

# The Effectiveness of Cognitive Behavioral Therapy on Changing Eating Disorder Symptoms and Psychopathology of 32 Anorexia Nervosa Patients at Hospital Discharge and One Year Follow-Up

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**Background.** This study aims to assess changes in core eating disorder psychopathology (Eating Attitudes Test, EAT; Eating Disorders Inventory-2, EDI-2), depression (Hamilton Rating Scale, HRSD; Beck Depression Inventory, BDI) and general psychopathology (MMPI-2) after inpatient treatment and one-year follow-up among patients diagnosed with anorexia.

**Methods.** Thirty-two patients were treated for anorexia nervosa on an inpatient unit, and were assessed before and after treatment. The inpatient milieu was designed to use cognitive therapy as the primary therapeutic intervention, along with weight restoration.

**Results.** At discharge, all patients displayed significant change in core eating disorder psychopathology in their depressive symptoms, as well as in general aspects of psychopathology. At one-year follow-up, changes in some areas of core eating disorder psychopathology and depressive symptoms continued to be significantly different than from admissions.

**Conclusions.** The combination of CBT and weight restoration can significantly reduce eating disorder symptoms, depression, and general psychopathology during hospitalization, with some sustained benefit over a one year period. Future research is needed to identify the effect of CBT on anorexia nervosa during a wide variety of treatment settings. Also, research must focus on the influence of outpatient treatment in the outcome of anorexia nervosa.

**Keywords** Eating disorders, Cognitive therapy, Inpatient treatment

## INTRODUCTION

Inpatient treatment of anorexia nervosa has been shown to be highly effective (1, 2). The fundamental approach to treatment is a combination of weight restoration and psychotherapeutic interventions. Combining psychotherapy and a stepped

approach to increasing caloric intake may lead to a healthy normal weight (1, 2). Descriptions of successful inpatient treatment programs can be found in several sources (2–4). Although most inpatient treatment programs combine a weight restoration program with psychotherapy, little has been written about the theoretical orientation used during treatment and/or psychological change that occurs as a result of inpatient treatment. The APA practice guidelines (5,6) suggest that a cognitive behavioral approach (CBT) is useful in the treatment of eating disorders. The National Institute for Clinical Excellence

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(NICE) and the Agency for Healthcare Research and Quality (HCRQ) have also suggested that CBT be considered as a psychological treatment for anorexia (7,8). However, the empirical support for CBT with anorexia is very sparse (7,8). Various authors have conceptualized the etiology and treatment of anorexia nervosa using a cognitive-behavioral model and have reported on its use as a specific approach for the treatment of anorexia nervosa (9–16).

A cognitive-behavioral model of anorexia has been advanced (3,12,17,18) and specific recommendations for treatment have been proposed (11,14) as part of a multidetermined perspective of anorexia nervosa. The cognitive-behavioral model conceptualizes eating disorders in a developmental framework, with primacy on cognition-mediating distressed emotion and resultant abnormal behavior (3,12,18). The cognitive model also views an eating disorder as a final common pathway of multiple events or experiences (3). Through various life experiences, specific distorted ideas regarding the self, the world, and the future are learned. These distorted thoughts then create vulnerability to an eating disorder. Vulnerable individuals, who are often introverted, sensitive, and isolative, develop the idea that weight loss will somehow alleviate psychological distress and dysphoria (3,12,13). Dieting, weight loss, and attaining thinness become factors these individuals manipulate in an attempt to exercise control over their internal and external environments, and lead to increased social isolation, which reinforces distorted cognitions and maladaptive behaviors (12,13,19).

Vitousek (19) notes that little research on the cognitive model for anorexia nervosa has been published. Even less empirical work exists about CBT as an intervention in the treatment of anorexia nervosa (1,19). There are no reports of the use of cognitive behavioral therapy during inpatient treatment, or of what effect or changes occur in the psychological functioning or core psychopathology of anorexia nervosa. Additionally, little has been written about what theoretical model is useful when integrating weight restoration and psychotherapeutic interventions (10).

We present a study that assessed changes after treatment on a specialized eating disorder inpatient unit based on the principals of cognitive therapy. It was hypothesized that, upon discharge, there would be significant changes in the core eating disorder pathology, depression, and general psychopathology of those patients treated within this CBT eating disorder program. The study also looks at how well those changes were sustained over a one-year period.

## METHODS

Adult patients who were being treated for anorexia nervosa at the University of Iowa Psychiatric Hospital were asked to participate. Thirty-two consecutive patients were asked to participate, and signed informed consent to be in the study. All had a minimum 8th grade education and sufficient reading comprehension capabilities to complete self-report forms. The diagnosis of anorexia nervosa was based on DSM-IV criteria

(20), and was established by the unit staff psychiatrist. All subjects were Caucasian; 29 (91%) were female and 3 (9%) were male. Nineteen were diagnosed with anorexia nervosa restricting subtype, and 13 were diagnosed with anorexia nervosa binge or purge subtype. The group as a whole was 27.8 years old, and had 14.1 years of education. Their mean age of onset for the disorder was 18.2 years, and they had suffered from the disorder an average of 9.6 years. The group had been hospitalized for 63.7 days on average. Demographic variables between those who returned one-year assessment measures and those who did not are displayed in Table 1.

## Assessment Instruments

Two instruments were used to assess change in eating disorder psychopathology: the Eating Attitudes Test ([EAT-26] 21,22) and the Eating Disorders Inventory ([EDI-2]23,24). Change in general psychopathology was assessed using the Minnesota Multiphasic Personality Inventory ([MMPI-2]25). Change in depressive symptoms was assessed by the Beck Depression Inventory ([BDI]26) and the Hamilton Rating Scale for Depression ([HRSD]27). The HRSD was administered by a trained research assistant. These instruments were part of a larger battery of tests administered to each subject within 3 days of admission. Tests were repeated approximately 7 days prior to discharge from the hospital, and at one year follow-up.

## Treatment Milieu

All patients were treated for their anorexia nervosa in the Psychiatric Hospital at the University of Iowa. This is a specialized unit designed primarily to treat eating disorders (anorexia nervosa, bulimia nervosa, eating disorder not otherwise specified). The unit follows principles of a cognitive therapy inpatient setting (9,10,28,29), and is designed to use cognitive therapy as the primary psychotherapeutic intervention (10). The unit nursing staff was trained in group and individual cognitive therapy. Other members of the treatment team

**Table 1** Demographic Variables Between Non-completers and Completers

	Drop-Outs		Completers			
	Mean	SD	Mean	SD	F	p
Age (years)	30.44	9.21	25.1	8.5	2.87	0.11
Education (years)	14.51	2.6	13.7	1.5	1.28	0.26
Days in Hospital	65.7	27.3	61.7	27.5	0.16	0.68
Age of Onset (years)	20.1	8.6	16.5	1.7	1.63	0.21
Duration of Illness (years)	10.6	7.9	8.7	5.7	0.58	0.45
Previous Hospital Admissions	2.8	3.8	3.2	2.9	0.98	0.32
Admission BMI <sup>a</sup>	16.3	3.0	17.1	2.4	0.80	0.37
Discharge BMI <sup>a</sup>	20.4	1.2	20.7	1.5	0.28	0.60

<sup>a</sup>Body Mass Index.

(psychiatrists, family therapist, occupational therapist, and recreational therapist) also used a cognitive model when working with these patients. Inpatient treatment combines a CBT milieu and nutritional rehabilitation to assist anorexia nervosa patients in restoring weight within a normal weight range (30).

The main psychotherapeutic interventions on the unit were individual cognitive therapy, group cognitive therapy, and family therapy. Each component is designed to blend with the other psychotherapies. Individual therapy follows Beck's model (31) with modifications specifically for an inpatient unit (9,10). A psychoeducational group was conducted with the patients to increase their understanding of anorexia nervosa and cognitive therapy. The psychoeducational group explores various aspects of cognitive therapy (i.e., cognitive distortions and automatic thoughts) in a didactic fashion. Group cognitive therapy combines Beck's theory and interventions in a process-oriented framework (1,32). Family therapy maintains a cognitive framework designed to work with family communications and schemas (33,34). A more detailed description of this inpatient treatment program has been published previously (10,30).

## RESULTS

All dependent measures (EAT, EDI-2, MMPI-2, BDI, & HRSD) were administered within 3 days of admission, within 7 days of discharge, and at 1-year follow-up. At admission, the group's mean Body Mass Index (BMI) was 16.7, and at discharge its mean BMI was 20.5. Outcome is presented for all individuals pre- and post-treatment ( $N = 32$ ), and those individuals who returned measures at 1 year ( $N = 16$ ). The naturalistic aspect of the follow-up meant no assessment of weight, treatment method (psychotherapy, medication or both), or general health was available at follow-up. T-tests were computed on demographic variables to see if there were significant differences between the individuals who did and did not return assessment measures, and can be found in Table 1. No significant differences were found between these two groups.

T-tests were computed on the whole group ( $N = 32$ ) to test for differences pre- and post-treatment. A Bonferroni correction ( $t = 3.13, p < 0.05, t = 3.75, p < 0.01$ ) was employed to control for high study-wise error due to the large number of equations being tested (35). Results for the whole group pre- and post-treatment on the EAT and EDI-2 are shown in Table 2. A significant difference was found from admission to discharge on the EAT. This indicates that just prior to discharge, patients self-reported a significant change in their attitudes toward being fat, eating and being out-of-control compared to attitudes at admission.

Significant differences between pre- and post-treatment were found on 8 of the 11 scales for the EDI-2 (Drive for Thinness, Bulimia, Ineffectiveness, Perfectionism, Interpersonal Distrust, Introceptive Awareness, Asceticism, and Social Isolation). Significant differences from admission to discharge on the Drive for Thinness and Bulimia scales suggest reduced

**Table 2** Means and Standard Deviations for the Eating Attitudes Test and Eating Disorders Inventory-2

	Pre	Post	<i>t</i>
	Mean (SD)	Mean (SD)	
Eating Attitudes Test	43.8 (17.4)	18.3 (14.7)	8.05**
Eating Disorders Inventory-2			
Drive for Thinness	14.9 (6.2)	9.6 (6.8)	4.26**
Bulimia	3.9 (4.4)	0.8 (1.4)	3.70*
Body Dissatisfaction	18.1 (7.4)	14.7 (8.3)	2.20
Ineffectiveness	16.2 (7.8)	8.4 (6.9)	5.34**
Perfectionism	9.2 (4.3)	7.0 (5.0)	3.46*
Interpersonal Distrust	7.8 (4.4)	4.0 (3.3)	4.49**
Introceptive Awareness	12.5 (6.6)	6.6 (5.6)	4.52**
Maturity Fears	6.1 (6.10)	3.7 (4.9)	3.04
Asceticism	9.3 (5.4)	5.7 (4.4)	4.10**
Impulse Regulation	6.8 (6.2)	3.5 (3.5)	3.03
Social Insecurity	10.7 (4.5)	5.4 (4.2)	6.36**

\* $t = 3.13, p < .05$ .

\*\* $t = 3.75, p < .01$ .

distress about being thin, the importance of being thin, and fewer thoughts about binge eating. Significant change was reported prior to discharge in the Ineffectiveness, Perfectionism, and Interpersonal Distrust scales. This suggests that patients reported a greater sense of personal adequacy and control over their lives, changed their attitudes regarding the use of extremely high personal standards to be accepted by others, and reported feeling less alienated and more open to form close relationships. Also, there were significant changes prior to discharge on the Introceptive Awareness, Asceticism, and Social Insecurity scales. Individuals experienced less confusion or apprehension in recognizing and accurately responding to emotional states, a reduced need to seek virtue through self-discipline or control over bodily urges, and a change in the belief that social relationships were tense, finding them rewarding and generally improved in quality.

Significant differences pre- to post-treatment that were found on 5 of 13 scales (Hypochondriasis, Depression, Hysteria, Psychasthenia, and Social Isolation) on the MMPI-2 are shown in Table 3. This suggests that from admission to discharge, patients reported fewer and less intense somatic or bodily concerns, less worry, less discouragement, and an overall improvement in their mood. Additionally, patients viewed themselves as having fewer obsessive thoughts, less fear and anxiety, more confidence in their own ability, and saw themselves as more secure and comfortable in social situations.

Significant changes occurred in all measures of depressive symptoms, and are displayed in Table 3. Changes in the BDI suggest a reduction in self-reported symptoms of depression just prior to the end of treatment. Changes in the HRSD suggest that prior to discharge, patients were observed to be less depressed than upon admission to treatment.

**Table 3** Means and Standard Deviations for the Minnesota Multiphasic Personality Inventory-II, Beck Depression Inventory and the Hamilton Rating Scale

	Pre	Post	<i>t</i>
	Mean (SD)	Mean (SD)	
Lie Scale	50.5 (10.3)	47.7 (7.8)	1.31
F Scale	65.7 (17.6)	61.2 (16.4)	2.10
K Scale	44.2 (7.4)	46.7 (9.9)	-1.5
Scale 1 (HS)	71.4 (14.9)	59.7 (14.9)	5.62**
Scale 2 (D)	82.5 (12.3)	68.7 (15.3)	4.98**
Scale 3 (HY)	70.0 (16.5)	60.4 (12.8)	3.74*
Scale 4 (PD)	68.5 (12.2)	63.3 (10.5)	2.96
Scale 5 (MF)	51.5 (12.0)	51.3 (10.5)	0.83
Scale 6 (PA)	69.5 (16.3)	66.2 (11.9)	1.38
Scale 7 (PT)	77.5 (14.4)	69.2 (12.1)	3.55*
Scale 8 (SC)	69.9 (18.5)	63.2 (16.3)	2.69
Scale 9 (MA)	49.5 (8.5)	52.4 (10.0)	-1.9
Scale 0 (SI)	65.9 (10.5)	60.0 (12.4)	4.14**
BDI	28.1(9.9)	11.6(10.8)	9.66**
HRSD	19.7(5.79)	9.1(6.36)	9.59**

\**t* = 3.13, *p* < .05.\*\**t* = 3.75, *p* < .01.

To more fully understand what happened to the group of patients that returned their assessments at one-year follow-up, repeated measures analysis of variance were conducted with a priori *T*-tests computed on the same variables as the total group, and are shown in Table 4. Due to the naturalistic follow-up there were no opportunities to collect measures of weight or medication use in this follow-up group. Inspection of scores on the EAT and EDI-2 indicate significant change pre- and post-treatment on the EAT (*t* = 6.78, *df* = 15, *p* < .0001), and on seven of eleven scales of the EDI-2 (Drive for Thinness (*t* = 3.75, *df* = 15, *p* < .0012, Bulimia (*t* = 2.85, *df* = 15, *p* < .006),

**Table 4** Means and Standard Deviations for the Eating Attitudes Test and Eating Disorders Inventory-2 for Individuals Returning One-Year Assessments

	Pre	Post	One Year	<i>F</i>
	Mean (SD)	Mean (SD)	Mean (SD)	
Eating Attitudes Test	42.0 (17.2)	15.8 (15.7)	25.9 (17.2)	9.05**
Eating Disorders Inventory-2				
Drive for Thinness	15.5 (6.2)	9.38 (6.8)	10.00 (6.6)	5.34**
Bulimia	4.25(4.5)	0.8 (1.2)	1.00 (1.7)	6.93**
Body Dissatisfaction	17.8 (8.5)	13.5 (8.5)	15.19 (8.5)	1.29
Ineffectiveness	14.8 (7.8)	6.4 (6.6)	10.3 (8.6)	4.35**
Perfectionism	8.1 (3.7)	5.6 (4.1)	7.7 (5.7)	1.9
Interpersonal Distrust	7.7 (4.4)	4.0 (4.0)	5.0 (5.2)	3.10
Introceptive Awareness	12.7 (6.0)	6.5 (5.6)	6.0 (6.1)	6.29**
Maturity Fears	6.1 (7.40)	3.1 (4.3)	3.7 (4.5)	1.54
Asceticism	9.6 (5.1)	4.7 (3.2)	7.7 (5.2)	4.63**
Impulse Regulation	7.4 (6.8)	3.6 (4.1)	3.0 (3.2)	3.54**
Social Insecurity	10.4 (3.8)	4.5 (3.9)	6.1 (3.8)	9.8**

\**t* = 3.13, *p* < .05;\*\**t* = 3.75, *p* < .01.

Ineffectiveness (*t* = 3.24, *df* = 15, *p* < .0027), Introceptive Awareness (*t* = 3.01, *df* = 15), *p* < .0044), Asceticism (*t* = 3.49, *df* = 15, *p* < .0016), Impulse Regulation (*t* = 2.07, *df* = 15, *p* < .028), and Social Isolation (*t* = 3.98, *df* = 15, *p* < .0006). This indicates that just prior to discharge, patients self-reported a significant difference in their attitudes toward being fat, eating, and being out-of-control than at admission. Additionally, this group was less distressed about being thin, and had fewer thoughts about binge eating. They had a greater sense of personal adequacy, modified their use of extremely high personal standards to be accepted by others, and experienced less alienation and a greater ease when forming close relationships. They were less apprehensive, and were more accurately responding to emotional states. There was a reduced need for self-discipline or control over bodily urges, and they saw social relationships as more rewarding and generally improved in quality.

The one-year follow-up indicated that the individuals who returned their assessment material sustained significant change on the EAT (*t* = 2.45, *df* = 15, *p* > .013), as well as on 5 of the 11 scales on the EDI-2 (Drive for Thinness (*t* = 2.38, *df* = 15, *p* > .015), Bulimia (*t* = 2.60, *df* = 15, *p* > .001), Introceptive Awareness (*t* = 2.86, *df* = 15, *p* > .006), Impulse Regulation (*t* = 2.03, *df* = 15, *p* > .030) and Social Isolation (*t* = 3.08, *df* = 15, *p* > .0038) when compared to the pre-treatment scores (see Table 5). Just prior to discharge, patients self-reported a significant change in their attitudes toward being fat, eating, and being out-of-control. They continued to be less distressed about being thin, had fewer thoughts about binge eating, experienced a greater sense of personal adequacy, modified their view on extremely high personal standards, and reported continuing to be open to forming close relationships. They reported continued comfort with emotional states, less need to have self-discipline and self-control, as well as continuing to see social relationships as rewarding.

**Table 5** Means and Standard Deviations for the MMPI-2, Beck Depression Inventory and Hamilton Rating Scale for Individuals Returning One-Year Assessments

	Pre	Post	One Year	<i>F</i>
	Mean (SD)	Mean (SD)	Mean (SD)	
Lie Scale	48.8 (9.1)	46.8 (6.2)	48.6 (7.9)	0.26
F Scale	60.8 (17.7)	58.7 (18.0)	54.7 (11.2)	0.71
K Scale	42.8 (7.3)	48.1 (9.9)	45.7 (9.4)	0.27
Scale 1 (HS)	66.5 (14.8)	57.2 (13.2)	61.5 (16.2)	2.77
Scale 2 (D)	80.5 (14.0)	67.9 (13.3)	69.4 (18.2)	3.49*
Scale 3 (HY)	65.1 (13.6)	60.5 (10.4)	63.1 (15.1)	0.72
Scale 4 (PD)	65.8 (13.2)	63.5 (12.1)	58.4 (13.1)	1.65
Scale 5 (MF)	50.4 (12.0)	51.3 (10.5)	49.3 (10.8)	0.47
Scale 6 (PA)	67.9 (14.9)	64.3 (12.4)	64.1 (11.4)	0.48
Scale 7 (PT)	74.9 (13.8)	67.3 (13.3)	67.7 (11.2)	1.66
Scale 8 (SC)	67.2 (18.5)	60.6 (16.1)	61.2 (14.4)	1.09
Scale 9 (MA)	49.5 (8.5)	52.4 (10.0)	49.5 (10.0)	-1.38
Scale 0 (SI)	63.13(11.5)	56.7 (12.7)	59.7 (10.2)	0.81
BDI	28.0(10.9)	11.6(13.7)	15.8 (14.4)	7.15**

\**t* = 3.13, *p* < .05;\*\**t* = 3.75, *p* < .01.

Significant changes occurred in all measures of depressive symptoms, and are displayed in Table 5. Changes in the BDI ( $t = 6.50$ ,  $df = 15$ ,  $p > .0001$ ) suggest a reduction in self-reported symptoms of depression just prior to the end of treatment. Changes in the HRSD ( $t = 9.71$ ,  $df = 15$ ,  $p > .0001$ ) suggest that prior to discharge, patients were observed to be less depressed than upon admission to treatment. Significant differences pre- to post treatment were found on 1 of 13 scales (Depression ( $t = 3.99$ ,  $df = 15$ ,  $p > .0006$ )) on the MMPI-2.

At one-year follow-up, there continued to be significant change on the Depression Scale of the MMPI-2 ( $t = 1.87$ ,  $df = 15$ ,  $p > .04$ ) and The BDI ( $t = 2.45$ ,  $df = 15$ ,  $p > .013$ ). This suggests that at follow-up, self-reported symptoms of depression continued to be less than at pre-treatment (see Table 5).

## DISCUSSION

Previous research with inpatients has indicated that cognitive therapy, when used alone or in conjunction with medications, can alter a wide range of symptoms at the end of treatment (36–38). The current findings on the inpatient treatment of anorexia nervosa using CBT extend that work. The present study indicates that use of cognitive behavioral therapy during in-patient treatment can change core eating disorder psychopathology and general psychopathology variables related to anorexia nervosa. Specifically, concepts related to the core psychopathology of anorexia nervosa were reported to change significantly. Eight of the 11 scales on the EDI-2 and the score on the EAT changed significantly from admission to just prior to discharge suggesting broad modification in attitudes related to eating, weight, shape, size and appearance. There was an alteration with the extreme drive for thinness, the fear of becoming fat, and the preoccupation with weight and fear of weight gain, as well as the tendency to think about or engage in uncontrollable overeating. Individuals saw themselves as more effective in their world and social settings, with a general perception of adequacy and control over life. They reported less perfectionism and concern that others would be critical of their accomplishments. There was an increased sense of efficacy in their ability to form close relationships, and a greater comfort in expression of thoughts and feelings. Internal awareness of body or physical sensations was enhanced, as well as a better understanding of emotional states. Additionally, there was a reported reduction in the need for self-discipline and a greater security and comfort with social and interpersonal relationships. On the EAT, the overall score changed to below a level that would be considered consistent with individuals who were diagnosed with an eating disorder. This suggests a change in the intensity of concerns about being fat, eating, and being out of control.

On a measure of more general psychopathology (MMPI-2), this group of patients also displayed significant change prior to discharge that parallels those for the core eating disorder psychopathology. Several scales [Hypochondrias (scale-1),

Hysteria (scale-3), and Social Introversion/Extraversion (scale-0)] changed from a pathological range to within a normal range. As with the change in their eating disorder concerns, patients self-reported less emotional distress, fewer concerns about physical problems, greater social awareness and insight into their own behavior, as well as increased comfort in social settings. Two other scales also displayed significant changes [Depression (Scale-2), Psychasthenia (Scale-7)], but did not change to a non-pathological range. The changes in these scales indicated that prior to discharge, these patients experienced less intense feelings of depression or dysphoria, as well as a lessening of anxiety symptoms.

Change in some symptoms and beliefs related to eating disorders before and after treatment have been documented. Kennedy, McVey, and Katz (39) indicated that there are changes in self-reported personality disorder symptoms among hospitalized eating disorder patients after weight restoration. Additionally, they reported a significant change in EAT-26 scores in a direction suggesting a reduction of attitudes similar to other eating disorders. These findings parallel the current study. Similarly, the current study noted significant changes in self-reported depression that were also found in the Kennedy et al. (39) report.

What could be considered contributing factors to the change in core eating disorder and general psychopathology, as well as depressive symptoms? One explanation is to look at the treatment as a whole. Successful weight restoration during inpatient treatment has been well-documented (4) and has been implicated in changing many of the symptoms in anorexia nervosa (40). The fact that all subjects in this study were within 95% of their target range at the time of retesting could explain the change in eating disorder and general psychopathology. The acute psychological distress that is seen just prior to hospitalization often becomes diminished during in-patient treatment, which may not be associated with any specific treatment. Additionally, the change could be related to an increase in morale and hopefulness that can accompany inpatient treatment.

Another way to look at the results is to examine the structure of the program that was developed on this service. The unit was designed to work from a cognitive therapy perspective using various CBT interventions. The focus on change in thoughts, feelings, and behaviors related to eating disorder symptoms directly influenced how patients viewed themselves just prior to discharge. The changes in core eating disorder psychopathology found in this sample were similar to changes described in the treatment of bulimia nervosa (41–43). Also, the current results are supported by other studies that have shown improvement as a result of inpatient treatment and the use of CBT (36–38).

In this study there were also significant changes in how patients felt about interpersonal interactions and they reported a greater degree of comfort in social situations. The therapeutic interventions of the program are designed to increase a patient's understanding of how his/her interpersonal interactions

contribute to the etiology and maintenance of his/her disorder. The CBT focus was not only on specific thoughts and cognitive distortions, but on increased awareness of schemas and core beliefs. Cognitive therapy addressed many affectively loaded situations, and assisted patients in expressing their emotions and in understanding the process and interaction of their thoughts, feelings, and behaviors. Patients were encouraged to take the risk of more open communication with peers, parents, significant others, and unit staff. This strong interpersonal focus may have been instrumental in changing or altering some of the patients' core eating disorder psychopathology related to interpersonal difficulties and expression of emotions. The change expressed by the patients is somewhat similar to what Wilson and colleagues (42, 43) noted when treating bulimia nervosa with interpersonal therapy. It seems that a milieu that looks at the interaction of thoughts, feelings, and behaviors with a strong encouragement to open and honest emotional expression and communication can effect change in the core eating disorder psychopathology. Vitousek and Hollen (44) suggest that a cognitive conceptualization that goes beyond specific self-statements and beliefs to include cognitive schemata is a key factor in changing the core psychopathology of anorexia nervosa.

At one-year follow-up, only half the original sample returned assessment measures. Although the pre- and post-treatment outcomes in this smaller sample were similar to the larger group, only some of the gains were sustained at one-year follow-up. Because this was a naturalistic follow-up it is difficult to ascertain what may have contributed to the sustained and unsustained changes. Given the complexity of this disorder, it is possible that while in treatment, these 16 individuals did become more aware of their core eating disorder psychopathology, but that the length of time in treatment (61 days) did not allow adequate time or a "real world" environment to create more permanent change. Also, the naturalistic nature of the follow-up does not offer an understanding of how out-patient treatment influenced these individual during the intervening year. The unsustained gains may have been the result of poor aftercare, or just the natural course of a complex and enduring disorder that takes several years to see consistent change in symptoms (45–47).

There are many limitations to this study. The small sample size may have affected the outcome of the study. This study did not have an effective comparison group and looks directly at a clinical sample of patients admitted for treatment in a "naturalistic" setting, so there may be a bias in the report of the patient population. The assessment tools (with the exception of the MMPI-2) did not effectively screen for a response bias, which may have influenced the outcome or responses given by the patients.

Although there is change in general psychopathology, core eating disorder psychopathology, and depression after treatment, this may not be directly related to the cognitive-behavioral treatment. As noted before, change in many areas of psychopathology for anorexia can be related to restoration (48). Change

in symptoms of depression has been shown to occur as a function of restoration (49). So it may be that change in anorexia nervosa symptoms might be more of a physiological phenomenon similar to changes in depressive symptoms (50) or anxiety during inpatient treatment with medications (51). Additionally, it would be unwise to suggest that the current results could be generalized to treatment based on an outpatient or partial hospital treatment setting.

## CONCLUSION

This study represents an exploration into what type of change in core eating disorder psychopathology and practical aspects of anorexia nervosa occur when patients are treated in a hospital milieu with cognitive-behavior therapy as the main therapeutic tool. The focus of treatment is very much centered on identifying, understanding, challenging and changing automatic thoughts, cognitive distortions, and schema and core beliefs. But there is a strong emphasis on open communication and the expression of emotion within interpersonal relationships. It is not surprising that with this type of focus, patients would report a change in these areas. However, as the focus of treatment is not clearly directed at specific symptoms of anorexia nervosa or on increasing psychosocial change in areas such as decreased social isolation, greater interpersonal comfort, or increased involvement in interpersonal relationships, the results do favor this treatment atmosphere, and offer an impact on this group of patients. It also suggests that cognitive behavioral therapy in the treatment of anorexia nervosa can influence change in a wide variety of psychopathology similar to what has been seen in the treatment of bulimia nervosa (43).

The research on treatment of anorexia nervosa has been lacking over the last 10 years (1). This study represents an initial examination of the psychotherapeutic treatment of anorexia nervosa with cognitive-behavior therapy. It is one of a small number of studies that are addressing the treatment of this disorder from a specific theoretical perspective (52). At this time, more research is needed to assess the efficacy of cognitive-behavioral therapy in the treatment of anorexia nervosa and the theory supporting these interventions.

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