

# Is Anorexia Nervosa a Delusional Disorder? An Assessment of Eating Beliefs in Anorexia Nervosa

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Anorexia nervosa (AN) is a serious mental illness, characterized in part by intense and irrational beliefs about shape and weight, including fear of gaining weight. Although these beliefs are considered to be a diagnostic criterion for the illness, they have not been systematically characterized. This study used the Brown Assessment of Beliefs Scale (BABS) to identify the dominant belief that interfered with eating in a sample of underweight patients with AN ( $N = 25$ ). The degree of insight was assessed quantitatively. The majority of participants (68%) spontaneously reported a dominant belief consistent with fear of gaining weight or becoming fat. Twenty percent of patients were categorized as delusional. The total score on the BABS was significantly correlated with the drive-for-thinness subscale of the Eating Disorders Inventory (EDI) ( $r = 0.41, p = 0.04$ ), but did not correlate with overall measures of AN severity (body mass index [BMI], duration of illness, lowest BMI, other subscales of the EDI, or total EDI score). These findings highlight the centrality of fear of fat in AN and suggest the possibility that there is a subgroup of patients whose concerns about their weight reaches delusional proportions. This subpopulation of patients warrants further study, since patients with more delusional beliefs may have a form of AN that is more refractory to treatment. (*Journal of Psychiatric Practice* 2007;13:65–71)

**KEY WORDS:** anorexia nervosa, eating disorders, delusions, delusional disorder, body dysmorphic disorder, obsessions, obsessive-compulsive disorder

Anorexia nervosa (AN) is a serious mental illness with a chronic course, high morbidity, and a mortality rate among the highest for any psychiatric illness.<sup>1</sup> The key diagnostic features listed in the criteria for AN in the *Diagnostic and Statistical Manual of Mental Disorders*, 4th Edition, Text Revision (DSM-IV-TR)<sup>2</sup> include a refusal to maintain a normal body weight, an intense fear of fat or gaining weight, a body image disturbance, and amenorrhea. These criteria emphasize the firmly held beliefs related to eating, shape, and weight seen in patients with AN, yet the criteria do not specifically address the range of intensity with which these beliefs are held. In some cases, self-starvation in AN is associated with beliefs about eating and body shape that are so extreme that patients are described by clinicians as “near delusional.” Bruch, one of the first to characterize in detail the features of AN, described “delusional denial of thinness” as a signature feature of the illness.<sup>3</sup> In fact, she distinguished primary anorexia nervosa from an atypical variant in which patients may not express this “delusion.” The DSM, however, does not refer to patients’ beliefs about their bodies as delusional,

instead using the term “intense” beliefs. The terminology of the DSM reflects the commonly held view that reality testing in patients with AN, apart from eating-related issues, is generally intact and that patients usually recognize that their beliefs are not shared by others. Questions related to reality testing in patients with AN (or how delusional is “near-delusional?”) have been

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This work was supported in part by the National Alliance for Research in Schizophrenia and Depression, and NIMH grants T32 MH15144 and R21 MH069898.

The authors would like to acknowledge Katharine Phillips, MD for her assistance in the preparation of this article.

largely ignored in the research literature, and belief systems in AN have not been systematically probed. However, AN remains an enigmatic illness, with unclear biological underpinnings and inadequate treatment options. A recent review reported little change in outcome in the past 5 decades.<sup>4</sup> It is possible that the intensity of irrational thinking about shape and weight accounts, in part, for resistance to treatment. In addition, in recent years, the potential utility of antipsychotic medication has received attention,<sup>5-7</sup> suggesting that it may be useful to characterize the intensity of thought disturbances in AN in more detail.

The presence of distorted thinking has long been recognized in AN and has been described as “the absence of concern about emaciation, even when advanced, and the vigor and stubbornness with which the often gruesome appearance is defended as normal and right.”<sup>78</sup> DSM-IV-TR criterion C for the diagnosis of AN—body image disturbance—is described as occurring in three possible ways: as a “disturbance in the way in which one’s body weight or shape is experienced,” or “undue influence of body weight and shape,” or “denial of the seriousness of the current low body weight.” These three descriptions represent a range of severity or intensity of beliefs and thus hint at a range of conviction among patients. While psychotic symptoms unrelated to the eating disorder have been described in patients with AN,<sup>9-11</sup> and study of cognitive processes in AN has recently received renewed attention as a useful way to develop a model of neuropathology,<sup>12,13</sup> eating disorder-related irrational beliefs have not been carefully examined for degree of reality-testing.

In obsessive-compulsive disorder (OCD) and body dysmorphic disorder (BDD), two other disorders characterized by severely distorted cognitions, irrational thinking has been described as occurring along a spectrum, with delusional thinking occurring at the extreme end.<sup>14,15</sup> In both cases, the DSM-IV-TR specifically describes the occurrence of psychotic features in some cases and recommends providing an additional diagnosis of delusional disorder to indicate the presence of psychotic features. The diagnostic specifier “with poor insight” was added to describe those patients with OCD whose reality testing with respect to disorder-related cognitions lies on the border between obsession and delusion. Systematic assessment of the irrational thinking in patients with AN will contribute to understanding the cognitive processes that characterize this illness. The present study is a preliminary investigation to determine, using the Brown Assessment of Beliefs Scale (BABS)<sup>16</sup>—a structured interview-based measure of irrational think-

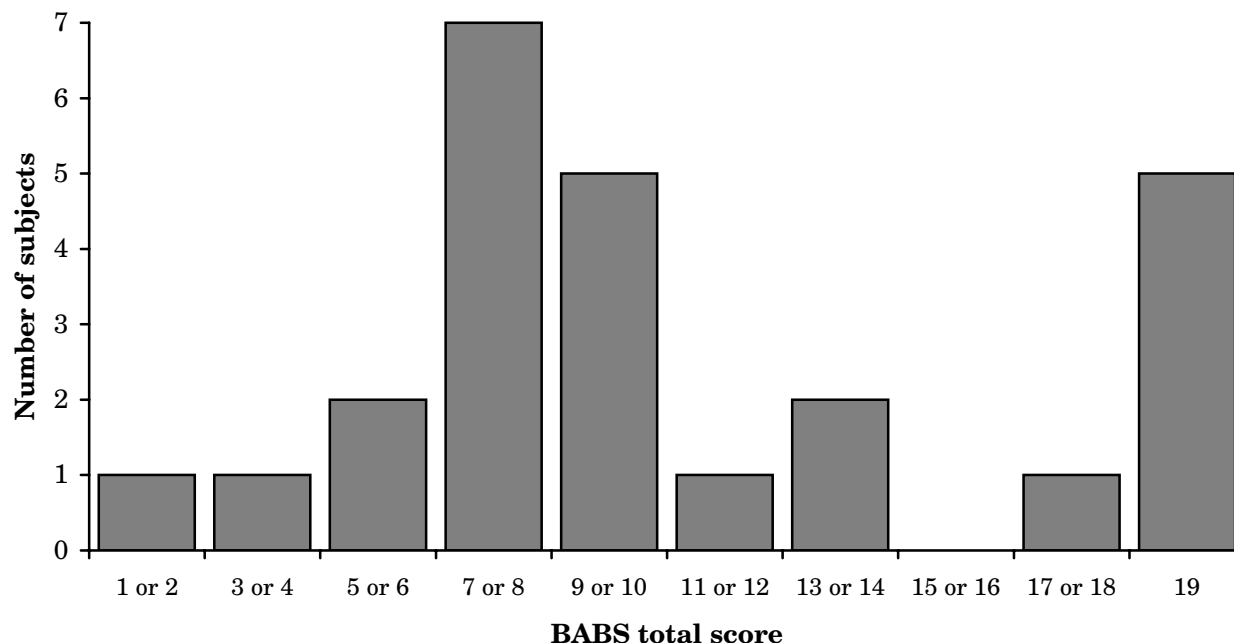
ing—whether patients with AN exhibited a degree of irrationality that could be viewed as delusional. We hypothesized that more severely ill patients would have BABS scores that reached delusional proportions.

## METHODS

Subjects were patients with AN ( $N = 25$ ) who presented for inpatient ( $n = 14$ ) or outpatient ( $n = 11$ ) treatment at the Eating Disorders Research Clinic at the New York State Psychiatric Institute. Subjects were screened using the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I)<sup>17</sup> and a semi-structured interview to assess eating disorder pathology in detail (Eating Disorder Examination).<sup>18</sup> Because of symptom overlap between disorders, patients with AN also often meet criteria for depressive or anxiety disorders, and such subjects were not excluded. However, subjects were excluded if they met criteria for other Axis I disorders. At the time of entry into treatment, patients met all DSM-IV-TR criteria for AN except criterion D, which requires amenorrhea. Patients who were menstruating were included ( $n = 7$ ) because amenorrhea does not appear to increase the specificity of the diagnosis of AN.<sup>19</sup> All participants were medically stable. This study was approved by the New York State Psychiatric Institute Institutional Review Board.

Following written informed consent, The Brown Assessment of Beliefs Scale (BABS)<sup>16</sup> was administered by the principle investigator (JES) who was trained by one of the authors of the BABS (JLE). The BABS is a 7-item, clinician-administered semi-structured interview designed to quantify delusional thinking related to a dominant belief along a spectrum from good insight to delusional thinking in a wide range of psychiatric illnesses. Psychometric properties of this scale have previously been established: inter-rater reliability and internal consistency are excellent; validity has been established via convergence with other measures of insight and symptom severity; intraclass correlation coefficient was 0.96 for the total score; Cronbach’s alpha coefficient was 0.87; mean test retest reliability was 0.95 (range 0.79–0.98).<sup>16</sup>

In administering the BABS assessment, a dominant belief is first determined in a semi-structured, open interview. In this study, the dominant belief was elicited by explaining to the patient that the interview aimed to assess beliefs that interfere with eating, even if these beliefs seem irrational. The patient was asked what thoughts or beliefs she has that interfere with eating and the interviewer and patient then phrased the belief

**Figure 1. Distribution of total scores on the Brown Assessment of Beliefs Scale (N = 25)\***

\*Each column represents an interval of two scores. Scores were normally distributed in the non-delusional range, with a second peak of frequency in the delusional range.

in one sentence that the patient agreed was the dominant belief. The seven items on the BABS assess conviction, perception of others' views, explanation of differing views, fixity of beliefs, attempts to disprove beliefs, insight, and ideas of reference. The questions have five anchors, with descriptions corresponding to each anchor. The score for each item ranges from 0 (non delusional or least pathological) to 4 (delusional or most pathological). The total score ranges from 0–24 (ideas of reference are not included in the total score). Ratings reflect an average score for the past week. Items are summed to reach a total score (dimensional). As in previous studies of OCD and BDD,<sup>20</sup> participants in this study were given the categorical score “delusional” if they received a 4 on item 1 and a total score  $\geq 18$  (categorical); this cutoff point was previously empirically derived.<sup>16</sup> Participants were categorized as having “poor insight” if they received a 3 on item 1 and a total score  $\geq 13$ .

The 5 initial BABS interviews were tape recorded and re-scored by an independent rater (JLE). Inter-rater reliability was examined using the intraclass correlation coefficient. Although the number of interviews rated by both interviewers was very small ( $n = 5$ ), there was perfect agreement between raters with respect to assignment of delusional categorization ( $n = 2$  delusional, 3

non-delusional). Agreement on the BABS total score was also excellent ( $ICC = 0.98$ ,  $0.85$ – $1.0$  with 95% CI), although the small number of interviews limits interpretation. In addition, discrepancies in scores were subsequently discussed and consensus scores were reached.

Height and weight were measured for all participants. Participants also completed the Eating Disorders Inventory (EDI),<sup>21</sup> a self-report questionnaire assessing eating disorder symptoms. The EDI generates a total score and 8 subscales (drive for thinness, bulimia, body dissatisfaction, ineffectiveness, perfectionism, interpersonal distress, maturity fears, and interoceptive awareness), with high scores indicating greater symptoms. The Positive and Negative Syndrome Scale (PANSS),<sup>22</sup> a semi-structured interview to measure positive and negative symptoms associated with schizophrenia, was administered to a subset of participants (outpatients,  $n = 11$ ). Higher scores on the PANSS indicate greater symptom severity. It was administered in this study as a second measure of psychosis and psychotic-like thoughts and behaviors in patients with AN.

The primary analyses in this study were descriptive. Frequency of delusional thinking, as measured by score on the BABS, was assessed. Qualitative analyses of responses were conducted by reviewing the specific

**Table 1. Dominant eating-related beliefs elicited from patients (N = 25)**

Category	Belief*	Number reporting	Number "delusional"†
Shape/weight fear	"If I feel full, I will get fat right away."	17	4
	"If I feel full, I will change shape right away."		
	"If I eat [something forbidden], I will get fat right away."		
	"If I eat [something forbidden], I will change shape right away."		
Loss-of-control fear	"If I eat [something forbidden], I will lose control."	4	1
	If I eat [something forbidden], I will never stop eating."		
Fullness concern	"If I eat, it will stay in my stomach undigested and I'll never feel hungry again."	1	0
	"If I feel full, the food will sit there forever."	1	0
Other concerns	"If I'm thin enough, I won't get traumatized/attacked again."	1	0
	"The only way to be successful is to not eat."	1	0

\*Dominant beliefs were elicited in open interview by asking the patient what interfered with eating. In qualitative analysis, the reported beliefs were sorted into four categories. Phrases in brackets indicate that patients identified specific foods or amounts of food (including any food at all) that they considered "forbidden." One subject in the shape/weight fear category reported that she would get fat "the next day" rather than "right away."

† "Delusional" is defined by receiving a BABS total score  $\geq 18$  and a 4 on Item 1.

belief identified by each participant. Beliefs were sorted into categories based on similarities in responses. As secondary analyses, comparisons between groups (delusional versus non-delusional) were made using the independent samples t-tests. Correlations between BABS score and clinical characteristics (lowest body mass index [BMI], current BMI, duration of illness, EDI subscales, EDI total score) were also examined. The alpha level was set at  $p = 0.05$ . Quantitative data were analyzed using SPSS (SPSS version 13.0).

## RESULTS

All study participants were women. The mean age of study participants was  $24.6 \pm 8.0$  years, with a mean BMI of  $16.1 \pm 1.4$  kg/m<sup>2</sup>. The mean lowest BMI at adult height was  $15.2 \pm 1.4$  kg/m<sup>2</sup>, and mean duration of illness was  $9.2 \pm 7.4$  years. The mean total EDI score was  $79.2 \pm 35.9$ .

The mean BABS score in this sample was  $9.92 \pm 5.4$  (range 1–19). Figure 1 presents a histogram of the distribution of BABS total scores for the group. Overall, 5 participants (20%) met criteria for delusional and 7 (28%) met criteria for poor insight.

Upon examination of the beliefs reported by patients, four categories emerged: shape/weight fear, fullness concern, loss-of-control fear, and other concerns. These beliefs are presented in Table 1. The majority of partici-

pants reported a shape/weight fear ( $n = 17$ , 68%). Fears of losing control were the next most common category ( $n = 4$ , 16%). Two patients (8%) reported a fullness concern, which may be a variant of the shape/weight fear, and 2 (8%) reported other beliefs.

Patients who were characterized as delusional by BABS score did not differ significantly from those who were non-delusional by age or by any measure of illness severity (BMI, duration of illness, lowest BMI at adult height, or total EDI score). BABS total score was significantly correlated with the drive-for-thinness subscale of the EDI ( $r = 0.41$ ,  $p = 0.04$ ), but did not correlate with BMI, duration of illness, lowest BMI, other subscales of the EDI, total EDI score, or PANSS scores.

In the subset of 11 outpatients to whom the PANSS was administered, there were statistically significant differences in scores between those who met criteria for being delusional by BABS ( $n = 2$ ) and those who did not ( $n = 9$ ). In the non-delusional group, the mean score on the General scale was  $24.0 \pm 4.7$  versus  $32.5 \pm 0.7$  in the delusional group ( $t[df] = -2.4[9]$ ,  $p = 0.038$ ). In the non-delusional group, the mean Total score was  $43.2 \pm 7.2$  versus  $56.5 \pm 0.7$  in the delusional group ( $t[df] = -2.5[9]$ ,  $p = 0.033$ ). The groups did not differ significantly on the Positive or Negative subscales. Effect sizes for differences between groups on the PANSS scores were large (see Table 2); however, the sample size was extremely small.

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**Table 2. Comparison of measures of illness severity between the non-delusional and delusional groups, and correlations with BABS total score**

	<i>Non-Delusional</i> ( <i>n</i> = 20)	<i>Delusional</i> ( <i>n</i> = 5)	<i>Difference between groups</i>			<i>Correlation with BABS total score</i>	
	( <i>Mean</i> ± <i>SD</i> )	( <i>Mean</i> ± <i>SD</i> )	<i>t</i> ( <i>df</i> )	<i>p</i>	<i>Cohen's d</i>	<i>Pearson's r</i>	<i>p</i>
BMI (kg/m <sup>2</sup> )	16.3 ± 1.1	15.3 ± 2.0	1.55 (23)	0.14	0.62	−0.31	0.14
Duration of illness (yrs)	8.9 ± 7.7	10.6 ± 6.8	−0.46 (23)	0.65	−0.23	−0.19	0.38
Lowest lifetime BMI	15.3 ± 1.3	14.6 ± 1.8	1.05 (23)	0.31	0.44	−0.26	0.20
EDI, total	79.5 ± 38.3 <sup>a</sup>	78.1 ± 28.3	0.08 (22)	0.94	0.04	0.33	0.11
EDI, drive for thinness	13.7 ± 7.3 <sup>a</sup>	16.2 ± 3.6	−0.74 (22)	0.47	−0.43	0.41	0.04
EDI, bulimia	3.6 ± 5.0 <sup>a</sup>	5.2 ± 8.4	−0.54 (22)	0.60	−0.23	0.31	0.15
EDI, body dissatisfaction	16.0 ± 7.4 <sup>a</sup>	16.4 ± 7.9	−0.10 (22)	0.92	−0.05	0.25	0.24
EDI, ineffectiveness	13.4 ± 8.9 <sup>a</sup>	14.7 ± 9.5	−0.26 (22)	0.80	−0.14	0.36	0.08
EDI, perfectionism	9.2 ± 4.9 <sup>a</sup>	8.0 ± 4.7	0.47 (22)	0.64	0.25	−0.03	0.90
EDI, interpersonal distress	6.6 ± 4.4 <sup>a</sup>	6.4 ± 4.7	0.10 (22)	0.93	0.04	0.19	0.38
EDI, maturity fears	6.0 ± 5.6 <sup>a</sup>	2.8 ± 2.3	1.26 (22)	0.22	0.74	−0.05	0.83
EDI, interoceptive awareness	10.9 ± 9.0 <sup>a</sup>	8.4 ± 6.4	0.58 (22)	0.57	0.32	0.16	0.44
PANSS <sup>b</sup> , Positive	8.6 ± 1.1	10.0 ± 0.0	−1.73 (9)	0.12	−1.80 <sup>c</sup>	0.40	0.23
PANSS <sup>b</sup> , Negative	10.6 ± 3.8	14.0 ± 1.4	−1.21 (9)	0.26	−1.19 <sup>c</sup>	0.00	0.99
PANSS <sup>b</sup> , General	24.0 ± 4.7	32.5 ± 0.7	−2.44 (9)	0.04	−2.53 <sup>c</sup>	0.53	0.09
PANSS <sup>b</sup> , Total	43.2 ± 7.2	56.5 ± 0.7	−2.52 (9)	0.03	−2.60 <sup>c</sup>	0.40	0.22

BMI = body mass index; EDI = Eating Disorder Inventory; PANSS = Positive and Negative Syndrome Scale

<sup>a</sup>EDI data are missing for one participant in the non-delusional group.

<sup>b</sup>PANSS data were collected from outpatients only (non-delusional *n* = 9, delusional *n* = 2).

<sup>c</sup>Effect sizes for the differences between groups on the PANSS are large, however the sample size in the delusional group is quite small (*n* = 2).

## CONCLUSION

This study presents the results of a systematic assessment of irrational beliefs that patients with AN report as interfering with food intake. Inadequate food intake is arguably the most significant pathology in AN, as the malnourished state is associated with serious medical morbidity in addition to worsened psychopathology. These results suggest that the firmly held beliefs seen in the low weight state are impressively stereotyped, with at least two-thirds of patients spontaneously reporting as a dominant belief that if they ate (either anything at all or some forbidden food), they would gain weight, get fat, or change shape in some way—either immediately upon eating or the following day. This observation has two important implications. First, it

lends support to the DSM-IV diagnostic criterion B, “intense fear of gaining weight or becoming fat,” as this emerges as a typical belief among patients with AN. As per the procedure for administration of the BABS, if a patient did not spontaneously report a fear of getting fat, then conviction about this belief was not assessed. Therefore, this study cannot comment on whether the 8 patients (32%) who reported a different dominant belief would also have endorsed this fear. Second, the finding that 5 patients (20%) reached the cut-off for delusional on their BABS scores during the acute phase of illness is provocative and suggests that this should be accounted for in diagnosis. As with OCD and BDD, some patients with AN may need to be classified as having a delusional disorder, or a specifier may be warranted to indicate “poor insight.” Prognostic implications of the

delusional categorization were not determined by this study and warrant further investigation.

While two previous studies have administered the BABS in a population of patients with eating disorders, these studies focused on comorbidity between BDD and eating disorders. The first study limited the interview to beliefs about body shape, and reported a mean BABS score of  $16.9 \pm 3.5$  for patients with AN and BDD ( $n = 16$ ), versus  $8.6 \pm 3.4$  for AN patients without comorbid BDD ( $n = 25$ ,  $p < 0.001$ ).<sup>23</sup> The second study reported a mean BABS score of  $15.2 \pm 6.5$  in a group of patients with BDD and a comorbid eating disorder ( $N = 65$ ), but this sample included both patients with AN and patients with bulimia nervosa.<sup>24</sup> Neither study reported on the frequency of delusional thinking. The present study examined delusional thinking both as a categorical and a dimensional variable and suggests that there may be a bimodal distribution of insight in this population. Most scores were normally distributed in the non-delusional range, with a second peak occurring at the delusional end, but future studies with larger sample sizes are needed to further examine the score distribution in this population. Some studies of BDD<sup>25</sup> and OCD<sup>26</sup> have reported no significant difference between delusional and non-delusional groups in response to treatment. However, one study of patients with OCD found that poor insight, as measured by BABS, predicted poor response to medication treatment.<sup>27</sup> Although no previous studies of AN have used the “delusional” categorization, one study in patients with AN measured insight using Morgan Russell criteria<sup>28</sup> and suggested that poor insight predicted poor prognosis.<sup>29</sup>

The clinical significance of the delusional categorization in this study is unclear. This approach to irrational thinking in AN may shed some light on the difficulty of engaging patients in behavior change, despite reported interest in becoming healthier. That is, the clinical observation that for patients, having an appreciation of the fact of being ill does not translate into ability to participate in treatment, may be partially explained by the “delusional” nature of the dominant belief. The distinction between acknowledgement of illness and fixity of eating disordered beliefs can be captured by this concept of delusional eating-related thinking. Notably, studies that examined patients without significant shape/weight concerns (the other end of the spectrum) using other methods have suggested that there may be clinically significant differences.<sup>30,31</sup> The present study was limited by a small sample size, and by the inclusion of a heterogeneous group of patients, some of whom were menstruating. Nonetheless, in an illness such as AN that

is characterized by significant treatment resistance, it is possible that this measure captures something new about the illness that merits further evaluation.

The current study, using a structured measure of irrational thinking, documented that a significant minority of patients with AN exhibit distortions of thinking regarding shape and weight that can be considered delusional. We detected only a single statistically significant correlation between BABS score and other measures of illness severity, namely, with the drive-for-thinness subscale of the EDI. It may be that our sample size was too small to detect significant correlations with other similar measures, and both the BABS and the drive-for-thinness subscale of the EDI are simply measures of the severity of illness. On the other hand, it is possible that the BABS provides an index of delusional thinking that is not simply another general measure of severity, but reflects a more specific aspect of AN. Further study of larger numbers of patients with AN is needed to determine whether the degree of irrational belief, as assessed by the BABS, is predictive of outcome in this illness, and whether irrational thinking responds to either psychological (e.g., cognitive-behavioral therapy) or pharmacological (e.g., antipsychotic) treatment.

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