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Dysmorphic concern in anorexia nervosa: Implications for recovery

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ABSTRACT

Body image disturbance ('dysmorphic concern') is a key diagnostic criterion for anorexia nervosa (AN). While dysmorphic concern has been described as a relapse predictor, relatively little is understood about the prevalence in AN, and the consequences upon wellbeing. The present study examined the rates of dysmorphic concern in a sample of treatment-seeking adults with AN ($N = 39$), and explored the associations with general mental health, disability and eating disorder symptoms. The majority of participants (61.5%) had clinically significant levels of dysmorphic concern. Furthermore, higher dysmorphic concern scores were associated with increased symptoms of anxiety, depression and eating disorder symptomatology. There was also a trend towards associations between dysmorphic concern and age of onset and stages of change (pre-contemplation, contemplation, preparation, action, maintenance), although replication is required. These findings suggest that strategies which specifically address body image distortions should be a key feature of treatment for anorexia nervosa to support long-term recovery and wellbeing.

1. Introduction

Anorexia nervosa (AN) is a severe psychiatric illness with the highest mortality rate of any mental health disorder (American Psychiatric Association [APA], 2013; Birmingham et al., 2005). In line with the current Diagnostic and Statistical Manual of Mental Disorders (5th Edition; DSM-5), AN is characterised by a persistent restriction of energy intake relative to requirements, leading to significantly low body weight, which is typically categorised as a body mass index (BMI) of below 18.5 kg/m^2. Diagnostic criteria also include an intense fear of weight gain and a disturbed experience of body image, or over importance of weight and shape in self-evaluation (APA, 2013). Individuals with AN experience a range of potentially life-threatening psychological and physiological consequences, which significantly impact daily functioning and quality of life. With treatment, the majority of those with AN can reach partial recovery (weight-restoration), yet the rates of full recovery are significantly reduced with a high rate of relapse, thus, AN is a chronic disorder maintained by many biopsychosocial factors (Herzog et al., 1999).

A major risk factor for AN relapse involves dysmorphic concern (Heilbrun and Witt, 1990; Keel et al., 2005); this is when an individual is preoccupied with a distorted appearance concern that is generally not observed by others or appears insignificant (Cash and Hrabosky, 2004). More than feeling dissatisfied with one's appearance, dysmorphic concern involves abnormalities in how people subjectively experience and perceive their body, compared to a more objective view (Mancuso et al., 2010). Dysmorphic concern was originally conceptualised as a symptom which can be present in a range of psychiatric disorders (Oosthuizen et al., 1998). Among individuals with AN, dysmorphic concern typically involves overestimating body shape or weight to be larger or heavier than objective measurements, or how they are perceived by others (Castellini et al., 2013; Keizer et al., 2016; Mohr et al., 2010; Phillipou et al., 2016).

While dysmorphic concern is transdiagnostic and has also been explored within schizophrenia and depression, it is predominantly observed among disorders of body image, most notably AN and body dysmorphic disorder (BDD; Jorgensen et al., 2001; Konstantakopoulos et al., 2012; Oosthuizen et al., 1998). BDD is characterised as a preoccupation with perceived defects in appearance that are unobservable or minor to others, but which cause significant distress and/or have a negative impact on functioning. By definition, areas of bodily concern in BDD are not better explained by concerns with body fat or weight in

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an individual who meets criteria for an eating disorder (ED; APA, 2013). Individuals with BDD also engage in repetitive behaviours in response to appearance concerns. Although BDD and AN share many conceptual features, these body image disorders are typically differentiated according to the area(s) of appearance concern and associated behaviours (Hartmann et al., 2013). There can be considerable comorbidity between these body image disorders, with research estimating that between 26% and 46% of those diagnosed with AN also experienced 'probable' comorbid BDD, which was associated with greater functional impairment (Cerea et al., 2018; Dingemans et al., 2012). High dysmorphic concern unrelated to weight in AN has been associated with increased symptoms of social anxiety, obsessions and compulsions, depression, alexithymia, and low self-esteem (Cerea et al., 2018; Fenwick and Sullivan, 2011). Individuals experiencing this symptom overlap were more likely to have attempted suicide due to their appearance concerns, indicating heightened distress and a negative impact on thoughts, emotions and behaviours (Grant et al., 2002). While the comorbidity of AN and BDD has received some research attention, little is known about the implications of dysmorphic concern as a symptom of AN. However, initial findings suggest that high levels of dysmorphic concern present in AN may have significant consequences for long-term treatment and recovery due to increased risk and psychopathology (Heilbrun and Witt, 1990).

The current study aims to identify the rates of dysmorphic concern in an adult sample diagnosed with AN. Based on previous studies, we expected high rates of dysmorphic concern in this sample. Similarly, due to previous findings of greater risk and psychopathology among those with high dysmorphic concern in AN, we also hypothesised that greater dysmorphic concerns would correlate with higher symptoms of depression, anxiety and stress, higher levels of functional impairment, and reduced quality of life. Due to the limited literature available regarding dysmorphic concern in AN, the authors also proposed exploratory analyses for variables of interest, namely BMI, stages of change, age of onset and duration of illness, to further characterise this construct.

2. Method

2.1. Participants and procedure

Participants were 35 females and four males, referred and assessed for outpatient treatment at the Body Image and Eating Disorder Treatment Recovery Service (BETRS) at St Vincent's Hospital Melbourne, Australia (see Newton et al. (2013) for a full description of the service). The sample comprised participants diagnosed with AN after a comprehensive assessment by specialist clinicians under the guidance of consultant psychiatrists in accordance with DSM-5. The dominant clinical feature was 'restraint eating' for 87.2% of the sample, with the remaining 12.8% characterised as 'purge' type. Data were collected upon initial presentation as part of a larger assessment protocol. The study was granted ethics approval from the Human Research Ethics Committee at St Vincent's Hospital, Melbourne and all procedures were in line with the Declaration of Helsinki. Informed consent was obtained from all participants.

2.2. Measures

The Dysmorphic Concern Questionnaire (DCQ; Oosthuizen et al., 1998) was used to assess levels of dysmorphic concern. The DCQ was initially developed to measure dysmorphic concern as a symptom which may be present in a range of mental health conditions, and has been validated in psychiatric inpatient units and the general population (Jorgensen et al., 2001; Bartsch, 2007). While Jorgensen et al. (2001) concluded that the presence of dysmorphic concern as captured by the DCQ does not necessarily imply a diagnosis of BDD, this questionnaire has also gained support as a brief screening measure for BDD (Mancuso et al., 2010). It is a self-report questionnaire has 7 items rated on a 4-point Likert scale from 0 = "Not at all" to 3 = "Much more than most people". Scores range from 0–21, with higher scores indicating greater dysmorphic concern. There has been some debate regarding the cut-off score used in the DCQ, with suggestions of 9, 11, 12 and 14 (Mancuso et al., 2010; Schieber et al., 2018; Stangier et al., 2003). This study chose to use the more liberal cut-off score of 9, which has demonstrated superior specificity and sensitivity, although further clinical assessment is necessary (Mancuso et al., 2010). While the DCQ has not, to the authors' knowledge, been validated in an AN population, this measure has been utilised in a prior study of AN (Fenwick and Sullivan, 2011) and other psychiatric conditions (Bartsch, 2007; Jorgensen et al., 2001; Oosthuizen et al., 1998).

Participants also completed the Depression Anxiety Stress Scale 21 Item Version (DASS-21; Antony et al., 1998) to assess the variables of depression, anxiety and stress, the Brief Disability Questionnaire (BDQ; Von Korff et al., 1996)) to assess overall perceived physical and mental disability, the Quality of Life Enjoyment and Satisfaction Questionnaire (Q-LES-Q-FS; Endicott et al., 1993) to assess overall quality of life, the Anorexia Nervosa Stages of Change Questionnaire (ANSOCQ; Rieger et al., 2002) to assess readiness and motivation for change specific to AN, and the Eating Disorder Examination Questionnaire (EDE-Q; Fairburn and Beglin, 1994) to assess eating disorder symptomatology including the subscales of eating restraint, eating concern, weight concern, shape concern and total score.

2.3. Analyses

Basic data cleaning and screening were performed, with all analyses conducted using IBM SPSS Statistics (Version 25). Descriptive and frequency analyses were used to explore the rates of dysmorphic concern in this population, and Pearson correlations were conducted to explore the relationship between dysmorphic concern and the aforementioned variables. To correct for multiple comparisons a more stringent significance level of $p = 0.01$ was utilised, given Bonferroni corrections can be considered too stringent when analysing exploratory correlations (Perneger, 1998).

3. Results

The mean age of the sample was 26.77 years (SD = 9.38), with mean BMI of 17.22 (kg/m^2) (SD = 2.24) at the time of assessment. Participant characteristics are presented in Table 1.

The frequencies of DCQ scores are presented in Table 2, with mean scores for each measure along with correlations with DCQ scores shown in Table 3 for the entire sample. Frequency analysis revealed that the mean dysmorphic concern score was above the clinical cut-off score of 9, with 61.5% of the sample reporting significant levels of dysmorphic concern, on par with levels indicative of a BDD diagnosis.

As seen in Table 3, the Pearson correlations revealed significant correlations between DCQ score and the following variables: depressive symptoms, anxiety symptoms, and all components of the EDE-Q except for restraint eating. Trends were noted between dysmorphic concern and age of onset and stages of change ($p < 0.05$), although these did not reach significance with the more stringent p-value.

However, when controlling for ED severity (EDEQ total) using partial correlations, the associations between DCQ and depressive and anxiety symptoms did not remain significant ($p > 0.05$). No other correlations reached significance when controlling for EDEQ total scores.

4. Discussion

Distorted body image is a key feature of anorexia nervosa (Cash and Hrabosky, 2004), although limited information is available regarding the prevalence and implications of dysmorphic concern in this

Table 1
Participant characteristics.

		n (*N* = 39)	%
Gender	Female	35	89.7
	Male	4	10.3
Employment	Student	11	28.2
	Full-time employed	7	17.9
	Part-time employed	7	17.9
	Home duties	3	7.7
	Unemployed	3	7.7
	Unable to work because of illness	8	20.5
Education	Tertiary commenced	14	35.9
	Tertiary completed	10	25.6
	Secondary years 11–12 completed	8	20.5
	Vocational completed	2	5.1
	Secondary years 7–10 completed	1	2.6
	Not stated	3	10.3
Marital status	Never married	31	79.5
	Married or de facto	4	10.3
	Divorced	1	2.6
	Separated	1	2.6
	Not stated	2	5.1
Ethnicity	Caucasian	33	84.6
	European	2	5.1
	'Other'	2	5.1
	Not stated	2	5.1

Table 2
Frequency table of DCQ scores.

DCQ Score	Frequency	Percent	Cumulative percent
<9	15	38.50	38.50
9 < 12	4	10.30	48.80
>12	20	51.30	100.00
Total	39	100.00	

population. In accordance with prior research, the present study found that nearly two-thirds of participants with AN scored above the cut-off recommended by Mancuso et al. (2010) indicating levels of dysmorphic concern comparative to a probable diagnosis of BDD on the DCQ. This percentage is slightly higher than reported in previous studies of comorbid BDD and AN (Cerea et al., 2018; Dingemans et al., 2012), which may reflect differences in methodology and screening measures. Although further assessment is required for a formal diagnosis of BDD, these findings demonstrate clinically significant levels of dysmorphic concern in AN (Dingemans et al., 2012; Konstantakopoulos et al., 2012). The results of this study indicate that dysmorphic concern is part of the AN profile, that varies in severity akin to ED symptoms and should be addressed within treatment.

It was also expected that higher rates of dysmorphic concern would be associated with poorer mental health and reduced quality of life (Dingemans et al., 2012; Grant et al., 2002). This was partially supported as significant associations were found between dysmorphic concern and a number of variables of interest. Firstly, higher dysmorphic concern scores were moderately associated with higher anxiety and depression scores which is reflective of previous findings (Grant et al., 2002).The relationship between mood and anxiety levels with distorted body image concern is complex, and likely bidirectional (Kostanski and Gullone, 1998; Leigh et al., 2004). This relationship may reflect the over-evaluation of appearance in gauging self-worth seen in AN, with distorted perceptions of oneself driving low self-esteem. This sense of dissatisfaction and negative comparison to others is reflected by our society which excessively focuses on dieting, weight and shape, and pressure to 'fit in' by looking a certain way. The preoccupations with food and weight in AN can also limit opportunities for social outings and other enjoyable or functional activities which may otherwise improve mood and sense of self. Additionally, low mood and increased anxiety can be significant consequences of the physiological changes associated with disordered eating behaviours, such as low energy, poor physical health, reduced sleep, cognitive abnormalities and hormonal imbalances (Gauthier et al., 2014). However, these results indicate the relationships observed between dysmorphic concern and mood symptoms are not independent of overall ED psychopathology, and so may be difficult to disentangle. Therefore, the relationship between dysmorphic concern and depression and anxiety presented here may be influenced by a variety of factors but could nevertheless be an important target of therapy, as addressing distorted body image may lift general mood and affect, and enhance engagement in treatment.

Secondly, greater dysmorphic concern was strongly associated with overall eating disorder symptomology, with a moderate relationship with eating concerns, and strong relationships with weight and shape concerns. As discussed previously, distorted body perception in AN often relates to overall body weight or shape contrary to specific facial or body features as in BDD. Therefore, there may be some overlap in these constructs which could account for the high correlation between dysmorphic concern and the Weight Concern and Shape Concern subscales of the EDE-Q. It should be noted that the DCQ simply asks about one's 'body' or 'physical appearance', which may be interpreted by participants as pertaining to either weight/shape-related concerns, non-weight/shape-related concerns, or both. Restrictive eating was not associated with increased dysmorphic concern, indicating this behaviour may not necessarily be a response to distorted appearance. However, the Eating Concern subscale of the EDE-Q, which encompasses guilt,

Table 3
Descriptive and correlational data.

Measure	Variable	*N*	Measure range	*M (SD)*	Correlation with DCQ
DCQ	Dysmorphic concern	39	0–21	10.46 (5.07)	
Demographics	Age at assessment	36	18–56	24.67 (5.94)	−0.12
	Age of onset	35	8–38	17.23 (4.33)	−0.40
	Duration of illness	35	1–40	6.91 (6.45)	0.09
	BMI at assessment	36	12.8–18.5	17.04 (1.81)	0.09
DASS-21	Stress symptoms	37	0–21	24.16 (10.19)	0.12
	Depressive symptoms	37	0–21	25.46 (12.18)	0.51*
	Anxiety symptoms	37	0–21	18.32 (9.91)	0.51*
BDQ	Disability	37	0–22	10.38 (5.51)	0.25
Q-LES-Q-FS	Quality of life	30	14–70	34.33 (8.08)	−0.17
ANSOCQ	Stage of change	14	1–5	2.29 (0.54)	−0.54
EDEQ	Restraint eating	39	0–6	3.93 (1.59)	0.20
	Eating concern	39	0–6	3.89 (1.39)	0.58*
	Shape concern	39	0–6	4.68 (1.71)	0.68*
	Weight concern	39	0–6	4.26 (1.71)	0.69*
	Total ED symptoms	39	0–6	4.19 (1.31)	0.63*

* $p < 0.01$.

secrecy, preoccupation, fear of losing control and difficulties with social eating, was associated with greater dysmorphic concern, which may reflect the emotional aspects of this eating construct. For example, dysmorphic concern involves a profound sense of defectiveness and shame (Weingarden et al., 2017), which may present in AN, specifically around food and appearance, and is interpreted as being negatively judged by others. If individuals with AN are able to adopt a perception of self which mirrors a more objective or self-compassionate view, this may reduce the painful emotional responses to food and weight, and assist in building emotional regulation skills.

Despite adjusting the significance value to $p < 01$, it must be noted that there is still a chance the results could be attributed to type I error due to the multiple correlation analyses utilised. However, there were some insignificant trends of interest that require replication. Specifically, there was a trend between dysmorphic concern and stages of change, indicating higher body image distortion may be related to lower motivation and readiness to change, as measured by the ANSOCQ. This potential link may reflect the overlap between dysmorphic concern and levels of insight, as by definition, dysmorphic concern involves a subjective experience of appearance which is not compatible with objective views or measurements (Hartmann et al., 2013). Intuitively, this association makes sense, as an individual with AN who perceives their body to be larger than it is, will likely continue engaging in behaviours associated with weight loss, therefore being less willing to reduce or change these behaviours for recovery. Although significant evidence was not available, it may be of interest to explore this relationship further as low motivation is a common barrier to change due to the ego syntonic nature of EDs.

Similarly, the association between age of onset and dysmorphic concern approached significance, indicating that those diagnosed with AN at a younger age may have higher levels of dysmorphic concern than those who have an older age of onset. Dysmorphic concern was not associated with duration of illness, indicating that there may be specific factors associated with early AN onset which contribute to this trend. For example, it is possible that cognitive abnormalities due to starvation may influence the development of brain areas associated with visual perception, body image or insight (Feusner et al., 2017; Smeets and Kosslyn, 2001). Alternatively, if children develop AN prior to puberty, body image distortion may be heightened by greater discrepancies between the natural hormonal and body composition changes, and the perceived ideal or pre-pubescent body shape and weight. It may also be possible that those who develop AN at an earlier age are more susceptible to societal influences and pressures to adopt a specific appearance. However further research is required to replicate the significance of this relationship. If dysmorphic concern is shown to be a predisposing factor for early onset AN, this has implications for early prevention and intervention services, such as public health programs.

Contrary to expectations, higher dysmorphic concern was not related to impaired quality of life or greater disability. However, it must be noted that the present sample's mean scores on these two measures were quite low, comparable to those with severe mental illness including psychosis and personality disorders (Stevanovic, 2011). It is possible our results may reflect a floor effect, with dysmorphic concern having limited impact upon quality of life among other factors associated with the eating disorder. Further research is required to clarify this hypothesis.

There was not a significant association between BMI and dysmorphic concern, indicating high levels of distorted body image are not dependent on objective weight and height measurements. While the present study only examined participants in the BMI category <18.5, future research should include those with atypical AN or weight-restored AN to further explore the relationship between subjective and objective experiences of the body. It would be of importance to examine dysmorphic concern over time, and how this construct may fluctuate with treatment and other environmental factors.

These findings are limited as data was not available regarding the focus or location of participants' distorted body image concerns. For example, it is unknown whether the DCQ scores captured appearance concerns relating to one's overall body weight or shape, as would be characteristic of AN, or more specific body features as seen in BDD. The location of dysmorphic concern would be an important differentiating feature to determine whether such body image distortions are a symptom of AN, or perhaps indicative of a comorbid BDD diagnosis. As such, future studies should incorporate this information when measuring dysmorphic concern in ED populations. Similarly, these findings are limited due to the difficulty disentangling dysmorphic concern from other characteristics of AN which may contribute to these relationships. Indeed, the present study found that dysmorphic concern was not independently related to mood symptoms when controlling for ED severity. As discussed above, it is possible there may be some overlap among the DCQ and EDEQ constructs involving weight and shape concerns. Further exploration of dysmorphic concern in this population would be beneficial in extricating any unique impacts of this factor, including validation of the DCQ in AN. A further limitation of the study is the small proportion of males with AN included in this sample, as it is unclear how their experience of body image disturbance may be related to ED symptoms. For example, endorsement of masculine ideals has been linked to a drive for muscularity, compared to the drive for thinness which is typically related to feminine ideals (Murray et al., 2013). This notion also reflects the BDD subtype of muscle dysmorphia, where individuals perceive their body to be insufficiently muscular and consequently engage in activities to increase muscle mass such as obsessive exercise, and use of nutritional supplements or anabolic steroids (Murray et al., 2017). Likewise, individuals identifying as transgender or gender non-conforming may have differing experiences of dysmorphic concern which should be highlighted given the increased prevalence of EDs within these populations (Diemer et al., 2018; Jones et al., 2018). Consequently, comparing the relationship of dysmorphic concern and AN symptomatology among gender diverse populations is an important focus for future research.

Together, these findings implicate dysmorphic concern as a common and concerning feature of AN associated with a range of factors that may impact insight, ability to participate in treatment, and long-term recovery. Due to the high prevalence of dysmorphic concern in AN, and difficulty entangling this construct from BDD, it is recommended that screening is utilised to determine if full diagnostic criteria for BDD are met. As the dysmorphic concern present in individuals with AN may be in relation to whole body size or shape, featural appearance concerns should also be explored which may be more indicative of BDD. It is also important to differentiate between observable changes in particular areas of concern, such as hair or teeth, which may be a physical consequence of starvation, compared to the unobservable or slight appearance concerns characteristic of dysmorphic concern (Cerea et al., 2018). Therefore, it is necessary to clarify whether an individual presents with comorbid BDD and AN which has significant implications regarding treatment planning and progress, compared to high levels of dysmorphic concern which present in the context of AN,

In regards to AN treatment, these findings support the inclusion of body image work as an integral part of AN recovery due to the high prevalence and associations with poor wellbeing. Although this data is unable to determine causation, the relationships between dysmorphic concern and motivation to change, eating disorder symptomatology, affect and age of onset may be potential targets of intervention and prevention. Furthermore, while this study only examined a single timepoint, previous studies have identified distorted body image as a predictor of relapse (Cash and Hrabosky, 2004; Keel et al., 2005). Therefore, treatments developed for BDD which focus on reducing dysmorphic concern, such as cognitive restructuring, exposure and response prevention, and innovative techniques involving mirror retraining or virtual reality, are likely beneficial for this population as well (Ferrer-Garcia and Gutierrez-Maldonado, 2012; Key et al., 2002;

Veale and Neziroglu, 2010). Such treatments have evidenced that body image distortion can be improved, which has promising outcomes for those experiencing dysmorphic concern in AN to reach full recovery (Keizer et al., 2016).

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Declarations of interest

None

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.psychres.2019.01.102.

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