 77–100.
Button, E. J., Loan, P., Davies, J., & Sonuga-Barke, E. J. (1997). Self-esteem, eating problems, and psychological well-being in a cohort of schoolgirls aged 15–16: a questionnaire and interview study. *International Journal of Eating Disorders*, *21*, 39–47.
Button, E. J., Sonuga-Barke, E. J., Davies, J., & Thompson, M. (1996). A prospective study of self-esteem in the prediction of eating problems in adolescent schoolgirls: questionnaire findings. *British Journal of Clinical Psychology*, *35*, 193–203.
Cassin, S. E., & von Ranson, K. M. (2005). Personality and eating disorders: a decade in review. *Clinical Psychology Review*, *25*, 895–916.
Croll, J., Neumark-Sztainer, D., Story, M., & Ireland, M. (2002). Prevalence and risk and protective factors related to disordered eating behaviors among adolescents: relationship to gender and ethnicity. *Journal of Adolescent Health*, *31*, 166–175.
Fairburn, C. G., Cooper, Z., Doll, H. A., Norman, P. A., & O'Connor, M. E. (2000). The natural course of bulimia nervosa and binge eating disorder in young women. *Archives of General Psychiatry*, *57*, 659–665.
Fairburn, C. G., Cooper, Z., Doll, H. A., & Welch, S. L. (1999). Risk factors for anorexia nervosa: Three integrated case-control comparisons. *Archives of General Psychiatry*, *56*, 468–476.
Fairburn, C. G., Peveler, R. C., Jones, R., Hope, R. A., & Doll, H. A. (1993). Predictors of 12-month outcome in bulimia nervosa and the influence of attitudes to shape and weight. *Journal of Consulting and Clinical Psychology*, *61*, 696–698.
Fairburn, C. G., Welch, S. L., Doll, H. A., Davies, B. A., & O'Connor, M. E. (1998). Risk factors for binge eating disorder: a community-based, case-control study. *Archives of General Psychiatry*, *55*, 425–432.
Fairburn, C. G., & Wilson, T. G. (1993). *Binge Eating: Nature, assessment, and treatment.* New York: The Guilford Press.
First, M. B., Spitzer, R. L., Gibbons, M., & Williams, J. B. W. (1995). The structured clinical interview for DSM-III-R. *Journal of Personality Disorders*, *9*, 83–91.
Frederick, C. M., & Grow, V. M. (1996). A mediational model of autonomy, self-esteem, and eating disordered attitudes and behaviors. *Psychology of Women Quarterly*, *20*, 217–228.
French, S. A., Leffert, N., Story, M., Neumark-Sztainer, D., Hannan, P., & Benson, P. L. (2001). Adolescent binge/purge and weight loss behaviors: associations with development assets. *Journal of Adolescent Health*, *28*, 211–221.
Fryer, S., Waller, G., & Kroese, B. S. (1997). Stress, coping, and disturbed eating attitudes in teenage girls. *International Journal of Eating Disorders*, *22*, 427–436.
Geller, J., Srikameswaran, S., Cockell, S. J., & Zaitsoff, S. L. (2000). Assessment of shape- and weight-based self-esteem in adolescents. *International Journal of Eating Disorders*, *28*, 339–345.
Harris, E. S., & Johnson, J. G. (1997). Investigation of the utility and validity of a new instrument for the assessment of adolescent mental disorders in primary care. *Paper presented at the 11th Annual NIMH International Research Conference on Mental Health Problems in the General Health Care Sector* Bethesda: MD.
Hoek, H. M., & van Hoeken, D. (2003). Review of the prevalence and incidence of eating disorders. *International Journal of Eating Disorders*, *34*, 383–396.
Holmbeck, G. N. (2002). Post-hoc probing of significant moderational and mediational effects in studies of pediatric populations. *Journal of Pediatric Psychology*, *27*, 87–96.
Johnson, J. G., Cohen, P., Kasen, S., & Brook, J. S. (2002). Childhood adversities associated with risk for eating disorders or weight problems during adolescence or early adulthood. *American Journal of Psychiatry*, *159*, 394.
Johnson, J. G., Harris, E. S., Spitzer, R. L., & Williams, J. B. (2002). The patient health questionnaire for adolescents: validation of an instrument for the assessment of mental disorders among adolescent primary care patients. *Journal of Adolescent Health*, *30*, 196–204.
Kenny, D. A., Kashy, D. A., & Bolger, N. (1998). Data analysis in social psychology. In D. Gilbert, S. Fiske, & G. Lindzey (Eds.), 4th ed *The handbook of social psychology, vol. 1.* (pp. 233–265)Boston, MA: McGraw-Hill.
Lewinsohn, P. M., Striegel-Moore, R. H., & Seeley, J. R. (2000). Epidemiology and natural course of eating disorders in young women from adolescence to young adulthood. *Journal of the American Academy of Child and Adolescent Psychiatry*, *39*, 1284–1292.
Lilenfeld, L. R., Wonderlich, S., Riso, L. P., Crosby, R., & Mitchell, J. (2006). Eating disorders and personality: a methodological and empirical review. *Clinical Psychology Review*, *26*, 299–320.
Mintz, L. B., & Betz, N. E. (1988). Prevalance and correlates of eating disordered behavior among undergraduate women. *Journal of Counseling Psychology*, *35*, 463–471.
Nielsen, S. (2001). Epidemiology and mortality of eating disorders. *Psychiatry Clinical North America*, *24*, 201–214.
Rogers, R. L., & Petrie, T. A. (2001). Psychological correlates of anorexic and bulimic symptomatology. *Journal of Counseling & Development*, *79*, 178–187.
Rosenberg, Morris (1989). *Society and the Adolescent Self-Image*, Revised edition Middletown, CT: Wesleyan University Press.
Schupak-Neuberg, E., & Nemeroff, C. J. (1993). Disturbances in identity and self regulation in bulimia nervosa: implications for a metaphorical perspective of "Body as Self". *International Journal of Eating Disorders*, *13*, 335–347.
Silverstone, P. H. (1990). Low self-esteem in eating disordered patients in the absence of depression. *Psychological Reports*, *67*, 276–278.
Silverstone, P. H. (1992). Is chronic low self-esteem the cause of eating disorders? *Medical Hypotheses*, *39*, 311–315.
Spitzer, R. L., Williams, J. B., Kroenke, K., Linzer, M. V., deGruy, F. V., Hahn, S. R., Brody, D., & Johnson, J. G. (1994). Utility of a new procedure for diagnosing mental disorders in primary care: The PRIME-MD 1000 study. *Journal of the American Medical Association*, *272*, 1749–1756.
Spoor, S. T. P., Stice, E., Bekker, M. H. J., Van Strien, T., Croon, M. A., & Van Heck, G. L. (2006). Relations between dietary restraint, depressive symptoms, and binge eating: A longitudinal study. *International Journal of Eating Disorders*, *39*, 700–707.

Steinhausen, H., & Voltrath, M. (1993). The self-image of adolescent patients with eating disorders. *International Journal of Eating Disorders*, *13*, 221–227.
Stice, E., Burton, E. M., & Shaw, H. (2004). Prospective relations between bulimic pathology, depression, and substance abuse: unpacking comorbidity in adolescent girls. *Journal of Consulting and Clinical Psychology*, *72*, 62–71.
Stice, E., Killen, J. D., Hayward, C., & Taylor, C. B. (1998). Age of onset for binge eating and purging during late adolescence: a 4-year survival analysis. *Journal of Abnormal Psychology*, *107*, 671–675.
Stice, E., Presnell, K., & Spangler, D. (2002). Risk factors for binge eating onset: a prospective investigation. *Health Psychology*, *21*, 131–138.
Stice, E., & Shaw, H. (2003). Prospective relations of body image, eating, and affective disturbances to smoking onset in adolescent girls: how Virginia slims. *Journal of Consulting and Clinical Psychology*, *71*, 129–135.
Tomori, M., & Rus-Makovec, M. (2000). Eating behavior, depression, and self-esteem in high school students. *Journal of Adolescent Health*, *26*, 361–367.
Wade, T. D., Treloar, S. A., & Martin, N. G. (2001). A comparison of family functioning, temperament, and childhood conditions in monozygotic twin pairs discordant for lifetime bulimia nervosa. *American Journal of Psychiatry*, *158*, 155–1157.
Zaider, T. I., Johnson, J. G., & Cockell, S. J. (2000). Psychiatric comorbidity associated with eating disorder symptomatology among adolescents in the community. *International Journal of Eating Disorders*, *28*, 58–67.