Is there a place for mindfulness in the treatment of anorexia nervosa?

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Published online: 24 May 2013.

To cite this article: Irene Mateos Rodríguez, Felicity A. Cowdrey & Rebecca J. Park (2014) Is there a place for mindfulness in the treatment of anorexia nervosa?, Advances in Eating Disorders: Theory, Research and Practice, 2:1, 42-52, DOI: 10.1080/21662630.2013.795755

To link to this article: http://dx.doi.org/10.1080/21662630.2013.795755
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Is there a place for mindfulness in the treatment of anorexia nervosa?

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(Received 27 December 2012; final version received 9 April 2013)

This article examines whether mindfulness has a place in the treatment of anorexia nervosa (AN). A theoretical rationale for the inclusion of mindfulness strategies in the treatment of AN is provided. Empirical evidence supporting the use of mindfulness-based interventions in eating disorders (EDs) is considered drawing on the existing research in bulimia nervosa and binge ED before moving onto preliminary studies investigating the effects of mindfulness in the treatment of AN. Evidence is emerging that mindfulness-based interventions may be able to target some aspects of the underlying psychopathology in AN, eliciting changes in eating behaviour as well as cognitive-affective processing. This conclusion is compromised by significant methodological limitations of the extant studies. We discuss implications for treatment and further research on the potential use of mindfulness in the management of AN.

Keywords: anorexia nervosa; treatment; eating disorder; rumination; mindfulness

Introduction

Individuals with anorexia nervosa (AN) limit their dietary intake in order to maintain a severely low body weight, they over-evaluate their shape and weight and ability to control these indices and display an intense fear of gaining weight or becoming fat (American Psychiatric Association [APA], 2000). To date there is a weak evidence-base for the treatment of adult AN (Bulik, Baucom, & Kirby, 2012; Fairburn, 2005; National Institute for Clinical Excellence [NICE], 2004) and AN continues to have the highest mortality rate of any psychiatric disorder (Bulik et al., 2012). New treatments and/or strategies that augment the effect of existing interventions for AN are desperately needed (Bulik et al., 2012; Park, Dunn, & Barnard, 2011, 2012).

Current psychological treatments and barriers to effective treatment

A number of psychological treatments have been evaluated for the treatment of AN including enhanced cognitive-behavioural therapy (CBT), interpersonal psychotherapy and family-based interventions (for a review see Hay, Touyz, & Sud, 2012). However, there are few methodologically sound randomised controlled trials (RCTs) evaluating the efficacy of psychological treatments of AN. Outcomes from the existing RCTs in AN leave much to be desired with only modest improvements in symptomatology as well as high dropout and relapse rates.
Potential barriers to the successful psychological treatment of AN include the egosyntonic nature of the disorder (Halmi et al., 2005), aberrant sense of reward (Park et al., 2011, 2012) and high levels of psychiatric comorbidity (Salbach-Andrae, Bohnekamp, Pfeiffer, Lehmkuhl, & Miller, 2008). The division between intellectual-cognitive and emotional meanings in AN (for example, ‘I know I am thin but I feel fat!’) is also recognised as a significant challenge in the psychological treatment of AN (Park et al., 2012). The difficulty some individuals with AN have in converting what they think intellectually to what they feel emotionally may be particularly problematic for psychological theories and treatments of AN which focus predominantly on the content of cognition, ignoring details of underlying cognitive, emotional and somatic processes and the interactions between such processes (Park et al., 2011, 2012). In order to improve treatment outcome for AN, the cognitive-affective mechanisms maintaining AN need to be better understood and subsequently addressed. Contemporary frameworks for AN have identified specific processes which may maintain AN (Park et al., 2011, 2012) and such frameworks have led to an increased interest in the application of experiential strategies, such as mindfulness and acceptance-based strategies, to the treatment of AN.

**Cognitive-affective maintaining mechanisms in AN**

A novel process account of AN (Park et al., 2011, 2012) suggests that abnormal cognitive, emotional and somatic processing in AN manifests in a mindset described as ‘AN doing mode’. This mode of mind is characterised by ruminative preoccupation with control of eating, weight and shape together with abnormal interoception and a perverse sense of reward (Park et al., 2011). This process account of AN is derived from a meta-theoretical information processing framework – interacting cognitive subsystem (ICS) – which describes the mind in terms of interactions between different cognitive subsystems (Teasdale & Barnard, 1993). By specifying the interactions between cognitive, affective and somatic processes, ICS enables conflicting aspects of psychological experience to be modelled (Teasdale & Barnard, 1993). This framework has been applied to a number of psychopathological conditions, most notably depression (Teasdale, 1999; Teasdale & Barnard, 1993) and in part facilitated the development of mindfulness-based cognitive therapy (MBCT) for depression (Segal, Williams, & Teasdale, 2002; Williams & Kuyken, 2012).

Park et al. (2011, 2012) have applied core principles from the ICS to explain the complex interaction between cognitions, emotions and somatic processes in AN. More specifically, it is proposed that in ‘doing AN mode’ attention is directed to ruminative streams of thought that focus on eating, weight and shape and their control whilst broader emotional meanings and bodily states (such as coldness and hunger) associated with starvation are neglected (Park et al., 2011). This intense ruminative focus may enable individuals with AN to uphold restrictive eating practices. Clinically, the avoidance of emotions and somatic experiences associated with starvation may explain the discrepancy between emotion-laden experiences of the body and intellectually explicit facts about the body – a discrepancy which has been identified as a specific barrier to current psychological interventions. This ICS process account of AN (Park et al., 2011, 2012) predicts that eating disorder (ED) psychopathology may be attenuated by interrupting the ‘doing AN’ mode and enhancing a mindful experiencing or ‘being embodied’ mode of self-focus. It is predicted that this shift in the processing mode would be characterised by a reduction in rumination and experiential avoidance and an increase in mindful awareness and non-judgemental attention to bodily states and emotional experiences (Park et al., 2012). Thus salient sensory and emotional cues that were previously avoided would be attended to directly and incorporated into more healthy self-representations which in turn...
may reduce ruminative processing (Park et al., 2012). Akin to that seen in depression, mindfulness strategies may be one way to facilitate a shift in the processing mode (Cowdrey, 2012; Park et al., 2012).

**Mindfulness**

Mindfulness has been defined as ‘awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally, to the unfolding of experience moment-by-moment’ (Kabat-Zinn, 2003, p. 145). Strategies which facilitate mindfulness have been combined with cognitive techniques to target a range of psychological disorders. For example, MBCT for depression aims to train individuals with a history of depression to recognise and disengage from depressogenic thinking styles, and this approach has been shown to reduce residual depressive symptoms and the risk of relapse (Geschwind, Peeters, Huibers, van Os, & Wichers, 2012; Segal et al., 2002). Mindfulness-based strategies are now also being incorporated into treatments for EDs and theoretically it seems plausible that mindfulness may be an effective strategy for the treatment of AN.

**Theoretical rationale for the use of mindfulness-based approaches to treat AN**

**The effect of mindfulness on rumination and working memory**

Ruminative processing is characterised by conscious self-focused dwelling on negative thoughts, emotions or experiences (Davis & Nolen-Hoeksema, 2000). In AN, ruminative processing is focused on control of eating, weight, and shape, and it has been proposed that this functions to avoid broader relational meanings and bodily states associated with starvation (Cowdrey, 2012; Cowdrey & Park, 2011, 2012; Park et al., 2011). There is emerging evidence from the neuroimaging literature that even after recovery, individuals with a history of AN have increased functional connectivity in the default mode network which is thought to be involved in self-referential processing or rumination (Cowdrey, Filippini, Park, Smith & McCabe, 2012). Meditation practice has been shown to affect the functional connectivity of this network (e.g. Taylor et al., 2012). Taylor et al. (2012) found that regions involved in self-referential processing or rumination are less active not only during a meditative state, but also at rest. Therefore, mindfulness practice could help decrease ruminative processing in AN, an effect which could be measured using a combination of self-report measures and more objective indices such as functional brain imaging.

Engagement in ruminative processing has been shown to compromise working memory (Brooks et al., 2012; Cowdrey & Park, 2012). Impaired working memory compromises other cognitive abilities such as concentration, decision-making and attending to the present, all of which are needed to engage successfully in psychological treatments (Park et al., 2012). In a recent experimental study, Brooks et al. (2012) examined the effect of subliminally presented food stimuli on working memory in restricting AN participants compared to those never ill. It was reported that the participants with AN had superior working memory, but this effect was lost when the subliminal food stimuli (and not neutral or aversive stimuli) were presented (Brooks et al., 2012). The authors suggested that food stimuli may trigger rumination on control of eating, weight and shape which may compete for limited attentional resources and as a result interfere with working memory performance (Brooks et al., 2012).

Mindfulness practice has been shown to significantly increase working memory capacity as measured by a digit-span task, and persistent practice significantly protected the working memory capacity of healthy individuals in the face of stress (see Chiesa, Calati, & Serretti, 2011 for review). It is, therefore, plausible that mindfulness could improve working memory.
function in AN, possibly through a reduction in rumination on eating, weight and shape. Future studies should directly examine the mechanisms of change and more specifically the hypothesis that mindfulness improves working memory through a reduction in rumination.

The effect of mindfulness on avoidance and direct experience
A number of theoretical frameworks for AN associate with the process of rumination with avoidance. For example, Park et al. (2011) suggest that rumination on themes of eating, weight and shape enable individuals to avoid emotional and body state cues which may threaten their control if attended to. In support of the premise that rumination functions as a form of avoidance, it has been shown that sub-clinical and clinical ED samples have a higher level of disorder-specific cognitions, depressive rumination, beliefs about the benefits of rumination and experiential avoidance compared to healthy controls (Rawal, Park, & Williams, 2010). Further, the link between rumination and avoidance may explain the disturbances in interoceptive awareness which have been reported in AN (Kaye, Fudge, & Paulus, 2009; Park et al., 2012; Pollatos et al., 2008).

Considering that the aim of mindfulness is to increase non-judgemental awareness and acceptance of the present experience, training in mindfulness may facilitate improvements in interoceptive accuracy in AN, which in turn may lead to improved emotional experience (Park et al., 2012). This would be in line with bodily feedback theories of emotion which argue that how we think and feel is in part shaped by perception of bodily activity (for a review see Dunn, Dalgleish, & Lawrence, 2006). Interestingly, evidence from the neuroscience literature has shown that mindfulness training can alter the neural response to emotionally evocative stimuli in the anterior insula—a region of the brain implicated in interoceptive accuracy (Farb et al., 2010). In addition, practising yoga that can be conceptualised as a form of body mindfulness has been associated with higher interoceptive awareness and less disordered eating attitudes in healthy individuals (Daubenmier, 2005; Dittmann & Freedman, 2009). Yoga practice has also been associated with reduced avoidance of, and reactivity to, negative emotions (Douglass, 2009). A pilot study with individuals with bulimia nervosa (BN), AN, or eating disorder not otherwise specified (EDNOS) showed that yoga practice as an adjunct to standard medical treatment, compared to medical treatment alone, significantly reduced the ED symptoms over time (Carei, Fyfe-Johnson, Breuner, & Brown, 2010). Future research should focus on examining the mechanisms through which yoga has its effect on ED symptoms.

The effect of mindfulness on cognitive flexibility
Individuals ill with AN are inflexible and rigid in their thinking style which can negatively affect engagement in therapy (Park et al., 2011, 2012). In an undergraduate sample, it has been shown that those who have a tendency to ruminate have impaired performance in a cognitive flexibility task compared to those who do not ruminate (Davis & Nolen-Hoeksema, 2000). The authors suggested that individuals who have a tendency to get caught up in rumination may find it more difficult to shift their response patterns in light of feedback (Davis & Nolen-Hoeksema, 2000). In the same way, individuals with AN find it difficult to shift their responses even in light of feedback (e.g. Zastrow et al., 2009). Neuroimaging studies have shown that this cognitive inflexibility in AN is associated with a hypoactivation of regions involved in motivation-related behaviour and a predominant activation of networks involved in cognitive control (Zastrow et al., 2009).

Mindfulness training has been significantly associated with increased cognitive flexibility in healthy subjects when compared to a waiting-list control group (Greenberg, Reiner, & Meiran,
2012) and with a significant improvement in attentional control processes (Moore & Malinowski, 2009). In line with these findings, Merwin et al. (2011) proposed that mindfulness-based approaches could potentially target the inflexible and rigid thinking style characteristic of AN through increasing attentional control. The authors suggested that by increasing attentional control, ruminative processing and experiential avoidance may reduce allowing individuals with AN to cultivate a more adaptive and accepting cognitive style which would facilitate recovery (Merwin et al., 2011).

Summary

There is a paucity of evidence for the psychological treatment of AN and outcome remains poor (see Bulik et al., 2012; NICE, 2004). Greater focus on the cognitive and affective maintaining mechanisms may contribute to the development of more effective strategies to augment existing treatment approaches for AN. A novel process account of AN (Park et al., 2012), presents a rationale for the incorporation of mindfulness into the treatment of AN. This account predicts that mindfulness strategies may interrupt some of the maintaining factors of AN which provide a barrier to current treatment approaches such as inflexible thinking, poor interoceptive awareness and ruminative preoccupation with eating, weight and shape. The next section will review studies which have integrated mindfulness-practices into the treatment of EDs.

Empirical evidence of mindfulness in the treatment of EDs

Studies of binge eating

Uncontrolled studies of mindfulness with binge ED (BED), report increased control over eating, greater awareness of hunger and satiety cues (Kristeller & Hallett, 1999) and increased mindfulness (Baer, Fischer, & Huss, 2005) together with reductions in binge eating and depression symptomatology, after 8–10 weeks’ treatment (Leahey, Crowther, & Irwin, 2008). Controlled studies in BED also report significant changes in ED symptoms when comparing the effect of dialectal behaviour therapy (DBT), which teaches adaptive emotion-regulation strategies combining cognitive-behavioural techniques with mindfulness exercises, with a waiting-list control group in individuals with BED (Telch, Agras, & Linehan, 2001), whereby 89% in the DBT group stopped binge eating post-treatment and 56% remained in abstinence at a six-month follow-up, figures significantly greater than in the wait-list control group (Telch et al., 2001). However, these studies are limited by small sample sizes and reliance on self-report measures which are susceptible to biases, and are of limited relevance to AN as the only common feature is binge eating, which occurs only in some individuals with AN.

Studies of bulimia nervosa

Like those with BED, individuals with BN suffer frequent episodes of binge eating (APA, 2000), but additionally experience core ED pathology of over-evaluation of control of eating, shape, and weight (Fairburn, Cooper, & Shafran, 2003) common to all other forms of ED, including AN and other forms of EDNOS. Three published studies to date assess the effects of mindfulness-based interventions for BN, and given transdiagnostic features across EDs, the findings may be of more relevance to those with AN.

A single case study by Safer, Telch, and Agras (2001) describes improvement after 20 sessions of DBT in a woman previously unresponsive to multiple psychological treatments who showed reduced binge-purge episodes and recovery post treatment sustained at six-month
follow-up (Safer et al., 2001). Similarly, Corstorphine (2006) in a case study of a 22-year-old female with a six-year history of BN unresponsive to CBT, a mindfulness-based approach resulted in significantly reduced frequency and severity of her impulsive eating-disordered behaviours (Corstorphine, 2006). Using a qualitative analysis technique, Proulx (2008) assessed the experience of attending a mindfulness-based ED treatment group in six women with BN. Each of the eight two-hour session involved four components: experiential meditation, psycho-education, discussion and assigned home practice. The authors described how the participants felt more connected with themselves after the mindfulness-based intervention and this resulted in greater awareness, compassion and acceptance (Proulx, 2008).

It is difficult to draw any firm conclusions as to the potential use of mindfulness-based strategies in the treatment of BN and BED based on the limited number of studies and the lack of a large-scale RCT, and there are no published studies in those with EDNOS. In addition, despite the positive findings, it is hard to identify what the unique contribution of mindfulness is, as this is being administered as part of a therapy package (for example, as one module of DBT). Nonetheless, there is some evidence to suggest that mindfulness-based strategies may target some processes common across EDs, with potential transdiagnostic implications. The next section will review the preliminary studies which have been conducted examining mindfulness-based approaches specifically in AN.

Empirical evidence of mindfulness in the treatment of AN

Experimental paradigms

A key prediction derived from the ICS process accounts is that ‘doing AN’ mode contributes to the maintenance of the disorder, such that AN psychopathology can be attenuated by interrupting the ‘doing AN’ mode. As in depression (Teasdale, 1999), this is facilitated by enhancing a shift to the present moment experiencing, cultivating a mindful ‘being embodied’ mode of mind (Park et al., 2011, 2012).

In a proof of principle study testing this prediction, Rawal, Williams, and Park (2011) manipulated the mode of self-focus prior to exposure to a stressor in the form of imagining eating a fattening meal. Students high in ED psychopathology reported lower post-stressor feelings of weight or shape change and less subsequent attempts to neutralise (e.g. imagining exercising) after experiential relative to analytical self-focus. Moreover, partially weight restored patients with AN had lower post-stressor estimates of their own weight and reported lower urge to cancel stressor effects following experiential compared to analytical self-focus. These results are consistent with the predictions made by Park et al. (2011, 2012), that ‘mindful being mode’ of processing may help ameliorate AN and suggest that examining the mode within which individuals with ED psychopathology focus on self and body may raise important implications for understanding of psychopathology and open new possibilities for augmenting current treatments.

Treatment studies of mindfulness in AN

There have been five preliminary studies examining the effect of training mindfulness-based skills in individuals with AN, two case studies and three case series. Heffner, Sperry, Eifert, and Detweiler (2002) were the first to introduce a mindfulness-based intervention to the treatment of AN using an adaptation of acceptance and commitment therapy (ACT) in a case-study design. ACT is based on the assumption that psychological disorders arise from a perceived loss of self-control and an inability to manage aversive emotions positively (Hayes, Strosahl, & Wilson, 1999). ACT specifically targets such ineffective efforts at control and maladaptive unwillingness to experience
negative thoughts and emotions through the use of discussion techniques, experiential exercises and mindfulness skills training (Hayes et al., 1999). Using 18 sessions of ACT with an adolescent with AN, Heffner et al. (2002) report that post-intervention the individual was significantly more accepting of cognitions and emotions and this was associated with a reduction in ED symptoms. In another case study, Albers (2011) reported the effect of 15 sessions of mindful eating on a 19-year-old woman with broadly defined AN (BMI = 17.9). Here, the author defines mindful eating as ‘the process of being more aware of and less reactive to distressing thoughts about food, body, and shape, and overwhelming emotions about food’ (Albers, 2011 p. 98) and practices aiming to facilitate mindful eating were integrated into each session. Following treatment, the participant’s BMI had increased to 19.5, caloric intake had significantly increased, fear of food had significantly decreased and rumination and emotional distress had decreased (Albers, 2011). This case study provides preliminary support that mindfulness may help reduce important maintaining factors such as ruminative processing and avoidance of emotions in AN (Park et al., 2011).

Similarly, using a case series design to examine the effect of ACT in women with AN, Berman, Boutelle, and Crow (2009) found that two out of the three individuals with AN improved substantially (defined as improvement in terms of AN symptoms, psychiatric comorbidities, and general psychological symptoms) post-ACT intervention and the third woman with AN improved modestly. Importantly, the authors report that the improvements recorded post-treatment were maintained at one-year follow-up suggesting that the effects of acceptance-based therapies are durable over time. In another case series study, Hepworth (2010) examined the effect of a mindful-eating group (based on DBT principles) in individuals diagnosed with a range of EDs, including AN. After 10 group sessions of mindful eating, participants reported significantly lower scores on food avoidance and on desire to be thin compared to pre-treatment. Unfortunately, the authors did not examine the effect of the mindful-eating group on subgroups of participants and so it is difficult to determine whether the mindful-eating group was effective for those with the AN diagnoses or whether the effect is driven by changes in the non-underweight ED participants.

In a pilot study aiming to cultivate experiential mindfulness of the body in an inpatient sample, Rawal, Enayati, Williams, and Park (2009) compared the effect of eight sessions of a mindful movement-group in patients with AN, which aimed to facilitate non-judgemental awareness of the body, with a psycho-education group which aimed to facilitate factual awareness of the body. The mindful movement-group experienced greater acceptance of their body and self, and reduced feelings of fatness compared to psycho-education (Rawal et al., 2009). Whilst this study has to be treated cautiously due to the small sample size, the results do suggest that training a qualitative shift in the experience of self and body, away from an object to be controlled to a subjective experience of embodiment may be beneficial for individuals with AN, consistent with the predictions of Park et al.’s (2011, 2012) process account of AN. Follow-up work is needed to investigate the long-term effects of such experiential training in AN.

Summary

Preliminary studies addressing the effect of mindfulness in treating AN have yielded some promising results. There is also limited evidence supporting the use of mindfulness-based interventions to treat BN and BED. Treatments which incorporate mindfulness-based strategies may be beneficial but further studies in larger samples and at different stages of AN are essential before any firm conclusions can be drawn. Small samples are subject to selection bias, where factors such as the patient’s motivation or readiness to change, could account for some of the positive findings. Current evidence suggests that mindfulness-based strategies may reduce avoidance and rumination (Cowdrey & Park, 2012) and increase acceptance (Rawal et al., 2011).
However, the preliminary nature of the majority of the studies examining mindfulness-based strategies in the treatment of AN severely limits the conclusions which can be drawn. Moreover, the optimal stage of AN at which to introduce mindfulness strategies remain to be determined. In particular Park et al. (2012) caution against attempting to use unmodified mindfulness strategies in those who are severely underweight, severely depressed, or starving as attending to experience in these circumstances can feel aversive, and unwittingly reinforce experiential avoidance (Cowdrey & Park, 2012). The next section will focus on the limitations of the discussed studies and will propose future directions for research.

Limitations and further work
The main limitations include small sample sizes, no control groups, and only a few studies include follow-up data. In addition, comorbid symptoms are not controlled for, which makes it unclear whether mindfulness influences core ED psychopathology or merely reduces associated comorbid symptoms, such as anxiety or depression. The clinical case reports and pilot studies, alongside the recent theoretical work provide an adequate foundation for larger and more rigorous controlled studies examining the effects of mindfulness on ED symptoms. Whether changes in ED symptoms and maintaining processes can be specifically attributed to mindfulness training itself, as opposed to confounding variables, could therefore be ascertained. Outcome measures also need careful consideration. Beyond the general limitations of self-reporting, there are additional concerns in using this methodology in AN participants. Cognitive impairment due to low weight, medication, and degree of psychopathology are just a few of the variables that are likely to influence the accuracy of self-report. Further, individuals with AN typically have poor introspective skills and this may interfere with the ability to accurately report on their internal experiences. Thus self-report process measures should usefully be augmented by objective measures, including psycho-physiological recordings or brain imaging. In addition, AN has been treated as a homogenous disorder, however, patients differ in their presentation (for example, restricting with or without binge eating and/or purging) and in terms of their stage of recovery. Thus, exploring the effect of mindfulness generally as well as different mindfulness skills (for example, attending to the body mindfully, mindful breathing, eating mindfully) across patients at different stages of illness would help understanding of the potential benefits of mindfulness-based practice in managing AN.

Additionally, given high relapse rates after inpatient and day-patient treatment, future research could usefully explore the potential for mindfulness in relapse prevention after weight restoration and could also examine the use of mindfulness-based strategies as a preventative measure in those at risk of developing AN. Finally, mediation analyses and objective measurements are required to examine the mechanisms driving any changes observed. A key question is whether mindfulness acts primarily by improving general affect regulation, anxiety and/or depression or has any specific direct effect on ED psychopathology. The role of eating disorder-specific ruminative processes – which the ICS account of AN (Park et al., 2011, 2012) suggests contribute to AN maintenance – predicts a specific treatment target at certain phases of the disorder, particularly in relapse prevention.

Conclusion
There is good theoretical and preliminary empirical evidence supporting the use of mindfulness in the treatment of EDs including AN. Mindfulness-based approaches may target factors hypothesised to maintain the core psychopathology underpinning AN such as rumination and avoidance, and in the long term may help cultivate a more adaptive way of being. The empirical evidence
supporting this is only beginning to emerge, but the preliminary results are promising. However, results are compromised by significant methodological limitations. Thus, further research is encouraged to investigate the extent to which mindfulness-based interventions can assist in the treatment of AN, with the aim of developing an effective first-line intervention for this disorder which is so challenging to treat.

Notes on contributors

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Dr Felicity A. Cowdrey obtained a DPhil from Oxford University in 2012. Her thesis examined the cognitive-affective processes which maintain AN. She is interested in the development of novel strategies to augment existing treatments for AN. Felicity is currently training in clinical psychology at the Bath University.

Rebecca J. Park is HEFCE (Higher Education Funding Council for England) Clinical Senior Lecturer at the Department of Psychiatry, University of Oxford and Consultant Psychiatrist to Oxfordshire NHS Eating Disorders Service. Her innovative research investigates aberrant reward, cognitive-emotional and somatic processes underpinning AN using experimental psychology and neuroimaging, and translates findings into novel treatment development.

References


