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Running title:

PERSONALITY DISORDER COGNITIONS

Full title:

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Abstract

Eating-disordered patients have relatively high rates of comorbid personality disorder diagnoses, including both anxiety-based personality disorders (obsessive-compulsive and avoidant) and borderline personality disorder. However, there is preliminary evidence that the core cognitions underlying personality pathology in the eating disorders are those related specifically to anxiety. This paper builds on that evidence, replicating and extending the findings with a large sample of eating-disordered patients (N = 374). There were no differences in personality disorder cognitions between eating disorder diagnoses. The study also examines the possibility that there are clusters of patients, differentiated by patterns of personality disorder cognition. Affect-related personality disorder cognitions were key to understanding the role of personality pathology in the eating disorders. It is suggested that those cognitions should be considered when planning psychological treatments.

Keywords: eating disorder; personality disorder; cognitions; anxiety

Personality disorder cognitions in the eating disorders

There is substantial evidence of comorbidity between the eating disorders and the personality disorders, with high levels of borderline personality disorder diagnosed among eating disorder patients who binge and purge, obsessive-compulsive and avoidant personality disorders among more restrictive patients, and avoidant personality disorder among patients with binge eating disorder (e.g., Raymond et al., 2005; Sansone et al., 2006). However, the personality disorders commonly co-occur (Dolan et al., 1995). This means that one cannot be sure which of them makes the most appropriate target when addressing such personality-level issues in treatment of the eating disorders.

One potential solution to this quandary is to determine the elements of personality pathology that are central in the eating disorders, rather than considering those personality disorders as separate entities. For example, using the Personality Beliefs Questionnaire (PBQ - Beck & Beck, 1991), Connan et al. (2009) demonstrated that eating pathology is more strongly associated with the cognitive element of avoidant and obsessive-compulsive personality disorder pathology than with borderline personality disorder. They hypothesized that the apparent link with borderline personality pathology in other research (e.g., Sansone et al., 2006) might be due to anxiety cognitions underlying the borderline personality disorder features in many cases. This finding supports an alternative approach to understanding the eating disorder-personality link, which is to focus at the level of personality pathology as it naturally clusters, rather than in terms of diagnostic categories.

This ‘naturalistic cluster’ approach is effective in understanding personality pathology in the eating disorders. For example, Thompson-Brenner & Westen (2005; Thompson-Brenner et al., 2008) have shown that eating-disordered patients fall into three personality types (high-functioning perfectionist, constricted/overcontrolled, dysregulated/ undercontrolled), where the dysregulated group show poorest levels of function and outcome. The importance of dysregulation to the eating disorders is supported by the finding that emotional lability is associated with behavioural impulsivity in bulimia nervosa (Anestis et al., 2009). Using an ecological momentary assessment methodology, Wonderlich et al.

(2007) found a somewhat different pattern among bulimic individuals, with three personality subtypes (interpersonal/emotional, stimulus-seeking/hostile, low personality pathology) that were validated by a range of clinical differences. However, given that the majority of the literature to date has focused on patients with bulimic disorders, it is not clear whether adopting a clustering methodology of this type will result in similar groupings when considering a wider clinical sample of eating disorder sufferers.

A cognitive-behavioural approach to treating different 'personality disorder types' of case depends on understanding the cognitions that characterise those clusters. Therefore, this study explored whether Connan et al.'s (2009) finding of a stronger role for anxiety-based cognitions (avoidant and obsessive-compulsive cognitions) than for borderline personality disorder cognitions) was replicated with a larger sample, and examined the natural clusters of personality disorder cognitions that are found in a broad clinical sample of eating-disordered patients.

Method

Participants

The patients were a case series, referred to a publicly-funded specialist eating disorder service in the UK, covering a largely urban and suburban population and providing out-, day- and in-patient services. Because the data were collected for routine clinical purposes, the study received approval from the local National Health Service Research and Development office rather than the ethics board.

A total of 509 patients were asked to complete the measures prior to assessment. Of these 509 patients, 79 declined or provided incomplete responses, 23 were excluded due to being male, and another 33 were excluded post assessment due to not meeting the criteria for any eating disorder. Thus, the final sample was 374 women who met DSM criteria for an eating disorder (American Psychiatric Association, 1994) and completed the measures. The mean age of the 374 women was 28.9 years (SD = 9.25). The women were assessed by clinicians trained in the use of DSM-IV, with all diagnoses verified by team discussion and the obtaining of further data if necessary. The women were grouped into four broad

diagnostic categories – anorexia nervosa (N = 130), including 46 patients with the restrictive subtype, 43 with the binge-purge subtype, and 41 with atypical anorexia nervosa (one criterion absent - 17 still had their periods; 24 reported an absence of core cognitions or body image disturbance); bulimia nervosa (N = 172) – including 131 with full bulimia nervosa, and 41 with atypical bulimia (below the frequency threshold on frequency of objective bingeing and/or purging); binge eating disorder (BED - N = 18); or other Eating Disorder Not Otherwise Specified (EDNOS – N = 54). The EDNOS group consisted of cases with eating pathology that did not fit the above criteria (e.g., women with purging disorder; severe and disabling eating disorder/body image cognitions in the absence of behaviours; more than one criterion missing for a full diagnosis of anorexia nervosa or bulimia nervosa). While the number of patients with binge eating disorder was lower than the population prevalence would suggest, such patients are less likely to be referred to specialist services in the UK.

Measures and Procedure

The women were posted the measures to complete ahead of the assessment, and were asked to return them at the assessment, in order to add to the information available regarding eating and other pathologies. Two measures were used to provide information regarding eating attitudes, bulimic behaviours and personality disorder cognitions.

Eating Disorder Examination Questionnaire – v6.0 (EDE-Q). The EDE-Q (Fairburn, 2008) is a self-report measure of behaviours and attitudes related to restraint, eating, weight and body image. It is adapted from the Eating Disorder Examination (Fairburn & Cooper, 1993). The attitudes measured are restraint, eating concern, shape concern and weight concern. Higher scores show greater levels of eating pathology. Self-report of objective binge-eating and vomiting was also taken from this measure. The EDE-Q has positive psychometric properties and good test-retest scores, even over an extended time (Berg et al., 2012). Its scales' internal consistency is acceptable, although it is not clear that the eating and weight concern scales measure different constructs or not (Peterson et al., 2007). However, the EDE-Q cannot be recommended as a diagnostic measure (hence diagnoses in

this study were conducted by the clinicians, as outlined above).

Personality Belief Questionnaire – Short Form (PBQ-SF). The PBQ-SF (Butler, Beck & Cohen, 2007) is a shorter version of the original PBQ (Beck & Beck, 1991), which had 126 items. Like the PBQ, the PBQ-SF is not a tool for diagnosing personality disorders or the full range of personality pathology, but is a measure of the cognitions that underpin different personality disorders. The PBQ-SF is a 65-item self-report questionnaire, assessing dysfunctional beliefs associated with ten personality disorders (example items given in parentheses) – avoidant ('I should avoid unpleasant situations at all costs'), dependent ('The worst possible thing would be to be abandoned'), passive-aggressive ('Other people are often too demanding'), obsessive-compulsive ('It is necessary to stick to the highest standards at all times, or things will fall apart'), antisocial ('If I don't push other people, I will get pushed around'), narcissistic ('Other people should satisfy my needs'), histrionic ('Unless I entertain or impress people, I am nothing'), schizoid ('In many situations, I am better off to be left alone'), paranoid ('Other people have hidden motives'), and borderline ('Unpleasant feelings will escalate and get out of control'). Higher scores are associated with greater levels of personality pathology. Both the PBQ and the PBQ-SF have strong psychometric properties, including internal consistency, test-retest reliability, discriminant validity and criterion validity (Bhar et al., 2012). Connan et al. (2009) have demonstrated the utility of the full version of the PBQ with the eating disorders..

In addition to these measures, objective measurements of weight and height were taken at the assessment, in order to calculate body mass index (BMI).

Data analysis

SPSS 20 was used to analyse the data. Initially, mean EDE-Q and PBQ-SF scores and BMI levels were compared across the four diagnostic groups, using MANOVA and post hoc multiple comparison tests (Least Significant Difference). Thereafter, the PBQ-SF scores were used as independent variables in a series of stepwise multiple regression analyses, predicting scores on each of the individual EDE-Q measures (controlling for BMI by including it as an independent variable). Finally, two-step cluster analysis was used to determine

whether the eating-disordered group fell into distinct clusters, defined by their personality disorder cognitions, and those clusters were validated against clinical variables.

Results

Table 1 shows the mean scores for the four diagnostic groups on the two measures and BMI. Sub-groups of anorexia nervosa and bulimia nervosa were compared in preliminary analyses, but showed no differences. Therefore, the findings are given for the broad diagnostic groups only. The scores on the PBQ-SF and EDE-Q are similar to those shown with another eating-disordered sample (Waller et al., 2013). While there were the expected differences in frequency of bulimic behaviours and BMI, there were no significant differences between the eating disorder diagnoses on the EDE-Q scales or the PBQ-SF, as previously found with a different eating-disordered sample completing the PBQ (Connan et al., 2009).

Insert Table 1 about here

Table 2 shows the results of the multiple regression analyses, in which the PBQ-SF scales and BMI were entered to predict the individual EDE-Q scales. When considering the pattern of associations with overall eating attitudes, three PBQ-SF scales were associated with the EDE-Q total scale – avoidant, obsessive compulsive and histrionic. This finding is similar to the finding of Connan et al. (2009), who found that the first two of these were linked to the EDE-Q (using a much smaller sample). However, there were different patterns of association for the individual EDE-Q scales.

Insert Table 2 about here

EDE-Q restraint was associated with high levels of obsessive-compulsive and

histrionic personality disorder cognitions, but the association with narcissism was negative (i.e., restrictive attitudes were higher among patients with more anxious personality structure, but lower if the patient had more self-centred thinking style). Avoidant and obsessive-compulsive thought patterns were positively associated with all the other three EDE-Q scales, and histrionic personality cognitions were positively linked to two of them. Higher BMI was also associated with two of the scales – shape concern and weight concern – as might have been expected. As shown by Connan et al. (2009), borderline personality disorder cognitions had little relevance to these eating attitudes, with the exception of eating concerns (where there was also a negative association with paranoid personality cognitions).

When considering links to bulimic behaviours, histrionic personality disorder pathology was associated with both objective bingeing and vomiting. Those patients with higher levels of binge-eating also had a higher body mass index.

Clusters of personality disorder cognitions in the eating disorders

The cluster analysis identified four groups of patients, differentiated by patterns of PBQ-SF scores. Table 3 shows the mean scores on the PBQ-SF for those four groups. ANOVAs demonstrated that there were significant inter-cluster differences on all ten scales ($F > 76.0$, $P < .001$ in all cases). One cluster ($N = 108$) had low scores on all scales, and was labelled 'Low personality pathology'. Another ($N = 115$) had moderate scores on all scales ('Moderate personality pathology'). A third cluster ($N = 72$) also had moderate scores on several scales but high scores on the scales that related to emotional lability (avoidant, obsessive-compulsive, histrionic, borderline), and were labelled ('Affective-impulsive personality pathology'). The final cluster ($N = 79$) had high scores on all the PBQ-SF scales, and was labelled 'High personality pathology'.

Insert Table 3 about here

In order to determine the clinical validity of the clusters relative to eating pathology,

the four groups' scores on the EDE-Q and BMI were compared, using MANOVA and post-hoc Least Significant Difference tests (see Table 4). There were no differences in BMI or frequency of vomiting, but there were significant differences on all other EDE-Q indices (all four attitudinal scales and frequency of binge-eating). In all cases, the 'Low personality pathology' group had lower levels of eating pathology than either of the other groups. The other three groups had comparable levels of restraint and binge-eating. However, the 'Affective-impulsive' and 'High personality pathology' groups had greater levels of concerns regarding eating, shape and shape than the 'Moderate' group. There were no differences between the 'Affective-impulsive' and 'High' groups.

Insert Table 4 about here

Discussion

This study of personality disorder cognitions in the eating disorders aimed to determine those cognitions that have the greatest relevance to levels of eating pathology, and to examine whether there are naturally-occurring clusters of cases, with distinct patterns of personality disorder cognitions. There were no differences between eating disorder diagnoses in either PBQ-SF or EDE-Q scores, supporting the use of a broad, transdiagnostic approach thereafter. While the study has a large number of participants and addressed a wide range of eating disorders, it has some weaknesses that need to be considered in further research. First, the sample were self-selecting, and future studies should allow for comparison of those who opt to participate and those who do not. Second, the diagnostic definitions were derived from DSM-IV, and that should be borne in mind when considering comparability with later studies that use DSM-5.

With regard to the first aim, the findings were similar to those of previous work (Connan et al., 2009). The personality disorder cognitions that were most strongly related to levels of eating pathology were avoidant, obsessive-compulsive and histrionic, with little

impact of borderline personality disorder cognitions. Given these findings, it is possible that the difference in personality disorder comorbidity between restrictive and binge/purge cases (avoidant/obsessive-compulsive vs borderline – Sansone et al., 2006) reflects different manifestations of underlying anxiety-centred cognitions. This pattern might be due to the fact that the restrictive and binge/purge groups have differences in serotonergic function that appears to make them more likely to respond compulsively or impulsively (e.g., Steiger et al. 2009). Thus, it is possible that the behavioural manifestations of different eating disorders (including the symptoms of different personality disorders) are biologically moderated reactions to the same core anxiety-based cognitions, rather than reflecting different cognitive underpinnings. In clinical and research terms, this supports an approach to formulating the eating disorders that includes a focus on understanding anxiety mechanisms, and treatment that aims to reduce anxiety, such as exposure and behavioural experiments (e.g., Fairburn, 2008; Strober et al., 2007; Waller et al., 2007). While this approach is likely to influence some secondary borderline personality cognitions, it will still be necessary to consider working with impulsivity in some cases (e.g., Bankoff et al., 2012; Fairburn, 2008).

In terms of the second aim, the group fell into four clusters, defined by different levels of personality disorder pathology. The groups differed in terms of their eating pathology, offering some clinical validation of these groups. However, the 'affective' and 'high' personality pathology groups did not differ in EDE-Q scores. This finding suggests that, in terms of eating disorder pathology, the core aspect of more severe personality pathology is the affective-impulsive element (e.g., PBQ-SF avoidant, borderline and obsessive-compulsive scales) rather than the social element (e.g., PBQ-SF antisocial or schizoid scales). This conclusion would impact on the personality disorder cognitions addressed when working with complex eating disorders. However, the role of other personality disorder cognitions cannot be neglected, as it is possible that future research will show that the 'affective-impulsive' and 'high' groups are differentiated by other clinical variables, such as co-morbid axis 1 pathology.

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Table 1

Levels of eating pathology (EDE-Q scores), body mass index, bulimic behaviours and personality disorder cognitions (PBQ-SF scores) in different eating-disordered groups

		Broad diagnostic group				MANOVA		
		Anorexia nervosa	Bulimia nervosa	BED	EDNOS	F	P	Multiple comparison tests (LSD; P < .05)
	N					Overall		
EDE-Q scales		130	172	18	54	**4.47**	**.001**	
Restraint		3.31 (2.08)	3.54 (1.76)	2.40 (1.72)	3.38 (1.82)	1.95	NS	-
Eating concern		3.13 (1.60)	3.61 (1.49)	3.39 (1.40)	3.23 (1.42)	2.46	NS	-
Weight concern		3.73 (1.77)	4.11 (1.45)	3.58 (1.49)	4.11 (1.40)	1.84	NS	-
Shape concern		4.05 (1.57)	4.46 (1.45)	4.19 (1.42)	4.51 (1.37)	2.15	NS	-
Binges/28 days		4.73 (10.1)	14.4 (14.4)	12.8 (8.29)	6.04 (8.39)	17.2	.001	AN = EDNOS < BN = BED
Vomiting/28 days		5.96 (14.9)	13.9 (23.4)	0 (0)	4.21 (11.3)	7.04	.001	BED < AN = EDNOS < BN
Body mass index		16.1 (2.06)	24.3 (7.03)	33.4 (8.75)	24.6 (8.79)	66.6	.001	AN < BN = EDNOS < BED

(Table continues)

Table 1 (continued)

	Broad diagnostic group				MANOVA		
	Anorexia nervosa	Bulimia nervosa	BED	EDNOS	F	P	Multiple comparison tests (LSD; P < .05)
PBQ-SF scales							
Avoidant	13.0 (6.80)	13.5 (6.28)	13.0 (9.59)	12.9 (7.38)	0.13	NS	-
Dependent	9.22 (6.29)	8.81 (6.40)	10.8 (9.50)	8.19 (6.02)	0.78	NS	-
Passive-aggressive	7.65 (6.11)	8.13 (5.88)	10.0 (6.60)	6.62 (6.31)	1.59	NS	-
Obsessive-compulsive	15.2 (7.61)	14.0 (7.22)	11.6 (7.37)	13.4 (7.70)	1.60	NS	-
Antisocial	4.84 (4.82)	5.28 (5.28)	6.53 (5.00)	5.02 (5.34)	0.61	NS	-
Narcissistic	3.08 (4.07)	4.02 (4.62)	4.65 (4.90)	3.03 (3.55)	1.74	NS	-
Histrionic	8.35 (6.36)	9.66 (6.43)	8.65 (6.20)	7.56 (6.06)	1.84	NS	-
Schizoid	11.4 (6.24)	11.1 (6.75)	11.4 (8.00)	10.5 (7.15)	0.21	NS	-
Paranoid	9.24 (8.41)	8.99 (7.20)	10.0 (7.98)	8.01 (7.92)	0.41	NS	-
Borderline	10.6 (6.81)	10.5 (6.70)	11.2 (9.34)	10.0 (6.86)	0.16	NS	-

Table 2

Association of eating pathology (EDE-Q scales) with personality disorder cognitions (PBQ-SF scales) and body mass index (BMI)

	Overall effect			**Significant independent variables**			
Dependent variable (EDE-Q score)	F	P	Variance explained	PBQ-SF scale	t	P	Beta
Total	48.2	.001	25.4%	Avoidant	3.64	.001	0.248
				Histrionic	2.81	.005	0.157
				OCPD	2.77	.006	0.183
Restraint	19.0	.001	12.7%	OCPD	4.40	.001	0.253
				Histrionic	3.44	.001	0.218
				Narcissistic	2.38	.02	-0.136
Eating concern	26.3	.001	25.4%	Borderline	3.23	.001	0.262
				Histrionic	2.75	.006	0.157
				Avoidant	2.42	.02	0.202
				OCPD	2.11	.04	0.141
				Paranoid	3.26	.001	-0.223
Weight concern	34.2	.001	21.1%	OCPD	3.87	.001	0.261
				Avoidant	3.53	.001	0.236
				BMI	2.34	.03	0.232
Shape concern	33.1	.001	25.6%	Avoidant	4.06	.001	0.278
				Histrionic	2.58	.01	0.144
				BMI	2.55	.02	0.116
				OCPD	2.37	.02	0.159
Objective binges	16.1	.001	7.9%	Histrionic	4.13	.001	0.211
				BMI	3.91	.001	0.200
Vomiting	9.84	.002	2.4%	Histrionic	3.14	.002	0.163

Table 3

Mean scores of each PBQ-SF scale for each cluster

	Cluster			
	1	2	3	4
N	79	108	72	115
PBQ-SF scales				
Avoidant	20.40	4.86	17.22	12.86
Passive-aggressive	15.45	2.50	7.49	7.64
Obsessive-compulsive	20.96	5.84	18.85	13.50
Antisocial	11.25	1.45	6.09	4.10
Narcissistic	7.89	.95	3.60	3.28
Histrionic	14.39	3.15	13.24	7.14
Schizoid	18.19	5.15	10.30	11.78
Paranoid	19.46	1.79	10.22	7.27
Borderline	17.01	2.99	16.60	8.63

Table 4

Levels of eating pathology among patients in different personality disorder cognition clusters, compared using MANOVA with post-hoc Least Significant Difference (LSD) tests

	Personality disorder cognitions cluster				**MANOVA**		
Characteristic	Low (N = 108)	Moderate (N = 115)	Affective-impulsive (N = 72)	High (N = 79)	F	P	Multiple comparison tests (LSD; P < .05)
BMI	22.6 (9.67)	22.4 (8.34)	22.5 (7.37)	21.5 (7.71)	0.31	NS	-
EDEQ Restraint	2.50 (2.01)	3.42 (1.77)	3.89 (1.72)	3.81 (1.88)	11.2	.001	L < M = A = H
EDEQ Weight concerns	2.90 (1.56)	3.98 (1.56)	4.69 (1.14)	4.61 (1.12)	32.5	.001	L < M < A = H
EDEQ Eating concerns	2.19 (1.48)	3.41 (1.46)	4.17 (1.28)	3.97 (1.19)	39.3	.001	L < M < A = H
EDEQ Shape concerns	3.28 (1.65)	4.28 (1.24)	5.02 (1.20)	5.00 (1.12)	34.8	.001	L < M < A = H
Binges	5.59 (11.6)	11.2 (15.2)	12.4 (13.4)	9.73 (11.6)	5.67	.001	L < M = A = H
Vomiting	4.94 (9.67)	9.50 (17.1)	10.9 (24.4)	9.63 (22.6)	1.99	NS	-