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Distorted body image in women and men suffering from Anorexia Nervosa – a literature review

Barbara Kostecka, Katarzyna Kalina Kordyńska, Sławomir Murawiec, Katarzyna Kucharska

Summary

The aim of this article is to shed some light on the phenomenology of distorted body image in Anorexia Nervosa (AN). Even though body image disturbance has already been identified as one of the central components of AN (as evident in various diagnostic criteria, such as those of the DSM-5 or ICD-10), it still does not receive enough clinical attention in the therapeutic process. In this literature review, we will investigate empirical body of evidence addressing the relationship between distorted body image and AN pathology. Furthermore, the authors propose to introduce a Body Image Therapy programme to assist treatment as usual (TAU) in targeting AN psychopathology. Similar treatment programs have already been implemented in Great Britain and the USA. In Poland, however, little is known about Body Image Therapy. To improve the understanding of distorted body image in AN, the following topics are discussed: phenomenology and prevalence of distorted body image in AN psychopathology, its role in the aetiology and symptom maintenance of eating disorders, a neurobiological view on body image and recommended treatment options.

distorted body image, anorexia nervosa, exposure therapy

THEORETICAL BACKGROUND: BODY IMAGE IN THE LITERATURE

Body image phenomenology inspires research from various disciplines of science, such as: psychology, genetics or medicine. The subject attracted public attention already in the 1920's and by the end of the 1990's sixteen different definitions of body image had emerged [1]. Body image is inarguably a multidimensional phenomenon. Contrary to what it may seem, it is not syn-

onymous to physical appearance. Even though the perception of one's own physical appearance is a part of the concept, it also comprises thoughts, feelings, bodily sensations and other cognitions that an individual experiences with respect to their own body.

Some researchers suggest that body image can be best understood as: (i) *body schema* and (ii) one's *emotional relationship* to it [2]. According to this viewpoint, *body schema* is a cognitive rather than emotional construct. It relates to the overall knowledge that one has about their own body. *Emotional relationship* with the body, on the other hand, relates to the level of satisfaction with one's own body. It has a cognitive, behavioural and emotional component. Various researchers [3,4] differentiate between perceptual and emotional components of body image. The latter, in-

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cluding body-related thoughts, feelings and attitudes, are thought to shape the perception of body image. This viewpoint posits that the level of body image satisfaction is determined by the distance between the actual and the ideal body image. The actual body image constitutes one's own perception of the body at the time being, while the ideal one represents what an individual would like their body to be. Thus, the more the two converge, the greater the level of body image satisfaction. In addition, the level of body image satisfaction is a dynamic concept and it is shaped by intra – and interpersonal experiences that an individual has in relation to their body.

Work with AN patients makes the relationship between their body image satisfaction and their body image perceptions become apparent. According to the ICD-10, AN can be diagnosed when body image of an individual is significantly disturbed and the disturbance leads to intrusive thoughts and anxiety about gaining weight. In the DSM-5, the criterion of disturbed body image is met when one's own perception of the body weight and shape is disturbed (which may include denial of low body weight).

There are various cognitive-behavioural approaches towards AN that are described in the scientific literature. Williamson *et al.* [5] proposed that body image is shaped by: personality characteristics, cognitive processes and emotions. They suggested that body image may be involved in a feedback loop, where its disturbance may induce negative mood states, which are, in turn, likely to further exacerbate body image dissatisfaction, leading into a downward spiral [5].

Another cognitive-behavioural model of body image [6] highlights the importance of environmental cues and context-dependent events in the activation of evaluations and emotions related to body image. To give an example, the presence of a mirror may attract an individual's attention and consequently elicit body-related cognitions. In such a scenario, a person with distorted body image is likely to experience high levels of distress and anxiety. Mancuso [7] proposed that as a response, an individual is likely to engage in one of the following three strategies: (i) experiential avoidance (attempt to avoid situations that may elicit body-related cognitions or emotions) (ii) body-fixing (efforts to correct

body parts perceived as flawed) or (iii) positive rational acceptance (focusing on the functionality of one's body parts, highlighting importance of positive self-care and rational self-talk). All of these strategies aim at decreasing body-related distress. The first two strategies are considered maladaptive, as they reinforce body image dissatisfaction. Even though they may appear successful in immediate distress reduction, in the long-run, they perpetuate body image distress and elevate anxiety levels. Positive rational acceptance is considered to be adaptive and promote body satisfaction.

Mancuso [7] proposes that maladaptive responses such as experiential avoidance or body-fixing in response to negative body image evaluations seem to be related to body image inflexibility. According to Sandoz *et al.* [8], body image inflexibility refers to unwillingness to experience negative thoughts, emotions or bodily sensations in relation to the appearance of one's own body. Consequently, it is usually accompanied by attempts to reduce both intensity and frequency of negative cognitions and evaluations associated with one's body. Study findings point out that body image inflexibility is related to negative body image and eating disorders symptomatology [9]. In his study, Mancuso [7] found that body image inflexibility moderated the relationship between body image evaluations and engagement in maladaptive strategies to release appearance-related distress, thus suggesting that body image inflexibility is likely to be responsible for negative body image. Therefore, next to targeting body image dissatisfaction, body image inflexibility may be important to address in order to decrease the burden associated with eating disorder psychopathology. Acceptance and Commitment Therapy (ACT) is a currently applied treatment method to reduce body image inflexibility [10].

There are many factors that contribute to disturbed body image. Social and cultural factors play a major role in its development [11,12]. Thinness is constantly promoted in the social media, particularly in the western culture. For many, it has become a golden standard, often associated with success and happiness. At the same time, it is known that striving for a thinself, with BMI significantly below clinical recommendations, may have detrimental effects

on health. It is particularly dangerous in individuals with disturbed body image and those experiencing high anxiety related to gaining weight. In such cases, exposure to social media that tend to pair thinness with happiness may result in a drastic restriction of daily caloric intake. In consequence, body biochemistry is likely to be disturbed (e.g. resulting in hormonal changes) and leading to gradual deterioration in health, which, in extreme cases, may result in death.

Besides the symptomatology of Anorexia Nervosa, affected individuals often experience symptoms of another disorder in which body image disturbance plays a central role. Namely, Anorexia Nervosa may be comorbid with Body Dysmorphic Disorder (BDD), which consists in an extreme preoccupation with one's physical appearance. Particularly, affected individuals tend to focus on body parts that they consider defective. The defect may be either real or imagined. In case of a real defect, it is significantly over-exaggerated. In both cases, BDD is accompanied by high levels of anxiety and distress with regard to the "defective" body parts [13–15].

Cognitive-behavioural models of AN distinguish between cognitive, behavioural and physical symptoms of AN [16]. Many argue that it is the cognitive symptoms that are mostly involved in the aetiology, maintenance and severity of eating pathology [17,16]. Mountjoy *et al.* [16] suggest that distorted body image cognitions are the first to develop in AN phenomenology. Lena *et al.* [10] provided some evidence that they are often present for at least 6 months before the actual diagnosis. Despite the critical role of distorted body image cognitions in the development and persistence of AN, little is known about their phenomenology. There is no agreement about the actual nature of distorted body image cognitions in the literature [16,18]. In mental disorders, distorted beliefs are typically defined as overvalued ideas, obsessions or delusions [16,18]. In clinical classifications of mental disorders (e.g. the DSM-5), the distinction between the three is often based on the level of insight and abnormality of held beliefs. Delusions are ideas that result from incorrect inferences. They are difficult to change, even in the presence of contradictory evidence. Obsessions are char-

acterized by involuntarily and recurring nature and include thoughts, impulses or images that cause significant distress and constitute a threat to an individual. Overvalued ideas, on the other hand, are beliefs that are persistent and sustained, preoccupying to the extent of dominating the sufferer's life. In contrast to delusional beliefs, an individual holding overvalued ideas can acknowledge that their beliefs may not be (entirely) true.

In AN, distorted body image cognitions are usually classified as overvalued ideas [16]. However, Mountjoy *et al.* [16] argue that abnormality of the belief and the strength of the conviction may not be the best criteria to distinguish between the three. Moreover, they suggest that this classification lacks empirical bases. Using the Brown Assessment of Beliefs Scale (BABS), Hartmann *et al.* [19] estimated that around 16% of AN patients displayed beliefs regarding their body image that were classified as delusional and 26% of them scored within the range of overvalued ideas. These findings highlight the possibility that the nature of distorted body image beliefs in AN patients may be, in fact, heterogeneous in nature and range anywhere between overvalued ideas and good insight to delusional convictions with poor insight. Given the fundamental role of distorted body image in AN patients, some researchers propose that AN may be actually better understood as a "body image disorder" [20], suggesting possible benefits of such a reconceptualisation. They propose that understanding AN in terms of body image distortion could reduce misconceptions about its psychopathology.

Regardless of the actual nature of distorted body image cognitions in AN patients, it is not to be argued that perceptions and cognitions of AN sufferers differ significantly from those of healthy persons. Individuals with distorted body image have a tendency to associate attractiveness and physical appearance with achievements and competence. In addition, AN patients are detail-oriented. They tend to be highly perfectionistic, introverted and have low self-esteem. Moreover, they tend to interpret neutral social interactions that emphasize their appearance as negative and threatening. They may also have deficits in emotional regulation skills [21, 22].

Distorted body image in men suffering from Anorexia Nervosa

Nowadays, not only women but also men experience the pressure to become thin and reduce body-fat. There are certain professions where thinness is recommended (eg. dancers, actors or media presenters) or even required (eg. athletes). Basically, any occupation that exposes an individual to public scrutiny is related to increased risk for eating pathology [23]. It is especially true when an individual who is pressured to be thin displays deficits in emotional regulation skills and tends to engage in maladaptive strategies to deal with their emotions.

According to the literature, 10% of reported AN cases involve men. However, it is likely that many AN cases that concern men remain underreported [24], as there is a widespread belief that eating disorders affect predominantly women. This creates a stigma for men (they consider it shameful to admit that they have an eating disorder and/or are afraid of judgment) and may prevent many from seeking help [25]. Moreover, even men who do seek help are less likely to be diagnosed with AN [24]. Ascribing AN predominantly to women may bias clinicians away from AN diagnosis.

One of the main risk factors for developing AN is disturbed body image. Carlat, Camargo and Herzog [26] investigated a sample of $n = 135$ men suffering from eating disorders. They found that as many as 60% of men reported low body image satisfaction or radical attempts to reduce weight before experiencing full-blown AN symptomatology. Empirical evidence shows that even men who have normalized their weight (but had experienced AN in the past) keep overestimating their body-fat level and experience distress with regard to their body image [27].

There is some evidence that sexual orientation mediates the relationship between distorted body image and eating disorders. Homosexuality is often associated with thin body-ideal and negative body image [28], which may contribute to attempts to lose weight [28].

Another factor that may contribute to the development of AN in the populations that constitute sexual minorities is difficulty in accepting one's own sexual orientation. Carlat, Camargo

and Herzog [26] hypothesised that attempts to deny one's own sexuality may contribute to the development of AN. While investigating AN patients, they found that as many as 58% of them considered themselves as asexual [26].

Another longitudinal study investigating body image, included $n = 154$ heterosexual men aged 18 – 30 years revealed that negative body image was a strong predictor of future eating pathology. Moreover, it was positively correlated to depression and anxiety [29]. Similar results were reported by McCabe and Ricciardelli [30], who also highlighted that high levels of body dissatisfaction were related to maladaptive behaviours in pursuit of a desired body ideal.

To sum up, disturbed body image among men is becoming a more severe and prevalent problem in the society. It is related to higher risk of eating disorders as well as comorbid disorders (eg. anxiety, depression). Despite detrimental effects of ED pathology, diagnosing ED in men remains a challenge, and AN cases among men are likely to be underreported. Increasing social awareness and providing education targeting eating disorders in men are the necessary steps to help to reduce the stigma associated with ED among men.

Neurobiology of distorted body image in AN

Most theories that aim to explain aetiology and maintenance of AN rely on cognitive-behavioural explanations. However, some authors [31] highlight the importance of neurobiological, clinical-developmental and interpersonal factors. Amianto *et al.* [31] consider AN as a disorder of the self. Having its roots in attachment theory [32], their approach proposes that deficits of the self (ie. integration of affect, cognition and conation) develop from infancy to adolescence. Amianto and colleagues [31] suggest the interplay between the development of the self and insecure attachment to be the foundation of eating pathology. They argue that in order to understand this theory, it is crucial to understand the organizing and coordinative function of the self. This function, among others, enables to distinguish between information related to the self and to the – a process called differentiation by Mahler [33]. Based on attachment the-

ory [32], emergence of relational self via differentiation allows a toddler to develop autonomy, while at the same time maintaining relatedness to primary caregiver and later on also to other people. It is further proposed [31] that disturbance in the relational self as well as reflective functioning (ie. understanding that own mental states and processes, even though possibly related, are separate from those of others) are at the core of eating pathology. Therefore AN patients' difficulty to relate to their own bodies may be associated with possible failure in the "separation – individuation line of development". It is said that it is when a child develops the "body-self," which should be internalized as distinct from the mother's body. Supposedly, that is why ED patients are likely to have incoherent identities, and in consequence, may feel incompetent and inadequate. Amianto *et al.* [31] argue that there is both clinical and neurobiological evidence to support this theory. Some studies [34] suggest that AN patients exhibit poor attachments as well as diminished reflective functioning (based on Adult Attachment Interview scales; [35]). From a neurobiological standpoint, Amianto *et al.* [31] argue that brain areas associated with attachment and eating disorders are likely to overlap. They argue that abnormalities in spatiotemporal functioning may constitute neurobiological pathways in the brain by which deficiencies in the self relate to insecure attachment in ED sufferers. They propose that various brain networks located in the precuneus, DLPFC, cingulate cortex, insula, thalamus, caudate nucleus are likely to be involved in both AN psychopathology and attachment formation. It is, however, important to notice that the evidence associating disturbance of the self, attachment styles and eating pathology is preliminary [31]. No substantial support exists for this theory, as the studies supporting the theory are correlational, which does not allow to infer causality (ie. it remains unsolved whether it is insecure attachment style and disturbance of the self that actually *cause* AN pathology).

Solms [36], on the other hand, proposes to distinguish between two aspects of the body, basing on neuroanatomical differences. He introduces a distinction between internal and external body. He postulates that "external body" is located on cortical somatotopic maps, claim-

ing that external body arises from these cortical maps. He calls this aspect of the body "external," as it relates to the external representation of the body (body as an object; the image that one sees while looking in the mirror). His rationale for calling this aspect of the body "external" is that the same brain areas are responsible for the formation of mental representations of other external objects. Deeper brain structures including the hypothalamus, circumventricular organs, parabrachial nucleus, area postrema or solitary nucleus [36] are responsible for monitoring and regulation of the vital processes in the body (homeostasis). This regulatory aspect of the body Solms [36] called "internal." According to his viewpoint, internal body does not have a direct mental representation, but rather plays a perceptual function. The author considers "external body" as the object of perception and "internal body" as its subject. Moreover, he ascribes different states of consciousness to each aspect of the body. He associates internal, autonomic body with affective consciousness, because this aspect "feels like something" [36] and external aspect of the body with cognitive consciousness as it is the object of perception. In sum, this viewpoint proposes the distinction between different aspects of the body, based on neurobiological and psychoanalytical accounts (hence the reference to consciousness). Such a distinction, even though preliminary, somehow philosophical and difficult to falsify (no scientific method exists to prove the relationships between different aspects of the body and various types of consciousness), presents a unique view on body image. It captures well the complexity of body image and highlights its multidimensional nature.

According to scientific literature, distorted body image may develop at any stage of AN psychopathology. It may be present before the full-blown onset of AN, develop during its course and/or persist after its remission. In general, there is a lack of agreement on whether neurobiological changes in the brain contribute to the development of AN psychopathology or rather result from prolonged periods of starvation. Even though their aetiology remains unclear, structural changes in the brains of AN patients have already been observed with the use of nuclear magnetic resonance imaging (NMRI). Namely, it has been found that AN is associated with reduced

cerebral volume, deepened sulci and fissures in the brain and dilated lateral ventricles. Dilation of lateral ventricles causes an increase in the amount of cerebrospinal fluid in the brain [37,38].

Fonville *et al.*, from the Institute of Psychiatry in London, observed changes in the medial temporal lobe, hypothalamus and brainstem in AN sufferers [39,40]. For the purpose of the study, they recruited $n = 66$ individuals (33 AN patients and 33 healthy controls). They used high frequency magnetic resonance to investigate cerebral volume, white and grey matter volumes, as well as the amounts of cerebrospinal fluid in the brains of their subjects, and voxel-based morphometry in order to assess their grey matter volume. Moreover, self-report measures were administered to the study subjects in order to assess the levels of depression, perfectionism and AN symptomatology. Results showed dilated ventricles and cerebral and overall grey matter volume loss in AN patients in comparison to healthy controls. With the use of voxel-based morphometry, it was found that AN patients experienced reduction in the volume of the cerebellum, as well as in the temporal, frontal and occipital lobes. There was a statistically significant correlation observed between the decrease in grey matter and cerebellar volumes and the duration of AN psychopathology. No correlations between AN psychopathology (as evidenced by the self-report measures) and changes in the brain structures were found.

Recent studies revealed the critical role of the insula in the experience of hunger and satiety [41]. The insula is located in the close proximity to the brain structures responsible for emotional regulation. At the same time, it is known that appetite, food responses and eating have an emotional component to them. This may explain the pathogenic role of the insula in AN and emotional regulation processes. Moreover, the insula is connected with the somatosensory cortex, a structure that is actively involved in body perceptions, sensations and monitoring. The somatosensory cortex is also involved in the perception of pain and the emotion of disgust. Studies investigating insula activity in AN patients and healthy controls (with the use of fMRI), suggest that the insula of AN patients is significantly less active [42].

Cortical areas of the brain are responsible for cognitive control and weight control. They

show a wide range of neuronal responses to visual food stimuli in ED patients. Cognitive “top-down” processes interact with “bottom-up” control mechanisms responsible for appetite and satiety. The dorsal anterior cingulate cortex (dACC) constitutes the basis for body representations and cognitive control processes.

Lee *et al.* [43] analysed functional connections of the brain in the resting state (comparing ED patients and patients without eating pathology). Resting-state synchrony between anterior cingulate cortex and precuneus is said to reflect body image disturbances in ED patients. The authors examined $n = 18$ women diagnosed with Anorexia Nervosa (AN), $n = 20$ diagnosed with Bulimia Nervosa (BN) and $n = 20$ healthy controls. The AN group showed the strongest synchrony between dACC and retrosplenial cortex (between the hippocampus and the parietal lobe, behind the posterior part of the corpus callosum; [28, 29]), whereas the individuals diagnosed with BN showed the strongest synchrony between dACC and the medial orbital-frontal cortex. Both patient groups showed strong synchronous activity between dACC and the precuneus, which correlated with high scores on the Body Shape Questionnaire. The synchrony in the dACC-precuneus connection may be linked to the intensification of obsessive thoughts regarding food, weight and body shape in patients with eating disorders.

Treatment recommendations: Body Image Therapy

Some researchers suggest [44] that CBT interventions in combination with pharmacotherapy (eg. SSRI) tend to decrease anxiety levels in patients with AN and Body Dysmorphic Disorder (BDD). Moreover, there is some evidence [45] that mindfulness interventions are likely to benefit ED patients. Another line of evidence proposes emotional regulation training, exposure therapy and ritual prevention methods to benefit AN patients [45]. Evidence-based interventions mentioned above constitute the basis for Body Image Therapy developed for ED patients in the Department of Neuroses, Personality Disorders and Eating Disorders.

Body Image Therapy consists of 12 one-hour-long sessions. The program is designed to last 12

weeks, with the frequency of 1 session per week. It is implemented in cooperation with cognitive-behavioural therapists. This highly structured therapy program is run in groups of 5-10 patients. It aims at targeting maladaptive perception, thinking patterns and behaviours. It is dedicated to patients suffering from distorted body image (commonly comorbid with eating disorders). The program does not only activate the patients behaviourally, but also encourages them to change their disturbed cognitions. Between the sessions, patients are assigned homework.

The program starts with an introductory session, explaining its main goals as well as the techniques that are to be implemented throughout the therapeutic process. Patients are encouraged to ask questions. The next step involves targeting the habits that prevent the patients from perceiving their bodies in a positive manner. They are taught techniques to develop non-judgmental attitudes towards themselves, accept their bodies and challenge the distorted body image. A part of this process is a task in which the patient is encouraged to draw their own body contour on a piece of paper in a 1:1 scale (as they perceive it). Next, the therapist asks the patient to lie down on the paper and draws the actual contour of their body. Then, the two images are compared. This is a helpful activity in the process of making the patient realise the divergence between their body image and the actual image of the body. Another part of the program has an educational component and comprises discussions about the thinness ideal that is promoted by the media. The remaining parts of the training include food exposure and mirror exposure.

In a broader sense, the goal of the Body Image Therapy is to improve patients' quality of life and to enhance treatment as usual. It is achieved by teaching them techniques facilitating body-acceptance and non-judgmental attitude towards it. Patients learn what body image actually is. They try to uncover the reasons for their negative body image and learn to view their bodies in a more adaptive manner.

FINAL CONCLUSIONS

Distorted body image is a considerable medical and social problem. It is one of the key factors

in the aetiology and maintenance of AN. Lack of clinical attention to the disturbed body image in AN treatment is likely to contribute to therapeutic difficulties in the management of AN patients.

In Poland, little is known about clinical interventions targeting disturbed body image. However, exploring the subject seems essential. The authors believe that by highlighting the importance of distorted body image in AN, it will be possible to develop more effective treatment options to successfully deal with body image disturbances. At the same time, more knowledge about disturbed body image in Polish patients is required (the prevalence rates of disturbed body image in the general population remain unknown). Epidemiological research could help to establish the magnitude of the problem in the Polish society. In addition, neither the phenomenology of disturbed body image nor its connection to AN is fully understood. More research could help to understand the role of disturbed body image in the course of AN. This could benefit not only clinicians but also patients and their families. Better understanding of distorted body image in AN is likely to reduce the stigma associated with AN pathology [20]. AN patients are often offered advice to "just eat normally," which clearly shows that the society often misperceives AN as a problem that is purely related to eating and thus neglects the component related to disturbed body image.

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Conflict of interest statement

None declared.

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