

USING EMDR TO TREAT OBESITY

By

Sarah Kathleen Cairns

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Approved:

Cherri K. Seese, Ph.D., Dissertation Chair

Stephanie Kerr, Ph.D., Committee Member

K. Kim Lampson, Ph.D., Committee Member

Leihua Edstrom, Ph.D., Program Director

Matt Nelson, Ph.D., Dean of College of Social and Behavioral Sciences

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### Abstract

Research has supported a correlation between early childhood trauma and obesity in adulthood. Currently, there are no mainstream treatments that treat obesity through an etiological focused methodology. This pilot study explores the usefulness of EMDR to treat early childhood trauma in adults who are currently obese in order to decrease maladaptive food behaviors. The dual hypothesis of the study is; obese adults who experienced childhood trauma and who undergo EMDR therapy will experience a decrease in maladaptive food behaviors as measured by (a) a decrease in the global score of the EDE-Q 6.0; and (b) experience a decrease in maladaptive food behaviors as measured by a decreased score on the EDE-Q 6.0 eating concerns subscale. The results of the study showed a decrease in maladaptive eating behaviors across all participants on both scores. These findings suggest that further research is warranted on EMDR as a treatment for obesity.

*Keywords:* childhood trauma and adult obesity, obesity treatment, weight loss therapy

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## Chapter One

Obesity is a growing health concern both globally and in the United States (Center for Disease Control [CDC], 2017; Flegal, Carroll, Ogden, & Curtin, 2010; Rodrigo, 2013; The World Health Organization [WHO], 2016). The impacts of obesity are both personal and societal, ranging from health problems to personal and publicly incurred medical expenses (Bhaskaran, Douglas, Forbes, Dos-Santos-Silva, Leon, & Smeeth, 2014; CDC, 2017; Flegal et al., 2010; Hubert, Feinleib, Mcnamara, Castelli, & Chalon, 1983; Mckinsey Global Institute, 2014; Rodrigo, 2013; Steinberger, Jacobs, Raatz, Moran, Hong, & Sinaiko, 2005; WHO, 2016). There are certain risk factors that have been identified in correlation with obesity, but current treatments are found to have minimal long term impacts (American College of Cardiology/American Heart Association Task for Practice Guidelines, 2014; CDC, 2017; Flegal et al., 2010; Monteiro, Conde, & Popkin, 2001; National Institute of Health, 2017; Rodrigo, 2013; Sobal & Stunkard, 1989; WHO, 2016)

The prevalence of obesity has increased approximately 100 percent in the last 25 years worldwide (Rodrigo, 2013; WHO, 2016). The World Health Organization (2016) reported that in 2014, 1.4 billion adults were overweight, and over 600 million adults were obese. Almost 40% of the global adult population is overweight, and 13% is obese (Mckinsey Global Institute, 2014; WHO, 2016). In the United States, 36.5% of adults are obese (CDC, 2017; Rodrigo, 2013). Obesity is also almost three times more prevalent in the United States than it is in the global population (CDC, 2015; Flegal et al., 2010; WHO, 2016).

Obese body weight is determined by having a body mass index (BMI) of 30 or higher (CDC, 2016; National Institute of Health, 2017; Webster & Garrow, 1985; WHO, 2016). A BMI of 40 or greater is considered severe, extreme or morbid obesity (CDC, 2016). BMI is calculated by dividing weight in kilograms by height in meters squared (CDC, 2016; Steinberger et al., 2005; Webster & Garrow, 1985).

Both globally and in the United States, women have a higher prevalence of obesity than men do (CDC, 2015; Flegal et al., 2010; Fuller-Thomson, Sinclair, & Brennenstuhl, 2013; National Institute of Health, 2017; Rodrigo, 2013; WHO, 2016). According to the CDC (2017), 38.3% of women are obese, and 34.3% of men are obese. Worldwide, women have a higher prevalence of approximately 15%, and men have a prevalence of approximately 11% (National Institute of Health, 2017; Rodrigo, 2013; WHO, 2016).

Certain groups in the United States have higher rates of obesity than others do. The African American population has the greatest rates of obesity (48.1%), Hispanic populations are second (42.5%), Caucasian populations are third (34.5%), and Asian populations have the lowest (11.7%) (CDC, 2017; Flegal et al., 2010; National Institute of Health, 2017). Persons aged 40-59 have the highest prevalence of obesity at 40.2%, followed by those over 60 years old at 37% (CDC, 2017; National Institute of Health, 2017).

Education and socioeconomics play a role in obesity rates (CDC, 2017; National Institute of Health, 2017). College educated women are less likely to experience obesity than are women who have less education, and women with higher incomes are less likely

to experience obesity compared to women with lower incomes (CDC, 2017; Monteiro, Conde, & Popkin, 2001; Sobal & Stunkard, 1989).

Obesity increases an individual's susceptibility to a number of noncommunicable diseases (NCD); heart disease, stroke, diabetes, musculoskeletal disorders, and some types of cancer (Bhaskaran et al., 2014; CDC, 2017; Flegal et al., 2010; Hubert et al., 1983; McKinsey Global Institute, 2014; Rodrigo, 2013; Steinberger et al., 2005; WHO, 2016). Cardiovascular diseases were the number one cause of death in the last 15 years globally according to WHO (2016). Also, in the United States cardiovascular disease has been the number one cause of death from 1999 to the present (CDC, 2017; Xu, Kochanek, & Bastian, 2016).

Persons whom are obese also have an increased risk of mental illness (Lin et al., 2011). Findings support a bidirectional association between obesity and depression (Marmorstein, Lacono, & Legrand, 2014; Pan et al., 2011). Obesity has also been significantly associated with an increase of both major and moderate depressive symptoms (Zhao et al., 2011). Additionally, anxiety may increase the risk of obesity, but the relationship is not bidirectional (Roberts, 2013).

The additional health risks and consequences of obesity are monetarily costly (McKinsey Global Institute, 2014; WHO, 2016). "The estimated annual medical cost of obesity in the U.S. was \$147 billion in 2008 . . . the medical costs for people who are obese were \$1,429 higher than those of normal weight" (CDC, 2017, p. 1). And according to the WHO (2016), obesity is a preventable problem.

Obesity is a complex and multi-faceted problem with contributing factors such as gender, trauma, and treatment. This study will focus on two major questions of the



obesity puzzle: 1) “How does childhood trauma contribute to adult obesity?”, and 2) “What are treatment options for obesity?”

### **Literature Review**

#### **How Does Childhood Trauma Contribute to Adult Obesity?**

One investigated contributing factor to adult obesity is childhood trauma (Adolfsson, Elofsson, Rossner, & Unden, 2004; Alvarez, Pavao, Baumrind, & Kimerling, 2007; Anda et al., 2006; Bellis, Lowey, Leckenby, Hughes, & Harrison, 2013; Felitti, 1993; Felitti et al., 1998). Fuemmeler, Dedert, McCleron, & Beckham 2009; Greenfield & Marks, 2009; Hollingsworth, Callaway, Duhig, Matheson, & Scott, 2012; Irish, Kobayashi, Douglas, & Delahanty, 2010; Kestila, Rahkonen, Mertelin, Lahti-Koski, & Koskinen 2009; Noll, Zeller, Trickett, & Putnam, 2007; Smith et al., 2009; Williamson, Thompson, Anda, Dietz, & Felitti, 2002). Correlating childhood trauma with adult obesity first became noteworthy with the initial Adverse Childhood Experiences Study (ACE study) that Kaiser Permanente conducted (Felitti et al., 1998). The researchers at Kaiser Permanente were interested in knowing if adverse childhood experiences had implications for health factors in adulthood (Felitti et al., 1998). In an analysis of 9,508 participants who underwent health screening and took the ACE questionnaire, Felitti et al. (1998) found a 140% to 160% increase in risk of obesity in adults who scored a 4 or higher on the ACE questionnaire. It is noteworthy that over 90% of the participants had at least a high school education, 75% had at least some college, and 39.3% were bachelor level college graduates or higher (Felitti et al., 1998). The educational component is important because low education is a risk factor for obesity in adulthood, but the sample used in the ACE study had a predominance of participants with at least some college and

over a third with a bachelor's degree (CDC, 2017; Felitti et al., Monteiro, Conde, & Popkin, 2001; National Institute of Health, 2017; Sobal & Stunkard, 1989). Their findings show statistical relevance and prompted further research into trauma and obesity.

Williamson et al. (2002) analyzed the Felitti et al. (1998) data to determine if there was any relationship between abuse and obesity. Their analysis revealed that "all types of abuse were associated with increased weight in adulthood" (Williamson et al., 2002, p. 1078). Specifically, the research indicated that being hit frequently and injured increased the risk of obesity by 39%. Furthermore, verbal abuse increased the risk of morbid obesity by 88%, and injurious abuse increased the risk by 71%. The risks of obesity and morbid obesity increased with the number of abuses experienced in childhood, and researchers found that the risk associated with each type of abuse decreased when controlling for covariates. The researchers estimated that in their sample, 8% of obesity cases were caused by abuse, and abuse caused 17% of morbidly obese cases.

Eight years after the initial study, Anda et al. (2006) analyzed 17,337 responses to the initial ACE study to understand the effects of childhood trauma. The researchers found supporting evidence to the initial two studies. The number of adverse childhood experiences as measured by the ACE study was significantly correlated with obesity in adulthood. Persons with a score of 4 or more on the ACE questionnaire were 2.7 times more likely to be obese in adulthood than participants with a score of 3 or fewer were. The study showed a positive correlation between obesity and a person's ACE score.

All of the findings in the previously mentioned three studies were similar, which is not surprising because they all utilized the same data. However, correlations between

weight and childhood experiences were consistent even when using similar measures in different populations.

A study involving approximately 1,500 ethnically diverse participants from low socioeconomic backgrounds in the United Kingdom showed similar findings to the Felitti et al. (1998), Williamson et al. (2002), and Anda et al. (2006) studies. The study used the ACE questionnaire and other surveys to understand childhood trauma and health outcomes for adults (Bellis, Lowey, Leckenby, Hughes, & Harrison, 2013). Their findings showed that obesity was more likely in people who scored 4 or more on the ACE, but the relationship did not hold when demographics such as age, gender, and ethnicity were controlled. However, a score of 4 or more was significant in morbidly obese participants, even when controlling for demographics.

Throughout the research utilizing the ACE questionnaire, findings consistently showed a significant relationship between the number of reported adverse childhood experiences and obesity in adulthood (Anda et al., 2006; Bellis et al., 2013; Felitti et al., 1998; Williamson et al., 2002).

In addition, researchers conducting other studies examined abuse in a broad sense as well, and the findings mirrored the findings of the ACE study. Potentially one of the first studies done in this area involved examining childhood sexual abuse, depression, and family dysfunction as possible predictors of obesity in adulthood (Felitti, 1993). Felitti (1993) used 100 obese participants and 100 participants who had always been within normal BMI range to investigate what experiences correlated with the onset of obesity. Obese participants experienced significantly higher levels of childhood traumatic/abuse

events, including sexual abuse, nonsexual abuse, parental loss, parental alcoholism, chronic depression, and family dysfunction (Felitti, 1993).

In a larger study involving 1,894 participants in Finland et al. (2009) investigated childhood circumstances and obesity specifically in early adulthood. Their findings showed that the following factors significantly predicted obesity in early adulthood for women: (a) being from a single family household, (b) parental alcohol problems, (c) parental mental ill health, and (d) at-school bullying. Being bullied remained a significant predictor for adult obesity in women even when controlling for other contributing demographic variables. No significant results were found for men related to childhood trauma and early adult obesity.

Obesity impacts a higher number of women than men globally (WHO, 2016). Researchers studied a large community sample of 11,115 females to understand the connection between child abuse in girlhood and obesity in adulthood (Alvarez, Pavao, Baumrind, & Kimerling, 2007). Using the Traumatic Stress Schedule, the researchers found that obese women were significantly more likely to have experienced child abuse than their non-obese counterparts were. The significance remained even when controlling for other variables thought to increase the likelihood of obesity: age, race/ethnicity, food insecurities, perceived stress, physical inactivity, and inadequate fruit and vegetable intake.

An additional all female study revealed an association between moderate to severe forms of physical, emotional, and sexual abuse and obesity pre-pregnancy in a sample of pregnant women using the Childhood Trauma Questionnaire (Hollingsworth,

Callaway, Duhig, Matheson, & Scott, 2012). An association between moderate to severe forms of emotional and physical neglect and pre-pregnancy obesity was also present.

The four previously mentioned studies were broad in their scope of abuse, and all of them showed a level of relationship between a variety of different childhood abuses and obesity in adulthood. One study focused on a smaller scope of abuse revealed the same findings.

Greenfield and Marks (2009) conducted an analysis of 1,650 participants' responses to the National Survey of Midlife in the United States, a national longitudinal study of health and well-being. The study was focused specifically on psychological violence and physical violence inflicted by a parent. The findings showed that persons who experienced psychological and/or physical violence from their parents in childhood were more likely to be obese compared to those who reported not experiencing any abuse (Greenfield & Marks, 2009).

One commonality between all of these studies and the studies involving the ACE questionnaire is that they show some level of significant connection between an increased BMI and traumatic events in childhood, especially in women. The majority of studies on this topic reveal the same findings. The studies already discussed were focused on childhood trauma in a broad scope in relationship to adult obesity. But even when looking at more specific forms of childhood abuse and trauma, the findings hold that there is a significant correlation between childhood traumas and adult obesity. The following studies are broken down into categories studied as appropriately as possible to reflect the childhood trauma studied and outcome of the study.

### **Childhood Sexual Abuse**

There is research showing the significance of childhood sexual abuse and its impacts on health outcomes (Irish, Kobayashi, & Delahanty, 2010; Noll, Zeller, Trickett, & Putnam, 2007; Smith et al., 2010). When studying these long-term physical health outcomes of childhood sexual abuse, Smith et al. (2009) conducted a women specific study and found that all forms of sexual abuse (lifetime sexual abuse, intrafamilial childhood sexual abuse, and extrafamilial childhood sexual abuse) are significantly associated with obesity in adulthood (Smith et al., 2009). This was true when all of these forms of sexual abuse were statistically isolated. However, intrafamilial sexual abuse is significantly correlated to obesity when not isolated from other variables (Smith et al., 2009).

Long-term, non-retrospective research shows the same results regarding sexual abuse and demonstrates that girls who experience sexual abuse show a three times higher risk of being obese by young adulthood than do their non-abused counterparts (Noll et al., 2007). The abused girls also gained weight at a higher rate than others in their age group during childhood and adolescence even when controlling for demographic variables.

Conversely, two studies that were located did not produce the same conclusions about the relationship between sexual abuse in girlhood and adult obesity (Adolfsson, Elofsson, Rossner, & Unden, 2004; Fuemmeler, Dedert, McClernon, & Beckham, 2009). However, these co-gender research studies show that boys who experience childhood sexual abuse are highly susceptible to developing adult obesity.

Fuemmeler et al. (2009) used a sample of 20,747 surveys and concluded that childhood sexual abuse significantly correlates to obesity in young adult males even

when controlling for other types of abuse and demographic variables. Their findings show no significant relationship between young, obese women and childhood sexual abuse. However, they did see a relationship between experiencing sexual abuse in girlhood and disordered eating. The researchers posited that childhood sexual abuse might not have impacted adult obesity in women because of the age category being investigated.

Additionally, some research only shows a correlation between childhood sexual abuse and obesity in older, overweight and obese men (50-74 years old) both when controlling for other variables and when not controlling for other variables (Adolfsson et al., 2004). The Adolfsson et al. (2004) study did not show the same findings for women or for any other male age category. These results are unique in a large study with 2,810 participants to have findings that are inconsistent with other research showing a generally significant relationship between sexual abuse in childhood and obese outcomes in adulthood for women.

In three of the four previous studies, childhood sexual abuse was the primary childhood experience investigated, and in one of the four, it was the only link between childhood trauma and adult obesity. Thus it appears that childhood sexual abuse could be a risk factor for adult obesity (Adolfsson et al., 2004; Fuemmeler et al., 2009; Irish et al., 2010; Noll et al., 2007; Smith et al., 2009).

### **Childhood Neglect and Quality of Parental Care**

There is also a potential link between childhood neglect and adult obesity (Lissau & Sorenson, 1994), but there is only a small body of research focusing on this topic.

Lissau and Sorenson (1994) are among a small group of researchers who have sought to

discover if there is a correlation between childhood neglect and adult obesity. In their study, they found that neglected children and those children with dirty hygiene, as rated by school personnel, were at a significantly higher risk of becoming obese in adulthood, regardless of demographics, including childhood BMI.

In addition, Sansone, Schumacher, Wiederman and Routsong-Weicher (2008) studied a morbidly obese population who had a mean BMI of 47.2 and who was seeking bariatric surgery to investigate the prevalence of childhood abuse and quality of caretaking. The results showed high levels of abuse in this population, but they were not significantly higher than those of the general population. However, Sansone et al. (2008) did find a statistically significant relationship between abuse and poor quality of parental caretaking.

Not all research has supported the theory of neglect outcomes on BMI. For example, a 30-year follow-up study using 410 participants in the experimental group who had experienced childhood abuse and neglect showed that physical abuse is linked with a significantly higher BMI than neglect and sexual abuse are, even when controlling for demographic differences (Bentley & Widom, 2009). In fact, neglect and sexual abuse showed no significant correlation at all. But overall, extensive research has not been conducted investigating the relationship between childhood neglect and adult obesity, and the results that have been discovered appear mixed.

### **Controlling for Mental Health Variables**

In addition to the scarcity of research investigating the link between childhood neglect and adult obesity, not many studies have involved controlling for mental health factors to isolate the significance of childhood trauma on adult obesity. However, the



studies that have involved controlling for mental health factors have shown that even when controlling for such variables, the correlation between childhood trauma and adult obesity remains statistically significant (D'argenio et al., 2009; Fuller-Thomson, Sinclair, & Brennenstuhl, 2013; Gunstad et al., 2006)

Gunstad et al. (2006) studied participants who were of normal weight, who were overweight, and who were obese to understand the relationship between early life trauma and obesity. This research was unique because participants with significant medical or psychological histories were excluded to reduce compounding variables. The goal of this exclusion was to seek a direct causal relationship between childhood trauma and obesity. The study results showed a relationship between early life trauma and obesity in adulthood, and it also showed that the number of exposures to trauma significantly related to BMI in adulthood (Gunstad et al., 2006). Exposure to such traumas in men predicted adult obesity. In addition, participants who experienced bullying or rejection had increased rates of obesity, and participants who experienced emotional abuse had lower rates of obesity. The researchers found no relationship between childhood trauma and female obesity in adulthood.

While studying mediating factors for childhood trauma and adult obesity, Fuller-Thomson et al. (2013) controlled for childhood stressors, socioeconomic indicators, marital status, health behaviors, and mental health. They concluded that these factors had no or minimal impact on female adult obesity in those who had experienced physical abuse. However, their findings were the same as other studies' findings; physical abuse significantly correlates with female adult obesity.

The findings were the same in a study designed to examine if psychological dysfunction was a mediating factor between childhood trauma and adult obesity (D'Argenio et al., 2009). Childhood sexual abuse and physical abuse are significantly correlated with obesity in adulthood, and so are less severe forms of childhood abuse, even when looking at persons who are obese and have psychological dysfunction.

### **Posttraumatic Stress Disorder**

The psychological diagnosis of posttraumatic stress disorder (PTSD) has also been specifically researched in relation to childhood trauma and adult obesity (Dedert et al., 2010; Roenholt, Beck, Karsberg, & Elklit, 2012). PTSD is viewed as a current diagnosis within research and a mediating factor for adult obesity (Dedert et al., 2010; Roenholt et al., 2012). The rates of obesity have been found to increase with increased childhood trauma and comorbid PTSD, strengthening the correlational relationship between trauma and obesity (Dedert et al., 2010; Roenholt, Beck, Karsberg, & Elklit, 2012).

Roenholt et al. (2012) conducted research to investigate the impact of PTSD symptoms and childhood abuse on BMI. The researchers questioned participants who were 24 years of age on their current PTSD symptoms and childhood trauma/abuses. The results were broken down by BMI utilizing four categories: underweight, normal weight, overweight, and obese.

There were significant findings between PTSD symptoms and BMI in the obese participants; obese participants had greater PTSD symptoms than the normal weight population had. Additional findings included a significant difference in the experience of trauma between the obese participants and the normal weight participants, specifically childhood sexual abuse and overall abuse.

The second study revealed a link between a sample of female veterans with PTSD who experienced childhood trauma and who were obese and an increase of obesity in the general population of women with PTSD who also experienced childhood trauma (Dedert et al., 2010). Their study shows significance in PTSD as a single, indirect, and intervening variable between childhood trauma and obesity. PTSD has shown to be a variable in mediating childhood trauma and adult obesity, and because it is itself indicative of trauma, it follows logically that it could also correlate with adult obesity.

### **Treatment Options for Obesity**

Most obesity treatments are focused primarily symptomology of obesity, weight loss (“Explore overweight and obesity treatment,” 2017). The National Heart, Lung, and Blood Institute proposes healthy lifestyle changes, behavioral weight-loss treatment programs, medicines, and surgical weight loss procedures as current treatment options (“Explore overweight and obesity treatment,” 2017). With the exception of bariatric surgery, the long-term results of current interventions are not convincing (Chang et al., 2014; American College of Cardiology/American Heart Association, 2014; Phelan & Wadden, 2002; Wadden, Butryn, & Byrne. 2004). And with weight loss surgery, the risks might outweigh the benefits (American College of Cardiology/American Heart Association, 2014).

Most lifestyle interventions, including behavioral change treatment programs, have initial effectiveness in the first six months (Phelan & Wadden, 2002; Wadden et al., 2004). But after the first year, many participants gain weight back to baseline. An exception occurs if people participate in maintenance programs on a consistent basis (Wadden et al., 2004). Similarly, once involvement in maintenance programs has ceased,

many participants then regain the weight back to baseline (Phelan & Wadden, 2002; Wadden et al., 2004).

There are varying results supporting a combination of lifestyle changes and medication (Phelan & Wadden, 2002). Medication usage directions generally include lifestyle changes (Phelan & Wadden, 2002). Certain types of medication are effective in studies, while others have not had the same results. However, there are differing long-term results according to Phelan and Wadden (2002) when participants were on medication long-term, but they did not analyze participants after they stopped using medication. Because available medications change frequently, the specific types/brands are not discussed here.

### **Rationale and Significance of the Study**

There is a growing body of research showing a link between early childhood trauma and adult obesity. However, most current obesity treatments focus only on changing present behaviors. Except for surgery, all of the current treatments show a high rate of weight regain in participants post treatment. Treatment needs to include an option that focuses on the source of the problem through targeting traumas.

### **Eye Movement Desensitization Reprocessing**

Francine Shapiro developed eye movement desensitization reprocessing (EMDR) as a treatment specifically for trauma (Shapiro, 2001). “EMDR entails an eight-phase approach guided by an information processing model that views pathology as based upon perceptual information that has been maladaptively stored” (Shapiro, 2001; Shapiro, 2002, p. 2). Shapiro (2002) explained that EMDR has three primary goals: (a) for the client to draw adaptive insights from experiences/memories, including body responses;

(b) to desensitize reactions to triggers; and (c) to incorporate learned information, insights, and new behaviors into day to day functioning. The client draws from his or her own internal resources to create present time behavior and interpersonal change (Shapiro, 2002; Shapiro & Maxfield, 2002).

EMDR is empirically supported by at least 13 studies for use with patients experiencing PTSD (Shapiro, 2002). In 4 out of 5 studies with single trauma participants, 77%-100% of participants were no longer diagnosable with PTSD after 3-6 hours of treatment (Shapiro, 2002). In studies using trauma victims with mixed numbers of trauma, all but one reported a 77-83% PTSD decrease with ten hours of treatment, with participant follow-up statuses staying the same or becoming more adaptive (Shapiro, 2002).

Organizations that work with trauma also recommend the use of EMDR with PTSD and trauma. The World Health Organization (2013) recommends EMDR use for trauma, loss, and acute stress. In addition, the American Psychological Association (2017) recommends EMDR to treat PTSD in adults. Also, the International Society for Traumatic Stress Studies stated, “Compared to other treatments targeting PTSD, the status of the evidence supporting EMDR is substantial and of high quality” (Foa, Keane, Friedman, & Cohen, 2009, pp. 573-574).

Currently, EMDR is used to treat other pathologies: anxiety, depression, dissociative identity disorder, personality disorders, eating disorders, etc. (Knipe, 2015; Shapiro, 2002; Shapiro, 2005; Shapiro, 2009). Shapiro (2002) stated that EMDR works for other disorders and pathologies because these too are based on and influenced by

previous experiences. By targeting maladaptively stored information in the same way as with PTSD, presenting symptoms are able to become adaptive using the same process.

Despite all of the research supporting the positive correlation between childhood trauma and obesity and despite the empirical research supporting EMDR as an effective trauma treatment, the researcher was unable to locate research of the two being used together. The purpose of this study is to investigate the use of EMDR with obese persons with a history of childhood trauma. The logic is that by treating an etiological component, behaviors will change, thus creating sustainable and sustained weight loss.

As discussed previously, sustained weight loss in obese populations is minimal. There is a focus on initial behavior changes that promote an initial weight loss, but after the intervention has ended, most participants regain weight to baseline. The purpose of using EMDR would be to reprocess the driving force behind eating behaviors by targeting childhood trauma.

At this time, there is only one locatable study in which EMDR is used in a similar way (Halvgaard, 2015). Halvgaard (2015) used a single-case study to treat emotional eating in a participant who fluctuated in her BMI range from normal to overweight. The study consisted of six sessions and two follow-up sessions. The results were measured by self-report, but the participant noted having a substantial decrease in emotional eating and an increase in adaptive behaviors over time. The current study utilizes three currently obese adult participants who have experienced childhood trauma to undergo 10 sessions of EMDR therapy to treat obesity.

### **Hypothesis**

There is data supporting significant relationships (both causal and correlational depending on the study) between childhood trauma and adult obesity (Felitti, 1993; Felitti et al., 1998; Fuemmeler et al., 2002). Current treatments for obesity focus on behavior changes and/or the use of medical/surgical means which are either unsustainable or have high risks of serious side effects (American College of Cardiology/American Heart Association Task for Practice Guidelines, 2014). On the other hand, there are no common treatments that focus on childhood trauma causes (American College of Cardiology/American Heart Association Task for Practice Guidelines, 2014).

The proposed research uses EMDR, a therapy specifically designed for trauma, to treat obesity. Three participants will undergo a series of 10 sessions of EMDR while food behaviors are monitored on an ongoing basis. At baseline, food behaviors will be measured using the Eating Disorder Examination Questionnaire (EDE-Q 6.0) and will be reassessed at four week intervals. The hypothesis is that obese adults who experienced childhood trauma and who undergo EMDR therapy will experience a decrease in maladaptive food behaviors as measured by (a) a decrease in the global score of the EDE-Q 6.0 and (b) experience a decrease in maladaptive food behaviors as measured by a decreased score on the EDE-Q 6.0 eating concern subscale.

## Chapter Two

A significant positive correlation exists between childhood trauma and adult obesity (Adolfsson, Elofsson, Rossner, & Unden, 2004; Alvarez, Pavao, Baumrind, & Kimerling, 2007; Anda et al., 2006; Bellis et al., 2013; Felitti, 1993; Felitti et al., 1998; Fuemmeler, Dedert, McCleron, & Beckham 2009; Greenfield & Marks, 2009; Hollingsworth, Callaway, Duhig, Matheson, & Scott, 2012; Irish, Kobayashi, Douglas, & Delahanty, 2010; Kestila, Rahkonen, Mertelin, Lahti-Koski, & Koskinen 2009; Noll, Zeller, Trickett, & Putnam, 2007; Smith et al., 2009; Williamson, Thompson, Anda, Dietz, & Felitti, 2002). Current treatments for obesity consist of weight-focused, lifestyle type changes and medical interventions (American College of Cardiology/American Heart Association Task for Practice Guidelines, 2014). Lifestyle and behaviors changes provide an initial decrease in weight, but regain after an initial six month period is a consistent finding. Medical interventions are more efficacious, but the risks might outweigh the benefits (American College of Cardiology/American Heart Association Task for Practice Guidelines, 2014). There are no well-known treatments for obesity that focus on trauma treatment (American College of Cardiology/American Heart Association, 2014). Could treating trauma impact obesity?

To better understand the connection between childhood trauma and adult obesity, a trauma therapy called EMDR could prove helpful. Food and weight related behaviors are the change in question because a calorie surplus is what physically causes weight to be gained, but there are also maladaptive emotional perceptions of the body that may play a role in behavior. For the purpose of this study, food and weight behaviors will be referred to as *food behaviors* or *food related behaviors* and are broad terms to reflect



what is assessed on the EDE-Q 6.0; weight concerns, eating concerns, food restraint, and shape concerns.

The purpose of this study is to investigate the impact of EMDR on food related behaviors with obese adult persons who have experienced childhood trauma. The hypothesis is: Obese adults who experienced childhood trauma and who undergo EMDR therapy will experience a decrease in maladaptive food behaviors as measured by (a) a decrease in the global score of the EDE-Q 6.0 and (b) experience a decrease in maladaptive food behaviors as measured by a decreased score on the EDE-Q 6.0 eating concern subscale.

### **Participants**

Participants were recruited from local medical and counseling facilities in Everett, WA and surrounding areas by flyers and by word of mouth from clinicians/practitioners. The criterion for being a participant in the study were briefly described on the flyer.

Three participants were selected who met the necessary criteria. Participants were female between the ages of 44 and 49 years. Participants had BMIs ranging from 30 to 37.3, which qualified them as medically obese. In addition, participants scored between a 6 and 7 on the ACE (see Appendix A).

Potential participants were excluded if they self-reported a current mental health diagnosis other than depression, anxiety, posttraumatic stress disorder (PTSD) or binge eating disorder. Participants were excluded if they reported other mental health diagnoses because such diagnoses may; (a) require longer treatment; (b) require a non-standard EMDR protocol; and (c) to promote homogeneity amongst participants. Other

contraindicative variables to selection were taking medications that impact appetite, thyroid disorders, or other medical issues that may directly impact food behaviors.

Interested prospective participants were directed to contact the primary researcher for screening and inclusion. The primary researcher conducted all screening measures. Initial screening took place on the phone and the ACE questionnaire was administered in person once all other qualification were met.

Participants were given a list of affordable, local counseling referrals at the beginning of treatment. At the end of the study each participant was contacted to be given a follow-up list of referrals. One participant was unable to be reached. Each participant was also offered a \$25 Amazon gift card upon completion of the study. One participant did not return contact for the gift card.

### **Materials and Procedures**

After participants were selected, they signed an informed consent for participation. Because actual therapy took place, the EMDR certified clinician whom provided services, Patrice M. Van Duine. MEd, MSN, PMHNP-BC, also provided her informed consent which was signed by participants. She discussed Washington state laws relating to confidentiality and their limitations at the onset of therapy.

Before treatment began, each participant was administered the EDE-Q 6.0 to assess baseline cognition and behaviors related to eating disorders. Subsequently, the assessment was given at the beginning of sessions five and ten to assess changes in cognitions and/or behaviors.

Each participant completed ten 90 minute sessions of EMDR therapy utilizing the standard treatment protocol as outlined by the EMDR manual.

**Eating Disorder Examination Questionnaire 6.0**

The Eating Disorder Examination Questionnaire 6.0 (EDE- Q 6.0) (see Appendix B) consists of 28 questions pertaining to eating disorder behaviors and cognitions in the last four weeks. The results measure four different subscales of concern to understand the participant's food related behaviors and food related thoughts in a variety of categories and when assessed across time periods assesses the change in those areas. The restraint subscale includes five questions about an individual's active behaviors and thoughts about food restraint including control or desired control over food intake, avoidance of food or eating, dietary restriction or food rules and feelings of fullness. The eating concerns subscale includes five questions about preoccupation of food, loss of control in eating, and eating patterns such as eating in secret and social eating behaviors. The shape concern subscale includes eight questions about thoughts about their shape including perception of shape, fear of weight gain, and preoccupation with weight and/or shape. The final subscale is weight concerns which includes five questions about a person's overall reaction to weight notably negative responses to their own weight. There is also a global score of all four subscales which aims to give an overall representation of a person's food behaviors.

Twenty-one of the questions ask about the number of times a behavior or thought has occurred in the last four weeks. The final seven questions are answered on a 7-point Likert scale. There are three additional questions asking for self-reported height and weight and if menstruation has been missed.

According to a psychometric review of current literature on the EDE-Q, the test-retest reliability of the EDE-Q was found to be between .66 and .94 for the subscales and

between .51 and .92 for behavior frequencies (Berg, Peterson, Frazier, & Crow, 2012).

The test-retest reliability was also found to be significant for the individual test questions.

The four subscales demonstrated acceptable internal consistency in all four studies, with alphas ranging from 0.70 to 0.93. One study also calculated the item-total correlations for the EDE-Q and found correlations ranging from 0.33 ('avoidance of eating,' 'eating in secret') to 0.76 ('dissatisfaction with weight,' 'dissatisfaction with shape'). (Berg et al., 2012, p. 4)

### **Eye Movement Desensitization Reprocessing**

Eye movement desensitization reprocessing (EMDR) is a manualized therapy that consists of an eight phase process with a three pronged approach addressing the past, the present, and the future (EMDR International Association [EMDRIA], 2016; Shapiro, 2001). The eight phases are presented in the following paragraphs (EMDRIA, 2016; Shapiro, 2001).

**Phase one: History and treatment planning.** The goal of this phase is to understand the presenting problem (obesity), subsequent issues caused by the presenting problem, and any additional related symptoms. A treatment plan will be developed for the individual for their specific traumas to be targeted.

**Phase two: Preparation.** The goal of the preparation phase is to prepare the client for processing. The clinician will assess the participant's ability for affect management. The clinician will also teach relaxation skills. During this phase, the level of participant's dissociation, if any, will be assessed. Also, an explanation of the theory behind EMDR will ensue.

**Phase three: Assessment.** The assessment phase targets a specific memory and the participant's current negative belief about self-relating to the memory. The current level of disturbance related to the memory is decided, the current emotions felt when thinking about the memory are discussed, and any current body sensations related to the memory are also discussed. An assessment of a preferred positive belief is also discussed as well as how strongly that positive belief is currently believed.

**Phase four: Desensitization.** In this phase, sets of eye movements, taps, or tones (bilateral stimulation [BLS]) are utilized to process the maladaptive target. The goal of this phase is to decrease the current level of disturbance in response to the memory.

**Phase five: Installation.** During this phase, BLS is used to increase the positive belief as described in Phase 3.

**Phase six: Body scan.** This phase focuses on any remaining somatic presentations. BLS is used to either strengthen positive feeling or to decrease any residual negative feelings.

**Phase seven: Closure.** Phase 7 is the end to each EMDR session where BLS is used. The participant is lead through a calming exercise to contain any unfinished targets and is briefed about what to expect with continued processing between sessions.

**Phase eight: Re-evaluation.** At the onset of sessions following the use of BLS, the subsequent target is re-evaluated to make sure disturbance has remained adaptive or has become increasingly adaptive between sessions.

### **Research Design**

A pilot study research design was utilized. The purposes of this design was to explore preliminary data, gather information from interventions that would be

challenging to initially experiment with on a large scale, to preliminarily investigate if larger studies are warranted, and to see if there are problems that arise or limitations that need addressing before a full scale study could be considered (Teijlingen & Hundley, 2001). A control group and/or randomization is not used in this particular pilot study design because of the time intensive nature and limited resources available at this time. According to Teijlingen & Hundley (2001), pilot study designs are often used when it is difficult to acquire funding for a larger sample, to pilot for larger studies, and to draw information from results that may be applied to later studies or research. The goal in this pilot study was to look for whether what is being evaluated is creating change within the study, is a difference being made, is the intervention helping (Teijlingen & Hundley, 2001).

Randomized control studies are done in a specific manner to rule out threats to validity. Teijlingen & Hundley (2001) expressed that problems relating to inaccurate assumptions and generalization of results may occur in pilot studies because of their often small size. However, pilot studies can each be designed in unique ways to rule out threats to validity as reasonably and plausibly as possible by the researcher. Kazdin (2011) explained that “from a methodological standpoint, the goal is to draw well-based conclusions about the impact of the intervention by ruling out or making threats to validity implausible...our goal is to draw valid inferences and rule out or make implausible threat to validity” (p. 262).

These factors explain why this method was appropriate in the aforementioned research. It would be both difficult, time consuming, and costly to recruit, treat, and assess a large enough sample to be generalizable to a population, and include a control group.

Because no research was available on the use of EMDR and the treatment of obesity, this design allowed for low cost research to be done, in a timely manner to gather information on the possibility of effectiveness in a larger sample. The results show change, producing positive outcomes, the intervention thus has a basis for larger and/or follow-up research.

### **Addressing Validity Threats**

To limit threats to validity and strengthen results collected from the data, three; baseline assessments will occur, multiple assessments took place during the treatment phase, and participants were as homogeneous as reasonably possible. Baseline assessments before treatment allowed for a pattern of previous behavior to be assessed. Because participants had to be of a minimum BMI, it was assumed that a pattern of behavior had persisted for a reasonable length of time. Data was collected using a well-known, validated inventory on multiple occasions during the treatment process to show various points of potential change during the treatment phase.

### **Data Analysis**

Data was analyzed using descriptive data to examine the data results of the study to see changes over the course of treatment and describe results without drawing conclusions. This method reduces type I errors, but may increase the possibility of type II errors – overlooking incremental weak effects (Kazdin, 2011). The data analysis allowed for change to be assessed across the study, focusing on the nuances of change between intervals of assessment.

Change was be assessed from two separate sources of data; the *global* scores because it is inclusive of all subscales of the EDE-Q 6.0 and the scores from the EDE-Q 6.0 *eating concerns subscale* because it is the subscale that is most directly related to how

an individual is eating. Pre-treatment means were analyzed from both data sources for all participants as well as the means at each reassessment point to see if change was detectable overtime from pre-treatment and during the intervention phase. The change was analyzed from pre-treatment to treatment and for any change over time while treatment persisted. The analysis includes both a group analysis of all three participants and an analysis of the participants as individuals.

### **Limitations**

There are two limitations to the study. First, the sample size was small, and thus the results were not generalizable to a larger population. Second, the measure of change involved specifically examining eating disorder related behaviors instead of caloric consumption/expenditure. Until reliable measurements for overeating other than calorie counting are empirically validated, the lack of empirically validated alternate measurements will remain a limitation in obesity research.

### **Summary**

The goal of the study was to assess if EMDR is useful in decreasing maladaptive food behaviors in obese adults who experienced childhood trauma. Participants were recruited from local medical facilities using flyers and word of mouth from clinicians. Participants were screened to adequately fit the study, and individuals with current severe mental health diagnoses, high levels of dissociation, or poor emotional regulation were excluded. Participants were also be screened for obesity and childhood trauma.

Once participant selection concluded, appropriate informed consent procedures ensued followed by a baseline measurement using the EDE-Q 6.0 to establish current cognitions and behaviors related to food. Once baseline had been established, EMDR



began for ten 90 minute sessions. On sessions 5 and 10, the EDE-Q 6.0 was administered to assess change over time.

### Chapter Three

To examine factors of change from baseline, midpoint, and final assessment, descriptive statistics are used to analyze the findings of both the global score and eating concerns subscales of the EDE-Q 6.0 to investigate the hypotheses of the study. Change across the remaining three subscales of the EDE-Q 6.0 (restraint, shape concern, and weight concern) are also examined post-hoc.

#### Participant Demographics

The baseline participant demographic information comprised of age and weight information can be seen below in Table 1.

Table 1

#### *Participant Information*

Participant Information	Participant One	Participant Two	Participant Three
Age	49	47	44
Starting Weight	260	176	202
Starting BMI	37.3	30	30.4

#### Baseline Data

At baseline, the *global score* mean on the EDE-Q 6.0 was ( $M = 4.5646$ ,  $SD = .31575$ ) with a range of 0.55 (minimum = 4.20, maximum = 4.75) (see Table 2). Participant One scored 4.20. Participant Two scored 4.7438. Participant Three scored 4.75 (see Table 3). At baseline the *eating concerns subscale* mean on the EDE-Q 6.0 was ( $M = 4.2267$ ,  $SD = .61101$ ) with a range of 1.20 (minimum = 3.60, maximum = 4.80)

(see Table 2). Participant One scored 3.60. Participant Two scored 4.40. Participant Three scored 4.80 (see Table 3). Baseline combined results can be seen in Table 2. Baseline individual participant results can be seen in Table 3 and Figures 1, 2, and 3.

Table 2

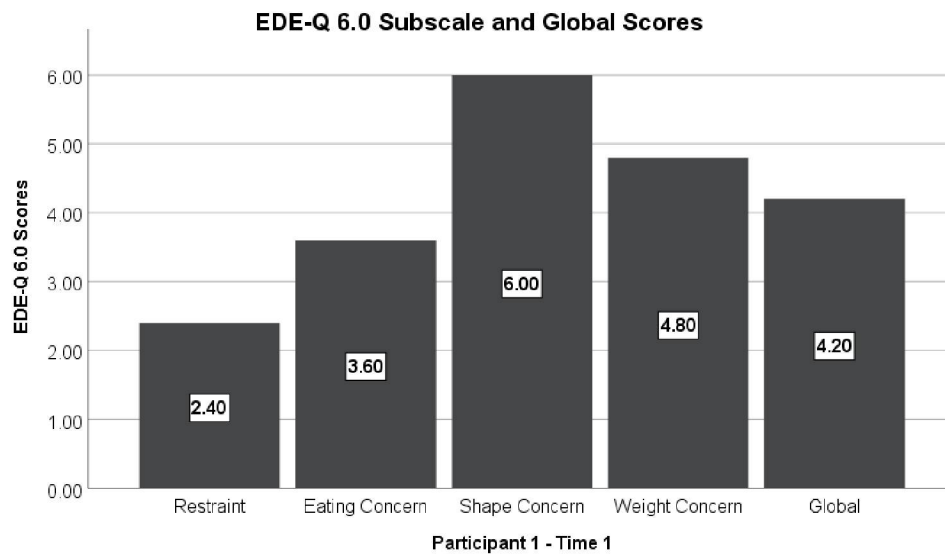
*Baseline Combined Participant Results*

Scale	Mean	Standard Deviation	Range	Minimum	Maximum	N
Global Score	4.5646	.31575	0.55	4.20	4.75	3
Eating Concerns Subscale Score	4.2267	.61101	1.20	3.60	4.80	3

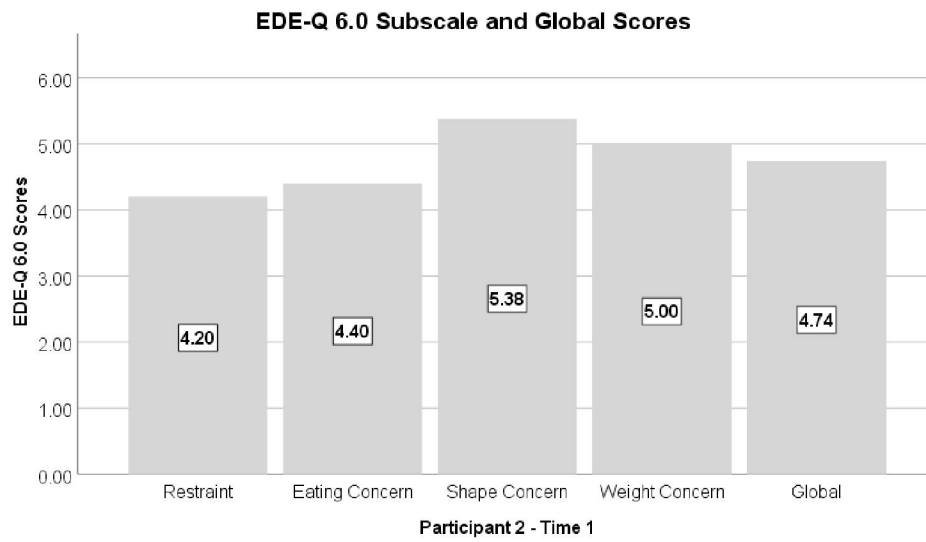
Table 3

*Baseline Individual Participant Results*

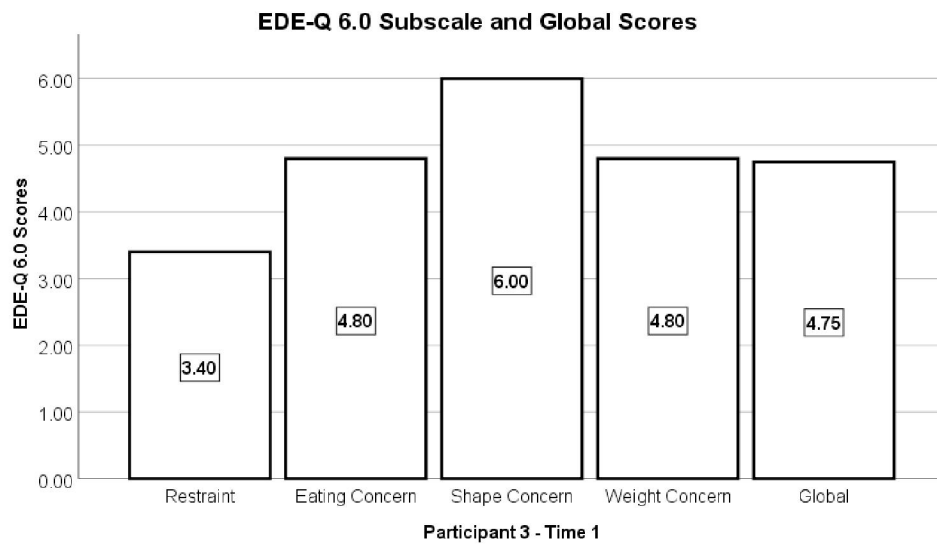
Scale	Participant One	Participant Two	Participant Three
Global Score	4.20	4.7438	4.75
Eating Concerns Subscale Score	3.60	4.40	4.80



*Figure 1.* Participant One baseline subscale and global scores from the EDE-Q 6.0.



*Figure 2.* Participant Two baseline subscale and global scores from the EDE-Q 6.0.



*Figure 3.* Participant Three baseline subscale and global scores from the EDE-Q 6.0.

**Session Five EDE-Q 6.0 Data**

At session five, the *global score* mean was ( $M = 3.5479$ ,  $SD = .61101$ ) with a range of 1.91 (minimum = 2.74, maximum = 4.65) (see Table 4). Participant One scored 2.7438. Participant Two scored 3.25. Participant Three scored 4.65 (see Table 5). At session five, the *eating concerns subscale* mean was ( $M = 2.5333$ ,  $SD = 1.47422$ ) with a range of 2.8 (minimum = 1.40, maximum = 4.20) (see Table 4). Participant One scored 1.40. Participant Two scored 2.0. Participant Three scored 4.65 (see Table 5). Session five combined results can also be seen in Table 4. Session five individual participant results can also be seen in Table 5 and Figures 4-6.

Table 4

*Session Five Combined Participant Results*

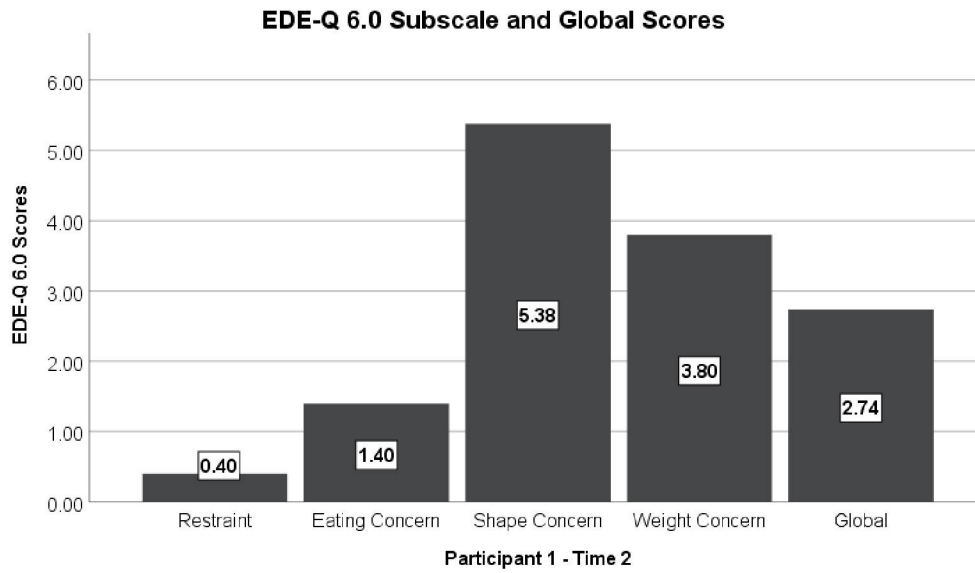
Scale	Mean	Standard Deviation	Range	Minimum	Maximum	N
Global Score	3.5479	.61101	1.91	2.74	4.65	3
Eating Concerns Subscale Score	2.5333	1.47422	2.8	1.40	4.20	3

Table 5

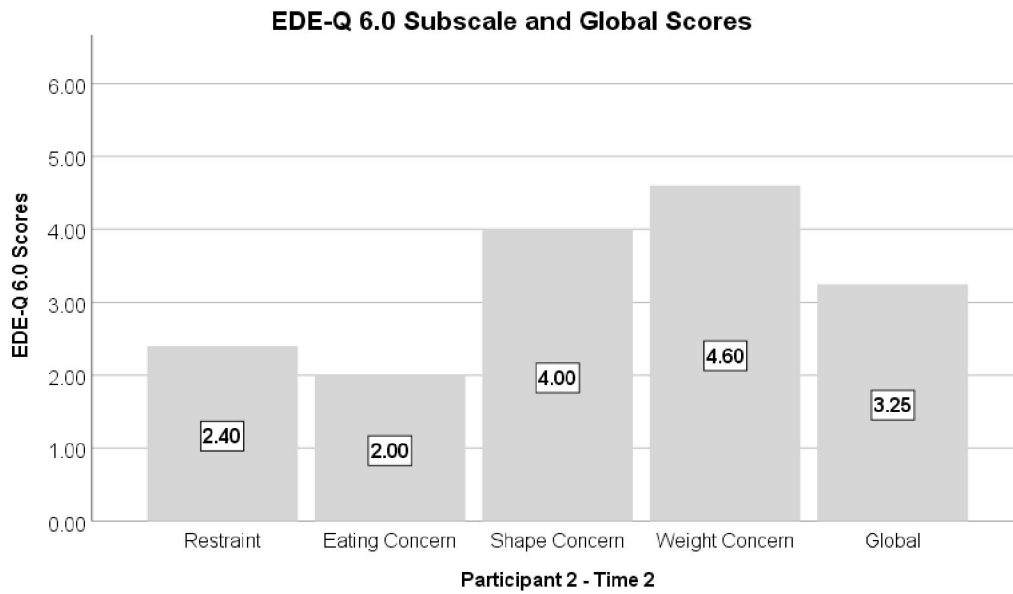
*Session Five Individual Participant Results*

Scale	Participant One	Participant Two	Participant Three
Global Score	2.7438	3.25	4.65
Eating Concerns Subscale Score	1.40	2.0	4.20

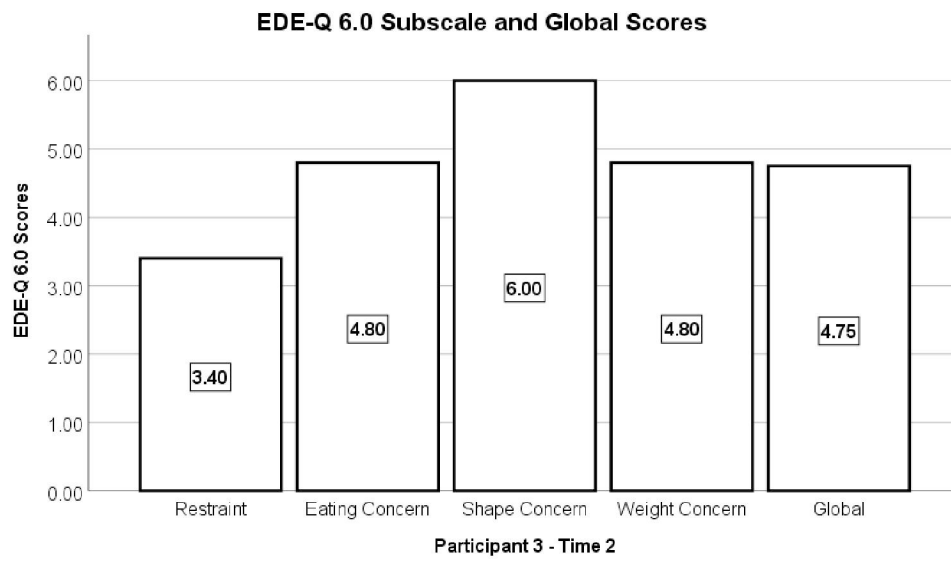




*Figure 4.* Participant One session five subscale and global scores from the EDE-Q 6.



*Figure 5.* Participant Two session five subscale and global scores from the EDE-Q 6.0.



*Figure 6.* Participant Three session five subscale and global scores from the EDE-Q 6.0.

### Change From Baseline to Session Five EDE-Q 6.0

The combined change in the *global score* from baseline to session five was a decrease of 22.27 % (-1.0167), showing an overall decrease. The combined change in the *eating concern subscale* from baseline to session five on the EDE-Q 6.0 was a decrease of 41% (-1.7333), showing a decrease in the subscale overall. The combined data changes can be seen in Table 6.

Participant One showed a decrease of 34.76% (-1.46) on the *global score* and a decrease of 61.11% (-2.20) on the *eating concern subscale*. Participant Two showed a decrease of 31.4% (-1.49) on the *global score* and a decrease of 54.54% (-2.40) on the *eating concern subscale*. Participant Three showed a decrease of 2.15% (-0.10) on the *global score* and a decrease of 12.5% (-0.60) on *eating concern subscale*. Individual data changes can be seen in Table 7.

Table 6

#### *Combined Participant Baseline to Session Five Change Results*

Scale	Baseline	Session Five	Change
Global Score	4.5646	3.5479	-1.0167
Eating Concerns Subscale Score	4.2267	2.5333	-1.7333

Table 7

*Individual Participant Baseline to Session Five Change Results*

Scale	Participant One	Participant Two	Participant Three
Global Score Baseline	4.20	4.7438	4.75
Global Subscale Score Session Five	2.7438	3.25	4.65
Change	-1.46	-1.49	-0.10
Eating Concerns Subscale Score Baseline	3.60	4.40	4.80
Eating Concerns Subscale Score Session Five	1.40	2.0	4.20
Change	-2.20	-2.40	-0.60

**Session Ten EDE-Q 6.0 Data**

At session ten, the *global score* mean was ( $M = 3.7375$ ,  $SD = .76147$ ) with a range of 1.99 (minimum = 2.26, maximum = 4.25) (see Table 8). Participant One scored 4.1. Participant Two scored 2.8625. Participant Three scored 4.25 (see Table 9). At session ten, the *eating concerns subscale* mean was ( $M = 2.7333$ ,  $SD = 1.10151$ ) with a range of 1.63179 (minimum = 1.60, maximum = 3.8) (see Table 8). Participant One scored 2.80.

Participant Two scored 1.60. Participant Three scored 3.80 (see Table 9). Session ten combined results can also be seen in Table 8. Session five individual participant results can also be seen in Table 9 and Figures 7-9.

Table 8

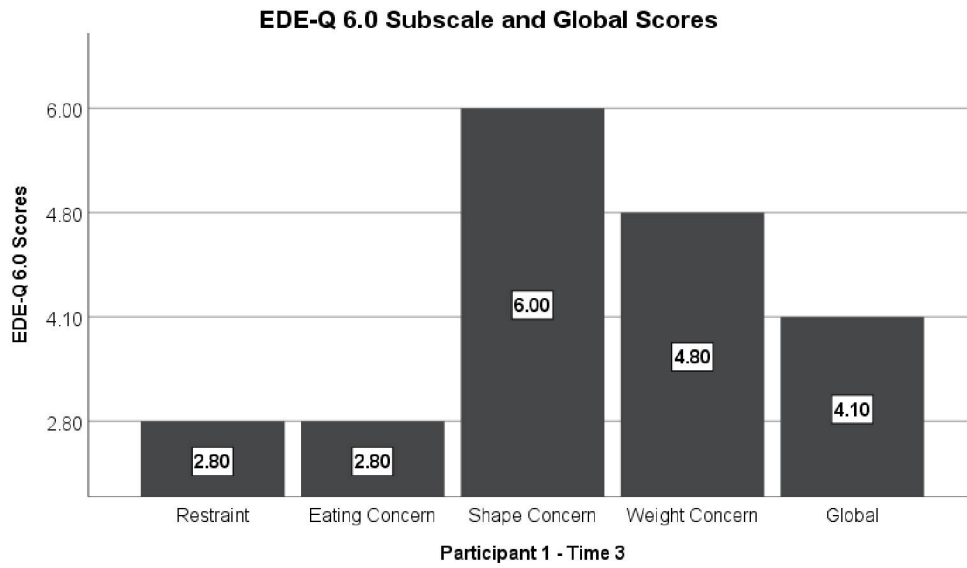
*Session Ten Combined Participant Results*

Scale	Mean	Standard Deviation	Range	Minimum	Maximum	N
Global Score	3.7375	.76147	1.99	2.86	4.25	3
Eating Concerns Subscale Score	2.7333	1.10151	1.63179	1.60	3.80	3

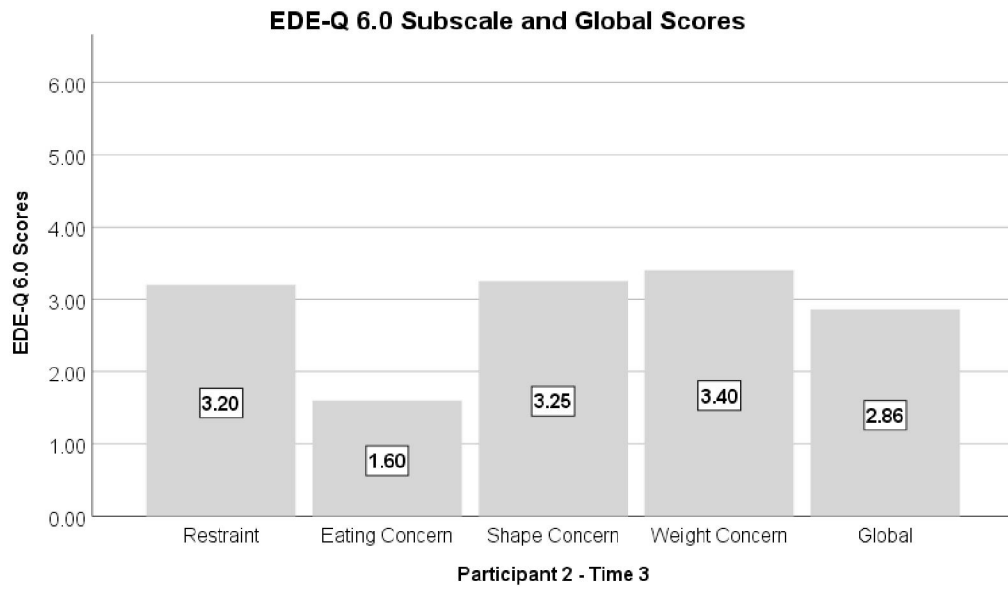
Table 9

*Session Ten Individual Participant Results*

Scale	Participant One	Participant Two	Participant Three
Global Subscale Score	4.10	2.8625	4.25
Eating Concerns Subscale Score	2.80	1.60	3.80

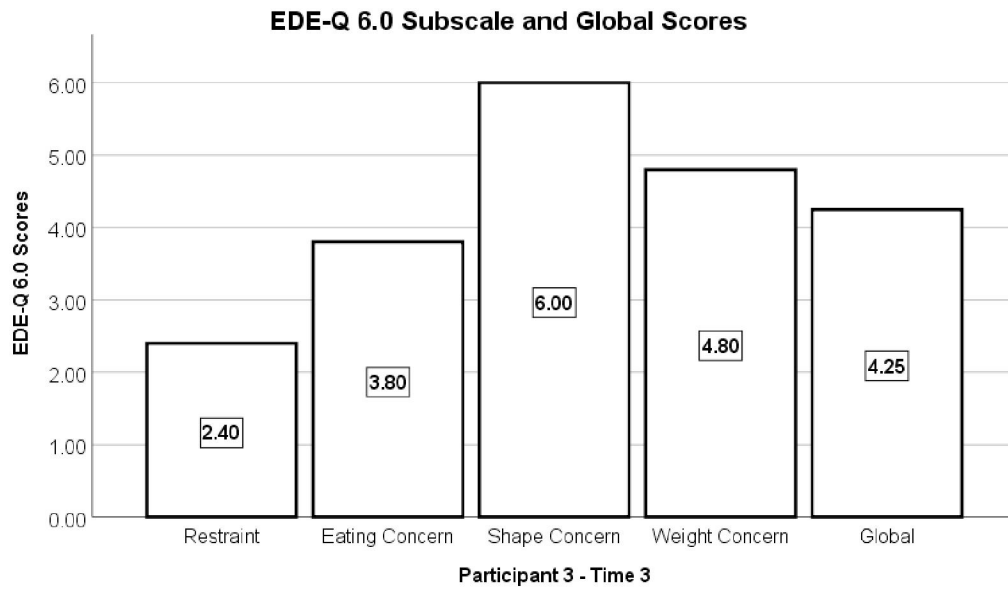


*Figure 7.* Participant One session ten subscale and global scores from the EDE-Q 6.0.



*Figure 8.* Participant Two session ten subscale and global scores from the EDE-Q 6.0.





*Figure 9.* Participant Three session ten subscale and global scores from the EDE-Q 6.0.

### Change From Session Five to Session Ten EDE-Q 6.0

The combined change in the *global scores* from session five to session ten was a decrease of 5.34% (-.1896). The combined change in the *eating concern subscale* from session five to session ten was an increase of 7.89% (.20). The combined data changes can be seen in Table 10 and Graphs 10-13.

Participant One showed increases of 33% (1.3562) on the *global score* and a 100% (1.40) increase on the *eating concern subscale*. Participant Two showed decreases in the *global score* of 11.92% (-0.3875) and decrease in the *eating concern subscale* of 20% (-0.40). Participant Three showed decreases in the *global score* of 8.6% (-0.40) and decrease in the *eating concern subscale* of 9.52% (-0.40). Individual data changes can be seen in Table 11 and Figures 10 and 11.

Table 10

#### *Combined Participant Change Results Session Five to Session Ten*

Scale	Session Five	Session Ten	Change
Global Score	3.5479	3.7375	-.1896
Eating Concerns Subscale Score	2.5333	2.7333	.20

Table 11

*Individual Participant Change Results Session Five to Session Ten*

Scale	Participant One	Participant Two	Participant Three
Global Score Session Five	2.7438	3.25	4.65
Global Subscale Score Session Ten	4.10	2.8625	4.25
Change	1.3562	-0.3875	-0.40
Eating Concerns Subscale Score Session Five	1.40	2.0	4.20
Eating Concerns Subscale Score Session Ten	2.80	1.60	3.80
Change	1.40	-0.40	-0.40

**Change From Baseline to Session Ten EDE-Q 6.0**

The combined change in the *global score* from baseline to session ten was a decrease of 18.11% (-.8271) showing an overall decrease. The combined change in the *eating concern subscale* from baseline to session ten was a decrease of 35.93% (-1.5333) showing an overall decrease. The combined data changes can be seen in Table 12 and Figures 10-13.

Participant One showed decreases on the *global score* of 2.38% (-0.10) and decrease on the *eating concern subscale* of 22.22% (-0.80). Participant Two showed decreases on the *global score* of 39.65% (-1.8813) and decreases on the *eating concern subscale* of 63.63% (-2.80). Participant Three showed decreases in the *global subscale* of 10.52% (-0.50) and decreases on the *eating concern subscale* of 20.83% (-1.0).

Individual data changes can be seen in Table 13.

Table 12

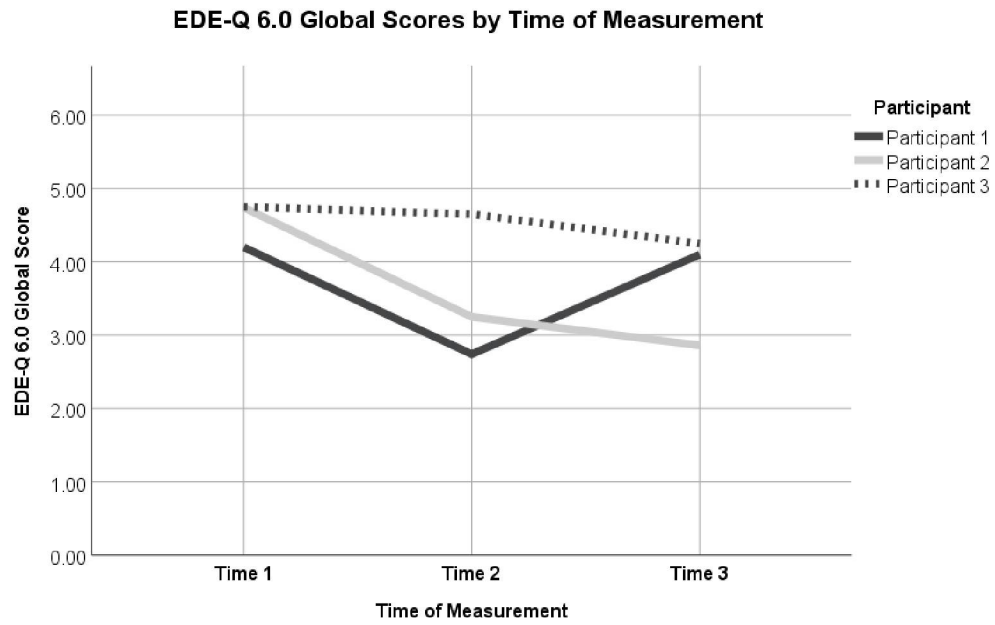
*Combined Participant Change Results Baseline to Session Ten*

Scale	Baseline	Session Ten	Change
Global Score	4.5646	3.7375	-.8271
Eating Concerns Subscale Score	4.2667	2.7333	-1.5333

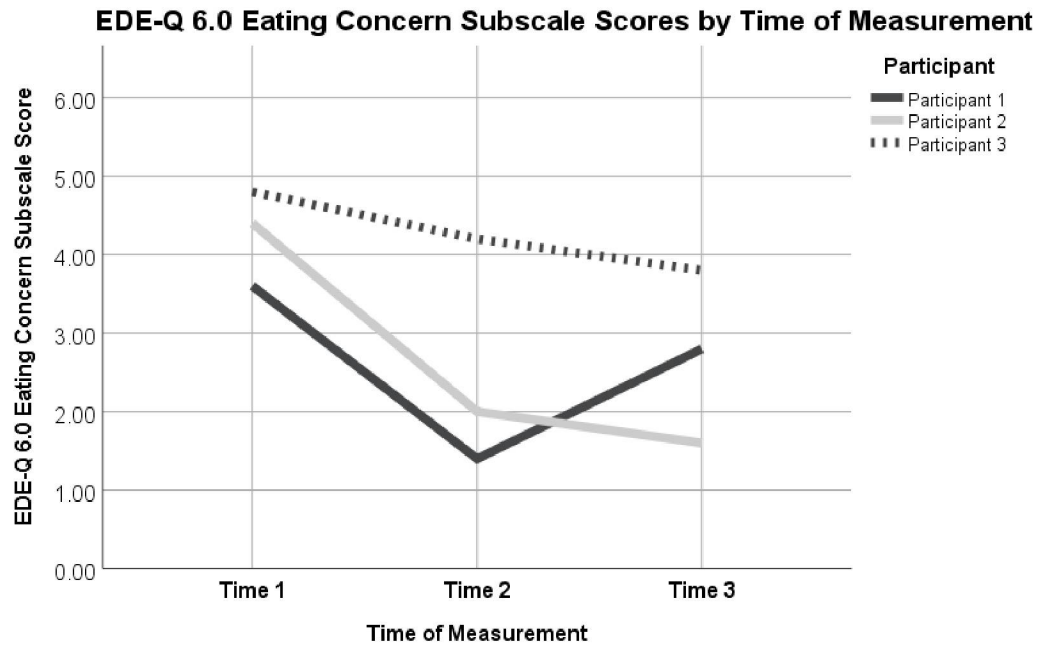
Table 13

*Individual Participant Change Results Baseline to Session Ten*

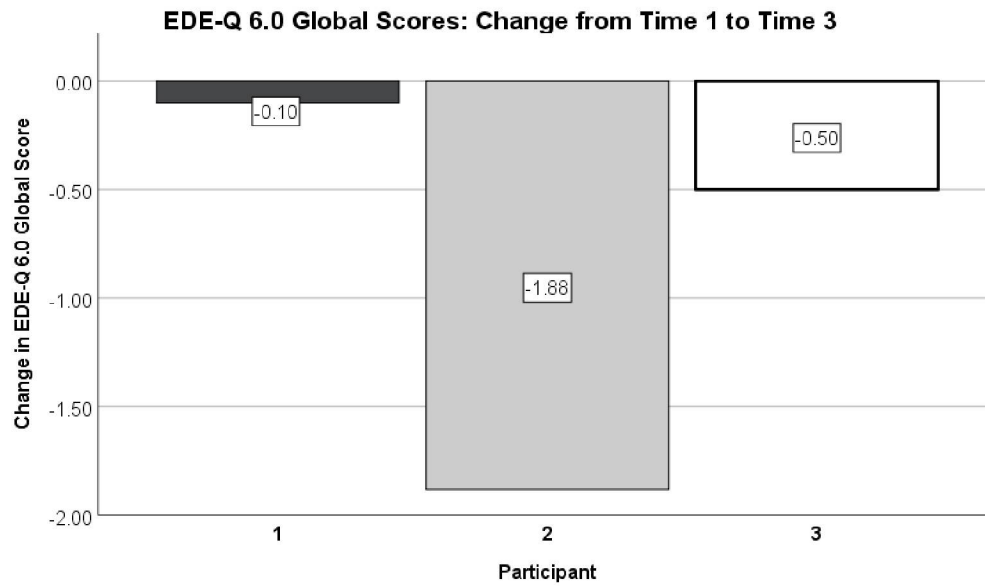
Scale	Participant One	Participant Two	Participant Three
Global Score Baseline	4.20	4.7438	4.75
Global Subscale Score Session Ten	4.10	2.8625	4.25
Change	-0.10	-1.8813	
Eating Concerns Subscale Score Baseline	3.60	4.40	4.80
Eating Concerns Subscale Score Session Ten	2.80	1.60	3.80
Change	-0.80	-2.80	-1.0



*Figure 10.* The EDE-Q 6.0 global scores by time of measurement.

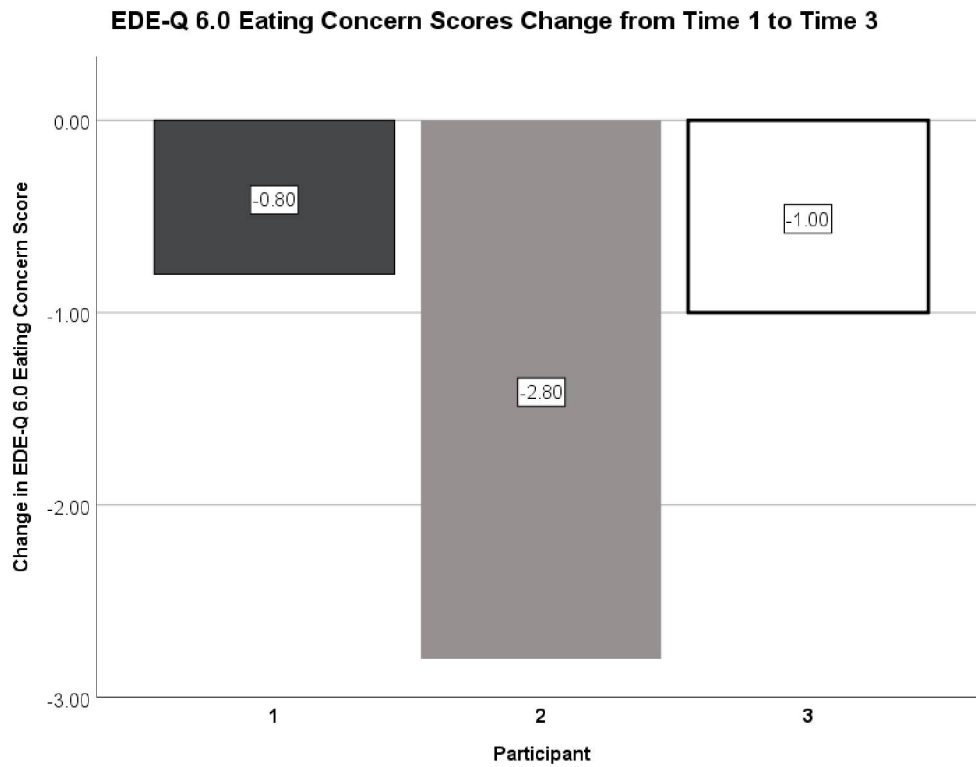


*Figure 11.* The EDE-Q 6.0 eating concerns subscale scores by time of measurement.



*Figure 12.* The EDE-Q 6.0 global score change from baseline to session ten.

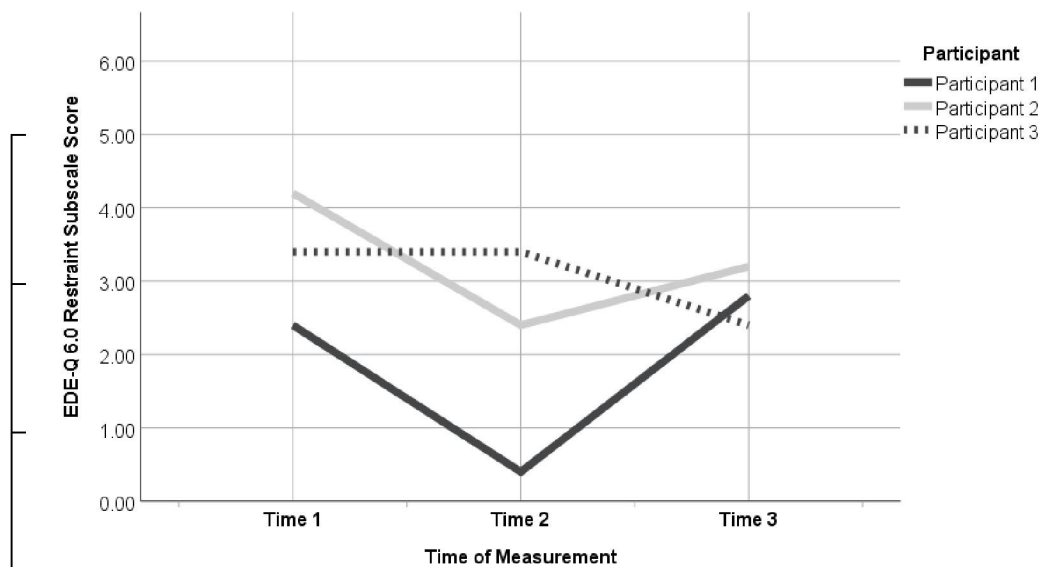




*Figure 13.* The EDE-Q 6.0 eating concerns subscale score change from baseline to session ten.

**Post-Hoc Analysis**

The change found from baseline to session ten in non-hypothesis related subscales was minimal. On the *restraint subscale* Participant One had an increase of 16.66% (0.40), Participants Two had a decrease of 23.8% (-1.0) and Participant Three had a decrease of 29.41% (-1.0). On the *shape concern subscale* Participant One and Three had no change (0.0) and Participant Two had a decrease of 39.59% (-2.13). On the *weight concern subscale* Participant One and Three had no change (0.0) and Participant Two had a decrease of 32% (-1.60). These results can be seen in Table 14 and in Figures 14-16. Figures 14-16 contain session five data points for the relevant subscales.

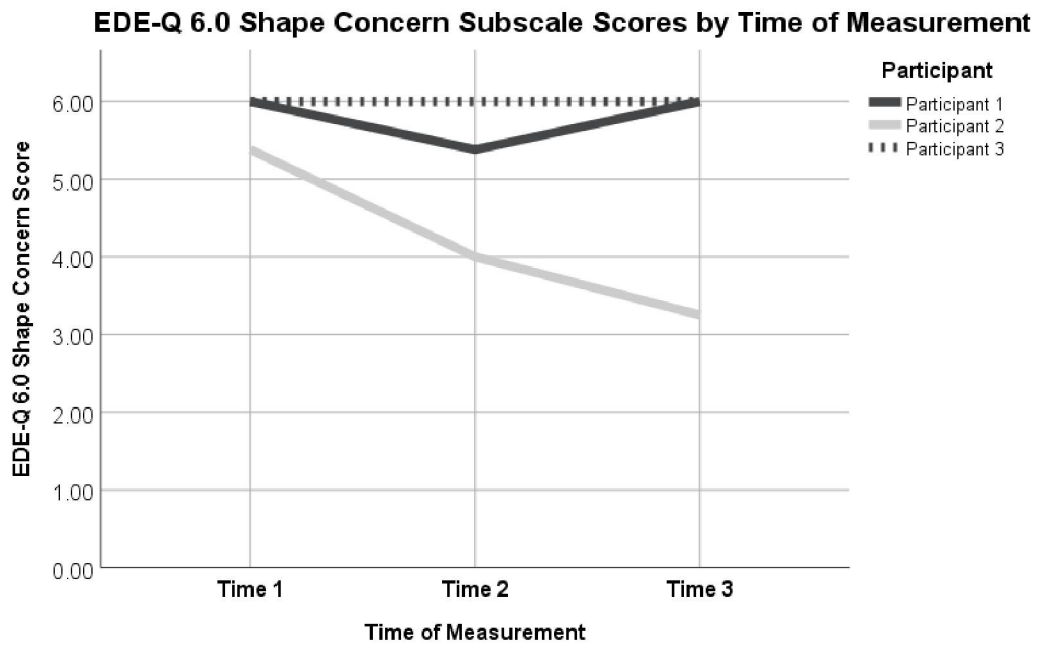
**EDE-Q 6.0 Restraint Subscale Scores by Time of Measurement**

Shape Concerns Subscale Score Baseline	6.0	5.38	6.0
Shape Concerns Subscale Score Session Ten	6.0	3.25	6.0
Change	0.0	-2.13	0.0
Weight Concern Subscale Score Baseline	4.80	5.0	4.80
Weight Concern Subscale Score Session Ten	4.80	3.40	4.80
Change	0.0	-1.60	0.0

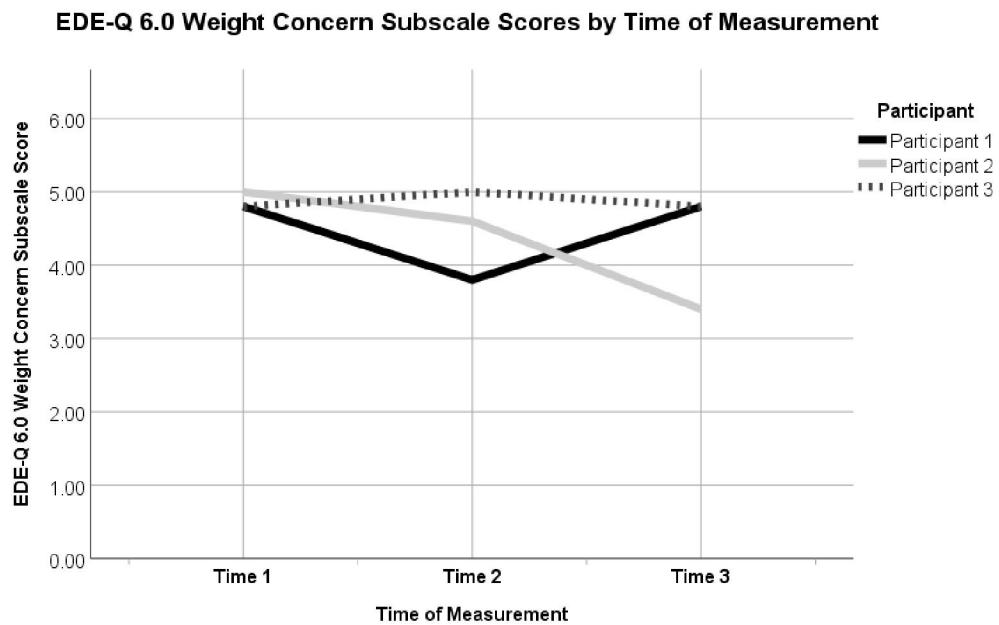
Table 14

*Change in EDE-Q 6.0 Restraint, Shape, and Weight Concerns Subscales*

*Figure 14. The change in EDE-Q 6.0 restraint subscale scores by time of measurement*



*Figure 15.* The change in EDE-Q 6.0 shape concern subscale scores by time of measurement



*Figure 15.* The change in EDE-Q 6.0 weight concern subscale scores by time of measurement

### Summary

The combined results show a decrease of 22.27% (-1.0167) from baseline to session five on the *global score* and a decrease of 41% (-1.7333) on the *eating concerns subscale*. From baseline to session five Participants One and Two showed larger decreases on both the *global scores* (34.76% and 31.4%) and *eating concerns subscale scores* (61.11% and 54.54%). Participant Three showed smaller decreases on the *global scores* (2.15%) and moderate decreases on the *eating concerns subscale scores* (12.5%).

The combined results show a decrease of 18.11% (-0.8271) from baseline to session ten on the *global score* and a greater decrease of 35.93% (-1.5333) on the *eating concerns subscale*. From baseline to session ten all three participants showed a decrease on both the *global scores* and *eating concerns subscale scores*.

The post-hoc analysis show mixed results across the three subscales (*restraint, weight concerns, and shape concerns*) from baseline to session ten. Participants Two and Three saw decreases on the *restraint subscale scores* (23.8% and 29.41%) whereas

Participant One increased (16.66%). Participant Two showed decreases on both the *shape concern subscale scores* (39.59%) and *weight concern subscale scores* (32%), and the other two participants showed no change on either subscale.

#### Chapter Four

The results of the study supported both hypotheses; a decrease in the *global score* of the EDE-Q 6.0 and a decrease score on the EDE-Q 6.0 *eating concern subscale*. Decreases in the *global score* and *eating concern subscale scores* were observed from baseline to session ten both in the combined results and for each individual participant. The amount of decrease in *global scores* and *eating concern subscale scores* varied by participant from baseline to session ten.

A point of interest is that between baseline and session five the combined scores of the participants showed a decrease for both the *global scores* and *eating concerns subscale*, with each individual participant showing a decrease in scores. However, from session five to session ten one participant showed increases on both scales skewing the combined change to an increase on the *eating concerns subscale scores*, despite each of the other participants showing decreases.

These results suggest that participants have experienced decreases in maladaptive food behaviors overall. Because of the small sample size and lack of control group it cannot be stated that the therapy was the result of the change. However, these results suggest that EMDR therapy was at least a contributing factor to the overall changes in food behaviors experienced by the participants.

### **Integration**

It is promising that the results from this study supported the hypotheses. Being that no other studies could be located focused on the use of EMDR to treat obesity, this pilot study is the first of its kind. The findings may assist to inform treatment for obesity.

### **Exploration**

This study was designed as a pilot study which implies three inherent weaknesses; sample size, lack of control group, and limited duration of treatment. In this study, a small sample size was used, which renders the results ungeneralizable. A larger sample size would remedy this. A control group should also be used in future studies to compare participants undergoing treatment and those who are not receiving treatment.

Additionally, the therapy was administered for ten sessions which is not an appropriate amount of time to measure weight changes directly.

This study used a self-report measure to determine changes in food related behaviors to indicate the potential for weight changes. The study did not utilize actual weighing of participants or utilize self-report weight, only behaviors as indicated by the EDE-Q 6.0 to infer the potential for weight loss because of the study's brief nature.

Ideally, an objective measurement of weight, such as a third party weighing and



recording participant's weight over a longer period of time would be utilized in addition to the self-report questionnaire. An additional measurement could be food logs as an indication of change in caloric intake specifically.

Post-treatment follow-up would add to this study. Previous EMDR studies have found that participants continue to increase in their adaptive behaviors after receiving EMDR therapy (Shapiro, 2002). It would add to the research to know if changes in food behaviors persist or continue to become more adaptive. The information of long-term change could then be used in comparison to other obesity treatments that have been thoroughly researched.

### **Future Directions and Recommendations**

This study was designed as a pilot study to explore EMDR as a treatment modality for obesity with the potential to inform future research. Because the results of the study supported the hypotheses, a full-scale study being conducted is recommended. Further research could utilize the format followed in this study and making adjustments from the weaknesses identified. A larger sample size would be utilized to create statistically relevant results that would be generalizable to a broad population. A control group would need to be used to demonstrate change from the treatment being used. A longer timespan of treatment would be useful to observe weight changes of the participants. An objective measurement of weight over time would need to be utilized. It is also advised to incorporate a follow-up of sustained change for participants in weight and behavior.

The pilot study conducted utilized the Standard EMDR Protocol. Future research in this area could focus on developing an efficacious EMDR protocol specifically for treating obesity in persons with a history of early childhood trauma. It may explore what types of early childhood memories are found to yield adaptive changes in food related behaviors when targeted in the protocol. Another potential point of interest in a new protocol may be what types of resources are needed in the early stages of EMDR to aid in adaptive food behavior changes and how future template may be used in later stages of EMDR to maintain progress.

Based on the finding of Participant One and her initial decrease in maladaptive eating behaviors and then an increase between session five and ten, it could assist in treatment to better understand this change. Future research could incorporate a qualitative component to further investigate and gain insight into the phenomenological components of regression from previously established progress into more adaptive food behaviors. Information found could assist in supporting participants to maintain progress and assist in modifying treatment to be flexible to the unique needs of the individual.

### **Summary**

Reviewed research has supported a correlation between early childhood trauma and obesity in adulthood. Currently, treatments for obesity focus predominantly on weight loss through behavior and lifestyle changes, medicine and/or surgery. The pilot study explored the usefulness of EMDR to treat early childhood trauma in adults who are currently obese, with the goal of changing eating behaviors to indicate a potential for weight loss. The results of the study showed a decrease in maladaptive eating behaviors

across all participants. These findings suggest that further research is warranted on EMDR as a treatment for obesity.

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Appendix A

## Adverse Childhood Experience (ACE) Questionnaire

### Finding your ACE Score ra hbr 10 24 06

**While you were growing up, during your first 18 years of life:**

1. Did a parent or other adult in the household **often** ...  
Swear at you, insult you, put you down, or humiliate you?  
**or**  
Act in a way that made you afraid that you might be physically hurt?  
Yes No If yes enter 1 \_\_\_\_\_
2. Did a parent or other adult in the household **often** ...  
Push, grab, slap, or throw something at you?  
**or**  
**Ever** hit you so hard that you had marks or were injured?  
Yes No If yes enter 1 \_\_\_\_\_
3. Did an adult or person at least 5 years older than you **ever**...  
Touch or fondle you or have you touch their body in a sexual way?  
**or**  
Try to or actually have oral, anal, or vaginal sex with you?  
Yes No If yes enter 1 \_\_\_\_\_
4. Did you **often** feel that ...  
No one in your family loved you or thought you were important or special?  
**or**  
Your family didn't look out for each other, feel close to each other, or support each other?  
Yes No If yes enter 1 \_\_\_\_\_
5. Did you **often** feel that ...  
You didn't have enough to eat, had to wear dirty clothes, and had no one to protect you?  
**or**  
Your parents were too drunk or high to take care of you or take you to the doctor if you needed it?  
Yes No If yes enter 1 \_\_\_\_\_
6. Were your parents **ever** separated or divorced?  
Yes No If yes enter 1 \_\_\_\_\_
7. Was your mother or stepmother:  
**Often** pushed, grabbed, slapped, or had something thrown at her?  
**or**  
**Sometimes or often** kicked, bitten, hit with a fist, or hit with something hard?  
**or**  
**Ever** repeatedly hit over at least a few minutes or threatened with a gun or knife?  
Yes No If yes enter 1 \_\_\_\_\_
8. Did you live with anyone who was a problem drinker or alcoholic or who used street drugs?  
Yes No If yes enter 1 \_\_\_\_\_
9. Was a household member depressed or mentally ill or did a household member attempt suicide?  
Yes No If yes enter 1 \_\_\_\_\_
10. Did a household member go to prison?  
Yes No If yes enter 1 \_\_\_\_\_

**Now add up your "Yes" answers: \_\_\_\_\_ This is your ACE Score**

Appendix B

## EATING QUESTIONNAIRE

**Instructions:** The following questions are concerned with the past four weeks (28 days) only. Please read each question carefully. Please answer all the questions. Thank you.

**Questions 1 to 12:** Please circle the appropriate number on the right. Remember that the questions only refer to the past four weeks (28 days) only.

On how many of the past 28 days .....	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
1 Have you been deliberately <u>trying</u> to limit the amount of food you eat to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
2 Have you gone for long periods of time (8 waking hours or more) without eating anything at all in order to influence your shape or weight?	0	1	2	3	4	5	6
3 Have you <u>tried</u> to exclude from your diet any foods that you like in order to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
4 Have you <u>tried</u> to follow definite rules regarding your eating (for example, a calorie limit) in order to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
5 Have you had a definite desire to have an <u>empty</u> stomach with the aim of influencing your shape or weight?	0	1	2	3	4	5	6
6 Have you had a definite desire to have a <u>totally flat</u> stomach?	0	1	2	3	4	5	6
7 Has thinking about <u>food, eating or calories</u> made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?	0	1	2	3	4	5	6
8 Has thinking about <u>shape or weight</u> made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?	0	1	2	3	4	5	6
9 Have you had a definite fear of losing control over eating?	0	1	2	3	4	5	6
10 Have you had a definite fear that you might gain weight?	0	1	2	3	4	5	6
11 Have you felt fat?	0	1	2	3	4	5	6
12 Have you had a strong desire to lose weight?	0	1	2	3	4	5	6



**Questions 13-18: Please fill in the appropriate number in the boxes on the right. Remember that the questions only refer to the past four weeks (28 days).**

**Over the past four weeks (28 days) .....**

- 
- 13 Over the past 28 days, how many times have you eaten what other people would regard as an unusually large amount of food (given the circumstances)? .....
- 
- 14 ..... On how many of these times did you have a sense of having lost control over your eating (at the time that you were eating)? .....
- 
- 15 Over the past 28 days, on how many **DAYS** have such episodes of overeating occurred (i.e., you have eaten an unusually large amount of food and have had a sense of loss of control at the time)? .....
- 
- 16 Over the past 28 days, how many times have you made yourself sick (vomit) as a means of controlling your shape or weight? .....
- 
- 17 Over the past 28 days, how many times have you taken laxatives as a means of controlling your shape or weight? .....
- 
- 18 Over the past 28 days, how many times have you exercised in a “driven” or “compulsive” way as a means of controlling your weight, shape or amount of fat, or to burn off calories? .....
- 

**Questions 19 to 21: Please circle the appropriate number. Please note that for these questions the term “binge eating” means eating what others would regard as an unusually large amount of food for the circumstances, accompanied by a sense of having lost control over eating.**

19 Over the past 28 days, on how many days have you eaten in secret (ie, furtively)? ..... Do not count episodes of binge eating	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
	0	1	2	3	4	5	6
20 On what proportion of the times that you have eaten have you felt guilty (felt that you've done wrong) because of its effect on your shape or weight? ..... Do not count episodes of binge eating	None of the times	A few of the times	Less than half	Half of the times	More than half	Most of the time	Every time
	0	1	2	3	4	5	6
21 Over the past 28 days, how concerned have you been about other people seeing you eat? ..... Do not count episodes of binge eating	Not at all	Slightly		Moderately		Markedly	
	0	1	2	3	4	5	6

Questions 22 to 28: Please circle the appropriate number on the right. Remember that the questions only refer to the past four weeks (28 days).

Over the past 28 days .....	Not at all		Slightly		Moderate -ly		Markedly
22 Has your <u>weight</u> influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
23 Has your <u>shape</u> influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
24 How much would it have upset you if you had been asked to weigh yourself once a week (no more, or less, often) for the next four weeks?	0	1	2	3	4	5	6
25 How dissatisfied have you been with your <u>weight</u> ?	0	1	2	3	4	5	6
26 How dissatisfied have you been with your <u>shape</u> ?	0	1	2	3	4	5	6
27 How uncomfortable have you felt seeing your body (for example, seeing your shape in the mirror, in a shop window reflection, while undressing or taking a bath or shower)?	0	1	2	3	4	5	6
28 How uncomfortable have you felt about <u>others</u> seeing your shape or figure (for example, in communal changing rooms, when swimming, or wearing tight clothes)?	0	1	2	3	4	5	6

What is your weight at present? (Please give your best estimate.) .....

What is your height? (Please give your best estimate.) .....

If female: Over the past three-to-four months have you missed any menstrual periods? .....

If so, how many? .....

Have you been taking the "pill"? .....

**THANK YOU**