Persistent Perfectionism, Symmetry, and Exactness After Long-Term Recovery From Anorexia Nervosa

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Objective: It is well recognized that patients with anorexia nervosa have perfectionistic and obsessive behaviors. This study investigated whether such behaviors persist after recovery.

Method: Twenty subjects who had recovered from anorexia nervosa were recruited for the study. They had been at normal weight and their menses had been regular for more than a year. These subjects were compared with 16 healthy women with the use of the Eating Disorder Inventory, the Frost Multidimensional Perfectionism Scale, and the Yale-Brown Obsessive Compulsive Scale. Results: The recovered anorexic patients had significantly higher scores than the comparison women on the measures of perfectionism on the Eating Disorder Inventory and on overall perfectionism on the Frost scale. Moreover, the recovered patients had higher scores on the Yale-Brown scale, with target symptoms suggesting that many had specific concerns with symmetry and exactness. Conclusions: Certain characteristics of anorexia nervosa, such as a need for order and precision, persist after good outcome and recovery, raising the question of whether these behaviors are traits that contribute to the pathogenesis of this illness.


Anorexia nervosa, a disorder of unknown etiology, most commonly occurs in adolescent females. According to DSM-III-R, anorexia nervosa is characterized by several essential features: 1) a refusal to maintain body weight over a minimum normal weight for one's age and height, 2) an intense fear of gaining weight or becoming fat, even though underweight, and 3) a disturbance in the way in which one's body weight, size, or shape is experienced (e.g., the person claims to "feel fat" even when emaciated). About 50% of patients with anorexia severely restrict their eating in order to lose weight. The other 50% alternate binge eating and/or purging with restrictive eating.

It is well recognized that most patients with anorexia display a stereotypic rigidity, ritualism, perfectionism, and meticulousness (1). Moreover, obsessive and compulsive behaviors are common (DSM-III-R). However, it is not understood why such behaviors occur. One reason for this limited understanding may be the problem of determining whether such symptoms are the cause of anorexia nervosa or are secondary to weight loss and malnutrition. It has been difficult to tease apart cause and effect in this illness. Premorbid studies of patients with anorexia are not feasible given the rarity of the illness and the young age at onset. Another strategy is to study anorexic patients after recovery to determine whether persistent disturbances remain. Persistent symptoms might help identify vulnerabilities that may contribute to the pathogenesis of the illness.

There is limited evidence suggesting that certain behaviors continue after recovery. Strober et al. (1) studied 22 adolescents with nonchronic anorexia at presentation for treatment and after short-term weight recovery. They found a persistence of obsessional behaviors after weight restoration, as well as inflexible thinking, social introversion, overly compliant behavior, and limited social spontaneity. Strober et al. suggested that these underlying traits may play a facilitatory role in the development of obsessive and compulsive symptoms during the acute illness.

Casper et al. (2) found that underweight patients with restricting-type anorexia had greater self-control, inhibition of emotionality, and conscientiousness than matched control subjects. Importantly, even after 8–10 years of recovery, women previously ill with anorexia nervosa showed greater risk avoidance, restraint in emotional expression and initiative, and greater conformity to authority than age-matched control subjects.
and had a greater degree of self-control and impulse control than their sisters (3). Together these data suggest that patients with restricting-type anorexia have a tendency toward overcontrol, reserve, and inhibition that is independent of weight.

Stonehill and Crisp (4) found that patients with anorexia whose weight had been recently restored showed trends toward anxiety and obsession scores that were lower than the scores they had when they were ill. However, when assessed 4–7 years after recovery, they had significantly higher phobia and hysteria scores than they did before treatment. The authors concluded that as long as the phobic focus of the anorexic patient is on her weight, her social phobia is not manifest; however, as she recovers, she is faced with increased social demands, and her social anxiety and phobias emerge.

It has also been postulated, for more than 50 years, that anorexia nervosa may be related to obsessive-compulsive disorder (5). The inherently obsessional nature of anorexia—compulsive calorie counting, preoccupation with the body, and incessant rumination about food—is obvious. In addition to symptoms pertaining to body image and food, obsessive-compulsive symptoms and disorders are frequently found in patients with anorexia (6). No studies, to our knowledge, have determined whether such behaviors persist after recovery. Several studies have reported that 7%–11% of women who present themselves for treatment of obsessive-compulsive disorder have a history of anorexia nervosa (7, 8).

The purpose of this study was to determine whether perfectionistic or obsessional behaviors persist after recovery from anorexia nervosa. Thus, we recruited subjects who had previously been ill with anorexia nervosa but at the time of this study had been recovered for more than 1 year.

METHOD

We recruited a total of 20 women who had previously been ill with anorexia nervosa (1) and who had been at less than 75% of average body weight in the past. Some subjects had been previously treated for anorexia on the inpatient eating disorders unit at Western Psychiatric Institute and Clinic, Pittsburgh, Pa. Other subjects were recruited through advertisements placed in local newspapers or through newsletters of national eating disorder self-help organizations. Each subject gave written informed consent for the study. Responders were eligible if they reported that in the last year they 1) had maintained a stable and normal weight (90%–110% of average body weight) (9, 2) had had regular menses, 3) had not binged, purged, or engaged in restrictive eating patterns, and 4) were medication free. This information was obtained through self-reports as well as a 7-day food and exercise diary completed by subjects in which they listed individual food items consumed, portion sizes, and exercise frequency. Results concerning caloric intake will be published in a separate manuscript.

The recovered anorexic patients were further divided into two groups based on whether or not they had engaged in binge eating and purging when they were ill with anorexia in the past. Eleven of them recovered patients had had restricting-type anorexia and nine had had bulimia. Three of the patients with restricting-type anorexia also reported having engaged in purging behavior without binge eating during their illness. These three subjects were grouped with the patients with restricting-type anorexia.

We assessed a total of 16 healthy women who served as the comparison group. These women had no history of an eating disorder or any psychiatric illness, had normal menses, and had been within a normal weight range since menarche. Like the subjects in long-term recovery, the healthy comparison women were asked to complete the food and exercise log and gave written informed consent for the study. These subjects were obtained through local advertisements.

Assessments

As part of a comprehensive screening process, demographic information was obtained, and subjects were given extensive psychological evaluations before their participation in biological studies. Not all subjects participated in each assessment.

Eating Disorder Inventory. Subjects completed the Eating Disorder Inventory (10), a standardized self-report measure consisting of eight subscales relating to specific behavioral and cognitive dimensions of eating disorders, including a measure of perfectionism.

Frost Multidimensional Perfectionism Scale. Subjects also completed the Frost Multidimensional Perfectionism Scale (11). This self-rating scale consists of overall assessment of perfectionism, as well as ratings on six subscales designed to assess the various dimensions of perfectionism. The personal standards subscale represents the high standards of performance people might directly place upon themselves. The concern over mistakes subscale highlights negative responses to mistakes that are also interpreted as failure. The parental expectations subscale represents the degree to which individuals feel as if they have met the expectations of their parents. The parental criticism subscale represents the belief that an individual's parents have set high standards of performance and are critical of performance. The doubting of actions subscale indicates feelings of dissatisfaction with performance on a particular task or project. Finally, the organization subscale highlights the degree of importance one places upon order and exactness. The overall perfectionism score is the combination of the individual scores on the six subscales. This scale has been shown to be a reliable and valid measure of perfectionism (12).

Yale-Brown Obsessive Compulsive Scale. The Yale-Brown Obsessive Compulsive Scale (13, 14) is a semistructured interview designed to rate the presence and severity of symptoms found in patients with obsessive-compulsive disorder. The subject first reviews a list of 66 target symptoms commonly found in patients with obsessive-compulsive disorder and endorses any target symptoms that she might have. Then the target symptoms are given a severity score based on the time or frequency, distress, interference, and control of symptoms and the effort made to suppress them. Yale-Brown scale assessments were performed by two doctoral-level psychologists who were blind to the diagnoses of the subjects.

Statistical Analysis

The BMDP Statistical Software package (15) was used for data analysis. Groups were compared by two-tailed group t tests or paired t tests as appropriate. When assumptions of homogeneity of variance were met according to Levine’s test for equal variance, pooled t tests were reported. When the assumption was not met, separate t tests were reported. The three scales of perfectionism and obsessiveness resulted in 16 score comparisons between the recovered anorexic patients and the healthy women. The Bonferroni-corrected p value for 16 comparisons is 0.0031. Therefore, differences between the two groups were considered significant if p values were less than 0.003. Comparisons of Yale-Brown scale target symptoms were made with Fisher’s exact test.

RESULTS

The patients who had recovered from restricting-type anorexia and from bulimic-type anorexia had similar low weights in the past (mean=69% of average body weight, SD=9%, and mean=68% of average body weight,
TABLE 1. Characteristics of Women With Long-Term Recovery From Anorexia Nervosa and Healthy Comparison Women

<table>
<thead>
<tr>
<th>Variable</th>
<th>Recovered Anorexic Patients (N=20)</th>
<th>Comparison Women (N=16)</th>
<th>Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean SD</td>
<td>Mean SD</td>
<td>t</td>
</tr>
<tr>
<td>Age (years)</td>
<td>24 5</td>
<td>22 4</td>
<td>1.70</td>
</tr>
<tr>
<td>Current percentage of average body weight</td>
<td>97 8</td>
<td>102 8</td>
<td>1.77</td>
</tr>
<tr>
<td>Highest percentage of average body weight</td>
<td>108 12</td>
<td>108 7</td>
<td>0.04</td>
</tr>
<tr>
<td>Lowest percentage of average body weight</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>since menarche</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eating Disorder Inventory subscale score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drive for thinness</td>
<td>4 5</td>
<td>1 2</td>
<td>2.63</td>
</tr>
<tr>
<td>Bulimia</td>
<td>1 1</td>
<td>0 0</td>
<td>1.45</td>
</tr>
<tr>
<td>Body dissatisfaction</td>
<td>8 8</td>
<td>5 5</td>
<td>1.46</td>
</tr>
<tr>
<td>Ineffectiveness</td>
<td>4 5</td>
<td>1 1</td>
<td>3.01</td>
</tr>
<tr>
<td>Perfectionism</td>
<td>9 5</td>
<td>2 3</td>
<td>4.55</td>
</tr>
<tr>
<td>Interpersonal distrust</td>
<td>3 3</td>
<td>1 1</td>
<td>2.49</td>
</tr>
<tr>
<td>Interceptive awareness</td>
<td>3 3</td>
<td>1 1</td>
<td>2.63</td>
</tr>
<tr>
<td>Maturity fears</td>
<td>4 5</td>
<td>2 3</td>
<td>1.23</td>
</tr>
<tr>
<td>Frost Multidimensional Perfectionism Scale</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>subscale score</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concern over mistakes</td>
<td>29 10</td>
<td>15 4</td>
<td>4.34</td>
</tr>
<tr>
<td>Personal standards</td>
<td>27 4</td>
<td>22 4</td>
<td>2.65</td>
</tr>
<tr>
<td>Parental expectations</td>
<td>16 6</td>
<td>11 4</td>
<td>2.55</td>
</tr>
<tr>
<td>Parental criticism</td>
<td>13 5</td>
<td>5 2</td>
<td>4.31</td>
</tr>
<tr>
<td>Doubts about action</td>
<td>11 5</td>
<td>6 3</td>
<td>2.98</td>
</tr>
<tr>
<td>Organization</td>
<td>25 5</td>
<td>20 4</td>
<td>2.95</td>
</tr>
<tr>
<td>Overall perfectionism</td>
<td>95 23</td>
<td>60 11</td>
<td>4.58</td>
</tr>
<tr>
<td>Yale-Brown Obsessive Compulsive Scale</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>degree of impairment</td>
<td>9 8</td>
<td>3 4</td>
<td>3.12</td>
</tr>
</tbody>
</table>

SD=7%, respectively; t=0.46, df=18, n.s.). They were also similar in age at onset (mean=14 years, SD=2, and mean=14 years, SD=2; t=0.20, df=18, n.s.), in duration of illness (mean=44 months, SD=23, and mean=41 months, SD=59; t=0.14, df=18, n.s.), in current percentage of average body weight (mean=94%, SD=8%, and mean=101%, SD=7%; t=1.77, df=18, n.s.), and in current age (mean=22 years, SD=3, and mean=27 years, SD=5; t=1.70, df=18, n.s.). However, recovered restricting- and bulimic-type patients were significantly different in highest percentage of average body weight in the past (mean=99%, SD=8%, and mean=118%, SD=8%, respectively; t=5.13, df=18, p<0.0001). The restricting- and bulimic-type patients had similar scores on all subscales of the Eating Disorder Inventory and the Frost Multidimensional Perfectionism Scale and on the Yale-Brown scale. Because these two subgroups were similar and because of the small number of subjects, the two subgroups were combined and compared with the group of healthy women.

When compared with the healthy women, the subjects with long-term recovery from anorexia nervosa were similar in age, current percentage of average body weight, and highest weight (table 1). The recovered subjects differed significantly from the comparison women, however, in lowest previous weight since menarche.

Differences between groups on the three principal measures of obsessiveness and perfectionism attained or nearly attained the Bonferroni-corrected significance level of 0.003 (table 1). That is, according to this conservative standard, the Yale-Brown scale measure of impairment from obsessions and compulsions showed a marginally significant difference between the two groups, and the groups differed significantly on the Frost Multidimensional Perfectionism Scale measure of overall perfectionism and the Eating Disorder Inventory subscale for perfectionism.

The recovered anorexic women had significantly higher scores on two other subscales of the Frost Multidimensional Perfectionism Scale, parental criticism and concern over mistakes. On the rest of the subscales of the Frost scale, the scores of the recovered patients were higher than those of the comparison subjects, but the difference was not significant according to the Bonferroni-corrected p values.

On the Eating Disorder Inventory, only the perfectionism subscale scores of the two groups differed significantly after the Bonferroni-corrected p values were used (table 1). However, the recovered anorexic women did show substantially more drive for thinness, ineffectiveness, interpersonal distrust, and interceptive awareness on that inventory.

The Yale-Brown scale provides two types of information; first, the specific obsessive-compulsive symptoms (target symptoms). The interviewers reviewed a list of 66 target symptoms with each subject to determine which, if any, of these symptoms were currently present. The recovered anorexic women did not endorse most target symptoms. For example, less than 10% of the recovered women endorsed one of 58 of the 66 target symptoms. However, there was a small group of target symptoms that were endorsed by many of the recovered women. Each of the five symptoms most frequently endorsed by the recovered patients was endorsed significantly more frequently by them than by the comparison women. These target symptoms included the need for symmetry (65% versus 6%, p<0.0001), ordering/arranging (50% versus 6%, p<0.005), repeating (35% versus 0%, p<0.008), fear of embarrassment (30% versus 0%, p<0.02), and rereading/rewriting (30% versus 0%, p<0.02).

The Yale-Brown scale also assesses the degree of impairment, interference, and intensity of these obsessive and compulsive target symptoms on a scale of 0 (none) to 40 (maximal). The recovered anorexic patients had substantially higher scores than did the comparison women (table 1); the difference just missed being significant after Bonferroni correction.
In our Yale-Brown scale interview, we asked the recovered patients to describe their target symptoms and the degree of impairment at the current time and, retrospectively, at their worst when they were ill in the past with anorexia nervosa. The symptoms that they recalled from the past (data not included here) were similar to their current symptoms. That is, if a subject identified a target symptom that she had in the past, she endorsed that same symptom as being present currently. In terms of the Yale-Brown scale score of impairment, interference, and intensity of symptoms, the recovered patients recalled significantly greater impairment in the past than at the present time (mean score=24, SD=13, versus mean=9, SD=8; t=5.67, df=17, p<0.0001). We only used the current Yale-Brown scale scores to compare the recovered patients with the comparison women.

DISCUSSION

We found that women who had had long-term weight recovery from anorexia nervosa continued to show behavior that could be characterized as an obsessive need for exactness and order. That is, the recovered patients had persistent elevations of perfectionism scores on the Eating Disorder Inventory and on the Frost Multidimensional Perfectionism Scale. In addition, they had elevated scores on the Yale-Brown scale and endorsed specific target symptoms suggesting that many had concerns with symmetry and exactness. The patients who had recovered from restricting-type and bulimic-type anorexia had similar scores on these measures.

The Eating Disorder Inventory is known to differentiate reliably between patients with anorexia nervosa and those without the disorder (10). We found that women who had recovered from anorexia nervosa were different from comparison women on the Eating Disorder Inventory subscale of perfectionism after a conservative correction for multiple t tests. The recovered women also had elevated scores on drive for thinness, ineffectiveness, interpersonal distrust, and interoceptive awareness, but these scores were not significantly different from those of the comparison subjects after correction for multiple t tests.

Casper (3) administered the Eating Disorder Inventory to a group of long-recovered anorexic patients and a comparison group. She also found that the recovered women had higher scores than the comparison women on the Eating Disorder Inventory subscales for ineffectiveness, drive for thinness, and interoceptive awareness but not the scales for perfectionism or interpersonal distrust. There may be several explanations for the differences between our study results and those of Casper. First, our comparison group had significantly lower scores on the Eating Disorder Inventory subscales of interpersonal distrust and perfectionism than the comparison group used by Casper. Our group of comparison women had no eating disorder symptoms or other psychopathology upon screening and after administration of the Schedule for Affective Disorders and Schizophrenia. Casper used female college and medical students who were not screened for psychopathology. Thus, the inclusion of subjects with psychopathology in the Casper study may have resulted in elevated scores on the Eating Disorder Inventory. Second, these two studies used different processes for selection of anorexic patients with long-term recovery. Casper followed up all subjects she had previously treated. In contrast, we recruited subjects locally and nationally who would participate in biological studies. Some of our subjects had never been treated for anorexia nervosa because they had spontaneously recovered. It is not certain which group is more representative of the population with anorexia nervosa.

To our knowledge, the Frost Multidimensional Perfectionism Scale has not been administered to people with long-term recovery from anorexia. The Frost scale overlaps slightly with the Eating Disorder Inventory perfectionism subscale because it contains questions from this subscale. We found that the recovered women scored higher than the healthy comparison women on all subscales of the Frost scale (table 1). Perfectionism has been described as "the practice of demanding of oneself or others a higher quality of performance than is required by the situation" (16). This demand is accompanied by tendencies for overly critical evaluation of one's own behavior. In addition, perfectionistic qualities include "setting unrealistic standards and striving to attain these standards, selective attention to and overgeneralization of failure, stringent self-evaluations, and a tendency to engage in all-or-none thinking whereby total success or total failure exist as outcomes" (17). In another study (18), we found that women suffering from anorexia nervosa who were studied when underweight and immediately after refeeding and weight restoration also had higher scores on the Frost scale than comparison women. Importantly, both groups of women who were ill with anorexia had scores that were similar to the scores reported in this article for women after long-term recovery. Together, these data raise the possibility that perfectionistic behavior is independent of the state of the illness and reflects underlying traits.

We found that the recovered anorexic patients had higher scores on the Yale-Brown Obsessive Compulsive Scale than the comparison subjects. However, these patients had Yale-Brown scale scores significantly lower than those derived from their retrospective recall of the symptoms they had when they were ill with anorexia nervosa in the past. Moreover, these recovered anorexic patients had significantly lower Yale-Brown scale scores than a group of ill, underweight patients with anorexia that we assessed directly in another study (19). The most common target symptoms of the recovered patients pertained to symmetry, exactness, ordering, and arranging. In the other study, we found that ill, underweight patients with anorexia also most commonly endorsed concerns with symmetry and exact-
ness. In other words, the recovered anorexic patients and the patients currently ill with anorexia endorsed similar types of target symptoms, concerns with symmetry and exactness. In summary, it appears that weight loss exaggerates the intensity of these concerns but that the content of the concerns remains unchanged. That is, we found no difference in the target symptoms endorsed by patients with anorexia at any stage of their illness. The difference was how intensely they were preoccupied with these symptoms and the degree of incapacitation. Other investigators have noted that patients with anorexia have particular concerns with ordering and cleanliness or obsessions with perfectionism or things going wrong (20).

Our data and those of Casper (3) suggest that certain behaviors, such as an obsessive need for symmetry and perfectionism, greater risk avoidance, restraint, and increased impulse control, persist after recovery from anorexia nervosa. Theoretically, such traits could be the behavioral expression of a biological vulnerability. Serotonin is one neurotransmitter system that could contribute to such behaviors. Reduced serotonin activity has been associated with impulsive and aggressive behaviors (21–25). Behaviors found in anorexia nervosa are opposite in character to impulsive and aggressive behaviors. In fact, we have reported evidence suggesting 1) that after long-term recovery from anorexia nervosa, women have increased neuronal serotonin activity (26) and 2) that serotonin-specific medications may improve outcome in the disorder (27). Together these data raise the possibility that such behaviors are traits expressing an underlying biological vulnerability.

REFERENCES