

Chapter

Evidence-Based and Novel Psychological Therapies for People with Anorexia Nervosa

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Abstract

Anorexia nervosa (AN) is a serious and often highly persistent psychiatric disorder, whereby sufferers struggle to maintain a healthy weight. Its complexity creates challenges regarding treatment, however psychological therapy is recommended by the National Institute for Health and Care Excellence (NICE). There are four major evidence-based psychotherapies recommended for treating adults – enhanced cognitive behavioural therapy (CBT-E), the Maudsley model of anorexia nervosa treatment for adults (MANTRA), specialist supportive clinical management (SSCM) and focal psychodynamic therapy (FPT)—and three main psychotherapies recommended for treating adolescents with anorexia—family therapy for anorexia nervosa (FT-AN), enhanced cognitive behavioural therapy (CBT-E) and adolescent focused therapy for anorexia nervosa (AFP-AN). Additionally, several novel adjunct treatments are under examination, two of which—cognitive remediation therapy (CRT) and cognitive remediation and emotion skills training (CREST)—are also discussed in this chapter. Other relevant areas regarding psychological treatment include: combinations of medication or occupational therapy and psychotherapy, treating individuals with comorbidities, the challenges of studying psychological treatment for anorexia and future directions of psychotherapies for anorexia, and are also discussed.

Keywords: anorexia nervosa, predisposing factors, precipitating factors, perpetuating factors, treatment, psychological therapy, psychotherapy

1. Introduction

Anorexia Nervosa (AN) is a serious and often highly persistent psychiatric disorder, whereby sufferers struggle to maintain a healthy weight. According to the Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-5), the diagnostic criteria for AN are as follows:

- a. the restricting of energy intake to a level lower than required in order to maintain a healthy body weight resulting in significantly low body weight relevant to a person's age, gender, development stage and physical health
- b. an extreme fear of weight gain or fatness, or continued attempts to interfere with weight gain

- c. disturbances to one's view of their body, e.g., the body being an unusually high basis for self-evaluation or an inability to recognise the seriousness of the low body weight [1].

It should be noted, here, the significant changes to the diagnostic criteria presented in the DSM-5 compared to the previous edition. These are revised guidelines for determining weight loss severity, revised weight loss criterion (specifying the significance of weight in relation to differences in individuals' age, gender, developmental stage or physical health), the omission of amenorrhoea and the absence of the need for the explicit verbalisation of fear of weight gain, so long as behaviours intentionally inhibiting weight gain are evident [1, 2]. Consistent with the DSM-5, AN can be divided into two subtypes, restricting and binge-eating/purging. A sufferer with restricting subtype predominantly uses dieting, fasting and/or excessive exercise to achieve a low body weight, with the absence of any recurrent bingeing or purging behaviours in the 3 months before diagnosis. Bingeing and purging behaviours include self-induced vomiting and/or laxative, diuretic or enema abuse. The binge-eating/purging subtype is characterised by repeated displays of such behaviours in the 3 months before diagnosis [1].

Anorexia can affect any individual, irrelevant of their age, gender, race or ethnicity, however it has been found to be most common in adolescent and young females [3]. Whilst some research has found a higher prevalence of AN in white adults, these findings are quite inconsistent, with others indicating no significant differences in rates of AN for different ethnicities [4]. Anorexia is highly comorbid, with significant numbers of sufferers reporting diagnoses of other psychiatric illnesses such as substance use disorders, personality disorders, anxiety disorders, mood disorders, obsessive-compulsive disorders and autism spectrum disorders [3, 5, 6], as well as an increased suicide risk [7]. Additionally, many negative physical consequences and health complications are associated with anorexia, including cardiovascular, gastrointestinal, endocrine and metabolic, pulmonary and dermatologic complications. Almost all of the body's organ systems can be negatively impacted as a result of malnutrition or other behaviours associated with AN (e.g., purging), and despite varying outcomes, anorexia is often extremely persistent, has a relatively high risk of relapse, and the highest mortality rate among psychiatric disorders [7].

2. Predisposing, precipitating and perpetuating factors of AN

A functional analysis of anorexia by Slade [8] describes "antecedent events", divided into "general setting conditions" and "specific psychosocial stimuli", that cause changes in an individual's behaviour/biological adaptation, the consequences of which lead to anorexia. Setting conditions such as low self-esteem, issues during development or perfectionistic tendencies, combine with specific psychosocial stimuli such as comments from others about weight or learnt dieting behaviour and trigger initial food restricting behaviour, indicating the first step towards an eating disorder. Changes in behaviour/biological adaptation are shown in response to these events, specifically restricting food intake and weight loss, and endocrine disturbances that may result in amenorrhoea in females, either due to the effects of low weight or due to a stress induced functional disorder. Slade then describes "consequences" of these behaviours in the form of positive reinforcers, feelings of control, success etc., and negative reinforcers, avoiding weight gain, or changes in body shape. These limited "antecedent events," "specific psychosocial stimuli" and "consequences" discussed by Slade are now commonly referred to as predisposing,

precipitating and perpetuating factors and cover a wide range of potential contributory factors to the development, onset and maintenance of anorexia.

It is now widely accepted that anorexia is developed, triggered and maintained by a combination of many different biological, psychological and social factors [9] with various models theorising the involvement of different core factors to different extents [10, 11]. Separating factors into those that predispose a person to anorexia and those that perpetuate the illness is crucial for identifying which are relevant for preventative strategies (i.e., predisposing or risk factors) and which are relevant to treatment and interventions (perpetuating or maintaining factors) [12]. It is also important to note that there is some overlap between factors as they converge and combine to increase risk of anorexia, for example some predisposing factors may also act as perpetuating factors. Additionally, some factors do not work independently and may be closely linked or impact upon each other, for example a social factor might serve to reinforce an existing psychological factor [11]. **Table 1** gives a summary of the predisposing, precipitating and perpetuating factors for anorexia and demonstrates how they can be categorised into psychological, biological and socio-cultural factors.

Many theories and models of anorexia nervosa consider there to be a vital role for psychological factors in predisposing an individual to the disorder, such as personality and cognitive variables [13]. Literature frequently discusses personality characteristics that are thought to be common among individuals with anorexia including: traits associated with anxiety and depression, obsessive–compulsive traits such as rigidity and concern with detail, perfectionism, being high achieving, socially withdrawn, sensitive and introverted. These characteristics combine with other risk factors and increase an individual's vulnerability to the illness [14, 15]. In addition to personality characteristics, combinations of experiences and events lead to the creation of various distorted cognitions, creating vulnerability in an individual for developing anorexia, for example beliefs about the importance of thinness and the need to feel in control, or a cognitive bias towards food, eating, weight or body shape information processing. Fairburn et al.'s [16] cognitive behavioural theory focuses on the need for control as a central feature of anorexia and suggests that a combination of existing feelings of ineffectiveness, perfectionistic tendencies and low self-esteem underpin this need for control. Other predisposing cognitive factors for anorexia include difficulties switching between tasks (set shifting) and a preference for 'detail-focused' thinking rather than 'bigger picture' thinking (poor central coherence) [9]. Biological models highlight a number of genetic predispositions and neurobiological factors involved in the development of anorexia [14], such as malfunctions of particular neurotransmitters that may increase risk of anorexia by altering appetite regulation and increasing locomotor activity levels, or specific inherited genes that may be responsible for altered mechanisms involved in energy metabolism or appetite and feeding regulation. For a full review see [17]. Sociocultural influences might also predispose an individual to anorexia, for example insecure attachment types as a child or stressful or traumatic life events can result in interpersonal issues and emotional avoidance, common in those with anorexia [14, 18, 19].

With existing predisposing factors in place, the onset of the illness may be triggered by one or more precipitating factors [14] such as periods of isolation or self-doubt, interpersonal conflict, existing loss or trauma, culture among particular occupations, e.g., ballet dancers, models or athletes, disrupted family dynamics and peer influence, for example dieting behaviour, teasing or body dissatisfaction. Additionally, biological factors like pregnancy [20–22] or weight loss [23] may influence eating disorder symptomology, psychopathology or behaviours.

	Predisposing factors	Precipitating factors	Perpetuating factors
Psychological factors	<ul style="list-style-type: none"> • Personality traits (e.g., anxiousness, concern with detail, perfectionism, high achieving) • Distorted cognitions, e.g., regarding need for control • Cognitive bias towards food, eating, weight etc. • Cognitive inflexibility 	<ul style="list-style-type: none"> • Direct reinforcement that restricting food intake = control • Salient eating behaviours in the family shifting need for control to focus on food • Threat to self-control • Negative psychological states, e.g., isolation, self-doubt • Developmental crisis, e.g., fearing puberty/independence 	<ul style="list-style-type: none"> • Association of self-control with self-worth • High standards and perfectionism applied to restriction of food intake • Effects of starvation threaten self-control and strengthen value of controlling food, e.g., preoccupation with food, poor concentration • Emotions less salient/numbed – belief that anorexia can manage adverse emotional states • Mood intolerance • Anxiety • Personality traits, e.g., perfectionism, high achieving, fear of making mistakes • Low self-esteem • Distorted cognitive beliefs, e.g., about benefits of anorexia • Impaired cognitive functioning, e.g., weak central coherence, poor set-shifting ability
Biological factors	<ul style="list-style-type: none"> • Inherited malfunctions to neurotransmitters involved in appetite regulation or locomotor activity levels • Genetic predisposition for altered energy metabolism or appetite and feeding regulation • Pre-natal stress exposure 	<ul style="list-style-type: none"> • Weight loss • Pregnancy 	<ul style="list-style-type: none"> • Altered physiological processes cause cognitive and psychological disturbances • Changes to hormone levels and digestive system due to malnourishment • Changes to serotonin/dopamine systems
Social factors	<ul style="list-style-type: none"> • Learnt beliefs/adopted values about importance of weight/shape • Insecure attachment types • Stressful/traumatic life events, e.g., abuse, disrupted family dynamics 	<ul style="list-style-type: none"> • Interpersonal conflict • Loss or trauma • Occupational cultures, e.g., ballet dancers, models, athletes • Disrupted family dynamics • Peer influence, e.g., dieting, teasing, body dissatisfaction 	<ul style="list-style-type: none"> • Difficult family dynamics/family conflicts • Concern from close others/enabling behaviours • Lack of family coping strategies • Societal ideals for thinness • Extreme concern/overvalued importance of weight/shape • Comments from others boosts confidence/gives attention • Body dissatisfaction

Table 1. Summary of predisposing, precipitating and perpetuating factors in AN.

It has been suggested that the most useful models for understanding the illness in terms of advancing treatment are maintenance models, focusing more specifically on factors that maintain the illness rather than those involved in the development of it [19, 24], though there is often a lot of overlap with some factors acting not only as perpetuating factors but also precipitating or predisposing ones. Many models of AN discuss psychological factors that perpetuate anorexia, either internally (self-perpetuating factors) or externally. Fairburn et al.'s [16] cognitive behavioural theory proposes a number of psychological maintaining factors. Fairburn et al. posit that achieving successful dietary restriction creates a sense of self-control in an individual, in turn improving their self-worth until restriction becomes an indication of both self-control and self-worth. This may be exacerbated by a highly perfectionist individual applying their high standards to restriction in the form of strict dietary rules. A second maintaining factor suggested in the theory is the direct effect of starvation on cognition. Intense feelings of hunger, exaggerated feelings of fullness, poorer concentration and preoccupation with food may cause an individual to feel their self-control is threatened or failing and strengthen the value that controlling food holds on the individual's self-control and self-worth. Finally, Fairburn et al. suggest extreme concerns about weight or shape is involved in perpetuating the illness, whereby an individual evaluates their self-worth highly on their weight and shape. This may be exacerbated by body checking behaviours, particularly when an individual is in an aroused and anxious state, which serves to enhance the individual's perceived imperfections regarding their body shape, encouraging further restricting and creating a vicious cycle. As a consequence of starvation, many of the aforementioned maintaining factors are worsened, facilitating the formation of vicious cycles that allow these maintaining factors and the illness to persist [15]. Further psychological, biological and social perpetuating factors are listed in **Table 1**.

3. History of treatment for AN

Historically, treatment for AN relied heavily on antipsychotic medication up until the second half of the 1990s when the shift towards a more complex approach to treatment began, taking into account an individual's biological and developmental factors and involving individual psychotherapy [25]. Advancements were made following this shift such as the introduction of cognitive and behavioural treatments. For example, an operant conditioning technique used from the mid-1960s involved the delivery of positive (e.g., more freedom) or negative reinforcers (e.g., bed rest) in response to desired behaviour (e.g., completing a meal). Despite being deemed effective at the time, questions surrounding its durability and wider impact (not just on weight), along with concerns about its coercive and controlling nature and lack of regard for other maintaining factors of the illness, dispute the claim of its superiority to other existing approaches for intervention [26].

A number of the cognitive techniques used at the time resemble a more basic and general version of cognitive therapy still used in present times [27], originating from the work of Bruch [28]. Bruch argued that psychotherapy to treat anorexia should be aimed at addressing the distorted thinking patterns and flawed core beliefs/assumptions that the sufferer holds, acquired as a result of their experiences during development. This might be accomplished using cognitive techniques such as *decentering* (adopting a less egocentric perspective for example by asking oneself 'do I notice this as much in others as I do in myself?') or *decatastrophising* (encouraging patients to imagine right through to the end of a feared situation to gauge the realistic likelihood of an event occurring and how bad it will be, rather

than assuming the worst and catastrophising immediately) [29]. After further refining of Bruch's (1973) ideas, a cognitive-behavioural approach to treatment for AN based on Beck's cognitive model of depression was developed by Garner and Bemis [16, 29, 30], which involved a mixture of cognitive techniques like those mentioned, along with behavioural techniques such as "scheduling pleasant events" (to help establish other reinforcers for pleasure other than those driving the eating disorder) and "behavioural rehearsal" (e.g., role playing scary events to they can be better coped with) [30]. Other research around this time emphasised the importance of therapy that addresses the need for control [8]. Garner et al.'s [31] model of cognitive-behavioural therapy for anorexia became the leading approach of its time and involved addressing core maintaining mechanisms such as low weight, the use of weight and shape as means of achieving self-control/self-worth and body checking, as well as other issues such as low self-esteem, poor emotion recognition and expression, disruptions in the family and interpersonal difficulties [16]. Following this, and with more recent research and models highlighting the importance of other maintaining factors for the illness, cognitive-behavioural therapy (CBT) for anorexia was further adapted and developed to become more focused on the central mechanisms involved in the maintenance of the disorder, with the suggestion that other issues only be targeted by treatment if they are preventative of change [16, 32], allowing a more person-centred treatment [9].

Family therapy for the treatment of eating disorders was introduced in the 1970s following changes to the accepted general beliefs and assumptions of the role family processes play in the development and maintenance of anorexia [25, 33]. For example, Minuchin et al.'s [34] psychosomatic family model argues that family processes involving rigidity, over-involvement and conflict avoidance, along with existing psychological vulnerability in the individual, underpin the development of anorexia, and therapy should therefore involve the family to work towards changing the family dynamic. Until this time, families were generally considered to hinder treatment and so patients were treated in isolation from their parents [35]. Other associations between eating disorders and family dynamics have since been examined suggesting specific areas where families have an impact, such as attachment, parenting style, communication orientation or family conflict [18, 36, 37], though more recent models hold in mind that no blame should be attributed to the family, rather treatment works with the family [33].

By the end of the twentieth century AN was rarely treated with medication alone, instead using a multifaceted approach involving both medication and psychological intervention to better suit the individual [25].

4. Evidence-based psychological treatment for AN

The current recommended treatment for AN is guided by The National Institute for Health Care and Excellence (NICE) guidelines and aims to improve care for sufferers of anorexia by providing details of what are considered to be the most effective interventions for AN in both adults, children and young people, and allowing for an individualized and integrated approach to be adopted. According to the guidelines, treatment for anorexia should involve one or more psychological therapy, along with additional support including psychoeducation about the illness, monitoring of mental and physical health including weight and risk factors, family/carer involvement and a multidisciplinary team approach from health-care professionals. The recommended psychological interventions differ for adults and children and young people as indicated below [38]. See **Table 2** for a brief summary of the psychological therapies for AN in adults and adolescents.

Psychological treatments	Evidence from clinical studies	Evidence from RCTs	Recommended in NICE guidelines
Established treatments			
<i>Psychological treatments for AN in adults</i>			
Eating-disorder-focused cognitive behavioural therapy (CBT-ED)	+	+	<input checked="" type="checkbox"/>
Maudsley Anorexia Nervosa Treatment for Adults (MANTRA)	+	+	<input checked="" type="checkbox"/>
Specialist supportive clinical management (SSCM)	+	+	<input checked="" type="checkbox"/>
Eating-disorder-focused focal psychodynamic therapy (FPT)	+	+	<input checked="" type="checkbox"/>
<i>Psychological treatments for AN in children and young people</i>			
Anorexia-nervosa-focused family therapy (FT-AN)	+	+	<input checked="" type="checkbox"/>
Eating-disorder-focused cognitive behavioural therapy (CBT-ED)	-/+	-/+	<input checked="" type="checkbox"/>
Adolescent-focused psychotherapy for anorexia nervosa (AFP-AN)	-/+	N/A	<input checked="" type="checkbox"/>
Novel treatments			
<i>Psychological treatments for AN in adults</i>			
Cognitive Remediation Therapy (CRT)	+	-/+	<input type="checkbox"/>
Cognitive Remediation and Emotion Skills Training (CREST)	-/+	N/A	<input type="checkbox"/>

Abbreviations: Not tested (N/A), negative study results (-), positive study result (+), inconsistent or limited results (-/+), recommended in the NICE guidelines (☑), not mentioned in the NICE guidelines (☐).

Table 2. Psychological therapies for AN in adults and adolescents: Evidence from clinical studies (including feasibility studies and non-randomised trials) and randomised controlled trials (RCTs) and whether they are recommended by the NICE guidelines.

4.1 Psychotherapies for AN in adults

The NICE guidelines recommend four major evidence-based psychological interventions for the treatment of AN in adults. These are: individual eating-disorder-focused cognitive behavioural therapy (CBT-ED), Maudsley Anorexia Nervosa Treatment for Adults (MANTRA), specialist supportive clinical management (SSCM) and eating-disorder-focused focal psychodynamic therapy (FPT). The guidelines recommend beginning with the first three mentioned therapies and, if found to be unsuitable or ineffective, then considering FPT [38].

4.1.1 Eating-disorder-focused cognitive behavioural therapy (CBT-ED)

CBT-ED is delivered on an individual basis, consisting of 20–40 sessions over 20 weeks, depending on the version used. An enhanced version of CBT is most commonly used (CBT-E) which originated from CBT for bulimia nervosa (CBT-BN), though as a “transdiagnostic” treatment can be used to treat a broad range of eating disorders including anorexia. It has two versions, a focused version which is shorter and just involves the core treatment, and a broad version which addresses further

maintaining mechanisms, such as perfectionism, low self-esteem or interpersonal difficulties, in addition to the core treatment. CBT-E aims to alter faulty cognitions by focusing on behavioural changes and monitoring the effects and implications of behaviours that reinforce the eating disorder [38, 39].

CBT-E is delivered in four main stages, the first of which aims to encourage the patient to engage with treatment, identify the processes that are maintaining the individual's illness, provide psychoeducation and introduce two essential elements of the therapy: weighing and regular eating. Stage two is a chance for the patient and therapist to review progress so far and plan for stage three, the main body of treatment. This main stage is tailored to the individual and targets the patient's own maintaining processes. These processes generally fall under six core headings: the over-evaluation of shape and weight, the over-evaluation of control over eating, dietary restraint, dietary restriction, being underweight and event- or mood-triggered changes in eating. If the patient has additional factors that are creating a barrier to change, e.g., high perfectionism, core low self-esteem or pronounced interpersonal problems, the broad form of therapy might be used and these additional maintaining mechanisms are addressed more specifically. Mood intolerance was originally included as an additional mechanism to be addressed in the broad form of therapy however is now included in the core treatment. Finally, stage four is in place to ensure changes are maintained following treatment ending and to minimise the risk of relapse [40].

A review of treatments for adults with anorexia concludes that there is a moderate evidence base for CBT-E for adults, with evidence suggesting that it produces a moderate and lasting beneficial effect. This is an improvement on the older version of CBT which was found to have weak evidence base and only a slight beneficial effect [9]. Another review found a large effect of CBT-E on EDE-Q (Eating Disorder Examination Questionnaire—indicating eating disorder psychopathology) outcomes specifically for AN [41]. Generally, studies show that CBT-E produces good outcomes regarding increases in BMI and decreases in eating disorder psychopathology and conclude that it is an effective and viable treatment option for anorexia. However, there does not yet appear to be any consistent convincing evidence to suggest it is superior to comparable psychotherapies [42–50]. There is some evidence to suggest that CBT-E may be feasible to deliver in a group setting for patients with eating disorders, including those with anorexia, without losing the desired positive outcomes regarding weight gain and reduction in eating disorder psychopathology [51], however sample sizes are small and so this requires further examining.

Despite its apparent success in the treatment of other eating disorders such as bulimia or binge eating disorder, and theoretical suitability for treating anorexia, there is less evidence to support its success in those with anorexia [49, 52]. It has been suggested that a combination of the malnourished brain, as a result of extremely low weight, and the ego-syntonic nature of anorexia makes motivation to engage with treatment low and the challenging of distorted cognitions even more difficult and distressing for the individual [52, 53].

4.1.2 Maudsley anorexia nervosa treatment for adults (MANTRA)

MANTRA is a flexible treatment based around a patient workbook and delivered over 10–20 sessions depending on the complexity of the patient's problems [38]. It is based on Schmidt and Treasure's [24] cognitive-interpersonal maintenance model and aims to target the maintaining factors of anorexia, for example unhelpful thinking styles, including rigidity, perfectionism and obsessive-compulsive traits, faulty cognition and beliefs, e.g., the benefits of AN, emotion avoidance and

responses from others that do not support recovery such as criticism or enabling of behaviours [15, 54]. MANTRA is taught in modules that address various aspects of the patient's life and recovery, for example nutrition, identity, cognitive styles or interpersonal relationships. It can be individualised once the core module of case formulation is complete by emphasising the optional modules to a greater or lesser extent depending on how ready or motivated the individual is, and by tailoring the therapy to match an individual's clinical symptoms, personality and neuropsychological traits. It is specifically designed for anorexia treatment and is tailored to suit the common temperamental traits associated with the illness, delivered using elements of motivational interviewing and CBT [9, 55].

In a number of RCTs comparing treatment for anorexia, MANTRA was found to have positive outcomes regarding BMI and eating disorder psychopathology though was not statistically significantly different in comparison with CBT-E or SSCM. However, MANTRA was more favourably rated by patients and resulted in increasing weight even in severely unwell patients [44, 54, 55]. A review of evidence from RCTs comparing treatments for anorexia concluded that MANTRA has a moderate evidence base which shows that it produces a moderate and lasting beneficial effect [9].

4.1.3 Specialist supportive clinical management (SSCM)

SSCM was developed as a standardised outpatient treatment to help support individuals with anorexia through education, advice, therapeutic guidance and reassurance [56, 57]. It is delivered in an outpatient setting as weekly sessions for 20 or more weeks depending on the severity of the individual's illness. The treatment aims to support the patient in gradually normalising their eating behaviour and gaining weight through physical health monitoring, clinical management and therapeutic content. This includes psychoeducation, nutritional advice and support in setting goals and understanding the link between their symptoms and abnormal eating behaviour [9, 38].

Evidence from RCTs suggests SSCM to be at least comparable to CBT and IPT regarding improved outcomes and global anorexia rating [56, 58]. Compared to MANTRA, SSCM seems to perform equally well overall, however in the treatment of particularly severely ill patients SSCM is slightly less successful in producing longer-term weight gain than MANTRA. There is the suggestion that SSCM might produce quicker responses to treatment and be best used for patients with less severe cases of anorexia who have higher motivation for treatment [54, 55, 58]. Still, other findings show no significant differences in outcome regarding BMI, eating disorder psychopathology or general psychopathology between SSCM, MANTRA and CBT-E [44]. Despite some mixed findings, a review of evidence from RCTs comparing treatments for anorexia concluded that SSCM has a moderate evidence based that demonstrates its moderate beneficial effect [9].

4.1.4 Eating-disorder-focused focal psychodynamic therapy (FPT)

Designed as an outpatient treatment, FPT is a person-centred treatment whereby an individualised hypothesis is created regarding how the person experiences their own symptoms. The patient's relevant central psychodynamic features are identified by the therapist using a standardised interview tool. Treatment is then delivered in three rough phases, the first of which centres around building a good therapeutic relationship, self-esteem, pro-AN beliefs and the ego-syntonic nature of anorexia. The second phase is focused on the link between interpersonal relationships and eating disorder behaviours, and the

third attends to the transfer from treatment to real life and preparing the patient for the end of treatment [9, 43, 59].

Although being an effective treatment in terms of weight gain, when compared to other specialist psychological treatments (family therapy and cognitive analytical therapy), FPT does not appear to be superior [60]. Additionally, FPT has shown no greater success than CBT-E and TAU regarding weight gain or reduction in anorexic psychopathology after treatment, though at 12-month follow up has shown significantly higher recovery rates than TAU as measured by global outcome (a combination of BMI and eating disorder psychopathology) [43].

One review of treatment for anorexia conclude there is a moderate evidence base for the treatment, and a moderate and lasting beneficial treatment effect of FPT for adults with anorexia [9]. There is the suggestion from existing eating disorder literature that due to the interpersonal element in psychodynamic interventions, they may need a longer timeframe for their positive effects to be exhibited [58]. In light of this, and due to a large part of FPT being focused on interpersonal relationships, there is the possibility that its strength lies in better long-term results [43].

4.2 Psychological treatment for AN in children and young people

For treating anorexia in children and young people, the NICE guidelines recommend one of the following: anorexia-nervosa-focused family therapy (FT-AN), CBT-ED or adolescent-focused psychotherapy for anorexia nervosa (AFP-AN). It is recommended that FT-AN is considered first, with CBT-ED or AFP-AN being considered if FT-AN is unacceptable, ill-advised or ineffective for the individual [38].

4.2.1 Anorexia-nervosa-focused family therapy (FT-AN)

FT-AN (or family-based therapy; FBT) is typically delivered in 10–20 sessions over 6 months to a year and is structured in three rough phases. FBT has a behavioural focus, whereby the family is encouraged to take some control and support the patient with weight restoration, making healthy diet decisions and gaining autonomy around eating. Despite an emphasis on the role that an individual's family has in their recovery, care should be taken to ensure no blame is attributed to either the patient or their family. The family should be encouraged to temporarily be part of helping the individual to manage their eating. The first phase of treatment is centred on the forming of therapeutic relationships between the therapist, patient and family members, weight restoration and a return to a more physically healthy state. The next phase involves supporting the patient to gradually acquire some autonomy that is appropriate for their age and development, for example portioning their own meals under the supervision of a parent or carer. Finally, phase three aims to identify any anticipated developmental challenges for the young person and how to manage them and establish plans following termination of treatment or in case of relapse [38, 61]. Family therapy is thought to be particularly useful for treating adolescents with the illness as it is during this time that individuals are going through critical development times that are often taking place in a home environment among family [62].

Reviews of FBT have summarised studies comparing different formats of FBT, and different types of family therapy to FBT [33, 61], finding no significant differences between the various formats and types. For example, comparing conjoint therapy (for family and patient together) to separate therapy (patient and family seen separately), studies have found no significant differences in outcomes [63, 64]. Additionally, a comparison of FBT of different lengths found no significant differences between short- and long-term FBT at end of treatment and 4-year

follow-up [65]. Comparisons of FBT with different types of family therapy, for example systemic family therapy, which is concerned more with the family system and issues surrounding relationships, interactions and dynamics [66], reveal no significant differences in terms of primary outcome, though FBT did produce more rapid weight gain and less incidents of hospitalisation for those assigned to it. Several reviews conclude that no one format for content/delivery of FT-AN has consistently been significantly more successful than another [50, 62, 67].

An expanding pool of evidence exists that supports the use of FBT as the primary intervention for treating children and young people with anorexia [9, 68] however there is still limited evidence to suggest FBT is consistently superior to other psychological treatments or treatment as usual [33]. Despite much of the research on anorexia treatment for adolescents focusing on FT-AN, a lack of high-quality studies comparing FT-AN to individual treatments means it cannot reliably be deemed superior [69]. Other reviews have concluded that FBT is no more successful in addressing anorexic psychopathology than other psychotherapies [70] and highlight the issue that it is not necessarily successful for all adolescents, for example for families with single or separated parents, or where the young person has high levels of obsessive-compulsive traits [61, 71].

4.2.2 Eating-disorder-focused cognitive behavioural therapy (CBT-ED)

Although designed as a treatment for adults, CBT-E for eating disorders can be adapted to be suitable for treating young people several ways. For example, many young people live at home in a family unit where they might become dependent on a parent or carer, therefore treatment should be delivered in such a way that encourages and facilitates the young person to take some responsibility and develop independence so that a return to normal adolescent development can be made following treatment. Due to the family involvement that is common and expected among young people living at home, care should also be taken to ensure the best use of the family's involvement, without the patient perceiving this as over-involvement and threatening their autonomy. Motivation for treatment is often quite low in younger patients making it important to incorporate strategies to engage the patient with the therapy. The therapy itself is delivered in largely the same way for children and adolescents as it is for adults, though minor adaptations may be made to ensure it is suitable and meets the additional needs of young people [72].

Studies show some promise from CBT-E regarding weight gain and reduced eating disorder and general psychopathology among adolescents with anorexia which lasted at follow up [73–75], and suggest that CBT-E may be even more successful in adolescents than adults [76]. Despite this, one study review concluded that there is a weak to moderate evidence base for CBT for young people with eating disorders, with inconsistent results regarding effects of treatment for CBT and only slightly beneficial effects for CBT-E [9].

4.2.3 Adolescent-focused psychotherapy for anorexia nervosa (AFP-AN)

AFP-AN (previously named ego-oriented individual therapy before being manualised) [77] is delivered primarily through up to around 40 individual sessions with the individual, with an additional 8–12 sessions involving the patient's family or carer(s) to support the individual work. Treatment begins more intensively, with regular sessions aiming to allow the therapist to establish a strong therapeutic relationship with the patient, as well as build the patient's motivation for behaviour change. The aim of AFP-AN is to facilitate independence and self-efficacy around eating behaviour through sessions focusing on the link between the person's eating

disorder and their self-image, emotion processing and regulation, and interpersonal processes. This helps the individual develop an understanding of how their self-concept perpetuates the illness and how they use their anorexia as a coping strategy. Unlike CBT, however, AFP is more concerned with employing strategies to challenge underlying psychological or developmental deficits rather than issues directly associated with food, weight or shape, for example. AFP supports the individual to manage fears surrounding weight gain and find alternative ways to cope with stress or adverse emotions, as well as providing psychoeducation about the consequences of malnourishment and the importance of nutrition and weight gain. As treatment is in its final stage, the emphasis is on applying the skills and knowledge acquired from treatment in real life situations [38, 71, 77, 78].

AFP was found to match FBT in terms of treatment completion and outcome in a clinical trial comparing the two [78]. However, at follow-up AFP was found to be statistically inferior to FBT regarding outcome, suggested to be due to fewer instances of full-remission threshold being met following treatment, as well as higher relapse rates, in individuals who completed AFP. One trial also found that AFP was less successful in treating patients with severe eating disorder psychopathology than FBT [79].

4.3 Conclusion

Though there appears to be some success for psychotherapies, still it is proving difficult to achieve consistently good outcomes with the treatments that are currently available for anorexia, particularly in adults [44]. Additionally, there is a consensus that despite a growing evidence-base for treatments for anorexia and a preference for psychotherapy as treatment, there still remains no established leading treatment [9, 80]. A number of treatment reviews conclude that among a variety of psychotherapies, including the aforementioned treatments recommended by the NICE guidelines, there is no convincing evidence to suggest one consistently superior intervention for treating adults, children or adolescents with anorexia nervosa [44, 50, 69, 81]. This is largely due to the difficulty of trialling treatments for anorexia because of difficulty recruiting participants, high rates of patient drop-out or non-adherence to treatment and withdrawal from clinicians as a result of risk not being stabilised [50]. Still, psychotherapies that include the family seem to be more promising and tentatively deemed most appropriate and preferred in the treatment of children and adolescents with anorexia [81].

5. Novel adjunct psychological treatments for AN

In addition to the aforementioned NICE recommended treatments, a number of novel adjunct treatments are being used and explored, generally in addition to other more established intensive psychotherapies [82]. The two adjunct psychological interventions are relatively new, though a growing evidence base for them is emerging. **Table 2** gives a brief indication of the current climate regarding the literature for the two following treatments.

5.1 Cognitive remediation therapy (CRT)

CRT was originally developed to be used for the rehabilitation of individuals with various neuropsychological issues, however has since been adapted to address the common problem of cognitive inflexibility (i.e., poor set shifting—inability to move flexibly between different tasks or stimuli—and weak central

coherence—inability to process information as a whole leading to a focus on details) among individuals with anorexia. The therapy aims to encourage switching between tasks, multitasking and bigger picture thinking to break inflexible thinking patterns and habits through the practice of simple tasks and mental exercises. After practicing these tasks, patients are encouraged to reflect on what cognitive style they have used to complete the task, explore how this may be helpful or unhelpful in day-to-day life and learn new strategies to help make small positive behavioural changes. CRT can be delivered either on a 1:1 basis typically over 10 45-min sessions, or as a briefer format in a group setting over 5 or 6 sessions. It can be used with adults or children and adolescents and is suitable even for patients with very low BMI, unlike most talking therapies, allowing them to engage in psychological work early on in treatment [83–85].

Based on evidence from randomised treatment trials, CRT reduces drop-out rates, with a 10–20% drop-out rate reported across these studies, suggesting that CRT can be a useful step to begin patient engagement with psychological interventions. In addition to low drop-out rates, qualitative feedback about CRT from both patients and therapists is very positive [86–88]. There is evidence from several RCTs that CRT improves performance and subjective evaluation of cognitive processes. This general improvement in cognition supports better general functioning [84, 85]. Available research across the lifespan suggests CRT can be used as an adjunct therapy to engage patients, improve cognitive processes and prepare grounds for further psychological work. However, CRT is not a stand-alone treatment for eating disorders, does not directly target weight change and, as such, is not included in the NICE guidelines.

5.2 Cognitive remediation and emotion skills training (CREST)

CREST is an intervention developed to address problems with identifying, managing and expressing emotions among individuals with anorexia nervosa. Like CRT, it is an intervention that can be offered early on in treatment when patients may not be able to use more complex psychological therapies. CREST is generally delivered over 8–10 sessions. Typically, if a patient has previously had CRT, they are offered eight individual sessions of CREST. If patients have not had any experience of CRT, they will first have two sessions focused on thinking styles, followed by eight sessions involving the psychoeducation and experiential elements of CREST [89].

The main evidence for CREST comes from qualitative and quantitative evaluation of the case series in individual (8–10 sessions) and group format (5–6 sessions). Whilst the majority of studies available examine the efficacy of CREST for adults, showing some promise, more recently there have been some studies published investigating CREST for adolescents with anorexia and findings suggest that it may also be suitable for this patient group [90]. At the present time, the efficacy of CREST in individual and group formats is still being examined. Detailed studies using qualitative data and self-report questionnaires offer positive feedback and show promise; however, more studies with RCT methodology are required to endorse this.

6. Discussion

The current chapter has given a brief introduction to the diagnosis of anorexia nervosa and a short history of its treatment. It has then described the current evidence-based psychological treatments for anorexia, as recommended by the NICE guidelines, and presented a summary of the literature regarding the efficacy

of these treatments. In addition to the standard treatment for anorexia, a number of more recently developed adjunct therapies are under examination. Two of these are described and again a summary of the literature investigating their efficacy is presented.

An alternative to psychotherapy alone for anorexia nervosa is to treat using combinations of treatment types and approaches. The following presents some of the current combinations under examination in the treatment of anorexia. Adapting treatment approach may be particularly important for treating individuals with comorbid diagnoses, which is discussed in this section, as well as some of the difficulties conducting studies that explore psychotherapy for anorexia, limitations of this chapter and future directions of the literature.

6.1 Combinations of medications and psychological therapy

One recognised potential treatment alternative to psychotherapy alone is the use of oxytocin, a hormone and neuropeptide that is involved in the modulation of a number of functions including eating behaviour and food consumption, emotional reactivity, stress and anxiety, trust and social interactions and bond formation [82, 91]. Evidence from reviews of the literature suggest that the oxytocin system becomes disrupted in individuals with anorexia, affecting oxytocin levels in response to stimulation or after a meal, among other things, that may return to “normal” following recovery [92]. If this is the case, there is the potential for oxytocin administration to be beneficial for treating anorexia. On the contrary, findings from RCTs show no significant weight gain following oxytocin administration in people with anorexia, however do propose that it may reduce the stress response in anticipation of food [91, 93]. Alternatively, oxytocin might impact some of the maintaining factors of anorexia, such as attachment and interpersonal issues or aspects of social cognition, e.g., emotion recognition [94–96]. With the suggestion that difficulties with emotional processing contribute to less effectivity from cognitive therapy [97], the addition of oxytocin to such psychotherapies may be beneficial, however findings on this remain inconclusive [94, 98, 99].

D-cycloserine is another drug that is suggested to show some promise in augmenting psychological treatment for anorexia [100]. For example, d-cycloserine is suggested to enhance CBT, by contributing to the consolidation of therapeutic learning from the treatment, and exposure therapy, by strengthening the mechanisms involved in fear extinction [101]. However, the results of one trial did not support this, finding that administering d-cycloserine to individuals with anorexia led to no significant differences in outcome measures following four exposure-therapy based training meals, though it was noted that the lack of effect may be due to the small sample size used [102]. On the other hand, a later RCT found that the administration of d-cycloserine with exposure therapy for individuals with anorexia led to significantly greater increases in BMI following treatment compared to placebo [103]. Still, there is certainly a need for a better understanding of the effect of combinations of medications and psychotherapies and it is clear that many more trials are required to investigate the impact of drugs such as oxytocin and d-cycloserine on treatment for anorexia [103, 104].

6.2 Combinations of occupational therapy (OT) and psychological therapy

Psychological treatment for anorexia nervosa should be part of a whole therapeutic programme including diet counselling, as well as weight and physical health monitoring, but may additionally offer occupational therapy (OT) and art therapy, typically led by occupational therapists [105]. OT is a profession which enables

engagement and performance [106]. It is a patient-centred health profession concerned with promoting health and well-being through occupation by enabling people to participate in activities they want to do, need to do and are expected to do [107]. Occupational therapists use psychotherapeutic skills and approaches and reflect on their relationship with the patients and families. They use approaches from psychodynamic therapy and DBT such as transference and countertransference. Occupational therapists use similar frames of reference to psychologists but through an activity-orientated approach in order to maximise the person's level of psychosocial functioning [108]. Eating disorders influence people's lives and the way they engage in meaningful occupations and OT can explore the meaning of new occupations which can emerge from the eating disorder. Through specific OT assessments using the Model of Human Occupation [109], OT can examine people's motivation, routine, habits, roles and skills in a range of areas such as self-care, leisure and productivity in order to promote a more adaptive occupational participation in daily activities. OT provides a unique opportunity to implement individual and group work provided in eating disorders services supporting plans made for the patients within the multidisciplinary team. OT works with the person within their social and physical environments using meaningful activities, which often support CBT and psychological changes in different areas of life. Providing occupationally focused interventions means that most goals can be addressed using everyday activities. Through OT interventions, people can learn to transfer their experience and skills from intervention to daily life. OT teams can receive psychotherapeutic supervision and are involved in handovers, meetings and ward rounds to feed information back to the multidisciplinary team, and thus contribute to or even lead the psychotherapeutic process by bringing a unique perspective of function to the team. Its contribution can be beneficial regarding improvements to self-awareness, self-esteem and greater independence [110]. For some patients, additional physiotherapy including strength training does also seem to be beneficial [111].

6.3 Psychological treatment for people with comorbidities

Autism spectrum disorder (ASD) is significantly overrepresented among individuals with eating disorders and a relatively common comorbidity of anorexia [112, 113]. Evidence suggests that this comorbidity is associated with more severe presentation, poorer illness outcomes and can hinder engagement with usual treatment, negatively impacting treatment outcome. This is perhaps due to some overlap in traits, e.g., poor flexibility, weak central coherence, emotional difficulties and poor introspection potentially exacerbating the maintaining factors of AN, such as rules and rigidity, which may be applied to food restriction or exercise, for example [6, 112, 114, 115]. There is the suggestion that cognitive remediation may be beneficial in the treatment of individuals high in traits like weak central coherence and poor flexibility, common to both ASD and AN [116]. As discussed, CRT and CREST are of interest in eating disorder literature and have attracted some attention regarding their use with individuals with both ASD and anorexia. Small trials and case studies indicate some potential and suitability for CRT and CREST in the treatment of AN, though further investigating is required regarding the efficacy of psychological treatment for anorexia in those with and without ASD traits, with the potential of adapting treatments to be more appropriate for use with individuals with both AN and ASD [115, 117, 118].

Also of a high comorbidity with anorexia are personality disorders (PD), with estimates of over 50% of individuals with eating disorders having comorbid diagnoses of PDs, most commonly borderline personality disorder (BPD), avoidant personality disorder (APD) and obsessive-compulsive personality disorder

(OCPD) [119]. There is the suggestion that a comorbid diagnosis of a PD with anorexia may lead to adverse implications regarding more chronic illness course, lower levels of functioning, higher rates of treatment termination and less positive outcomes. Such implications may be due to various influences of PD traits including increased self-harm/suicide risk, a lack of trust in the therapist interfering with therapy engagement, poor insight into own illness and exacerbated maintaining factors of anorexia like dysregulated emotion control [114, 119–121]. In light of this there appears to be a need for adapting the therapy approach used to better suit these individuals and their co-occurring symptoms [122], for example using adapted versions of alternative psychotherapies such as dialectical behavioural therapy (DBT) to treat individuals with comorbid diagnoses of anorexia and BPD [123, 124]. Likewise, similar dysfunctions in brain circuitry suggested to underlie both obsessive–compulsive personality traits and impairments to cognitive flexibility may explain some of the overlap in diagnoses of anorexia and OCPD and obsessive–compulsive disorder (OCD). Perhaps, then, therapies that target these cognitive maintaining factors of anorexia, such as CRT or CREST, could be most appropriate for treating individuals with comorbid diagnoses of OCPD or OCD and AN, though this merits further examination [125].

6.4 Difficulties conducting studies exploring psychotherapy for anorexia

Several factors make exploring the efficacy of psychotherapy for anorexia nervosa particularly difficult, leaving almost all treatment trials in the field inherently methodologically limited before they have even begun [50]. For example, the severity of the illness makes recruiting participants challenging and participant that are recruited are almost always female only samples, with very few studies investigating the efficacy of treatments for males or minority groups with anorexia [50, 126]. This leaves an absence of knowledge regarding the way males respond to treatment and the impact of culture, race, gender and sexuality on treatment, creating a large gap in the literature regarding the efficacy of treatments for males and minority groups with anorexia [81]. Additionally, drop-out rates are particularly high leading to small or incomplete data sets, or a lack of follow-up data. These issues create problems regarding cost, statistical power, interpretation and comparison of results, and potentially undermine research results, biasing estimates of treatment effects [50, 126]. One suggested explanation for the high drop-out rates is the role of personality. With PDs having relatively high comorbidity with anorexia, issues forming and maintaining interpersonal therapeutic relationships may be exacerbated due to the nature of the PD, making continued engagement in therapy difficult [119].

Despite the growing evidence base for psychotherapies for anorexia, another major issue that persists is the absence of untreated comparison groups or control groups altogether [69]. Due to the severity of the physical effects of anorexia, as well as its high mortality rate and often chronic course of development, it is unethical for patient groups to remain untreated or on waiting lists as a control group as part of a study. For this reason, it is only possible to evaluate the superiority of a treatment when compared to an alternative active treatment, often referred to as “treatment as usual” (TAU), rather than its real efficacy when compared to no treatment. However, this creates further methodological issues as TAU varies from study to study and so does not provide a common comparison group, meaning findings supporting a treatment’s superiority, or inferiority, to another still cannot be reliably compared [50, 69]. Likewise, with recovery rates varying due to different definitions of recovery, varying outcome measures and inconsistent follow-up lengths between studies, the problem of reliably comparing treatments

for anorexia is exacerbated [82]. Poor clarity of the “criteria” for recovery and measures of recovery being based on physical changes, such as weight gain, skews the apparent efficacy of treatment, sometimes ignoring the impact of the participants’ initial weights (some perhaps being much lower than others), as well as cognitive and behavioural changes that might indicate recovery leading to outcomes appearing more or less positive [69, 81]. For example, one systematic review found that family-based therapies yielded a very slight superiority regarding impact on weight outcome, but the same was not true for psychological outcomes [127]. Furthermore, a lack of independently replicated studies comparing treatments for anorexia contributes to the lack of reliable estimates of which treatments are most efficacious [69].

6.5 Limitations of chapter

Several limitations of this chapter should be noted. The chapter has summarised some of the literature relevant to psychological therapies for anorexia nervosa however is not a systematic review, therefore does not present *all* of the current research in the field. Additionally, the therapies discussed that make up the main section of the chapter are those recommended by the National Institute for Health and Care Excellence (NICE) who provide recommendations for health and care only in the UK [128]. Therefore these are not necessarily the first choice of treatment for other countries, though it does not go unrecognised that many other countries have developed practices and guidelines for treating eating disorders including anorexia. This is relevant as despite a consensus regarding the importance of psychotherapy in the treatment of anorexia across a number of countries’ guidelines, including several European countries, Australia, New Zealand and the US, there still remains some inconsistencies regarding the recommended first-line treatment, optimal intensity of treatment (i.e., inpatient, outpatient or day patient) for different stages of the illness and criteria for hospitalisation. Furthermore, many of the available studies evaluating the various therapies for anorexia come from highly Westernised, English speaking countries such as the UK, US, Australia and some of Europe, with few to none from places such as Africa, South America, Eastern Europe and Asia. This may impact heavily on the efficacy of different treatments and their formats, as well as treatment adherence, due to sociocultural influences such as family ties, cultural beliefs and values, parenting styles and education [81]. Thus, this chapter may be most helpful for colleagues who practice in the UK or for readers who are interested in the psychological treatment of AN in the UK, but our chapter does not provide a comprehensive worldwide view on the topic.

6.6 Future directions

There appears to still be a lot of progression required regarding treatment for anorexia nervosa and what is most effective, though looking to the future there are a number of suggestions under investigation. For example, identifying individuals who may not be suitable for conventional treatments, perhaps those with comorbidities, and adapting treatments in response to this may increase the number of patients that treatments are efficacious for. For example, systemic family therapy may be more beneficial than FBT for individuals with obsessive–compulsive traits [66], and an adapted version of DBT might be a more suitable and effective way of treating individuals with comorbid diagnoses of anorexia and PD [123, 124]. For individuals with a comorbid diagnosis of ASD, specific maintaining factors of AN, such as weak central coherence, poor flexibility and emotional difficulties, are often particularly apparent and problematic. Therefore, for these patients it may

that treatments that target these traits, e.g., CRT or CREST, could be most effective [116], particularly if modified to suit these individuals' needs [129]. Perhaps, then, the answer to this could be identifying patient subgroups that might respond particularly well (or not) to one treatment over another and tailoring treatment accordingly [69], though this is yet to be examined fully.

An additional consideration looking forward is that much of the current research is conducted in outpatient settings, omitting those most critically ill (who are most likely to be using inpatient services) from being participants and limiting the ability of researchers to evaluate the impact that different treatment settings have on the efficacy of psychological treatments, how successfully treatments translate to different levels of care and make recommendations regarding the best setting for treatment [50]. More intense treatment contexts such as inpatient or day-patient typically mean that patients live-in or spend up to around 10 h at the treatment location, which is significantly more therapeutic input than the typical 1 h per week of treatment offered to less chronically ill patients who access outpatient treatment [130]. Despite this, research indicates that evidence comparing inpatient and outpatient treatment shows there to be little or no differences regarding outcome between the two treatment settings and the majority of young people suffering with anorexia can be kept safe and managed well as outpatients, with high levels of patient satisfaction and significantly lower costs [131, 132]. Though the severity of some cases might mean that inpatient treatment is necessary to reduce immediate risk, research shows that a short inpatient stay followed by day-patient treatment was no less successful or safe than inpatient treatment [133], and extended hospital admissions might actually have adverse impacts on long-term recovery [134]. Considering such research, further investigation about effective settings for psychological treatment would be beneficial so that better informed decisions can be made regarding efficacy, safety, suitability for various age groups or stages of illness and cost effectiveness of treatment for anorexia in various settings.

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Conflict of interest

The authors declare no conflict of interest.

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References

- [1] American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (DSM-5). 5th ed. Washington: American Psychiatric Publishing; 2013
- [2] Attia E, Becker AE, Bryant-Waugh R, Hoek HW, Kreipe RE, Marcus MD, et al. Feeding and eating disorders in DSM-5. *The American Journal of Psychiatry*. 2013;**170**:1237-1239. DOI: 10.1176/appi.ajp.2013.13030326
- [3] Keski-Rahkonen A, Mustelin L. Epidemiology of eating disorders in Europe: Prevalence, incidence, comorbidity, course, consequences, and risk factors. *Current Opinion in Psychiatry*. 2016;**29**:340-345. DOI: 10.1097/YCO.0000000000000278
- [4] Cheng ZH, Perko VL, Fuller-Marashi L, Gau JM, Stice E. Ethnic differences in eating disorder prevalence, risk factors, and predictive effects of risk factors among young women. *Eating Behaviors*. 2019;**32**:23-30. DOI: 10.1016/j.eatbeh.2018.11.004
- [5] Himmerich H, Hotopf M, Shetty H, Schmidt U, Treasure J, Hayes RD, et al. Psychiatric comorbidity as a risk factor for mortality in people with anorexia nervosa. *European Archives of Psychiatry and Clinical Neuroscience*. 2019;**269**:351-359. DOI: 10.1007/s00406-018-0937-8
- [6] Westwood H, Tchanturia K. Autism spectrum disorder in anorexia nervosa: An updated literature review. *Current Psychiatry Reports*. 2017;**19**:1-10. DOI: 10.1007/s11920-017-0791-9
- [7] Treasure J, Duarte TA, Schmidt U. Eating disorders. *Lancet*. 2020;**395**:899-911. DOI: 10.1016/S0140-6736(20)30059-3
- [8] Slade P. Towards a functional analysis of anorexia nervosa and bulimia nervosa. *British Journal of Clinical Psychology*. 1982;**21**:167-179. DOI: 10.1111/j.2044-8260.1982.tb00549.x
- [9] Zipfel S, Giel KE, Bulik CM, Hay PH, Schmidt U. Anorexia nervosa: Aetiology, assessment, and treatment. *The Lancet Psychiatry*. 2015;**2**:1099-1111. DOI: 10.1016/S2215-0366(15)00356-9
- [10] Munro C, Randell L, Lawrie SM. An integrative bio-psycho-social theory of anorexia nervosa. *Clinical Psychology & Psychotherapy*. 2016;**24**:1-21. DOI: 10.1002/cpp.2047
- [11] Murray T. Wait not, want not: Factors contributing to the development of anorexia nervosa and bulimia nervosa. *The Family Journal*. 2003;**11**:276-280. DOI: 10.1177/1066480703252470
- [12] Stice E. Risk and maintenance factors for eating pathology: A meta-analytic review. *Psychological Bulletin*. 2002;**128**:825-848. DOI: 10.1037/0033-2909.128.5.825
- [13] Vitousek K, Manke F. Personality variables and disorders in anorexia nervosa and bulimia nervosa. *Journal of Abnormal Psychology*. 1994;**103**:137-147. DOI: 10.1037//0021-843x.103.1.137
- [14] Woerwag-Mehta S, Treasure J. Causes of anorexia nervosa. *Psychiatry*. 2008;**7**:147-151. DOI: 10.1016/j.mppsy.2008.02.010
- [15] Schmidt U. Maudsley model of anorexia nervosa treatment for adults (MANTRA): A cognitive-interpersonal model of illness development and maintenance. In: Wade T, editor. *Encyclopedia of Feeding and Eating Disorders*. Singapore: Springer; 2015. pp. 1-5. DOI: 10.1007/978-981-287-087-2_95-1
- [16] Fairburn CG, Shafran R, Cooper Z. A cognitive behavioural theory of

- anorexia nervosa. *Behaviour Research and Therapy*. 1999;**37**:1-13. DOI: 10.1016/S0005-7967(98)00102-8
- [17] Himmerich H, Bentley J, Kan C, Treasure J. Genetic risk factors for eating disorders: An update and insights into pathophysiology. *Therapeutic Advances in Psychopharmacology*. 2019;**9**:1-20. DOI: 10.1177/2045125318814734
- [18] Jewell T, Collyer H, Gardner T, Tchanturia K, Simic M, Fonagy P, et al. Attachment and mentalization and their association with child and adolescent eating pathology: A systematic review. *International Journal of Eating Disorders*. 2016;**49**:354-373. DOI: 10.1002/eat.22473
- [19] Treasure J, Schmidt U. The cognitive-interpersonal maintenance model of anorexia nervosa revisited: A summary of the evidence for cognitive, socio-emotional and interpersonal predisposing and perpetuating factors. *Journal of Eating Disorders*. 2013;**1**:1-10. DOI: 10.1186/2050-2974-1-13
- [20] Micali N, Treasure J, Simonoff E. Eating disorders symptoms in pregnancy: A longitudinal study of women with recent and past eating disorders and obesity. *Journal of Psychosomatic Research*. 2007;**63**:297-303. DOI: 10.1016/j.jpsychores.2007.05.003
- [21] Micali N. Eating disorders and pregnancy. *Psychiatry*. 2008;**7**:191-193. DOI: 10.1016/j.mppsy.2008.02.003
- [22] Tiller J, Treasure J. Eating disorders precipitated by pregnancy. *European Eating Disorders Review*. 1998;**6**:178-187. DOI: 10.1002/(SICI)1099-0968(199809)6:3<178::AID-ERV231>3.0.CO;2-Y
- [23] Brandenburg BMP, Andersen AE. Unintentional onset of anorexia nervosa. *Eating and Weight Disorders*. 2007;**12**:97-100. DOI: 10.1007/BF03327584
- [24] Schmidt U, Treasure J. Anorexia nervosa: Valued and visible. A cognitive-interpersonal maintenance model and its implications of research and practice. *British Journal of Clinical Psychology*. 2006;**45**:343-366. DOI: 10.1348/014466505x53902
- [25] Steinhausen H. The outcome of anorexia nervosa in the 20th century. *The American Journal of Psychiatry*. 2002;**159**:1284-1293. DOI: 10.1176/appi.ajp.159.8.1284
- [26] Bemis KM. The present status of operant conditioning for the treatment of anorexia nervosa. *Behavior Modification*. 1987;**11**:432-463. DOI: 10.1177/01454455870114003
- [27] Grave RD, Ghoch ME, Sartirana M, Calugi S. Cognitive behavioural therapy for anorexia nervosa: An update. *Current Psychiatry Reports*. 2015;**18**:1-8. DOI: 10.1007/s11920-015-0643-4
- [28] Bruch H. *Eating Disorders: Obesity, Anorexia Nervosa and the Person Within*. New York: Basic Books; 1973
- [29] Garner DM, Bemis KM. Cognitive therapy for anorexia nervosa. In: Garner DM, Garfinkel PE, editors. *Handbook of Psychotherapy for Anorexia Nervosa and Bulimia*. New York: The Guilford Press; 1985. pp. 107-146
- [30] Garner DM, Bemis KM. A cognitive-behavioral approach to anorexia nervosa. *Cognitive Therapy and Research*. 1982;**6**:123-150. DOI: 10.1007/BF01183887
- [31] Garner DM, Vitousek KM, Pike KM. Cognitive-behavioral therapy for anorexia nervosa. In: Garner DM, Garfinkel PE, editors. *Handbook of Treatment for Eating Disorders*.

New York: Guilford Press; 1997.
pp. 94-144

[32] Turner H. Classics revisited. Garner and Bemis (1982): "A cognitive-behavioural approach to anorexia nervosa". *Advances in Eating Disorders: Theory, Research and Practice*. 2014;2:300-306. DOI: 10.1080/02619288.2014.875675

[33] Fisher CA, Skocic S, Rutherford KA, Hetrick SE. Family therapy approaches for anorexia nervosa. *Cochrane Database of Systematic Reviews*. 2019;5:1-165. DOI: 10.1002/14651858.CD004780.pub3

[34] Minuchin S, Rosman BL, Baker L. *Psychosomatic Families: Anorexia Nervosa in Context*. Cambridge: Harvard University Press; 1978. DOI: 10.4159/harvard.9780674418233

[35] Le Grange D, Eisler I. Family interventions in adolescent anorexia nervosa. *Child and Adolescent Psychiatric Clinics of North America*. 2009;18:159-173. DOI: 10.1016/j.chc.2008.07.004

[36] Cerniglia L, Cimino S, Tafà M, Marzilli E, Ballarotto G, Bracaglia F. Family profiles in eating disorders: Family functioning and psychopathology. *Psychology Research and Behavior Management*. 2017;10:305-312. DOI: 10.2147/PRBM.S145463

[37] Miller-Day M, Marks JD. Perceptions of parental communication orientation, perfectionism, and disordered eating behaviors of sons and daughters. *Health Communication*. 2006;19:153-163. DOI: 10.1207/s15327027hc1902_7

[38] National Institute for Health and Care Excellence. *Eating Disorder: Recognition and Treatment* [Internet]. 2017. Available from <https://www.nice.org.uk/guidance/ng69/chapter/Recommendations> [Accessed: 10 December 2019]

nice.org.uk/guidance/ng69/chapter/Recommendations [Accessed: 10 December 2019]

[39] Fairburn CG, Cooper Z, Shafran R. Enhanced cognitive behaviour therapy for eating disorders ("CBT-E"): An overview. In: Fairburn CG, editor. *Cognitive Behavior Therapy and Eating Disorders*. New York: Guilford Press; 2008

[40] Fairburn CG, Cooper Z, Shafran R, Bohn K, Hawker DM, Murphy R, et al. Enhanced cognitive behavior therapy for eating disorders: The core protocol. In: Fairburn CG, editor. *Cognitive Behavior Therapy and Eating Disorders*. New York: Guilford Press; 2008

[41] Dahlenburg SC, Gleaves DH, Hutchinson AD. Treatment outcome research of enhanced cognitive behaviour therapy for eating disorders: A systematic review with narrative and meta-analytic synthesis. *Eating Disorders*. 2019;27:482-502. DOI: 10.1080/10640266.2018.1560240

[42] Calugi S, El Ghoch M, Dalle GR. Intensive enhanced cognitive behavioural therapy for severe and enduring anorexia nervosa: A longitudinal outcome study. *Behaviour Research and Therapy*. 2017;89:41-48. DOI: 10.1016/j.brat.2016.11.006

[43] Zipfel S, Wild B, Groß G, Friederich HC, Teufel M, Schellberg D, et al. Focal psychodynamic therapy, cognitive behaviour therapy, and optimised treatment as usual in outpatients with anorexia nervosa (ANTOP study): Randomised controlled trial. *Lancet*. 2014;383:127-137. DOI: 10.1016/S0140-6736(13)61746-8

[44] Byrne S, Wade T, Hay P, Touyz S, Fairburn CG, Treasure J, et al. A randomised controlled trial of three psychological treatments for anorexia nervosa. *Psychological Medicine*.

2017;**47**:2823-2833. DOI: 10.1017/S0033291717001349

[45] Atwood ME, Friedman A. A systematic review of enhanced cognitive behavioral therapy (CBT-E) for eating disorders. *International Journal of Eating Disorders*. 2020;**53**:311-330. DOI: 10.1002/eat.23206

[46] Agras WS. Cognitive behavior therapy for the eating disorders. *Psychiatric Clinics of North America*. 2019;**42**:169-179. DOI: 10.1016/j.psc.2019.01.001

[47] Dalle Grave R, El Ghoch M, Sartirana M, Calugi S. Cognitive behavioral therapy for anorexia nervosa: An update. *Current Psychiatry Reports*. 2016;**18**:1-8. DOI: 10.1007/s11920-015-0643-4

[48] Hay PJ, Claudino AM, Touyz S, AbdEG. Individual psychological therapy in the outpatient treatment of adults with anorexia nervosa. *Cochrane Database of Systematic Reviews*. 2015;**7**:1-97. DOI: 10.1002/14651858.cd003909.pub2

[49] Galsworthy-Francis L, Allan S. Cognitive behavioural therapy for anorexia nervosa: A systematic review. *Clinical Psychology Review*. 2014;**34**: 54-72. DOI: 10.1016/j.cpr.2013.11.001

[50] Watson HJ, Bulik CM. Update on the treatment of anorexia nervosa: Review of clinical trials, practice guidelines and emerging interventions. *Psychological Medicine*. 2013;**43**:2477-2500. DOI: 10.1017/S0033291712002620

[51] Wade S, Byrne S, Allen K. Enhanced cognitive behavioral therapy for eating disorders adapted for a group setting. *International Journal of Eating Disorders*. 2017;**50**:863-872. DOI: 10.1002/eat.22723

[52] Bamford BH, Mountford VA. Cognitive behavioural therapy for

individuals with longstanding anorexia nervosa: Adaptations, clinician survival and system issues. *European Eating Disorders Review*. 2012;**20**:49-59. DOI: 10.1002/erv.1080

[53] Gregertsen EC, Mandy W, Serpell L. The egosyntonic nature of anorexia: An impediment to recovery in anorexia nervosa treatment. *Frontiers in Psychology*. 2017;**8**:1-9. DOI: 10.3389/fpsyg.2017.02273

[54] Schmidt U, Oldershaw A, Jichi F, Sternheim L, Startup H, McIntosh V, et al. Out-patient psychological therapies for adults with anorexia nervosa: Randomised controlled trial. *British Journal of Psychiatry*. 2012;**201**:392-399. DOI: 10.1192/bjp.bp.112.112078

[55] Schmidt U, Magill N, Renwick B, Keyes A, Kenyon M, Dejong H, et al. The Maudsley outpatient study of treatments for anorexia nervosa and related conditions (MOSAIC): Comparison of the Maudsley model of anorexia nervosa treatment for adults (MANTRA) with specialist supportive clinical management (SSCM) in outpatients with broadly defined anorexia nervosa: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*. 2015;**83**:796-807. DOI: 10.1037/ccp0000019

[56] McIntosh VVW, Jordan J, Carter FA, Luty SE, McKenzie JM, Bulik CM, et al. Three psychotherapies for anorexia nervosa: A randomized, controlled trial. *American Journal of Psychiatry*. 2005;**162**:741-747. DOI: 10.1176/appi.ajp.162.4.741

[57] McIntosh VVW, Jordan J, Luty SE, Carter FA, McKenzie JM, Bulik CM, et al. Specialist supportive clinical management for anorexia nervosa. *International Journal of Eating Disorders*. 2006;**39**:625-632. DOI: 10.1002/eat.20297

- [58] Carter FA, Jordan J, McIntosh VV, Luty SE, McKenzie JM, Framton CM, et al. The long-term efficacy of three psychotherapies for anorexia nervosa: A randomized, controlled trial. *International Journal of Eating Disorders*. 2011;**44**:647-654. DOI: 10.1002/eat.20879
- [59] Wild B, Friederich H-C, Gross G, Teufel M, Herzog W, Giel KE, et al. The ANTOP study: Focal psychodynamic psychotherapy, cognitive-behavioural therapy, and treatment-as-usual in outpatients with anorexia nervosa—A randomised controlled trial. *Trials*. 2009;**10**:1-7. DOI: 10.1186/1745-6215-10-23
- [60] Dare C, Eisler I, Russell G, Treasure J, Dodge L. Psychological therapies for adults with anorexia nervosa. *British Journal of Psychiatry*. 2001;**178**:216-221. DOI: 10.1192/bjp.178.3.216
- [61] Rienecke R. Family-based treatment of eating disorders in adolescents: Current insights. *Adolescent Health, Medicine and Therapeutics*. 2017;**8**:69-79. DOI: 10.2147/AHMT.S115775
- [62] Le Grange D, Lock J. The dearth of psychological treatment studies for anorexia nervosa. *International Journal of Eating Disorders*. 2005;**37**:79-91. DOI: 10.1002/eat.20085
- [63] Eisler I, Dare C, Hodes M, Russell G, Dodge E, Le Grange D. Family therapy for adolescent anorexia nervosa: The results of a controlled comparison of two family interventions. *Journal of Child Psychology and Psychiatry*. 2000;**41**:727-736. DOI: 10.1111/1469-7610.00660
- [64] Le Grange D, Eisler I, Dare C, Russell GF. Evaluation of family treatments in adolescent anorexia nervosa: A pilot study. *International Journal of Eating Disorders*. 1992;**12**:347-357. DOI: 10.1002/1098-108X(199212)12:4<347::AID-EAT2260120402>3.0.CO;2-W
- [65] Lock J, Agras WS, Bryson S, Kraemer HC. A comparison of short- and long-term family therapy for adolescent anorexia nervosa. *Journal of the American Academy of Child and Adolescent Psychiatry*. 2005;**44**:632-639. DOI: 10.1097/01.chi.0000161647.82775.0a
- [66] Agras WS, Lock J, Brandt H, Bryson SW, Dodge E, Halmi KA, et al. Comparison of 2 family therapies for adolescent anorexia nervosa: A randomized parallel trial. *JAMA Psychiatry*. 2014;**71**:1279-1286. DOI: 10.1001/jamapsychiatry.2014.1025
- [67] Keel PK, Haedt A. Evidence-based psychosocial treatments for eating problems and eating disorders. *Journal of Clinical Child and Adolescent Psychology*. 2008;**37**:39-61. DOI: 10.1080/15374410701817832
- [68] Lock J. An update on evidence-based psychological treatments for eating disorders in children and adolescents. *Journal of Clinical Child and Adolescent Psychology*. 2015;**44**:707-721. DOI: 10.1080/15374416.2014.971458
- [69] Zeeck A, Herpertz-Dahlmann B, Friederich H, Brockmeyer T, Resmark G, Hagenah U, et al. Psychotherapeutic treatment for anorexia nervosa: A systematic review and network meta-analysis. *Frontiers in Psychiatry*. 2018;**9**:1-14. DOI: 10.3389/fpsy.2018.00158
- [70] Lock J, Nicholls D. Toward a greater understanding of the ways family-based treatment addresses the full range of psychopathology of adolescent anorexia nervosa. *Frontiers in Psychiatry*. 2020;**10**:1-8. DOI: 10.3389/fpsy.2019.00968

- [71] Lock J, Fitzpatrick KK. Advances in psychotherapy for children and adolescents with eating disorders. *American Journal of Psychotherapy*. 2009;**63**:287-303. DOI: 10.1176/appi.psychotherapy.2009.63.4.287
- [72] Cooper Z, Stewart A. CBT-E and the younger patient. In: Fairburn CG, editor. *Cognitive Behavior Therapy and Eating Disorders*. New York: Guilford Press; 2008. pp. 221-230
- [73] Dalle Grave R, Sartirana M, Calugi S. Enhanced cognitive behavioural therapy for adolescents with anorexia nervosa: Outcomes and predictors of change in a real-world setting. *International Journal of Eating Disorders*. 2019;**52**:1042-1046. DOI: 10.1002/eat.23122
- [74] Dalle Grave R, Calugi S, El Ghoch M, Conti M, Fairburn CG. Inpatient cognitive behavior therapy for adolescents with anorexia nervosa: Immediate and long-term effects. *Frontiers in Psychiatry*. 2014;**5**:1-7. DOI: 10.3389/fpsy.2014.00014
- [75] Dalle Grave R, Calugi S, Doll HA, Fairburn CG. Enhanced cognitive behaviour therapy for adolescents with anorexia nervosa: An alternative to family therapy? *Behaviour Research and Therapy*. 2013;**51**:R9-R12. DOI: 10.1016/j.brat.2012.09.008
- [76] Calugi S, Dalle Grave R, Sartirana M, Fairburn CG. Time to restore body weight in adults and adolescents receiving cognitive behaviour therapy for anorexia nervosa. *Journal of Eating Disorders*. 2015;**3**:1-6. DOI: 10.1186/s40337-015-0057-z
- [77] Fitzpatrick KK, Moye A, Hoste R, Lock J, Le Grange D. Adolescent focused psychotherapy for adolescents with anorexia nervosa. *Journal of Contemporary Psychotherapy*. 2010;**40**:31-39. DOI: 10.1007/s10879-009-9123-7
- [78] Lock J, Le Grange D, Agras WS, Moye A, Bryson SW, Jo B. Randomized clinical trial comparing family-based treatment with adolescent-focused individual therapy for adolescents with anorexia nervosa. *Archives of General Psychiatry*. 2010;**67**:1025-1032. DOI: 10.1001/archgenpsychiatry.2010.128
- [79] Le Grange D, Lock J, Agras WS, Moye A, Bryson SW, Jo B, et al. Moderators and mediators of remission in family-based treatment and adolescent focused therapy for anorexia nervosa. *Behaviour Research and Therapy*. 2012;**50**:85-92. DOI: 10.1016/j.brat.2011.11.003
- [80] Van den Berg E, Houtzager L, de Vos J, Daemen I, Katsaragaki G, Karyotaki E, et al. Meta-analysis on the efficacy of psychological treatments for anorexia nervosa. *European Eating Disorders Review*. 2019;**27**:331-351. DOI: 10.1002/erv.2683
- [81] Alckmin-Carvalho F, Vega JB, Cobelo AW, Fabbri AD, Pinzon VD, Melo MHS. Evidence-based psychotherapy for treatment of anorexia nervosa in children and adolescents: Systematic review. *Archives of Clinical Psychiatry*. 2018;**45**:41-48. DOI: 10.1590/0101-60830000000154
- [82] Brockmeyer T, Friederich HC, Schmidt U. Advances in the treatment of anorexia nervosa: A review of established and emerging interventions. *Psychological Medicine*. 2018;**48**:1228-1256. DOI: 10.1017/S0033291717002604
- [83] Tchanturia K, editor. *Cognitive Remediation Therapy (CRT) for Eating and Weight Disorders*. Sussex: Routledge; 2015
- [84] Tchanturia K, Lounes N, Holtum S. Cognitive remediation in anorexia nervosa and related conditions: A systematic review. *European Eating Disorders Review*. 2014;**22**:454-462. DOI: 10.1002/erv.2326

- [85] Tchanturia K, Giombini L, Leppanen J, Kinnaird E. Evidence for cognitive remediation therapy in young people with anorexia nervosa: Systematic review and meta-analysis of the literature. *European Eating Disorders Review*. 2017;**25**:227-236. DOI: 10.1002/erv.2522
- [86] Tchanturia K, Lloyd S, Lang K. Cognitive remediation therapy for anorexia nervosa: Current evidence and future research directions. *International Journal of Eating Disorders*. 2013;**46**:492-495. DOI: 10.1002/eat.22106
- [87] Whitney J, Easter A, Tchanturia K. Service users' feedback on cognitive training in the treatment of anorexia nervosa: A qualitative study. *International Journal of Eating Disorders*. 2008;**41**:542-550. DOI: 10.1002/eat.20536
- [88] Easter A, Tchanturia K. Therapists' experiences of cognitive remediation therapy for anorexia nervosa: Implications for working with adolescents. *Clinical Child Psychology and Psychiatry*. 2011;**16**:233-246. DOI: 10.1177/1359104511401185
- [89] Tchanturia K, Brown A, Fleming C. Thinking about emotions: CREST group. In: Tchanturia K, editor. *Brief Group Psychotherapy for Eating Disorders: Inpatient Protocols*. Sussex: Routledge; 2015. pp. 74-106
- [90] Giombini L, Nesbitt S, Leppanen J, Cox H, Foxall A, Easter A, et al. Emotions in play: Young people's and clinician's experience of 'thinking about emotions' group. *Eating and Weight Disorders*. 2019;**24**:605-614. DOI: 10.1007/s40519-019-00646-3
- [91] Russell J, Maguire S, Hunt GE, Kesby A, Suraev A, Stuart J, et al. Intranasal oxytocin in the treatment of anorexia nervosa: Randomized controlled trial during refeeding. *Psychoneuroendocrinology*. 2018;**87**:83-92. DOI: 10.1016/j.psyneuen.2017.10.014
- [92] Maguire S, O'Dell A, Touyz L, Russell J. Oxytocin and anorexia nervosa: A review of the emerging literature. *European Eating Disorders Review*. 2013;**21**:475-478. DOI: 10.1002/erv.2252
- [93] Russell J, Maguire S, Kesby A, McGregor I, O'Dell A, Treasure J. Oxytocin as a treatment enhancer in anorexia nervosa. *European Psychiatry*. 2017;**41**:S37. DOI: 10.1016/j.eurpsy.2017.01.171
- [94] Giel K, Zipfel S, Hallschmid M. Oxytocin and eating disorders: A narrative review on emerging findings and perspectives. *Current Neuropharmacology*. 2018;**16**:1111-1121. DOI: 10.2174/1570159X15666171128143158
- [95] Galbiati F, Aulinas A, Eddy K, Miller K, Klibanski A, Plessow F, et al. SAT-441 oxytocin levels are associated with psychopathology in restricting but not binge-purge subtype of anorexia nervosa. *Journal of the Endocrine Society*. 2019;**3**:S1. DOI: 10.1210/js.2019-SAT-441
- [96] Schmelkin C, Plessow F, Thomas JJ, Gray EK, Marengi DA, Pulumo R, et al. Low oxytocin levels are related to alexithymia in anorexia nervosa. *International Journal of Eating Disorders*. 2017;**50**:1332-1338. DOI: 10.1002/eat.22784
- [97] Jansch C, Harmer C, Cooper MJ. Emotional processing in women with anorexia nervosa and healthy volunteers. *Eating Behavior*. 2009;**10**:184-191. DOI: 10.1016/j.eatbeh.2009.06.001
- [98] Leppanen J, Ng KW, Tchanturia K, Treasure J. Meta-analysis of the effects of intranasal oxytocin on interpretation and expression of emotions.

Neuroscience and Biobehavioral Reviews. 2017;**78**:125-144. DOI: 10.1016/j.neubiorev.2017.04.010

[99] Plessow F, Eddy KT, Lawson EA. The neuropeptide hormone oxytocin in eating disorders. *Current Psychiatry Reports*. 2018;**20**:1-11. DOI: 10.1007/s11920-018-0957-0

[100] Schade S, Paulus W. D-cycloserine in neuropsychiatric diseases: A systematic review. *International Journal of Neuropsychopharmacology*. 2016;**19**:1-7. DOI: 10.1093/ijnp/pyv102

[101] Otto MW, Kredlow MA, Smits JAJ, Hofmann SG, Tolin DF, de Kleine RA, et al. Enhancement of psychosocial treatment with d-cycloserine: Models, moderators, and future directions. *Biological Psychiatry*. 2016;**80**:274-283. DOI: 10.1016/j.biopsych.2015.09.007

[102] Steinglass J, Sysko R, Schebendach J, Broft A, Strober M, Walsh BT. The application of exposure therapy and d-cycloserine to the treatment of anorexia nervosa: A preliminary trial. *Journal of Psychiatric Practice*. 2007;**13**:238-245. DOI: 10.1097/01.pra.0000281484.89075.a8

[103] Levinson CA, Rodebaugh TL, Fewell L, Kass AE, Riley EN, Stark L, et al. D-Cycloserine facilitation of exposure therapy improves weight regain in patients with anorexia nervosa: A randomized controlled trial. *Journal of Clinical Psychiatry*. 2015;**76**:787-793. DOI: 10.4088/JCP.14m09299

[104] Ori R, Amos T, Bergman H, Soares-Weiser K, Ipser JC, Stein DJ. Augmentation of cognitive and behavioural therapies (CBT) with d-cycloserine for anxiety and related disorders. *Cochrane Database of Systematic Reviews*. 2015;**5**:1-131. DOI: 10.1002/14651858.CD007803.pub2

[105] Hughes K, Halford SJ, Cowan M, Himmerich H, Tchanturia K. Evaluation

of a step-up treatment programme for individuals inscribed with a psychiatric diagnosis of eating disorder. *Clinical Psychology Forum*. 2019;**324**:23-36

[106] Turner A, Alsop A. Unique core skills: Exploring occupational therapists' hidden assets. *British Journal of Occupational Therapy*. 2015;**78**:739-749. DOI: 10.1177/0308022615601443

[107] World Federation of Occupational Therapists. About Occupational Therapy [Internet]. 2020. Available from: <https://wfot.org/about/about-occupational-therapy>. [Accessed: 03 April 2020]

[108] Giles GM, Allen ME. Occupational therapy in the rehabilitation of the patient with anorexia nervosa. *Occupational Therapy in Mental Health*. 1986;**6**:47-66. DOI: 10.1300/J004v06n01_04

[109] Taylor RR. *Kielhofner's Model of Human Occupation: Theory and Application*. 5th ed. Philadelphia: Lippincott Williams & Wilkins; 2017

[110] Harris P. Facilitating change in anorexia nervosa: The role of occupational therapy. *British Journal of Occupational Therapy*. 1992;**55**(9):334-339. DOI: 10.1177/0308022692Q5500903

[111] Hughes K, Woodgate D, Halford SJ, Cowan M, Himmerich H. The therapeutic effect of physical activity in a day-hospital patient with anorexia nervosa. *Psychiatria Danubina*. 2019;**31**:201-203. DOI: 10.24869/psyd.2019.201

[112] Kinnaird E, Norton C, Tchanturia K. Clinicians' views on working with anorexia nervosa and autism spectrum disorder comorbidity: A qualitative study. *BMC Psychiatry*. 2017;**17**:1-8. DOI: 10.1186/s12888-017-1455-3

- [113] Huke V, Turk J, Saeidi S, Kent A, Morgan JF. Autism spectrum disorders in eating disorder populations: A systematic review. *European Eating Disorders Review*. 2013;**21**:345-351. DOI: 10.1002/erv.2244
- [114] Kelly C, Davies M. A review of anorexia nervosa, its relationship to autism and borderline personality disorder, and implications for patient related outcomes. *Journal of Psychiatry and Psychiatric Disorders*. 2019;**3**:207-215. DOI: 10.26502/jppd.2572-519X0075
- [115] Adamson J, Leppanen J, Murin M, Tchanturia K. Effectiveness of emotional skills training for patients with anorexia nervosa with autistic symptoms in group and individual format. *European Eating Disorders Review*. 2018;**26**:367-375. DOI: 10.1002/erv.2594
- [116] Treasure J. Coherence and other autistic spectrum traits and eating disorders: Building from mechanism to treatment. The Birgit Olsson lecture. *Nordic Journal of Psychiatry*. 2013;**67**:38-42. DOI: 10.3109/08039488.2012.674554
- [117] Dandil Y, Baillie C, Tchanturia K. Cognitive remediation therapy as a feasible treatment for a young person with anorexia nervosa and autism spectrum disorder comorbidity: A case study. *Clinical Case Studies*. 2020;**19**:115-132. DOI: 10.1177/1534650119890425
- [118] Kinnaird E, Norton C, Stewart C, Tchanturia K. Same behaviours, different reasons: What do patients with co-occurring anorexia and autism want from treatment? *International Review of Psychiatry*. 2019;**31**:308-317. DOI: 10.1080/09540261.2018.1531831
- [119] Martinussen M, Friborg O, Schmierer P, Kaiser S, Øvergård KT, Neunhoeffler A-L, et al. The comorbidity of personality disorder in eating disorders: A meta-analysis. *Eating and Weight Disorders – Studies on Anorexia, Bulimia and Obesity*. 2017;**22**:201-209. DOI: 10.1007/s40519-016-0345-x
- [120] Link TM, Beermann U, Mestel R, Gander M. Treatment outcome in female in-patients with anorexia nervosa and comorbid personality disorders prevalence—Therapy drop out and weight gain. *Psychotherapy, Psychosomatic, Psychological Medicine*. 2017;**67**:420-430. DOI: 10.1055/s-0043-103271
- [121] Skodol AE, Oldham JM, Hyler SE, Kellman HD, Doidge N, Davies M. Comorbidity of DSM-III-R eating disorders and personality disorders. *International Journal of Eating Disorders*. 1993;**14**:403-416. DOI: 10.1002/1098-108x(199312)14:4<403::aid-eat2260140403>3.0.co;2-x
- [122] Miller AE, Racine SE, Klonsky ED. Symptoms of anorexia nervosa and bulimia nervosa have differential relationships to borderline personality disorder symptoms. *Eating Disorders*. 2019;**15**:1-14. DOI: 10.1080/10640266.2019.1642034
- [123] Navarro-Haro MV, Botella C, Guillen V, Moliner R, Marco H, Jorquera M, et al. Dialectical behaviour therapy in the treatment of borderline personality disorder and eating disorders comorbidity: A pilot study in a naturalistic setting. *Cognitive Therapy and Research*. 2018;**42**:636-649. DOI: 10.1007/s10608-018-9906-9
- [124] Bankoff SM, Karpel MG, Forbes HE, Pantalone DW. A systematic review of dialectical behaviour therapy for the treatment of eating disorders. *Eating Disorders*. 2012;**20**:196-215. DOI: 10.1080/10640266.2012.668478
- [125] Friederich HC, Herzog W. Cognitive-behavioural flexibility in anorexia nervosa. In: Adan RAH, Kaye WH, editors.

Behavioral Neurobiology of Eating Disorders. Heidelberg/Berlin: Springer; 2010. pp. 111-123

[126] Downs KJ, Blow AJ. A substantive and methodological review of family-based treatment for eating disorders: The last 25 years of research. *Journal of Family Therapy*. 2013;**35**:3-28. DOI: 10.1111/j.1467-6427.2011.00566.x

[127] Murray SB, Quintana DS, Loeb KL, Griffiths S, Le Grange D. Treatment outcomes for anorexia nervosa: A systematic review and meta-analysis of randomized controlled trials. *Psychological Medicine*. 2018;**49**:535-544. DOI: 10.1017/S0033291718002088

[128] National Institute for Health and Care Excellence. NICE Guidelines [Internet]. 2020. Available from: <https://www.nice.org.uk/about/what-we-do/our-programmes/nice-guidance/nice-guidelines> [Accessed: 19 March 2020]

[129] Tchanturia K, Larsson E, Brown A. Benefits from group cognitive remediation therapy in anorexia nervosa: Case series. *Neuropsychiatry*. 2016;**30**:42-49. DOI: 10.1007/s40211-016-0177-y

[130] Friedman K, Ramirez AL, Murray SB, Anderson LK, Cusack A, Boutelle KN, et al. A narrative review of outcome studies for residential and partial hospital-based treatment of eating disorders. *European Eating Disorders Review*. 2016;**24**:263-276. DOI: 10.1002/erv.2449

[131] Gowers SG, Clark AF, Roberts C, Byford S, Barrett B, Griffiths A, et al. A randomised controlled multicentre trial of treatments for adolescent anorexia nervosa including assessment of cost-effectiveness and patient acceptability. *Health Technology Assessment*. 2010;**14**:1-98. DOI: 10.3310/hta14150

[132] Madden S, Hay P, Touyz S. Systematic review of evidence for

different treatment settings in anorexia nervosa. *World Journal of Psychiatry*. 2015;**5**:147-153. DOI: 10.5498/wjp.v5.i1.147

[133] Herpertz-Dahlmann B, Schwarte R, Krei M, Warnke A, Wewetzer C, Pfeiffer E, et al. Day-patient treatment after short inpatient care versus continued inpatient treatment in adolescents with anorexia nervosa (ANDI): A multicentre, randomised, open-label, non-inferiority trial. *The Lancet*. 2014;**383**:1222-1229. DOI: 10.1016/S0140-6736(13)62411-3

[134] Gowers SG, An JW, Shore A, Hossain F, Elvins R. Impact of hospitalisation on the outcome of adolescent anorexia nervosa. *British Journal of Psychiatry*. 2000;**176**:138-141. DOI: 10.1192/bjp.176.2.138