Send Orders for Reprints to reprints@benthamscience.ae

1122 *Current Neuropharmacology*, 2018, *16*, 1122-1130

REVIEW ARTICLE

Premorbid and Illness-related Social Difficulties in Eating Disorders: An Overview of the Literature and Treatment Developments

Valentina Cardi*, Kate Tchanturia and Janet Treasure

Section of Eating Disorders, King's College London, Institute of Psychiatry, Psychological Medicine, 103 Denmark Hill, London SE5 8AF, UK

ARTICLE HISTORY

Received: December 06, 2017
Revised: December 07, 2017
Accepted: January 11, 2018

DOI:
10.2174/1570159X16666180118100028

Abstract: ***Background*:** Social difficulties in eating disorders can manifest as predisposing traits and premorbid difficulties, and/or as consequences of the illness.

***Objective*:** The aim of this paper is to briefly review the evidence of social problems in people with eating disorders and to consider the literature on treatments that target these features.

***Method*:** A narrative review of the literature was conducted.

***Results*:** People with eating disorders often manifest traits, such as shyness, increased tendency to submissiveness and social comparison, and problems with peer relationships before illness onset. Further social difficulties occur as the illness develops, including impaired social cognition and increased threat sensitivity. All relationships with family, peers and therapists are compromised by these effects. Thus, social difficulties are both risk and maintaining factors of eating disorders and are suitable targets for interventions. Several forms of generic treatments (*e.g.* interpersonal psychotherapy, cognitive analytic therapy, focal psychodynamic therapy) have an interpersonal focus and show some efficacy. Guided self-management based on the cognitive interpersonal model of the illness directed to both individuals and support persons has been found to improve outcomes for all parties. Adjunctive treatments that focus on specific social difficulties, such as cognitive remediation and emotion skills training and cognitive bias modification have been shown to have a promising role.

***Conclusion*:** More work is needed to establish whether these approaches can improve on the rather disappointing outcomes that are attained by currently used treatments for eating disorders.

Keywords: Social, eating disorders, anorexia, bulimia, treatment, cognition, emotion.

1. A NARRATIVE REVIEW OF THE LITERATURE ON SOCIAL DIFFICULTIES IN EATING DISORDERS

1.1. Social Difficulties in Eating Disorders

1.1.1. Historical Accounts of Anorexia Nervosa

Historical accounts of anorexia nervosa specified the role of relationships in both the treatment and prognosis of the illness. Richard Morton in 1694 advised "let the patient endeavour to divert and make his mind cheerful by exercise and the conversation of his friends". Louis-Victor Marcé, in 1860 considered that the home environment played a role in maintaining the illness and suggested that "it is indispensable to change the habitation and surrounding circumstances and to entrust the patient to the care of strangers". William Gull, in 1874 gave a similar advice, "...patients should be fed at regular intervals and surrounded by persons who would have moral control over them: relatives and friends being generally the worst attendants". Later, Ryle (1936), reporting on his experience of 51 cases described how the family could be effectively involved in treatment if they were given advice (*e.g.* "in five months following the consultation, again with home treatment, after full explanation to the mother, she gained 1 stone (14 lb) in weight"). Hilde Bruch (1982) drawing upon research on animal development suggested that attachment problems might contribute to the aetiology. She suggested that "the tight involvement of the family needs to be resolved".

In addition to these historical voices, people with lived experience of anorexia nervosa also validate the important consequences of the disorder on social functioning. For example, one patient describing her personal journey said that

*Address correspondence to this author at the Section of Eating Disorders, King's College London, Institute of Psychiatry, Psychological Medicine, 103 Denmark Hill, London SE5 8AF, UK; E-mail: valentina.cardi@kcl.ac.uk

1570-159X/18 $58.00+.00 ©2018 Bentham Science Publishers

anorexia nervosa could be described in one word, "isolation" [1]. Further studies have emphasised the loneliness and social alienation associated with the illness.

In this paper, we review the evidence that supports the key role that social processes have in eating disorders. It is difficult to separate antecedent problems from those that are a consequence of the illness because few studies have taken a lifetime approach to risk, and those that do, are limited in the information they provide. However, it could be argued that concerns about the timing of the onset of social problems is irrelevant for the development of interventions for clinical cases, rather the focus needs to be on whether these anomalies can be modified.

1.1.2. Premorbid Social Difficulties and Aversive Experiences

People with eating disorders recall interpersonal difficulties from early age [2]. Retrospective accounts of childhood functioning from clinical cases of anorexia nervosa report few friends [3, 4] and a propensity to undertake solitary activities [5]. Individuals recall themselves as shy, worried about fitting in, inhibited and inferior to others (Cardi *et al.*, unpublished data). Although memory biases might account for some of these reports, parental informants also describe early problems in social aptitude in a subgroup of patients [6].

Longitudinal cohort studies on adolescents indicate that early aversive experiences within the social network (family and peers) increase the risk for the later development of eating disorder symptoms. A large Scandinavian cohort study found that prenatal and postnatal exposure to sudden death of a close relative is associated with an increased risk of developing an eating disorder [7]. Poor care and communication within the family predicted restrictive symptoms in a population-based study of adolescents followed up at 5 years [8].

Prospective studies on adolescent cohorts consistently find that teasing based on weight and physical appearance is associated with the development of abnormal eating behaviours and attitudes [9-11]. This goes above and beyond the predictive value of actual weight [12]. Critical comments about eating [13] and general bullying are also risk factors [14]. Critical social feedback increases unfavourable social comparisons and body dissatisfaction [15]. Comparisons based on body [16] eating and exercise [15] predict eating-related concerns [16] and eating disorder symptoms [15].

A more specific effect of others' eating behaviours on the individual's disordered eating is also found and could be explained by the process of vicarious learning. Parental abnormal eating attitudes and behaviours, for example, seem to play a role in the development of abnormal eating in the offspring [17-19]. Vicarious learning of eating-, weight-, and shape-related preoccupations could also underline the "social contagion" occurring amongst adolescents in relation to dieting and physical exercise [20].

1.1.3. Social Difficulties in the Acute Illness State

In the acute state of the eating disorder, most areas of social functioning are affected [21, 22]. These include difficulties generating personal resolutions during a social problem-solving task [23] and inferring emotional mental states in social interactions [24, 25]; impaired facial emotion expressivity [26-28] and mirroring of others' emotion expressions [29], and increased sensitivity to threat, as demonstrated by attentional bias towards faces expressing rejection or social rank [30, 31] and negative interpretation of ambiguous social situations [32]. Similarly, patients show biased behaviours towards others, such as a tendency to respond coldly to feedback delivered with warmth [33] and an inclination to compare unfavourably and respond submissively [21, 34].

The deficits in social cognition and lack of social skills might impact negatively on the psychological and physical wellbeing of partners in the interaction (*e.g.* for the effect or reduced facial expressivity on others, [35]; still face paradigm, [36]), and might underpin patients' social isolation [3, 4, 37, Cardi *et al.*, unpublished data] and lack of perceived social support [38].

The difficulties observed in the acute state of the illness might be predisposing traits or secondary to starvation. The children of mothers with a history of an eating disorder show poorer social communication and poorer recognition of fear from social motion cues than children born to mothers with no lifetime eating disorder [39]. Increased sensitivity to social threat [30, 31] and impaired recognition of emotions from bodily gestures and vocal prosody [40] remain after recovery. Similarly, some findings support the hypothesis that difficulties recognising emotions and mental states in others are a risk factor for the development of the disorder (*e.g.* [39, 41]). Emotional expressivity [42] and emotion recognition of facial expressivity [43], on the other hand, seem to recover after weight restoration.

1.1.4. Possible Mechanisms to Explain how Social Difficulties Contribute to the Development of Eating Disorder Symptoms

A number of theoretical models on the aetiology of eating disorders include the proposition that interpersonal difficulties predispose to the development of abnormal eating symptoms directly or *via* negative affect [44-47]. Some of these models postulate that is the potential or actual rejection based on body image and weight that specifically predispose to the risk of developing eating disorder symptoms, as opposed to other psychiatric disorders [44, 46]. Recent empirical testing of the hypothesised relationships between interpersonal difficulties and eating disorder symptoms validates and extends the interpersonal theories of eating disorders by including the moderating role of intrapersonal variables, such as self-esteem, anxiety, appearance-based rejection sensitivity and social rank [48, 49].

The hypothesis that abnormal eating behaviours and attitudes are motivated by unmet innate needs, such as social belonging, social safeness and self-worth is also supported by empirical findings. A recent study (Cardi *et al.* unpublished data) asked patients with a lifetime diagnosis of anorexia nervosa whether they thought their eating disorder had been triggered by early interpersonal difficulties, and in what way, the development of their eating disorder was associated

to these difficulties. Two thirds of the sample (N=90) recognised a significant contribution of early interpersonal difficulties and adversity in triggering eating disorder symptoms (Cardi *et al*. unpublished). They also argued that the illness represented an attempt to fit in, gaining control on some areas of life, silencing negative emotions and thoughts, distracting from the pain of social isolation or self-punishing for their unworthiness (Cardi *et al*. unpublished).

2. TREATMENTS INTRODUCED OR DEVELOPED TO TARGET SOCIAL DIFFICULTIES IN EATING DISORDERS

A variety of interventions have been introduced or developed to target the problems in social functioning that affect those suffering from eating disorders. Social skills training can be integrated in cognitive-behavioural therapy protocols [50]. Transdiagnostic interventions, such as Interpersonal Psychotherapy (IPT), Focal psychodynamic therapy (FPT) and Cognitive Analytic Therapy (CAT) are the forms of psychotherapy more specifically focused on interpersonal issues. Other approaches, such as the Maudsley Model of Anorexia Nervosa Treatment for Adults (MANTRA), RecoveryMANTRA and the New Maudsley approach are based on the specific cognitive interpersonal model of anorexia nervosa [44]. Cognitive Remediation and Emotion Skills Training (CREST), Cognitive Bias Modification training towards positive social stimuli, and oxytocin target specific elements of interpersonal processing and have been applied as "add-on" treatments.

2.1. Transdiagnostic Interventions

2.1.1. Interpersonal Psychotherapy

A model of interpersonal psychotherapy for eating disorders was developed by Rieger *et al*., in 2010 [46]. This model poses that negative social evaluation exerts both a causal (*via* its impact on negative affect and negative self-evaluation) and a maintaining role in the illness. A later paper published by Arcelus presented a systematic review of the literature on interpersonal difficulties in eating disorders and also proposed a testable model [34]. This model postulates the impact of attachment difficulties, genes and temperament on the later development of interpersonal issues and eating disorders, and hypothesises that eating disorders are maintained by social inhibition, isolation and anxiety. To date, no clinical trials have been published testing these two models, rather several studies have tested Interpersonal Psychotherapy (IPT) for bulimic disorders [51] adapted from standard IPT for depression. IPT for eating disorders usually includes 16 weekly sessions. The assessment focuses mainly on current, as opposed to earlier interpersonal difficulties [51] and on the role that these difficulties have in maintaining the eating disorder. A shared formulation is made which shapes the interpersonal focus of the intervention and the behavioural goals for change.

Clinical trials comparing the efficacy of IPT with Cognitive Behavioural Therapy (CBT) show that although CBT is associated with greater clinical change at the end of treatment, IPT has comparable outcomes at longer-term follow-ups [52-54]. Almost identical clinical changes associated with IPT or CBT are also evidenced in group settings [55, 56]. A pilot study of a shorter IPT intervention (10 sessions) developed by the Leicester team in the UK [57] found no differences with standard IPT and significant reductions of eating disorder symptoms compared to waiting list [57]. To date, only one study tested IPT in anorexia nervosa (20 manualised weekly sessions) and compared it with CBT and "nonspecific supportive clinical management" (SSCM) [58]. The findings indicated that SSCM was superior to the more specialised forms of psychotherapy [58]. A later study assessing outcomes at 6.7 years follow-up found that although IPT was associated with the poorest global outcome at post-treatment, it produced the best global outcome at longer term follow-up compared to CBT and SSCM [59].

2.1.2. Cognitive Analytic Therapy

Cognitive analytic therapy (CAT) originates from concepts derived from cognitive and psychodynamic therapies [60] CAT is based on the assumption that the early interactions with significant others shape internal representations of self, others and the world. The formulation includes a diagram and letter and focuses on relational terms [61]. CAT usually includes 16 to 24 sessions. Patients are encouraged to explore their early and current relationships, and to identify the place that their disorder has amongst those, and for themselves.

Two studies have evaluated the efficacy of CAT in eating disorders (20 monthly sessions followed by monthly sessions, for 3 months) [62, 63]. In the first study, CAT was associated with greater subjective improvement at 1 year follow-up, compared to an educational behavioural treatment [63]. A later study by Dare *et al*. compared CAT against focal psychodynamic therapy, family therapy and "low contact routine treatment". At one year, weight gain was superior in all of the specialised treatment groups compared to routine treatment [62].

2.1.3. Focal Psychodynamic Therapy

Focal psychodynamic therapy (FPT) is a time-limited form of psychotherapy [64] which targets the unconscious and conscious significance of eating disorder symptoms and the impact that these have on interpersonal functioning (including the relationship with the therapist). It consists of 40 sessions delivered over 10 months [65]. The first part of the therapy is based on establishing the therapeutic relationship and assessing the ego-syntonic and valued aspects of the disorder. The second phase focuses on analysing the associations between abnormal eating and interpersonal relationships. The third part aims at discussing how changes could be translated to daily life. FPT was found to be as effective as CAT and family therapy and superior to routine treatment [62]. A recent large randomised controlled trial in which FPT and CBT-E were compared with optimised treatment as usual found no differences in weight recovery between the three conditions, although FPT was associated with greater recovery rates at 12 month follow-up [66].

2.2. Maudsley Model of Anorexia Nervosa Treatment for Adults (MANTRA)

The Maudsley Model of Anorexia Nervosa Treatment for Adults (MANTRA) is based on the cognitive interpersonal model of anorexia nervosa [44]. This model posits that pre-

morbid traits such as cognitive rigidity and obsessionality increase the vulnerability to the illness and maintain the disorder. Furthermore, in the acute state, the eating disorder has a profound effect on close others and can lead them to adopt unhelpful behaviours such as accommodation to the symptoms and high criticism [44].

MANTRA includes modules with a focus for the individual on emotional management, social identity, thinking styles and perfectionism [67]. In addition, there are sections for people providing social support to increase awareness and teach helpful skills to cope with the disorder [67]. The therapy workbook is shared as a form of guided self-help (20-30 sessions). The pace and progress of the intervention are jointly set by therapist and patient. The introductory section culminates in a shared letter and diagrammatic formulation. A choice to work through the most relevant modules follows [67].

The efficacy of MANTRA has been tested in two randomised controlled trials [68, 69]. In the MOSAIC trial, MANTRA was compared to specialist supportive clinical management (SSCM) [68]. Although no differences between the two treatment's arms were found on the primary outcome measure (*i.e.* weight), secondary analyses showed a trend for more underweight patients to have a greater increase in BMI at 6- and 12-months in MANTRA compared to SSCM [68]. MANTRA had also some advantages compared to SSCM. Firstly, it was thought by patients to be significantly more acceptable and credible than SSCM [70]. Also, patients in their first episode of illness (*i.e.* 50% of those receiving MANTRA), had made a complete recovery at two years after starting treatment compared to only 14% of patients receiving SSCM [71]. In the two-year follow-up of the MOSAIC trial, the clinical changes made at 12 months were maintained [71]. However, three patients in the SSCM arm experienced harm (one patient died and two patients became overweight due to episodes of binge eating) [71]. A later Australian study failed to find advantages for MANTRA over SSCM or CBT-E, however there is a major caveat in interpreting this trial as the follow up rate was poor and included only 50% of patients [69].

A more condensed, self-directed version of MANTRA has been developed to be delivered in an online format. This includes a workbook and behaviour change tips from people with the lived experience of the illness (*i.e.* Recovery MANTRA; [72]). The guidance is provided by ex-patients or psychology postgraduates and given in the form of live 1:1 chat (six, 1-hour sessions).

2.3. Collaborative Care: The Involvement of Friends and Family as Social Support

Several forms of interventions used for anorexia nervosa target the family or other sources of social support and work through moderating interpersonal processes or increasing social connection. The form and content of family-based treatment has been modified with a focus on other areas aside from meal support and working with parents alone [73] or groups of parents [74]. The New Maudsley Model [75] and Emotion Focused Family Treatment (EFFT) [76] target common problems in care giving relationships that arise in the context of anorexia nervosa.

2.3.1. The New Maudsley Approach

The cognitive interpersonal model of anorexia nervosa [44] forms the theoretical background for this approach. The underlying proposal is that the illness produces a high stress state and negatively affects patients' perception of, and response to others. In turn, these difficulties cause unhelpful behaviours in others. Family members may submit to the eating disorder bully and accommodate to, or enable, symptoms through fear and/or self-blame. Alternative responses include either disengaging or engaging with criticism and hostility, or over protection. These emotion-driven responses serve to maintain the illness.

The New Maudsley approach is aimed at teaching carers more helpful strategies to respond to the eating disorder behaviours. It has three steps: (1) sharing the state of the art knowledge about the illness with a particular emphasis on symptoms' social consequences, (2) teaching skills of how to change patterns of behaviour that maintain the illness (*e.g.* accommodating or enabling, hostility), (3) teaching skills of how care for themselves and to support change in the individual [77]. It includes the use of web materials [78], books and DVDs [79, 80]. This form of intervention has been found to improve carer wellbeing and skills [81, 82] and was associated with reduced patient symptoms and rates of admissions [83] and with improvements in peer relationships [83].

A current trial is investigating the use of an online, guided self-help intervention for patients with anorexia nervosa admitted for intensive treatment and their carers based on the New Maudsley approach and Recovery MANTRA [84]. The intervention is delivered on a website that includes a workbook, short video-clips, online groups with patients or carers and joint Skype sessions with parents and carers.

2.3.2. Emotion Focused Family Treatment (EFFT)

Emotion focused family treatment (EFFT) teaches families the principles of emotion processing and regulation [76]. This includes supporting and educating carers in: (1) recovery coaching, by helping their loved one with symptom interruption, (2) emotion coaching, by supporting their loved one in the processing of emotions, and (3) engaging in a process of "relationship repair" to facilitate the healing of old wounds. The unifying process is to identify and process emotion experiences that block the parent from carrying out the tasks within each domain or that lead to therapy-interfering behaviours such as denial, criticism or accommodating and enabling behaviours [76]. EFFT consists of three phases. In the first phase, the main task is to support restoration of health and families are taught about emotion management. The second phase focuses on giving control over food and eating back to the person affected by the eating disorder and on encouraging them to socialise more. At the same time, the therapist's intervention aims at empowering parents in becoming their children's emotional coaches. This includes validating their pain, and also guiding them in re-evoking and processing earlier interpersonal difficulties. The

third and final phase is about assisting the family in their journey away from the illness.

A published testimonial of the application of the EFFT model was written by a parent and describes the important achievements associated with it [76]. As yet there are no published treatment trials for this approach.

2.4. Specific Treatment Adjuncts to Improve Social Cognition and Interpersonal Functioning

2.4.1. CREST-Cognitive Remediation and Emotion Skills Training

This is a manualised treatment specifically developed to help patients with severe anorexia nervosa during inpatient treatment to recognise, manage and express emotions and address their underlying needs safely ([85, 86] the clinical manual is available on http://www.katetchanturia.com/publications). CREST has been informed by empirical studies and builds upon previous work in cognitive remediation and various aspects of emotional processing experimental studies (for CRT review [86, 87], for empirical studies in emotion regulation recent reviews [88, 26]). The active ingredients of CREST include: psychoeducation based on neuroscience research and simple experiential exercises and skills practice related to cognitive style (*e.g.* cognitive puzzles and games to help patients to think about their thinking strategies), emotional recognition (*e.g.* helping to develop language and labels for emotional states) and management and positive communication with others (*e.g.* role plays and positive experience log books). The individual format (1 hour, 10 sessions) has 2 sessions on inflexible and detail-focused thinking styles, and the remaining 8 sessions are on social emotional functioning including: a) learning about the adaptive function of emotions, b) learning how to identify emotions, and c) practice in experiencing and expressing emotions [85]. More recently, a group format for CREST (5x 1 hour sessions) has been developed and evaluated. This was introduced to support inpatients to consolidate their experience from the individual sessions [86].

CREST has been tested in case series and at the present no data from randomised controlled trials are available. Qualitative feedback from patients is favourable showing acceptability [89]. Outcome data from individual or group formats suggest that patients' self-reported alexithymia and social anhedonia scores reduce after the intervention [85, 86]. Neuropsychological assessment results are less impressive [90], however taking together the evidence available to date CREST shows promise as an additional brief intervention for patients with severe anorexia nervosa.

2.4.2. Cognitive Bias Modification Training to Target Cognitive Biases Towards Social Stimuli

The interpersonal model of eating disorders developed by Rieger *et al*. [46] suggests that increased sensitivity to negative social feedback plays a role in the development and maintenance of eating disorders. An experimental medicine approach has been used to examine whether this model can translate into "add on" treatment for eating disorders. Cognitive bias modification includes a computerised training in which the individual is reinforced for attending to positive facial expressions or producing positive interpretations of ambiguous scenarios depicting the risk for rejection. In a case series of 28 patients with anorexia nervosa admitted for inpatient care the training was successful to produce an attention bias towards accepting faces and fewer negative interpretations [91]. Far-transfer effects were also found, in that patients reported lower levels of anxiety and higher self-compassion after watching a video clip of a supervisor making critical comments [91].

2.4.3. Radically Open-dialectical Behaviour Therapy

Radically open-dialectical behaviour therapy is based on many core principles of dialectical-behaviour therapy, but also includes a specific focus on social isolation and loneliness [92]. The proposal is that over-control develops from the interaction between heightened threat sensitivity, decreased reward sensitivity and early experiences that emphasise the importance of self-control [92]. Treatment involves individual therapy sessions, skills training group sessions, including training on interpersonal skills, telephone support and team consultations [93]. Preliminary testing of radically open-dialectical behaviour therapy for inpatients with restrictive anorexia nervosa found that the treatment was feasible and that it was associated with improvements in weight and general wellbeing [93].

2.4.4. The Role of Oxytocin in Social/emotional Functioning

Preclinical studies have found that the neuropeptide oxytocin may regulate social-emotional functioning [94] and also be involved in threat processing [95]. In humans, meta-analytic reviews have reported that intranasal oxytocin improves recognition of anger and happiness, and increases in-group trust with small effect size [96, 97]. Moreover, a recent meta-analysis found that a single dose of intranasal oxytocin lowered cortisol in clinical populations with chronic stress [98].

The possible role of oxytocin as a mechanism underpinning the anomalies in both threat and social emotional functioning in anorexia nervosa has been tested in single dose studies, with mixed findings. In one study, oxytocin reduced the raised level of cortisol in people with anorexia nervosa throughout the study period, suggesting that it may have a role in moderating the threat response [99]. In another study, a single dose of oxytocin was associated with increased emotional sensitivity in people with bulimia nervosa and healthy controls and had no effect in people with anorexia nervosa [100]. Also, oxytocin did not have an effect on the reduced facial expressivity which is seen in anorexia nervosa neither did it impact on theory of mind [101].

A recent randomised-controlled trial testing the efficacy of repeated administration of oxytocin over 4-6 weeks of intensive treatment found that the use of oxytocin was associated with reduced eating concern, cognitive rigidity and cortisol levels in patients with anorexia nervosa [102]. These results suggest that oxytocin might moderate stress response and eating concerns in people with anorexia nervosa, whereas its impact on emotional functioning appears less robust.

CONCLUSION

The importance of social difficulties in eating disorders has been emphasised in clinical research. Early social difficulties and adversity seem to precede the onset of the illness in some cases and interpersonal functioning deteriorates with illness progression. This impacts on family and peer relationships with the effect of isolating the individual and fuelling the disorder further. Several generic individual treatments have an interpersonal focus including IPT, FPT, CAT and MANTRA. The New Maudsley approach and EFFT have been developed for carers with the aim of restoring a balance to interpersonal relationships. More recently, adjunctive interventions to target specific anomalies in social functioning have been tested (*e.g*. CREST and CBM). The preliminary results from some of these interventions and trainings show potential.

CONSENT FOR PUBLICATION

Not applicable.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

ACKNOWLEDGEMENTS

Declared none.

REFERENCES

[1] McKnight, R.; Boughton, N. A patient's journey. Anorexia nervosa. *BMJ,* **2009**, *339*, b3800. [http://dx.doi.org/10.1136/bmj.b3800] [PMID: 19778976]

[2] Allen, K.L.; Crosby, R.D.; Oddy, W.H.; Byrne, S.M. Eating disorder symptom trajectories in adolescence: Effects of time, participant sex, and early adolescent depressive symptoms. *J. Eat. Disord.,* **2013**, *1*(1), 32. [http://dx.doi.org/10.1186/2050-2974-1-32] [PMID: 24999411]

[3] Doris, E.; Westwood, H.; Mandy, W.; Tchanturia, K. Patients with Anorexia Nervosa show similar friendships difficulties to people with Autism Spectrum Disorders: A Qualitative Study. *Psychol. Special Issue Autism,* **2014**, *5*, 1338-1349.

[4] Westwood, H.; Lawrence, V.; Fleming, C.; Tchanturia, K. Exploration of friendship experiences, before and after illness onset in females with anorexia nervosa: A qualitative study. *PLoS One,* **2016**, *11*(9), e0163528. [http://dx.doi.org/10.1371/journal.pone.0163528] [PMID: 27676072]

[5] Krug, I.; Penelo, E.; Fernandez-Aranda, F.; Anderluh, M.; Bellodi, L.; Cellini, E.; di Bernardo, M.; Granero, R.; Karwautz, A.; Nacmias, B.; Ricca, V.; Sorbi, S.; Tchanturia, K.; Wagner, G.; Collier, D.; Treasure, J. Low social interactions in eating disorder patients in childhood and adulthood: A multi-centre European case control study. *J. Health Psychol.,* **2013**, *18*(1), 26-37. [http://dx.doi.org/10.1177/1359105311435946] [PMID: 22491496]

[6] Rhind, C.; Bonfioli, E.; Hibbs, R.; Goddard, E.; Macdonald, P.; Gowers, S.; Schmidt, U.; Tchanturia, K.; Micali, N.; Treasure, J. An examination of autism spectrum traits in adolescents with anorexia nervosa and their parents. Mol Autism 2014; 20, 5(1): 56 [http://dx.doi.org/10.1186/2040-2392-5-56]

[7] Su, X.; Liang, H.; Yuan, W.; Olsen, J.; Cnattingius, S.; Li, J. Prenatal and early life stress and risk of eating disorders in adolescent girls and young women. *Eur. Child Adolesc. Psychiatry,* **2016**, *25*(11), 1245-1253. [http://dx.doi.org/10.1007/s00787-016-0848-z] [PMID: 27083434]

[8] Haynos, A.F.; Watts, A.W.; Loth, K.A.; Pearson, C.M.; Neumark-Stzainer, D. Factors predicting an escalation of restrictive eating during adolescence. *J. Adolesc. Health,* **2016**, *59*(4), 391-396. [http://dx.doi.org/10.1016/j.jadohealth.2016.03.011] [PMID: 27161416]

[9] Menzel, J.E.; Schaefer, L.M.; Burke, N.L.; Mayhew, L.L.; Brannick, M.T.; Thompson, J.K. Appearance-related teasing, body dissatisfaction, and disordered eating: A meta-analysis. *Body Image,* **2010**, *7*(4), 261-270. [http://dx.doi.org/10.1016/j.bodyim.2010.05.004] [PMID: 20655287]

[10] Puhl, R.M.; Wall, M.M.; Chen, C.; Bryn, A, S.; Eisenberg, M.E.; Neumark-Sztainer, D. Experiences of weight teasing in adolescence and weight-related outcomes in adulthood: A 15-year longitudinal study. *Prev. Med.,* **2017**, *100*, 173-179. [http://dx.doi.org/10.1016/j.ypmed.2017.04.023] [PMID: 28450124]

[11] Fairweather-Schmidt, A.K.; Wade, T.D. Weight-related peer-teasing moderates genetic and environmental risk and disordered eating: twin study. *Br. J. Psychiatry,* **2017**, *210*(5), 350-355. [http://dx.doi.org/10.1192/bjp.bp.116.184648] [PMID: 27979821]

[12] Zuba, A.; Warschburger, P. The role of weight teasing and weight bias internalization in psychological functioning: a prospective study among school-aged children. *Eur. Child Adolesc. Psychiatry,* **2017**, *26*(10), 1245-1255. [http://dx.doi.org/10.1007/s00787-017-0982-2] [PMID: 28361259]

[13] Jacobi, C.; Fittig, E.; Bryson, S.W.; Wilfley, D.; Kraemer, H.C.; Taylor, C.B. Who is really at risk? Identifying risk factors for subthreshold and full syndrome eating disorders in a high-risk sample. *Psychol. Med.,* **2011**, *41*(9), 1939-1949. [http://dx.doi.org/10.1017/S0033291710002631] [PMID: 21276276]

[14] Copeland, W.E.; Bulik, C.M.; Zucker, N.; Wolke, D.; Lereya, S.T.; Costello, E.J. Does childhood bullying predict eating disorder symptoms? A prospective, longitudinal analysis. *Int. J. Eat. Disord.,* **2015**, *48*(8), 1141-1149. [http://dx.doi.org/10.1002/eat.22459] [PMID: 26337405]

[15] Fitzsimmons-Craft, E.E.; Bardone-Cone, A.M. One-year temporal stability and predictive and incremental validity of the body, eating, and exercise comparison orientation measure (BEECOM) among college women. *Body Image,* **2014**, *11*(1), 27-35. [http://dx.doi.org/10.1016/j.bodyim.2013.09.003] [PMID: 24120182]

[16] Fitzsimmons-Craft, E.E.; Ciao, A.C.; Accurso, E.C. A naturalistic examination of social comparisons and disordered eating thoughts, urges, and behaviors in college women. *Int. J. Eat. Disord.,* **2016**, *49*(2), 141-150. [http://dx.doi.org/10.1002/eat.22486] [PMID: 26610301]

[17] Hansson, E.; Daukantaité, D.; Johnsson, P. Disordered eating and emotion dysregulation among adolescents and their parents. *BMC Psychol.,* **2017**, *5*(1), 12. [http://dx.doi.org/10.1186/s40359-017-0180-5] [PMID: 28376909]

[18] Loth, K.A.; MacLehose, R.; Bucchianeri, M.; Crow, S.; Neumark-Sztainer, D. Predictors of dieting and disordered eating behaviors from adolescence to young adulthood. *J. Adolesc. Health,* **2014**, *55*(5), 705-712. [http://dx.doi.org/10.1016/j.jadohealth.2014.04.016] [PMID: 24925491]

[19] Smolak, L.; Levine, M.P.; Schermer, F. Parental input and weight concerns among elementary school children. *Int. J. Eat. Disord.,* **1999**, *25*(3), 263-271. [http://dx.doi.org/10.1002/(SICI)1098-108X(199904)25:3<263::AID-EAT3>3.0.CO;2-V] [PMID: 10191990]

[20] Allison, S.; Warin, M.; Bastiampillai, T. Anorexia nervosa and social contagion: clinical implications. *Aust. N. Z. J. Psychiatry,* **2014**, *48*(2), 116-120. [http://dx.doi.org/10.1177/0004867413502092] [PMID: 23969627]

[21] Oldershaw, A.; Lavender, T.; Sallis, H.; Stahl, D.; Schmidt, U. Emotion generation and regulation in anorexia nervosa: a systematic review and meta-analysis of self-report data. *Clin. Psychol. Rev.,* **2015**, *39*, 83-95. [http://dx.doi.org/10.1016/j.cpr.2015.04.005] [PMID: 26043394]

[22] Caglar-Nazali, H.P.; Corfield, F.; Cardi, V.; Ambwani, S.; Leppanen, J.; Olabintan, O.; Deriziotis, S.; Hadjimichalis, A.; Scognamiglio, P.; Eshkevari, E.; Micali, N.; Treasure, J. A systematic review and meta-analysis of 'Systems for Social Processes' in eating disorders. *Neurosci. Biobehav. Rev.,* **2014**, *42*, 55-92. [http://dx.doi.org/10.1016/j.neubiorev.2013.12.002] [PMID: 24333650]

[23] Sternheim, L.; Startup, H.; Pretorius, N.; Johnson-Sabine, E.; Schmidt, U.; Channon, S. An experimental exploration of social problem solving and its associated processes in anorexia nervosa. *Psychiatry Res*., **2012**, *200*(2-3), 524-9. [http://dx.doi.org/10.1016/j.psychres.2012.06.029]

[24] Brockmeyer, T.; Pellegrino, J.; Münch, H.; Herzog, W.; Dziobek, I.; Friederich, H.C. Social cognition in anorexia nervosa: Specific difficulties in decoding emotional but not nonemotional mental

states. *Int. J. Eat. Disord.,* **2016**, *49*(9), 883-890. [http://dx.doi.org/10.1002/eat.22574] [PMID: 27315544]

[25] Renwick, B.; Dejong, H.; Kenyon, M.; Samarawickrema, N.; Loomes, R.; Watson, C.; Ghelani, S.; Schmidt, U. Social perception in people with eating disorders. *Eur. Psychiatry,* **2013**, *28*(7), 436-441. [http://dx.doi.org/10.1016/j.eurpsy.2013.03.004] [PMID: 23769324]

[26] Davies, H.; Wolz, I.; Leppanen, J.; Fernandez-Aranda, F.; Schmidt, U.; Tchanturia, K. Facial expression to emotional stimuli in non-psychotic disorders: A systematic review and meta-analysis. *Neurosci. Biobehav. Rev.,* **2016**, *64*, 252-271. [http://dx.doi.org/10.1016/j.neubiorev.2016.02.015] [PMID: 26915928]

[27] Dapelo, M.M.; Hart, S.; Hale, C.; Morris, R.; Lynch, T.R.; Tchanturia, K. Facial expression of positive emotions in individuals with eating disorders. *Psychiatry Res.,* **2015**, *230*(1), 70-77. [http://dx.doi.org/10.1016/j.psychres.2015.08.019] [PMID: 26323166]

[28] Cardi, V.; Corfield, F.; Leppanen, J.; Rhind, C.; Deriziotis, S.; Hadjimichalis, A.; Hibbs, R.; Micali, N.; Treasure, J. Emotional processing, recognition, empathy and evoked facial expression in eating disorders: An experimental study to map deficits in social cognition. *PLoS One*. **2015**, *10*(8), e0133827

[29] Dapelo, M.M.; Bodas, S.; Morris, R.; Tchanturia, K. Deliberately generated and imitated facial expressions of emotions in people with eating disorders. *J. Affect. Disord.,* **2016**, *191*, 1-7. [http://dx.doi.org/10.1016/j.jad.2015.10.044] [PMID: 26599363]

[30] Cardi, V.; Di Matteo, R.; Corfield, F.; Treasure, J. Social reward and rejection sensitivity in eating disorders: An investigation of attentional bias and early experiences. *World J. Biol. Psychiatry,* **2013**, *14*(8), 622-633. [http://dx.doi.org/10.3109/15622975.2012.665479] [PMID: 22424288]

[31] Cardi, V.; Di Matteo, R.; Gilbert, P.; Treasure, J. Rank perception and self-evaluation in eating disorders. *Int. J. Eat. Disord.,* **2014**, *47*(5), 543-552. [http://dx.doi.org/10.1002/eat.22261] [PMID: 24549635]

[32] Cardi, V.; Turton, R.; Schifano, S.; Leppanen, J.; Hirsch, C.R.; Treasure, J. Biased interpretation of ambiguous social scenarios in anorexia nervosa. *Eur. Eat. Disord. Rev.,* **2017**, *25*(1), 60-64. [http://dx.doi.org/10.1002/erv.2493] [PMID: 27943534]

[33] Ambwani, S.; Berenson, K.R.; Simms, L.; Li, A.; Corfield, F.; Treasure, J. Seeing things differently: An experimental investigation of social cognition and interpersonal behavior in anorexia nervosa. *Int. J. Eat. Disord.,* **2016**, *49*(5), 499-506. [http://dx.doi.org/10.1002/eat.22498] [PMID: 26712303]

[34] Arcelus, J.; Haslam, M.; Farrow, C.; Meyer, C. The role of interpersonal functioning in the maintenance of eating psychopathology: A systematic review and testable model. *Clin. Psychol. Rev.,* **2013**, *33*(1), 156-167. [http://dx.doi.org/10.1016/j.cpr.2012.10.009] [PMID: 23195616]

[35] Butler, E.A.; Egloff, B.; Wilhelm, F.H.; Smith, N.C.; Erickson, E.A.; Gross, J.J. The social consequences of expressive suppression. *Emotion,* **2003**, *3*(1), 48-67. [http://dx.doi.org/10.1037/1528-3542.3.1.48] [PMID: 12899316]

[36] Mesman, J.; van Ijzendoorn, M.H. Bakermans-Kranenburg. The many faces of the Still-Face Paradigm: A review and meta-analysis. *Dev. Rev.,* **2009**, *29*(2), 120-162. [http://dx.doi.org/10.1016/j.dr.2009.02.001]

[37] Levine, M.P. Loneliness and eating disorders. *J. Psychol.,* **2012**, *146*(1-2), 243-257. [http://dx.doi.org/10.1080/00223980.2011.606435] [PMID: 22303623]

[38] Geller, J.; Iyar, M.; Srikameswaran, S.; Zelichowska, J.; Dunn, E.C. Social support satisfaction in adults with eating disorders: Does stance matter? *Int. J. Eat. Disord.,* **2017**, *50*(7), 842-846. [http://dx.doi.org/10.1002/eat.22695] [PMID: 28199028]

[39] Kothari, R.; Barona, M.; Treasure, J.; Micali, N. Social cognition in children at familial high-risk of developing an eating disorder. *Front. Behav. Neurosci.,* **2015**, *9*, 208. [http://dx.doi.org/10.3389/fnbeh.2015.00208] [PMID: 26300753]

[40] Bentz, M.; Jepsen, J.R.; Pedersen, T.; Bulik, C.M.; Pedersen, L.; Pagsberg, A.K.; Plessen, K.J. Impairment of social function in young females with recent-onset anorexia nervosa and recovered individuals. *J. Adolesc. Health,* **2017**, *60*(1), 23-32. [http://dx.doi.org/10.1016/j.jadohealth.2016.08.011] [PMID: 28341015]

[41] Kanakam, N.; Krug, I.; Raoult, C.; Collier, D.; Treasure, J. Social and emotional processing as a behavioural endophenotype in eating disorders: a pilot investigation in twins. *Eur. Eat. Disord. Rev.,* **2013**, *21*(4), 294-307. [http://dx.doi.org/10.1002/erv.2232] [PMID: 23649701]

[42] Leppanen, J.; Dapelo, M.M.; Davies, H.; Lang, K.; Treasure, J.; Tchanturia, K. Computerised analysis of facial emotion expression in eating disorders. *PLoS One,* **2017**, *12*(6), e0178972. [http://dx.doi.org/10.1371/journal.pone.0178972] [PMID: 28575109]

[43] Davies, H.; Schmidt, U.; Tchanturia, K. Emotional facial expression in women recovered from anorexia nervosa. *BMC Psychiatry,* **2013**, *13*, 291. [http://dx.doi.org/10.1186/1471-244X-13-291] [PMID: 24200423]

[44] Schmidt, U.; Treasure, J. Anorexia nervosa: Valued and visible. A cognitive-interpersonal maintenance model and its implications for research and practice. *Br. J. Clin. Psychol.,* **2006**, *45*(Pt 3), 343-366. [http://dx.doi.org/10.1348/014466505X53902] [PMID: 17147101]

[45] Goss, K.; Gilbert, P. Eating disorders, shame and pride: A cognitive-behavioural functional analysis. Body shame: Conceptualisation, research and treatment; Gilbert, P.; Miles, G., Eds.; Brunner-Routledge: London, **2002**.

[46] Rieger, E.; Van Buren, D.J.; Bishop, M.; Tanofsky-Kraff, M.; Welch, R.; Wilfley, D.E. An eating disorder-specific model of interpersonal psychotherapy (IPT-ED): causal pathways and treatment implications. *Clin. Psychol. Rev.,* **2010**, *30*(4), 400-410. [http://dx.doi.org/10.1016/j.cpr.2010.02.001] [PMID: 20227151]

[47] Wilfley, D.E.; Welch, R.R.; Stein, R.I.; Spurrell, E.B.; Cohen, L.R.; Saelens, B.E.; Dounchis, J.Z.; Frank, M.A.; Wiseman, C.V.; Matt, G.E. A randomized comparison of group cognitive-behavioral therapy and group interpersonal psychotherapy for the treatment of overweight individuals with binge-eating disorder. *Arch. Gen. Psychiatry,* **2002**, *59*(8), 713-721. [http://dx.doi.org/10.1001/archpsyc.59.8.713] [PMID: 12150647]

[48] Raykos, B.C.; McEvoy, P.M.; Fursland, A. Socializing problems and low self-esteem enhance interpersonal models of eating disorders: Evidence from a clinical sample. *Int. J. Eat. Disord.,* **2017**, *50*(9), 1075-1083. [http://dx.doi.org/10.1002/eat.22740] [PMID: 28649729]

[49] De Paoli, T.; Fuller-Tyszkiewicz, M.; Halliwell, E.; Puccio, F.; Krug, I. Social rank and rejection sensitivity as mediators of the relationship between insecure attachment and disordered eating. *Eur. Eat. Disord. Rev.,* **2017**, *25*(6), 469-478. [http://dx.doi.org/10.1002/erv.2537] [PMID: 28752904]

[50] Halmi, K.A. Salient components of a comprehensive service for eating disorders. *World Psychiatry,* **2009**, *8*(3), 150-155. [http://dx.doi.org/10.1002/j.2051-5545.2009.tb00235.x] [PMID: 19812744]

[51] Fairburn, C.G. Interpersonal psychotherapy for bulimia nervosa. Handbook of Treatment for Eating Disorders; Garner, D.M.; Garfinkel, P.E., Eds.; Guilford Press: New York, **1997**, pp. 278-294.

[52] Agras, W.S.; Walsh, T.; Fairburn, C.G.; Wilson, G.T.; Kraemer, H.C. A multicenter comparison of cognitive-behavioral therapy and interpersonal psychotherapy for bulimia nervosa. *Arch. Gen. Psychiatry,* **2000**, *57*(5), 459-466. [http://dx.doi.org/10.1001/archpsyc.57.5.459] [PMID: 10807486]

[53] Fairburn, C.G.; Jones, R.; Peveler, R.C.; Carr, S.J.; Solomon, R.A.; O'Connor, M.E.; Burton, J.; Hope, R.A. Three psychological treatments for bulimia nervosa. A comparative trial. *Arch. Gen. Psychiatry,* **1991**, *48*(5), 463-469. [http://dx.doi.org/10.1001/archpsyc.1991.01810290075014] [PMID: 2021299]

[54] Fairburn, C.G.; Jones, R.; Peveler, R.C.; Hope, R.A.; O'Connor, M. Psychotherapy and bulimia nervosa. Longer-term effects of interpersonal psychotherapy, behavior therapy, and cognitive behavior therapy. *Arch. Gen. Psychiatry,* **1993**, *50*(6), 419-428. [http://dx.doi.org/10.1001/archpsyc.1993.01820180009001] [PMID: 8498876]

[55] Wilfley, D.E.; Agras, W.S.; Telch, C.F.; Rossiter, E.M.; Schneider, J.A.; Cole, A.G.; Sifford, L.A.; Raeburn, S.D. Group cognitive-behavioral therapy and group interpersonal psychotherapy for the nonpurging bulimic individual: A controlled comparison. *J. Consult. Clin. Psychol.,* **1993**, *61*(2), 296-305. [http://dx.doi.org/10.1037/0022-006X.61.2.296] [PMID: 8473584]

[56] Wilfley, D.E.; Welch, R.R.; Stein, R.I.; Spurrell, E.B.; Cohen, L.R.; Saelens, B.E.; Dounchis, J.Z.; Frank, M.A.; Wiseman, C.V.; Matt, G.E. A randomized comparison of group cognitive-behavioral therapy and group interpersonal psychotherapy for the treatment of overweight individuals with binge-eating disorder. *Arch. Gen. Psychiatry,* **2002**, *59*(8), 713-721. [http://dx.doi.org/10.1001/archpsyc.59.8.713] [PMID: 12150647]

[57] Arcelus, J.; Whight, D.; Brewin, N.; McGrain, L. A brief form of interpersonal psychotherapy for adult patients with bulimic disorders: a pilot study. *Eur. Eat. Disord. Rev.,* **2012**, *20*(4), 326-330. [http://dx.doi.org/10.1002/erv.2164] [PMID: 22383297]

[58] McIntosh, V.V.; Jordan, J.; Carter, F.A.; Luty, S.E.; McKenzie, J.M.; Bulik, C.M.; Frampton, C.M.; Joyce, P.R. Three psychotherapies for anorexia nervosa: A randomized, controlled trial. *Am. J. Psychiatry,* **2005**, *162*(4), 741-747. [http://dx.doi.org/10.1176/appi.ajp.162.4.741] [PMID: 15800147]

[59] Carter, F.A.; Jordan, J.; McIntosh, V.V.; Luty, S.E.; McKenzie, J.M.; Frampton, C.M.; Bulik, C.M.; Joyce, P.R. The long-term efficacy of three psychotherapies for anorexia nervosa: a randomized, controlled trial. *Int. J. Eat. Disord.,* **2011**, *44*(7), 647-654. [http://dx.doi.org/10.1002/eat.20879] [PMID: 21997429]

[60] Ryle, A.; Kellett, S.; Hepple, J.; Calvert, R. Cognitive analytic therapy at 30. *Adv. Psychiatry. Treat.,* **2014**, *20*(4), 258-268. [http://dx.doi.org/10.1192/apt.bp.113.011817]

[61] Ryle, A.; Kerr, I.B. Cognitive analytic therapy. *Br. J. Psychiatry,* **2003**, *183*(1), 79. [http://dx.doi.org/10.1192/bjp.183.1.79] [PMID: 12835257]

[62] Dare, C.; Eisler, I.; Russell, G.; Treasure, J.; Dodge, L. Psychological therapies for adults with anorexia nervosa: Randomised controlled trial of out-patient treatments. *Br. J. Psychiatry,* **2001**, *178*, 216-221. [http://dx.doi.org/10.1192/bjp.178.3.216] [PMID: 11230031]

[63] Treasure, J.; Todd, G.; Brolly, M.; Tiller, J.; Nehmed, A.; Denman, F. A pilot study of a randomised trial of cognitive analytical therapy *vs* educational behavioral therapy for adult anorexia nervosa. *Behav. Res. Ther.,* **1995**, *33*(4), 363-367. [http://dx.doi.org/10.1016/0005-7967(94)00070-Z] [PMID: 7755523]

[64] Dare, C.; Crowther, C. Living dangerously: Psychoanalytic psychotherapy of anorexia nervosa. Eating disorders: Handbook of theory, treatment and research; Szmukler, G.; Dare, C.; Treasure, J., Eds.; John Wiley & Sons: Chichester, **1995**.

[65] Wild, B.; Friederich, H.C.; Gross, G.; Teufel, M.; Herzog, W.; Giel, K.E.; de Zwaan, M.; Schauenburg, H.; Schade-Brittinger, C.; Schäfer, H.; Zipfel, S. The ANTOP study: Focal psychodynamic psychotherapy, cognitive-behavioural therapy, and treatment-as-usual in outpatients with anorexia nervosa - a randomized controlled trial. Trials. 2009, 23; 10: 23

[66] Zipfel, S.; Wild, B.; Groß, G.; Friederich, H.C.; Teufel, M.; Schellberg, D.; Giel, K.E. Focal psychodynamic therapy, cognitive behaviour therapy, and optimised treatment as usual in outpatients with anorexia nervosa (ANTOP study): Randomised controlled trial. Lancet. 2014; 11; 383(9912): 127-37

[67] Schmidt, U.; Renwick, B.; Lose, A. The MOSAIC study - comparison of the Maudsley Model of Treatment for adults with Anorexia Nervosa (MANTRA) with Specialist Supportive Clinical Management (SSCM) in outpatients with anorexia nervosa or eating disorder not otherwise specified, anorexia nervosa type: study protocol for a randomized controlled trial. *Bio. Med. Central,* **2013**, *30*, 14-160.

[68] Schmidt, U.; Magill, N.; Renwick, B.; Keyes, A.; Kenyon, M.; Dejong, H.; Lose, A.; Broadbent, H.; Loomes, R.; Yasin, H.; Watson, C.; Ghelani, S.; Bonin, E.M.; Serpell, L.; Richards, L.; Johnson-Sabine, E.; Boughton, N.; Whitehead, L.; Beecham, J.; Treasure, J.; Landau, S. 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. *J. Consult. Clin. Psychol.,* **2015**, *83*(4), 796-807. [http://dx.doi.org/10.1037/ccp0000019] [PMID: 25984803]

[69] Byrne, S.; Wade, T.; Hay, P.; Touyz, S.; Fairburn, C.G.; Treasure, J.; Schmidt, U.; McIntosh, V.; Allen, K.; Fursland, A.; Crosby, R.D. A randomised controlled trial of three psychological treatments for anorexia nervosa. *Psychol. Med.,* **2017**, *29*, 1-11. [PMID: 28552083]

[70] Allen, K.L.; O'Hara, C.B.; Bartholdy, S.; Renwick, B.; Keyes, A.; Lose, A.; Kenyon, M.; DeJong, H.; Broadbent, H.; Loomes, R.; McClelland, J.; Serpell, L.; Richards, L.; Johnson-Sabine, E.; Boughton, N.; Whitehead, L.; Treasure, J.; Wade, T.; Schmidt, U. Written case formulations in the treatment of anorexia nervosa: Evidence for therapeutic benefits. *Int. J. Eat. Disord.,* **2016**, *49*(9), 874-882. [http://dx.doi.org/10.1002/eat.22561] [PMID: 27257748]

[71] Schmidt, U.; Ryan, E.G.; Bartholdy, S.; Renwick, B.; Keyes, A.; O'Hara, C.; McClelland, J.; Lose, A.; Kenyon, M.; Dejong, H.; Broadbent, H.; Loomes, R.; Serpell, L.; Richards, L.; Johnson-Sabine, E.; Boughton, N.; Whitehead, L.; Bonin, E.; Beecham, J.; Landau, S.; Treasure, J. Two-year follow-up of the MOSAIC trial: A multicenter randomized controlled trial comparing two psychological treatments in adult outpatients with broadly defined anorexia nervosa. *Int. J. Eat. Disord.,* **2016**, *49*(8), 793-800. [http://dx.doi.org/10.1002/eat.22523] [PMID: 27061709]

[72] Cardi, V; Ambwani, S; Crosby, R; Macdonald, P; Todd, G; Park, J Self-Help And Recovery guide for Eating Disorders (SHARED): study protocol for a randomized controlled trial. *Trials*. **2015**, *16*, 165.

[73] Lock, J.; Le Grange, D. Treatment Manual for Anorexia Nervosa: A Family-Based Approach, 2nd ed; Guilford Press: New York, **2013**.

[74] Eisler, I.; Simic, M.; Hodsoll, J.; Asen, E.; Berelowitz, M.; Connan, F.; Ellis, G.; Hugo, P.; Schmidt, U.; Treasure, J.; Yi, I.; Landau, S. A pragmatic randomised multi-centre trial of multifamily and single family therapy for adolescent anorexia nervosa. *BMC Psychiatry,* **2016**, *16*(1), 422. [http://dx.doi.org/10.1186/s12888-016-1129-6] [PMID: 27881106]

[75] Treasure, J.; Rhind, C.; Macdonald, P.; Todd, G. Collaborative Care: The new maudsley model. *Eat. Disord.,* **2015**, *23*(4), 366-376. [http://dx.doi.org/10.1080/10640266.2015.1044351] [PMID: 26010051]

[76] Robinson, A.L.; Dolhanty, J.; Greenberg, L. Emotion-focused family therapy for eating disorders in children and adolescents. *Clin. Psychol. Psychother.,* **2015**, *22*(1), 75-82. [http://dx.doi.org/10.1002/cpp.1861] [PMID: 23913713]

[77] Treasure, J.; Smith, G.; Crane, A. Skills-based learning for caring for a loved one with an eating disorder: The new Maudsley method, 2nd ed; Routledge: London, **2016**.

[78] Grover, M.; Naumann, U.; Mohammad-Dar, L.; Glennon, D.; Ringwood, S.; Eisler, I.; Williams, C.; Treasure, J.; Schmidt, U. A randomized controlled trial of an Internet-based cognitive-behavioural skills package for carers of people with anorexia nervosa. *Psychol. Med.,* **2011**, *41*(12), 2581-2591. [http://dx.doi.org/10.1017/S0033291711000766] [PMID: 21733215]

[79] Goddard, E.; Salerno, L.; Hibbs, R.; Raenker, S.; Naumann, U.; Arcelus, J.; Ayton, A.; Boughton, N.; Connan, F.; Goss, K.; Lacey, H.; Laszlo, B.; Morgan, J.; Moore, K.; Robertson, D.; Schreiber-Kounine, C.; Sharma, S.; Whitehead, L.; Schmidt, U.; Treasure, J. Empirical examination of the interpersonal maintenance model of anorexia nervosa. *Int. J. Eat. Disord.,* **2013**, *46*(8), 867-874. [http://dx.doi.org/10.1002/eat.22172] [PMID: 23946124]

[80] Hibbs, R.; Magill, N.; Goddard, E.; Rhind, C.; Raenker, S.; Macdonald, P.; Todd, G.; Arcelus, J.; Morgan, J.; Beecham, J.; Schmidt, U.; Landau, S.; Treasure, J. Clinical effectiveness of a skills training intervention for caregivers in improving patient and caregiver health following in-patient treatment for severe anorexia nervosa: pragmatic randomised controlled trial. *B. J. Psych. Open,* **2015**, *1*(1), 56-66. [http://dx.doi.org/10.1192/bjpo.bp.115.000273] [PMID: 27703724]

[81] Sepulveda, A.R.; Lopez, C.; Todd, G.; Whitaker, W.; Treasure, J. An examination of the impact of "the Maudsley eating disorder collaborative care skills workshops" on the well being of carers: a pilot study. *Soc. Psychiatry Psychiatr. Epidemiol.,* **2008**, *43*(7), 584-591. [http://dx.doi.org/10.1007/s00127-008-0336-y] [PMID: 18360732]

[82] Whitney, J.; Murphy, T.; Landau, S.; Gavan, K.; Todd, G.; Whitaker, W.; Treasure, J. A practical comparison of two types of family intervention: an exploratory RCT of family day workshops and individual family work as a supplement to inpatient care for adults with anorexia nervosa. *Eur. Eat. Disord. Rev.,* **2012**, *20*(2), 142-150. [http://dx.doi.org/10.1002/erv.1076] [PMID: 21732500]

[83] Magill, N.; Rhind, C.; Hibbs, R.; Goddard, E.; Macdonald, P.; Arcelus, J.; Morgan, J.; Beecham, J.; Schmidt, U.; Landau, S.; Treasure, J. Two-year follow-up of a pragmatic randomised controlled trial examining the effect of adding a carer's skill training intervention in inpatients with anorexia nervosa. *Eur. Eat. Disord. Rev.,* **2016**, *24*(2), 122-130. [http://dx.doi.org/10.1002/erv.2422] [PMID: 26695507]

[84] Cardi, V.; Ambwani, S.; Robinson, E.; Albano, G.; MacDonald, P.; Aya, V.; Rowlands, K.; Todd, G.; Schmidt, U.; Landau, S.; Arcelus, J.; Beecham, J.; Treasure, J. Transition care in anorexia ner-

vosa through guidance online from peer and carer expertise (TRIANGLE): study protocol for a randomised controlled trial. *Eur. Eat. Disord. Rev.,* **2017**, *25*(6), 512-523. [http://dx.doi.org/10.1002/erv.2542] [PMID: 28944595]

[85] Tchanturia, K.; Doris, E.; Mountford, V.; Fleming, C. Cognitive remediation and emotion skills training (CREST) for anorexia nervosa in individual format: Self-reported outcomes. *BMC Psychiatry*. **2015**, *20*, 15: 53.

[86] Tchanturia, K.; Doris, E.; Fleming, C. Effectiveness of cognitive remediation and emotion skills training (CREST) for anorexia nervosa in group format: a naturalistic pilot study. *Eur. Eat. Disord. Rev.,* **2014**, *22*(3), 200-205. [http://dx.doi.org/10.1002/erv.2287] [PMID: 24616049]

[87] 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. *Eur. Eat. Disord. Rev.,* **2017**, *25*(4), 227-236. [http://dx.doi.org/10.1002/erv.2522] [PMID: 28573705]

[88] Westwood, H.; Kerr-Gaffney, J.; Stahl, D.; Tchanturia, K. Alexithymia in eating disorders: Systematic review and meta-analyses of studies using the Toronto Alexithymia Scale. *J. Psychosom. Res.,* **2017**, *99*, 66-81. [http://dx.doi.org/10.1016/j.jpsychores.2017.06.007] [PMID: 28712432]

[89] Money, C.; Genders, R.; Treasure, J.; Schmidt, U.; Tchanturia, K. A brief emotion focused intervention for inpatients with anorexia nervosa: A qualitative study. *J. Health Psychol.,* **2011**, *16*(6), 947-958. [http://dx.doi.org/10.1177/1359105310396395] [PMID: 21441359]

[90] Davies, H.; Fox, J.; Naumann, U.; Treasure, J.; Schmidt, U.; Tchanturia, K. Cognitive remediation and emotion skills training for anorexia nervosa: An observational study using neuropsychological outcomes. *Eur. Eat. Disord. Rev.,* **2012**, *20*(3), 211-217. [http://dx.doi.org/10.1002/erv.2170] [PMID: 22431401]

[91] Cardi, V.; Esposito, M.; Bird, G.; Rhind, C.; Yiend, J.; Schifano, S.; Hirsch, C.; Treasure, J. A preliminary investigation of a novel training to target cognitive biases towards negative social stimuli in Anorexia Nervosa. *J. Affect. Disord.,* **2015**, *188*(188), 188-193. [http://dx.doi.org/10.1016/j.jad.2015.08.019] [PMID: 26363616]

[92] Lynch, T.R.; Hempel, R.J.; Dunkley, C. Radically open-dialectical behavior therapy for disorders of over-control: signaling matters. *Am. J. Psychother.,* **2015**, *69*(2), 141-162. [http://dx.doi.org/10.1176/appi.psychotherapy.2015.69.2.141] [PMID: 26160620]

[93] Lynch, T.R.; Gray, K.L.; Hempel, R.J.; Titley, M.; Chen, E.Y.; O'Mahen, H.A. Radically open-dialectical behavior therapy for adult anorexia nervosa: feasibility and outcomes from an inpatient program. *BMC Psychiatry,* **2013**, *13*, 293. [http://dx.doi.org/10.1186/1471-244X-13-293] [PMID: 24199611]

[94] Dölen, G.; Darvishzadeh, A.; Huang, K.W.; Malenka, R.C. Social reward requires coordinated activity of nucleus accumbens oxytocin and serotonin. *Nature,* **2013**, *501*(7466), 179-184. [http://dx.doi.org/10.1038/nature12518] [PMID: 24025838]

[95] Zheng, J.; Babygirija, R.; Bülbül, M.; Cerjak, D.; Ludwig, K.; Takahashi, T. Hypothalamic oxytocin mediates adaptation mechanism against chronic stress in rats. *Am. J. Physiol. Gastrointest. Liver Physiol.,* **2010**, *299*(4), G946-G953. [http://dx.doi.org/10.1152/ajpgi.00483.2009] [PMID: 20689056]

[96] Shahrestani, S.; Kemp, A.H.; Guastella, A.J. The impact of a single administration of intranasal oxytocin on the recognition of basic emotions in humans: A meta-analysis. *Neuropsychopharmacology,* **2013**, *38*(10), 1929-1936. [http://dx.doi.org/10.1038/npp.2013.86] [PMID: 23575742]

[97] Van IJzendoorn, M.H.; Bakermans-Kranenburg, M.J. A sniff of trust: meta-analysis of the effects of intranasal oxytocin administration on face recognition, trust to in-group, and trust to out-group. *Psychoneuroendocrinology,* **2012**, *37*(3), 438-443. [http://dx.doi.org/10.1016/j.psyneuen.2011.07.008] [PMID: 21802859]

[98] Cardoso, C.; Kingdon, D.; Ellenbogen, M.A. A meta-analytic review of the impact of intranasal oxytocin administration on cortisol concentrations during laboratory tasks: Moderation by method and mental health. *Psychoneuroendocrinology,* **2014**, *49*, 161-170. [http://dx.doi.org/10.1016/j.psyneuen.2014.07.014] [PMID: 25086828]

[99] Leppanen, J.; Cardi, V.; Ng, K.W.; Paloyelis, Y.; Stein, D.; Tchanturia, K.; Treasure, J. The effects of intranasal oxytocin on smoothie intake, cortisol and attentional bias in anorexia nervosa. *Psychoneuroendocrinology,* **2017**, *79*, 167-174. [http://dx.doi.org/10.1016/j.psyneuen.2017.01.017] [PMID: 28288443]

[100] Kim, Y.R.; Eom, J.S.; Yang, J.W.; Kang, J.; Treasure, J. The impact of oxytocin on food intake and emotion recog-nition in patients with eating disorders: a double blind single dose within-subject cross-over design. *PLoS One*, **2015**, *24*, *10*(9), e0137514

[101] Leppanen, J.; Cardi, V.; Ng, K.W.; Paloyelis, Y.; Stein, D.; Tchanturia, K.; Treasure, J. Effects of intranasal oxytocin on the interpretation and expression of emotions in anorexia nervosa. *J. Neuroendocrinol.,* **2017**, *29*(3), 29. [http://dx.doi.org/10.1111/jne.12458] [PMID: 28140486]

[102] Russell, J.; Maguire, S.; Hunt, G.E.; Kesby, A.; Suraev, A.; Stuart, J.; Booth, J.; McGregor, I.S. Intranasal oxytocin in the treatment of anorexia nervosa: Randomized controlled trial during re-feeding. *Psychoneuroendocrinology,* **2018**, *87*, 83-92. [http://dx.doi.org/10.1016/j.psyneuen.2017.10.014] [PMID: 29049935]