TREATING BINGE EATING DISORDER

WITH

EYE MOVEMENT DESENSITISATION REPROCESSING:

A PRELIMINARY

RANDOMISED CONTROLLED TRIAL

by

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Certificate of Originality

This thesis is submitted to the University of Sydney in fulfilment of the requirements for the Degree of Master of Science. The work presented in this thesis is, to the best of my knowledge and belief, original except as acknowledged in the text. I hereby declare that I have not submitted this material, either in full or in part, for a degree at this or any other institution.

Katie Richard

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Abstract

TREATING BINGE EATING DISORDER WITH EYE MOVEMENT DESENSITISATION REPROCESSING: A PRELIMINARY RANDOMISED CONTROLLED TRIAL

Cognitive Behavioural Therapy and Interpersonal Therapy have been recognized as the gold standard treatments used for people with binge eating disorder (BED). However, these treatments are lengthy - usually about 22 sessions and usually exclude the goal of weight loss despite the fact that the majority of binge eaters struggle with weight management. Because Eye Movement Desensitization Reprocessing (EMDR) is an evidence-based treatment found to an effective and efficient treatment for post traumatic stress disorder (PTSD) and trauma is prevalent in the BED population, a newly developed EMDR protocol was trialled for BED. This new protocol was based on Forester's bulimia nervosa EMDR protocol designed in a ten 1-hour session format and included a resource development to improve engagement in exercise.

Results indicated that the 16 participants randomly assigned to the EMDR treatment, administered by three trained experienced registered psychologists with EMDR training/certification, fared better than the 22 waitlisted participants in terms of BED symptoms (as assessed by the Eating Disorder Examination, Binge Eating Scale, Eating Beliefs Questionnaire), weight loss, mental health symptoms including anxiety and sleep (as assessed by the Trauma Symptom Checklist-40) and engagement in exercise (IPAQ). Though this is only a preliminary trial with a limited sample size, was not compared to an active control group and no follow-up period to see if results are maintained and weight further decreases, results are nevertheless encouraging. Furthermore, BED and comorbid weight management problems may be best treated with a multidisciplinary approach.

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INTRODUCTION

1.1. Definition of Binge Eating Disorder

Whereas the eating disorders bulimia nervosa (BN) and anorexia nervosa (AN) have been classified in the Diagnostic and Statistical Manual (DSM) since 1980, the diagnosis "binge eating disorder" was not specified as a disorder in the DSM-IV and could only be termed EDNOS (eating disorder not otherwise classified). In 1994 the term "binge eating disorder," first named non-purging bulimia nervosa (McCann, 1990), was listed in the DSM-IV, but only in the appendix as a "disorder requiring further research." It was only in 2013 that binge eating disorder (BED) was identified as a specific disorder in the DSM-5, differentiated from other eating and feeding disorders. This is surprising, given that BED is up to six times more prevalent than the eating disorders AN and BN (Hoek & Hoeken, 2003). However, research has since demonstrated the clinical significance and validity of BED (Striegel-Moore & Franko, 2008; Wilfley & Bishop, 2007). Thus, although BED is clearly not a new disorder, its recent formal recognition in the research community has left far more gaps in the data on the incidence and prevalence of BED than for AN and BN (Westerberg & Waitz, 2013).

According to the DSM-5 (APA, 2013), BED is diagnosed when over a period of at least three months an individual has recurrent episodes of binge eating (eating a large amount of food and having a sense of loss of control), experiences significant feelings of distress about the amount and/or type of food that is eaten as well as having at least three of the following five symptoms: eating quickly, until uncomfortably full, even if not hungry or eating alone due to feeling embarrassed to eat/binge in front of others as well as feeling disgusted, depressed or guilty after eating/bingeing. Severity can range from mild when bingeing occurs 1-3 binges per week, moderate when bingeing occurs 4-7 binges per week, to severe when bingeing occurs 8 or times per week (see DSM-5 BED criteria in Appendix I). Characterised by recurrent episodes of excessive food

consumption accompanied by a sense of loss of control of eating and psychological, BED - unlike BN – is not accompanied by inappropriate compensatory weight loss behaviors e.g., excessive exercise, use of laxatives or vomiting (APA, 2013).

Although binge eating also occurs in those with BN and AN, it is more frequent amongst those who eat fewer meals per day and less likely amongst those who eat smaller or lower calorie meals (Elran-Barak *et al*., 2015). Similarly, although picking and nibbling of food occurs in AN, BN and also in BED (Conceição, 2013), binge eating involves eating specific binge foods in large quantities in a short amount of time. Binge foods typically include high-fat, high-carbohydrate foods e.g. biscuits, cakes, ice cream and chocolate. A typical binge may consist of about 1,500 to 3,000 calories, although some individuals have reported eating up to 60,000 calories or more during a binge (Mathes, 2009). Schreiber-Gregory and colleagues (2013) found that the average binge episode duration is about 42 minutes, and binge eating episodes are more likely to occur on weekdays and are during the early afternoon and evening hours.

Although not one of the diagnostic criteria of BED, food cravings too, are common (Ng & Davis, 2013). Ng and Davis (2013) discovered that binge eaters had higher cravings and consumed more food than non-binge eaters when presented with their favourite food. Although food cravings are present even in those without BED, the same in those with BED are associated with binge eating and eating psychopathology. This association is especially strong in females (Chao, Grilo & Sinha, 2015). Imperatori and colleagues (2013) too found that regardless of binge eating severity and BMI, females experience more cravings than males. Typically, males prefer warm savoury foods including steak, casseroles, and soup, while females and younger people prefer sweet snack foods including chocolate and ice cream (Wansink, Cheney & Chan, 2003). According to Yamamoto (2003), these foods raise endorphin levels, thus enhancing the body's natural pleasure providers.

Apart from differences in binge eaters in regards to food cravings seen between male and female binge eaters, further differences have been identified within the BED population. Sysko and

colleagues (2010) proposed that subtypes exist within BED with class 1 having a lower mean body mass index (BMI), increased physical activity and a greater likelihood of having past eating disorder diagnosis; class 2 engage in more binge eating and compensatory behaviors, have more shape and weight concerns, negative affect and are more likely to respond to Interpersonal Therapy; class 3 engage in more binge eating, have lower levels of exercise/compensation, are less likely to have a past eating disorder and are more likely to respond to Cognitive Behavior Therapy (CBT); class 4 have higher BMI, more overeating episodes, fewer binge episodes and have no compensatory behaviours.

Variations within the BED population have also been associated in relation to culture. Research has confirmed that body shape ideals, dietary patterns, concerns about body shape, distress associated with overeating and people's rationale for adopting particular eating habits may vary between cultural groups (Becker, 2007; Gardner *et al.,* 2010). For example, Lydecker and Grilo's (2016) investigation of 775 Black, Hispanic and White adults with BED revealed that whereas eating disorder psychopathology (as measured by EDE scales and Global Severity) was the same across racial/ethnic groups, several differences were apparent: Black participants had higher BMI and reported more frequent binge eating episodes but lower levels of depression. White participants (who also had higher education) had younger ages of onset for dieting, binge eating and obesity, but not BED.

Apart from differences within the BED population related to culture, differences may also be related directly to weight. More specifically, although functional impairment and stress about binge eating and shape and weight overvaluation is the same for both normal-weight and overweight/obese BED individuals (Goldschmidt *et al*., 2011), Fandiño and colleagues (2010), have suggested that differences exist between normal weight and overweight binge eaters. A study of 212 obese women of which 54 had a BED diagnosis, found that obese women with BED presented a more severe psychopathological profile than obese controls. Among all, Fandiño's research revealed “obsessivity-compulsivity, interpersonal sensitivity, paranoid ideas, and psychoticism” were

strongly linked to BED severity. In addition, de Zwaan and colleagues (1994) identified that obese people with BED show higher levels of impulsivity.

The recognition of variations within the BED population has facilitated identification of response to treatment. For example, Potoczna and colleagues (2004) have identified that carriers of the MC4R gene have a variant of BED that is not only associated with metabolic syndrome and gastrointestinal pathology, but also with poorer response in terms of weight loss. Utzinger and colleagues (2015) also found that those with BED who also have a history of AN/BN presented with higher rates of mood disorders and greater eating-related symptom severity and did not respond well to group-based CBT in terms of binge eating outcomes.

1.2.Differentiation from other feeding and eating disorders

Distinctly different from other eating and feeding disorders, BED is the most common eating disorder: up to 15% of women will suffer from a diagnosable eating disorder (ED) in their lifetime (Wade *et al*., 2006) with the rate of anorexia nervosa (AN) occurring in about 0.3% and BN occurring in about 1% of the population (Hoek & Hoeken, 2003) and the BED prevalence reportedly ranging from 3% (in female college students) to 5% in obese individuals in the community (Spitzer *et al*., 1992, 1993) and from 0.7% and 6.6% in the general population (APA, 2013) with the lifetime prevalence for BED 1.75 times higher for females than for males (BHF, 2004): from 0.8 -1.7% in males and 1.6% to 2.5% in females (Hudson, 2007; APA, 2013).

Not only is BED more common than other eating disorders, the other main differences between BED and other eating and feeding disorders is that BED has some distinct differences in regards to reaction to negative affect. Firstly, Munsch and colleagues (2011) have identified that binge eating in BED seems to be triggered by an immediate breakdown of emotional regulation. Other researchers too, have found that individuals with BED experience more negative affect prior to binge eating episodes compared to those with other eating disorders (Haedt-Matt & Keel, 2011). According to Nicholls and colleagues (2016), following a systematic review of 15 studies between

2004 and 2014, poorer weight loss treatment responses were explained by the negative emotions that preceded binge eating. More specifically, depressed mood, anxiety and mood instability were typical antecedents of binge eating in an obese BED sample. Stress, anger and positive emotions within the obese BED population was not confirmed. However, some studies have found these emotions may play a role. However, in BED, unlike in BN, binge eating does not seem to stabilise or improve mood. In other words, food does not act as a reinforcer – at least not for mood - as it does in BN (Munsch *et al.,* 2011).

Apart from a different emotional reaction to food, the other main difference between AN and BN compared to BED is the difference in body weight. Those with AN are typically underweight whereas those with BED range from normal weight, overweight to obese (APA, 2012) and is present in 30% of persons applying for weight-loss treatment (Stunkard, 2002; Spitzer *et al*., 1992). More than 65% of people with BED are obese with a body mass index/BMI greater than 30 kg/m2, morbidly obese (BMI=30-39) or overweight, defined as BMI between 25-29 (Hudson *et al.,* 2007). It is estimated between 5–20% of individuals with obesity have BED (Mitchell, Devlin, de Zwaan, Crow, & Peterson, 2008). The occurrence rate varies across the research because some studies limited the sample population to those with full syndrome BED whereas other studies included those with subthreshold BED. Those with full syndrome BED, which is a new diagnosis, meet all of the criteria outlined in the *Diagnostic and Statistical Manual 5th Edition* (*DSM-5*; American Psychiatric Association [APA], 2013). Recent research has found that those with BN – typically associated with a "healthy" weight with a BMI between 18 and 24 (APA, 2013), are in fact overweight or obese (Bulik, 2012). Weight cycling is also common in those with BED (Escott-Stump, 2008).

Differences – apart from weight – are also seen in regards to sex ratio, age of onset, cultural factors, remission rates and duration of illness. More specifically, BED has an uneven sex ratio and is associated with a much broader demographic distribution than BN in terms of gender and race (Yanovski *et al*., 1993). The age of onset between AN and BN compared with BED also differs:

whereas the symptoms of AN and BN typically begin during adolescence or young adulthood (APA, 2013), BED seems to primarily affect an older age group (Wilfley *et al.,* 1993), affecting even those aged 46 to 55 (Weight-Control Information Network).

In addition, although BN and BED can remit spontaneously (Fairburn *et al*., 2000), BED tends to last longer (Nunez-Navarro *et al*., 2011; Vervaet, van Heeringen & Audenaert, 2004). According to the APA (2013), AN can remit within 5 years whereas a review containing six studies from different Western countries found the average duration of AN is only 1.78 years (Schoemaker, 1997). In the National Women's Study of 3006 women (Brewerton *et al*., 2014), 707 women were found to meet criteria for BED: 212 (30%) reported that they had been binge eating since childhood or adolescence and 495 (70%) reported adult-onset bingeing. Those who reported bingeing prior to adulthood had higher rates of lifetime BN, greater severity of bulimic symptoms, earlier age of first dieting, earlier age at highest weight and greater likelihood of eating disorder treatment. However, BED has a better treatment outcome at five years compared to those with BN (Fairburn, 2000).

Thus, among eating disorders AN, BN and BED all include a disordered eating pattern. The other eating disorder termed night eating syndrome (NES) also involves disordered eating although it is differentiated in that individuals with NES will wake up to eat, consuming at least one third of calories (at least three times per week), and wake up with poor morning appetite (APA, 2013). Nocturnal eating has been found to be related to nocturnal anxiety among those with NES, whereas it is related to diurnal anxiety among those affected by BED (Sassaroli *et al.,* 2009). Although treatment studies of NES are still in their early stages, various treatment approaches have been trialed targeting evening hyperphagia and nocturnal eating episodes. As with the other eating disorders, mood symptoms and weight problems for those with NES have been targeted with CBT (Allison *et al*., 2010) and anti-depressant medications sertraline and escitalopram (Vander *et al.,* 2012) but in the case of NES also with light therapy (Friedman *et al*., 2002) and muscle relaxation strategies (Pawlow, o'Neil & Malcolm, 2003).

Similarly, also involving disordered eating and considered by some to be no different than NES

(Vinai *et al.,* 2012), sleep-related eating disorder (SRED) – classified as a parasomnia rather than an eating disorder – SRED is characterised by recurrent episodes of waking up to eat. Just like BED and NES, individuals with SRED will consume foods high in calories. However, due to being in a somnulent state, these individuals may even eat toxic or inedible foods and forget or have only a vague memory of eating and may gain weight without knowing why. Associated symptoms of SRED include sleepwalking, restless legs syndrome, obstructive sleep apnea syndrome or use of sleeping tablets. As with BED, treatments for SRED include anti-depressants and topiramate but also the anxiolytic clonazepam (Chiaro, Caletti & Provini, 2015).

Thus, BED is a common disorder, considered a distinct eating disorder that shares the aspect of disordered eating with some other eating and feeding disorders but involves mainly binge eating but yet has within-group differences and unique features related to affect, culture, weight and response to treatment.

1.3. Associated symptoms of BED

The literature has pointed out that BED does not involve only binge eating but also food cravings, weight management problems and psychopathology and is therefore - although termed an eating disorder, a multi-faceted disorder. In fact, BED is a very complex disorder associated with obesity-related health problems (e.g., Lavie, 2009), psychosocial problems (e.g., Spahlholz *et al.,* 2015), eating-related disturbance but also body weight-related pathology (Eldredge & Agras, 1996; Vancampfort *et al*., 2014) including body image distortion, body preoccupation, overvaluation of shape and weight (Ahrberg *et al.,* 2011; Dunkley & Grilo, 2007; Mussell, Mitchell & de Zwaan, 1996), eating concerns (Herbozo, Schaefer & Thompson, 2015), and psychiatric comorbidity (e.g., Javaras, 2008).

Although AN was thought to have the highest mortality rate at 4% (Arcelus *et al*., 2011), EDNOS is slightly higher at 5.2% (Crow, 2009) with BED linked to a high risk of mortality due to significant obesity-related illnesses (e.g., Rexrode *et al.,* 1997) including type 2 Diabetes Mellitus

(Koh-Banerjee, 2004), cardiovascular disease including hypertension, coronary artery disease, cerebrovascular accidents (Lavie, 2009), various cancers, including breast, colorectal, endometrial, ovarian, prostate, renal and pancreatic (Shoff & Newcomb, 1998; Ziegler *et al*., 1996), asthma, osteoarthritis and gallbladder disease (Guh *et al*., 2009), sleep apnoea (Cicotini, Baker & Spector, 1996) and sudden death events (Rexrode *et al*., 1997). Given that obesity is the fifth leading cause of death worldwide (WHO, 2009) and that data from the NHS (2007) show that overweight and obesity are the second most common self-reported preventable risk factor for chronic disease after physical inactivity, BED is, in fact, a major health risk and very much linked to increased mortality.

Apart from severe health-related issues, BED is also associated with impaired quality of life (Greenberg *et al*., 2005) and high degrees of psychosocial problems including weight-related discrimination (Puhl, 2008). This includes reduced chance of obtaining employment or promotions (Cawley, 2004) as well as reduced chance of getting married, especially those who are female (Mukhopadhyay, 2008). Discrimination was found to occur in 19.2% to 29.8% for individuals with class I obesity (BMI = 30–35 kg m−2) and 41.8% to 46.9% for individuals with more extreme obesity (BMI > 35 kg m−2) especially in women (Spahlholz *et al*., 2015).

But apart from feeling scrutinized by others in terms of facing social discrimination, those with BED also themselves engage in critical evaluation about their shape and weight. Overvaluation of shape and weight (an undue influence of body shape or weight on self-evaluation) - although not included in the diagnostic criteria as in AN and BN, is common in BED (Ahrberg *et al.,* 2011). It appears that the more severe the overvaluation, the more severe the BED (DuBois *et al*., 2017; Gianini *et al*., 2017). Although body image dissatisfaction has been found to be independent of BMI (Wadden *et al*., 2002), obese binge eaters – according to research by Eldredge and Agras (1996) and Vancampfort and colleagues (2014) - have higher degrees of body weight-related pathology including body image distortion, body preoccupation and weight and shape concerns than non-obese binge eaters (Mussell, Mitchell & de Zwaan, 1996). This overvaluation of shape and weight is associated particularly in those with more severe eating disorder pathology, comorbid

psychopathology and psychosocial impairment (Grilo *et al*., 2008; Grilo *et al.,* 2009; Grilo *et al*., 2010; Mond *et al.,* 2007). This overvaluation does not simply reflect distress due to excess weight, it also is associated with greater severity of eating-related psychopathology and psychological distress (Grilo, 2013). Grilo (2013) also identified that the higher levels of overvaluation of weight and shape lead to higher levels of psychopathology and depression even if the number of binge episodes are the same. Pearl, White and Grilo (2014) found that overvaluation of shape and weight contributes to weight bias internalisation: the higher the overvaluation, the higher the binge eating frequency. Furthermore, Grilo, Ivezaj and White (2015) identified that the more frequent the binge episodes, the higher the eating psychopathology, the worse the overvaluation of shape and weight.

Nicoli and Junior (2011) also found that people with BED tend to overestimate their body size and show higher self-image inadequacy in comparison to people without the disorder. Schreiber-Gregory and colleagues (2013) found that binge eaters who binge eat for long periods not only have lower self-esteem but also depression. According to Mitchell and colleagues (2015), the odds of having BED is increased by six factors, according to a sample of 2266 participants (based on a sample with a median age of 46 years; 78.6% female; 86.9% white; median BMI 45.9 kg/m2): being a college graduate, eating more times per day, taking psychotropic medication, having symptoms of alcohol use disorder, having lower self-esteem and greater depressive symptoms. One of the consequences of negative body image is avoidance of sex (Zwickl & Merriman, 2011).

Poor self-esteem (Pearl, White & Grilo, 2014) and negative self-evaluation (Javaras *et al*., 2008; Vancampfort *et al*., 2014) are frequently noted in the BED literature as significant. Cossrow *et al*. (2013) found in a survey of 22 397 respondents, that those with BED – a total of 344 (women, n = 242; men, n = 102) had lower self-esteem scores as assessed by the Rosenberg Self-Esteem Scale than those without BED. Fleming and Levy (2002) found that those with eating disorders often feel a great deal of shame over their eating patterns, seeing themselves as ineffectual, stupid, out-of-control and helpless. A study of 194 overweight and obese women by Herbozo, Schaefer and Thompson (2015), found that binge eaters had significantly greater levels of eating, weight and

shape concerns and lower levels of appearance satisfaction, but also lower levels of self-esteem than the non-binge eating group. Likewise, Dunkley and Grilo (2007) identified in a study of 236 participants, that BED is associated not only with depressive symptoms and over-evaluation of shape and weight but also with self-criticism and poor self-esteem. More specifically, they found a relationship between self-criticism and overvaluation of shape and weight that was partly mediated or explained by low self-esteem and depressive symptoms. In addition, the higher the body mass, the poorer the self-esteem (Ackard *et al*., 2003; Taylor *et al*., 2012). Similarly, intense feelings of shame are common in BED sufferers. In the definition of Gilbert and colleagues (1994), shame includes self-consciousness, rage, fear of negative opinions of others and feelings of weakness and loneliness, disgust and exhaustion compared to obese and normal weight people without BED. Likewise, binge eating has also been associated with mood instability (Nicholls *et al*., 2016), emotional dysregulation (Munsch *et al.,* 2011), negative emotions including anger (e.g., Engel *et al*., 2007) but also "stress" (e.g., Rosenberg *et al.,* 2013; Smyth *et al.,* 2007) and physical states including low alertness (Greeno, Wing & Shiffman, 2003). Thus, when considering treatment for BED, it appears that not only does binge eating itself need to be addressed but also issues related to these obesity-related health problems and problems related to psychosocial issues, body image, self-esteem and negative affects.

As well as being associated with individual symptoms including depressed mood, anxiety, BED is also commonly linked to more chronic and persistent symptoms, implying the presence of a psychiatric disorder. In fact, 70% of people with BED have a comorbid psychiatric disorder (Grilo *et al*., 2013), including mood and anxiety disorders (Becker & Grilo, 2015; Cossrow *et al.,* 2016; Swanson *et al*., 2011), with reported comorbidity rates with major depressive disorder at 45%–86% (O'Brien & Vincent, 2003). Utzinger and colleagues (2015) found that within the BED population that those with a history of AN/BN presented with higher rates of mood disorders and greater eating-related symptom severity compared to those without and ED history. Schreiber-Gregory and colleagues (2013) found that binge eaters who binge eat for long periods also have more symptoms

of depression and more negative affect prior to binge eating episodes (Haedt-Matt & Keel, 2011; Nicholls *et al*., 2016) but in BED, unlike in BN, binge eating does not seem to stabilise or improve mood (Munsch *et al*., 2011).

Negative affect and mood states are associated not only with binge eating but also with food cravings, especially cravings for sweet carbohydrates (Christensen & Pettijohn, 2001) which in turns leads to binge eating on craved foods. In fact, the greater the depression, the greater the chocolate consumption – according to Rose, Koperski and Golomb (2010). Macht and Mueller (2007) have identified that because eating tasty chocolate causes an immediate (although only a three minute) mood lift, chocolate-eating becomes a habitual way to cope with stress. Similarly, Wurtman and Wurtman (1995) have found that eating carbohydrate-rich foods is a way a person self-medicates low serotonin levels. Since serotonin levels are naturally lower mid-afternoon – evening, cravings and tendency to binge are greater during these periods (Wurtman & Wurtman (1995), particularly for women who have lower serotonin levels (Nishizawa *et al.,* 1997). This explains one of the reasons that anti-depressants, particularly SSRIs, which act on serotonin—reduce carbohydrate cravings (Wurtman *et al*., 1985).

1.4. Psychiatric comorbidity with BED

Because of the finding that weight loss and maintenance is linked to an absence of depression (Klem *et al.,* 1998), that obesity (particularly abdominal obesity) is associated with major depressive disorder (McElroy *et al.,* 2004), that non-depressed people are more likely to achieve weight loss (Klem *et al*., 1998) and that those without depression and BED are more than double as likely to achieve clinically significant weight loss (Klem *et al.,* 1998), it appears that both BED and obesity are inextricably linked to mood.

However, anxiety disorders are also commonly associated with BED (Javaras, 2008) and anxiety has found to be a typical antecedent of BE in the obese BED population (Nicholls *et al.,* 2016; Sassaroli *et al.,* 2009). The rate of comorbidity of BED with social phobia and obsessive

compulsive disorder is 64% (Kaye *et al.,* 2004); with post-traumatic stress disorder: 21% (Dansky, *et al.,* 1998; Mitchell & Wolf, 2016); with substance use disorders: 24 % (Grilo, White & Masheb, 2009) and with personality disorders: 58% (Rosenvinge, Martinussen & Ostensen, 2000); Furthermore, the odds for any mood disorder in people with obesity is approximately 1.2 (95% CI 1.03 to 1.48) and for any anxiety disorder is approximately 1.5 (95% CI 1.23 to 1.72) when compared with those with a BMI of 18.5–29.9 kg/m2. Binge eaters also have lower smoking cessation rates compared to non-binge eaters and gain more weight when they do quit smoking (White, Peters & Toll, 2010).

Apart from mood and anxiety disorder, several researchers have also identified a high comorbidity between disordered eating - and BED in particular - and ADHD (Cortese, Bernado & Mouren, 2007; Cossrow *et al.,* 2016; Davis *et al*., 2006; Mattos *et al.*, 2004; Surman, Randall & Biederman, 2006). In a study of 187 bariatric surgery patients, 10% were found to have ADHD (Alfonsson, Parling & Ghaderi, 2012). The symptoms of ADHD were significantly correlated with those of anxiety, depression and disordered eating. It has been suggested that binge eating behaviors may aggravate ADHD symptoms and contribute to the adverse outcome of ADHD (Cortese, Bernado & Mouren, 2007).

Impulsivity, a common symptom in ADHD, has been identified as potential risk factors for less successful weight loss among bariatric surgery patients (Alfonsson, Parling & Ghaderi, 2012). According to Davis *et al.* (2006), the ADHD symptom impulsivity (defined as lacking inhibitions and aversion to delay and poor planning), may contribute to eating when not hungry, binge eating and tendency to eat fast food. The ADHD symptom of attention deficits and other executive functions (such as planning and working memory) may contribute to difficulties in adhering to a regular eating pattern. However, inattentiveness may also lead to being less attentive to internal signs of hunger especially when engaged in more stimulating activities (Fleming & Levy, 2002), leading to meal skipping and extreme hunger later on. Alternatively, attempting to manage frustration (with food) associated with attention and organization difficulties may explain

compulsive eating (Schweickert, Straber & Moskowitz, 1997).

Apart from comorbidity with other mental health disorders, BED shares a variety of common symptoms with other disorders. In other words, there is symptom overlap. For example, poor distress tolerance – a perceived or actual capacity to withstand aversive experiential states (Simons & Gaher, 2005) including negative affect, uncertainty and physical discomfort (Zvolensky *et al*., 2010) – have been associated with eating disorders (Harrison *et al.,* 2010; Telch *et al.,* 2001), but also with PTSD (Vujanovic *et al*., 2011). In addition, depression is associated with ADHD (Dulcan, 1997) as well as with binge eating (Stunkard & Allison, 2003) and in fact, the comorbidity of ADHD and binge eating might be mediated by major depressive disorders (Cortese, Bernado & Mouren, 2007).

1.5. Theories of Binge Eating Disorder

Genetic, neurochemical and hormone theories

As the literature has pointed out, BED has within group differences and is associated with a variety of physical and psychological disturbances involving affect, self-esteem and psychosocial effects. To identify an appropriate treatment, research has identified several factors that have identified possible causes including genetic, metabolic, environmental and behavioural factors (Di Segni *et al.,* 2014). The Cross-Disorder Group of the Psychiatric Genomics Consortium (2013) identified that among schizophrenia, bipolar disorder, major depressive disorder, autism spectrum disorders (ASD) and attention-deficit/hyperactivity disorder (ADHD), genetics explains 17–29% of the variance in liability. In BED, Kirkpatrick *et al*. (2017) have identified Cyfip2 as a significant genetic factor underlying binge eating. According to Mitchell *et al*. (2010), liability to BED was heritable, although 45% of the variance was due to genetic factors whereas 55% was environmental. Similarly, in a structural equation model to estimate heritability from a case-control family study of BED of 150 overweight/obese probands with lifetime BED, Javaras *et al.* (2010) identified that heritability was estimated as 57% (CI: 30-77%).

Other biological theories of BED have involved brain studies that have confirmed that abnormal eating patterns in humans appear to be associated with specific disturbances in neuro-chemical functioning (Kaye *et al.,* 1985). Sweet cravings in overweight and obese people (although not necessarily only those with BED) have been explained by their heightened sensitivity to immediate rewards, thus experiencing food as more pleasurable and rewarding than normal weight people (Marney, White & Grilo, 2005). Other researchers have found that overeating and bingeing may be a person's response to gain pleasure from eating when their pleasure receptors have been blunted (Barry *et al.,* 2009). Similarly, research with Positron Emission Tomography (PET) have shown that obese people (although not specifically those with BED) have significantly fewer pleasure receptors compared with normal weight people (Volkow, Wang & Maynard, 2003).

Researchers who have found that low levels of pleasure receptors are found not only in people with a high BMI but also in chronic drug and alcohol users have proposed that BED may be conceptualised as a "food addiction" (Volkow, Wang & Maynard, 2003). According to Baumeister and colleagues (2013), just like substance addiction, BED can be described as an addiction, because it has the same features as a substance addiction: consuming more than planned, being unable to cut down (on certain foods/amount), spending a great deal of time on food/eating, giving up important activities in favour of food/eating, developing tolerance (eating more to experience the same effect), experiencing "withdrawal" and continuing to eat to excess despite impairment as a result of eating.

The finding that Transcranial Magnetic Stimulation (TMS) which involves high frequency pulsing to stimulate parts of the brain - that has shown promise in regards to reducing craving and bingeing (Maranhão *et al*., 2015) - points to the idea that BED may be due to dysfunction in certain regulatory parts of the brain. Maranhão and colleagues (2015) too, have confirmed that both drug and food craving are associated with increased neural activity in the orbitofrontal and anterior cingulate cortex and a diminished regulatory influence from lateral prefrontal circuits. According to Cserjési (2009), the impaired shifting capacity and mental rigidity associated with frontal lobe based executive functions and difficulty in categorising negative emotions (e.g., sadness) in obese

binge eaters makes this appear more like an addictive behaviour than an eating disorder per se (Cserjési, 2009). Consequently, some have proposed that BED is not an eating disorder but rather a "food addiction" (Drewnowski, 1989). The fact that pharmacological treatment shown to be effective for alcohol use disorder – is also effective for BED (Doggrell, 2008) may also provide evidence that BED could be conceptualised as a food addiction rather than an eating disorder. Furthermore, the findings that Naloxone and Baclofen, both successful for the treatment of drug and alcohol addiction, are useful for binge eaters (Corwin *et al.,* 2012), especially at reducing preferences for sugar/fat mixtures (McElroy *et al*., 2015) suggests that BED may indeed be a "food addiction."

Other evidence relating BED being related to dysfunctional brain receptors are those studies that have identified neuro-chemical influences including hormonal disturbances that may contribute to binge eating. For example, Edler, Lipson and Keel (2007) discovered that in women with BN, decreases in estradiol and increases in progesterone may contribute to increases in binge eating. Likewise, Klump and colleagues (2013) identified that emotional eating is influenced by changes in the menstrual cycle, confirming that women are more likely to engage in emotional eating during the mid-luteal phase, when progesterone peaks and estradiol demonstrates a secondary peak. Hildebrandt and colleagues (2015) found that weight preoccupation increases in the premenstrual and menstrual phases but did not find a link between ovarian hormones. Instead, they found that the most significant predictor of menstrual cycle changes in weight preoccupation was the change in emotional eating. In a study of 11 503 women found that binge eating is associated with menstrual dysfunction (amenorrhea or oligomenorrhea), possibly explained by metabolic and endocrinological factors (Algars *et al.,* 2014). Similarly, Klump and colleagues (2014) found stronger associations between dysregulated eating and ovarian hormones in binge eating women and that progesterone moderated the effects of lower estradiol levels on dysregulated eating in binge eating women.

Psychological theories

Whereas genetic, neurochemical and hormone theories may explain the biological etiology of

BED, other explanations have been proposed from psychological perspectives. One of these theories relates to interpersonal functioning. The Interpersonal Psychotherapy model of eating disorders (Rieger *et al*., 2011) conceptualises BED as a deficit in coping with negative affect that results from poor interpersonal functioning. Other researchers too, have found that poor social experiences (Steiger *et al.,* 1999) and negative family interactions precede binge eating (Okon, Greene & Smith, 2003).

The notion that interpersonal factors play a role in eating disorder pathology has also been explored in terms of how caregivers' characteristics affect eating disorder pathology. For example, a study by Amianto and colleagues (2015) examining the relationship between parents' characteristics and daughters' eating pathology, found that explosive/adventurous mothers were found to relate to their daughters' level of interoceptive awareness. Fathers who were explosive/methodic correlated with their daughters' severity of eating pathology (Amianto *et al*., 2015). Attachment theories have also explained how eating disorders may facilitate both the over-activation and under-activation of the attachment system to manage difficult feeling states. Focus on tangible objects including food and sociocultural ideals regarding weight and shape is said to be a form of conflict avoidance and distress alleviation caused by unavailable, harsh or rejecting caregivers (Cole-Detke & Kobak, 1996). Levitan and Davis (2010) propose in "Emotions and Eating Behaviour: Implications for the Current Obesity Epidemic," that emotional regulation plays a major role in terms of alleviating distress related to attachment problems. They also point out that highly palatable, energy dense foods (which contribute to weight gain) have the strongest effect on alleviating negative mood states in most contexts and therefore have a critical influence on the emotional eating behavior. Thus, it appears that a large body of evidence points to the influence of negative emotional states in triggering and maintaining BED symptoms caused by interpersonal distress which in turn further contributes to poor self-esteem.

Similarly, eating in order to self-soothe or self-medicate uncomfortable affects (triggered by interpersonal distress) is the self-medicating behavior theory observed by Hart (2006) who

proposed that physiological and psychological needs are temporarily, although never entirely, satisfied by "comfort eating," because eating activates the same structures as social contact. According to Hart, sugar in particular, stimulates the release of opioids that reduces psychological pain. In fact, eating in response to negative emotional states or "comfort eating" has been evidenced in both humans and laboratory animal studies (DiSegni *et al.,* 2014). Similarly, the role of social contact in the development of eating disorders has also been outlined by attachment theorists Ainsworth and Bell (1970) who suggested that affect management problems develop due to disturbed attachments to primary caregivers leading to eating to manage affect.

Similar to this comfort eating theory is the escape and masking theory which conceptualises binge eating as a maladaptive coping mechanism in which food is used to escape, avoid or mask distress (Freeman & Gil, 2004; Koo-Loeb, Costello, Light, & Girdler, 2000), used as an attempt to temporarily relieve stress (Heatherton & Baumeister, 1991; Polivy & Herman, 1993; Stein *et al.,* 2007). Based on the escape theory, bingeing serves to temporarily distract from self-awareness, shifting the focus from the stressor and negative emotions to food (Heatherton & Baumeister, 1991; Polivy & Herman, 1993). Additionally, focusing on food along with the trance-like state often experienced during a binge episode serve as an escape from self-awareness. Stein *et al*. (2007) describes the masking theory as a stress management process in which negative feelings e.g., guilt and shame are attributed to binge eating rather than other problems, because binge eating may be perceived as more controllable and/or tolerable than other aspects that may be the actual cause of distress. However, binge episodes only provide temporary relief from negative feelings and also result in further guilt which in turn, perpetuates the binge cycle (Arnow, Kenardy & Agras, 1992).

Also taking mood intolerance and interpersonal difficulties into account is Fairburn's Transdiagnostic Model of eating disorders (1997) which explains eating pathology as a consequence of mood intolerance, interpersonal difficulties, perfectionism but also core low self-esteem. Whereas some research has identified that dietary restraint itself may trigger binge eating (Ozier & Henry, 2011), Yanovski (1995) found that dietary restraint appears to precede binge eating

or being overweight in only 20% of the people with BED. In other words, it may not be dietary restraint itself or dietary restraint alone, but other factors associated with dietary restraint, that trigger binge eating. Typically, these include depression, anxiety, somatic concerns, interpersonal sensitivity and low self-esteem (Goldfein, Devlin & Spitzer, 2000). According to Fairburn, Marcus and Wilson (1993), BED can develop from low self-esteem which leads to extreme concerns about shape and weight which in turn, leads to dieting that is alternated with binge eating. The distress due to failure to diet then reinforces poor self-esteem. In fact, other researchers too have confirmed the role of poor self-concept in BED (Steiger *et al.,* 2005) but also how depression, interpersonal discrepancies and dietary restraint contribute to the binge eating cycle (Mackinnon *et al.*, 2011). However, in contrast to AN and BN in which eating pathology is explained as a function of perfectionism, in BED eating pathology is a function of the concern over mistakes (Mackinnon *et al.,* 2011).

Apart from mood intolerance (as a result of interpersonal distress) and poor self-esteem, Stice's Dual Pathway Model (1994) explains eating disorder as the interaction of greater perceived social pressure to be thin, internalisation of the thin-ideal, body dissatisfaction and dieting (Pathway 1) and negative affect (Pathway 2). Reas and colleagues (2007), who investigated the triggers for BED in 73 men and 211 women, found that 63% were overweight prior to the onset of binge eating; those who were overweight first had significantly greater BMI; 16% who were binge eating prior to weight problems were significantly younger at the onset of BED diagnosis and had significantly less dietary restraint; 25% of women and 11% of men dieted prior to binge eating or having weight problems; most of those overweight BED participants who wanted treatment, reported that weight problems preceded dieting and binge eating.

Psychological trauma theories of BED

Although different, various psychological theories of eating disorders have proposed similar etiologies including interpersonal distress, negative affect and poor self-esteem all of which may be

a result of trauma. Although trauma history is not unique to those with eating disorders (Connors & Morse, 2003), Vanderlinden and colleagues (1993) believe eating disorders may be part of a larger trauma response. Smyth *et al*. (2008) too agreed that trauma or adverse events may be associated with subsequent eating disturbance. This finding was echoed by those identifying childhood physical abuse (van der Kolk, 1991), psychological abuse (Rorty *et al*., 1994) and various forms of victimisation in adulthood (Danksy *et al.*, 1997) as playing a major role in the etiology of eating disorders. Brewerton and colleagues (2014) found that childhood-onset binge eating is associated with higher rates of molestation, physical assault, any direct victimisation and post-traumatic stress disorder (PTSD). Similarly, a study found that BED respondents reported overall more abuse compared to non-binge eaters. More specifically, BED respondents reported more emotional abuse and emotional neglect than non-binge eaters (Allison *et al*., 2007). In a study of 38 352 participants, PTSD was found to be associated with a higher risk of weight gain (Leard-Mann *et al*., 2015) but in a systematic review of 70 studies involving 306 583 participants, 87% of studies found that adverse life experiences were a risk factor for developing obesity but also BED. In fact, 85% indicated a positive association between traumatic experiences and obesity, 86% between PTSD and obesity and 90% between trauma and the development of BED in adulthood (Palmisano, Innamorati & Vanderlinden, 2016).

In addition, according to Elk and Ilfeldt (2005), more than 40% of a group of 286 obese people (aged 15-74 years) had experienced one or more traumatising life experiences, including sexual abuse, mental and physical abuse, violence, neglect or the loss of a close relative. According to the survey, 47.9% of the group experienced at least one symptom of PTSD and that the traumatising experiences had triggered the need to comfort eat and marked the day when food became a soothing strategy and the weight problem began (Elk & Ilfeldt, 2005). The idea of eating to self-soothe a trauma reaction was found too by Brewarton (2007) who identified more specifically that trauma is more prevalent in EDs of binge/purge subtype than in those with a restrictive ED. This has been explained by the way eating becomes a way to soothe, numb or distract from trauma triggers (Briere

& Spinazzola, 2005) and that food binging creates positive feelings and distracts the person from negative cognitions (Briere & Scott, 2007). Rosenberg and colleagues (2013) identified - with a group of 24 participants - that sweet cravings and desire to binge were significantly higher for BED individuals compared to obese and normal weight participants without BED after a Trier Social Stress Test (TSST). The researchers concluded that BED individuals' response to stress is food craving.

Thus, trauma has not only been directly linked to disordered eating (Allison *et al*., 2007; Brewarton 2007; Briere & Spinazzola, 2005; Danksy *et al*., 1997; Elk & Ilfeldt, 2005; Palmisano, Innamorati & Vanderlinden, 2016; Rorty *et al*., 1994; Smyth *et al*., 2008; van der Kolk, 1991; Vanderlinden *et al*., 1993) but also to the mechanisms – proposed by other researchers - that are said to fuel it. For example, trauma has been said to result in affect dysregulation (Brière, Kaltman, & Green, 2008; Mitchell *et al*., 2012; Silverman, Reinherz, & Giaconia, 1996; van der Kolk, 2005), impulse control problems (Mitchell *et al.,* 2012; van der Kolk, 2005), problems with attention or consciousness, poor self-perception, interpersonal problems (van der Kolk, 2005), loss of control (Vanderlinden *et al*., 1993), dissociation (Brière, Kaltman, & Green, 2008; Mitchell *et al*., 2012; Silverman, Reinherz, & Giaconia, 1996), depression, anxiety, poor distress tolerance (Harrison *et al*., 2010; Telch *et al*., 2001), anger and sexual problems (Silverman, Reinherz & Giaconia, 1996).

Despite the fact that trauma and eating disorders appear inextricably linked, so far, the American Psychiatric Association guidelines for the treatment of trauma and eating disorders are not integrated. However, an integrated approach for those who have PTSD with a comorbid eating disorders has been outlined by Brewerton (2004; 2007). Furthermore, not much research has been done on trauma-focused treatment for those with eating disorders. However, Mitchell and colleagues (2012) have evaluated the outcome of cognitive processing therapy for assault victims with eating disorders. This treatment resulted in improved scores in the Eating Disorder Inventory-2 (EDI-2), improved impulse regulation, interoceptive awareness, interpersonal distrust and ineffectiveness. It appears that addressing eating disorders by treating the underlying trauma may be

an effective strategy.

1.6. CURRENT TREATMENTS FOR BED

Although many people with BED may seek bariatric surgery (Kalarchian & Marcus, 2015) or diet-based interventions (Finkelstein *et al*., 2009), evidence-based treatments options for BED include medication (e.g., Brownley, 2015) and various types of psychological therapy (NICE, 2004) which include Cognitive Behavioural Therapy (CBT), Interpersonal Therapy (IPT), Dialectical Behaviour Therapy (DBT) and other Mindfulness-based therapies as well as a combination of psychological, pharmacological and/or nutritional counseling.

Currently, the treatment guidelines for BED, according to NICE, include the recommendation to follow an evidence-based self-help program with or without support from a healthcare professional. However, according to Hay, Marley and Lemar (1998) only a minority of individuals with a binge eating behaviours seek appropriate therapy for fear of stigma, shame, fear of change and costs (Hepworth & Paxton, 2007; Hepworth, Paxton, & Williams, 2007). A guided self-help manual for the treatment of disordered eating accessible on the internet (Fursland, Byrne, & Nathan, 2007) may be preferred, considered to be more cost-effective and time efficient i.e., for those who live in remote areas with limited access to a therapist. Just as group therapies have been shown to be more cost-effective than individual therapies and - in some cases - as successful (Grenon *et al.,* 2017), self-help material may be an attractive option for some.

However, self-help therapies have not been found to be very effective. One study of 72 BED participants undergoing both pure self-help and guided self-help, resulted in almost half the participants ceasing to binge eat at 6-month follow up (Carter & Fairburn, 1998). Another study of 105 overweight adolescents undergoing a 16-week internet-facilitated intervention for weight maintenance and binge eating, not only lost weight, they also had fewer binge episodes as well as reduced weight and shape concerns at follow-up (Jones, Luce and Osborne, 2008). However, this is in contrast to other studies that have found less positive outcomes. For example, Peterson and

colleagues (2009) who investigated the efficacy of self-help treatment for BED found that of 259 adults, only 17% were abstinent from binge eating compared to 33% in the therapist-assisted group. In addition, a recent overview by McElroy *et al*. (2015) of randomised clinical trials of BED found that self-help was not very effective compared to CBT, IPT and even BWLT. Similarly, another investigation of 11 randomised controlled trials of psychosocial treatments with 1073 Caucasian, African American, and Hispanic/Latino participants with BED found that self-help treatment administered in a group showed negative outcomes (Thompson-Brenner, 2013).

Furthermore, a systematic review of Brownley and colleagues (2007) of six major databases for 26 studies on the treatment of BED published from 1980 to September 2005, concluded that the strength of the evidence self-help was weak. A systematic review and meta-regression analysis of 73 publications reporting on 50 different trials of manualised self-help interventions for binge eating published through 2012 were revealed that one of the problems with self-help interventions is the drop-out rate (Beitner *et al.,* 2014). Although varying in range, drop-out rates were as high as 88%. Those in the CD-ROM interventions had the highest drop-out rates; the lowest drop outs were in the internet-based interventions. Drop-out rates were also highest among those with higher degrees of dietary restraint at baseline, lower age and lower BMI. Although factors associated with drop-out included number of sessions, age, BMI and eating disorder related attitudes, outcomes were moderated for those provided with assistance from a health professional. The research overall of self-help therapies – although in some cases more practical or cost-efficient, are not as effective as person-to-person contact therapies.

1.6.1. Bariatric Surgery

Opolski *et al.* (2015) found that up to 45% of bariatric surgery patients have BED and that many pre-surgical candidates believe bariatric surgery will improve their eating behaviours. However, bariatric surgery neither prevents binge eating (Kalarchian & Marcus, 2015; Niego *et al*., 2007) nor cravings, especially for savoury foods and chocolate (Guthrie, Tetley & Hill, 2014). Because

bariatric surgery fails to curb binge eating, weight regain following surgery is common (Kalarchian & Marcus, 2015). Obese people with BED undergoing bariatric treatment also lose less weight than obese people without BED (Blaine & Rodman, 2007) and experience more weight regain compared to those without BED (McElroy *et al*., 2015): the typical pre-surgery BMI is about 45, reducing to 29 post surgery but rising to 33 after 10 years (Ames *et al*., 2009).

In addition, despite the fact that weight loss resulting from bariatric surgery can improve quality of life (Adami *et al*., 1998) and body image (Foster, Wadden & Vogt, 1997), bariatric surgery has several negatives. Firstly, those with BED, also have more post-operative complications (Kalarchian & Marcus, 2015). Other research has also found that bariatric surgery patients have greater psychopathology and lower quality of life (de Zwaan, Ghaderi & Norring, 2011). Neither does bariatric surgery eliminate the chance that patients start to feel dissatisfied with other aspects of their appearance once their body fat/weight reduces (Song *et al.,* 2006). In addition, because they are not obtaining psychological help, they are also not addressing potential comorbid mental health conditions (Goodman & Whitaker, 2002).

1.6.2. Pharmacological Treatments

Another popular medical option for BED is medication. However, according to the National Institute for Health and Care Excellence treatment guidelines for BED (2017) medication should not be offered as a sole treatment for BED. A systematic review by Brownley and colleagues (2007) of six major databases of 26 studies on the treatment of BED published from 1980 to September 2005, concluded that the strength of the evidence for medication was moderate. Sefano and colleagues' (2008) systematic review and meta-analysis of randomised controlled trials of 6 databases from January 1994 to December 2005, found that binge-eating remission rates were higher in those receiving anti-depressants when compared with placebo. Overall, the efficacy rate of SSRI antidepressants (citalopram, escitalopram and sertraline) has been found to range from 22 to 50 % (Brownley, 2015). However, none made a difference in body weight. The finding that

pharmacological treatments has some efficacy in binge eating treatment (yet not as far as weight is concerned), has been confirmed by several other researchers (Grilo *et al*., 2005; Vocks *et al.,* 2009).

For example, the SSRI antidepressant fluoxetine was superior to CBT in reducing anxiety but no different or inferior in reducing binge eating, weight and eating-related psychopathology (Brownley, 2015). Likewise, the SSRI antidepressant fluvoxamine (300 mg/day) was effective only in reducing anxiety but in regards to binge frequency, it was found to be effective only in the short term; neither did fluvoxamine make significant differences in weight (Brownley, 2015). Other anti-depressant types including the mixed norepinephrine reuptake inhibitor duloxetine has been found not only to reduce depression, but also to achieve more rapid rates of reduction in binge frequency and severity, although the effects on binge eating were not sustained long term and achieved a weight loss of only 2% total body weight (Brownley, 2015).

In contrast to SSRI's and NRI duloxetine, tricyclic antidepressants including imipramine and desipramine seem to address binge eating as well as weight. For example, imipramine, has been found to not only reduce depression but also reduce binge eating as well as achieve mean weight losses of 2.2 kg even after long term follow up (Brownley, 2015). Desipramine has been found to achieve reductions in binge eating and eating-related psychopathology as well as 3.5 kg weight loss (Brownley, 2015).

Bupropion, originally designed as an antidepressant - acting not on serotonin but on norepinephrine as well as dopamine reuptake (Yanovski & Yanovski, 2015) - has been trialled in the hope of decreasing binge eating. White and Grilo's (2013) 8-week study of bupropion of 61 overweight and obese (mean BMI = 35.8) women with BED, found that of the 89% who completed the trial, bupropion did not improve binge eating, food craving, nor associated eating disorder features or depression relative to placebo. However, participants taking 300 mg/d bupropion lost 1.8% of weight compared to 0.6% in the placebo group. Whether bupropion is effective in this area is due to its effect on depression is unclear but research has demonstrated its effectiveness in depression (Ascher *et al.,* 1995; Branconnier *et al*., 1983) in doses ranging from 150 mg – 300 mg

and causing weight loss in some cases (Fraile *et al.,* 2011). From the results of the positive effect of several types of antidepressants on BED and weight, it implies that BED may be partly treated when the mood component of BED is addressed.

Other medications that target mood include topiramate, known commercially as topamax. Primarily an anti-convulsant (USDA, 2016) but also a mood stabilizer (Schmidt & Bacaltchuck, 2002), that not only reduces impulsiveness and stabilises mood (Amianto *et al*., 2015), topiramate has also been investigated in the treatment of BED. It appears to have the added benefit of having a side effect of weight loss (Guerdjikova & McElroy, 2015; Schmidt do Prado-Lima & Bacaltchuck, 2002). A multi-site study of 407 participants found binge abstinence rates of 58% in the group treated with topiramate compared to 29% in the placebo group. Additionally, those receiving topiramate lost an average of 4.5 kg compared with 0.2 kg in the placebo group (McElroy, 2007). In a 21-week trial that specifically looked at weight reduction in binge eaters, those taking topiramate had a weight reduction from 96.6 to 89.8 kg compared to a weight of 98.4 to 97.5 kg in the placebo group (Doggrell, 2008). So far, however, topiramate has not been recommended as a first line treatment for weight loss and BED. The utility of topiramate is also limited by its adverse event profile (McElroy *et al.,* 2015). Nevertheless, the results confirm again that mood regulation may be important in the treatment of BED as well as weight management problems.

Like topiramate – used as a mood stabilizer but also as an anti-convulsant, the anticonvulsant zonisamide has been found to be effective in BN treatment (Guerdjikova, 2013) and shown to produce weight loss (Gadde, 2012). For BED, zonisamide resulted in a 7.3 kg weight loss when combined with diet and lifestyle counseling by a dietitian (Gadde, 2012). Zonisamide was also investigated in a 16-week randomized, double-blind, placebo-controlled, flexible-dose (100-600 mg/day) trial on 60 outpatients with BED (McElroy *et al*., 2006). Zonisamide was associated with a significantly greater rate of reduction in binge eating episode frequency, body weight, scores on the Clinical Global Impressions-Severity scale, Yale-Brown Obsessive-Compulsive Scale Modified for Binge Eating and Three Factor Eating Questionnaire disinhibition scales. Ghrelin levels (hunger)

increased with zonisamide but decreased with placebo. Eight discontinued due to adverse side effects. One of the benefits of zonisamide is that it facilitates weight loss when taken in combination with CBT (Ricca, 2009). A study of CBT and zonisamide demonstrated that after 12 months, the CBT group regained weight, while the CBT and zonisamide group reduced weight and showed more improvement in regards to binge eating frequency on the Binge Eating Scale, Eating Disorder Examination-Questionnaire Restraint and State and Trait Anxiety Inventory scores. It is possible that because eating disorders are commonly associated with epilepsy/seizures (Tegethoff *et al*., 2015) that anti-convulsant medication may assist some people with BED.

However, BED seems to respond not only to pharmacological agents that target mood lability but also those targeting addiction. For example, as well as targeting mood, bupropion – has also been used to treat nicotine use disorder (Mooney *et al.,* 2016) as well as BED (Stahl, 2014). Other medications originally used for substance use disorders have been found to be effective for BED. For example, acamprosate (GABA-receptor agonist), mostly used in the treatment of alcohol use disorder, has shown some promise in regards to reducing binge eating, obsessions and cravings although not weight (Brownley, 2015). Another GABA receptor agonist - baclofen, normally used to treat withdrawal symptoms and cravings in in substance dependence - has shown – in preliminary studies – to reduce binge frequency (Brownley, 2015). Furthermore, naloxone, another medication used primarily in the treatment of drug and alcohol use disorders, also has shown to be effective in reducing binge eating (Corwin *et al.,* 2012), especially at reducing preferences for sugar/fat mixtures (McElroy *et al*., 2015). The evidence that BED may be treated by pharmacological agents that target addictions implies that BED may mean that BED could be conceptualized as an addiction rather than an eating disorder.

Apart from antidepressants/mood stabilisers, anticonvulsants and pharmacological agents targeting addictions, medications specific to ADHD have also been trialled for BED. For example, a*tomoxetine*, a selective norepinephrine reuptake inhibitor (SNRI) and second-line medication for attention deficit hyperactivity disorder (ADHD), has been shown to be effective in reducing binge

eating as well as weight (McElroy, 2007) even without the combination with psychological intervention. According to a 10-week, randomised, double-blind, placebo-controlled, flexible dose (40-120 mg/day) trial with 40 outpatients with BED, atomoxetine was associated with a significantly greater rate of reduction in binge-eating episode frequency, as well as in binge day frequency, and scores on the Clinical Global Impressions-Severity of Illness scale, Yale-Brown Obsessive-Compulsive Scale Modified for Binge Eating obsession subscale, and Three Factor Eating Questionnaire hunger subscale. However, insufficient research prevents recommendation of this medication as a treatment for BED at this point. In regards to weight loss, atomoxetine achieved some, but not substantial weight loss.

Other ADHD medications (lisdexamfetamine and methylphenidate agents) have been found to be useful not only for BED but also associated weight problems (Sanfilippo, 2009). For example, lisdexamfetamine (known commercially as Vyvanse), was investigated by McElroy and colleagues (2015) for the treatment of moderate to severe BED in an 11-week randomised, double-blind, placebo-controlled trial at 30 sites from 2011 to 2012 with 514 adults. Not only did a dose of 70 mg achieve binge eating cessation for 50% of participants, it also resulted in a mean weight loss of 4 kg. However, compared to psychological therapies that do not have negative physical side-effects, 85% experienced negative side effects. Nevertheless, the research on ADHD medication – as well as for antidepressants, mood stabilisers, anticonvulsants and substance use treatment medication - suggests that BED responds to these medications either because of the comorbidity with or the overlap in symptoms with BED or that the mechanisms involved in mood disorders, seizure disorders and addictions are similar.

1.6.3. Nutritional/Diet approaches

Although psychological and pharmacological interventions appear – to some extent – to be effective for BED (e.g., Brownley, 2015; NICE, 2004), the American Dietetic Association supports the use of nutritional intervention in the treatment of an eating disorder (Ozier, Henry & American,

2011). Indeed, some research has confirmed that many people rely on unscientific sources to obtain nutritional information (González-Soltero *et al*., 2014). Improving knowledge of nutrition has, in fact, resulted in improved outcomes in BED treatment, whereas nutritional counselling by itself has not (Brauhardt, de Zwaan & Hilbert, 2014).

Further evidence that a nutritional counseling component adds to the effect of psychological treatments is a study by Painot and colleagues (2001) who found that the 60 obese participants with eating disorders in a combination treatment of 12 weekly CBT sessions and nutritional counselling had superior outcomes compared to those without the nutritional approach. The study found that depression, anxiety and eating disorder symptoms were similar with CBT alone or in combination. However, weight loss was achieved only for those in the nutritional counseling and CBT combination approach. Masheb, Grilo and Rolls' (2011) randomised controlled trial of 50 participants with BED of CBT plus a low-calorie diet or CBT plus nutritional counseling (not weight loss focused) also found reductions not only in BED symptoms but also weight: at 6 and 12 months follow up, 86% participants completed treatment. Both groups achieved similar outcomes with binge eating remission ranging from 55-75% and 30% achieved at least a 5% weight loss. This research indicates that treatments for BED are enhanced by a nutritional component, especially in terms of weight management.

1.6.4. Combination Treatments

In addition to the combination of nutritional/diet interventions with psychological therapies that have been shown to improve outcome, several researchers have found that pharmacological and psychological therapy combination treatments also have better treatment outcomes than individual treatments. For example, the combination of CBT with the antidepressant fluvoxamine is more effective at reducing eating-related psychopathology than either intervention alone (Brownley, 2015). In a study by Grilo *et al.* (2005) of 108 participants who were randomised to either 16-week of double-blind study of the antidepressant fluoxetine (60 mg/day), placebo, CBT combined with

fluoxetine (60 mg/day) or CBT combined with placebo, had the following results: 80% completed treatments; 29% in the fluoxetine group had complete remission from binges compared to 30% in the placebo group, 55% in the CBT combined with fluoxetine and 73% in the CBT combined with placebo. Binge eating remission rates for intent-to-treat (ITT) were: 22% for fluoxetine, 26% for placebo, 50% for CBT and fluoxetine and 61% for CBT and placebo. Furthermore, the mood stabilizer topiramate in combination with CBT led to an abstinence rate of over 80% compared with 61% for placebo (Claudino *et al.*, 2007). However, weight loss was not reported in this study but another study revealed that the combination of CBT with topiramate as well as Orlistat (a fat absorber) resulted also in modest weight loss (Reas & Grilo, 2008). Thus, the combination of the psychological intervention CBT with pharmacological agents targeting mood appear to be successful in regards to alleviating BED symptoms but the addition of a diet intervention appears to also target the weight aspect commonly associated with BED.

In fact, the combination of psychological, pharmacological with nutritional counseling has been investigated by Brambilla and colleagues (2009) who found good results regarding eating frequency as well as weight with a combination of CBT with 1700-calorie diet and antidepressant/mood stabilizer medications (50-150 mg sertraline/topiramate 25-150 mg. Those in the diet, CBT plus topiramate group achieved significant reductions in binge frequency and weight as well as improved scores on the Eating Disorder Inventory-2 scores, especially bulimia, drive for thinness, maturity fear, ascetism, total SCL-90-R scores and in the sub-item somatization, in PDQ-4-R sub-items schizotypal personality and dependent personality. Those receiving diet, CBT and sertraline improved only on depression and interpersonal relationship and in the PDQ-4-R schizoid personality items. So far, it seems that CBT, the mood stabilizer topiramate and diet interventions fare best in terms of BED and weight loss.

However, the literature has also pointed out that combination treatments do not always fare any better than pharmacological or psychological treatments by themselves (Andersen & Mehler, 1999). For example, Vocks and colleagues (2009) concluded from a meta-analysis of 38 studies with 1973

participants, that medication combined with psychological interventions did not result in better outcomes. McElroy *et al*. (2007) too, found that pharmacotherapy combined with psychotherapy interventions did not achieve better outcomes in terms of binge eating. The evidence that combination methods including nutritional, psychological and pharmacological approaches – in some cases only - fare better than single treatments, implies that BED and consequent weight management problems respond with a multi-disciplinary approach. The question still remains why certain people respond to combination treatments better than single approaches.

1.6.5. Cognitive Behavioral Therapy (CBT)

Approaches involving psychological treatments alone include behavioral weight loss therapy (BWLT), Cognitive-Behavioral Therapy (CBT) including Self-Help CBT, Interpersonal Therapy (IPT) and Dialectical Behavioral Therapy (DBT). Although BWLT is an intervention that can be effective for BED and weight loss (Wilson *et al*., 2010), the National Institute for Health and Care Excellence (NICE) recommends only CBT, specifically adapted for BED, IPT or DBT for those with persistent BED. NICE specifies that concurrent or consecutive intervention for comorbid obesity should be included for overweight and obese patients with BED.

Devised by Fairburn (1981), CBT is a 15-20 session therapy based on a theoretical understanding of the origin of disordered eating and weight and shape concern based on a cycle of binge-eating followed by dieting and/or weight-control behaviours which exacerbate extreme weight concern and reinforce the eating disorder behaviours. The therapy targets irrational beliefs about food, body weight and eating. Cognitive restructuring is combined with behavioral experiments that help to disconfirm beliefs and confirm alternative beliefs. The goal is a "normalisation" of both eating patterns and an individual's thoughts (and subsequently feelings) about food and body image issues (Fairburn, 1993). Although Fairburn's CBT model was originally designed to treat other eating disorders, it was modified for BED. Brownley and colleagues (2007) asserted that treatments found effective for BN are also effective for BED.

Cognitive-behavioral therapy is the treatment most supported by research and shows a 40% to 50% success rate in binge eating reduction (Fairburn, Cooper & Shafran, 2003). A systematic review and meta-analysis of BED treatment for adults found that therapist-led CBT decreased binge-eating frequency and increased binge-eating abstinence at 4.95 (95% CI, 3.06 to 8.00). A prior meta-analysis of 38 studies with 1973 participants investigating the effectiveness of RCT of psychological and pharmacological treatments for BED, CBT was found to have large effect sizes in regards to binge eating reduction (Vocks *et al*., 2010). For example, Cassin and colleagues (2008) conducted a randomised controlled trial of 108 women with BED of a CBT-based adapted motivational interviewing treatment. At 4, 8 and 16-week follow up, the motivational interviewing group had an abstinence rate of 27.8% compared to 11.1% of the control group who were given a handbook only. Furthermore, 87% of those in the motivational interviewing group no longer met diagnostic criteria for BED compared to 57.4% in the control group. CBT alone, compared to medication, was also shown to be superior in a controlled outcome study (Grilo, 2005).

Despite the success of CBT in reducing binge eating, CBT does not necessarily lead to reductions in body weight. For example, Grilo *et al*.'s (2012) study comparing CBT with behavioral weight loss (BWL) found that 67% of those in the CBT group and 47% of the BWL group had a 70% reduction in binge eating by week four. Although more CBT participants reduced binge eating (compared to the BWL), they did not achieve weight loss. However, whereas the BWL participants had lower rates of reduction in binge eating, they achieved short-term weight loss.

Similarly, binge eating was successfully reduced according to a study comparing individual with group CBT (Brownley *et al.,* 2007) and according to a recent overview by McElroy and colleagues (2015) of randomised clinical trials. However, again, weight loss was not achieved. In fact, in CBT – if weight loss occurred – weight regain occured once treatment ceased. Weight regain – at 6-year follow up was also found by Fichter, Quadflieg and Gnutzmann (1998) despite reduction of binge eating during treatment and slight increase of binge eating at 3-year follow up and some improvement and stabilisation at 4, 5 and 6-year follow up. Weight regain has also been cited by

various other researchers, which usually occurs at 1 year follow up in obese with or without BED (Marcus, Wing, Hopkins, 1988; de Zwaan, Nutzinger & Schonbeck, 1992; Yanovsky, 1993).

Grilo and colleagues (2011) too, confirmed that whereas CBT has mostly resulted in better outcomes than other therapies including IPT and BWL, CBT rarely produces weight loss. In their study of 123 obese participants with BED, they found that at 12-month follow-up, binge-eating remission rates were 51% for CBT, 36% for BWL and 40% for CBT and BWL combination. In terms of weight loss, CBT lead to a reduction of 0.9kg, BWL 1.5kg whereas the greatest weight loss (2.1 kg) was achieved by the CBT in combination with BWL. Wilson (2011) noted that although CBT improves eating disorder psychopathology and psychosocial functioning in BED patients, the lack of weight loss negatively influences the improvement profile.

However, the results of CBT with abstinence rates from BED up to 80% in some studies, still point to a problem that CBT may not be suitable or effective for all. The difficulty with memory, attention, executive functioning (problem solving, reasoning, planning and organisation, self-regulation and impulse control) commonly seen in trauma survivors (Scott *et al.,* 2015) may explain the difficulty with CBT which has in some cases found to require executive functioning skills (Mohlman & Gorman, 2005).

1.6.6. Interpersonal Therapy (IPT)

Based on the principle that a relationship exists between mental health and the way people communicate and interact with others IPT is a 12-16 session therapy that encourages the client to regain control of mood and functioning (Frank, 1971). Although some studies have found that IPT does not fare well (Agras *et al*., 2000), various studies have found IPT useful in treating BED (Fairburn *et al.,* 1993). For example, Wilson and colleagues (2010) investigated the effect of 20-sessions of IPT in comparison with behavioural weight loss (BWL) and 10 sessions of guided self-help CBT on 205 overweight and obese women and men with BED. At 2-year follow-up, both IPT and guided self-help CBT resulted in greater remission from binge eating compared to BWL as

measured by the Eating Disorder Examination (EDE). The results were odds ratios in BWL vs self-help CBT: 2.3; BWL versus IPT: 2.6; and CBT self-help versus IPT: 1.2. Self-esteem and global EDE scores were moderators of treatment outcome. The odds ratios for self-esteem were 2.4 for BWL, 1.9 for CBT self-help, and 0.9 for IPT. Similarly, McElroy *et al*. (2015) in a randomised clinical trial of BED, found that IPT was effective, even more so than behavior weight loss therapy (BWLT).

Similarly, Wilfey and colleagues (2002) investigated the effects of 20 weekly group sessions of CBT or IPT with 162 overweight BED patients. Abstinence from binge eating at post-treatment were similar: 79% in CBT compared to 73% in IPT. At 1-year follow-up, binge eating increased slightly but remained significantly below baseline levels: 59% in the CBT and 62% in the IPT remained abstinent. Dietary restraint decreased more quickly in CBT but IPT had equivalent levels by later follow-ups. Patients' relative weight decreased significantly but only slightly, with the greatest reduction among patients sustaining recovery from binge eating from post-treatment to 1-year follow-up. In both CBT and IPT, stability of treatment effects has been documented in randomised controlled trials over a period of up to 2 years following treatment cessation (Wilson *et al*., 2010; Devlin *et al*., 2007). Furthermore, Wilson et *al*. (2010) showed that - apart from improved abstinence from binge eating (91% IPT, 80% for BWL and 80% for CBT-based guided self-help) - even showed reduced drop-out rates: 30% for CBT, 28% for BWL and only 6% for IPT.
With the evidence that antidepressants, mood stabilisers and IPT – a therapy targeting emotional dysregulation (often caused by interpersonal distress) effectively treat BED, it appears that a treatment that targets mood dysregulation in the context of interpersonal distress would be effective.

1.6.7. Dialectical Behaviour Therapy (DBT)

In contrast to CBT which is focused on modifying unhelpful thoughts and beliefs about eating/food and weight/shape, DBT is aimed at acceptance of judgment of these thoughts (Baer, Fischer & Huss, 2006) through mindfulness, emotion regulation and distress tolerance skills (Telch, Agras &

Linehan, 2000). Originally designed for treating suicidal behaviours and then borderline personality disorder symptoms, DBT is now being used to treat a variety of disorders, including eating disorders and binge eating specifically (Telch, Agras & Linehan, 2001).

Emotion regulation skill development is believed to be useful for binge eaters as emotional dysregulation appears prominent in binge eaters (Agras & Telch, 1998). With improved tolerance of uncomfortable feelings, binge eaters are then less likely to avoid, minimise or convert the uncomfortable feelings (Matz & Frankel, 2004). Thus, unlike CBT which is aimed at changing thoughts that then influence feelings, DBT's process of acceptance rather than change is also said to appeal to those resistant to or ambivalent about to change (Levine & Marcus, 2003).

Emerging research on DBT has shown promise in the treatment of BED. For example, Telch and colleagues (2000) found that DBT was efficacious in reducing binge eating, achieving abstinence rates of 89% at post-test which was well maintained at 6-month follow-up with only 18% drop out. Weight loss was not reported. Klein, Skinner & Hawley's (2013) study of 15 group-based DBT sessions (with coaching calls between sessions) with BED/BN females resulted in medium to large effect sizes on improving eating mindfulness, emotion regulation, distress tolerance, binge eating, bulimic symptoms, interoceptive awareness, ineffectiveness, drive for thinness, body dissatisfaction and perfectionism. Treatment retention was also good compared to conventional treatment which was attributed in part to greater interoceptive awareness. Another study with 101 binge eaters who underwent 20 group sessions of DBT found post-treatment binge eating abstinence rate was 64% for DBT group compared to 36% for the active group therapy. However, drop-out rate was only 4% compared to active group therapy which had 33.3% drop out (Safer & Jo, 2010). At this point, the lack of meta-analytic reviews on DBT for BED means that thus far, DBT cannot be recommended as a first line treatment for BED. However, the evidence that BED responds to a treatment that targets emotional regulation, indicates again that treatments targeting mood regulation are likely to be effective.

1.7.8. Mindfulness-based interventions

Apart from DBT, other mindfulness approaches including Acceptance and Commitment Therapy (ACT), meditation and mindful eating interventions have been used to treat BED. Mindfulness approaches are said to address emotional regulation deficits that are said to underlie eating disorders (Lattimore *et al.,* 2017). Self-objectification, the tendency to experience one's body as an object, to be evaluated for its appearance rather than for its effectiveness, has been said to account for poorer interoceptive awareness (Ainley & Tsakiris, 2013). In turn, interoceptive awareness deficits have been found to play a role in mediating the relationship between mindfulness and eating pathology (Tylka & Kroon Van Diest, 2013). Lattimore and colleagues (2017) have found evidence that non-acceptance of emotional experiences, a facet of interoceptive awareness, mediates the relationship between mindfulness and eating specific EDI scores.

Mindfulness-based psychotherapies have been found to be helpful in the treatment of pain, stress, anxiety, depression as well as disordered eating (Hepworth, 2011). A literature review of 21 papers on mindfulness-based interventions, found that 86% of the reviewed studies reported improvements in the targeted eating behaviours (O'Reilly, Cook, Spruijt-Metz & Black, 2014). Another systematic review of 14 studies that investigated mindfulness meditation as the primary intervention for binge eating, emotional eating, and/or weight loss found that mindfulness meditation effectively decreases binge eating and emotional eating (Katterman, 2014).

Godfrey, Gallo and Afari (2015) who included mostly ACT and DBT and only two pure mindfulness therapies in his systematic review and meta-analysis of 19 mindfulness-based interventions, concluded that mindfulness-based therapies showed large effect sizes; random effects meta-analyses supported large or medium-large effects of these interventions on binge eating (within group random effects mean Hedge's g = -1.12, 95 % CI -1.67, -0.80, k = 18; between-group mean Hedge's g = - 0.70, 95 % CI -1.16, -0.24, k = 7. Another meta-analysis of mindfulness-based interventions revealed that – although not very effective at reducing BMI – are effective in improving eating behaviours, depression and anxiety (Rogers *et al*., 2016).

Carrière and colleagues (2017) found – from a systematic review and meta-analysis of mindfulness-based interventions (MBI's) on weight loss and eating behaviours in 18 publications (19 studies, n = 1160) - the mean weight loss for MBIs at post-treatment was 6.8 and 7.5lb at follow-up. In pre–post comparisons, effect-size estimates suggest that MBIs are moderately effective for weight loss (n=16; Hedge's g=.42; 95% CI [.26, .59], p <.000001) and largely effective in reducing obesity-related eating behaviours (n = 10; Hedge's g=.70; CI 95% [.36, 1.04], p <.00005). Larger effects on weight loss were found in studies that used a combination of informal and formal meditation (n=6; Hedge's g=.55; CI 95% [.32, .77], p <.00001) compared with formal meditation practice alone (n=4; Hedge's g=.46; CI [.10, .83], p <.05). However, despite this evidence long term follow-up to identify weight loss maintenance was not investigated. A great deal of evidence suggests that mindfulness-based methods may be effective both for targeting binge eating behaviours but also weight problems. Again, the research on the impact of mindfulness methods at least indicates that disordered eating may be changed with a psychological method that specifically addresses emotional dysregulation and inattention. However, at this stage, mindfulness-based methods have not yet been recognised as a treatment of choice for BED and weight loss due to the research on this therapy only being in its infancy with only preliminary evidence of its effectiveness at this stage.

1.7. OTHER FACTORS RELATED TO TREATMENT OUTCOME

Whereas the literature has pointed out that treatment outcome is related to treatment method used, a number of other variables have been associated with treatment success. These include participant variables, therapist variables and the therapeutic alliance. More specifically, participants' intrapersonal variables that affect outcome include motivation to change, treatment expectations motivation and therapy expectations (Bakker *et al.,* 2000; Brauhardt, de Zwaan & Hilbert, 2014) and self-efficacy *(*Miller *et al*., 1999), symptom severity (Campbell, Staley, Matas, 1991; Centorrino *et al*., 2001; Klein, Skinner & Hawley, 2013), the presence of comorbid disorders

(Grunebaum *et al*., 1996 Vall & Wade, 2015), sociodemographic variables (Hunt & Andrews, 1992; Thompson-Brenner, 2013) and presence of interpersonal stressors (Jones *et al.,* 2015). Treatment outcome may also be affected by therapist variables including education and experience (Campbell, Staley & Matas, 1991) but also the relationship between therapist and client (Vincent & Lionberg, 2001) and client treatment preferences (Blouin *et al.,* 1995; MacNair & Corazzini, 1994; Mueller & Pekarik, 2000); Rabin, Kaslow, Rehm, 1985; Renjilian *et al*., 2001; Wierzbicki & Pekarik, 1993), all of which may also affect treatment adherence.

As with pharmacological treatments which are often associated with discontinuation due to negative side effects (e.g., McElroy *et al*., 2015), psychological therapies are also associated with drop out. Research by Linardon, Hindle and Brennan (2018) investigated ninety-nine RCT's, finding that the overall dropout of CBT treatment is 24%. No significant differences in dropout rates were observed between CBT and non-CBT interventions for all eating disorder subtypes. Drop-out has been found to be associated with a variety of reasons e.g., situational characteristics such as the distance traveled to attend therapy (Centorrino *et al*., 2001), However, even in self-help interventions that may not require attendance does not necessarily improve adherence. For example, a systematic review and meta-regression analysis of 73 publications reporting on 50 different trials of manualised self-help interventions for binge eating published through 2012 (Beitner et *al*., 2014) found that drop-out rates were as high as 88%. Other reasons for discontinuing treatment include dislike of a particular method e.g., they may find the CBT task of self-monitoring food intake aversive due to feelings of shame (Craighead, Elder, Niemeier & Pung, 2002). Investigations have also found that a group format – which may make therapy more appealing for some due to greater cost efficiency – does not necessarily fare better than individual therapy (Brauhardt, de Zwaan & Hilbert, 2014). The length of treatment too has been investigated in relation to drop-out: surprisingly, the longer the treatment, the lower the dropout rate (Linardon, Hindle & Brennan, 2018).

1.7.1. Participant variables

(a) *motivation to change, treatment expectations and self-efficacy*

Treatment success and adherence to treatment appears to be associated to factors more intricate than which method is used, whether it is more cost-efficient or more convenient to attend. Rather, it is an interplay between treatment method and variables in the individual being treated. A number of studies have demonstrated that motivation to change mediates the relationship between eating disorder symptomatology and treatment outcome, treatment engagement, treatment continuation and decreases in eating pathology (Castro-Fornieles *et al*., 2011; Martínez *et al*., 2007), and a low motivation to change has been shown to be a predictor of relapse (Richard *et al*., 2005). In addition, treatment expectation has been found to play a role in outcome (Brauhardt, de Zwaan & Hilbert, 2014) and the combination of high motivation and positive treatment expectations (Brauhardt, de Zwaan & Hilbert, 2014) have been found to influence not only treatment outcome (Castro-Fornieles *et al*., 2011; Richard, Bauer & Kordy, 2005) but also drop out – the lower the motivation to recover, the more likely the drop out (Vall & Wade, 2015). In nutritional counselling, motivation has been found to influence the number of sessions needed (Spahn *et al*., 2010).

Research has also found that motivation can be influenced by source and reason for referral – which for some individuals - may be health related. For example, a study of 98 adult obese participants identified that completers were more likely to have been referred by a physician (53.3% sent by a physician vs 34.1%) and had higher diastolic blood pressure. Interestingly, those with higher body fat were also less likely to drop out - the risk of drop-out reduced by 15% for each single percentage increase in starting body fat (Colombo *et al*., 2014). These studies imply that those motivated by health reasons or have realistic expectations or hope are more likely to complete and succeed in treatment. Related to hope and expectation is self-efficacy – the belief in being able to cope/recover. The research on self-efficacy has found that improving self-efficacy – not only eating- or exercise-specific self-efficacy (Teixeira *et al*., 2005) can reduce binge eating severity (Goodrick *et al*., 1999; Miller *et al*., 1999). Thus, any treatment that focuses on improving self-

efficacy may improve outcomes more so than treatment not addressing this aspect.

(b*) severity and duration of illness*

The literature has noted that those who want to change, believe they can change and expect to change are more likely to succeed. It is, however, clear that realistically, the worse the illness, the less change of recovery. That treatment success is dependent on how severe the disease is, was demonstrated, for example by Klein, Skinner and Hawley (2013) who found that outcomes at 6-month follow-up were better for those who had higher levels of drive for thinness, higher levels of interoceptive awareness, lower levels of binge eating pathology and, in women, lower levels of body dissatisfaction (Lammers *et al*., 2015). Ricca and colleagues (2010) also found that those who did not have a history of amphetamine use and had lower binge eating severity at baseline were more likely to recover from BED. Grilo et *al*. (2013) also identified the greater the overvaluation, the less positive the treatment outcome. Similarly, Vall and Wade (2015) identified that those with better outcomes in eating disorder treatments at post treatment and follow-up included fewer binge/purge behaviors and lower shape/weight concerns. Furthermore, in a study of AN found that predictors of a poor outcome include a low BMI, severe psychological comorbidities and social problems (Lowe *et al*., 2001) whereas the strongest predictor, not surprisingly, is a higher BMI (Howard *et al*., 1999; Zipfel *et al*., 2000).

Not only does greater psychopathology but also longer duration of psychopathology impact treatment outcome, according to Safer and colleagues (2002) who found that relapsers were those who had early onset of binge eating. Ricca and colleagues (2010) too found that being overweight during childhood, full BED diagnosis, and high emotional eating were predictors of treatment resistance. This is the same for AN in which treatment outcome is better when it is implemented before the illness becomes too severe and protracted. In other words, the shorter the duration of the illness, the more likely it is that treatment will be successful (Steinhausen, 2002). The issue of "the Duration of Untreated Illness," i.e., the time between the onset of an illness and the initiation of treatment, has also been raised with other illnesses including schizophrenia (Perkins *et al*., 2005),

mood (Altamura *et al*., 2010) and anxiety disorders (Altamura *et al*., 2008). It would appear likely then, that the longer an individual has had BED symptoms, the poorer the treatment outcome, regardless of treatment method used. Thus, it is important to take into account pre-treatment severity and duration of psychopathology when evaluating the success of any treatment modality.

(c) comorbid conditions

Apart from severity and duration of eating pathology, Vall and Wade (2015) found that those who had lower depression and fewer comorbidities, had better outcomes. Whereas Dalle *et al*. (2015) identified that whereas personality traits do not predict drop out (and therefore treatment outcome), Bossert (1992) found that the presence of depression not only exacerbates eating disorders, it also interferes with treatment. Also, greater pre-treatment levels of depression have been found to predict greater post-treatment eating disorder psychopathology and body dissatisfaction.

Treatment outcome studies in other disciplines have also found that multiple diagnoses impact the number of sessions needed (Leemrijse & de Bakker, 2006). Yager (2008) asserts that because of the physical and psychiatric comorbidities, BED is considered to be the most difficult disorder to treat. Thus, when assessing whether a particular treatment type is effective for BED, it appears necessary to identify not only which treatment method was used, but also how severe and protracted the eating pathology has been and whether comorbid disorders are preventing treatment success.

(*d) cultural differences*

Apart from motivation, treatment expectation, severity and duration of eating pathology and comorbidity, other intrapersonal variables have been found to affect treatment outcome. These include cultural factors including age and race. For example, an analysis of 24 completed trials that recruited over 11,000 participants indicated that treatment drop out did not vary according to gender or race/ethnicity but increased for older participants (Korte *et al*., 2011). Since this study was specific to treatment-seeking patients with substance use disorders, it is unclear whether the same

holds true for those with BED. However, evidence suggests that response to treatment depends on an individual's cultural background. For example, Thompson-Brenner's (2013) investigation of 11 randomized, controlled trials of psychosocial treatments with 1073 Caucasian, African American, and Hispanic/Latino participants with BED revealed African Americans were more likely to drop out of treatment than Caucasians. Those with a lower level of education predicted greater post-treatment objective binge episodes. African Americans showed a small but significantly greater reduction in EDE global score relative to Caucasians but also lower treatment retention and lesser treatment effects for individuals with lower levels of educational attainment (Thompson-Brenner, 2013).

Outcome variations/attrition rates among different cultures may also be partly explained by the evidence that treatment may not be delivered in a culturally sensitive manner. For example, a study of 102 clients revealed that ethnic minority clients were less satisfied with treatment when their treatment was not culturally sensitive (Meyer & Zane, 2013). Socio-environmental factors (Spahn *et al*., 2010) and communication problems (Leemrijse & de Bakker, 2006) have been found to increase the number of sessions needed in nutritional counseling. A study by Chowbey, Salway and Ismail (2012) have emphasised the need for the treatment of eating disorders to include socially and linguistically appropriate diagnostic tools and be sensitive to religious beliefs and practices (Chowbey, Salway & Ismail, 2012). This is in line with the recommendation by the Australian Psychological Society's guideline which stipulates the need to adjust assessment questions and therapy according to the level of acculturation of the client. This includes - but is not limited to - using micro-counselling skills to adjust space, level of eye contact and non-verbal language (APS, 2017). Thus, the evidence demonstrating that socio-economic variables may account for differences in treatment outcome, suggests that it is not only important to identify these variables in participants but also to recognize that any treatment method is likely to be more successful if delivered in a culturally appropriate manner.

(e) interpersonal problems and daily stressors

The research has pointed out various intrapersonal factors affect treatment outcome but studies have also identified that interpersonal factors also play a factor. For example, Jones and colleagues (2015) found that – after examining 6 databases and from 13 studies of 1519 participants with eating disorders - those with interpersonal problems at the start of therapy had poorer outcomes than those without them**.** Similarly, Vall and Wade (2015) found that better interpersonal functioning and fewer familial problems predicted better outcomes. According to Tasca and colleagues (2012) people with BED are more likely to have interpersonal problems than people without BED and according to Pike *et al*. (2006), in the year preceding onset of disturbed eating, individuals with BED experience an increased number of interpersonal stressors. Furthermore, negative family interactions (Okon, Greene & Smith, 2003) and social relationships and interactions have been found to affect diet, physical activity and weight (Ball & Crawford, 2006; Tamers *et al*., 2013). More specifically, social undermining and lack of support influence diet and exercise behaviour and consequently also weight (Kiernan *et al*., 2012).

But apart from interpersonal stressors that play a role in outcome success, the presence of (or inability to cope with) daily stressors is also relevant. According to Crowther and colleagues (2001) and Wolff *et al*. (2000), binge eaters without obesity report more frequent and/or more severe daily hassles than individuals who do not binge. Additionally, for those who binge eat, daily hassles were perceived as more severe on days that a binge episode occurred than on days without a binge episode (Wolff *et al*., 2000). In regards to weight loss, Wadden and Letizia (1992) found that even major life stressors such as house renovations, death of a parent, financial or legal problems and relationship problems, interfere with weight loss efforts. Because it is evident that coping skills and presence and extent of interpersonal and daily stressors affect outcome, it would be important to not assume that a particular treatment method's efficacy is solely due to modality.

1.7.2. Therapist variables

As noted above, outcome is not only dependent on treatment type but also on a variety of participant factors. In addition, the research has also pointed out that successful treatment outcome depends a great deal on therapist variables including level of education and clinical experience. Although Scott *et al*. (2005) found that the more qualified and experienced a therapist, the better the outcome, several researchers have indicated that therapists with a higher level of education do not necessarily have better outcomes than therapists with less education (Anderson, 2016; Jones, 2017; Pirikis *et al*., 2011). Furthermore, whereas some research (e.g., Beutler, Machado & Neufeldt, 1994; Christensen & Jacobson, 1994) including a study of 6,591 patients seen in individual psychotherapy by 170 therapists revealed that the more experienced therapists have poorer outcomes (Goldberg *et al*., 2016), other research has pointed out that greater experience does improve outcome. More specifically, when "experience" is defined not only as the number of years practising as a therapist/number of clients treated, but also as level of training in a particular treatment, then better outcomes are seen with those therapists with greater experience (Beutler, 1997). Earlier research had revealed that a less experienced therapist may achieve results comparable to a more experienced therapist (not using a treatment manual) only if following a treatment manual for an empirically supported treatment (Crits-Christoph, 1991). Research has also found that clinically inexperienced student therapists who receive supervision from experienced supervisors can achieve treatment effects that are on a par with those of experienced psychotherapists (Öst, Karlstedt, & Widén, 2012).

However, other than education and experience, the research on therapist variables has also pointed out that the therapists' personal qualities are correlated with treatment outcome (e.g., Luborsky *et al*., 1985). These may include expressions of genuine empathy, warmth, support, understanding in a non-judgmental, trustworthy and validating manner (Bachelor & Horvath, 1999; Gulliksen *et al.,* 2012) and engaging with active listening skills and instillation of hope (Escobar-Koch *et al*., 2012). Therapist empathy has been found to be directly related to treatment outcome in

addiction treatments (Miller, Benefield & Tonigan, 1993) and general therapist interpersonal skills have been found to be related to engagement in motivational interviewing sessions (Moyers, Miller & Hendrickson, 2005) and directly to treatment outcomes (Schottke *et al.,* 2016).

Other therapist variables that influence outcome include the therapist's health and interest in helping people (Heinonen *et al*., 2012) and – as pointed out by Linley and Joseph (2007), therapists with high levels of self-care may have superior outcomes compared to those with less self-care. In essence, the therapist is said to be so important that an effective clinician giving a patient a placebo is able to achieve better results than a poor physician using an effective psychoactive agent (McKay *et al.,* 2006). The idea that successful outcome is the result of "a healthy therapist – a healthy patient" is supported by the social influence theory (Strong, 1968; Strong & Matross, 1973) which means the more credible a therapist is, the more successful the outcome. Credibility may also be enhanced by therapists who themselves have experiential knowledge of overcoming an eating disorder – as discovered by de Vos, Netten and Noordenbos (2016) who found that this type of experience improves insight into the recovery process which in turn enhances the therapeutic relationship and consequently the hope for recovery for those with an eating disorder.

Treatment credibility has also been found to be influenced by the cost of treatment. Freud (1913/1958), for example, proposed that a patient must pay for treatment in order to benefit. Herron and Sitkowski (1986) and Subich and Coursol (1985) too have found that fees have an influence on therapy. The cost of treatment is said to influence how a client perceives the therapist (Bloom, Schroeder & Babineau, 1981; Brigham & Brigham, 1985; Gingerich, 1987; Subich & Hardin, 1985; Traut & Bloom, 1982). Thus, when considering treatment outcome, it would seem important to identify treatment effects based on therapists' education, experience and personal attributes as well as treatment cost which may influence treatment credibility.

1.7.3. Therapeutic alliance

As noted above, the therapists' education, clinical experience, cost of treatment and personal attributes affect treatment credibility and consequently the response to treatment. But even more important is the therapeutic alliance which has been found to be even more important that the therapists' professional competence and therapy type (Swain-Campbell e*t al*., 2001). Although some research has shown that the therapeutic alliance has no effect on outcome (Waller, Evans & Stringer, 2012; Wilson *et al.,* 2002; Zaitsoff *et al.,* 2008), other research (on eating disorders) has shown that the therapeutic relationship has multiple impacts. Primarily, the therapeutic alliance has been shown to improve treatment outcome (Constantino *et al*., 2005; Treasure *et al.,* 1999; Zeeck & Hartmann, 2005). A strong and positive therapeutic alliance, in the form of a collaborative, empathic and accepting bond between client and therapist, is an established predictor of outcome in psychotherapy in general (Martin, Garske, & Davis, 2000) and specifically for working with those with an eating disorder (Constantino, Arnow, Blasey & Agras, 2005; Brisman, 1994; Geller, 2006; Toman, 2002; Loeb *et al.,* 2005) most of whom have issues related to trust (Pyle, 1999). From the client's perspective, trust in the therapist has been found to be the most important criterion for the quality of the therapy for eating disorders (de al Rie *et al*., 2008) and related to satisfaction with therapy (Escobar, 2010). In addition, a healthy therapeutic relationship also reduces drop out (Prestano *et al.,* 2008) and decreases the number of sessions needed (Brauhardt, de Zwaan & Hilbert, 2014). Furthermore, a meta-analysis of 20 studies of eating disorder studies revealed that early symptom improvement was related to subsequent alliance quality and that alliance ratings were also related to subsequent symptom reduction, especially for younger patients and for those receiving non-behaviorally oriented treatments (Graves *et al*., 2017).

1.7.4. Treatment choice, format and adherence

The literature has also highlighted the importance of involving patients in decision making about their treatment, taking their preferences into account when deciding upon and initiating a treatment

plan. In fact, taking patients' preferences and values into consideration when recommending a treatment plan is an integral component of patient-centered care (Barry & Edgman-Levitan, 2012). When treatment is aligned with patient preferences, patients are more engaged in their care (Kwan, Dimidjian, & Rizvi, 2010) and are more likely to be treatment adherent (Schottenbauer *et al*., 2008; Thompson, & McCabe, 2012) and more likely to remain in treatment (Mott *et al*., 2014). Further, aligning treatment with patient preferences has been associated with improvements in treatment outcomes (Lin *et al*., 2005). For example, in a study by Le and colleagues (2018) providing PTSD patients aged 18-65 with a choice of treatment (either sertraline or exposure therapy) and whether the treatment received is the preferred therapy was found to result in better outcome (as measured by the EuroQol-5D.

Overall, the literature points out that – apart from treatment modality - a number of factors affect treatment outcome. These include participants' intrapersonal factors including motivation, self-efficacy, treatment expectations, premorbid functioning, comorbid conditions, socioeconomic status, interpersonal and other stressors, various therapist characteristics including training, experience and credibility and the therapeutic alliance. Whereas some treatments may work better because they target intrapersonal barriers and address comorbid conditions and interpersonal stressors specifically, others may have better outcomes due to therapists' characteristics and or the therapeutic relationship.

1.8. LIMITATIONS OF CURRENT TREATMENTS

According to current reviews (Brownley *et al.,* 2007; Wilson *et al.,* 2007), meta-analyses (Hay *et al*., 2009; Vocks *et al*., 2009) and clinical treatment guidelines (NICE, 2004) CBT is considered the first-line specialty treatment for BED. A survey of 52 psychologists by von Ranson and Robinson (2006) revealed that 87% use CBT with eating-disordered clients. However, there are several limitations with current treatments CBT, IPT and DBT:

(a) Treatment does not reliably lead to weight loss

The research has indicated that 65% of people with BED are obese (Hudson *et al*., 2007) and that weight cycling is also common in those with BED (Escott-Stump, 2008). NICE (2004) recommends concurrent or consecutive interventions focusing on the management of comorbid obesity in BED treatment. The National Heart, Lung and Blood Institute recommends a weight loss of at least 5% of body weight for health benefits. However, as noted above, current BED treatments have been found to be effective in reducing BED pathology, but not weight.

Most SSRI antidepressants have failed to achieve significant weight loss (Grilo *et al*., 2005; Sefano *et al*., 2008; Vocks *et al*., 2009). Although in some cases CBT is better than BWL in regards to BED symptom reduction, CBT also does not achieve weight loss (Grilo & Masheb, 2005). In addition, according to a systematic review of six major databases of 26 studies on the treatment of BED published from 1980 to September 2005 (Brownley *et al*., 2007), neither CBT nor IPT reduce weight effectively. Those psychological and dietary approaches that do result in weight loss, showed that this weight loss was generally not sustained in long-term follow-up assessments (Stunkard, 1996; Wing, 1998; Ivker, 1999; Wonderlich *et al.,* 2003).

For example, a study of a 12-month follow-up on CBT and BT treatments targeting weight problems specifically demonstrated initial weight loss but regain upon follow-up: a randomized controlled trial by Cooper *et al*. with 150 participants (age 20 to 60 years; mean BMI 34.7 kg/m2) over 3 years of follow-up. At 24 weeks, those in the CBT group lost 6.7%, in the Behaviour Therapy (BT) 11.3% and 10.0% in the guided self-help therapy. At 1-year follow-up, those who had lost weight at the end of treatment had regained, overall, almost half the weight that they had lost: 43.5% in BT and 58.0% in CBT and at 3-year follow-up those in the BT regained 89.8% and those in the CBT group regained 88.6%.

Investigations into weight loss resistance has identified a variety of different factors. At face value it appears that treatment success can be achieved by improving nutritional knowledge and improving adherence to these nutritional guidelines with psychological strategies.

(e.g., Masheb, Grilo & Rolls, 2011; Painot *et al*., 2001). However, a variety of other factors involved in weight loss have been identified. These include psychological factors including depression or anxiety (Legenbauer *et al*., 2009), but also poor social support and negative family interactions (Okon, Greene & Smith, 2003), major life stressors such as house renovations, death of a parent, financial or legal problems and relationship problems (Wadden & Letizia, 1992).

However, apart from psychological factors, several physical obstacles have also been identified as obstacles to successful weight loss. These include sleep deprivation – which can, in some cases, be caused by obstructive sleep apnoea (Whited, 2016). Sleep disruption in turn inhibits weight loss due to increased cortisol levels (Aldabal & Bahammam, 2011) and increases hunger (Taheri *et al*., 2004) and preference for energy-dense foods (Chamorro, 2011). Additionally, a specific gene variant associated metabolic syndrome and gastrointestinal pathology (Potoczna *et al*., 2004) has also been associated with weight loss resistance.

Furthermore, other physiological reasons that may interfere with weight loss include specific nutritional deficiencies. For example, a systematic review and meta-analysis of 23 studies confirmed that the prevalence of vitamin D deficiency was 35 % higher in obese people and 24 % higher in overweight people (Salehpour *et al*., 2012). In addition, research has found that inadequate Vitamin D levels will prevent weight loss even when a low-calorie diet is introduced (Ortega *et al.,* 2008) and that Vitamin D3 supplementation (25 ug) alone (without diet) was effective in reducing body fat by 2.7 kg in 12 weeks (Salehpour *et al.,* 2012). Calcium supplementation (1500 mg per day) too, has been associated with weight loss, according to six observational studies and three controlled trials (Heaney, Davies & Barger-Lux, 2002).

Hormonal problems have also been implicated in weight problems. For example, hyperinsulinemia has been shown to increase hunger, heightened palatability of sucrose or sweetness, and greater food intake (Rodin *et al*., 1985). Several researchers have demonstrated a positive association between thyroid dysfunction and obesity or weight gain, even when the serum TSH levels are within the reference range (De Pergola, 2007; Reinehr, 2010). Higher serum TSH

levels are also associated with larger waist circumference and overall increased fat accumulation (Biondi, 2010). Treatment of hypothyroidism has been shown to result in significant weight loss (4.3 kg) although it could be attributed to water loss (Karmisholt *et al*., 2011).

Whereas psychological treatments target psychological factors, it appears various physiological variables need to be considered as part of weight loss: sleep quality, nutritional deficiencies (Vitamin D, calcium) and hormonal factors (thyroid function, menstrual issues). Whereas it is unclear whether psychological treatments target these and therefore cause weight loss, it appears that it cannot be assumed that psychological methods are ineffective if these physiological variables have not been assessed and consequently not been addressed.

(b) treatments fail to target need to exercise

According to the Obesity Management Guidelines, the most effective approach to weight loss is to make behavioural changes that facilitate calorie reduction and increase in physical activity. More specifically, the recommendation is to engage in aerobic activity such as walking for at least 150 minutes per week and to maintain lost weight or minimise weight regain long-term, 200-300 minutes per week are recommended (Jensen *et al*., 2013). The Physical Activity and Weight Management Research Center at the University of Pittsburgh concluded that for fat loss, 150 minutes per week of moderate intensity exercise is a good starting point and the ideal duration per day is 60 minutes (Jakicic, 2003).

The importance of including an exercise component for interventions targeting weight problems have been demonstrated by several studies. A Cochrane review of 43 randomised controlled trials showed that exercise-only interventions can result in an average weight loss of 2kg compared with no treatment. Interventions that combine exercise and diet resulted in a greater reduction in weight than dietary interventions alone, with an average of 3 kg loss. Increasing the intensity of the exercise increased weight loss by 1.5 kg (Shaw, 2006). Furthermore, a systematic review of six randomised controlled trials evaluating diet, or diet and exercise together, indicated that diet in combination with exercise interventions achieved a 20% greater sustained weight loss at one year

compared to diet alone (Curioni & Lourenco, 2005). A study of 45 trials with 7788 individuals investigated whether behavioural/lifestyle, pharmacological (e.g., Orlistat), food replacement/supplement, or alternative interventions were most effective. The researchers concluded that behavioural interventions focusing on both food intake and physical activity were the most effective for weight loss (Dumbrowski, 2014).

Studies have investigated which exercise specifically works best for fat loss with Villanova and colleagues (2006) identifying that even walking 1000 steps per day increases the probability of losing from 5 to 10% of initial weight and the probability of losing more than 10% increases by over 30%. But rather than just "weight" loss, exercise has been found to improve body fat distribution and reduce visceral fat deposits (Després & Lamarche, 1993). In regards to abdominal adiposity, resistance training has been found to be more effective at decreasing waist measurements compared to aerobic exercise (Herring, Wagstaff & Scott, 2014). However, High Intensity Intermittent Exercise (HIIT) has been found to reduce abdominal fat better (Trapp *et al*., 2008), build muscle tone, improve fat loss faster and suppress appetite better than regular sustained aerobic exercise (Boutcher, 2011).

Apart from weight and fat loss, exercise also leads to decreased appetite (King, Burley & Blundell, 1994) and improved executive functioning (Davis *et al*., 2011) which implies, for example, improved reasoning and planning ability in regards to food choices. In addition, exercise has even been found to improve self-esteem (Spence, McGannon & Poon, 2005), improve sleep (Yang *et al.,* 2012), reduce anxiety, reduce sensitivity to stress and depression (Salmon, 2001) with a 30% greater mood lift if exercise is done in the morning (Maraki *et al.,* 2005).

Despite these documented benefits of exercise, fewer than one fifth of US adults engage in regular, sustained, vigorous exercise; this fraction has not increased since the mid-1980s – according to older findings (USDHHS, 1996). Similarly, in Australia (according to the Australian Bureau of Statistics 2015) over 65% of Australians (12 million) aged over 15 were sedentary (33.8%) or had low

levels of exercise (31.5%) with the prevalence of low levels of exercise increasing with age (ABS, 2015).

Typical barriers to engaging in exercise include being overweight/obese, having physical health problems, having financial restrictions (e.g., to afford gym memberships or personal trainers), having time limitations and feeling discomfort in taking part in organised exercise activities, particularly alone (Thomas *et al*., 2008), inclement weather, disruptions in routine, lack of access to facilities, and dislike of vigorous exercise (Blair, Kohl & Gordon, 1992). However, other research has also identified neural signalling and pleasure/reward systems in the brain that relate to the propensity to be physically active and to adhere to an exercise programme (Herring, Sailors & Bray, 2014). So far, strategies to improve exercise adherence include personal counselling and advice, feedback and offering choices of exercise and supervision (Tegethoff *et al*., 2015). Outcomes are improved if the intervention comprises a specified type of physical activity and is supervised by a non-health professional using a combination of group and individual approaches to encourage exercise (Richards *et al.*, 2013).

Thus, in implementing a program to address BED and commonly associated weight management problems, it is important to include an exercise component. Whereas the literature has indicated that barriers to exercise include physical health problems, financial restrictions or other restrictions preventing access to gym facilities/trainers, inclement weather, time limitations, it is clear that some reasons including shame, brain-related pleasure/reward associations, dislike of exercise and possible "excuses" that prevent integration of physical exercise into a daily routine may be overcome with psychological methods, possibly with EMDR.

(c) treatment is lengthy

There is evidence that the longer the treatment, the better the outcome (Thompson-Brenner, 2013). In fact, in general, standard treatments vary between 16-22 sessions. Wadden & Osei (2002), for example, recommended 16-26 sessions for behavioral treatment whereas CBT is recommended in a

20-22 session format. Several other studies have found that providing booster sessions and longer overall treatment duration improves treatment outcome (Brauhardt, de Zwaan & Hilbert, 2014).

In regards to weight loss, Shaw and colleagues (2005) found that increasing the intensity of behavioural interventions (more behavioural strategies, more frequent clinical contact, or longer duration of intervention) resulted in increased weight reduction of approximately an additional 2.3 kg in adults. Klein, Skinner and Hawley (2013) too found that treatment drop out has been associated with level of intensity and length of time, unlike pharmacological treatments which have higher attrition rates than psychotherapies (Hay & Claudino, 2012). Ghaderi (2006) found that the shorter the treatment duration, the less attrition. The frequency of treatment sessions also affects treatment costs – which may lead to drop out: Kessler (2000) noted that financial barriers prevented treatment in 57.3 % of surveyed individuals with PTSD. One of the reasons that shorter treatments may be more beneficial – apart from reducing attrition – is that shorter treatments also have the benefit of being more cost efficient. One of the aims of this study was to find a treatment that is less labour intensive, more cost efficient and more accessible to people. The rationale for the 10-session format in this study was based on the fact that in Australia the Medicare system allows for a maximum of 10 sessions in private practice.

1.9. EYE MOVEMENT DESENSITISATION REPROCESSING (EMDR)

1.9.1. Definition and Mechanism of EMDR

Designed by psychologist Shapiro in 1987, EMDR was originally used only for treatment of trauma/PTSD related to sexual and physical abuse or combat (Shapiro, 1995). Its process is explained by the Adaptive Information Processing Theory (Shapiro, 2002). According to this model, humans have an innate information processing system that processes experiences and stores them in an adaptive state (Shapiro, 2002). Memory networks link thoughts, images, emotions and sensations associated with experiences. When someone experiences a traumatic event, information processing may be incomplete, and new information may not be adequately processed with available adaptive

information in memory networks. Thus, elements of experiences are stored as maladaptive or distorted thoughts, sensations and emotions that are associated with them. Traumatic memories are isolated and not adequately integrated with memory networks or semantic knowledge. External cues that are similar to the trauma experience are able to trigger sensations and images from the traumatic event, so that the person re-experiences these traumatic feelings or bodily sensations. If these memories remain unprocessed, they become the basis of symptoms of PTSD (Shapiro and Maxfield, 2002).

The Adaptive Information Processing theory hypothesizes that unprocessed memories of negative life experiences are inappropriately stored as episodic memories and underlie current dysfunctional responses and symptoms. Through EMDR, these memories of adverse events are processed through integration of these memories to semantic memory networks resulting in the memories no longer negatively impacting functioning and emotional wellbeing. Thus, symptoms may be eliminated when the memories are adequately processed and integrated. Shapiro (2001) proposed that EMDR can assist in processing the traumatic memories using bilateral stimulation such as eye movements.

In information processing terms, even humiliations and disappointments are identified as traumas ('small t's) as they are stored in implicit/motoric rather than in explicit/narrative memory (van der Kolk, 1994). In other words, a trauma is anything that exceeds someone’s ability to process an experience to adaptive resolution. Thus, a trauma is not necessarily defined as something life threatening, relating to serious injury or physical or sexual abuse. Rather, a 'small t' is a trauma such as verbal abuse, shaming, intimidation, neglect, deprivation and abandonment. Small t's are said to lead to attachment problems (failures of physical connection, affective attunement, secure emotional holding) as well as affect management problems and deficiencies in modeling.

In terms of disordered eating, small t's are said to lead to re-enactment of the trauma and the re-experiencing of unresolved affects through the individual's relationship to food (Omaha, 2000). Similar to other theories of BED that involve affect regulation, EMDR theory explains that “ED

symptoms are major defenses against experiencing and examining certain feelings, thoughts, conflicts and fantasies" (Bloom *et al*., 1994, pp 212). Or, as Scholom states, "a secure, healthy attachment facilitated by emotional attunement is critical to the development of affect regulation, and for people with EDs, . . . food symbolizes the time when merger of mother with baby was or should have been a soothing experience" (Scholom, 2009, p. 116). Scholom (2009) adds that EMDR needs to target specific aspects of the ED as well as the underlying traumas and traumas developing out of the disorder itself e.g., lack of body/self-acceptance.

1.9.2. EMDR Procedure

According Shapiro (1987), EMDR facilitates the movement of the thoughts, emotions and physical reactions about traumatic events that are stored in implicit/motoric to explicit/narrative memory via bilateral stimulation, typically by eye movements which are facilitated by the therapist who guides the clients' eyes rapidly from side to side in 30-60 second increments. This is done through a 3-pronged approach of targeting past experiences, current triggers and future potential challenges that results in the alleviation of presenting symptoms, decrease/elimination of distress from the disturbing memory, improved view of the self, relief from bodily disturbance and resolution of present and future anticipated triggers and resource development (Shapiro, 1991).

EMDR consists of an 8-Phase process of which the first three include rapport building and preparation which includes providing information about EMDR. The preparation phase also includes gathering of history to identify negative cognitions and corresponding emotions and body sensations related to the first, worst and most recent major trauma "big T" or minor trauma "little t." Specific questions can be used to facilitate identification of treatment targets e.g., "what do you feel/what thoughts do you have when you can't stop eating?" or "how would you feel about yourself/body if you were standing in front of a crowd?" Have you had these thoughts/feelings before? When was the first time/what happened then?" The purpose of such questions is to identify and activate the neural network containing the traumatic material so that it can be processed with eye movements.

The fourth phase is the desensitisation phase. Here the therapist prompts the person with questions that activate the trauma(s) that result in uncomfortable feelings (e.g., sadness, guilt, shame, etc.) and body sensations, typically tingling. Desensitisation of Subjective Units of Distress (SUDS) which include emotion and body sensations (measured from 0-100) is achieved by eye movements which are facilitated by the therapist who moves his or her finger from side to side (horizontally or diagonally) in increments typically lasting 30-60 seconds. Sets of these 30-second increment eye movements are continued until the level of distress reduces, preferably as close to zero as possible. Once the person has achieved complete desensitisation, phase 5 follows: positive cognitions are installed so that the person has new cognitions. For example, a new, more positive cognition is identified "I'm fine as I am", "my body is fine as it is" "I am safe" and installed by having the client keeping this cognition in mind during eye movements. Phase 6 includes identifying current triggers and future templates to prepare the person to a new response to a previous trauma or trigger. Phase 7 involves installation of a "Safe Place" which is a coping tool which can be used outside the session should a traumatic memory emerge after the session. Finally, Phase 8 is a debriefing of the session (see EMDR Protocol in Appendix II).

EMDR also uses a resource development and "installation" procedure (Shapiro, 1991; Shapiro, & Maxfield, 2002; Stickgold, 2002). Korn and Leeds (2002) have found evidence to support their use of their resource and installation method for Complex PTSD. More specifically, they found that the inclusion of the bilateral stimulation in the protocol appears to lead to spontaneous, rapid increases in affective intensity within an initially selected memory network and to rich, emotionally vivid associations to other functional (positive) memory networks. These increases in intensity of positive emotions and new functional associations bring additional ego-strengthening material into consciousness. (p.1469). The Safe Place Installation (see Appendix II) is a resource development and installation procedure which involves combining an image of a safe place with bilateral eye movement to increase feelings of calm and to enhance a client's ability to successfully engage in subsequent trauma processing. However, the resource development protocol can also be used to

develop missing resources and strengths e.g. “I’d like to feel safer, more confident, more trusting, more determined, better able to self-soothe or tolerate uncomfortable feelings.” As with the Safe Place Installation, the client is asked to think of something positive – but in contrast to a calming, soothing place/situation, the client is asked to think of a situation he or she has personally had these qualities. If not, he or she can think of another person e.g., teacher, public figure, mentor or even a fictional character, animal or spiritual guide who may possess these qualities in which he or she felt e.g., safe, confident, soothed, able to tolerate your feelings, etc. However, the same procedure is used to install these feelings (by associating them with words, images or symbols). Just as the client is able to calm himself or herself with the Safe Place method, the client who has had the Resource Development Installation (RDI) is then able to use this newly installed resource to engage in a new behaviour due to possession of these installed feelings. The RDI is said to strengthen connections to resources in functional (positive) “memory networks” (Leeds & Shapiro, 2000; Shapiro, 1995) while deliberately not stimulating dysfunctional (traumatic) memory networks (Greenwald, 1993a, 1993b; Martinez, 1991; Wildwind, 1992).

1.9.3. Efficacy of EMDR

To date at least 20 studies have provided evidence for the clinical efficacy of EMDR therapy in the treatment of PTSD (ACPMH, 2013; Bisson *et al*., 2013, Ehlers *et al*., 2010; WHO, 2013) and symptoms associated with trauma (Edmond *et al*., 1999). EMDR has been found to be efficacious in the treatment of PTSD as per 16 published controlled, randomised studies with comparisons to antidepressant medication, CBT and in several meta-analyses. These have found EMDR is comparable to other treatments, including exposure therapy (Bisson *et al*., 2007; Bradley, Greene, Russ, Dutra, & Westen, 2005). More recently, Chen and colleagues (2015) have found – through a quantitative meta-analysis on the findings of 26 randomized controlled trials of EMDR therapy for PTSD published between 1991 and 2013 - that EMDR therapy significantly reduced the symptoms of PTSD, depression, anxiety, and subjective distress in PTSD participants.

In some cases, meta-analyses and single study comparisons of CBT and EMDR, EMDR has been shown to relieve PTSD symptoms as effectively, but often more quickly than the gold-standard CBT (c.f. Jaberghaderi *et al*., 2004; Van Etten & Taylor, 1998), cited by Shapiro (2014) to produce significant improvements after a limited number of sessions. Shapiro (1989) suggested that 75% of individuals with a traumatic memory had complete desensitisation, i.e., were treated successfully - in one 50-minute session and that between one and three individual traumatic memories could be treated in a single session. However, a primary difference between EMDR and other treatments is that the recommended session duration for an EMDR session is 90 minutes (Shapiro, 1997). For example, at least one study has shown that treatment duration of more than 60 minutes was a major contributing factor in the amelioration of anxiety and depression (Chen *et al.,* 2014). The reason for its efficacy has been explained by its unique mechanism, i.e., that it addresses the trauma memory network on emotional, cognitive as well as physiological levels simultaneously (Shapiro, & Maxfield, 2002; Stickgold, 2002). Because EMDR sessions target physiological, emotional and cognitive disturbance, changes may appear to the client to be more spontaneous or automatic compared to CBT which may require homework and a conscious effort to change negative beliefs (Shapiro, & Maxfield, 2002; Stickgold, 2002).

In addition to being effective for PTSD, EMDR has also been found – over the past 36 years - to be useful in the treatment of panic attacks (De Jongh, & ten Broeke, 2009), phobias (Haour & de Beaurepaire, 2016), grief (Solomon & Rando, 2014), pain (Tesarz *et al*., 2014), depression (Hase *et al.*, 2015), performance (Foster & Lendl, 1995), addictions (Hase, O'Brien, & Abel, 2011; Luber, 2009; Shapiro, 2005; Zweben, & Yeary, 2006), dissociative disorers (Paulsen, 1995), body dysmorphic disorder (Brown, McGoldrick & Buchanan, 1997) and morbid jealousy (Blore, 1997). EMDR has also been found to be useful in the alleviation of psychotic and affective symptoms as well as prove useful as an adjunct treatment for chronic pain conditions (Valiente-Gómez *et al*., 2017).

1.9.4. Current EMDR protocols

Balbo *et al*. (2017) concluded after a systematic review of EMDR for the treatment of eating disorders of EMBASE, MEDLINE, PsycINFO and CINAHL from the beginning of records to February 2017 that there was not only insufficient support due to the scarcity of studies but also methodological limitations that make it difficult to identify if EMDR is efficacious for eating disorders. In addition, these protocols are for eating disorders in general, rather than for BED specifically.

For example, a single case study using the EMDR DeTur protocol (Popky, 2005) to treat "emotional eating" has been published (Halvgaard, 2015). It outlines the effect of an adjusted version of the desensitization of triggers and urge reprocessing (DeTUR) protocol which includes resource installation, affect management, ego state work and the standard EMDR protocol. This protocol aimed to target affect regulation in specific eating behaviour, urges in triggering situations, impulse control and body image. It did not have any standardised measures for testing targets, thus the outcome is difficult to assess and compare.

Omaha proposed a BED protocol at the EMDRIA Conference in 2000. Omaha's "Chemotion" protocol involves desensitising trauma but added a component to develop specific affect regulation resources. According to Omaha, food ("the abused substance"), then no longer provides the means for re-enactment of childhood emotional trauma and no longer facilitates a re-experiencing of unresolved affects related to the trauma. Treatment outcome data were not available and no randomised controlled trials have been conducted.

In 2003 Balbo conducted a symposium on "EMDR treatment of BED" at the annual meeting of the EMDR Europe Association in Rome. Balbo analysed 10 cases of clients with various dysfunctional ideas caused by distorted constructions with respect to their self-esteem, self-acceptance and personal value, as shown both in their EDI-2 (Eating Disorder Inventory-2 scores), the analysis of their life histories and The Symptom Questionnaire after 6 EMDR sessions. Results indicated that the use of EMDR on negative cognitions as well as on BE produced a reduction of dysfunctional ideas, binge eating, an increase in motivation to change, an increase in compliance

and autonomy in therapy progress. However, there was no report of weight loss.

Hornsfeld conducted a symposium on “Cue exposure and EMDR: a new protocol description of procedure and demonstration of clinical application in the treatment of Binge Eating” at the annual meeting of the EMDR Europe Association in Belgium in 2005. Hornsfeld's protocol is based on Jansen’s (1997) cue exposure protocol (that is aimed at extinction of the conditioned response pattern) with an added component that targets processing of emotional and cognitive reactions. No treatment outcomes are available and no controlled trials have been conducted.

Neither Omaha, Balbo nor Hornsfeld have tested their proposed protocols in randomised controlled trials. However, Bloomgarden and Calogero (2008) conducted a randomised trial with 43 women who underwent standard residential eating disorders treatment (SRT) or and EMDR therapy (SRT and EMDR) for treatment of negative body image. At post-treatment, 3-month, and 12-month follow-up, those receiving SRT and EMDR reported less distress about negative body image and lower body dissatisfaction compared to SRT. However, whether the effect was due to the combination i.e., more treatment compared to SRT only is unclear as it was not compared to EMDR only.

Because trauma history is prominent in the BED population (e.g., Smyth *et al*., 2008; Vanderlinden *et al*., 1993; van der Kolk, 1991) and current evidence suggests that EMDR is an effective and efficient treatment for trauma (e.g., Jaberghaderi *et al*., 2004; Shapiro, 2014; Van Etten & Taylor, 1998), as well as being applicable for disorders other than trauma/PTSD (e.g., Tesarz e*t al*., 2014; Shapiro, 2014), it would seem that EMDR may be an effective and efficient treatment for BED. However, as noted above, a specific protocol for BED has not been developed – other than those proposed by Omaha (2000), Balbo (2003) and Hornsfeld (2005). Since above mentioned protocols were not available, an adapted form of a BN protocol is proposed. The new proposed protocol for BED will be an adaptation of Forester's BN protocol outlined in Robin Shapiro's (2009) *EMDR Solutions II (*see Appendix II).

MAJOR RESEARCH AIMS AND HYPOTHESES

The aim of this study was to examine the effectiveness of EMDR, an evidence-based treatment usually indicated for PTSD, to treat BED. It was proposed that EMDR may be effective for the BED population because not only is trauma history common in this population (e.g., Smyth *et al*., 2008; Vanderlinden *et al*., 1992) but also because EMDR has shown – in some cases – to be an effective and efficient treatment for disorders other than PTSD (e.g., Hase *et al.*, 2015; Valiente-Gómez *et al*., 2017). The main target of the treatment, adapted from an EMDR protocol used for BN, was to reduce BED symptoms. Secondary outcomes include reductions in comorbid mental health symptoms, increased engagement in exercise and facilitation of weight loss. More specifically, the main hypotheses are the following:

Hypothesis 1 is that compared to no treatment, EMDR decreases BED symptoms Hypothesis 2 is that EMDR improves engagement in exercise. Hypothesis 3 is that EMDR reduces comorbid mental health symptoms, general anxiety, depression and stress symptoms and improves self-esteem. Hypothesis 4 is that there is a relationship between childhood trauma and response to treatment. Hypothesis 5 is that EMDR facilitates weight loss. These hypotheses will be tested by a randomized controlled trial of participants who will have ten 1-hour EMDR treatment sessions over 10 weeks and will be compared those wait-listed participants. Participants will be assessed pre-treatment/waitlist period and post-treatment/10-week waitlist period on weight as well as with questionnaires assessing not only BED symptoms but also frequency, duration and intensity of exercise, mental health indices and trauma history.

CHAPTER 2

METHOD

2.1. Participant Recruitment

Participants were recruited from an advertisement in a Sydney newspaper as well as through flyers that were distributed in GP clinics in the Sydney area as well as the University of Sydney campus (see Appendix III). Information about the trial was also available on the Clinical Trials Registry website. The recruitment advertisement requested potential participants to contact the researcher to participate in a Binge Eating Disorder treatment study.

2.1.2. Participant Inclusion/Exclusion Criteria

Inclusion criteria were that participants were: adults able to speak/understand English, met the principal diagnostic criteria for BED - as assessed by the BEDQ, a questionnaire designed by the researcher (see Appendix IV) based on the DSM-5 diagnosis for BED (see Appendix I). Exclusion criteria included: (1) the presence of a medical condition or medication that affects appetite, eating or weight; (2) use of Benzodiazepines because these reduce treatment efficacy through the mechanisms of state-dependent learning (Paulson, 2007); (3) the presence of epilepsy or dissociative identity disorder (which are contra-indications for EMDR) as measured by the Dissociative Experiences Scale (Carlson and Putnam, 1993); (4) current pregnancy or planning a pregnancy within 6 months from starting treatment; (5) participation in another weight control treatment program or any psychological therapy; (6) engagement in legal proceedings relating to their weight or eating (e.g., in legal proceedings to sue the perpetrator of sexual abuse that lead to trauma); (7) presence of another major stressor that would interfere with their ability to focus on their weight/eating goal (e.g., divorce, etc.) or (7) presence of any substance use or alcohol use disorder or use of any illicit drugs on a regular basis that would have required the focus of treatment; (8) presence of substantial borderline personality disorder traits - as assessed by the 12-item Borderline Personality Test (Grohol, 2013); (9) current active suicidal ideation (or in the last 6 months) with plan/intent; (10) presence of psychotic symptoms because using EMDR without special training on those with borderline disorders, schizophrenia and substance use disorders is contra-indicated (Fine *et al.,* 1995). The research was approved by and complied with the University of Sydney Human Research

Ethics (Approval 2014/025 on 29/10/2014; see Appendix A) and was registered with Australian New Zealand Clinical Trials Registry (ANZCTR, ACTRN12614000894695 on 05/08/2014).

2.2 Measures

2.2.1. Screening Measures

(a) BED Questionnaire

This questionnaire was designed by the investigator, based on the BED criteria as outlined by the DSM-5 for the purpose of identifying those who had BED diagnosis. It was used during the telephone screening to identify suitable participants (see Appendix IV). For example, “do you eat a large amount of food and feel like you can't stop?/have no control; at least once weekly the past 3 months, do you eat very quickly, eat when you're not hungry, feel guilty, embarrassed or disgusted about what/how much you eat?”

(b) Borderline Personality Disorder Test

This is 12-item test (see Appendix IV) designed by Grohol (2013), includes questions about self-harm, mood dysregulation and anger outbursts. For example, “have you ever purposely cut or burnt yourself or injured yourself as a suicide attempt?” Questions are rated on a 5 point scale from “strongly disagree” to “strongly agree.” Psychometric properties of this screen have not been objectively researched.

(c) The Dissociative Experiences Scale (DES)

The DES (see Appendix IV) is a 28-item questionnaire developed by Carlson and Putnam (1993), typically used as a screen for Dissociative Disorders. The DES is freely available to use and no special training is required to administer and score it. Questions include “Some people have the experience of finding themselves in a place and having no idea how they got there,” or “some people have the experience of looking in the mirror and not recognizing themselves.”

The DES and/or its taxon score has been used to screen out those people who were deemed unsuitable for EMDR by assessing presence and level of dissociative symptoms (Paulson, 2007).

Although it has been under debate recently (de Jongh *et al*., 2016), research has indicated that the risk of retraumatisation during EMDR with clients with dissociative disorder is particularly high (Paulson, 2007). The overall DES score is obtained by summing the 28 item scores and dividing by 28: this yields a total score ranging from 0 to 100. A recommended cut off score on the DES is 25 (Saxe *et al*., 1993). Scores above 25 are clear indications that EMDR should not proceed (Paulson, 2007). However, a subset of 8 DES items (3, 5, 7, 8, 12, 13, 22, and 27) form the Dissociative Experiences Scale Taxon (Waller *et al.,* 1996), which is thought to be especially sensitive to pathological dissociation. The DES-T total score can be obtained by averaging across DES items 3, 5, 7, 8, 12, 13, 22, and 27. Waller *et al.* (1996) have proposed a procedure to derive Bayesian taxon membership probabilities from these 8 items (Waller & Ross, 1997). The DES has very good validity and reliability, and good overall psychometric properties (Carlson, 1994; Carlson & Armstrong, 1994; Carlson & Putnam, 1993; Carlson *et al*., 1993). The DES cut off score used for this study was 25.

2.2.2. Measures at Baseline only

(a) Invalidating Childhood Environment Scale (ICES) (Mountford, 2007)

Developed by Mountford *et al.* (2006), the ICES (see Appendix IV) measures the impact of parental invalidation. Items include fourteen items related to mother's and father's response to emotions during childhood rated from 1 (never) to 5 (all of the time). For example, “During my childhood my parents would become angry if I disagreed with them,” “when I was anxious my parents ignored this,” “if I couldn't do something, my parents would say things like ‘you're being difficult on purpose’.” The additional four items assess perceptions regarding perceptions of parents during childhood which are rated from 1 (not like my family) to 5 (like my family all the time). These include “everything in my family was perfect on the surface. However, my parents couldn't stand it if I showed I was upset, scared or angry. They expected me to put aside my feelings and get on with it” and “I felt listened and cared for. My parents were interested in my thoughts and ideas and

encouraged me to make my own decisions and choices. If things were difficult for me, they supported me and tried to comfort me."

Trauma related to invalidation has been found to be associated with the difficulties in tolerating distress that is often seen in adults with eating disorders (Corstorphine *et al*., 2007). High scores on the ICES tend to have greater levels of eating disturbance (Mountford *et al*., 2007). According to the developers, the ICES has acceptable psychometric and clinical validity (Mountford *et al*., 2007). In terms of concurrent validity, Mountford *et al*. (2007) found that the ICES paternal and maternal invalidation scores were associated with some of the subscales in the Eating Disorders Inventory (EDI; Garner, Olmsted, & Polivy, 1983) among both the clinical and non-clinical samples. The ICES was also able to differentiate clinical from non-clinical groups with the clinical group reporting higher levels of both maternal and paternal invalidation.

2.2.3. Pre- and Post- Measures

Apart from the BMI (a measure derived by height/weight), questionnaires included three eating disorder measures - the clinician-administered Eating Disorder Examination (Fairburn & Beglin, 1994) and two pen-and-paper measures - the Eating Beliefs Questionnaire (Groves, 2008) and Binge Eating Scale (Gormally *et al.,* 1982), one exercise measure - the International Physical Activity Questionnaire (IPAQ; Craig *et al*., 2003), and three mental health measures: the Trauma Symptom Checklist-40 (Briere & Runtz, 1989), the Rosenberg Self-Esteem Scale (Rosenberg, 1965) and the Depression, Anxiety and Stress Scale (DASS21; Lovibond & Lovibond, 1995).

2.2.3.1. Eating Disorder Related Measures

(a) Eating Disorder Examination 16th edition (EDE 16.0D)

The EDE is a 36-item clinician administered self-report measure of eating disorder features that focuses on the past 28 days (Fairburn & Beglin, 1994; see Appendix IV). Scores on each of the four

subscales, as well as a global score, may be derived from 22 items assessing core attitudinal eating disorder features, namely, restraint, eating concern, weight concern and shape concern (see Appendix). Scores on these items (and subscales) range from '0' to '6', with higher scores indicating greater symptom levels (Fairburn & Beglin, 1994).

The EDE-Q subscales have been found to have very good internal consistency, test-retest reliability, and convergent validity in a range of study populations, including general population samples of women (Berg *et al*., 2012; Fairburn & Beglin, 1994; Mond *et al*., 2004). Reliability and validity have been supported in the use of BED (Grilo, Masheb, Lozano-Blanco, Barry, 2004): inter-rater reliability 0.98 for objective bulimic episodes, on the eating disorder scales 0.65-.96; test-retest reliability 0.70 on episodes and .70 on days and on the eating disorder scales 0.50-.88. Reas and colleagues (2006) found in their investigation of the reliability of the EDE-Q for people with BED, that the EDE-Q is useful for assessing the number of objective bulimic episodes and associated features of eating disorders in patients with BED. However, it is not reliable for assessing subjective bulimic episodes.

Although not specific to BED, the EDE has diagnostic items and items specific to eating, weight and body image. Eating items include patterns of eating, picking (nibbling), preoccupation with food, eating or calories, bulimic episodes and other episodes of overeating, social eating and eating in secret. Weight items include satisfaction with weight, desire to lose weight, desired weight, weighing, reaction to prescribed weighing and sensitivity to weight gain. Body image items include dissatisfaction with shape, preoccupation with shape or weight, importance of weight, shape and strict control over eating, discomfort seeing body, discomfort about body exposure and feeling fat.

Special training is needed to administer and score the EDE. The investigator who also acted as a therapist, administered all EDE's at pre-treatment/wait-list. Those participants who were treated by the assessor, were assessed at post-treatment by an independent assessor.

(b) Eating Beliefs Questionnaire (EBQ)

Developed by Groves (2008), this 32-item scale assesses negative and positive beliefs about eating (see Appendix IV). Items are scored on a Likert scale from 1-5 with 1 (strongly disagree) and 5 (strongly agree). Items include "I will never be able to control my urges to eat," "Eating helps me cope," and "once I start eating I can't stop." Results of an exploratory factor analysis study supported a two-factor solution (negative and positive beliefs) providing evidence that it is a valid and reliable measure within a non-clinical sample.

The EBQ has excellent internal consistency α = .93-.96. It also has good test-retest reliability. The EBQ also has strong positive correlations with EBQ subscales, BMI and DEBQ subscales and moderate positive correlations with EBQ subscales and DASS subscales (Groves, 2008). In addition, Burton *et al.'s* (2017) validation study also supported the two-factor solution (negative and positive beliefs) in a confirmatory factor analysis. It provided evidence that the EBQ is a valid and reliable measure within a large clinical and non-clinical sample. It confirmed significant differences in EBQ scores between clinical and non-clinical groups and supported test and re-test reliability in both clinical and non-clinical samples over a period of 2-10 weeks. It also confirmed treatment sensitivity/responsiveness across two binge eating treatment samples and showed an internal consistency α = .91-.94. Strong positive correlations were found between EBQ subscales and BMI, the EDE-Q, binge eating frequency, DASS21 scale scores and measures of eating disorder symptoms (DEBQ, EDBQ, ED-CBQ, Body Shape Q), measures of emotion regulation (ACS and DERS) and a measure of negative self-beliefs (CBQ). In this sample, the EBQ Positive Beliefs had a α = 0.93 indicating excellent reliability and Negative Beliefs a α =0.84 indicating good reliability.

(c) Binge Eating Scale (BES)

The BES was originally developed by Gormally *et al*. (1982) to identify binge eaters within an obese population (see Appendix IV). It consists of 16 items that are specific to attitudes about weight, body size, eating, binge urges, emotional eating, binge behaviours, preoccupation with

food, weighted from severity of 1-4. Respondents are classified as mild (<=17), moderate (18 to 26), and severe (>=27). In general, a score >=17 is indicative of binge eating. The BES has demonstrated excellent performance (96.7%) on discriminating clinically significant cases of binge eating, showing a sensitivity of 81.8% and specificity of 97.8% (Duarte, Pinto-Goveia & Ferreira, 2015).

Items include "I don't feel self-conscious about my weight or body size when I'm with others," "I feel capable to control my eating urges when I want to." The BES has good test-retest reliability (r = .87, p <.001) and a moderate association with binge eating severity as measured by food records (r = .20-.40, p <.05; Timmerman, 1999). For this study, the BES had a α = 0.83 indicating good reliability.

2.2.3.2. Mental Health Related Measures

(a) The Depression Anxiety Stress Scale – short form (DASS21; Lovibond & Lovibond, 1995)

The DASS21 is a 21-item self-report measure that assesses the presence and severity of depression, anxiety and stress over the past week (see Appendix IV). Respondents are instructed to rate each item using a 4-point Likert scale ranging from 0 (*did not apply to me*) to 3 (*applied to me very much*). Items on the Depression subscale include "I felt down-hearted and blue;" on the Anxiety subscale "I was close to panic" and on the Stress subscale "I found it hard to wind down." Scores of the DASS21 range from 0 to 42, with higher scores on each scale representing higher levels of each negative emotional state. The DASS21 has shown good reliability in the detection of depression (α = .94), anxiety (α = .84), and stress (α = .91), as well as adequate internal consistency and face validity. The coefficient alphas for the DASS subscales were .88 for depression, .81 for anxiety, and .85 for stress (Antony *et al*., 1998).

For this sample, the DASS21-Depression subscale the Cronbach alpha was excellent (α = 0.96), for Anxiety subscale excellent (α = 0.91) and for DASS21-Stress subscale also excellent (α = 0.91).

(b) Trauma Symptom Checklist-40 (TSC-40*;* Briere & Runtz, 1989)

The TSC-40 is a 40-item self-report questionnaire that evaluates symptomatology in adults associated with childhood and adult traumatic experiences (see Appendix IV). The TSC measures aspects of post-traumatic stress and other symptom clusters found in some traumatized individuals. The TSC-40 consists of six subscales: Anxiety, Depression, Dissociation, Sexual Abuse Trauma Index (SATI), Sexual Problems and Sleep Disturbance. Each symptom item is rated according to its frequency of occurrence over the prior two months, using a four-point scale ranging from 0 ("never") to 3 ("often"). Items include, for example: “headaches, stomach problems, having trouble breathing, insomnia, weight loss, sexual problems, flashbacks, low sex drive, nightmares, sadness, memory problems and feelings of guilt.”

The TSC-40 requires approximately 10-15 minutes to complete and can be scored in approximately 5-10 minutes. The TSC-40 has predictive validity with reference to a wide variety of traumatic experiences and has been found to be a relatively reliable measure with subscale α typically ranging from .66 to .77, with α for the full scale averaging between .89 and .91 (Briere, 1996). For this sample the TSC-40 had a $\alpha = 0.94$ (excellent).

(c) Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965)

The RSES is a 10-item self-report measure evaluating self-esteem esteem (see Appendix IV) using a 4-point Likert scale ranging from 0 (strongly disagree) to 3 (strongly agree) of an individual's global self- with higher scores representative of higher self-esteem. Items include “I feel that I have a number of good qualities” and “I take a positive attitude toward myself.” Reliability and validity of this scale has been supported by previous studies (e.g., Byrne, 1983; Fleming & Courtney, 1984; Rosenberg, 1965; Silber & Tippet, 1965). The Cronbach alpha for this sample was good ($\alpha = 0.81$).

2.2.3.3. Other Measures

(a) International Physical Activity Questionnaire (IPAQ) short version

This 7-item questionnaire assesses engagement in exercise, but also time spent sitting (see Appendix IV). Items include questions about number of minutes/hours of vigorous and moderate physical activity as well as walking over the past week. The IPAQ has reasonable measurement properties for monitoring population levels of physical activity among 18- to 65-year-old adults in diverse settings. Criterion validity had a median of about 0.30. (Craig *et al*., 2003). The IPAQ includes a question regarding sitting – as per research that has confirmed that sitting for many hours without getting up, increases risk of diabetes, heart disease and early mortality regardless of physical activity throughout the day (Dunstan *et al*., 2012).

(b) Working Alliance Inventory (WAI-S)

This 12-item questionnaire, developed by Tracey and Kokotovic (1989), is based on the original 36-item Working Alliance Inventory (WAI) by Horvath and Greenberg (1989) to measure the working alliance – the quality of the bond between therapist and client. It measures three aspects of the therapeutic relationship: agreement on task and goals. The WAI-S produces a total alliance score, as well as scores for the three subscales (Goal, Task, Bond), where the total 12-items are comprised of 4 items from each of the subscales.

Items include “I am worried about the outcome of these sessions,” “my therapist and I understand each other,” “I disagree with my therapists about what I ought to get out of therapy.” Each item is responded to using a 7-point format. It yields three 12-item, summed subscale scores (Task, Bond, and Goal) as well as one overall score. Horvath and Greenberg (1986) demonstrated adequate reliability for the WAI. Internal consistency estimates of alpha were .93 for the overall client score (with subscale alphas of .85 to .88) and .87 for the overall therapist score (with subscale alphas of .68 to .87). Content validity has been supported through both rational and empirical

methods (Tracey & Kokotovic, 1989). For this study, it was administered at session 4 to participants in the EMDR group (Appendix IV).

(c) Confidence in Treatment (CIT)

The Confidence in Treatment scale (see Appendix IV), also known as the Credibility/Expectancy Questionnaire or the Treatment Expectancy Questionnaire (Devilly & Borkovec, 2000), measures perceived credibility/confidence in treatment. For this study, the three questions were modified to measure participants' perceived credibility specific to the EMDR treatment and eating/weight pathology: (1) How logical does this type of treatment seem to you? (2) How confident are you that this treatment will be successful *in reducing your binge eating and helping you with your weight*? and (3) How confident would you be in recommending this treatment to a friend who was experiencing *struggling with binge eating and weight management?*

This scale demonstrates high internal consistency within each factor with a standardised alpha between 0.79 and 0.90 for the expectancy factor, a Cronbach's α of between 0.81 and 0.86 for the credibility factor, and a standardized α of between 0.84 and 0.85 for the whole scale. Test retest reliability over a one-week period was also found to be good at 0.82 for expectancy and 0.75 for credibility. The original version of this scale has been used successfully to compare the reliability of control treatments in treatment outcome research (Heimber *et al*., 1990) and to determine the extent to which treatment credibility predicts treatment outcome (Chambless Tran, & Glass, 1997). It was modified to include the wording of binge eating/weight management problems and administered at session 4 by each therapist. For this sample, the Cronbach alpha was acceptable (α = 0.68).

(d) Body Mass Index (BMI)

BMI is calculated by dividing weight by height and then identifying the weight category. For example, 65kg at 160 m, BMI = 24. This score is then categorised: a BMI between 18 and 24 is normal/healthy; BMI=25-29 is overweight; a BMI greater than 30 is obese and 30-39 is morbidly obese, 40+ = super obese (Hudson *et al.,* 2007). For this study, all participants were weighed by the

investigator pre-treatment/waitlist period and after 10 sessions/10-week waitlist period.

2.3. Procedure

Of the initial 90 potential participants who contacted the clinic, 38 met eligibility criteria and were invited for assessment. Participants were then randomly allocated by an independent researcher using a computer generated randomisation procedure into either the ten 1-hour session individual EMDR treatment with the therapist one of the three options or allocated to the waitlist group. Participants' characteristics are described in the results section. Due to the randomized allocation (which was computer generated), only 16 were allocated to the EMDR group whereas 22 to the waitlist group.

At the assessment interview, participants signed the Participant Consent Form (Appendix III). They were weighed by the investigator to calculate a BMI. They also completed a total of eight measures including the Eating Beliefs Questionnaire (EBQ), Binge Eating Scale (BES), Eating Disorder Examination (EDE), International Physical Activity Questionnaire (IPAQ), Trauma Symptom Checklist (TSC-40), Rosenberg Self-Esteem (RSES), Depression, Anxiety and Stress Scale (DASS21) and the Invalidating Childhood Experiences Scale (ICES).

Those in EMDR treatment were able to choose their preferred location/therapist. Therapist A, also the investigator, was a clinical psychologist with a Doctorate in Clinical Psychology with 14 years clinical experience; Therapist B was a generalist psychologist with a Bachelor of Arts in Psychology and Post-Graduate Diploma in Psychology with 25 years' experience; Therapist C was a clinical psychologist with a Doctorate in Clinical Psychology with 5 years post-doctoral experience. All three therapists were female and were registered psychologists with AHRPRA and had EMDR Level II training (accredited by EMDRIA) which meant they adhered to the ethical guidelines outlined by these professional bodies.

All EMDR participants were also asked to complete two questionnaires that assessed confidence in treatment with the Confidence in Treatment Scale (Devilly & Borkovec, 2000; see Appendix IV) and the quality of the therapeutic alliance with the Working Alliance Questionnaire (Horvath & Greenberg, 1986) in session 4 (see Appendix IV). The Dissociative Experiences Scale (DES;

Carlson & Putnam, 1993) administered during the phone screening were forwarded to the therapists to assist with treatment. After a wait-list period of 10 weeks, participants on the wait-list were asked to complete post-treatment (waitlist) questionnaires and were also given the opportunity to participate in the EMDR treatment. EMDR treatment was administered in the form of 10 weekly 1-hour individual sessions. Although some participants may achieve desired treatment goals in fewer than 10 sessions, all participants were required to attend 10 sessions in order to standardize the treatment across all three therapists. Participants were asked to pay $ 10 per session. All participants who had 10 EMDR sessions, were asked to complete post-treatment questionnaires. Statistical analyses were performed with SPSS Version 21 (IBM, 2012).

In regards to fidelity checks, all ten 1-hour sessions were audiotaped so that an external auditor would be able to verify that (1) therapists used only EMDR therapy, (2) therapists presented the therapy in ten 1-hour sessions and (3) therapists used assessment methods and the EMDR protocol specifically developed for this particular BED study.

2.3.1. Eye Movement Desensitisation Reprocessing (EMDR)

Because existing BED EMDR protocols were not available, the protocol used for this study was one developed and modified by the investigator, based on a protocol designed for BN by Forester (2001). Modifications included (1) the removal of the processing of compensatory behaviours (vomiting/use of laxatives and excessive exercise) that is used for BN behaviours; (2) the addition of a protocol to improve motivation to exercise – this was based on the Safe Place Installation; (3) the addition of a protocol - based on a standard trauma protocol - to lose weight. Although the standard session time for an EMDR is 90 minutes, the therapy sessions duration was reduced to the standard 50-60 minutes. The focus of the EMDR was to remove the underlying trauma(s) to desensitize anxiety about eating/weight/weight loss/food and body shape, improve associated self-esteem and general mental health, eliminate binge eating, improve engagement in exercise and decrease body weight. See Appendix II for the complete treatment protocol.

CHAPTER 3

RESULTS

3.1. Tests of normality, sphericity and randomness of missing data

The data was assessed for any violations to assumptions of normality using the Shapiro-Wilk test and to assumptions of sphericity using Mauchly's test of sphericity in SPSS. Most variables did not violate assumptions of normality. However, scores on the DASS21 anxiety and depression subscales, and the TSC-40 anxiety subscale although broadly distributed, were somewhat positively skewed, as were scores on the TSC-40 dissociation subscale. These distributions are in keeping with relatively low mean scores on these measures and with the mean scores for these measures more generally. Inspection of Q-Q normal plots indicated linear distributions of scores for these variables and as such raw scores were retained for analysis. In keeping with expectations, EDE shape concerns subscale scores were somewhat negatively skewed, but again, inspection of Q-Q plots indicated a linear distribution of scores. There were no violations to assumptions of sphericity using Mauchley's test of sphericity. Little's MCAR test was conducted, collapsed across groups, for all quantitative self-report questionnaires completed at baseline (i.e., pre-treatment/waitlist), showing no significant result, indicating that data are missing at random, $p = 1.00$.

3.2. Attendance Rates

Of the 90 people who contacted the investigator to participate, 85 people were available for the phone screening. Of those, 47 people were not eligible for treatment for a variety of reasons most notably because binge eating without compensatory behaviours was not their primary concern, they were already regularly engaged in other therapy, or lived too far away to attend therapy regularly. Of the 16 participants who started EMDR treatment, a total of 11 completed all 10 sessions. Of the 7 participants who started with Therapist A, 6 completed (85%); of the 4 participants who started with Therapist B, 1 completed (25%); and of the 5 participants who started with Therapist C, 4 completed all 10 sessions (80%). Attendance ranged from 3 to 10 sessions with a mean attendance rate of 8 sessions ($SD = 2.7$). No significant differences were found in session attendance rates

among the three therapists, $\chi 2$ (2, N = 16) = 4.79, p = 0.09, although Therapist B had the lowest attendance rates.

3.3. Attrition and Questionnaire Return Rates

Of the 16 participants who were assigned to EMDR treatment, 11 completed all 10 sessions and post-treatment measures, and 5 did not. Attrition rates were calculated as non-attendance at less than 80 percent of EMDR treatment sessions. A Chi-square analysis demonstrated no significant differences in attrition rates between the two group, 32%, n = 7 for the waitlist group, and 31%, n = 5, for the EMDR group, $\chi 2$ (1, N = 38) = 0.001, p = 0.97. A Chi-square analysis revealed that there was no significant difference between the two groups in the number of participants who completed post measures, $\chi 2$ (1, N=38) =1.67, p = 0.20.

3.4. Study Flowchart

Figure 1 illustrates the flow of participants from initial contact and throughout the study to post treatment/waitlist. As shown in Figure 1, ninety people responded to the recruitment advertisements and a total of 85 could be contacted for screening. Participants were "screened" over the phone for eligibility using a screening questionnaire (see Appendix IV). Of the 85 people who were screened, 47 were not eligible for treatment for a variety of reasons most notably because they did not meet BED criteria, they were already regularly engaged in other therapy, or lived too far away to attend therapy regularly. Thus, 38 participants were invited to attend an assessment session and were provided with written informed consent to participate. All 38 met inclusion criteria and were invited to participate in the EMDR therapy trial. An independent researcher randomly assigned the 38 participants using a computer-generated randomization procedure, to either EMDR treatment (n = 16) or a waitlist control group (n = 22). Of the total of 16 participants who started EMDR treatment: 7 chose location 1 with Therapist A, a total of 4 participants chose location 2 with therapist B, and 5 participants chose location 3 with therapist C. Twelve participants from the 22 participants on the

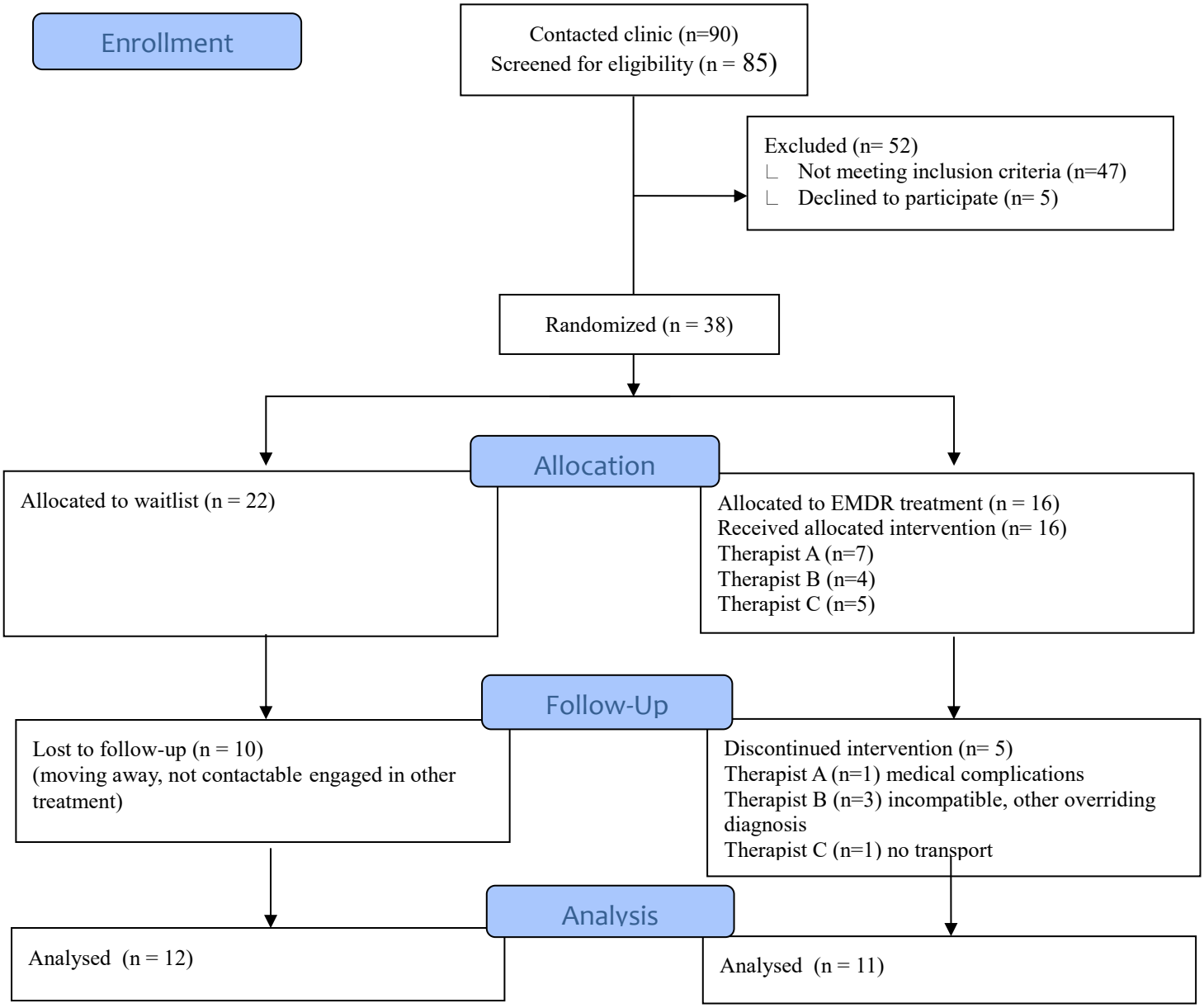
waitlist group and 11 of the 16 participants from the EMDR treatment group completed post questionnaires/interviews. Ten participants who were on the waitlist did not complete post-waitlist period assessment – reasons included moving away, not being available or contactable for a post-waitlist period assessment or engaging in another treatment during the course of the 10-week waitlist period. Reasons for discontinuing EMDR treatment included medical reasons that prevented being able to attend (Therapist A), feeling incompatible (Therapist B) and the therapist identifying other more severe comorbid issues needing more attention i.e., hoarding disorder and marital distress (Therapist B) and not having transport anymore to attend treatment (Therapist C).

3.5. Pre-treatment demographic and symptom comparisons for EMDR and waitlist groups

Participants in the EMDR treatment group were compared on various demographic and symptom measures to those in the waitlist group at pre-treatment/pre-waitlist period using a priori planned contrasts and comparisons using one way analyses of variance (ANOVA) and Chi square analyses, as appropriate.

Of these 38 participants who were assessed, all were female except for 1 male participant. Table 1 summarises other characteristics including the age, mean BMI, mean scores and standard deviations for specific eating disorder measures (EBQ, BES and EDE) as well as other general psychological health measures (DASS21, ICES, TSC, RSES) for both groups. Table 1 also includes the *F* values and indicates significance for comparisons of the two groups using one-way ANOVAs. The only significant baseline differences between the two groups included higher DASS21-anxiety scores for waitlist participants and significantly higher ICES-invalidating scores for the EMDR group participants.

Participant Flow Diagram



Body Mass Index (BMI)

The relevant BMI weight category was calculated for each participant (i.e., underweight, normal, overweight and obese ranges). The resulting proportions of waitlist participants in the BMI weight categories included: 13.2% in the normal range, 15.8% in the overweight range and 21.1% in the obese range, while participant in the EMDR group consisted of 5.3% in the normal range, 10.5% in the overweight range and 23.7% in the obese range. A Chi-square analysis showed that the proportions of participants in each of the BMI weight categories was not significantly different for the EMDR and waitlist groups, $\chi 2$ (3, N = 38) = 1.8, p = 0.61.

Eating Disorder and Mental Health Indices

Results of comparison at pre-treatment/waitlist assessment between EMDR treatment and waitlist groups showed no significant differences on eating disorder measures (EBQ, BES and EDE) as well as other general psychological health measures (TSC, RSES) with the exception of two variables: the waitlist group showed significantly higher mean DASS21–anxiety scores compared to the EMDR group at baseline, F (1,36) = 4.5, p =.04, while the EMDR group showed significant differences in ICES–invalidating scores at baseline, F (1,36)=11.0, p = .002. DASS-21 means appear to be significantly different at baseline between groups.

Table 1

Pre-treatment demographics and symptom scores for waitlist (n=22) and EMDR (n=16) groups

	Waitlist		**EMDR**		
	Mean	***SD***	**Mean**	***SD***	***F***
Age	48.5	15.5	49.4	18.4	0.03
BMI	31.9	8.3	31.7	6.0	0.01
DASS21 Depression	17.5	14.5	9.5	8.2	3.9
DASS21 Anxiety	12.0	11.9	5.1	5.7	4.5*
DASS21 Stress	19.2	11.5	14.1	8.9	2.2
EBQ – positive beliefs	54.6	12.1	50.2	12.2	1.2
EBQ – negative beliefs	47.2	8.7	44.8	8.1	0.7
EDE Weight Concern	4.4	1.2	3.6	1.0	3.8
EDE Shape Concern	4.5	1.1	4.3	1.3	0.2
EDE Eating Concern	2.8	1.6	2.9	1.6	0.1
EDE Restraint	2.7	1.4	2.5	1.7	0.2
EDE Binge days/month	17.6	11.3	14.1	9.8	1.0
EDE Binge episodes/month	22.2	17.4	25.4	23.5	0.2
Binge Eating Scale total	31.0	7.1	29.3	8.7	0.4
Rosenberg Self Esteem	17.3	4.8	15.0	3.4	2.5
ICES Invalidating	-1.2	1.9	1.1	2.4	11.0**
ICES mother	2.6	0.6	2.3	0.4	3.5
ICES father	2.7	0.7	2.4	0.6	2.6
TSC Dissociation	4.7	4.1	3.3	2.6	1.4
TSC Anxiety	6.8	6.2	6.1	4.2	0.2
TSC Depression	10.9	5.4	8.8	4.3	1.6
TSC Sexual Problems	5.6	4.9	3.9	4.1	1.2

*$p < .05$; **$p < .01$

3.6. Completer Analyses

Treatment completers were defined as participants who had attended all 10 sessions for those in the EMDR group and returned post-treatment questionnaires. Those who completed less than 10 sessions were not included as the 10-session treatment format was used to standardize the treatment for all three therapists. Waitlist completers were defined as having completed post-waitlist questionnaires after the 10-week waitlist and who did not complete any further treatment during their waitlist period, or formally discontinued the study.

Bonferroni corrections were applied to the main completer analyses for the eating disorder and

other mental health measures separately (corrected *p* value = .02). All eating disorder by group analysis remained significant. Apart from the TSC-40, all the other mental health measures remained significant when the correction was applied. A priori planned comparisons using Repeated Measures Analyses of Variance (ANOVAs) were conducted to assess overall effects of time, and any time x group interactions for each of the symptom measures. Effects of time for each of the symptom measures compared symptom scores at pre versus post measurement points. Time x group interactions assessed any differences in the effect of time for the two groups on relevant symptom variables. The completer means and standard deviations for each of the symptom measures at pre- and post-treatment/waitlist are reported in Table 2. Table 2 also reports *F* values and associated significance levels for main effects of time, and time by group interactions for each symptom variable as well as Cohen's *d* effect sizes. Significance is indicated as $p < .05$, $p <. 01$ and $p <.001$. We hypothesized that the EMDR treatment would have significantly greater effect on symptom variables than the waitlist control group, resulting in significantly greater improvements in symptom scores from pre to post treatment. Results are summarised below according to two sets of measures, that is, (1) those that relate to eating pathology and (2) those that relate to measurement of general mental health symptoms and concerns.

Hypothesis 1: EMDR decreases BED symptoms

Several BED symptoms reduced for the EMDR treatment participants according to post-treatment measures. As can be seen in Table 2, a number of significant time by group interactions were observed for the eating-related pathology measures that indicated significantly improved scores for the EMDR group, but not for the waitlist group from pre to post treatment/waitlist. These included significantly lower BES, EBQ-positive and EBQ-negative scale scores from pre to post for the EMDR group relative to the waitlist group, *p*'s < .001, as well as lower EDE scores from pre to post on the eating, shape, and weight subscales, *p*'s < .05. Importantly, the EMDR group showed significantly less days per month binging and had significantly less binge episodes per month from

pre to post, p's <.001, relative to the waitlist control group, as measured by the EDE. A conservative Bonferroni correction decision rule was also applied to the main completer analyses for the eating disorder measures (corrected *p* value = .02). All eating disorder measure time by group analyses remained significant.

More specifically, although only 11 of the 16 in the EMDR treatment group completed post-treatment questionnaires, improvements were noted in regards to binge days per month and binge episodes per month with improvements ranging from 33 to 100%. Regarding binge days per month the mean improvement was 83% (*SD* = 22) in the EMDR treatment group; regarding binge episodes per month, the mean improvement was 85% (*SD* = 21).

Three Measures were converted to change scores by subtracting post treatment scores from pre-treatment scores for the EMDR group only. The measures converted into change scores included the Binge Eating Scale (BES) and EDE items 9A (number of days binged) and 9B (number of binge episodes). These three measures were thought to be the most indicative of binge eating related symptoms. The three change scores were then correlated with measures at pre-treatment including BMI scores, EBQ subscales, EDE subscales, DASS-21 subscales, RSES scores, TSC subscales and ICES subscales. Only four significant correlations emerged from the analysis.

Firstly, greater weight concerns at pre-treatment, as measured by the EDE-weight concerns subscale, was significantly positively correlated with greater change following EMDR on the BES, r = 0.78, *p* = 0.01. In addition, greater self-report of sexual problems at pre-treatment was also significantly negatively correlated with change in the number of days binge eating, r = - 0.74, *p* = 0.01, such that greater improvement in days binge eating was significantly associated with less reported sexual problems at pre-treatment for the EMDR group.

Preliminary Estimates of Clinical Significance

The BES, EBQ positive and negative belief scales, and EDE items 9A (number of binge days per month) and 9B (number of binge episodes per month) were used to indicate whether participant scores fell in the nonclinical range at post (in the case of the BES and the EBQ scales) or in the "mild binge eating" range (in the case of the EDE items 9A and 9B) based on available clinical cut-offs. Scores of less than or equal to 17 on the BES have been categorised as "non-binge eating" (Celio *et al*., 2004; Gormally *et al*., 1982; Greeno *et al*., 1995), while scores of 25 or higher on the EBQ positive beliefs scale, and scores of 17 or higher on the EBQ negative beliefs scale indicate clinical levels of binge eating related beliefs (Burton, Smith & Abbott, in press). Participant scores on EDE items 9A (binge eating on 1 to 4 days per month) and 9B (1 to 12 binge episodes per month) were classified as "mild binge eating" according to DSM-5 (APA, 2013) criteria.

Chi-square analyses were conducted to assess significant differences in the distribution of non-clinical cases for the EMDR and waitlist groups for each of these variables. Significantly more participants in the EMDR group (55%) fell in the nonclinical range on the BES at post-treatment compared to the waitlist group (0%), $\chi 2$ (1, N=29) = 12.4, p = 0.001. Similarly, the EMDR group (27.3%) had significantly more participants at post-treatment in the nonclinical range for EBQ positive belief scores than the waitlist group (0%), $\chi 2$ (1, N=28) = 5.2, p = 0.02. No participants in either group fell in the nonclinical range at post for EBQ negative belief scores.

A larger proportion of participants in the EMDR group (days/month 80%; episodes/month 100%) were rated as in the “mild binge-eating range” at post-treatment compared with waitlist participants (days/month 5.6%; episodes/month 50%), for both number of days binge eating per month, $\chi 2$ (1, N=28) = 16.3, p = 0.001, and number of episodes binge eating per month, $\chi 2$ (1, N=28) = 7.4, p = 0.01.

Hypothesis 2: EMDR improves engagement in exercise

According to the IPAQ, a questionnaire measuring engagement in physical activity including

vigorous exercise, moderate exercise, time spent walking and time spent sitting over the past seven days, the analyses (one way ANOVA) did not reveal significant improvement, all *p*'s >.20. Repeated Measures ANOVAs were conducted using completer data, and time and time by group interaction effects were assessed for each type of physical activity. The results indicated no significant effects of time or time by group interactions, all p's ranged from .07 to 1.00. However, the time by group interaction for the number of days spent walking over the past week approached significance, F (1,25) = 3.49, *p* =.07. The waitlist group walked longer than ten minutes for 4.94 days (SD = 2.08) at pre, and for 4.23 days (*SD* = 2.14) on average at post, whereas the EMDR group walked on average for 4.8 days (*SD* = 2.40) at pre-treatment and 5.1 days (SD = 2.18) at post treatment. The complete means and standard deviations for the IPAQ are available on request.

Hypothesis 3: EMDR reduces comorbid mental health symptoms and improves self-esteem

Analyses that were performed on scores on the DASS21, TSC-40 and RSES questionnaires revealed that EMDR treatment improved sleep and dissociation on the TSC-40 anxiety as well as anxiety but only TSC-40 subscale, not the DASS21 anxiety subscale: significantly improved scores were seen on the TSC global scale, *p* <.05, sleep scale, *p* <.01, and anxiety scale, *p* <.01 from pre to post, relative to the waitlist group. A significant time by group interaction was also observed for the TSC-dissociation scale, showing dissociation scores worsened for waitlist participants while scores remained stable for EMDR participants from pre to post treatment, *p* <.05. Higher self-esteem scores on the RSES at pre-treatment were significantly and positively correlated with greater change following EMDR on the BES, r = 0.72, *p* = 0.02. A conservative Bonferroni correction decision rule was also applied to the main completer analyses (corrected *p* value = .02) for the other mental health measures, which also remained significant when the correction was applied, with the exception of the TSC-dissociation subscale.

Hypothesis 4: Childhood trauma is related to response to EMDR treatment

As the literature revealed, BED conceptualized as a trauma reaction, would respond well to EMDR treatment, a method primarily used to treat trauma disorders. The results revealed that the lower the trauma – as measured by the ICES – the greater the improvement in binge eating. In fact, change in the number of days binge eating following EMDR (EDE9A) was significantly negatively correlated with ICES-mother scores, r = -0.64, $p = 0.01$, and ICES-father scores, r = -0.70, $p = 0.02$, indicating greater improvement in days binge eating in those with lower levels of perceived emotional invalidation from parents during childhood.

Hypothesis 5: EMDR facilitates weight loss

This hypothesis was confirmed: significantly lower mean BMI scores from pre to post were observed for the EMDR treatment participants relative to the waitlist participants, $p < .01$.

3.7. Intent to Treat Analyses

More conservative intent to treat analyses (ITT) were conducted comparing change from pre to post treatment/waitlist for the EMDR and waitlist groups. No data was missing at baseline. Missing data at post treatment/waitlist was managed by carrying the relevant baseline score forward (essentially inferring no change). Again, a priori comparisons of the groups were analysed using Repeated Measures Analyses of Variance (ANOVAs), and the results are summarised according to the eating-related measures and general mental health measures separately. Table 3 reports the means and standard deviations for each of the symptom measures at pre- and post-treatment/waitlist for the intent to treat data. Table 3 also reports *F* values and associated significance levels for main effects of time, and time by group interactions for each symptom variable as well as Cohen's *d* effect sizes.

Table 2: Completer pre and post means and standard deviations Cohen's d effect sizes, and F values for time and time by group interactions for the EMDR and Waitlist participants

	Waitlist Group					**EMDR Group**					**Time**	**Time x group**
	Pre		**Post**		**ES**	**Pre**		**Post**		**ES**	***F***	***F***
	M	***SD***	**M**	***SD***	***d***	**M**	***SD***	**M**	***SD***	***d***		
Eating-Related Measures												
BMI	33.7	8.1	34.0	7.8	0.04	34.1	3.7	33.3	3.6	0.22	1.19	9.06**
BES total	31.1	5.8	31.1	6.4	0.00	30.7	6.4	16.6	8.8	1.83	59.91***	59.91***
EBQ-positive	55.0	11.6	55.8	9.6	0.07	49.6	11.6	37.1	11.7	1.07	13.04**	16.55***
EBQ-negative	47.2	6.7	47.2	7.6	0.00	45.8	6.5	32.0	10.0	1.64	25.27***	25.48***
EDE-restraint	2.5	1.3	2.4	1.4	0.07	1.8	1.6	1.5	1.3	0.21	0.41	0.10
EDE-eating	2.8	1.6	2.9	1.6	0.06	2.9	1.4	1.5	1.2	1.07	4.38*	6.08*
EDE-shape	4.4	1.1	4.5	1.1	0.09	4.6	0.88	3.2	1.8	0.99	4.96*	7.18*
EDE-weight	4.4	1.3	4.2	1.0	0.17	3.7	0.90	2.8	1.1	0.58	6.49*	3.34
EDE-binge days/month	16.2	11.0	15.4	10.2	0.08	17.5	10.6	2.1	2.7	1.99	29.21***	23.86***
EDE-binge episodes/month	22.1	18.3	19.2	17.1	0.16	31.9	27.2	2.4	2.8	1.53	20.86***	14.08**
General Mental Health Measures												
DASS21-dep	16.6	13.6	18.25	12.0	0.13	10.4	9.2	9.5	8.9	0.10	0.05	0.60
DASS21-anxiety	12.0	11.3	11.8	11.5	0.02	3.1	2.9	2.7	2.9	0.14	0.16	0.01
DASS21-stress	20.0	11.0	22.4	11.9	0.21	13.5	9.8	10.9	8.0	0.29	0.00	3.65
RSES	16.8	4.0	16.7	5.1	0.02	14.9	3.6	13.1	3.0	0.54	2.44	1.94
TSC-dissociation	4.4	3.0	6.1	3.7	0.50	2.1	1.6	2.3	2.0	0.11	6.23*	4.08*
TSC-anxiety	6.6	4.8	7.7	5.2	0.22	4.1	2.7	2.0	1.0	1.03	1.55	14.28**
TSC-depression	10.8	4.6	11.7	3.8	0.21	8.1	3.5	6.2	3.4	0.55	0.52	3.89
TSC-sexual	5.5	4.8	5.8	4.8	0.06	3.3	4.2	3.8	4.3	0.12	1.09	0.06
TSC-sleep	9.4	4.2	10.3	4.6	0.20	8.5	3.9	5.7	2.1	0.89	2.25	8.30**

* $p < .05$; ** $p < .01$; ***$p < .001$

Effect on binge-eating related indices

Compared to waitlist participants, EMDR participants showed - on average - significantly greater improvements post-treatment compared to waitlist control participants: they had lower BES scores, $p < .001$, significantly lower EBQ positive and EBQ negative scores, p's <.01; on the EDE, significantly lower levels of EDE eating and shape concerns, p's < .05, significantly fewer days binge eating over the past month, $p < .01$ and significantly fewer binge episodes over the past month, $p <.05$. In addition, the time by group interaction for BMI scores was significant: whereas waitlist participants had a slight increase in BMI, EMDR participants had a slight decrease in BMI ($p < .01$). When Bonferroni correction to the ITT analyses were applied, these were unchanged except that the time by group analyses for the EDE eating ($p = .04$) and shape subscales ($p = 0.03$) were now not significant.

Effect on mental health

Repeated Measures Analyses of Variance assessing pre to post effects and time by group interactions for the DASS21, RSES, TSC-40 for the ITT data revealed that both anxiety and dissociation changed: whereas the TSC-40 dissociation subscale scores significantly increased from pre to post for those on the waitlist whereas they remained stable for EMDR participants, $p < .05$. The TSC-40-anxiety subscale scores also decreased significantly from pre to post for EMDR participants, but not for the waitlist group, $p <.01$. However, the TSC-40 dissociation subscale scores were not significant once the Bonferroni correction to the ITT was applied ($p = 0.03$).

Confidence in treatment and the therapeutic relationship

EMDR participants' confidence in treatment and therapy alliance were evaluated using the Confidence in Treatment (Devilly & Borkovec, 2000) and the Working Alliance Questionnaire (Horvath & Greenberg, 1986) that were administered to EMDR participants in session 4. The mean CIT score was 24.6 (SD = 4.5, range 18 to 30), indicating high levels of confidence in the treatment

provided. The mean WAI score for the EMDR group was 209.7 (SD = 39.2, range 135 to 240), indicating strong therapeutic alliance ratings from participants.

Table 3: Intent to Treat pre and post means and standard deviations, Cohen's d effect sizes and F values for time and time by group interactions, for EMDR and waitlist participants

	Waitlist Group					**EMDR Group**					**Time**	**Time x group**
	Pre		**Post**		**ES**	**Pre**		**Post**		**ES**	***F***	***F***
	M	**SD**	**M**	**SD**		**M**	**SD**	**M**	**SD**			
Eating-Related Measures												
BMI	31.9	8.3	32.2	8.1	0.04	31.7	6.0	31.3	5.8	0.07	0.30	7.36*
BES total	30.9	7.1	31.0	7.5	0.01	29.3	8.7	19.6	10.7	0.98	24.20***	24.20***
EBQ-positive	54.6	12.2	55.3	10.6	0.06	50.2	12.2	41.6	14.0	0.65	8.05**	10.81**
EBQ-negative	47.2	8.7	47.2	9.3	0.00	44.8	8.1	35.3	11.3	0.97	13.82**	13.97**
EDE-restraint	2.7	1.4	2.6	1.4	0.07	2.5	1.7	2.4	1.7	0.06	0.37	0.05
EDE-eating	2.8	1.6	2.9	1.7	0.06	3.0	1.6	2.1	1.7	0.55	2.90	4.44*
EDE-shape	4.5	1.1	4.6	1.1	0.09	4.3	1.4	3.5	1.8	0.50	3.19	5.19*
EDE-weight	4.4	1.2	4.3	1.0	0.09	3.7	1.1	3.1	1.3	0.50	4.97*	2.07
EDE-binge days/month	17.6	11.3	17.0	10.7	0.05	14.1	9.8	4.5	4.8	1.24	14.70***	11.30**
EDE-binge episodes/month	22.2	17.4	19.8	16.4	0.14	25.4	23.5	6.9	8.7	1.04	12.30**	7.4*
Mental Health Measures												
DASS21-dep	17.5	14.5	18.8	13.3	0.09	9.5	8.3	8.9	8.0	0.07	0.07	0.63
DASS21-anxiety	12.0	11.9	11.8	12.0	0.02	5.1	5.7	4.9	5.8	0.03	0.16	0.00
DASS21-stress	19.2	11.6	21.1	12.4	0.16	14.1	8.9	12.4	7.8	0.20	0.00	3.58
RSES	17.3	4.8	17.2	5.7	0.02	15.0	3.5	13.8	3.2	0.36	1.91	1.40
TSC-dissociation	4.7	4.1	6.2	4.5	0.35	3.3	2.6	3.4	2.7	0.04	7.09*	5.04*
TSC-anxiety	6.9	6.2	7.8	6.4	0.14	6.1	4.2	4.7	4.6	0.32	0.62	11.20**
TSC-depression	10.9	5.4	11.7	4.8	0.16	8.8	4.3	7.5	4.6	0.29	0.3	3.55
TSC-sexual	5.6	4.9	5.9	4.9	0.06	3.9	4.1	4.3	4.2	0.10	1.05	0.19
TSC-sleep	9.3	4.6	10.1	4.9	0.17	9.2	4.4	7.3	4.0	0.45	1.31	6.92*

* $p < .05$; ** $p < .01$; *** $p < .001$

CHAPTER 4

DISCUSSION

4.1. Summary of the main findings

The aim of this study was to examine the effectiveness of newly designed ten 1-hour-session EMDR treatment protocol applied to BED. The study results of this modified EMDR protocol, adapted from a previously used BN protocol, supported the main hypothesis: that EMDR is effective at reducing BED symptoms. This study also supported the hypotheses that weight loss can be achieved as well that EMDR can improve some associated mental health symptoms including anxiety and sleep. However, it did not find sufficient evidence to support the hypothesis that self-esteem can be improved. Although there was insufficient evidence to support the hypothesis that engagement in exercise can be facilitated with EMDR, results were encouraging.

4.1.1. EMDR decreases BED symptoms

(1) EMDR reduces binge eating frequency/episodes

The main aim of this study was to evaluate how effective EMDR would be at eliminating or at least decreasing BED symptoms. The results of this study demonstrated that EMDR was indeed effective in significantly reducing frequency of binge eating, both in terms of days and the number of binge episodes per month, relative to the waitlist control group. More specifically, 11 of the 16 EMDR treatment participants who completed post-treatment questionnaires, reported a reduction in number of days per month binging and binge episodes per month, ranging from 33-100%. Regarding binge days per month, the mean improvement was 83% (SD = 22) in the EMDR treatment group; regarding binge episodes per month, the mean improvement was 85% (SD = 21). In regards to whether EMDR would reduce the severity of the disorder, the results also show that 55% of the EMDR participants fell in the non-clinical range on the BES at post-treatment compared to 0% in the waitlist group (0%), $\chi 2$ (1, N=29) = 12.4, p = 0.001 and over 27% were in the non-clinical range for EBQ positive belief scores compared to the waitlist group (0%), $\chi 2$ (1, N=28) = 5.2, p = 0.02.

Furthermore, more EMDR participants (days/month 80%; episodes/month 100%) were rated as in the "mild binge-eating range" at post-treatment compared with waitlist participants (days/month 5.6%; episodes/month 50%), for both number of days binge eating per month, $\chi 2$ (1, N=28) = 16.3, p = 0.001, and number of episodes binge eating per month, $\chi 2$ (1, N=28) = 7.4, p = 0.01. Interestingly, those with fewer sexual problems pre-treatment had greater improvement in binge eating frequency (r = - 0.74, p = 0.01).

Compared to other available treatments, the reduction in binge eating for the EMDR treatment fares well: whereas bariatric surgery has not been found to be effective in treating binge eating (Kalarchian & Marcus, 2015; Niego *et al*., 2007), the binge eating efficacy rates for antidepressants (e.g., citalopram, escitalopram and sertraline) for BED ranges from 22 to 50% (Brownley, 2015), with an effect size at 1.67 (CI, 1.24 to 2.26). Fairburn's (1981) 15-20 session CBT-based intervention for BED has been found to be the most effective treatment for BED with only a 50% success rate in reducing binge (Fairburn, Cooper & Shafran, 2003).

A systematic review and meta-analysis of BED treatment for adults found that therapist-led CBT decreased binge-eating frequency and increased binge-eating abstinence at 4.95 (95% CI, 3.06 to 8.00). Other psychological treatments including IPT (e.g., Wilfey *et al*., 2002) and DBT (e.g., Telch *et al*., 2000) and other mindfulness methods (O'Reilly, Cook, Spruijt-Metz & Black, 2014) may show comparable results, but do not yet have enough studies to support their use. Thus, although this trial is preliminary only, it appears that EMDR – compared to the currently recommended CBT - may be an even more effective treatment for binge eating and binge-eating related meta-cognitions.

(2) EMDR reduces body shape and weight concerns

This study also showed that EMDR is effective at reducing body shape concerns, beliefs that binge eating is helpful, beliefs in ability to control urges and binge eating episodes and also at reducing body shape preoccupations. Compared to CBT studies measuring effect on eating restraint and

weight concerns, this study showed that EMDR does not fare as well. This study found the EDE-restraint for the EMDR participants (F = 0.37) was not significant whereas Peterson *et al*.'s (2009) study of a CBT self-help group treatment and therapist-led group treatment for BED found that therapist-led CBT group had significantly greater reductions than the waiting list group on the EDE-restraint subscale (F = 3, 46, *df*-3, 252, $p = 0.017$; partial eta-squared=0.040). Furthermore, Striegel-Moore *et al*.'s (2010) study of self-guided CBT versus CBT showed that the self-guided CBT treatment group had a binge eating abstinence rate of 64% at 12-month follow-up but also had improvements in dietary restraint (d = 0.30); eating, shape, and weight concern (*ds* = 0.54, 1.01, 0.49), as measured by the EDE.

The results also indicated that those who had greater weight concerns at pre-treatment (as measured by the EDE-weight concerns subscale) had greater improvements with EMDR. This result seems to be in line with the research that has found that those with higher body fat were more motivated and less likely to drop out of treatment (Colombo *et al*., 2014).

4.1.2. EMDR increases engagement in exercise

The EMDR treatment in this study which included a protocol increase engagement in exercise showed that the only improvement was seen in number of days spent walking over the past week which approached significance, $F(1,25) = 3.49$, $p = .07$): EMDR participants increase number of days walking from 4.8 days (SD = 2.40) at pre-treatment to 5.1 days (SD = 2.18) post-treatment compared to the waitlist group which walked longer than ten minutes for 4.94 days (SD = 2.08) at pre, and for 4.23 days (SD = 2.14) on average after the 10-week waiting period. The treatment thus falls short of achieving the goal of increasing exercise to the recommended minimum of 150 minutes a week or 60 minutes a day of moderate intensity exercise. Thus, the aim of exercise - primarily weight loss (improve body fat distribution and reduce visceral fat deposits, build muscle tone) and secondary aim of suppressing appetite, improving executive functioning, improving self-esteem, improving sleep, reducing anxiety, reducing sensitivity to stress and depression and

improving mood, was also not achieved. It is likely that the sample size was too small to detect significant change.

Comparisons with results from other interventions that have a component to improve engagement in exercise is difficult as – according to the The Cochrane database - high-quality, randomised trials with long-term follow up that explicitly address adherence to exercises and physical activity and uses standardised validated measures of exercise are sparse. However, available studies e.g., Dishman and colleagues (1988) have found that those who do complete exercise studies typically have minimal to average adherence rates.

Malik *et al*. (2014) have identified some interventions (although still unclear which) that are effective in improving adherence to an exercise routine, although none have yet to show long term adherence. Studies citing moderate to high effect sizes for treatment effectiveness of strategies to enhance exercise adherence range in type of assessment used to measure engagement in exercise. Nichols and colleagues' (2012) study of 64 participants in a behavioural skills training intervention (focusing on social support, self-efficacy, benefits and barriers to exercise and enjoyment) showed effect sizes due to the intervention moderate to moderately-high for moderate (p=.23, r2=.71) and vigorous (p=.41, r2=.40) physical activity. A 7-session counselling-based intervention by Proper and colleagues (2003) on 299 participants found no significant effect on the proportion of participants that met the recommendations of moderate physical activity (OR=1.46). In the intervention group, 23% changed from "not active enough" to "active" compared to the control group with a change of 19%. However, no effects were observed for changes in moderate intensity physical activity (Sallis *et al.,* 1985; Dishman *et al*., 1988).

4.1.3. EMDR improves mental health

The main aim of this EMDR study was to identify whether EMDR would reduce BED symptoms but also reduce weight. However, because binge eating duration (Schreiber-Gregory *et al*., 2013) and cravings, especially cravings for sweet carbohydrates (Christensen & Pettijohn, 2001) including chocolate consumption (Rose, Koperski & Golomb, 2010) have been associated with depression, it

is assumed that a reduction in depression would also be associated with a reduction in binge eating – as seen in the outcome of BED studies with antidepressants (Wurtman *et al*., 1985) ranging from 22-50% binge eating remission rate (Brownley, 2015).

Likewise, because weight loss and maintenance is linked to an absence of depression (Klem *et al.,* 1998), that obesity (particularly abdominal obesity) is associated with major depressive disorder (McElroy *et al.,* 2004), that non-depressed people are more likely to achieve weight loss (Klem *et al*., 1998) and that those without depression and BED are more than double as likely to achieve clinically significant weight loss (Klem *et al.,* 1998), it is assumed that a reduction in depression would be associated with greater weight loss.

To assess the effectiveness of EMDR on mental health, participants were assessed with the DASS21 and TSC-40 which have items including depressed mood, anxiety, stress as well as typical trauma symptoms including headaches, stomach problems, breathing difficulties, insomnia, sexual problems, flashbacks, poor libido, nightmares, memory problems and feelings of guilt. Interestingly, this study indicated that although BED symptoms reduced, scores on the DASS21 and TSC-40 indicated no reduction in depression. It is possible that EMDR did not reduce depression. However, because of the evidence that EMDR can effectively reduce depression (*Hase et al.,* 2015), it is possible that reductions in depression were not apparent either because of the small sample size or because the questionnaires (DASS21 and TSC-40) did not capture depression compared to other measures (e.g., BDI-II or HADS) which may have shown clearer evidence.

In regards to other mental health indices, this study indicated that it was able to improve sleep (as measured in the TSC-40), as other EMDR studies have also shown to do (Raboni, Tufik & Suchecki, 2006). Although CBT studies have shown that it can be effective for sleep problems (Trauer *et al*., 2015), studies of CBT for BED have not reported improvements with sleep, indicating that EMDR for BED may be unique in that it can target sleep while also addressing BED symptoms. According to research, improved sleep has various benefits including decreased feelings of hunger (Schmid *et al*., 2008). However, the presence and persistence of poor sleep has also been

found to increase comorbidity and attrition from ED treatment and also directly predicts the severity of the ED symptoms both directly and through the mediation of depression (Lombardo *et al*., 2015). Thus, it is possible that the reduction in binge eating behaviour of this study may be partially due to improvements in sleep.

In regards to self-esteem, this study showed that EMDR did not effectively improve self-esteem as measured by the Rosenberg Self-Esteem Scale. This is in contrast to various studies of eating disorder treatments which have resulted in increased self-esteem, generally with medium effect sizes identified between pre- and post-treatment means (Hepburn & Wilson, 2014). Again, it is possible that the sample size was too small or the follow-up period too short to detect changes.

4.1.4. Childhood trauma is related to response to EMDR treatment

According to the results of the scores on the ICES which measures emotional trauma, those participants with less emotional invalidation by parents had a better outcome than those with more trauma. This appears to be in line with the research indicating that the worse the illness, the less change of recovery. Although not specifically related to sexual problems, many studies have confirmed that the severity of the illness predicts outcome, e.g., the research by Klein, Skinner and Hawley (2013) who found that outcomes at 6-month follow-up were better for those who had higher levels of drive for thinness, higher levels of interoceptive awareness, lower levels of binge eating pathology and, in women, lower levels of body dissatisfaction. Likewise, Ricca and colleagues (2010) study who found that those without a severe comorbid disorder and had lower binge eating severity at baseline were more likely to recover from BED. However, as the ICES is specific to childhood emotional trauma by parents, it is possible that the outcome that those with sexual problems were less likely to recover because the ICES did not capture sexual abuse or other types of abuse. It is clear from the literature that BED is clearly a trauma response (Smyth *et al*., 2008), but with sexual trauma are likely to have sexual problems as a result (Brewerton, 2014) e.g., those with histories of child sexual abuse were nearly twice as likely to report current sexual

problems (28 per cent compared with 47 per cent) and for women whose abuse involved penetration, nearly 70 per cent complained of current sexual problems (Mullen & Fleming, 1998)

4.1.4. EMDR facilitates weight loss

During the 10-week treatment, the effect sizes for both groups were small in regards to BMI, but showed significantly different changes for the two groups: over the 10 weeks, BMI marginally decreased for EMDR treatment participants and slightly increased for waitlist participants. BMI for both groups, on average, remained in the obese range: the mean BMI for the waitlist group was 33.7 (SD = 8.1) at pre-wait-list period and 34.0 (SD = 7.8) after the 10-week waitlist period compared to the EMDR participants with a BMI of 34.1 (SD = 3.7) pre-treatment which reduced to 33.3 post-treatment with a time x group interaction of 9.06. It is possible that further changes may have been seen with time. Studies investigating weight loss and maintenance of weight loss typically have follow-up periods of at least 6 months and up to 2 years (Headland *et al.,* 2016).

However, compared to CBT (e.g., Brownley *et al*., Grilo *et al*., 2012; McElroy *et al*., 2015) IPT and mindfulness methods which – in most cases do not lead to weight loss at all (Rogers *et al*., 2016), this study has had comparable results. However, given that there was no long term follow-up, changes in weight and body composition may have to be further analysed at longer follow-up periods to identify whether EMDR has significant long term results.

The reduction in weight may be explained in part by the marginal increase in exercise in EMDR participants who tended to increase the number of days they engaged in walking-related exercise (although this was non-significant). Although some studies show no change in weight once exercise is introduced, the majority of studies support the use of exercise in addition to diet to maximise weight loss (Miller *et al.,* 2013) and body composition (Stiegler & Cunliffe, 2006).

However, another explanation for change in weight (given that increase in exercise was only marginal) is that EMDR was able to improve sleep (as measured in the TSC-40) as - according to research - improved sleep has various benefits including decreased feelings of hunger (Schmid *et*

al., 2008) but also decreased cortisol levels – which facilitates weight loss (Aldabal & Bahammam, 2011) and decreases calorie consumption (Brondel *et al*., 2010). However, more importantly, the success in achieving weight loss may indeed provide support for the Adaptive Information Theory that underpins EMDR in the use of weight management. It appears that the protocol (which essentially reduces the anxiety about losing weight) can be effectively eliminated.

4.2. Strengths, Limitations and Suggestions for Future Research

4.2.1. Strengths

One of the strengths of this study was that it used a randomized design and an intent-to-treat analysis. Quality of treatment was also ensured by the provision of clinical supervision by an EMDR supervisor. Although a review by random sampling of audiotapes by an independent researcher was planned, time limitations made this difficult. This study also used assessments not only of BED symptoms but also of mental health symptoms with standardised tests that are commonly used in BED investigations. In addition, unlike common CBT and pharmacological studies that typically do not target an exercise or have a weight loss component, this study also aimed to address weight loss (including exercise motivation EMDR component).

Another strength of this study is that the EMDR treatment was implemented by three different qualified and experienced therapists which not only made treatment more accessible to people who lived in different locations, it also facilitated analyses of potential differential therapist responses and minimised experimenter expectancy effects. Furthermore, because this study used trained, experienced clinicians it provided treatment that would have been offered in standard private practice with therapists who were professionally trained and had at least 5 years clinical experience.

Another strength is that ethical guidelines were adhered to in regards to involving only those appropriate for EMDR treatment, i.e., through the process of screening of potential participants that had contraindications to EMDR (e.g. dissociative disorders, use of benzodiazepines, etc.).

Furthermore, a strength of this study is that it assessed the therapeutic alliance and confidence in

treatment (with the WAI and CIT) to identify factors other than treatment modality that may have impacted outcome. Although the results of this study were difficult to compare to other eating disorder treatment studies as none were available, the results indicated that participants were confident in the treatment and had a strong therapeutic relationship – which both may have also contributed to the positive outcomes.

4.2.2. Limitations

The results of this EMDR study, while promising, should be interpreted with caution due to weakness in this study including a small sample size, lack of follow-up assessment and lack of comparison to an active control group. In regards to sample size, it is clear that the lack of diversity limited generalizability (in terms of age, gender, ethnicity, socioeconomic status, and other demographic variables). This study appeared to attract those aged in their mid-30's and 70's, as is typical for the BED population (Klein, Skinner & Hawley, 2013). The small sample size also reduced the power of the study, increasing the likelihood of a Type II error, skewing the results. Furthermore, because demographic details including age, level of education, culture and marital status, etc. were assessed but not analysed, it is difficult to identify whether any of these indices may have played a role in differences in outcome, as identified in other studies e.g., SES and culture (Thompson-Brenner, 2013).

The second major limitation of this study was the lack of long term follow up. Consequently, it makes it difficult to determine whether the improvements in binge eating and other eating-related pathology, weight and mental health indices achieved directly after treatment are going to be maintained long term. Other investigations in BED have found that treatment may work initially but not long term (Fichter, Quadflieg & Gnutzmann, 1998). Studies with CBT (e.g., Agras *et al*., 1997) and IPT (e.g., Wilfley *et al*., 2002) usually measure at follow up at 6-month, 1-year and 2-year periods. In both CBT and IPT, stability of treatment effects has been documented in randomised controlled trials over a period of up to 2 years following treatment cessation (Wilson *et al*., 2010;

Devlin *et al*., 2007). The average length of the follow up across exercise studies ranged from 3 weeks (Luszczynska, 2006) to 30 months whereas most have a follow up of 12 months (Jordan *et al.,* 2010. Thus, the lack of follow-up period makes it difficult to draw conclusions regarding the permanency of results.

The third major weakness of this study was the lack of an active control group in which participants who do not receive EMDR treatment, receive standard treatment e.g., CBT. Thus, the study allowed only for associative and theoretical conclusions about the improvements in symptoms. Thus, it is unclear whether treatment outcomes were a result of the intervention alone or whether they were due to other extraneous and uncontrolled variables and could be explained by regression to the mean due to the small sample of individuals who may not have accurately represented a true random sampling of the population. If the scores on baseline measures were particularly extreme (compared to the "true" population mean), then it is conceivable that less extreme scores (indicating a downward regression to the mean) were reported at post-treatment, making it appear as though improvements were achieved. Thus, the efficacy beyond the treatment as usual is unclear. Furthermore, whereas this research was conducted in an objective and unbiased manner, it is important to acknowledge that researcher bias (including experimenter bias, and systematic errors) could also be a possible source of error.

Whereas every effort was made to improve sample size (in terms of power analyses, recruitment and preventing drop out), unfortunately, the fact that potential participants could not take part in the treatment or dropped out of treatment or failed to complete follow-up assessments, could not be prevented. This research was limited due to funding and time, making it difficult to obtain a larger and more representative sample, a longer follow-up assessment period and implement active control groups.

4.2.3. Suggestions for Future Research

Improving generalizability and maximising application

In regards to the sample size, future research would benefit from a larger sample size to maximise generalisability of results to individuals not represented in this study e.g. children, adolescents, younger adults and males. Additional research into the application of EMDR to those who were screened out in this study would provide further insight as to the benefit of application to those e.g., with comorbid conditions including personality disorders, substance use disorders, etc. This would mean additional measures would be used e.g., Beck Depression Inventory II (Beck *et al*., 1996) for major depressive disorder, the PTSD Checklist (PCL; Blevins et al., 2015) for PTSD, the State-Trait Anxiety Inventory (STAI; Speilberger *et al.,* 1983) for anxiety, the attention deficit hyperactivity disorder Self-Rating Scale (ASRS) for Adult ADHD (Kessler *et al*., 2005) as well as measures that identify related symptoms e.g., Difficulties in Emotion Regulation Scale (DERS), the Barratt Impulsivity Scale-11 (BIS-11; Patton *et al*., 1995), the Pittsburgh Sleep Quality Index (Buysse *et al.,* 1989). Furthermore, a more general questionnaire of trauma or a more specific sexual abuse related questionnaire would also be useful in identifying whether EMDR is effective for individuals with trauma other than emotional abuse in childhood by parents only as in this study. These may include The Brief Trauma Questionnaire (BTQ; Schnur *et al.,* 1999), a 10-item measure that also assesses war traumas, serious car accidents, natural disasters, exposure to violent death, life-threatening illness, and physical or sexual abuse.

In addition, future research may benefit from minimizing drop-out e.g., by improving treatment expectancy and low self-efficacy which has been shown to be related to drop out (Davis & Addis, 1999). Future research would also benefit from not only assessing but also analysing the relationship between demographic variables and treatment drop out as previous studies have indicated that cultural background (Thompson-Brenner, 2013) and age (Korte *et al.,* 2011), including age at first dieting attempt (Colombo *et al*., 2014) have been linked to rate of attrition. Drop outs have also

been associated with levels of eating pathology at baseline and body mass index (Colombo *et al.,* 2014). Furthermore, analysing whether and which treatment outcomes were achieved in fewer than 10 sessions may also provide further insight as to how quickly EMDR therapy starts to take effect.

Increasing follow-up period

In regards to follow-up period, future research would benefit from follow-up assessments of up to 2 years to gain not only an insight as to whether the reductions in BED related symptoms are maintained but also to identify whether weight would reduce further. However, rather than weight only, future studies may have a more accurate assessment with measurements with a tape measure to measure loss of centimetres in waist, hips, arms, etc and measurements with a digital scale that indicates body fat percentage, increases in muscle mass and changes in water as well as measurements (e.g. waist, hips, arms, thighs).

Identifying treatment protocol and combinations

In regards to comparing EMDR to an active control group, future studies would benefit from investigating not only EMDR compared to another single treatment e.g. CBT but also combination treatments which, in general – have been found to be more effective than single approaches (Andersen & Mehler, 1999; Brauhardt, de Zwaan & Hilbert, 2014; Grilo *et al*., 2005), including the combination of psychological, pharmacological and nutritional treatments (Brambilla *et al*., 2009; Masheb, Grilo and Rolls, 2011), including nutritional supplementation e.g., Vitamin D (Salehpour *et al*., 2012) and calcium (Heaney, Davies & Barger-Lux, 2002). However, given that combination treatments are likely to extend the number of sessions needed, further investigations may provide information as to whether participants prefer and/or benefit more from a greater number of sessions or whether fewer sessions is more "consumer-friendly" in terms of practicality and accessibility.

Furthermore, the session length and duration may be investigated, i.e., comparing a 10-session program of EMDR to a 10-session CBT treatment or comparing a 22-session EMDR with a 22-

session CBT treatment. These and other treatment modalities could also be compared to the recommended 90-minute versus the standard 50-60 minute treatments sessions to identify whether duration and quantity of sessions affects outcome as EMDR is best delivered in 90 minute sessions (Chen *et al*., 2014; Shapiro, 1997).

In regards to exercise, further studies may benefit from investigating how other reasons for not engaging in exercise may be overcome. For example, other studies have identified typical barriers including weight, physical health problems, financial restrictions (e.g., to afford gym memberships or personal trainers), time limitations, discomfort in taking part in organised exercise activities, particularly alone (Thomas *et al*., 2008). Because High Intensity Intermittent exercise (Trapp *et al*., 2008) and resistance training have been found to be most effective for weight loss, especially if done in the morning (Maraki *et al*., 2005), a study including an exercise component may illucidate whether further improvements in mental health can be achieved.

Whereas this study has shown promising results using the modified BN protocol, future studies may investigate whether using a different EMDR protocol would further improve results. Because BED has also been conceptualized as a substance addiction (Cserjési, 2009; Maranhão *et al*., 2015; Volkow, Wang, Maynard, 2003) and "food addiction" (Baumeister *et al*., 2013) and that medications normally used for addictions (e.g., Naloxone and Baclofen) also work in BED (Corwin *et al*., 2012), the Popky's (2005) EMDR addiction DeTur protocol (Appendix II) or CravEx protocol (Hase, Schallmayer & Sack, 2008) would be a potential option to explore in regards to binge eating behavior as well as application with food cravings as these has been identified as being common in individuals with BED (Imperatori *et al.,* 2013).

4.3. Clinical implications

The literature has clarified that because a variety of factors impact treatment outcome, that treatment with BED individuals depends not only on treatment type but also on individual differences in the client but also in the therapist and the therapeutic relationship. Consequently, a

thorough assessment not only of BED symptoms with e.g. BES or EBQ but also of other mental health indices would assist in approaching treatment more wholistically. This would mean adding an exercise component to further improve results. At the same time, it seems prudent to be vigilant of treatment drop out and that the treatment targets should include aspects to potentiate these e.g. treatment efficacy, self-esteem and motivation to change. Because EMDR is potentially a more efficient treatment, it would mean that it would be a method that may be more appealing to those who have difficulty accessing severing treatment sessions.

4.4. Conclusions

Although this particular study found that EMDR could be effective at alleviating symptoms of BED, it is clear that it is a very difficult disorder to treat. Yager (2008) asserts that because of the physical and psychiatric comorbidities, BED is considered to be the most difficult disorder to treat. The literature has pointed out that BED is influenced by genetics (APA, 2013) and is related to specific disturbances in neuro-chemical functioning (Kaye *et al.,* 1985) NS hormonal factors (Edler, Lipson and Keel, 2007; Hildebrandt *et al.,* 2015; Klump *et al*., 2013). Based on the evidence that even the gold-standard CBT does not achieve favourable outcome for all those BED, this study of EMDR has resulted in admirable outcomes in achieving improvements for those with BED. Although EMDR is said to be a more efficient form of therapy (Shapiro, & Maxfield, 2002; Stickgold, 2002), reported to produce significant improvements after a limited number of sessions, at least with PTSD (Shapiro, 2014), it is possible that outcomes may have been improved had the number of treatment sessions been extended beyond this ten one-hour format, especially if follow-up period was extended to at least 6 months and ideally to 2 years. It is clear, however, that BED is a multifaceted disorder that is unlikely to remit with a single approach – a multidisciplinary approach integrating EMDR as an alternative to CBT may prove to be the treatment that works best.

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APPENDIX I

BINGE EATING DISORDER 307.51 (F50.8)

A. Recurrent episodes of binge eating. An episode of binge eating is characterized by both of the following:

1. Eating, in a discrete period of time (e.g., within any 2-hour period), an amount of food that is definitely larger than what most people would eat in a similar period of time under similar circumstances.

2. A sense of lack of control over eating during the episode (e.g., a feeling that one cannot stop eating or control what or how much one is eating).

B. The binge-eating episodes are associated with three (or more) of the following:

1. Eating much more rapidly than normal.
2. Eating until feeling uncomfortably full.
3. Eating large amounts of food when not feeling physically hungry.
4. Eating alone because of feeling embarrassed by how much one is eating.
5. Feeling disgusted with oneself, depressed, or very guilty afterward.

C. Marked distress regarding binge eating is present.

D. The binge eating occurs, on average, at least once a week for 3 months.

E. The binge eating is not associated with the recurrent use of inappropriate compensatory behavior as in bulimia nervosa and does not occur exclusively during the course of bulimia nervosa or anorexia nervosa.

In partial remission: After full criteria for binge-eating disorder were previously met, binge eating occurs at an average frequency of less than on episode per week for a sustained period of time.
In full remission: After full criteria for binge-eating disorder were previously met, none of the criteria have been met for a sustained period of time.

Specify current severity:

Mild: 1-3 binge-eating episodes per week
Moderate: 4-7 binge-eating episodes per week
Severe: 8-13 binge-eating episodes per week
Extreme: 14 or more binge-eating episodes per week

APPENDIX II

EMDR Protocol
THE EIGHT PHASES OF EMDR THERAPY
(according to Francine Shapiro)

Phase 1: History Taking

The first session is focused on assessment in order to set up a treatment plan.

Assessment generally includes gathering information on presenting symptoms (e.g. binge eating, depressed mood/mood lability, panic attacks, insomnia, restlessness, poor short term memory, etc), demographic information (age, relationship status/sexual orientation, cultural background, children), interpersonal relationships and communication issues (e.g. with parents, partners, children and other family members, friends), sexual functioning and libido, medical conditions (e.g., anemia, hypothyroidism, pain, sleep apnoea, digestive problems) and use of medications/compliance, cognitive functioning (memory, concentration, estimated IQ and educational level), work, leisure activities (hobbies, work/life balance), stressors (financial/legal/living conditions, major move, etc), alcohol/drug use/addiction and gambling/internet or other addiction (incl. nicotine use), suicidality, self-harm, self-esteem, sleep (nightmares, sleep disruption) and energy levels, diet, exercise and self-care, other mental health conditions (e.g. ADHD, Mood D/o, phobias, OCD, psychosis, personality disordered behaviours, etc), experience of therapy including current expectations and motivation; traumas (e.g., domestic violence victim or witness, sexual assault, workplace/childhood bullying, deaths of family members, friends, colleagues, pets) are then also identified.

With a clear assessment, EMDR targets are identified. These can be disturbing issues, events, feelings, or memories. Maladaptive beliefs are also identified (e.g., ″I can′t trust people″ or ″I can′t protect myself″).

Phase 2: Preparation Phase

While focusing on building a therapeutic relationship, the preparation includes the “Safe Place”

installation (an image or memory that elicits comfortable feelings and a positive sense of self). This serves to help a client after the session should further feelings or images emerge.

Phase 3: Assessment/Target identification

The client identifies an image or images that represents the target and the disturbance as well as the negative cognition(s) e.g., ″I can′t trust people″ associated with these. Positive Cognitions (PC) e.g., “I am able to trust” that replace these negative cognitions are also identified.

Phase 4: The Desensitization Phase

With the images, the negative cognitions, the disturbing emotions or body sensations in mind, the client is asked how disturbing this is on the SUDS (Subjective Units of Disturbance Scale). The therapist begins the bilateral stimulation i.e. the client follows the therapist’s fingers with his or her eyes from side to side. Bilateral stimulation can be done with auditory stimulation or physical stimulation e.g., alternatively tapping one side of the body in quick succession. After a set of eye movements (that may last 30-60 seconds), the client is asked to report briefly on thoughts, feeling and/or physical sensations, images or memories that have emerged. The desensitization phase ends when the SUDS has reached 0 or as close to 0 as possible.

Phase 5: The Installation Phase

Once desensitised, the therapist installs the positive cognition with bilateral stimulation until the belief in this new cognition is raised from 1 to 7 on the Validity of Cognition Scale. This may take several sets of bilateral stimulation.

Phase 6: Body Scan

The bilateral stimulation continues until any pain, stress or discomfort is relieved.

Phase 7: Closure:

The therapist gives appropriate information and support.

Phase 8: Re-evaluation:

The processing is reviewed to identify if the client has had any new sensations or experiences and whether SUDS are still elevated. If so, processing continues.

Example of a Standard EMDR Protocol

The client presents with symptoms including insomnia, avoiding work and depressed mood due to being bullied at work e.g., her boss humiliating her in front of colleagues. She identifies the worst part was that she felt helpless, but also identified negative cognitions including “I am worthless, I am shameful, I am unlovable, I am incompetent.”

The client would like to believe (positive cognitions): “I'm worthy, I am fine as I am, I'm competent and capable.”

The client identifies the first memory of having similar feelings and beliefs when rejected by her step-father. She also identifies that her future fear - she is worried that her current partner will reject her, again believing “I'm not good enough.”

Processing begins with eye movements (EM) to reduce/eliminate the cognition “I'm worthless” and install “I'm worthy” by first addressing the cornerstone memory of the rejection by her father, then the current bullying situation and then the future of being rejected by her current partner.

SAFE PLACE INSTILLATION PROTOCOL IN EMDR

The person should be instructed to practice "safe place" daily by retrieving the positive image, emotions, and sensations via the cue word. People can then use "safe place" to relax and reduce stress any time needed.

When "safe place" is taught to a person preparing for EMDR, the therapist will guide the person through the following steps shared by Shapiro (2001):

1. The person is asked to imagine a place that generates feelings of calm and safety e.g., forest, beach, favourite holiday location, etc.
2. The person is asked to focus on the physical sensations and emotions that this image elicits.
3. The therapist encourages a sense of security and may add soothing tones, such as ocean waves, to enhance the effect.
4. While the person concentrates on the image, sensations and emotions, 4-8 sets of slow eye movements or other bilateral stimulation may be included to "install," or strengthen, the "safe place."
5. The person is asked to think of a word to associate with the "safe place" and add this to the calm, safe image and sensations. Sets of bilateral stimulation are added.
6. The person is asked to self-cue the image and feelings.
7. The person is asked to think of a minor annoyance and its accompanying emotions. The therapist then guides the person through the exercise until the undesired emotions melt away.
8. The person is asked to think of another disturbance and follow the exercise without the therapist's assistance to ensure the person can perform the exercise unassisted.

Shapiro, F. (2001). *Eye movement desensitization and reprocessing: Basic principles, protocols, and procedures* (2nd). New York, NY: The Guilford Press.

FORESTER'S EMDR PROTOCOL FOR BULIMIA NERVOSA

Phase 1:

The first 4-8 sessions (lasting 50-60 minutes) are used to gather history, develop a therapeutic relationship and develop foundations for treatment. This includes a timeline of major events in life, useful to identify first, worst and most recent examples of a cluster (several instances of a certain type of trauma) related to a big T (major trauma) or small t (other trauma).

Emphasise the need to be honest as talking about their behaviour is likely to be a great source of shame. Reminding them also to be honest when asking if they have improved (even after doing eye movements) is particularly important. It is also worth cautioning that their bulimic symptoms may initially increase due to the tendency to engage in bulimic behaviours to cope with difficult emotions that may emerge during the history taking sessions. Monitoring dissociation (common in those with BED) may also be necessary, particularly when doing eye movements.

It is also important to discuss expectations – that therapy is not a rapid cure and that treatment resistance is common due to the many years of memory networks that have been hardwired but be assured that more effective coping mechanisms will be taught. The history taking also involves the following questions:

How long have you had an issue with food?

How did you first come to use bingeing/purging?

How old were you when you first binged?

How old were you when you first binged and purged?

How did you learn about bingeing and purging?

What else was going on in your life when bulimia first became a problem?

Has there ever been a time when you stopped bingeing and purging since you started?

Have you ever binged and not purged? If so, what was it like?

What thoughts do you have about yourself when you binged but did not purge?

What thoughts do you have about yourself now?

Does anyone know about your bulimia? If so, how did the person find out?

What do you believe people/family members think of you?

How is the bulimia helping you? How do you see the bulimia as harmful to you?

When you think of all the events that have impacted your life, which ones stand out most?/which had the biggest impact on your developing bulimia? This may be – for example, domestic violence, a major move in childhood or a hospital/surgical trauma.

The last question helps determines the target order. However, the target may be evident e.g., current shame that is related to an earlier life event related to shame. The treatment plan covers the past contributing events, present triggers and the development of future templates (i.e., the 3-pronged Protocol). Resource Development and Installation (strength building and coping skill development) can be used to stabilise prior to EMDR targeting traumas. This may be particularly useful to replace binge/purging used as emotional regulation coping mechanism.

Phase 2:

After EMDR is explained to the client, Safe Place Installation – this is particularly helpful as it induces a state change just as bingeing/purging has done. Clients who struggle to "contain" difficult emotions may benefit from first doing a "containment" exercise, particularly if the session is limited to 60 minutes. This involves asking the client to imagine putting overwhelming feelings/memories into a container. Start eye movements (EM) and say to the client "I am going to start EM's. I want you to imagine putting the feelings/memories into the container. Give me a hand signal when everything is in."

The first EMDR session is 90-100 minutes followed by a 50-60 minute session to process the outcome. The second session is followed by another 90-100 minute session followed by another processing session. New Negative Cognitions and new EMDR targets may surface.

Phase 3:

The EMDR target is chosen from the list of the top 10 worst things that have happened. Alternatively, the therapist chooses the one that appears to be most relevant. The client is asked to hold the most upsetting part of that event in mind and then ask "what does it make you believe about yourself? E.g. "I am not loveable" or "I'm not good enough." Once the negative cognitions (NC) have been identified, it is followed by identification of positive cognitions (PC), the validity of the cognition (VOC), the emotion, the Subjective Units of Disturbance (SUDS) and location in the body.

The Bridging Technique/Floatback may be used for those who have sufficient ego strength and have processed past events to be able to deal with spontaneous distressing material. The associated memories related to negative cognitions are activated, and recent triggers for negative cognitions are elicited. This includes emotions/sensations associated with them. Then ask them to float back in time to the earliest time this particular feeling emerged. This memory/image is then processed with EM. Identification of blocking beliefs that interfere with progress may also be necessary. These may include "I need to binge/purge to calm/comfort myself, I have to be thin to be successful/ happy/loved, eating fills up my emptiness, I need to binge to not feel sad."

The client may also need "sensitivity training" to help identify body sensations and make connection. This involves asking the client to close eyes, tune into the body and notice how the body feels. Then ask "think of the memory we just discussed and tell me what you first noticed."

Phase 4:

The targets are processed with EM. Sets generally start with 24 horizontal EM and may continue with a set of 24 or longer, typically 36. Direction of EM may be useful if the client gets stuck/loops.

Phase 5:

Once the SUD rating is 0 or 1, the VOC is rated a 7, the installation phase commences: the memory of the original target and the PC's are installed with a short set (about 12) EM.

Phase 6:

Once the body scan is clear, current triggers can be addressed and future templates can be developed. If the body scan is not clear, the client is asked to hold the original memory along with the PC the area in the body that is blocked is targeted. The blockage is targeted by asking the client to notice where in the body it is, t notice the shape, size, color, texture and smell of it to identify as many senses as possible to start the EM's.

Phase 7:

The client is reminded that processing may continue after the session – a log of emerging emotions/issues may be helpful. An incomplete session may have to be shut down with "containment" exercise or the Safe Place exercise.

Phase 8:

The SUDs are re-evaluated. The client is asked about recent triggers. The client is also asked how he or she feels about the progress. The previous EMDR target memory is re-evaluated and if still a 0, the next step is to continue processing current triggers and future templates.

Protocol for BED and weight management problems

Adapted from Forester's protocol for Bulimia Nervosa

1. **Standard assessment**

- Psychosocial (age, culture, religion, relationship status, children, social support)
- cognitive functioning (memory/concentration), education/work and work/life balance (e.g. presence of hobbies, leisure time), mental status
- medical issues incl. thyroid, anemia, pain, etc/medication
- drug/alcohol use/comorbid conditions/symptoms: e.g., sleep problems (nightmares, insomnia), panic attacks, anxiety, depressed mood, sexual dysfunction, compulsive/obsessive behaviours, phobias, etc or personality disorder
- genetic predisposition (parental/familial mental health/weight issues),
- treatment history (medication, therapy) and reason for seeking help now including level of motivation, presence of leverage, effect
- weight, body image, eating pattern, binge episodes, overeating, quality of diet, food/sweet cravings
- onset of binge eating/precipitating factor (s) e.g., death of loved one, sexual/physical abuse or neglect, schoolyard/workplace bullying
- perpetuating factors e.g., financial stressors/loss or change of job, onset of medical illness, relocating, poor social support

1. EMDR specific assessment
    - Identify past contributing event (cornerstone event) and current triggers
    - Develop future template for coping – which future events/situations are likely to trigger relapse of binge eating
    - Resource development – which resources deficits are present
    - Familiarity with treatment – explanation of EMDR

1. **Safe Place Instillation**
2. **Identify Negative Cognitions (NC) and Positive Cognitions**

- General trauma related NC's e.g**. "**I'm not good enough"
- weight/shape specific NC's e.g., "my body is ugly" "I can't control my weight"
- food/eating related NC's "carbs will make me fat," "I can't control my eating**"**
- exercise related NC "I'm too lazy to exercise"
- Positive Cognition (PC) needed to replace it e.g,, "I'm fine as I am,"
- Validity of the Cognition (VOC) on a scale (0-7), emotion (e.g., shame, embarrassment, helplessness) and the Subjective Unit of Distress (SUDS) and body sensations

1. **Commence eye movements (EM) or other bilateral stimulation on targets**

   Continue EM until SUD rating is 0 and VOC is 7

2. **Close and evaluate**

   Remind client of possible continued processing after session

Example:

The client presents with daily binge eating on chocolate and difficulty controlling her weight.

The client identifies the following negative cognitions in relation to the eating/weight:

"I'm not good enough," "I'm shameful," "my body is ugly," "I did something wrong" and "I'm not in control." The client would like to believe (positive cognitions): "I'm worthy, I am fine as I am, I'm competent and capable, "I accept myself as I am," and "I'm in control."

The client identifies the cornerstone memory of feeling inadequate, shameful (having negative beliefs listed above) after she was sexually abused by her uncle. She identifies that her future "loss of control" is related to the impending death of her mother.

Processing begins with eye movements (EM) to reduce/eliminate the cognitions related to the sexual abuse, the present loss of control over her weight and the future "loss" of her mother.

DeTUR* Protocol
Desensitization of Triggers and Urge Reprocessing

EXTERNAL SUPPORT RESOURCES: 12-step, support groups, family, friends, therapy, yoga, etc.

INTERNAL RESOURCES: What things about you as a person will you need to use for your recovery?

POSITIVE TREATMENT GOAL (PG): Stated in present tense (achievable, vision of health & happiness, concrete, picture self already having achieved it, install with BLS)

POSITIVE STATE (PS): positive feelings in body, breath into the feeling, experience it, describe it, install with BLS

Anchor – touch knuckle with index finger, thumb/forefinger, etc.

Test anchor and positive state without BLS or cuing

TRIGGERS person, place, time, emotion, smell, taste, event, action, object, etc.; prioritize in order of strength by taking LOU; process lowest LOU trigger first [or reverse it; clinical judgment should be used+]:

1. _____ LOU
2. _____ LOU
3. _____ LOU
4. _____ LOU
5. _____ LOU
6. _____ LOU

DESENSITIZATION: bring up the trigger, see the images, notice what you are feeling in your body, just go with that (BLS set until LOU is 0 or ecological).

INSTALLATION: link positive state (PS) and anchor with trigger and use BLS.

FUTURE TEMPLATE: imagine a future time this trigger could happen, how much of a trigger is that situation now? If LOU not 0, process to 0.

If LOU=0, use anchor and BLS to further install.

CLOSURE: Suggest that if pt. feels urges, notice what, where, and then use anchor, PG & PS.

APPENDIX III

THE UNIVERSITY OF SYDNEY

RESEARCH PARTICIPANTS NEEDED FOR INNOVATIVE BINGE EATING DISORDER THERAPY

Do you overeat regularly?
Are you overweight?
Would you like to get professional therapy for binge eating?
Contact the University of Sydney research investigator
Katie: kric8984@unisydney.edu.au or on 040267 6186

The University of Sydney

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Dr Katie Richard / Dr Maree Abbott
Chief Investigator / Supervisor

PARTICIPANT CONSENT FORM

I, ... [PRINT NAME], give consent to my participation in the research project

TITLE: **A RANDOMIZED CONTROLLED TRIAL OF TREATING BINGE EATING DISORDER WITH EYE MOVEMENT DESENSITISATION REPROCESSING**

In giving my consent I acknowledge that:

1. The procedures required for the project and the time involved have been explained to me, including any inconvenience, risk, discomfort or side-effect, and their implications, and any questions I have about the project have been answered to my satisfaction.

2. I have read the Participant Information Statement and have been given the opportunity to discuss the information and my involvement in the project with the researcher/s.

3. I understand that being in this study is completely voluntary – I am not under any obligation to consent.

4. I understand that my involvement is strictly confidential. I understand that any research data gathered from the results of the study may be published. However, no information about me will be used in any way that is identifiable.

5. I understand that I can withdraw from the study at any time, without affecting my relationship with the researcher(s) or the University of Sydney now or in the future.

6. I understand that I can stop the treatment at any time if I do not wish to continue and with my request that the audio recording will be erased and the information provided will not be included in the study.

7. I consent to:

Audio-recording	YES	NO
Receiving Feedback	YES	NO

If you answered YES to the “Receiving Feedback” question, please provide your details i.e. mailing address, e-mail address.

Feedback Option

Address: _____

_____

Email: _____

....
Signature PRINT name

...../...../201.....
Date

Maree Abbott, PhD, M.Clin.Psych
PBA Reg No: PSY0001045344

APPENDIX IV

Binge Eating Disorder Questionnaire

Name: _____ Date: _____/____/2014

	Check if yes
1.Do you binge eat? i.e. eat large amount of food in a short amount of time? e.g. eat a whole packet of chips or a whole carton of biscuits	
2. Do you have a sense of lack of control over your food intake?	
If both 1 and 2 occur, continue to question 3.	
3. Do you eat quickly?	
4. Do you eat until you're uncomfortably full?	
5. Do you eat even when not hungry? e.g. when you're bored, anxious, just because it's there, etc?	
6. Do you eat alone due to being embarrassed about your eating?	
7. Do you feel disgusted, embarrassed or depressed about your eating?	
If you have checked at least 3 of questions 3-7, continue to question 8.	
8. Do you feel great distress about your eating? *If yes, continue to question 9.*	
9. Have you been binge eating at least once weekly the past 3 months? *If yes, continue to question 10.*	
10. Have you NOT used laxatives, vomiting or excessive exercise regularly to compensate for your bingeing?	

Name: _____ Date:_____/_____/201__

BPD Checklist

	Check if yes
1. Do you have frequent mood swings?	
2. Do you tend to go from loving someone one minute to hating him/her the next?	
3. Do you tend to have an unstable sense of self? e.g. not knowing what you want to do career-wise, unsure about sexual orientation, change your mind about how you want to portray yourself?	
4. Do you engage in impulsive behaviours? e.g. go on a gambling spree, drive recklessly take drugs, have (unprotected) sex with strangers/are promiscuous, etc	
5. Have you ever purposely cut or burnt yourself or injured yourself as a suicide attempt?	
6. Do you go to extreme lengths to avoid abondonment? e.g. stay in abusive relationships; manipulate/threaten someone into staying with you?	
7. Do you tend to mistrust people, sometimes to the point of paranoia?	
8. Do you tend to feel empty?	
9.Do you have angry outbursts?	

DISSOCIATIVE EXPERIENCES SCALE (DES)

This questionnaire consists of 28 questions about experiences you have had in your daily life. We are interested in how often you have had these experiences. It is important, how- ever, that your answers show how often these experiences happen to you when you *are not* under the influence of alcohol or drugs. To answer the questions, please determine to what degree the experience described in the question applies to you and circle the ap- propriate number to show what percentage of the time you have had the experience.

Example: 0% 10 (20) 30 40 50 60 70 80 90 100%

1.Some people have the experience of driving a car and suddenly realizing that they don't remember what has happened during all or part of the trip. Circle a number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

2.Some people find that sometimes they are listening to someone talk and they suddenly realize that they did not hear part or all of what was just said. Circle a number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

3.Some people have the experience of finding themselves in a place and having no idea how they got there. Circle a number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

4.Some people have the experience of finding themselves dressed in clothes that they don't remember putting on. Circle a number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

5.Some people have the experience of finding new things among their belongings that they do not remember buying. Circle a number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

6. Some people sometimes find that they are approached by people that they do not know who call them by another name or insist that they have met them before. Circle a number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

7. Some people sometimes have the experience of feeling as though they are standing next to themselves or watching themselves do something, and they actually see themselves as though they were looking at another person. Circle a number what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

8.Some people are told that they sometimes do not recognize friends or family mem- bers. Circle a number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

9.Some people find that they have no memory for some important events in their lives (for example, a wedding or graduation). Circle a number to show what percentage of the important events in your life you have no memory for.

0% 10 20 30 40 50 60 70 80 90 100%

10.Some people have the experience of being accused of lying when they do not think that they have lied. Circle a number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

11.Some people have the experience of looking in a mirror and not recognizing them- selves. Circle a number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

12.Some people sometimes have the experience of feeling that other people, objects, and the world around them are not real. Circle a number to show what percent- age of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

13.Some people sometimes have the experience of feeling that their body does not seem to belong to them. Circle a number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

14.Some people have the experience of sometimes remembering a past event so vividly that they feel as if they were reliving that event. Circle a number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

15.Some people have the experience of not being sure whether things that they re- member happening really did happen or whether they just dreamed them. Circle a number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

16.Some people have the experience of being in a familiar place but finding it strange and unfamiliar. Circle a number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

17. Some people find that when they are watching television or a movie they become so absorbed in the story that they are unaware of other events happening around them. Circle a number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

18. Some people sometimes find that they become so involved in a fantasy or day- dream that it feels as though it were really happening to them. Circle a number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

19. Some people find that they sometimes are able to ignore pain. Circle a number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

20. Some people find that they sometimes sit staring off into space, thinking of nothing, and are not aware of the passage of time. Circle a number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

22.Some people find that in one situation they may act so differently compared to another situation that they feel almost as if they were two different people. Circle a number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

23.Some people sometimes find that in certain situations they are able to do things with amazing ease and spontaneity that would usually be difficult for them (for example, sports, work, social interactions, etc.). Circle a number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

24. Some people sometimes find that they cannot remember whether they have done something or have just thought about doing that thing (for example, not knowing whether they have just mailed a letter or have just thought about mailing it). Circle a number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

25. Some people sometimes find evidence that they have done things that they do not remember doing. Circle a number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

26. Some people sometimes find writings, drawings, or notes among their belongings that they must have done but cannot remember doing. Mark the line to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

27. Some people sometimes find that they hear voices inside their head which tell them to do things or comment on things that they are doing. Circle a number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

28. Some people sometimes feel as if they are looking at the world through a fog so that people and objects appear far away or unclear. Circle a number to show what percentage of the time this happens to you.

0% 10 20 30 40 50 60 70 80 90 100%

The amnestic dissociation subscale includes items 3, 4, 5, 6, 8, 10, 25, and 26.
The absorption and imaginative involvement subscale include items 2, 14, 15, 16, 17, 18, 20, 22, and 23.
The depersonalization and derealization subscale include items 7, 11, 12, 13, 27, and 28.
Scores for the subscales can be calculated by dividing the sum of the item scores divided by the number of items in each subscale.

INVALIDATING CHILDHOOD ENVIRONMENT SCALE

The following questions address your experiences of how your parents responded to your emotions when you were young. For each item, please choose the rating from 1-5 that most closely reflects your experiences up to the age of 18 years.

1- Never; 2 -rarely; 3 – some of the time; 4 – most of the time; 5 – all of the time

Because your parents may have been very different, please rate them separately. The left-hand column is to rate your mother, and the right-hand column is to rate your father:

Mother	During my childhood ...	Father
	my parents would become angry if I disagreed with them	
	when I was anxious my parents ignored this	
	If I was happy, my parents would be sarcastic and say things like "what are you smiling at?"	
	if I was upset, my parents said things like: "I'll give you something to cry about!"	
	my parents made me feel okay if I told them I didn't understand something difficult for the first time	
	if I was pleased because I had done well at school, my parents would say things like "don't get too confident"	
	if I said I couldn't do something, my parents would say things like "you're being difficult on purpose"	
	my parents would understand and help me if I couldn't do something straight away	
	my parents used to say things like "talking about worries just makes them worse"	
	if I couldn't do something however hard I tried, my parents told me I was lazy	
	my parents would explode with anger if I made decisions without asking them first	
	when I was miserable, my parents asked me what was upsetting me, so that they could help me	
	if I couldn't solve a problem, my parents would say things like "don't be so stupid – even an idiot could do that"	
	when I talked about my plans for the future, my parents listened to me and encouraged me	

Finally, we would like to know how you saw your whole family when you were younger. Please read the following descriptions and rate how closely each one matches your experience of growing up in your family (up to 18 years):

1- not like my family
2- a little bit like my family
3- like my family some of the time
4- like my family most of the time
5- like my family all of the time

During my childhood, ...	Rating
1. my parents were often not available, and I got a little time or attention. I was often left to fend for myself or go round to friends/relatives. My parents often got angry if I asked for things. One of both of my parents may have had a substance misuse difficulties, mental health problems or financial problems (chaotic)	
2. I felt listened to and cared for. My parents were interested in my thoughts and ideas and encouraged me to make my own decisions and choices. If things were difficult for me, they supported me, and tried to comfort me (validating)	
3.everything in my family was perfect on the surface. However, my parents, couldn't stand it if I showed I was upset, scared or angry. They expected me to put aside my feelings and get on with it (perfect)	
4. it was important to be able to control your emotions and focus on achievement and success “behaving like a grown up” was desirable (typical)	

Thank you very much for answering these questions.
Mountford, V., Corsorphine, E. Tomlinson, S. & Waller, G. (2005). Invalidating Childhood Environment Scale.

In Fairburn C.G. Cognitive Behavior Therapy and Eating Disorders. Guilford Press, New York, 2008.

EATING DISORDER EXAMINATION

(Edition 16.0D)

Christopher G Fairburn, Zafra Cooper and Marianne O'Connor

OVERVIEW OF EDE 16.0D

The sixteenth edition of the EDE is the latest version of this widely used instrument. It differs from the version that is generally used (EDE 12.0D; Fairburn and Cooper, 1993) in the following major ways:

1. There is a new way of rating the Dietary Restraint subscale items such that restraint for the purpose of gaining a sense of control in general is rated, in addition to restraint intended to influence shape or weight. This is in order to detect a type of restraint seen mainly in younger patients and in the earlier stages of an eating disorder (see page ***). It is also seen in non-Western cases. Thus two Dietary Restraint subscale scores may be computed as well as a combined one.
2. There is a "binge eating disorder" module based on the research criteria in DSM-IV (American Psychiatric Association, 1994).
3. A distinction is drawn between compensatory and non-compensatory forms of purging (see page ***).
4. There is a new "Importance" item designed to detect the over-evaluation of control over eating per se (see page ***).

In all other significant respects the instrument is the same as EDE 12.0D and it generates EDE 12.0D-compatible data.

For further information about the EDE, see Fairburn and Cooper (1993). For full details about the differences between EDE 12.0D and EDE 16.0D see the list at the end of the EDE schedule (page ***). Note that there is a version of the EDE designed specifically for use with children and adolescents (Bryant-Waugh, Cooper, Taylor and Lask, 1996). If either version of the EDE is going to be used for research purposes, training is essential.

RECOMMENDED READING

American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders (4th edition).* Washington, D.C.: American Psychiatric Association.

Bryant-Waugh, R. J., Cooper, P. J., Taylor, C. L., & Lask, B. D. (1996). The use of the Eating Disorder Examination with Children: A pilot study. *International Journal of Eating*

Disorders, 19, 391-397.

Cooper, Z., & Fairburn, C. G. (1987). The Eating Disorder Examination: a semi-structured interview for the assessment of the specific psychopathology of eating disorders. *International Journal of Eating Disorders, 6,* 1-8.

Fairburn C. G., & Cooper, Z. (1993). The Eating Disorder Examination (twelfth edition). In: C. G. Fairburn & G. T. Wilson (eds.). *Binge Eating: Nature, Assessment and Treatment*. (pp. 317-360). New York: Guilford Press, 1993.

Grilo, C. M. (2005). Structured instruments. In J. E. Mitchell & C. B. Peterson (eds.), *Assessment of eating disorders* (pp. 120-128). New York: Guilford Press.

GENERAL GUIDELINES FOR INTERVIEWERS

The EDE is an *investigator-based interview*. This may be contrasted with respondent-based interviews in which the participant's answers to specified questions are rated without additional questioning. Respondent-based interviews are in essence verbally administered self-report questionnaires. They work well where the concepts being assessed are simple and there is general agreement as to their meaning, but they are unsatisfactory when the concepts are complex or key terms do not have a generally accepted specific meaning. With investigator-based interviews interviewers need training to ensure that they fully understand the concepts being assessed. The structure in such interviews lies in the detailed specifications provided for the interviewer of the concepts to be rated and the rating scheme, rather than in the precise wording of individual questions. In summary, investigator-based interviews such as the EDE require that interviewers be trained both in the technique of interviewing and in the concepts and rules governing the ratings.

When using the EDE, it is essential that the participant understands the purpose of the interview. The interviewer should explain why the interview is being conducted and, before starting formal questioning, should aim to establish good rapport. The interviewer and participant together should be trying to obtain an accurate picture of the participant's current eating behaviour and attitudes. It is important to explain that a standard set of questions is being asked and that some may not apply. Participants also need to know in advance how long the interview will take. At a minimum this will be 45 minutes but it can take as long as an hour and a quarter. (EDE interviews should rarely be allowed to take longer than this since otherwise interviewer and participant fatigue will affect the quality of the ratings.)

The interviewer should explain that the interview mainly focuses on the preceding four weeks (28 days), although if the interview is also being used for diagnostic purposes certain questions extend out to cover the previous three months.[1] To help the participant accurately recall the primary period of interest, time should be devoted at the beginning of the interview to the identification of events which have taken place during these 28 days. For example, the interviewer should establish whether the participant has been at home or away and what has happened on each of the four weekends. It can be helpful referring to a prepared calendar to locate the four weeks in question (see below). If the interview is also being used for diagnostic purposes events of note in (28-day) months 2 and 3 (counting back from the present 28 days) should also be noted together with their boundaries. Rarely should the orientation to the time frame be allowed to take more than 10 minutes.

Each of the items in the EDE has one or more (asterisked) obligatory questions in bold type which must be asked. Special emphasis should be placed upon the words and phrases that are underlined. The obligatory questions should be supplemented with additional questions of the interviewer's choice. The phrase "over the past four weeks" which precedes most obligatory question may be varied as seems appropriate (e.g., "over the past month" or "over the past 28 days") and inserted at any point within the question, but otherwise the obligatory questions should be asked as specified in the schedule. The items in the interview may be covered in any

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[1] The DSM-IV research diagnostic criteria for the provisional new diagnosis binge eating disorder encompass a six-month time frame. Interviewers wanting to elicit these diagnostic criteria should refer to the “Binge Eating Disorder Module” (see page ***) which opens with an orientation to this extended period of time.

order although for most purposes the sequence presented in the schedule will be found to be satisfactory. It is perfectly appropriate to return to earlier items if further information emerges during the interview which is of relevance to prior ratings. The interview should never be undertaken in the absence of the full schedule as even the most experienced interviewers need to refer to the questions, definitions, and rating schemes.

The interviewer should pay careful attention to everything that the participant says. The interview should never be hurried. It should proceed at a steady relaxed pace with the interviewer not moving on to the next item until he or she is satisfied that all the necessary information has been obtained. The interviewer should not be rushed along by rapid, and possibly impatient, replies. Apparently glib answers which do not seem to have been given thought should be sensitively explored. Conversely, participants who are loquacious and over-detailed in their replies need to be kept to the point. Care must always be taken to ensure that the participant understands what information the interviewer is trying to elicit. It is good practice to check back with the participant before making each rating.

The physical circumstances under which the interview is conducted are also important. The interviewer and participant need to be comfortably seated and the interviewer needs to be able to have the schedule in front of him/her together with the rating sheet. There should be as few distractions as possible and except under unusual circumstances no one else should be present since otherwise participants tend not be to be frank and forthcoming.

Guidelines for making ratings are provided for most items. Ratings should be made as the interview proceeds (although certain calculations may be delayed until afterwards). The instructions for making the ratings are given in square brackets and they are followed by the rating scheme itself. Frequency ratings should be based on a 28-day month: if a feature is not present, rate 0; if a feature is present on up to and including 5 days, rate 1; if it is present half the time, rate 3; if it is present almost every day (with up to and including 5 exceptions), rate 5; if it is present every day, rate 6. Some items are rated on a seven-point severity scale ranging from 0 to 6. In these cases 0 represents the absence of the feature in question and 6 represents its presence to an extreme degree; a rating of 1 should be made only if the feature is barely present, and a rating of 5 should be made only if the feature is present to a degree not quite severe enough to justify a rating of 6. A rating of 3 should be used for degrees of severity midway between 0 and 6. *If it is difficult to decide between two ratings, the lower rating (i.e., the less symptomatic) should be chosen.* [The exception is the first item "Pattern of eating" in which higher scores are (with the exception of nocturnal eating) less symptomatic.] This general rating scheme is summarised in Table A.1 overleaf.

TABLE A.1 TO FOLLOW HERE

SCORING

The EDE, and its self-report version, the EDE-Q, generate two types of data. First, they provide frequency data on key behavioural features of eating disorders in terms of number of episodes of the behaviour and in some instances number of days on which the behaviour has occurred. Second, they provide subscale scores reflecting the severity of aspects of the psychopathology of eating disorders. The subscales are Restraint, Eating Concern, Shape Concern and Weight Concern. To obtain a particular subscale score, the ratings for the relevant items (listed below) are added together and the sum divided by the total number of items forming the subscale. If ratings are only available on some items, a score may nevertheless be obtained by dividing the

resulting total by the number of rated items so long as more than half the items have been rated. To obtain an overall or 'global' score, the four subscales scores are summed and the resulting total divided by the number of subscales (i.e. four). Subscale scores are reported as means and standard deviations.

Subscale Items (the numbers are the item number on the EDE-Q):
Restraint
1 Restraint over eating
2 Avoidance of eating
3 Food avoidance
4 Dietary Rules
5 Empty stomach

Eating Concern
7 Preoccupation with food, eating or calories
9 Fear of losing control over eating
19 Eating in secret
21 Social eating
20 Guilt about eating

Shape Concern
6 Flat stomach
8 Preoccupation with shape or weight
23 Importance of shape
10 Fear of weight gain
26 Dissatisfaction with shape
27 Discomfort seeing body
28 Avoidance of exposure
11 Feelings of fatness

Weight Concern
22 Importance of weight
24 Reaction to prescribed weighing
8 Preoccupation with shape or weight
25 Dissatisfaction with weight
12 Desire to lose weight

COMMUNITY NORMS

The data below are from a community-based sample of 243 young women assessed using the EDE and EDE-Q (see Fairburn and Beglin, 1994).

Measure	Mean	SD	N
EDE interview			
Global EDE (4 subscales)	0.932	0.805	243
Restraint subscale	0.942	1.093	243
Eating Concern subscale	0.266	0.593	243
Shape Concern subscale	1.339	1.093	243
Weight Concern subscale	1.181	0.929	243
EDE Q			
Global EDE-Q (4 subscales)	1.554	1.213	241
Restraint subscale	1.251	1.323	241
Eating Concern subscale	0.624	0.859	241

Shape Concern subscale	2.149	1.602	241
Weight Concern subscale	1.587	1.369	241

EATING DISORDER EXAMINATION
(Edition 16.0D)

THE INTERVIEW SCHEDULE

ORIENTATION TO THE TIME PERIOD
What we are going to do is a partially structured interview in which I will ask you about your eating habits and your feelings about your shape, and weight. Because a standard set of questions is going to be asked, please note that some may not apply to you.

Most of the questions focus on the past four weeks (that is, the last 28 days), but there will be some that extend out to cover the previous three months. I know this will test your memory because the weeks tend to blend together.

What I have done to help you is to make this calendar for the last 28 days [show the blank calendar - see below]**; it ends on yesterday because today is not over yet. So it goes from yesterday (day and date) to (day and date). I know it seems strange to have the weekends in the middle, but that is just the way it has worked out.**

And here are the dates for the two months before that, (date) to (date). And to help you remember these periods, I have noted down the holidays (e.g., May Bank Holiday, Thanksgiving).

What I would like you to do now is tell me about any events that have happened in the past 28 days since this will help us discuss these four weeks. Have there been any events out of the ordinary ..... such as celebrations of any type, trips away or days off work? Then we can note these down on the calendar.

[These should be noted on the calendar (see Table A.2) thereby allowing the interviewer and participant to use it as an aide memoire.]

TABLE A.2 TO FOLLOW ON NEXT PAGE

INTRODUCTORY QUESTIONS

[Having oriented the participant to the specific time period being assessed, it is best to open the interview by asking a number of introductory questions designed to obtain a general picture of the participant's eating habits. Suitable questions are suggested below.]

To begin with I should like to get a general picture of your eating habits over the last four weeks. What has been your usual eating pattern?

Have your eating habits varied much from day to day?

Have weekdays differed from weekends?

[The definition (and number) of weekdays and weekend days that best fits the patient's lifestyle needs to be established at this point (e.g., check if the participant's days off work regularly fall on weekdays).]

Have there been any days when you haven't eaten anything?

[Ask about months 2 and 3]

What about the previous two months (specify months) ..... Were your eating habits much the same or were they different?

PATTERN OF EATING

***I would like to ask about your pattern of eating. Over the past four weeks which of these meals or snacks have you eaten on a regular basis?**

- breakfast [ ]
- mid-morning snack [ ]
- lunch (mid-day meal) [ ]
- mid-afternoon snack [ ]
- evening meal [ ]
- evening snack [ ]
- nocturnal eating (i.e., an episode of eating after the participant has been to sleep) [ ]

[Rate each meal and snack separately, usually accepting the participant's classification (within the guidelines above). Ask about weekdays and weekends separately. Meals or snacks should be rated even if they lead on to a "binge". "Brunch" should generally be classed as lunch. With the exception of nocturnal eating, rate up (i.e., give a higher rating) if it is difficult to choose between two ratings. Rate 8 if meals or snacks are difficult to classify (e.g., due to shift work).]

0 - Meal or snack not eaten
1 - Meal or snack eaten on 1 to 5 days
2 - Meal or snack eaten on less than half the days (6 to 12 days)
3 - Meal or snack eaten on half the days (13 to 15 days)
4 - Meal or snack eaten on more than half the days (16 to 22 days)
5 - Meal or snack eaten almost every day (23 to 27 days)
6 - Meal or snack eaten every day

[If participants report having had episodes of nocturnal eating, ask about their level of awareness (alertness) at the time and their recall of the episodes afterwards.]

When you ate ….. how awake were you and how well could you recall the episode the next day?

0 - no nocturnal eating
1 - nocturnal eating with no impairment of awareness (alertness) or recall
2 - nocturnal eating with impairment of awareness (alertness) or recall

[ ]

PICKING (NIBBLING)

***Over the past four weeks have you picked at (nibbled) food between meals and snacks. By "picking" (nibbling) I mean eating in an unplanned and repetitious way.**

What about when cooking?

What have you typically eaten at these times?

Why would you not call these episodes snacks?

Have you known in advance how much you were going to eat?

[Rate the number of days on which picking (nibbling) has occurred. To count as picking (or nibbling) the episode of eating should have been unplanned, the amount eaten should have been uncertain at the time that the episode started, and the eating should have had a repetitious element to it. Typically what is eaten is incomplete (i.e., it constitutes part of something or a less-than-usual amount), but the total amount consumed should not have been minute (e.g., not simply one edge of a piece of toast). In general, participants themselves should view the episodes as examples of "picking" ("nibbling").

Picking (nibbling) may be contrasted with eating a "snack". A snack is an episode of eating in which the amount eaten was modest (smaller than a meal), known at the outset with some certainty, and did not have the repetitious element associated with picking. Episodes of picking which merge into snacks, meals or "binges" should not be rated. The rating of picking may require the re-rating of snacks.]

0 - No picking (nibbling)
1 - Picking (nibbling) on 1 to 5 days
2 - Picking (nibbling) on less than half the days (6 to 12 days)
3 - Picking (nibbling) on half the days (13 to 15 days)
4 - Picking (nibbling) on more than half the days (16 to 22 days)
5 - Picking (nibbling) almost every day (23 to 27 days)
6 - Picking (nibbling) every day [ ]

RESTRAINT OVER EATING (Restraint subscales)

***Over the past four weeks have you been consciously trying to restrict (cut back) the overall amount that you eat, whether or not you have succeeded?**

What have you been trying to do?

Has this been to influence your shape or weight, or to avoid triggering an episode of overeating?

[Rate the number of days on which the participant has *consciously attempted* to restrict his or her *overall* food intake (i.e., energy intake), whether or not he or she has succeeded. The restriction should have affected a *range of food items* and not just certain specific foods (c.f., "Food avoidance"). This restriction should have been intended either to influence shape, weight or body composition, or to avoid triggering an episode of overeating, although this may not have been the sole or main reason. It should have consisted of planned attempts at restriction, rather than spur-of-the-moment attempts such as the decision to resist a second helping.]

0 - No attempt at restraint
1 - Attempted to exercise restraint on 1 to 5 days
2 - Attempted to exercise restraint on less than half the days (6 to 12 days)
3 - Attempted to exercise restraint on half the days (13 to 15 days)
4 - Attempted to exercise restraint on more than half the days (16 to 22 days)
5 - Attempted to exercise restraint almost every day (23 to 27 days)
6 - Attempted to exercise restraint every day [ ]

Some people consciously try to restrict their eating for another reason - to give them a sense of being control - of being in control in general.

Over the past four weeks has this applied to you?

[Rate again only taking this reason into account.] [ ]

[Also rate number of days on which one or other, or both, of these reasons has applied.]
[ ]

AVOIDANCE OF EATING (Restraint subscales)

***Over the past four weeks have you gone for periods of eight or more waking hours without eating anything?**

Has this been to influence your shape or weight, or to avoid triggering an episode of overeating?

[Rate the number of days on which there has been at least eight hours abstinence from eating food (soup and milkshakes count as food, whereas drinks in general do not) during waking hours. It may be helpful to illustrate the length of time (e.g., 9 a.m. to 5 p.m.). The abstinence must have been at least partly *self-imposed* rather than being due to force of circumstances. It should have been intended to influence shape, weight or body composition, or to avoid triggering an episode of overeating, although this may not have been the sole or main reason (i.e., fasting for religious or political reasons would not count). Note that the rating should be consistent with those made earlier for "Pattern of eating".]

0 - No such days
1 - Avoidance on 1 to 5 days
2 - Avoidance on less than half the days (6 to 12 days)
3 - Avoidance on half the days (13 to 15 days)
4 - Avoidance on more than half the days (16 to 22 days)
5 - Avoidance almost every day (23 to 27 days)
6 - Avoidance every day [ ]

Some people avoid eating in this way ..... for eight or more waking hours ..... for another reason - to give them a sense of being control - of being in control in general.

Over the past four weeks has this applied to you?

[Rate again only taking this reason into account.] [ ]

[Also rate number of days on which one or other, or both, of these reasons has applied.]
[ ]

EMPTY STOMACH (Restraint subscales)

***Over the past four weeks have you wanted your stomach to <u>be empty</u>?**

Has this been to influence your shape or weight, or to avoid triggering an episode of overeating?

[Rate the number of days on which the participant has had a *definite desire* to have a completely empty stomach for reasons to do with dieting, shape or weight. This desire should not simply be a response to episodes of perceived overeating; rather, it should exist between any such episodes. The rating of "Empty stomach" should not be confused with a desire for the stomach to *feel empty* or *be flat* (c.f., "Flat stomach".]

0 - No definite desire to have an empty stomach
1 - Definite desire on 1 to 5 days
2 - Definite desire on less than half the days (6 to 12 days)
3 - Definite desire on half the days (13 to 15 days)
4 - Definite desire on more than half the days (16 to 22 days)
5 - Definite desire almost every day (23 to 27 days)
6 - Definite desire every day [ ]

Some people want to have an empty stomach for another reason - to give them a sense of being control - of being in control in general.

Over the past four weeks has this applied to you?

[Rate again <u>only</u> taking this reason into account.] [ ]

[Also rate number of days on which one or other, or both, of these reasons has applied.]
[ ]

FOOD AVOIDANCE **(Restraint subscales)**

***Over the past four weeks have you <u>tried</u> to avoid eating any foods which you like, whether or not you have succeeded?**

What foods? Have you been attempting to exclude them altogether?

Has this been to influence your shape or weight, or to avoid triggering an episode of overeating?

[Rate the number of days on which the participant has *actively attempted to avoid eating specific foods* (which he or she likes, or has liked in the past) whether or not he or she succeeded. The goal should have been to *exclude the foods altogether* and not merely to restrict their consumption. Drinks do not count as food. The avoidance should have been planned and intended either to influence shape, weight or body composition, or to avoid triggering an episode of overeating, although this may not have been the sole or main reason.]

0 - No attempts to avoid foods
1 - Attempted to avoid foods on 1 to 5 days
2 - Attempted to avoid foods on less than half the days (6 to 12 days)
3 - Attempted to avoid foods on half the days (13 to 15 days)
4 - Attempted to avoid foods on more than half the days (16 to 22 days)
5 - Attempted to avoid foods almost every day (23 to 27 days)
6 - Attempted to avoid foods every day [ ]

Some people avoid eating certain foods for another reason - to give them a sense of being control - of being in control in general.

Over the past four weeks has this applied to you?

[Rate again <u>only</u> taking this reason into account.] [ ]

[Also rate number of days on which one or other, or both, of these reasons has applied.]
[ ]

DIETARY RULES **(Restraint subscales)**

***Over the past four weeks have you tried to follow certain definite rules regarding your eating; for example, a calorie limit, pre-set quantities of food, or rules about what you should - or should not - eat, or when you should eat? What have you been trying to do?**

If answered negatively:

Have there been occasions when you have been aware that you may have broken a dietary rule that you have set for yourself?

Have these rules been designed to influence your shape or weight, or to avoid triggering an episode of overeating?

Have they been definite rules or general guidelines? Examples of definite rules would be "I must not eat eggs" or "I must not eat cake", whereas you could have the general guideline "I should try to eat healthy food".

[Dietary rules should be rated as present if the participant has been attempting to follow "definite" (i.e., specific) dietary rules regarding his or her food intake. The rules should be self-imposed, although originally they may have been prescribed (i.e., prescribed rules can be rated if they have been adopted by the participant). They should have concerned what the participant should have eaten or when eating should have taken place. They might consist of a calorie limit (e.g., below 1,200 kcals), not eating before a certain time of day, not eating specific foods (c.f., "Food avoidance") or not eating at all. They should have been specific rules and not general guidelines. If the participant is aware that he or she has occasionally broken a personal dietary rule, this indicates that one or more specific rules has been present. In such cases the interviewer should ask in detail about the transgression in an attempt to identify the underlying rule. The rules should have been intended to influence shape, weight or body composition, although this may not have been the sole or main reason.
Rate 0 if no dietary rule can be identified. If there has been more than one rule straddling different time periods within the four weeks, these periods should be combined to make the rating.]

0 - Has not attempted to obey such rules
1 - Attempted to obey such rules on 1 to 5 days
2 - Attempted to obey such rules on less than half the days (6 to 12 days)
3 - Attempted to obey such rules on half the days (13 to 15 days)
4 - Attempted to obey such rules on more than half the days (16 to 22 days)
5 - Attempted to obey such rules almost every day (23 to 27 days)
6 - Attempted to obey such rules every day [ ]

Some people attempt to follow dietary rules for another reason - to give them a sense of being control - of being in control in general. Over the past four weeks has this applied to you?
[Rate again only taking this reason into account.] [ ]
[Also rate number of days on which one or other, or both, of these reasons has applied.]
[ ]

PREOCCUPATION WITH FOOD, EATING, OR CALORIES
(Eating Concern subscale)

***Over the past four weeks have you spent much time between meals thinking about food, eating, or calories?.....**

***..... Has thinking about food, eating, or calories <u>interfered</u> with your ability to concentrate on things that you are actively engaged in, for example, working, following a conversation or reading? What has it affected?**

[This definition of preoccupation requires the presence of concentration impairment. Concentration is regarded as impaired if there have been *intrusive thoughts about food, eating, or calories which have interfered with activities one is actively engaged in* rather than one's mind simply drifting off the matter at hand. Rate the number of days on which this has happened, whether or not bulimic episodes occurred.]

0 - No concentration impairment
1 - Concentration impairment on 1 to 5 days
2 - Concentration impairment on less than half the days (6 to 12 days)
3 - Concentration impairment on half the days (13 to 15 days)
4 - Concentration impairment on more than half the days (16 to 22 days)
5 - Concentration impairment almost every day (23 to 27 days)
6 - Concentration impairment every day [ ]

FEAR OF LOSING CONTROL OVER EATING **(Eating Concern subscale)**

***Over the past four weeks have you been <u>afraid</u> of losing control over eating?**

[Rate the number of days on which a *definite fear* (common usage) of losing control over eating has been present, irrespective of whether the participant has felt he or she has been in control. *"Loss of control" involves a sense that one will not be able to resist or stop eating*. If the participant feels unable to answer this question because he or she has already totally lost control, rate 9.]

0 - No fear of losing control over eating
1 - Fear of losing control over eating present on 1 to 5 days
2 - Fear of losing control over eating present on less than half the days (6 to 12 days)
3 - Fear of losing control over eating present on half the days (13 to 15 days)
4 - Fear of losing control over eating present on more than half the days (16 to 22 days)
5 - Fear of losing control over eating present almost every day (23 to 27 days)
6 - Fear of losing control over eating present every day [ ]

BULIMIC EPISODES AND OTHER EPISODES OF OVEREATING

(Diagnostic item)

Classificatory Scheme

[Four forms of episodic "overeating" are distinguished. The distinction is based upon the presence or absence of two characteristics:

i) **loss of control** (required for both types of "bulimic episode")

ii) **the consumption of what would generally be regarded as a "large" amount of food** (required for "objective bulimic episodes" and "objective overeating").

The classificatory scheme is summarised below.

	"Large" amount eaten (EDE definition)	Amount eaten not "large" but viewed by participant as excessive
"Loss of control" present	Objective bulimic episodes	Subjective bulimic episodes
No "loss of control"	Objective overeating	Subjective overeating

Guidelines for Proceeding Through the Overeating Section

The interviewer should ask about each form of overeating. It is important to note that *the four forms of overeating are not mutually exclusive*: it is possible for participants to have had several different forms within the time period being considered. With some participants it is helpful to explain the classificatory scheme.

There are five steps in making this series of ratings:

1. In general it is best to start by asking the asterisked questions to identify the various types of perceived or true overeating that have occurred over the previous 28 days.
2. Each form should be noted down on the blank section of the coding sheet.
3. Then, detailed information should be obtained about a *representative example* of each form of overeating to decide whether or not it involved eating a "large" amount of food and whether or not there was "loss of control" (as defined below).
4. The next task is to establish for each form of overeating the number of days on which it occurred and the total number of occasions. Where there is possibility of overlap (i.e., two types of episode may have occurred on the same day, this should be clarified since this will affect the “days” ratings).
5. Finally, check with the participant to ensure that no misunderstandings have arisen (e.g., that no types of episode have been omitted).

It is advisable to make comprehensive notes.

Definition of Key Terms

"**Loss of control**". The interviewer should ask the participant whether he or she experienced a

sense of loss of control over eating at any point in the episode. If this is clearly described, "Loss of control" should be rated as present. Similarly, if the participant describes having felt "driven" or "compelled" to eat, "Loss of control" should be rated as present.

If the participant reports having had no sense of loss of control yet describes having felt unable to stop eating once eating had started or having felt unable to prevent the episode from occurring, "Loss of control" should be rated as present. If participants report that they are no longer trying to control their eating because overeating is inevitable, "Loss of control" should once again be rated as present. Thus "Loss of control" may be rated positively even if the episode had been planned (i.e., the participant knew that he or she was going to overeat and had made provision for this).

The decision whether or not "loss of control" was present should be made by the interviewer; it does not require the agreement of the participant. If the interviewer remains in doubt, "Loss of control" should be rated as absent.

"**Large amount of food**". The decision whether or not the amount eaten was "large" should also be made by the interviewer; it does not require the agreement of the participant. The notion of "large" may refer to the amount of any particular type of food consumed or the overall quantity of food eaten. The amount should have been unequivocally large but it does not have to have been enormous. In deciding whether the amount was "large", *the interviewer must take into account what would be the usual amount eaten under the circumstances.* This requires some knowledge of the eating habits of the participant's general, but not necessarily immediate, social group (e.g., those of female students, women in their 50s) as well as circumstances that tend to influence eating (e.g., Thanksgiving Day, Christmas Day). What else was eaten during the day is not taken into account when making this rating, nor is the speed of eating or whether or not the participant subsequently spat out or vomited the food.

If the interviewer remains in doubt, the amount should not be classified as "large".

Interviewers should not share with the patient their view on the amount eaten and they should avoid using potentially emotive terms such as such as "binge" and "large".

The number of episodes of overeating. When calculating the number of episodes of overeating, the participant's definition of separate episodes should be accepted unless, within a period of eating, there was an hour or more when the participant was not eating. In this case the initial episode should be regarded as having been completed. An exception is if the episode was temporarily interrupted by an outside event and then restarted afterwards, and it was experienced as one single episode (somewhat like operating the pause button on a recorder). When estimating the length of any gap, do not count the time spent vomiting. *Note that "purging" (self-induced vomiting or laxative misuse) is not used to define the end of individual episodes of overeating*.]

QUESTIONS FOR IDENTIFYING BULIMIC EPISODES AND OTHER EPISODES OF OVEREATING

[See preceding section "Guidelines for Proceeding Through the Overeating Section". The asterisked questions should be asked in every case.]

Main Probe Questions (to get the overall picture)

> ***I would like to ask you about any episodes of overeating, or loss of control over eating, that you might have had over the past four weeks.**
>
> ***Different people mean different things by overeating. I would like you to describe any times when you have felt that you have eaten, or might have eaten, too much at one time.**
>
> ***And any times you have felt you have lost control over eating?**

Additional Probe Questions

> ***Have there been any times when you have felt that you have eaten too much, but others might not agree?**
>
> ***Have there been any times when you have felt that you have eaten an ordinary amount of food but others might have regarded you as having overeaten?**

[N.B. For subjective bulimic episodes to be eligible, they must have been viewed by the participant as having involved eating an excessive amount of food (i.e., they involved "overeating").]

Subsidiary Probe Questions (to classify any episodes of overeating)

To assess the amount of food eaten:

> **Typically what have you eaten at these times?**
>
> For subjective bulimic episodes (i.e., where the amount is not viewed by the interviewer as "large")
> **Did you view this amount as excessive?**

To assess the social context:

> **What were the circumstances?**
> **What were others eating at the time?**

To assess "loss of control":

> **Did you have a sense of loss of control at the time?**
> **Did you feel you could have stopped eating once you had started?**
> **Did you feel you could you have prevented the episode from starting?**

[For objective bulimic episodes, subjective bulimic episodes and episodes of objective overeating the following two ratings should be made:

i) number of days (rate 00 if none)
ii) number of episodes (rate 000 if none)

In general, it is best to calculate the number of days first and then the number of episodes. Rate 777 if the number of episodes is so great that their frequency cannot be calculated. Episodes of subjective overeating are not rated.]

Objective bulimic episodes
days [ ][ ]
episodes [ ][ ][ ]

Subjective bulimic episodes
days [ ][ ]
episodes [ ][ ][ ]

Episodes of objective overeating
days [ ][ ]
episodes [ ][ ][ ]

[Ask about each of the preceding two months referring back to the relevant dates and any events of note. For objective and subjective bulimic episodes, rate the number of episodes over the preceding two months and the number of days on which they occurred. Rate 0s if none and 9s if not asked.]

Objective bulimic episodes
days - month 2 [ ][ ]
month 3 [ ][ ]

episodes - month 2 [ ][ ][ ]
month 3 [ ][ ][ ]

Subjective bulimic episodes
days - month 2 [ ][ ]
month 3 [ ][ ]

episodes - month 2 [ ][ ][ ]
month 3 [ ][ ][ ]

[Also rate the longest continuous period in weeks free (not due to force of circumstances) from objective bulimic episodes over the past three months. Rate 99 if not applicable.]

[ ][ ]

DSM-IV "BINGE EATING DISORDER" MODULE

[Only enter this DSM-IV module if objective bulimic episodes have been present over the preceding 12 weeks. Use a respondent-based interviewing style, rather than the investigator-based style of the EDE.]

In line with the DSM-IV research criteria for "binge eating disorder", a six-month assessment needs to be made of the number of *days* (NB: not episodes) on which objective bulimic episodes have occurred. Therefore, having focused initially on the preceding two 28-day months (months 2 and 3), the interviewer needs to move back to the three earlier 28-day months (months 4 to 6). To help patients recall this far back, they need to be told the specific dates in question. They also need help to recall the specific time period (along the lines specified earlier).]

> ***What about the three months prior to the three months that we have been talking about** (specify the beginning and end dates)**? .....**
>
> **..... Did you have episodes like .....**. (describe a representative objective bulimic episode)**?**
>
> **Did you have any other equivalent episodes .....** (refer, if applicable, to other types of objective bulimic episode that the participant reported)**?**
>
> **Did they occur more or less often than in the past 28 days?**
>
> **Let's estimate together, on average over the past six months** (specify months)**, how many days per week have you had episodes like .....** (refer to the representative objective bulimic episode)**?**

[Estimate the average number of days per week on which objective bulimic episodes have occurred over the past six months (i.e., rate between 0 and 7). Rate 9 if not asked.]

[ ]

<u>Features Associated with Binge Eating</u>

[Only rate these items if, on average over the past six months, there have been at least two days per week on which episodes of binge eating have occurred. Otherwise rate 9.]

During these episodes (refer to objective bulimic episodes that are <u>representative</u> of those over the past six months)**, have you *typically* .....**

... Eaten much more rapidly than normal? [ ]
... Eaten until you have felt uncomfortably full? [ ]
... Eaten large amounts of food when you haven't felt physically hungry? [ ]
... Eaten alone because you have felt embarrassed about how much you were eating? [ ]

... Felt disgusted with yourself, depressed, or very guilty? [ ]

[Rate each feature individually using the binary scheme below.]

0 - Feature not present
1 - Feature present

Distress about Binge Eating

In general, over the past six months how distressed or upset have you felt about these episodes (refer to objective bulimic episodes that are representative of those over the past six months)**?**

[Rate the presence of marked distress about the binge eating. This may stem from the actual behaviour itself or its potential effect on body shape and weight.]

0 – No marked distress
1 – Marked

[ ]

DIETARY RESTRICTION OUTSIDE BULIMIC EPISODES (Diagnostic item)

[**RETURN TO THE THREE-MONTH TIME FRAME and EDE STYLE OF QUESTIONING.** Only rate this item if there have been at least 24 objective bulimic episodes over the past three months.]

Outside the times when you have lost control over eating ..... (refer to objective and subjective bulimic episodes), ... **how much have you been actually restricting (limiting) the amount that you eat? What have you eaten on a typical day?**

Has this been to influence your shape or weight?

[Ask about actual food intake outside the objective and subjective bulimic episodes. *Rate a typical day (whether or not it involves an episode of overeating)*. The dietary restriction should have been intended to influence shape, weight or body composition, although this may not have been the sole or main reason. Rate each of the past three months separately. Rate 9 if not asked.]

0 - No extreme restriction outside objective and subjective bulimic episodes
1 - Extreme restriction outside objective and subjective bulimic episodes
(i.e., purposeful low energy intake (e.g., <1,200 kcals))
2 - No eating outside objective and subjective bulimic episodes (i.e., purposeful "fasting")

month 1 [ ]

month 2 [ ]

month 3 [ ]

SOCIAL EATING (Eating Concern subscale)

***Outside the times when .....** (refer to any objective bulimic episodes and episodes of objective overeating), **over the past four weeks have you been concerned about other people seeing you eat?**

How concerned have you been? Has this concern led you to avoid such occasions? Could it have been worse?

[NB: This is the first severity item. Rate the degree of concern about eating normal or less than normal amounts of food in front of others. *Do not consider objective bulimic episodes or episodes of objective overeating.* Also, do not consider concern restricted to family members who are aware that the participant has an eating problem. On the other hand the concern can stem from idiosyncratic eating habits (e.g., very slow eating; eating fewer courses than others; eating different types of food) or allied behaviour such as indecision when ordering in a restaurant. One index of the severity of such concern is whether it has led to avoidance. In common with all severity items, the rating should generally represent the *mode for the entire month*. If the possibility of eating with others has not arisen, rate 9.]

0 - No concern about being seen eating by others and no avoidance of such occasions.
1 -
2 - Has felt slight concern at being seen eating by others
3 -
4 - Has felt definite concern at being seen eating by others
5 -
6 - Has felt extreme concern at being seen eating by others [ ]

EATING IN SECRET **(Eating Concern subscale)**

***Outside the times when .....** (refer to any objective bulimic episodes and episodes of objective overeating), **over the past four weeks have you eaten in secret?**

[Rate the number of days on which there has been at least one episode of secret eating. *Do not consider objective bulimic episodes or episodes of objective overeating.* Secret eating refers to eating which is furtive and which the participant wishes to conceal because he or she does not want to be seen eating (i.e., it is not simply eating alone). Do not rate secrecy that stems from a desire not to be interrupted or a wish not to share food. Sensitivity about eating in front of others will have been rated under "Social eating" but it can result in eating in secret. If the possibility of eating with others has not arisen, rate 9.]

0 - Has not eaten in secret
1 - Has eaten in secret on 1 to 5 days
2 - Has eaten in secret on less than half the days (6 to 12 days)
3 - Has eaten in secret on half the days (13 to 15 days)
4 - Has eaten in secret on more than half the days (16 to 22 days)
5 - Has eaten in secret almost every day (23 to 27 days)
6 - Has eaten in secret every day [ ]

GUILT ABOUT EATING **(Eating Concern subscale)**

***Outside the times when .....** (refer to any objective and subjective bulimic episodes)**, over the past four weeks have you felt guilty after eating?**

Have you felt that you have done something wrong? Why?

On what <u>proportion</u> of the times that you have eaten have you felt guilty?

[NB: This rating is based on occasions. Rate the *proportion of times* that feelings of guilt have followed eating. *Do not consider objective or subjective bulimic episodes*, but do consider other episodes of overeating. These feelings of guilt should relate to the effects of eating on shape, weight or body composition. *Distinguish guilt from regret*: guilt refers to a feeling that one has done wrong.]

0 - No guilt after eating
1 -
2 - Has felt guilty after eating on less than half the *occasions*
3 -
4 - Has felt guilty after eating on more than half the *occasions*
5 -
6 - Has felt guilty after eating on every *occasion* [ ]

SELF-INDUCED VOMITING (Diagnostic item)

***Over the past four weeks have you made yourself sick as a means of controlling your shape or weight?**

[Rate the number of discrete episodes of self-induced vomiting. If the participant denies that the vomiting is under his or her control, determine whether it has the characteristics that would be expected were it not self-induced (e.g., unpredictability, occurrence in public). If the available evidence suggests that the vomiting is under the participant's control (i.e., it is self-induced), then rate it as such. Accept the participant's definition of an episode. Rate 777 if the number of episodes is so great that it cannot be calculated. Rate 000 if no vomiting.]

[ ][ ][ ]

Outside the times when ..... (refer to objective and subjective bulimic episodes)**, over the past four weeks how many times have you made yourself sick as a means of controlling your shape or weight? ?**

[Rate the number of episodes of "non-compensatory" self-induced vomiting. Accept the participant's definition of an episode. Rate 000 if no vomiting.]

[ ][ ][ ]

[Ask about the preceding two months. Estimate the number of discrete episodes of self-induced vomiting over each of the two preceding months.]

month 2 [ ][ ][ ]

month 3 [ ][ ][ ]

[Ask about the three months prior to that (to make diagnoses of binge eating disorder). Estimate the number of discrete episodes of self-induced vomiting over these three months.]

months 4 to 6 [ ][ ][ ]

LAXATIVE MISUSE (Diagnostic item)

***Over the past four weeks have you taken laxatives as a means of controlling your shape or weight?**

[Rate the number of episodes of laxative-taking as a means of controlling shape, weight or body composition. This should have been the *main* reason for the laxative-taking, although it may not have been the sole reason. Only rate the taking of substances with a true laxative effect. Rate 00 if there was no laxative use or there is doubt whether the laxative-taking was primarily to influence shape, weight or body composition.]

[ ][ ][ ]

[Rate the average number of laxatives taken on each occasion. Rate 999 if not applicable. Rate 777 if not quantifiable, e.g., use of bran.]

[ ][ ][ ]

[Note the type of laxative taken.]

Outside the times when ..... (refer to objective and subjective bulimic episodes)**, over the past four weeks how many times have you taken laxatives as a means of controlling your shape or weight? ?**

[Rate the number of episodes of "non-compensatory" laxative misuse. Accept the participant's definition of an episode. Rate 000 if no laxative misuse.]

[ ][ ][ ]

[Ask about the preceding two months. Estimate the number of episodes of laxative misuse over each of the two preceding months.]

month 2 [ ][ ][ ]

month 3 [ ][ ][ ]

[Ask about the three months prior to that. Estimate the number of episodes of laxative misuse over these three months.]

months 4 to 6 [ ][ ][ ]

DIURETIC MISUSE (Diagnostic item)

***Over the past four weeks have you taken diuretics as a means of controlling your shape or weight?**

[Rate the number of episodes of diuretic-taking as a means of controlling shape, weight or body composition. This should have been the *main* reason for the diuretic-taking, although it may not have been the sole reason. Only rate the taking of substances with a true diuretic effect. Rate 00 if there was no diuretic use or there is doubt whether the diuretic-taking was primarily to influence shape, weight or body composition.]

[ ][ ][ ]

[Rate the average number of diuretic taken on each occasion. Rate 999 if not applicable.]

[ ][ ][ ]

[Note the type of diuretic taken.]

Outside the times when ..... (refer to objective and subjective bulimic episodes)**, over the past four weeks how many times have you taken diuretics as a means of controlling your shape or weight? ?**

[Rate the number of episodes of "non-compensatory" diuretic misuse. Accept the participant's definition of an episode. Rate 000 if no diuretic misuse.]

[ ][ ][ ]

[Ask about the preceding two months. Estimate the number of episodes of diuretic misuse over each of the two preceding months..]

month 2 [ ][ ][ ]

month 3 [ ][ ][ ]

[Ask about the three months prior to that. Estimate the number of episodes of diuretic misuse over these three months.]

months 4 to 6 [ ][ ][ ]

DRIVEN EXERCISING (Diagnostic item)

***Over the past four weeks have you exercised as a means of controlling your weight, altering your shape or amount of fat, or burning off calories?**

***Have you felt driven or compelled to exercise?**

Typically, what form of exercise have you taken? How hard have you exercised? Have you pushed yourself?

Have you exercised even when it might interfer with other commitments or do you harm?

Have there been times when you have been unable to exercise for any reason? How has this made you feel?

[Rate the number of days on which the participant has engaged in "driven" exercising. Such exercising should have been intense in character and have had a "compulsive" quality to it. The participant may describe having felt compelled to exercise. Other indices of this compulsive quality are exercising to the extent that it significantly interferes with day-to-day functioning (e.g. such that it prevents attendance at social commitments or it intrudes on work or exercising when it might do one harm (e.g., when possibly injured). Another suggestive feature is having a strong negative reaction to being unable to exercise. Only rate driven exercising that was *predominantly* intended to use calories or change shape, weight, or body composition. Exercising that was exclusively intended to enhance health or fitness should not be rated. Rate 00 if no such driven exercising.]

[ ][ ]

[Rate the *average* amount of time (in minutes) per day spent exercising in this way. Only consider days on which the participant has exercised. Rate 999 if no such exercising.]

[ ][ ][ ]

[Ask about the preceding two months. Rate the number of days on which the participant has exercised in this manner over each of the two preceding months. If not asked, rate 99.]

month 2 [ ][ ]

month 3 [ ][ ]

OTHER EXTREME WEIGHT-CONTROL BEHAVIOUR

***Over the past four weeks have you done anything else to control your shape or weight?**

[Rate other noteworthy (i.e., potentially effective) dysfunctional forms of weight-control behaviour (e.g., spitting, insulin under-use, thyroid medication misuse). Rate number of days and nature of the behaviour. Rate 99 if no such behaviour.]

month 1 [ ] [ ]

---

month 2 [ ] [ ]

month 3 [ ] [ ]

PERIODS OF ABSENCE OF EXTREME WEIGHT-CONTROL BEHAVIOUR

[Only ask this question if at least one of the five main methods of weight-control behaviour has been rated positively at the specified severity level over the past three months (see the section on "Eating disorder diagnoses"). The five forms of behaviour are as follows:

- fasting (rating of 1 or 2 on Dietary restriction outside bulimic episodes)
- self-induced vomiting (on average at least once a week)
- laxative misuse (on average at least once a week)
- diuretic misuse (on average at least once a week)
- driven exercise - ignore in this context]

Over the past three months has there been a period of two or more weeks when you have not .....

[Ask as for individual items. Ascertain the number of consecutive weeks over the past three months "free" (i.e., not above threshold levels) from all five forms of extreme weight-control behaviour. Do not rate abstinence due to force of circumstance. Rate 99 if not applicable.]

[ ][ ]

I am now going to ask you some questions about your shape and weight .....

DISSATISFACTION WITH WEIGHT (Weight Concern subscale)

***Over the past four weeks have you been dissatisfied with your weight (..... the number on the scale)? What has this been like?**

Why have you been dissatisfied with your weight? Have you been so dissatisfied that it has made you unhappy? Could you have felt worse? How long has this feeling lasted?

[Only rate dissatisfaction due to weight being regarded as too high. Assess the participant's attitude to his or her weight and rate accordingly. In common with all severity items, the rating should generally represent the *mode for the entire month*. Only rate 4, 5 or 6, if there has been distress. Do not prompt with the terms "slight", "moderate" or "marked". This rating can be made with participants who do not know their exact weight. Only rate 9 with participants who are totally unaware of their weight.]

0 - No dissatisfaction
1 -
2 - Slight dissatisfaction (no associated distress)
3 -
4 - Moderate dissatisfaction (some associated distress)
5 -
6 - Marked dissatisfaction (extreme concern and distress; weight totally unacceptable) [ ]

DESIRE TO LOSE WEIGHT (Weight Concern subscale)

***Over the past four weeks have you wanted to weigh less (again I am referring to the number on the scale)?**

Have you had a <u>strong desire</u> to lose weight?

[Rate the number of days on which there has been a *strong desire* to lose weight. This rating can be made with participants who do not know their exact weight. Only rate 9 with participants who are totally unaware of their weight.]

0 - No strong desire to lose weight
1 - Strong desire on 1 to 5 days
2 - Strong desire on less than half the days (6 to 12 days)
3 - Strong desire on half the days (13 to 15 days)
4 - Strong desire on more than half the days (16 to 22 days)
5 - Strong desire almost every day (23 to 27 days)
6 - Strong desire every day [ ]

DESIRED WEIGHT

***On average, over the past month what weight have you wanted to be?**

[Rate weight in kilograms. Rate 888 if the participant is not interested in his or her weight. Rate 777 if no specific weight would be low enough. Rate 666 if the participant is primarily interested in his or her shape but has some concern about weight (but not a specific weight). Rate 555 if cannot be rated.]

[ ][ ][ ]

WEIGHING
***Over the past four weeks how often have you weighed yourself?**

[Calculate the approximate frequency that the participant has weighed himself or herself. If the participant has not weighed himself or herself determine whether this is the result of avoidance. Rate 777 if it is due to avoidance.]

[ ][ ][ ]

REACTION TO PRESCRIBED WEIGHING (Weight Concern subscale)

***Over the past four weeks how would you have felt if you had been asked to weigh yourself once each week for the subsequent four weeks ..... just once a week; no more often and no less often?**

[Rate the strength of negative reaction to the prospect of having to weigh once weekly (no more often, no less often) over the subsequent four weeks. This assumes that the participant would thereby be made aware of his or her weight. Positive reactions should be rated 9. In common with all severity items, the rating should generally represent the *mode for the entire month*. Ask the participant to describe in detail how he or she would have reacted and rate accordingly. Check whether other aspects of the participant's life would have been influenced. Do not prompt with the terms "slight", "moderate" or "marked". If the participant would not have complied with such weighing because it would have been extremely disturbing, rate 6.]

0 - No reaction
1 -
2 - Slight reaction
3 -
4 - Moderate reaction (definite reaction, but manageable)
5 -
6 - Marked reaction (pronounced reaction which would affect other aspects of the participant's life)

[ ]

SENSITIVITY TO WEIGHT GAIN

***Over the past four weeks what amount of weight gain, over a period of one week, would have <u>definitely</u> upset you?**

[Ascertain what weight gain (from the participant's average weight over the past four weeks) would have led to a *marked negative reaction*. Check several numbers. Be particularly careful to code the number correctly. This should represent the average degree of sensitivity for the entire month.]

0 - 7 lb or 3.5 kg (or more) would have generated a marked negative reaction, or no amount of weight gain would generate this type of reaction
1 - 6 lb or 3 kg would have generated a marked negative reaction
2 - 5 lb or 2.5 kg would have generated a marked negative reaction
3 - 4 lb or 2 kg would have generated a marked negative reaction
4 - 3 lb or 1.5 kg would have generated a marked negative reaction
5 - 2 lb or 1 kg would have generated a marked negative reaction
6 - 1 lb or 0.5 kg (i.e., any weight gain) would have generated a marked negative reaction

[ ]

DISSATISFACTION WITH SHAPE **(Shape Concern subscale)**

***Over the past four weeks have you been dissatisfied with your overall shape (your figure)? What has this been like?**

Why have you been dissatisfied with your shape? Have you been so dissatisfied that it has made you unhappy? Could you have felt worse? How long has this feeling lasted?

[Only rate dissatisfaction with overall shape or figure because it is viewed as too large. This dissatisfaction may include concerns about relative proportions of the body but not dissatisfaction restricted to specific body parts. Do not rate concerns about body tone. Assess the participant's attitude to his or her shape and rate accordingly. In common with all severity items, the rating should generally represent the *mode for the entire month*. Only rate 4, 5, or 6, if there has been associated distress. Do not prompt with the terms "slight", "moderate" or "marked". Reports of disgust or revulsion should be rated 6.]

0 - No dissatisfaction with shape
1 -
2 - Slight dissatisfaction with shape (no associated distress)
3 -
4 - Moderate dissatisfaction with shape (some associated distress)
5 -
6 - Marked dissatisfaction with shape (extreme concern and distress; shape totally unacceptable)

[ ]

PREOCCUPATION WITH SHAPE OR WEIGHT

(Shape and Weight Concern subscales)

***Over the past four weeks have you spent much time thinking about your shape or weight?.....**

***..... Has thinking about your shape or weight <u>interfered</u> with your ability to concentrate on things that you are actively engaged in, for example, working, following a conversation or reading? What has it affected?**

[This definition of preoccupation requires concentration impairment. Concentration is regarded as impaired if there have been *intrusive thoughts about shape or weight which have interfered with activities one is actively engaged in* rather than one's mind simply drifting off the matter at hand. Rate the number of days on which this has happened, whether or not bulimic episodes occurred.]

0 - No concentration impairment
1 - Concentration impairment on 1 to 5 days
2 - Concentration impairment on less than half the days (6 to 12 days)
3 - Concentration impairment on half the days (13 to 15 days)
4 - Concentration impairment on more than half the days (16 to 22 days)
5 - Concentration impairment almost every day (23 to 27 days)
6 - Concentration impairment every day [ ]

IMPORTANCE OF WEIGHT, SHAPE AND STRICT CONTROL OVER EATING
(Diagnostic items, Weight and Shape Concern subscales)

Weight

***I am now going to ask you a rather complex question - you may not have thought about this before. Over the past four weeks has your weight (the number on the scale) been important in influencing how you feel about** (judge, think, evaluate) **yourself as a person?**

.....*If you imagine the things which influence how you feel about (judge, think, evaluate) yourself - such as (your performance at work, being a parent, your marriage, how you get on with other people) **- and put these things in order of importance, where does your weight fit in?**

(If, over the past four weeks, your weight had changed in any way, would this have affected how you felt about yourself?)

(Over the past four weeks has it been important to you that your weight does not change? Have you been making sure that it does not change?)

Shape

***What about your shape? How has it compared in importance with your weight in influencing how you feel about yourself?**

[NB: Make all the unadjusted "shape" and "weight" ratings at this point.]

Strict Control over Eating

***What about maintaining strict control over your eating? How has it compared in importance with your weight and shape in influencing how you feel about yourself?**

[First gauge the degree of importance the participant has placed on body weight and its position in his or her scheme for self-evaluation. The rating can be made with participants who do not know their exact weight - the importance of their presumed weight can be rated. To make the rating, comparisons need to be made with other aspects of the participant's life which are of importance in his or her scheme for self-evaluation (e.g., quality of relationships, being a parent, performance at work or in leisure activities) including body shape and maintaining strict control over eating. In common with all severity items, the rating should generally represent the *mode for the entire month*.

The three "Importance" items can be difficult to rate. It is best to start by discussing weight and then address shape. At this point ratings of the importance of weight and shape should be made. Then, maintaining strict control over eating should be added to the equation and the importance of all three domains rated (i.e., importance of weight and shape are rated twice).

When starting with weight, it is recommended that the two mandatory probe questions be asked in tandem. Then the interviewer should help the participant formulate his or her answer. After that it is good practice to repeat the two probe questions to ensure that the participant has fully

grasped the concept that is being assessed. The questions in brackets should only be asked if the participant is denying that weight is important yet his or her behaviour suggests otherwise. Do not prompt with the terms "some", "moderate" or "supreme".]

0 - No importance
1 -
2 - Some importance (definitely an aspect of self-evaluation)
3 -
4 - Moderate importance (definitely one of the main aspects of self-evaluation)
5 -
6 - Supreme importance (nothing is more important in the participant's scheme for self-evaluation)

Weight (unadjusted rating) [ ]

Shape (unadjusted rating) [ ]

[Ask about each of the preceding two months. Rate 9 if not asked.]

Weight (unadjusted) month 2 [ ]
Weight (unadjusted) month 3 [ ]
Shape (unadjusted) month 2 [ ]
Shape (unadjusted) month 3 [ ]

Maintaining strict control over eating [ ]

Weight (adjusted for strict control over eating) [ ]

Shape (adjusted for strict control over eating) [ ]

FEAR OF WEIGHT GAIN (Diagnostic item, Shape Concern subscale)

***Over the past four weeks have you been <u>afraid</u> that you might gain weight?**

[With participants who have recently gained weight the question may rephrased as "**..... have you been afraid that you might gain *more* weight**".]

How afraid have you been?

[Rate the number of days on which a <u>definite fear</u> (common usage) has been present. Exclude reactions to actual weight gain.]

0 - No definite fear of weight gain
1 - Definite fear of weight gain on 1 to 5 days
2 - Definite fear of weight gain on less than half the days (6 to 12 days)
3 - Definite fear of weight gain on half the days (13 to 15 days)
4 - Definite fear of weight gain on more than half the days (16 to 22 days)
5 - Definite fear of weight gain almost every day (23 to 27 days)
6 - Definite fear of weight gain every day [ ]

[With participants whose weight might make them eligible for the diagnosis of anorexia nervosa, ask about each of the preceding two months. Rate 9 if not asked.]

month 2 [ ]

month 3 [ ]

DISCOMFORT SEEING BODY (Shape Concern subscale)

***Over the past four weeks have you felt uncomfortable seeing your body, for example, in the mirror, in shop window reflections, while undressing, or while taking a bath or shower?**

What have you felt like at these times? Could you have felt worse? Have you avoided seeing your body?

[Only rate discomfort about overall shape or figure because it is viewed as too large. The discomfort should not stem from sensitivity about specific aspects of appearance (e.g., acne) or from modesty. One index of the severity of such discomfort is whether it has led to avoidance (ask for examples, e.g., when washing). In common with all severity items, the rating should generally represent the *mode for the entire month*.]

0 - No discomfort about seeing body
1 -
2 - Some discomfort about seeing body
3 -
4 - Definite discomfort about seeing body
5 -
6 - Extreme discomfort about seeing body (e.g., viewed as loathsome) [ ]

DISCOMFORT ABOUT EXPOSURE (Shape Concern subscale)

***Over the past four weeks have you felt uncomfortable about <u>others seeing your body</u>, for example, in communal changing rooms, when swimming, or when wearing clothes that show your shape? What about your partner or friends seeing your body?**

What have you felt like at these times? Could you have felt worse?

Have you avoided others seeing your body? Have you chosen to wear clothes that disguise your shape?

[Only rate discomfort arising from concerns about overall shape or figure (because it is viewed as too large). Do not consider discomfort restricted to family members who are aware that the participant has an eating problem. The discomfort should not stem from sensitivity about specific aspects of appearance (e.g., acne) or from modesty. One index of the severity of such discomfort is whether it has led to avoidance (ask for examples, e.g., when dressing). If the possibility of exposure has not arisen, rate 9. In common with all severity items, the rating should generally represent the *mode for the entire month*.]

0 - No discomfort about seeing body
1 -
2 - Some discomfort about seeing body
3 -
4 - Definite discomfort about seeing body
5 -
6 - Extreme discomfort about seeing body [ ]

FEELING FAT **(Diagnostic item, Shape Concern subscale)**

***Over the past four weeks have you "felt fat"?** [With participants who have already acknowledged such feelings, this question may need to be prefaced by an apology.]

[Rate the number of days on which the participant has "felt fat" in general (not with respect to a particular body part) accepting his or her use of this expression. Distinguish "feeling fat" from feeling bloated premenstrually, unless this is experienced as feeling fat.]

0 - Has not felt fat
1 - Has felt fat on 1 to 5 days
2 - Has felt fat on less than half the days (6 to 12 days)
3 - Has felt fat on half the days (13 to 15 days)
4 - Has felt fat on more than half the days (16 to 22 days)
5 - Has felt fat almost every day (23 to 27 days)
6 - Has felt fat every day [ ]

[With participants whose weight might make them eligible for the diagnosis of anorexia nervosa, ask about each of the preceding two months. Rate 9 if not asked.]

month 2 [ ]

month 3 [ ]

REGIONAL FATNESS

***Over the past month have you felt that any <u>particular part</u> of your body is too fat?**

[Rate the number of days on which the participant has thought that one or more specific parts of his or her body are definitely too "fat". This does not preclude also thinking that his or her entire body is too "fat".]

0 - No regional fatness
1 - Regional fatness on 1 to 5 days
2 - Regional fatness on less than half the days (6 to 12 days)
3 - Regional fatness on half the days (13 to 15 days)
4 - Regional fatness on more than half the days (16 to 22 days)
5 - Regional fatness almost every day (23 to 27 days)
6 - Regional fatness every day [ ]

VIGILANCE ABOUT SHAPE

***Over the past four weeks have you been actively monitoring your shape ..... for example, by scrutinising yourself in the mirror, by measuring or pinching yourself, or by repeatedly checking that certain clothes fit?**

[Rate the number of days on which the participant has *actively monitored* his or her shape with the intention of detecting any changes. The participant should believe that the method used is capable of detecting change.]

0 - No vigilance
1 - Vigilance on 1 to 5 days
2 - Vigilance on less than half the days (6 to 12 days)
3 - Vigilance on half the days (13 to 15 days)
4 - Vigilance on more than half the days (16 to 22 days)
5 - Vigilance almost every day (23 to 27 days)
6 - Vigilance every day [ ]

FLAT STOMACH (Shape Concern subscale)

***Over the past four weeks have you had a definite desire to have a completely flat stomach?**

[Rate the number of days on which the participant has had a definite desire to have a flat or concave stomach. Demonstrate by holding a pen vertically. Participants who already have a flat stomach can be rated, whereas the desire to have a "flatter" (i.e., less protruding) stomach should not be rated.]

0 - No definite desire to have a flat stomach
1 - Definite desire to have a flat stomach on 1 to 5 days
2 - Definite desire to have a flat stomach on less than half the days (6 to 12 days)
3 - Definite desire to have a flat stomach on half the days (13 to 15 days)
4 - Definite desire to have a flat stomach on more than half the days (16 to 22 days)
5 - Definite desire to have a flat stomach almost every day (23 to 27 days)
6 - Definite desire to have a flat stomach every day [ ]

BODY COMPOSITION

***Over the past four weeks have you thought about the actual composition of your body ..... the percentage of fat as compared with muscle ..... the way you are under the skin?**

How concerned have you been about the composition of your body?

[Rate the strength of the participant's concern about the proportion of fat in his or her body. *Do not rate concern about "being fat" or concerns about particular parts of the body.* Do not prompt with the terms 'slight', 'moderate' or 'marked'. In common with all severity items, the rating should generally represent the *mode for the entire month*.]

0 - No concern about body composition
1 -
2 - Slight concern about body composition (aware of the notion, but it is not of personal importance to the participant)
3 -
4 - Moderate concern about body composition (clearly interested in composition of body and regularly thinks about it)
5 -
6 - Marked concern about body composition (extreme interest in actual make-up of body and frequently thinks about it) [ ]

WEIGHT AND HEIGHT **(Diagnostic item)**

[The participant's weight and height should be measured.] Weight in kg [ ][ ][ ]

Height in cm [ ][ ][ ]

MAINTAINED LOW WEIGHT (Diagnostic item)

[Rate for participants whose weight might make them eligible for the diagnosis of anorexia nervosa. If in doubt, make this rating.]

Over the past three months have you been trying to lose weight?

If no: **Have you been trying to make sure that you do not gain weight?**

[Rate presence of attempts either to lose weight or to avoid weight gain. Rate 9 if not asked.]

0 - No attempts either to lose weight or to avoid weight gain over the past three months
1 - Attempts either to lose weight or to avoid weight gain over the past three months for reasons concerning shape or weight
2 - Attempts either to lose weight or to avoid weight gain over the past three months for other reasons

[ ]

MENSTRUATION (Diagnostic item)

***Have you missed any menstrual periods over the past few months?**

How many periods have you had?

***Are you taking an oral contraceptive (the "pill")?**

[With post-menarchal females, rate number of menstrual periods over the past three and six months. Rate 33 if the participant has never menstruated; rate 44 if she has been taking an oral contraceptive during the months in question; rate 55 if she has been pregnant or breast feeding; rate 66 if she is not menstruating because of a gynaecological procedure (e.g., a hysterectomy); rate 77 if she is clearly post-menopausal; and rate 88 if participant is male.]

months 0-3 [ ][ ]

months 0-6 [ ][ ]

END OF EDE SCHEDULE

DIFFERENCES BETWEEN EDE 16.0D AND EDE 12.0D

New Items in EDE-16.0D

Picking (nibbling)
Binge Eating Disorder module:
- Average frequency (days per week) over past six months
- Associated features
  - eating more rapidly
  - eating until full
  - eating when not hungry
  - eating alone
  - feeling disgust
- Distress about binge eating

Other extreme methods for controlling shape or weight
Weighing
Maintaining strict control over eating
Regional fatness
Vigilance about shape
Body composition

Modification to EDE-12.0D Items

Nocturnal eating
- level of alertness

Restraint over eating
- to give sense of control
- shape and weight/sense of control

Avoidance of eating
- to give sense of control
- shape and weight/sense of control

Empty stomach
- to give sense of control
- shape and weight/sense of control

Food avoidance
- to give sense of control
- shape and weight/sense of control

Dietary rules
- to give sense of control
- shape and weight/sense of control

Importance of Weight
- adjusted for control

Importance of Shape
- adjusted for control

Subjective bulimic episodes
- number of days in month 2
- number of days in month 3
- number of episodes in month 2

- number of episodes in month 3

Self-induced vomiting
- episodes independent of objective and subjective bulimic episodes
- number of episodes in months 4 to 6

Laxative misuse
- episodes independent of objective and subjective bulimic episodes
- number of episodes in months 4 to 6

Diuretic misuse
- episodes independent of objective and subjective bulimic episodes
- number of episodes in months 4 to 6

Items Dropped from EDE-12.0D

Self-induced vomiting, Laxative misuse and Diuretic misuse
- 4 weeks - number of days

Items Re-named in EDE-16.0D

'Intense exercising to control shape and weight' changed to 'Driven exercising'
'Avoidance of exposure' changed to 'Discomfort about exposure'
'Feelings of fatness' changed to 'Feeling fat'

Change in Scoring

For severity items, ratings now based on mode over the previous 28 days rather than mean

Appendix I.1 - The EDE rating scheme

Severity ratings	*Frequency ratings*
0 - Absence of the feature	0 - Absence of the feature
1 - Feature almost, but not quite absent	1 - Feature present on 1 to 5 days
2 -	2 - Feature present on 6 to 12 days
3 - Severity midway between 0 and 6	3 - Feature present on 13 to 15 days
4 -	4 - Feature present on 16 to 22 days
5 - Severity almost meriting a rating of 6	5 - Feature present almost every day (23 to 27 days)
6 - Feature present to an extreme degree	6 - Feature present every day

---

Rate 8 if, despite adequate questioning, it is impossible to decide upon a rating. Experienced interviewers will find that they rarely need to use this rating. If it is difficult to choose between two ratings, the lower (i.e., less symptomatic) rating should be made.

Rate 9 for missing values (or "not applicable")

Appendix 1.2. EDE calendar.

CALENDAR

Month 2 from ..... to .....

events .....

Month 3 from ..... to .....

events .....

Months 4 – 6* from ..... to .....

events .....

***** This period is only of relevance if the DSM-IV research diagnostic criteria for binge eating disorder are being elicited. It is best to postpone focussing on months 4 to 6 until the beginning of the binge eating disorder module (see page ***)

EBQ

ID#_____

Listed below are a number of beliefs people have expressed in relation to food and eating. Colour in one of the circles on the scale below to indicate how much you agree with each statement. Please respond to all the items. There are no right or wrong answers.

The items below refer to eating, or urges to eat, that occur when you are **NOT HUNGRY**. The items do not relate to eating, or urges to eat, that occur in response to normal hunger signals or appetite.

1	2	3	4	5
Strongly disagree	**Disagree**	**Unsure**	**Agree**	**Strongly agree**

		1	2	3	4	5
1.	I will never be able to control my urges to eat	○	○	○	○	○
2.	Eating helps me to cope.....	○	○	○	○	○
3.	My eating will always need to be controlled.....	○	○	○	○	○
4.	Once I start eating I can't stop	○	○	○	○	○
5.	I should be able to control my eating	○	○	○	○	○
6.	I have no will power in relation to food.....	○	○	○	○	○
7.	Eating helps to reduce unpleasant physical feelings.....	○	○	○	○	○
8.	Food controls my life	○	○	○	○	○
9.	Eating helps me to feel calm	○	○	○	○	○
10.	Eating helps me to feel better	○	○	○	○	○
11.	Trying to stop **non-hungry eating** is pointless	○	○	○	○	○
12.	I have to monitor my eating and food intake constantly .	○	○	○	○	○
13.	Eating is a distraction from other problems in my life.....	○	○	○	○	○
14.	Eating means I don't have to think about negative things	○	○	○	○	○
15.	I have to give in to my urges to eat	○	○	○	○	○
16.	Eating helps to control my emotions	○	○	○	○	○
17.	I have to give in to my 'food related' thoughts	○	○	○	○	○
18.	I am an 'emotional' eater	○	○	○	○	○
19.	When I have an urge to eat, nothing but food will satisfy me.....	○	○	○	○	○
20.	I can't control my eating because I am weak.....	○	○	○	○	○
21.	Eating keeps my feelings at a tolerable level.....	○	○	○	○	○
22.	If I don't control myself I would never stop eating.....	○	○	○	○	○
23.	Eating helps me to cope with negative thoughts	○	○	○	○	○
24.	Eating helps me to cope with unpleasant physical sensations.....	○	○	○	○	○

EBQ ID#_____

1	2	3	4	5
Strongly disagree	**Disagree**	**Unsure**	**Agree**	**Strongly agree**

		1	2	3	4	5
25.	Eating has nothing to do with my feelings	○	○	○	○	○
26.	There is nothing I can do to stop eating.....	○	○	○	○	○
27.	I eat until I feel 'nothing'.....	○	○	○	○	○
28.	Eating helps me cope with negative feelings.....	○	○	○	○	○
29.	Eating helps to stop feelings that I don't like.....	○	○	○	○	○
30.	I can't cope with feeling hungry.....	○	○	○	○	○
31.	Eating is very soothing	○	○	○	○	○
32.	I can't have sweet or fatty foods near me, without eating them.....	○	○	○	○	○

Binge Eating Scale (B.E.S.)

Name: *Date: / /201_*

Below are groups of numbered statements. Please read all of the statements in each group and tick on this sheet the **one statement** that best describes the way you feel about your eating behaviour.

1.		4
i.	I don't feel self-conscious about my weight or body size when I'm with others.	0
ii.	I feel concerned about how I look to others, but it normally does not make me feel disappointed with myself.	0
iii.	I do get self-conscious about my appearance and weight which makes me feel disappointed in myself.	1
iv.	I feel very self-conscious about my weight and frequently, I feel intense shame and disgust for myself. I try to avoid social contacts because of my self-consciousness.	3

2.		4
i.	I don't have any difficulty eating slowly in the proper manner.	0
ii.	Although I seem to "gobble down" foods, I don't end up feeling stuffed because of eating too much.	1
iii.	At times, I tend to eat quickly and then, I feel uncomfortably full afterwards.	2
iv.	I have the habit of bolting down my food, without really chewing it. When this happens I usually feel uncomfortably stuffed because I've eating too much.	3

3.		4
i.	I feel capable to control my eating urges when I want to.	0
ii.	I feel like I have failed to control my eating more than the average person.	1
iii.	I feel utterly helpless when it comes to feeling in control of my eating urges.	3

iv.	Because I feel so helpless about controlling my eating I have become very desperate about trying to get in control.	3

4.		4
i.	I don't have the habit of eating when I'm bored.	0
ii.	I sometimes eat when I'm bored, but often I'm able to "get busy" and get my mind off food.	0
iii.	I have a regular habit of eating when I'm bored, but occasionally, I can use some other activity to get my mind off eating.	0
iv.	I have a strong habit of eating when I'm bored. Nothing seems to help me break the habit.	2

BES continued.

5.		4
i.	I'm usually physically hungry when I eat something	0
ii.	Occasionally, I eat something on impulse even though I really am not hungry.	1
iii.	I have the regular habit of eating foods, that I might not really enjoy, to satisfy a hungry feeling even though physically, I don't need the food.	2
iv.	Even though I'm not physically hungry, I get a hungry feeling in my mouth that only seems to be satisfied when I eat a food, like a sandwich, that fills my mouth. Sometimes, when I eat the food to satisfy my mouth hunger, I then spit the food out so I won't gain weight	3

6.		4
i.	I don't feel any guilt or self-hate after I overeat.	0
ii.	After I overeat, occasionally I feel guilt or self-hate.	1
iii.	Almost all the time I experience strong guilt or self-hate after I overeat.	3

7.		4
i.	I don't lose control of my eating when dieting even after periods when I overeat.	0
ii.	Sometimes when I eat a "forbidden food" on a diet, I feel like I "blew it" and eat even more.	2
iii.	Frequently, I have the habit of saying to myself, "I've blown it now, why not go all the way" when I overeat on a diet. When that happens I eat even more.	3
iv.	I have a regular habit of starting strict diets for myself, but I break the diets by going on an eating binge. My life seems to be either a "feast" or "famine".	3

8.		4
i.	I rarely eat so much food that I feel uncomfortably stuffed afterwards.	0

ii.	Usually about once a month, I eat such a quantity of food, I end up feeling very stuffed.	1
iii.	I have regular periods during the month when I eat large amounts of food, either at mealtime or at snacks.	2
iv.	I eat so much food that I regularly feel quite uncomfortable after eating and sometimes a bit nauseous.	3

BES continued.

9.		4
i.	My level of calorie intake does not go up very high or go down very low on a regular basis.	0
ii.	Sometimes after I overeat, I will try to reduce my caloric intake to almost nothing to compensate for the excess calories I've eaten.	1
iii.	I have a regular habit of overeating during the night. It seems that my routine is not to be hungry in the morning but overeat in the evening.	2
iv.	In my adult years, I have had week-long periods where I practically starve myself. This follow periods when I overeat. It seems I live a life of either "feast" or "famine".	3

10.		4
i.	I usually am able to stop eating when I want to. I know when "enough is enough".	0
ii.	Every so often, I experience a compulsion to eat which I can't seem to control.	1
iii.	Frequently, I experience strong urges to eat which I seem unable to control.	2
iv.	I feel incapable of controlling my urges to eat. I have a fear of not being able to stop eating voluntarily.	3

11.		4
i.	I don't have any problem stopping eating when I am full.	0
ii.	I usually can stop eating when I feel full but occasionally overeat leaving me feeling uncomfortably stuffed.	1
iii.	I have a problem stopping eating once I start and usually I feel uncomfortably stuffed after I eat a meal.	2
iv.	Because I have a problem not being able to stop eating when I want, I sometimes have to induce vomiting to relieve my stuffed feeling.	3

12.		4
i.	I seem to eat just as much when I'm with others (family, social	0

	gatherings) as when I'm by myself.	
ii.	Sometimes, when I'm with other persons, I don't eat as much as I want to eat because I'm self-conscious about my eating.	1
iii.	Frequently, I eat only a small amount of food when others are present, because I'm very embarrassed about my eating.	2
iv.	I feel so ashamed about overeating that I pick times to overeat when I know no one will see me. I feel like a "closet eater".	3

BES continued.

13.		4
i.	I eat three meals a day with only an occasional between meal snack.	0
ii.	I eat three meals a day, but I also normally snack between meals.	0
iii.	When I am snacking heavily, I get in the habit of skipping regular meals.	2
iv.	There are regular periods when I seem to be continually eating, with no planned meals.	3

14.		4
i.	I don't think much about trying to control unwanted eating urges.	0
ii.	At least some of the time, I feel my thoughts are pre-occupied with trying to control my eating urges.	1
iii.	I feel that frequently I spend much time thinking about how much I ate or about trying not to eat anymore.	2
iv.	It seems to me that most of my waking hours are pre-occupied by thoughts about eating or not eating. I feel like I'm constantly struggling not to eat.	3

15.		4
i.	I don't think about food a great deal.	0
ii.	I have strong cravings for food but they last only for brief periods of time.	1
iii.	I have days when I can't seem to think about anything but food.	2
iv.	Most of my days seem to be pre-occupied with thoughts about food. I feel like I live to eat.	3

16.		4
i.	I usually know whether or not I'm physically hungry. I take the right portion of food to satisfy me.	0
ii.	Occasionally, I feel uncertain about knowing whether or not I'm physically hungry. At these times it's hard to know how much food I should take to satisfy me.	1

iii.	Even though I might know how many calories I should eat, I don't have any idea what is a "normal" amount of food for me.	2

Depression, Anxiety and Stress Scale (DASS21)

For each statement below, please circle the number in the column that best represents how you have been feeling in the last week.

Statement	Did not apply to me at all	Applied to me to some degree or some of the time	Applied to me a considerable degree or a good part of the time	Applied to me very much or most of the time
1. I found it hard to wind down	0	1	2	3
2. I was aware of dryness of my mouth	0	1	2	3
3. I couldn't seem to experience any positive feeling at all	0	1	2	3
4. I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5. I found it difficult to work up the initiative to do things	0	1	2	3
6. I tended to over-react to situations	0	1	2	3
7. I experienced trembling (eg, in the hands)	0	1	2	3
8. I felt that I was using a lot of nervous energy	0	1	2	3
9. I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10. I felt that I had nothing to look forward to	0	1	2	3
11. I found myself getting agitated	0	1	2	3
12. I found it difficult to relax	0	1	2	3
13. I felt down-hearted and blue	0	1	2	3
14. I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15. I felt I was close to panic	0	1	2	3
16. I was unable to become enthusiastic about anything.	0	1	2	3
17. I felt I wasn't worth much as a person	0	1	2	3
18. I felt that I was rather touchy	0	1	2	3
19. I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
20. I felt scared without any good reason.	0	1	2	3
21. I felt that life was meaningless	0	1	2	3

Lovibond, S.H. & Lovibond, P.F. (1995). Manual for the Depression Anxiety Stress Scales. (2nd. Ed.) Sydney: Psychology Foundation

DASS21 SCORING

1) For questions numbered 3, 5, 10, 13, 16, 17, 21 add up the numbers circled then multiply that number by 2 and enter it here: _____
2) For questions numbered 2, 4, 7, 9, 15, 19, 20 add up the numbers circled then multiply that number by 2 and enter it here: _____
3) For questions numbered 1, 6, 8, 11, 12, 14, 18 add up the numbers circled then multiply that number by 2 and enter it here: _____

Refer to the chart below and for each numbered question above, refer to the same number in the table below to determine how mild or serious each condition may be.

Rating	Depression #1	Anxiety #2	Stress #3
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely Severe	28+	20+	37+

TRAUMA SYMPTOM CHECKLIST-40 (TSC-40)

How often have you experienced each of the following in the last month?

Symptom	***Never - - - - - - - - - - - Often***			
	0	**1**	**2**	**3**
1. Headaches				
2. Insomnia				
3. Weight loss (without dieting)				
4. Stomach problems				
5. Sexual problems				
6. Feeling isolated from others				
7. “Flashbacks” (sudden, vivid, distracting memories)				
8. Restless sleep				
9. Low sex drive				
10. Anxiety attacks				
11. Sexual overactivity				
12. Loneliness				
13. Nightmares				
14. “Spacing out” (going away in your mind)				
15. Sadness				
16. Dizziness				
17. Not feeling satisfied with your sex life				
18. Trouble controlling your temper				
19. Waking up early in the morning				
20. Uncontrollable crying				
21. Fear of men				
22. Not feeling rested in the morning				
23. Having sex that you didn’t enjoy				
24. Trouble getting along with others				
25. Memory problems				
26. Desire to physically hurt yourself				
27. Fear of women				
28. Waking up in the middle of the night				
29. Bad thoughts or feelings during sex				
30. Passing out				
31. Feeling that things are “unreal”				
32. Unnecessary or over-frequent washing				
33. Feelings of inferiority				
34. Feeling tense all the time				
35. Being confused about your sexual feelings				
36. Desire to physically hurt others				
37. Feelings of guilt				
38. Feeling that you are not always in your body				
39. Having trouble breathing				
40. Sexual feelings when you shouldn’t have them				

Subscale composition and scoring for the TSC-40: The score for each subscale is the sum of the relevant items.

Dissociation – 7, 14, 16, 25, 31, 38
Anxiety – 1, 4, 10, 16, 21, 27, 32, 34, 39
Depression – 2, 3, 9, 15, 19, 20, 26, 33, 37
SATI (Sexual Abuse Trauma Index) – 5, 7, 13, 21, 25, 29, 31
Sleep Disturbance – 2, 8, 13, 19, 22, 28
Sexual Problems – 5, 9, 11, 17, 23, 29, 35, 40

TSC Total Score (1-40)

Briere, J.N. & Runtz, M.G. (1989). The Trauma Symptom Checklist (TSC-33): Early data on a new scale. Journal of Interpersonal Violence, 4, 151-163.

Rosenberg Self-Esteem Scale (Rosenberg, 1965)

The scale is a ten item Likert scale with items answered on a four point scale - from strongly agree to strongly disagree. The original sample for which the scale was developed consisted of 5,024 High School Juniors and Seniors from 10 randomly selected schools in New York State.

Instructions: Below is a list of statements dealing with your general feelings about yourself. If you strongly agree, circle **SA**. If you agree with the statement, circle **A**. If you disagree, circle **D**. If you strongly disagree, circle **SD**.

1.	On the whole, I am satisfied with myself.	SA	A	D	SD
2.*	At times, I think I am no good at all.	SA	A	D	SD
3.	I feel that I have a number of good qualities.	SA	A	D	SD
4.	I am able to do things as well as most other people.	SA	A	D	SD
5.*	I feel I do not have much to be proud of.	SA	A	D	SD
6.*	I certainly feel useless at times.	SA	A	D	SD
7.	I feel that I'm a person of worth, at least on an equal plane with others.	SA	A	D	SD
8.*	I wish I could have more respect for myself.	SA	A	D	SD
9.*	All in all, I am inclined to feel that I am a failure.	SA	A	D	SD
10.	I take a positive attitude toward myself.	SA	A	D	SD

Scoring: SA=3, A=2, D=1, SD=0. Items with an asterisk are reverse scored, that is, SA=0, A=1, D=2, SD=3. Sum the scores for the 10 items. The higher the score, the higher the self esteem.

The scale may be used without explicit permission. The author's family, however, would like to be kept informed of its use:

The Morris Rosenberg Foundation
c/o Department of Sociology
University of Maryland
2112 Art/Soc Building
College Park, MD 20742-1315

References

References with further characteristics of the scale:

Crandal, R. (1973). The measurement of self-esteem and related constructs, Pp. 80-82 in J.P. Robinson & P.R. Shaver (Eds), **Measures of social psychological attitudes. Revised edition**. Ann Arbor: ISR.

Rosenberg, M. (1965). **Society and the adolescent self-image**. Princeton, NJ: Princeton University Press.

Wylie, R. C. (1974). **The self-concept. Revised edition**. Lincoln, Nebraska: University of Nebraska Press.

INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE (August 2002)

SHORT LAST 7 DAYS SELF-ADMINISTERED FORMAT

FOR USE WITH YOUNG AND MIDDLE-AGED ADULTS (15-69 years)

The International Physical Activity Questionnaires (IPAQ) comprises a set of 4 questionnaires. Long (5 activity domains asked independently) and short (4 generic items) versions for use by either telephone or self-administered methods are available. The purpose of the questionnaires is to provide common instruments that can be used to obtain internationally comparable data on health–related physical activity.

Background on IPAQ

The development of an international measure for physical activity commenced in Geneva in 1998 and was followed by extensive reliability and validity testing undertaken across 12 countries (14 sites) during 2000. The final results suggest that these measures have acceptable measurement properties for use in many settings and in different languages, and are suitable for national population-based prevalence studies of participation in physical activity.

Using IPAQ

Use of the IPAQ instruments for monitoring and research purposes is encouraged. It is recommended that no changes be made to the order or wording of the questions as this will affect the psychometric properties of the instruments.

Translation from English and Cultural Adaptation

Translation from English is supported to facilitate worldwide use of IPAQ. Information on the availability of IPAQ in different languages can be obtained at www.ipaq.ki.se. If a new translation is undertaken we highly recommend using the prescribed back translation methods available on the IPAQ website. If possible please consider making your translated version of IPAQ available to others by contributing it to the IPAQ website. Further details on translation and cultural adaptation can be downloaded from the website.

Further Developments of IPAQ

International collaboration on IPAQ is on-going and an ***International Physical Activity Prevalence Study*** is in progress. For further information see the IPAQ website.

More Information

More detailed information on the IPAQ process and the research methods used in the development of IPAQ instruments is available at www.ipaq.ki.se and Booth, M.L. (2000). *Assessment of Physical Activity: An International Perspective*. Research Quarterly for Exercise and Sport, 71 (2): s114-20. Other scientific publications and presentations on the use of IPAQ are summarized on the website.

INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the **last 7 days**. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the **vigorous** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think *only* about those physical activities that you did for at least 10 minutes at a time.

1. During the **last 7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling?

   _____ **days per week**

   ☐ No vigorous physical activities → ***Skip to question 3***

2. How much time did you usually spend doing **vigorous** physical activities on one of those days?

   _____ **hours per day**

   _____ **minutes per day**

   ☐ Don't know/Not sure

Think about all the **moderate** activities that you did in the **last 7 days**. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

   _____ **days per week**

   ☐ No moderate physical activities → ***Skip to question 5***

4. How much time did you usually spend doing **moderate** physical activities on one of those days?

_____ **hours per day**

_____ **minutes per day**

☐ Don't know/Not sure

Think about the time you spent **walking** in the **last 7 days**. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise, or leisure.

5. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time?

_____ **days per week**

☐ No walking → ***Skip to question 7***

6. How much time did you usually spend **walking** on one of those days?

_____ **hours per day**

_____ **minutes per day**

☐ Don't know/Not sure

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the **last 7 days**, how much time did you spend **sitting** on a **week day**?

_____ **hours per day**

_____ **minutes per day**

☐ Don't know/Not sure

This is the end of the questionnaire, thank you for participating.

Working Alliance Inventory

Short Form (C)

Instructions

On the following pages there are sentences that describe some of the different ways a person might think or feel about his or her therapist (counsellor). As you read the sentences mentally insert the name of your therapist (counsellor) in place of _____in the text.

Below each statement inside there is a seven point scale:

1	2	3	4	5	6	7
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always

If the statement describes the way you always feel (or think) circle the number 7; if it never applies to you circle the number 1. Use the numbers in between to describe the variations between these extremes.

This questionnaire is CONFIDENTIAL; neither your therapist nor the agency will see your answers.

Work fast, your first impressions are the ones we would like to see. (PLEASE DON'T FORGET TO RESPOND TO EVERY ITEM.)

Thank you for your cooperation.

1. _____ and I agree about the things I will need to do in therapy to help improve my situation.						
1	2	3	4	5	6	7
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always
2. What I am doing in therapy gives me new ways of looking at my problem.						
1	2	3	4	5	6	7
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always
3. I believe _____ likes me.						
1	2	3	4	5	6	7
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always
4. _____ does not understand what I am trying to accomplish in therapy.						
1	2	3	4	5	6	7
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always
5. I am confident in _____ 's ability to help me.						
1	2	3	4	5	6	7
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always
6. _____ and I are working towards mutually agreed upon goals.						
1	2	3	4	5	6	7
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always
7. I feel that _____ appreciates me.						
1	2	3	4	5	6	7
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always
8. We agree on what is important for me to work on.						
1	2	3	4	5	6	7
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always
9. _____ and I trust one another.						
1	2	3	4	5	6	7
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always
10. _____ and I have different ideas on what my problems are.						
1	2	3	4	5	6	7
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always
11. We have established a good understanding of the kind of changes that would be good for me.						
1	2	3	4	5	6	7
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always
12. I believe the way we are working with my problem is correct.						
1	2	3	4	5	6	7
Never	Rarely	Occasionally	Sometimes	Often	Very Often	Always

(Modified) CONFIDENCE IN TREATMENT QUESTIONNAIRE

Please indicate on the three scales below how much you believe that the therapy you are receiving will help the symptoms that you most want to see improve? Belief usually has two aspects to it: *(a.)* what one *thinks* will happen, and *(b.)* what one *feels* will happen. Sometimes these are similar; sometimes they are different. Please answer the questions below. For the first, answer in terms of what you really *think*. For the second and third, answer in terms of what you really *feel*.

(1) How logical does this type of treatment seem to you?

0% 10 20 30 40 50% 60 70 80 90 100%

2) How confident are you that this treatment will be successful *in reducing your binge eating and helping you with your weight*?

0% 10 20 30 40 50% 60 70 80 90 100%

(2) How confident would you be in recommending this treatment to a friend who was experiencing *struggling with binge eating and weight management?*

0% 10 20 30 40 50% 60 70 80 90 100%

Original **CONFIDENCE IN TREATMENT QUESTIONNAIRE**

Please indicate on the three scales below how much you believe that the therapy you are receiving will help the symptoms that you most want to see improve? Belief usually has two aspects to it: *(a.)* what one *thinks* will happen, and *(b.)* what one *feels* will happen. Sometimes these are similar; sometimes they are different. Please answer the questions below. For the first, answer in terms of what you really *think*. For the second and third, answer in terms of what you really *feel*.

1.) By the end of the therapy, how much improvement in your symptoms do you *think* will occur?

0% ***10*** ***20*** ***30*** ***40*** ***50%*** ***60*** ***70*** ***80*** ***90*** ***100%***

2.) At this point, how much do you really *feel* that therapy will help you to reduce your symptoms?

0% ***10*** ***20*** ***30*** ***40*** ***50%*** ***60*** ***70*** ***80*** ***90*** ***100%***

3.) By the end of the therapy, how much improvement in your symptoms do you really *feel* will occur?

0% ***10*** ***20*** ***30*** ***40*** ***50%*** ***60*** ***70*** ***80*** ***90*** ***100***

Phone Screening Assessment

	yes/no
1. Are you **over 18 years** (must be adult)	
2. Do you speak sufficient fluency in **English** to participate in therapy ? Or do you have any intellectual disability that prevents comprehension of instructions (must speak & understand English)	
3. What is your height and weight (BMI must be **overweight or obese- see BMI chart**)	
4. Are you currently on another weight control program (e.g. Jenny Craig, Weight Watchers, etc) or seeing a dietician, using another treatment (pills, devices, etc) for weight/eating problems? (must **not be engaged with other treatment)**	
5. Are you **pregnant** or planning pregnancy in the next 6 months (answer must be no)	
6. Do you have any **legal proceeding** related to your weight/eating (must be no)	
7. Are you **currently seeing a psychologist/**MHC professional or have you seen one in the past 12 months (must be no)	
8. Are you able to go to a G.P. to get a **Mental Health Care Plan** (must be yes)	
9. Do you have a **medical disorder or taking a medication** that is affecting appetite/weight (as assessed by G.P.) e.g.steroids, diabetes medication (sulfonylureas, thiazolidinediones)**,** allergy medication (diphenhydramine), blood pressure medication (beta blockers), anti-psychotics, mood stabilizers, anti-epileptics, certain contraceptives and adrenergic blockers incl. propranolol (must be no/not new Rx)	
10. Have you started a **new medication** (okay only if stable on dose for min 2 months)	
11. Are you taking **Benzodiazepines** e.g. Valium, temazepam, etc "sleeping pill or tranquilizer? (must be no due to interference with EMDR)	
12. Are you able to **pay** by credit card/cash $ 134.50 (minus $124.50 medi-Care rebate) i.e. pay a nominal fee of $ 10 per session for up to 10 sessions (must be yes)	
13. Do you drink **alcohol** (if more than 2 std drinks per day, do AUDIT. If AUDIT >7, refer to Alcohol treatment (if less than 2 std drinks per day, then eligible, but remind participant not to drink alcohol within 12 hours of treatment due to interference with treatment effects of EMDR).	
14. Do you take (illegal) **drugs** on a regular basis (if yes, refer to G.P. for referral for drug treatment); if yes (e.g., occasionally) remind participant not to take drugs within 72 hours of treatment due to interference with treatment effects of EMDR. Must not meet criteria for SUD or use drugs on a regular basis	
15. Do you have **epilepsy** (risk of harm with EMDR so must be no)	
16. Are you currently depressed? If yes: are you that depressed that you have thoughts of harming yourself? If yes, refer to G.P. for S.O.S. or other psychological treatment as well as Lifeline. If **suicidal ideation** in the past, must be at least 6 months prior (eligible if depressed, but must not have current s.i with plan and intent.)	
17. Other than effects of drugs or medications or a medical condition, have you ever experienced a period of feeling depressed preceded by several days or weeks when you felt unusually or excessively high or irritable, have decreased need for sleep, racing thoughts, and distractibility and an unusual increase in the number of activities you got involved in? Did these symptoms interfere with your ability to function at home and work? Did you experience the following for a week or more? a. irritability b. elevated or expansive mood	

c. inflated self-esteem or grandiosity d. decreased need for sleep e. more talkative than usual or pressure to keep talking f. flight of ideas or feelings that thoughts are racing g. distractibility h. increase in distractibility i. increase in activities or agitation/restlessness j. involvement in pleasurable activities with a high potential for painful consequences (buying sprees, foolish investments, sexual indiscretions) k. delusions or hallucinations. If yes, consider likelihood of bipolar disorder – refer/recommend for psychological assessment & treatment per G.P. referral., psychiatric referral treatment.	
18. Has there ever been a period of time when you had strange or unusual experiences such as: a. hearing or seeing things that other people didn't notice? b. hear voices or conversations when no one was around? c. visions that no one else saw? d. had the feeling that something odd was going on around you, that people were doings things to test you or antagonize or hurt you so that you felt you had to be on guard constantly? If yes, consider likelihood of nonorganic psychosis and refer/recommend for psychological assessment & treatment per G.P. referral., psychiatric referral treatment.	
19. Have you ever been hospitalized for a mental illness. If yes, which one?_____(not eligible if SUD in the past 6 months, or psychosis, bipolar)	
20. Do you have **B.ED**. (see B.E.D.Q. below): must be yes	