Can Yoga Aid in the Treatment of Eating Disorders? A Randomized Controlled Trial

by

Margaret Alena Brennan

A thesis submitted in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

in

Counselling Psychology

Department of Educational Psychology

University of Alberta

Abstract

Binge eating disorder (BED) and bulimia nervosa (BN) are psychological disorders with devastating effects. Many individuals with these disorders either do not seek treatment or fail to improve with standard treatments. Over the past decade, Yoga has increasingly been incorporated into the treatment of eating disorders. While preliminary research provides some support for this practice, further research is needed. This randomized controlled trial investigated the effects of participating in an eight-week Kripalu Yoga program or a waitlist control condition on women with BN and BED. Participants in both groups completed measures of binge eating frequency, self-compassion, self-criticism, and difficulties with emotion regulation at weeks zero, eight, and twelve. Participants in the Yoga group also completed measures of state mindfulness following the first, third, sixth, and eighth Yoga classes, and kept a log of their home Yoga practice. A series of mixed model ANOVAs revealed that Yoga participants experienced larger decreases in binge eating frequency, self-criticism and emotion regulation difficulties, and larger increases in self-compassion across time than controls. Yoga participants also experienced increases in mindfulness states across the eight weeks of the program. While amount of home practice predicted improvements in emotion regulation, self-compassion, and self-criticism, it did not predict changes in binge eating frequency or mindfulness skills. These results provide further support for the continued use of Yoga in eating disorder treatment. The findings also shed light on the mechanisms of change—participation in the eight-week Yoga program enhanced self-compassion and mindfulness skills, which have demonstrated benefits for individuals with eating disorders, and positively influenced self-criticism and emotion regulation difficulties, both of which perpetuate these disorders. As predicted, Kripalu Yoga was a good fit for individuals with BN or BED, likely due to its emphasis on self-compassion and mindfulness.

Preface

This thesis is an original work by Margaret Brennan. The research project, of which this thesis is a part, received research ethics approval from the University of Alberta Research Ethics Board, Project Name “Can Yoga Aid in the Treatment of Bulimia and Binge Eating Disorder? A Randomized Controlled Trial”, No. Pro00044361, January 7, 2014.

Dedication

For those struggling with an eating disorder and their loved ones.

May you find hope and healing.

Acknowledgements

There are many people I would like to acknowledge who assisted and supported me throughout this journey. First and foremost I would like to thank all of the women who participated in my study. This study would have not been possible without your willingness to try a new approach to treating eating disorders and I will be forever grateful for your participation.

I would also like to thank the individuals and corporations who donated their time, guidance, and financial assistance in support of this project. Thank you to my research assistants, Lauren Berlinguette and Shaylyn Hunter. I greatly appreciate that I could rely on you both. I would also like to thank Dr. Don Sharpe for sharing his statistical expertise. Your guidance, support, and encouragement have been invaluable to me and I cannot express enough my gratitude to you. Thank you to Naresh (Ron King) for sharing your time, feedback, and wisdom with me. I am so grateful to have learned Yoga from you and I appreciate your support of this project. Lastly, thank you to Gaiam Canada for donating Yoga props in support of this study and to both Gaiam Canada and Half Moon for providing me with reduced pricing. Your financial support helped to make this project a reality and is an example of the giving spirit of Yoga.

Thank you to my committee members Dr. Steve Knish, Dr. William Hanson, Dr. Jacqueline Pei, Dr. Doug Gross, and Dr. Adele LaFrance Robinson for your support and assistance in helping me to refine this project. I would like to especially thank my supervisor Dr. William Whelton for allowing me to pursue a project that I was passionate about. This gift has made all the difference in my enjoyment throughout every step of this journey. Thank you Bill for your ongoing guidance, support and encouragement.

I would like to humbly thank the Social Sciences and Humanities Research Council of Canada, the Government of Alberta, the University of Alberta's Faculty of Graduate Studies and Research, and the University of Alberta's Department of Educational Psychology for their generous support of this project.

Finally, thank you to my family, friends, and colleagues. Your belief, encouragement, and support have given me the strength, determination, and confidence to finish this project. I would especially like to thank my parents, Barb and Dave Brennan, my sister Katie Brennan, and my partner Ben Carriere. I love you all so much and would not have made it here without your unconditional love and support. Ben, I cannot fully express my appreciation for your support of my academic endeavors. Although this required us to be separated by a whole continent at times, I always knew you were there for me every step of the way and I could never have finished this project without you. You have truly taught me the meaning of the word compassion and for this I will be forever grateful.

Table of Contents

List of Tables

List of Figures

Introduction

Binge eating is an increasingly common phenomenon among women living in industrialized countries (Micali, Hagberg, Petersen, & Treasure, 2013). It is defined as eating more food than most people would eat during a two hour period while experiencing a perceived loss of control (American Psychiatric Association [APA], 2013). Binge eating comprises a central component of two eating disorder diagnoses in the Diagnostic and Statistics Manual of Mental Disorders (5th ed.; DSM-5): bulimia nervosa (BN) and binge eating disorder (BED; APA, 2013). BN and BED are mental health disorders that pose detrimental physical and psychological consequences. Alarmingly, the majority of women with these disorders do not seek treatment. A recent study showed that only 40% of women with BN surveyed received treatment for their eating behaviours, and the majority of these women (89%) sought help from a general practitioner as opposed to a mental health professional (11%; Mond, Hay, Rodgers, & Owen, 2007). Similarly, only 43% of individuals with BED receive treatment (National Eating Disorder Association [NEDA], 2013). Unfortunately, even when individuals do receive treatment, they may not be helped as standard psychological treatments for these disorders are ineffective for up to half of those seeking treatment (Wilson, Grilo, & Vitousek, 2007) and relapse post-treatment is common (NICE, 2005; Steinhausen, 2002). Therefore, it is essential to find treatment approaches that individuals with BN and BED will be willing to engage and that will be effective for those not helped by standard treatments.

Currently many researchers are conceptualizing binge eating as a way of managing affect and other internal experiences perceived as distressing (e.g., Dolhanty & Greenberg, 2007; Safer, Telch, & Agras, 2001; Telch, Agras, & Linehan, 2001; Wiser & Telch, 1999). These conceptualizations are based on the knowledge that binge eating is frequently preceded by

negative affect (Haedt-Matt and Keel, 2011). Research into the precipitating nature of negative affect on binge eating has recently focused on the emotional processing deficits that characterize the eating disorder population (Fox & Froom, 2009). Individuals with BN demonstrate lower levels of emotional awareness and emotion regulation capabilities than controls (Bydlowski et al., 2005) and individuals with BED have a well-documented deficit in their ability to regulate emotions (Telch et al., 2001). It is hypothesized that binge eating is a means of controlling affect that individuals cannot otherwise manage (e.g., Dolhanty & Greenberg, 2007). In this way, emotional processing deficits not only predispose individuals to developing eating disorders, but they also perpetuate these disorders by necessitating the reliance on eating disorder behaviours to manage emotions (APA, 2000; Stice, 2002).

One known contributor to negative affect is self-criticism (Dunkley, Zuroff, & Blankenstein, 2003; Gilbert, 2009). Self-criticism contributes to shame and other difficult emotions because self-critical individuals experience minor hassles in catastrophic terms and perceive others as condemning, which leads to chronic dysphoria (Dunkley et al., 2003; Gilbert, 2009). Self-critical individuals also become overly identified with their thoughts and emotions (Nolen-Hoeksema, 1991), making effective management of emotions difficult (Bennett-Goleman, 2001). Not surprisingly, individuals with eating disorders are often highly self-critical and self-criticism has been connected to eating disorder pathology (Fennig et al., 2008; Steiger et al., 1989). Self-criticism contributes to negative affect, which in turn leads to binge eating as these individuals attempt to avoid and inhibit the experience of emotion (Heatherton & Baumeister, 1991; McManuss, Waller & Chadwick, 1996; Schupak-Neuberg & Nemeroff, 1993). Considering these research findings, the necessity of addressing self-criticism and emotion regulation difficulties in the treatment of BN and BED becomes apparent.

An exciting current trend in the treatment of eating disorders is the incorporation of mindfulness-based practices. Mindfulness is defined as "the awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to things as they are" (Williams, Teasdale, Segal, & Kabat-Zinn, 2007, p. 47) rather than as we want them to be. A variety of mindfulness practices exist, all of which aim to enhance the development of mindfulness. Mindfulness practices are theoretically well-suited for the treatment of BN and BED for several reasons. First, developing a regular mindfulness practice has been shown to increase emotion regulation capabilities (Lutz, Brefczynski-Lewis, Johnstone, & Davidson, 2008; Perlman, Salomons, Davidson, & Lutz, 2010; Teper, Segal, & Inzlicht, 2013). Second, mindfulness decreases emotional reactivity and impulsive behaviours (Creswell et al., 2007; Ortner, Kilner, & Zelazo, 2007), which often lead to binge eating episodes (Fischer, Smith, & Anderson, 2003; Nasser, Gluck, & Geliebter 2003). Third, the emphasis on acceptance in mindfulness practices contributes to increases in self-compassion (Farb, Anderson, & Segal, 2012; Germer, 2009; Leary et al., 2007), which helps to counteract self-criticism and facilitates greater regulation of internal experiences (i.e., thoughts, emotions, sensations; Neff, 2003; Neff & McGehee, 2010).

Another potential benefit to adopting a mindfulness-based approach is the prominence of mindfulness in mainstream culture. The current Zeitgeist embraces mindfulness and other contemplative practices as a path to wellness. The spirit of the times may make mindfulness-based treatments more appealing to individuals suffering from eating disorders than standard psychological treatments. Indeed, many individuals are opting to use complementary and alternative medicines (CAM) over traditional approaches. CAM is "a group of diverse medical and health care systems, practices, and products that are not generally considered part of

conventional medicine" (National Center for Complementary and Alternative Medicine [NCCAM], 2010, para. 10). A National Canadian survey conducted between 2001 and 2005 found that 12.4% of Canadians surveyed had accessed CAM services within the past 12 months (Metcalfe, Williams, McChensey, Patten, & Jetté, 2010). Females between the ages of 25 to 44 years of age were the most likely to have used CAM services. Similarly, 85 million American adults and 8.5 million American children (under the age of 18) accessed CAM services in 2007, with mind-body therapies the most frequently accessed services (Barnes, Bloom & Nahin, 2008). Mind–body therapies are one category of CAM services. These therapies "focus on the relationships among the brain, mind, body, and behavior, and their effect on health and disease" (Wahbeh, Elsas, & Oken, 2008, p. 2321). Many practices fall under mind-body therapies such as Yoga, tai chi, hypnosis, and biofeedback (Wahbeh et al., 2008). Individuals are increasingly choosing mind-body therapies to treat mental health issues (Barnes et al., 2008). These alternative approaches are often viewed as more holistic and offer several benefits: they involve low levels of physical or emotional risk, they are frequently cheaper than traditional medical approaches, and they allow individuals to be more directly involved in guiding their own treatment (Wahbeh, Elsas, & Oken, 2008).

One of the most commonly used CAM mind-body therapies is Yoga (Barnes et al., 2008). Yoga is an ancient mind-body practice that emerged out of India (Feuerstein, 2002). The word Yoga will be capitalized throughout in recognition of its "stature of a highly evolved cultural system of beliefs and practices, even though clinical applications tend to de-contextualize it from its cultural and spiritual roots" (Salmon, Lush, Jablonski, & Sephton, 2009, p. 59). Yoga practice adopts a holistic approach to wellness that involves moral principles, ethical practices, physical postures, breathing practices, and meditation (Feuerstein, 2002). Over

the past decade, the popularity of Yoga has surged in the Western world. According to the most recent survey, 1.4 million Canadians reported practicing Yoga in 2005 (North American Studio Alliance [Namasta], 2005). This statistic represents a 15% increase from 2004 and a 45.4% increase from 2003 (Namasta, 2005). The growing popularity of Yoga does not appear to be slowing down—2.1 million Canadians (one in twelve individuals not practicing Yoga) reported intending to try Yoga within the next year (Namasta 2005). The attraction to Yoga does not stop in the public sphere. Many health care professionals are embracing Yoga because of its physiological benefits. Yoga is also increasingly being incorporated into psychotherapeutic practices as the field of psychology is beginning to understand the importance of addressing the interconnection between the mind and body. As such, researchers have begun to investigate the effects of Yoga on a wide range of clinical issues. Yoga has been found to be beneficial for depression (Brown & Gerbarg, 2005; Shapiro et al., 2007; Woolery, Myers, Sternlieb, & Zeltzer, 2004), anxiety (Gupta, Khera, Vempati, Sharma, & Bijlani, 2006), posttraumatic stress disorder (PTSD; Carter & Byrne, 2003), substance abuse (Khalsa, Khalsa, Khalsa, & Khalsa, 2008), and attention deficit hyperactivity disorder (ADHD; Harrison, Manocha, & Rubia, 2004).

Yoga is also being incorporated into the treatment of eating disorders. This move is supported by research on the effects of mindfulness-based programs. Yoga is a mindfulness practice, allowing for the generation of "hypotheses about the effects of Yoga-based programs based on the larger body of knowledge about the effects of mindfulness-based programs" (Gard et al., 2012, p. 173). Considering the beneficial impact of mindfulness practices on emotion regulation difficulties (Lutz, Brefczynski-Lewis, Johnstone, & Davidson, 2008; Perlman, Salomons, Davidson, & Lutz, 2010; Teper, Segal, & Inzlicht, 2013), impulsive behaviours (Creswell et al., 2007; Ortner, Kilner, & Zelazo, 2007) and self-criticism (Farb, Anderson, &

Segal, 2012; Germer, 2009; Leary et al., 2007; Neff, 2003a; Neff & McGehee, 2010), all of which contribute to the etiology and maintenance of BN and BED, it seems plausible that Yoga may help its practitioners develop greater mindfulness and emotion regulation skills, and lessen self-criticism. Yoga has the added benefit of potentially appealing to individuals unlikely to seek help through traditional eating disorder treatments.

Purpose of the Study

While regular Yoga practice appears theoretically well-suited to the treatment of eating disorders, the efficacy of incorporating Yoga into treatment has yet to be determined. Relatively few studies have examined the impact of incorporating this ancient mind-body practice into eating disorder treatment and the majority of existing studies have significant methodological limitations. Currently only one randomized controlled trial (RCT) has investigated the effects of Yoga on individuals meeting full diagnostic criteria of an eating disorder (Carei, Fyfe-Johnson, Breuner, & Brown, 2010) and this study focused solely on adolescents. Thus, to date no RCTs have investigated the effects of Yoga on adults with eating disorders. There is a need for more rigorous research to investigate the effects of Yoga on eating disorder symptoms in clinical populations. Responding to this need, the present study adopted an RCT design, focusing specifically on the effects of Yoga on binge eating in women meeting diagnostic criteria for BN or BED. Additionally, the present study investigated the effects of Yoga on emotion regulation difficulties and self-criticism, both of which play a role in the etiology and maintenance of eating disorders (Fennig, Hadas, Itzhaky, Roe, Apter, & Shahar, 2008; Fox & Froom, 2009; Hayaki, 2009). Exploring whether Yoga practice leads to a reduction of binge eating episodes adds to the empirical investigation of whether Yoga practices can lead to changes in eating disorder symptoms. Investigating whether Yoga practice helps to decrease self-judgment, improve

emotion regulation, and increase both self-compassion and the ability to invoke a mindfulness state adds to our understanding of the effects of Yoga on individuals with BN and BED and begins to explore how this practice may lead to changes in eating disorder behaviours.

The purpose of the present study was to evaluate the efficacy of incorporating Yoga into the treatment of eating disorders. The guiding research question asked: does participation in an eight-week Kripalu (pronounced Kri-pah-loo) Yoga program benefit women formally diagnosed with BN or BED? Exploring this research question served the important function of helping to inform treatment decisions about whether, how, and why to include Yoga in the treatment of BN and BED. Furthermore, exploring this question contributed to the field of counselling psychology.

Relevance to Counselling Psychology

Counselling psychology is "one of the major specialties within the broad science and profession of psychology" (Gelso, Williams, & Fretz, 2014, p. 3). The field of counselling psychology is concerned with three primary roles: remediation, prevention, and education-development (Gelso et al., 2014). As is often the case, the present study aligned with more than one of these roles. Specifically, this study was rooted in the remedial role—its aim was to to add to the existing knowledge of eating disorders and their treatment in order to be able to help women overcome BN or BED and the struggles associated with these disorders. The present study also aligned with the educative-developmental role of counselling psychology, which strives to "help individuals to plan, obtain, and derive maximum benefits from the kinds of experiences that will enable them to discover and develop their potentialities" (Jordann, Myers, Layton, & Morgan, 1968, p. 1). The Yoga program used in this study can be viewed as a form of mindfulness and self-compassion skills training that taught participants new ways of relating to

their inner experiences. Finally, while the present study was not specifically focused on prevention, information gained in this study could potentially be applicable to the prevention of eating disorders.

The present study's investigation of whether participation in an eight-week Kripalu Yoga program can benefit women with BN or BED is relevant for the field of counselling psychology. It satisfies Krumboltz and colleagues' (1968) *test of relevance* for counselling psychology research, which asserts that research must impact what counsellors do in practice in order to be relevant to the discipline. While we understand that counselling psychologists will not be able to lead their clients through a Yoga program, our study is relevant to practice in a number of ways. First, the results may influence counselling psychologists' willingness to incorporate Yoga into eating disorder treatments. By expanding on their understanding of how and why Yoga may be beneficial for the eating disorder population, professionals working in this area may be more likely to use Yoga as an adjunct to treatment or to refer clients for Yoga classes geared specifically to this population. Second, the present study may influence how professionals think about working with women struggling with an eating disorder and may inform their practice. For example, professionals may develop a greater understanding of the importance of addressing emotion regulation deficits when working with the eating disorder population or the value of helping these individuals develop skills in mindfulness and self-compassion. Lastly, our study builds on the research of other counselling psychologists and their attempts to improve treatment outcomes for women struggling with eating disorders. It is our hope that our research may in turn spur other counselling psychologists to build on our findings and conduct their own research in this area.

A thorough review of the literature will now be provided in order to more fully contextualize the problem and the importance of the proposed study. This review is followed by a detailed description of the present study's methodology, analyses, results, and a subsequent discussion of these results.

Literature Review

Eating Disorders

Eating disorders are a group of psychological disorders characterized by disordered eating, overvaluation of shape and weight, and body dissatisfaction (APA, 2013). This group of disorders most commonly afflicts women. It is estimated that 3% of women in Canada will be affected by an eating disorder in their lifetime (Zhu & Walsh, 2002). Unfortunately the situation is worsening—the incidence of eating disorders in females 10–24 years-of-age has increased over the past half century (Hoek & van Hoeken, 2003). Eating disorders are among the top ten causes of disability in young women (Mathers, Vos, Stevenson, & Begg, 2000) and are now the third most common chronic illness in adolescent girls (Adolescent Medicine Committee, 2001). Sadly, signs of eating disturbances are being seen at increasingly younger ages (Smolak, 2004).

These statistics are alarming because eating disorders cause a host of negative and debilitating consequences on an individual's physical, psychological, and social well-being (Proulx, 2008). Individuals with eating disorders may develop serious physical problems such as heart conditions, endocrine disorders, electrolyte imbalance, and kidney failure (Fairburn & Harrison, 2003), explaining why eating disorders have the highest mortality rate the of any mental illness. Between 18–20% of individuals with an eating disorder will die prematurely due to complications related to their disorder (Cavanaugh & Lemberg, 1999). While this statistic is staggering, it must not overshadow the psychological and social impact of living with an eating

disorder. Individuals afflicted by these disorders experience high degrees of self-criticism, shame, and isolation (APA, 2013; Goss & Gilbert, 2002; Speranza et al., 2003). They also frequently experience comorbid mood, personality, or substance abuse disorders (Bulik & Reichborn-Kjennerud, 2003; DeAngelis, 2002; Dingemans, et al., 2002; Hudson et al., 2007; Sansone & Levitt, 2005; Stein, et al., 2001).

Sadly, the majority of individuals with eating disorders do not seek treatment (Mond et al., 2007; NEDA, 2013) and thus the prevalence rates of these disorders are likely much higher than we know. Without treatment, eating disorders often become chronic illnesses (Proulx, 2008). While previously it was believed that eating disorders primarily affect young women, we now know that eating disorders are often lifetime conditions and may develop later in adulthood (APA, 2013). Perhaps due to the chronic nature of these disorders, crossover between eating disorder diagnoses is common, with many individuals cycling between diagnoses (Fairburn, Cooper, & Shafran, 2003).

The DSM-5 recognizes three main eating disorder diagnoses. These include anorexia nervosa (AN), characterized by self-induced caloric restriction and excessive weight loss; bulimia nervosa (BN), characterized by binge eating and compensatory behaviours; and binge eating disorder (BED), characterized by frequent binge eating (APA, 2013). The DSM-5 also includes two additional categories: other specified feeding or eating disorder (OSFED) and unspecified feeding or eating disorder (UFED; APA, 2013). A diagnosis of OSFED is given when an individual presents with an atypical or partial presentation of AN (e.g., meeting all of the criteria of AN with the exception of being within the normal weight range), BN or BED (e.g., engaging in binge eating or compensatory behaviours at a lower frequency or a shorter duration than is required for the full diagnosis), engages in recurrent episodes of nighttime eating, or

purges in the absence of binge eating (APA, 2013). In contrast, UFED is diagnosed when behaviours cause clinically significant distress or impairment of functioning, but the symptoms fail to meet the criteria for a specific diagnosis, or there is insufficient information to make a specific diagnosis (APA, 2013). The OSFED and UFED categories serve to recognize individuals who exemplify symptoms that do not fit into AN, BN, or BED, but are problematic.

This study focuses on two eating disorder diagnoses: BN and BED. While eating disorders as a whole share much in common, these two disorders are particularly similar. Both disorders are marked by frequent episodes of binge eating (APA, 2013), harsh self-criticism (APA, 2013; Dunkley, Masheb, & Grilo, 2010; Speranza et al., 2003), impulsive tendencies (Fischer, Smith, & Anderson, 2003; Nasser, Gluck, & Geleibter, 2003), and frequent histories of failed diet attempts (APA, 2013).

Diagnostic criteria of bulimia nervosa. According to the DSM-5, BN is characterized by recurrent episodes of binge eating that are accompanied by inappropriate compensatory behaviours in order to prevent weight gain (APA, 2013). In order to qualify for the diagnosis of BN, an individual must engage in both behaviours a minimum of once a week for three months on average (APA, 2013). This criterion marks a change from the previous edition of the DSM, which required that an individual engage in binge eating and compensatory behaviours at least twice a week for six months (APA, 2000). A binge episode continues to be defined as eating more food than most people would eat during a discrete period of time (i.e., less than two hours), during which the individual feels out of control (APA, 2013). Inappropriate methods of compensation to prevent weight gain include behaviours such as self-induced vomiting, excessive exercise, fasting, insulin neglect, and abuse of laxatives, diuretics, enemas, or thyroid medication (APA, 2013; Mehler, 2011; World Health Organization [WHO], 2008). Beyond the

behavioural symptomology, the DSM-5 requires that the self-evaluation of an individual with BN be unduly influenced by body shape and weight (APA, 2013). Lastly, the individual's symptoms must occur outside of anorexia nervosa (AN; APA, 2013).

Diagnostic criteria of binge eating disorder. BED is also characterized by recurring episodes of binge eating, as defined above, but is not accompanied by recurrent compensatory behaviours in order to prevent weight gain (APA, 2013). In order to qualify for a diagnosis of BED, an individual must engage in binge eating at least once a week for three months (APA, 2013). Additionally binge eating must be accompanied by three or more of the following symptoms: "eating much more rapidly than normal; eating until feeling uncomfortably full; eating large amounts of food when not feeling physically hungry; eating alone because of feeling embarrassed by how much one is eating; and feeling disgusted with oneself, depressed, or very guilty afterwards" (APA, 2013, p. 350). Individuals who meet the criteria for this diagnosis experience marked distress regarding their eating behaviours and their binge eating does not occur exclusively during the course of BN or AN (APA, 2013).

Prevalence and gender ratio. Bulimia nervosa disproportionately affects females (Hoek & van Hoeken, 2003). Recent reviews indicate that the average prevalence of BN in young women is between 1.0% and 1.5% (Hoek, 2006; Smink, van Hoeken, & Hoek, 2012) and the lifetime prevalence in males is between 0.1 % and 0.5 % (Hudson, Hiripi, Pope, & Kessler, 2007). There is less agreement regarding the prevalence of BED. While the DSM-5 states that the 12-month period prevalence is 1.6% for females and 0.8% for males (APA, 2013), other sources suggest that it affects between 2-5% of the general population (Dingemans, Bruna, & van Furth, 2002; Hudson, Hiripi, Pope, & Kessler, 2007). Despite these inconsistencies, the ratio of females to males who meet the diagnostic criteria for BED is less disproportionate than is the

case for BN. Approximately 90% of individuals diagnosed with BN are female (Hoek & van Hoeken, 2003; Keski-Rahkonen et al., 2009; Marques et al., 2011; Swanson et al., 2011), whereas approximately 60% of individuals diagnosed with BED are female (NEDA, 2013). Both disorders occur in roughly similar rates across industrialized countries and prevalence rates do not appear to fluctuate according to cultural or ethnic groups (APA, 2013; Marques et al., 2011).

The onset of BN among women typically occurs during adolescence or early adulthood (APA, 2013; Favaro, Caregaro, Tenconi, Bosello, & Santonastaso, 2009). Most females receive a diagnosis before 20 years of age (Favaro et al., 2009). In contrast, the typical age of onset is later among males. Most males are diagnosed with BN after the age of 20 (Favaro et al., 2009). Comparatively, BED typically develops later in life. Most individuals are diagnosed with BED at the age of 25 (Hudson, Hiripi, Pope & Kessler, 2007); however, it is not uncommon for individuals to develop BED in later adulthood (APA, 2013).

Associated features of bulimia nervosa. Most individuals with BN present within the normal weight or overweight range; however, they often have higher weights relative to their peers prior to the development of BN (APA, 2013; Shaw et al., 2012). In addition to engaging in episodes of binge eating, BN is also associated with periods of caloric restriction during which individuals attempt to adhere to low-calorie diets (Vögele, Hilbert, & Tuschen-Caffier, 2009; WHO, 2008). Individuals with BN commonly avoid foods they believe would cause them to gain weight or trigger them to binge (APA, 2013). They also experience a great deal of shame about their eating disorder behaviours (APA, 2013) and a generalized sense of personal shame (Goss & Gilbert, 2002). Additionally, these individuals are highly self-critical, which has been linked to the high levels of dysphoric mood states and depressive symptomology found in this population (Speranza et al., 2003).

Strikingly, 94.5 % of the individuals with BN have comorbid psychiatric diagnoses (Hudson et al., 2007). The most common co-occurring diagnoses are mood and anxiety disorders (Hudson et al., 2007). Major depressive disorder (APA, 2013; Hudson et al., 2007) and dysthymic disorder (APA, 2013; Herzog, Keller, Sacks, Yeh, & Lavori, 1992) are the most commonly observed mood disorders. Substance abuse is another frequent comorbidity and is found in up to 34% of the individuals with BN (Hudson et al., 2007). BN is also associated with personality disorders (APA, 2013), most frequently borderline personality disorder (Sansone & Levitt, 2005).

Unfortunately, individuals with BN are at a significantly increased risk for mortality (APA, 2013). Bulimic behaviours can result in serious medical complications. Purging of any kind can cause fluid and electrolyte imbalances (APA, 2013; Mehler, 2011). Specific consequences are also associated with the different types of purging behaviours. For example, vomiting is often accompanied by oral and gastrointestinal complications (i.e., dental erosion, gum disease, swollen parotid glands), esophageal complications (occasionally involving a life-threatening esophageal rupture), heartburn, and acid reflux (Mehler, 2011). Some individuals induce vomiting using Ipecac syrup, which is a chemical used in the treatment of toxic overdoses (Mehler, 2011). This is a dangerous practice and may cause toxicity, skeletal myopathy, congestive heart failure, arrhythmias, and consequently death (APA, 2013; Mehler, 2011). Purging through the use of laxatives is often accompanied by gastrointestinal problems and colon damage (Mehler, 2011). In severe cases, laxative use may cause irreversible colon damage that requires corrective surgery or the insertion of an ostomy bag (Mehler, 2011). Bulimic behaviours may also lead to the development of irregular menses and fertility issues (APA, 2013; Mehler, 2011).

Associated features of binge eating disorder. Individuals struggling with BED can present with normal weight but are often overweight or obese (Striegel-Moore & Franko, 2008; Bulik & Reichborn- Kjennerud, 2003; Stein, et al., 2001). They commonly experience significant shame and guilt over their eating behaviours and typically engage in these behaviours privately (APA, 2013). They also report a lower quality of life than weight-matched controls without the disorder (APA, 2013). Additionally, individuals with BED experience greater body dissatisfaction than those of similar weights who do not have an eating disorder (Wilson, Grilo, &Vitousek, 2007). This dissatisfaction drives a strong desire to lose weight and many individuals with BED have a history of unsuccessful attempts to lose weight through dieting and exercise programs (APA, 2013; Marcus, Wing, & Hopkins, 1988; Wilson et al., 2007).

As is the case with BN, individuals with BED often have comorbid psychiatric diagnoses. The most common comorbidity is depression—half the individuals diagnosed with BED also suffer from depression (DeAngelis, 2002; Stein, et al., 2001). Anxiety disorders, bipolar disorders, personality disorders, and substance use disorders also commonly co-occur with BED (APA, 2013; Bulik & Reichborn-Kjennerud, 2003; DeAngelis, 2002; Dingemans, et al., 2002).

BED is also associated with physical consequences. The disorder increases an individual's risk for weight gain and mortality (APA, 2013; Field et al., 2012). It can cause several adverse health effects, most of which are associated with obesity. These adverse effects include high blood pressure, high cholesterol levels, heart disease, diabetes mellitus, gallbladder disease, musculoskeletal problems, joint pain, gastrointestinal problems, menstrual problems, and certain types of cancer (Bulik & Reichborn-Kjennerud, 2003; Dingemans et al., 2002; Yanovsky, 2003).

Emotional processing deficits and self-criticism. Researchers have consistently demonstrated that emotion-processing difficulties are endemic to the eating disorder population (e.g., Bruch, 1973;Wonderlich, Joiner, Keel, & Williamson, 2007). These individuals have difficulty identifying, distinguishing, and describing their emotions (Bruch, 1962), making it challenging to process and regulate emotions effectively (Becker-Stoll & Gerlinghoff, 2004). This is true of individuals with BN, who demonstrate low levels of emotional awareness and emotion regulation (Bydlowski et al., 2005), and individuals with BED, who also have difficulty regulating their emotions (Telch, Agras & Linehan, 2001).

An important element of emotion regulation is the expression of emotion. Ioannou and Fox (2009) examined the relationship between eating disorder symptomology and emotional expression in a sample of women with eating disorders, including those suffering from AN, BN, BED, and eating disorder not otherwise specified (EDNOS). These researchers found negative correlations between emotional expression and three Eating Disorder Inventory-3 subscales: bulimia, drive for thinness and body dissatisfaction. Ioannou and Fox also found that participants perceived emotions as threatening, a phenomenon commonly referred to as distress intolerance (Anestis, Selby, Fink, & Joiner, 2007). Recently, researchers have realized that it is the extent to which individuals perceive emotions to be intolerable that predicts dysregulated eating, rather than the mere presence of negative affect as was believed previously (Anestis et al., 2007). Distress intolerance leads to experiential avoidance, defined as "an unwillingness to remain in contact with unpleasant cognitive, physical, and emotional processes" (Chawla & Ostafin, 2007, p. 871). Binge eating becomes a form of experiential avoidance. Bulimic behaviours have been shown to reduce an individual's awareness of distressing thoughts or feelings (McManuss, Waller & Chadwick, 1996). Women with BN report being aware that they use their disordered

eating behaviours as a way of managing emotion (Schupak-Neuberg & Nemeroff, 1993). Similarly, both caloric restriction and binge eating allow individuals to dissociate, block, or escape from emotional experiences perceived as being painful and intolerable (Heatherton & Baumeister, 1991; Reiser, 1990).

Emotion dysregulation is also closely related to self-criticism. The self-critical nature of individuals with BN and BED is a common precipitant to negative affect (Gilbert, 2009). Self-critical individuals experience chronic dysphoria because they view others as critical and judgmental, and their negative self-evaluations and expectations morph ordinary hassles into catastrophic events (Dunkley et al., 2003). Understandably self-criticism is associated with more global negative affect (Zuroff, Stotland, Sweetman, Craig, & Koestner, 1995) and contributes to feelings of shame (Gilbert et al., 2010; Whelton & Greenberg, 2005).

The high degree of internalized shame among individuals with eating disorders is believed to contribute to the maintenance of these disorders (Goss & Allan, 2009). Gilbert (2005) asserts that eliciting support and compassion is the most effective means of managing shame. However, individuals who have difficulty tolerating distress, such as those with BN and BED, avoid disclosing their internal experiences because doing so requires expressing painful feelings (Gilbert, 2007; Gilbert et al., 2010). Failing to express feelings prevents these individuals from receiving the support and compassion that would help to counteract their feelings of shame. Instead, those with BN and BED often opt for more secretive ways of managing the experience of shame, such as binge eating and/or purging (Gilbert, 2007). Unfortunately, while these behaviours may ameliorate feelings of shame temporarily, the individual perceives these behaviours as abnormal, which serves to perpetuate self-critical thoughts and feelings of shame (Goss & Allan, 2009). Self-critical individuals also have a tendency to become overly identified

with their emotions (Nolen-Hoeksema, 1991), which further exacerbates difficulties regulating emotions (Bennett-Goleman, 2001). The difficulties associated with being highly self-critical may help to explain the poor response rates to psychotherapy experienced by self-critical individuals (Blatt, Quinlan, Pilkonis, & Shea, 1995; Rector, Bagby, Segal, Joffe, & Levitt, 2000).

Standard psychological treatments. The most commonly recommended psychological treatments for BN and BED in adults are cognitive behavioural therapy (CBT) and interpersonal therapy (IPT; Phillips, Greydanus, Pratt, & Patel, 2003; Wilson, Grilo, & Vitousek, 2007). Both therapies focus on factors hypothesized to maintain these eating disorders, rather than focusing on the reasons for their initial development. The two approaches differ in their view of the maintaining factors.

Cognitive behavioral therapy. CBT is the most widely researched and prescribed form of psychotherapy for both BN and BED (Phillips et al. 2003; Wilson, Grilo, & Vitousek, 2007). Proponents of this approach theorize that binge eating is a response to restrictive eating and negative affect (Bulik & Reichborn-Kjennerud, 2003; Levine & Marcus, 2003). While CBT for BED is an adaptation of CBT for BN, both forms of CBT focus on the mechanisms believed to maintain the eating disorder, namely the over-evaluation of shape and weight and attempts at dietary restraint (DeAngelis, 2002; Dingemans, et al., 2002; Fairburn, 2008; Pendleton, et al., 2002).

Conceptualization. The CBT model conceptualizes the individual's over-evaluation of shape and weight as the core psychopathology of BN (Fairburn, 2008). It is hypothesized that this core psychopathology perpetuates the disorder as individuals base their self-worth on their appearance, necessitating attempts to alter their shape and weight (Fairburn, 2008). Furthermore, it is believed that when individuals are unable to adhere to the strict dietary rules they have set

for themselves, they engage in binge eating which has the negative consequence of intensifying the individual's concern with shape and weight, thus reinforcing the core psychopathology (Fairburn, 2008). While individuals with BED do not engage in the same degree of dietary restraint seen in individuals with BN, they share the overly harsh self-criticism and acquiescence to the standard cultural contempt for excess body weight (Marcus, 1997). This overvaluation of shape and weight and disdain for fat is believed to trigger episodes of binge eating by contributing to body dissatisfaction and the subsequent negative feelings that arise (Levine & Marcus, 2003; Wiser & Telch, 1999).

Treatment goals and protocol. The treatment goals of CBT for BN are to alter the individual's dysfunctional schema for self-evaluation and reduce dietary restraint (Fairburn, 2008). These goals may also apply to individuals with BED, but when working with this population altering beliefs about what an acceptable body looks like and stopping binge eating behaviours are more important (Levine & Marcus, 2003; Wilfley et al., 2002).

CBT for individuals with BN and BED is a three stage, time-limited approach that generally consists of 16-20 sessions (Wilson & Fairburn, 1993). The first phase consists of providing psychoeducation and normalizing eating behaviours (Wilson & Fairburn, 1993). Specifically, clients are taught about their particular eating disorder, its physiological consequences, and the role that their thinking and behaviours play in the maintenance of the disorder (Wilson & Fairburn, 1993). They are also taught self-monitoring and other behavioural strategies to help them eliminate binge eating and/or the caloric restriction that leads to binge eating (Hilbert & Tuschen-Caffier, 2004; Levine & Marcus, 2003; Pendleton et al., 2002; Wilfley et al., 2002).

During the second stage, the cognitive restructuring phase, the focus shifts toward helping clients to change their thoughts (i.e., about food, weight and self-worth) that work to maintain their disorder (Hilbert & Tuschen-Caffier, 2004; Levine & Marcus, 2003; Pendleton et al., 2002; Wilfley et al., 2002; Wilson & Fairburn, 1993). Challenging stereotyped beliefs about overweight people and addressing beliefs about what an acceptable body looks like is of particular importance when working with individuals with BED because, while they may lose weight during treatment, they are unlikely to experience the amount of weight loss they desire (Clarke, 2008; Levine & Marcus, 2003).

The final phase of treatment focuses on relapse prevention and maintenance strategies (Wilfey et al., 2002; Wilson & Fairburn, 1993). During this phase, the therapist and client actively problem solve and come up with strategies for coping with and managing high-risk situations. An additional element during the third stage for individuals with BED is goal setting focused on weight loss in a manner that will not result in binge eating (Clarke, 2008).

Treatment outcomes. Several researchers have demonstrated that CBT is a successful treatment for BN and BED. For example, authors of a recent meta-analysis reported that CBT results in the cessation of binge eating and purging in roughly 30% to 50% of all cases of BN and those who do not make a full recovery often show some improvement (Wilson, Grilo &Vitousek, 2007). While there is limited research available on the outcomes of CBT for BED, researchers have demonstrated similar success rates. In one study, 58% of participants recovered from BED following participation in CBT treatment (Hilbert & Tuschen-Caffer, 2004). Conversely, 82% of participants in another study recovered by the end of treatment and 72% remained abstinent from binge eating a year after treatment (Wilfley et al., 2002). While outcome statistics vary, consistently CBT has been shown to be effective for at least 50% of

individuals with BED, resulting in a cessation of binge eating (Agras & Apple, 1997; Fairburn et al., 1995; Wilson, Fairburn, Agras, Walsh & Kraemer, 2002). These treatment gains are generally maintained six to twelve months later (Pendleton et al., 2005).

Enhanced cognitive behavioural therapy. Over roughly the last decade, the CBT model for eating disorders has been adapted to address shortcomings of the model and improve treatment outcomes (Fairburn, Cooper, & Shafran, 2003). This adapted form of CBT, titled enhanced cognitive behavioural therapy (CBT-E), is an extension of the original CBT for BN model (Fairburn et al., 2003). Different from its predecessors, CBT-E adopts a transdiagnostic perspective. This adoption is based on research demonstrating commonalities among the eating disorder diagnoses, namely over-evaluation of shape and weight, and attempts at their control (Fairburn et al.), and the frequent crossover between eating disorder diagnoses (Agras, Walsh, Fairburn, Wilson, & Kraemem, 2000a; Sullivan, Bulik, Fear, & Pickering, 1998; Tozzi et al., 2005). CBT-E is delivered individually and its specifics are determined by the client's individual formulation rather than his or her diagnosis (Murphy, Straebler, Cooper, & Fairburn, 2010).

Treatment goals and protocols. CBT-E is delivered in one of two intensities: 20 sessions over 20 weeks, which is used with the majority of individuals receiving treatment, or 40 sessions over 40 weeks when clients are significantly underweight (Fairburn, Cooper, & Shafran, 2003). The only difference between the two intensities is that the longer version contains elements focused on helping clients gain weight. In both versions of treatment, the initial sessions are held twice weekly in order to maximize early treatment gains as this has been shown to improve treatment outcomes (Agras et al., 2000b). There are also two forms of CBT-E: a focused form and a broad form. The focused form addresses eating disorder psychopathology as previously defined in the CBT-BN model, namely the overevaluation of eating, shape, and weight, and

attempts to control them (Murphy, Straebler, Cooper, & Fairburn, 2010). In contrast, the broad form also addresses the following additional maintaining mechanisms when it is indicated for the client: clinical perfectionism, core low self-esteem, and/or interpersonal difficulties (Fairburn et al., 2003; Murphy et al., 2010). The broad form of CBT-E is an attempt to address mechanisms maintaining the disorder that were not addressed in previous CBT practices (Fairburn et al., 2003).

Regardless of which form is used, CBT-E consists of four stages. Stage one is generally delivered in eight sessions over four weeks and focuses on education, developing a personalized formulation of the maintaining mechanisms of the disorder, establishing a regular and stable pattern of eating, and addressing concerns about weight. Stage two usually only lasts one to three sessions and involves a review of the client's progress, barriers to change, an assessment of which form of treatment would be most appropriate for the client, and the creation of a revised and extended formulation of the client's eating disorder. Stage three makes up the bulk of treatment. Its content largely depends on the revised formulation developed in stage two. For all patients stage three focuses on modifying what is still believed to be the core psychopathology of eating disorders, namely over-evaluation of eating, weight, and shape (Fairburn, Cooper, & Shafran, 2003). Different from previous forms of CBT, the focused form also addresses events and moods that help to maintain the disorder when this is indicated in the client's formulation (Murphy, Straebler, Cooper, & Fairburn, 2010).

If clinical perfectionism, core low self-esteem, and/or interpersonal difficulties are identified as contributing to the client's eating disorder, the broad form of CBT-E is used. The broad form involves using modules to address each of these issues specifically as needed and this is done at the same time that the core psychopathology is addressed. For example, interpersonal

difficulties would be addressed throughout stage three, alongside the client's over-evaluation of eating, shape, and weight (Murphy et al., 2010). Finally, stage four consists of three bi-weekly sessions and aims to prepare clients for the end of treatment and ensure treatment gains are maintained (Fairburn et al., 2003).

Treatment outcomes. Empirical testing of CBT-E is in its early stages, with few studies conducted to date. A review of the literature suggests that preliminary results have been promising, although existing research has largely been conducted by a small group of researchers (Groff, 2015). In a recent RCT multi-site study of CBT-E, researchers found that 52.7% of individuals with BN and 53.3% of individuals with EDNOS achieved levels of eating disorder features less than one standard deviation above the community mean post-treatment in contrast to little change in the control group. These results improved to 61.4% for individuals with BN and decreased to 45.7% for individuals with EDNOS at 60-week follow-up (Fairburn et al., 2009). Another group of researchers conducted an open trial of CBT-E with adults experiencing a full range of eating disorders (Byrne, Fursland, Allen, & Watson, 2011). Full or partial remission of symptoms was achieved by 50% of participants with AN, 66.7% of participants with BN, and 73.3% of individuals with EDNOS. Their results suggest that CBT-E may be more effective for AN than previous forms of CBT, although dropout rates continued to be high for this population. Interestingly, improvements were not found on measures of perfectionism, which has been linked to self-criticism (Blatt, 1995), or mood intolerance (Byrne et al., 2011).

Other studies have found preliminary evidence for the use of CBT-E with adolescent and adult AN populations (Dall Grave, Calugi, Doll, & Fairburn, 2013; Fairburn et al., 2013). CBT-E has also performed favourably in comparison to two years of psychoanalytic psychotherapy in the treatment of BN (Poulsen et al., 2014). In a recent study by Poulsen and colleagues (2014),

42% of participants receiving CBT-E ceased binge eating and purging post-treatment, which increased to 44% at two-years follow-up. Lastly, CBT-E performed comparably to a new form of eating disorder treatment called integrative cognitive-affective therapy in an RCT for individuals with BN (Wonderlich et al., 2014). Unfortunately none of these researchers reported measures of effect size. While these results are promising, especially with regard to AN, a large number of individuals continue to struggle post-treatment and CBT-E does not appear to adequately address emotion regulation difficulties or perfectionism despite attempts to address these deficits.

Interpersonal therapy. IPT was originally developed for the treatment of depression (Klerman, Weissman, Rounsaville, & Chevron, 1984). It is a short-term therapy, generally consisting of 12 to 20 sessions, that is founded on the belief that positive interpersonal functioning is the cornerstone of psychological well-being. As such, the focus of therapy is on current difficulties with interpersonal relationships (Arcelus, Whight, Brewin, &McGrain, 2012). IPT has been adapted for the treatment of BN and BED. This adaptation focuses on difficulties with interpersonal functioning that contribute to eating disorder symptoms (Fairburn et al., 1991).

Conceptualization and treatment goals. The IPT model conceptualizes binge eating as a way of managing strong affect that arises as a result of interpersonal deficits (Dingemans et al., 2002). In contrast to CBT, IPT does not focus on eating behaviours or attitudes about weight (Levine & Marcus, 2003). Instead, IPT helps clients understand the interpersonal circumstances that surround binge eating episodes with the goal of resolving difficulties in interpersonal patterns of relating so as to render binge eating unnecessary (DeAngelis, 2002; Levine & Marcus, 2003; Wilfley et al., 2002).

Treatment protocol. As adapted for eating disorders, IPT involves three stages (Arcelus et al., 2012). During the initial assessment stage, current difficulties are identified in the context of interpersonal relationships. The second stage uses a variety of techniques like psychoeducation, modeling, and symptom review to help clients understand the connections between their mood, eating behaviours, and interpersonal problems. Focus is given to resolving problems in four areas of interpersonal functioning: grief, role disputes, role transitions, and interpersonal deficits (Robertson, Rushton, & Wurm, 2008). During the final stage, the therapist and client review the work done in therapy, prepare the client to maintain the practices he or she has put into place, and identify areas where further work is needed (Arcelus et al., 2012; Philips et al., 2003).

Treatment outcomes. IPT has been found to be as effective as CBT for both BED and BN, resolving symptoms in approximately half of the individuals completing treatment (Agras, Walsh, Fairburn, Wilson, & Kraemer, 2000; Stein et al., 2001; Wilfley et al., 2002; Wonderlich, de Zwaan, Mitchell, Peterson, & Crow, 2003). However, change is generally slower to occur with IPT than it is with CBT (Agras et al., 2000; Stein et al., 2001; Wilfley et al., 2002; Wonderlich et al., 2003).

While both cognitive behavioural and interpersonal approaches to treatment are successful for many individuals with BN or BED, they are regrettably unsuccessful at helping approximately as many individuals as they help. One possible explanation for the inconsistent effectiveness of these treatments is their lack of emphasis on emotion regulation difficulties, which are involved in the perpetuation of these disorders (APA, 2000; Stice, 2002). Interestingly, while neither traditional CBT nor IPT explicitly states that emotion regulation difficulties contribute to the etiology and maintenance of BN or BED, proponents of both approaches agree

that individuals with BN and BED have difficulty regulating their emotions, regardless of whether these negative emotions arise due to interpersonal difficulties, overvaluation of appearance, or body dissatisfaction. The developers of CBT-E have acknowledged and responded to research demonstrating the importance of addressing emotional processing deficits (Fairburn, Cooper, & Shafran, 2003); however, research findings suggest this approach has little impact on mood intolerance and does not adequately address emotional dysregulation (Byrne et al., 2011).

Research into the effectiveness of CBT and IPT for eating disorders has also failed to take common factors, such as therapeutic alliance, therapist effects, and therapist allegiance to a particular therapeutic approach (Messer & Wampold, 2002), into consideration. This limitation is also true of research investigating the effectiveness of newer eating disorder treatments, such as mindfulness-based approaches.

Mindfulness-based treatments. Mindfulness-based approaches have been shown to increase one's ability to manage emotions effectively (Lutz, Brefczynski-Lewis, Johnstone, & Davidson, 2008; Perlman, Salomons, Davidson, & Lutz, 2010; Teper, Segal, & Inzlicht, 2013). Specifically, mindfulness-based approaches are proving valuable in their ability to improve emotional processing in a number of ways. For example, mindfulness-based approaches have been shown to decrease experiential avoidance (Twohig, Hayes, & Masuda, 2006; Weinrib, 2011), which is an ineffective emotion regulation strategy that leads to increased distress and dysregulation (Tull & Roemer, 2007). Experiential avoidance has also been found to mediate the relationship between alexithymia and emotion regulation difficulties (Venta, Hart, & Sharp, 2013). Mindfulness-based approaches have also been shown to increase self-compassion (Farb, Anderson, & Segal, 2012; Germer, 2009; Leary et al., 2007), which decreases emotional

suppression (Jazaieri et al., 2014) and is starting to be recognized as an adaptive emotion regulation strategy in its own right (Diedrich, Grant, Hoffman, Hiller, & Berking, 2014). Additionally, mindfulness-based approaches increase one's capacity to tolerate distress (Eifert & Heffner, 2003; Twohig, Hayes, & Masuda, 2006; Weinrib, 2011), an important emotion regulation skill (Corstorphine, Mountford, Tomlinson, Waller, & Meyer, 2007).

Within the past decade, several pre-existing mindfulness-based treatments have been adapted for use with the eating disorder population. Clinicians have also created new eating disorder treatments grounded in or incorporating a mindfulness approach. While research into the effectiveness of mindfulness-based treatments is limited, results have been promising.

Dialectical behaviour therapy. The most researched treatment for BN and BED that incorporates a focus on mindfulness is dialectical behavior therapy (DBT). DBT was originally developed by Marsha Linehan (1993) to treat individuals with borderline personality disorder. One of the key features of borderline personality disorder is extreme emotion dysregulation, which can cause individuals to engage in impulsive behaviours, such as binge eating, in an attempt to self-soothe (APA, 2013). DBT has since been adapted to treat eating disorders (Safer, Telch, & Agras, 2000; 2001; Telch, Agras, & Linehan, 2000; 2001). This adaptation is built upon the premise that binge eating is a way of coping with difficult emotions (Wiser & Telch, 1999). Accordingly, DBT subscribes to an affect regulation model of binge eating (Safer et al., 2001; Telch et al., 2001; Wiser & Telch, 1999). DBT proponents postulate that binge eating serves the function of reducing distressing emotions in individuals who otherwise have difficulty managing their emotions (Wiser & Telch, 1999). Binge eating works to temporarily direct attention away from the aversive emotion, effectively reinforcing the behaviour (Pendleton et al., 2002; Safer et al., 2001; Telch et al., 2001; Wiser & Telch, 1999).

The main treatment goal of DBT as adapted for eating disorders is to teach individuals the skills necessary to manage and tolerate difficult emotions when they arise so that they are no longer dependent on eating disorder behaviours as a means of coping (Safer et al., 2001; Telch, et al., 2001; Wiser & Telch, 1999). This approach consists of twenty, two-hour weekly individual or group sessions that focus on teaching skills in three of the four modules included in standard DBT: emotional regulation, distress tolerance, and mindfulness (Kristeller, Baer & Quillian-Wolever, 2006).

Several studies have provided support for the efficacy of DBT in the treatment of BN and BED. Telch and colleagues (2001) conducted an RCT wherein they compared the effectiveness of DBT for BED to a wait-list control group. Eighty-nine percent of the participants in the treatment group stopped binge eating, whereas only 12.5% of individuals in the control group stopped binge eating. Follow-up results were also positive, with 56% of individuals in the DBT group remaining abstinent six months post-treatment. Another RCT conducted by Safer and colleagues (2001) found positive results for the use of DBT with individuals meeting diagnostic criteria for BN. In their study, 29% of participants in the treatment group completely stopped binge eating and purging post-treatment, and an additional 36% of participants demonstrated decreases in these behaviours. More recently, Masson and colleagues (2013) conducted an RCT comparing a guided self-help form of DBT for BED to a waitlist control. Participants in the DBT condition experienced a decrease in the frequency of binge eating, whereas participants in the control condition did not. Similarly, 40% of participants in the DBT condition were no longer binge eating at six-month follow-up, whereas only 3.3% of controls stopped binge eating.

To date, only one RCT has compared DBT for binge eating disorder to an active comparison therapy (Safer, Robinson, & Jo, 2010). Safer and colleagues compared group DBT

to a non-specific structurally similar group therapy. Participants in both groups experienced reductions in their frequency of binge eating, with 64% of participants in the DBT group and 36% of participants in the active comparison therapy group achieving abstinence at post-treatment. Interestingly, while those in the DBT group achieved abstinence more quickly, the two groups did not differ at the 12-month follow-up (Safer et al., 2010).

Acceptance and commitment therapy. Acceptance and commitment therapy (ACT) is another treatment approach that incorporates mindfulness and has been adapted for use with the eating disorder population. ACT is based on an experiential avoidance model, asserting that avoidance of thoughts, emotions, urges, and sensations perceived to be aversive leads to disordered behaviours (Hayes, Wilson, Gifford, Folette, & Strosahl, 1996). This approach emphasizes acceptance of these internal experiences while concurrently working toward the goals and life directions congruent with one's values (Hayes, Strosahl, & Wilson, 1999).

Initial support for this model comes from a case study conducted by Heffner and colleagues (2002) who investigated the effects of ACT on 14-year-old female with AN. Following the 18-session study, the participant no longer met the diagnostic criteria for AN. Her weight increased to a healthy level, her scores on the drive for thinness and ineffectiveness subscales of the Eating Disorder Inventory-2 dropped to the non-clinical range, and her menstrual cycle returned. More recently, Jurascio and colleagues (2013) examined the efficacy of an ACT group in the treatment of eating disorders. In this study, individuals with AN or BN receiving treatment in a residential eating disorder treatment program were assigned to an ACT condition or a control condition. Participants in the ACT condition attended an ACT group in addition to treatment as usual, whereas participants in the control group only received treatment as usual. Participants in both conditions demonstrated improvement; however, those who

participated in the ACT group demonstrated a greater decrease in eating pathology post-treatment and were less likely to be readmitted to the hospital six months later (Jurascio et al., 2013).

Mindfulness-based cognitive therapy. Mindfulness-based cognitive therapy (MBCT) has also been adapted for use with the eating disorder population. For example, Baer, Fischer and Huss (2005) adapted MBCT for use with BED. Their approach "includes a variety of mindfulness practices designed to cultivate nonjudgmental and nonreactive observation and acceptance of bodily sensations, perceptions, cognitions and emotions" (Kristeller, Baer, & Quillian-Wollever, 2006, p. 79). Preliminary investigation of this approach has been encouraging. The participant in a case study conducted by Baer and colleagues (2005) reported a complete cessation of binge eating and a reduction in concerns regarding her shape, eating, and weight post-treatment. The authors followed up with a pilot study examining the effectiveness of MBCT on six individuals with BED. Following treatment, the participants reported reductions in the number of binge eating episodes, as well as decreases in their experience of eating concerns, and beliefs that they would lose control while eating (Baer, Fischer, & Huss, 2006).

Mindful-based eating awareness training. Mindful-based eating and awareness training (MB-EAT) is another mindfully focused eating disorder treatment that has emerged recently. This approach was specifically developed for individuals with BED. The MB-EAT program integrates elements from Kabat-Zinn's mindfulness-based stress reduction (MBSR) program, CBT, and eating meditations (Kristeller & Hallett, 1999). According to this approach, "overeating, particularly binge eating, can be viewed as symptomatic of a prototypical dysregulation syndrome involving disturbances of affect regulation, cognitive and behavioural dysregulation, and physiological dysregulation" (Kristeller, Baer, & Quillian-Wolever, 2006, p.

80). Mindfulness meditation is used to train individuals to develop greater self-awareness, particularly of automatic patterns of behaviour, with the goal of increasing self-regulation (e.g., the ability to stop these reactive patterns; Kristeller, 2003). It is also used to help individuals learn to recognize hunger and satiety cues, with the goal of allowing this awareness to guide their eating behaviours (Kristeller, 2003).

An initial pilot study examined the effectiveness of a six-week MB-EAT group program for 20 women with BED (Kristeller & Hallett, 1999). Eighteen participants completed the study and the average number of binges per week dropped from four to one and a half (Kristeller & Hallett, 1999). More recently, Kristeller, Quillian-Wolever and Sheets (2014) conducted an RCT of the MB-EAT program with 150 men and women meeting diagnostic criteria of BED. Participants were randomly assigned to the treatment condition, a psychoeducational/cognitive behavioural condition (PECB), or a waitlist control group. Participants in the MB-EAT and PECB conditions reported statistically significant and similar decreases in BED symptomology and depression scores, whereas the control group did not report improvements. Interestingly, those in the MB-EAT group fared better in the long-term; at four months post-treatment, 95% of individuals in the MB-EAT group and 76% of individuals in the PECB group no longer met the criteria for BED (Kristeller, Quillian-Wolever, & Sheets, 2014). Participants in the MB-EAT group experienced greater decreases in the number of binge days per month than participants in both the PECB or waitlist groups. The difference between the MB-EAT and waitlist groups exhibited a large effect size ($d = 0.96$), whereas the difference between the PECB and waitlist groups exhibited a medium effect size ($d = 0.74$). The effect size of the difference between the MB-EAT and PECB groups was not reported.

Mindful eating as an adjunct to treatment. Several other mindful eating approaches have also been developed, however, they have been subjected to less empirical examination than the MB-EAT program. A recent study examined one such ten-week mindful eating group delivered as an adjunct to outpatient eating disorder treatment (Hepworth, 2011). This mindful eating program was designed to enhance awareness of hunger and satiety cues. The program was delivered to 33 women with a variety of eating disorder diagnoses (i.e., AN, BN, or EDNOS) who were attending an outpatient eating disorder treatment centre, where they received individual therapy (i.e., CBT or narrative therapy), met regularly with a dietitian, and were monitored by medical professionals. Statistically significant decreases were observed in scores on the Eating Attitudes Test-26 (EAT-26; Garner et al., 1982), which measures body image concerns and disordered eating behaviours. Large effect sizes were observed for changes on the global EAT-26 scores ($\eta^2 = .63$) as well as all three of its subscales: the diet subscale ($\eta^2 = .52$), the bulimia and food preoccupation subscale ($\eta^2 = .57$), and the oral control subscale ($\eta^2 = .43$). Differences between diagnoses were also examined and no differences were found, suggesting that using the mindful eating program as an adjunct to treatment was helpful for individuals with eating disorders regardless of their diagnosis (Hepworth, 2011).

Meta-Analysis. A recent meta-analysis investigated the effects of mindfulness-based interventions on binge eating (Godfrey, Gallo, & Afari, 2015). They included studies that incorporated (e.g., DBT, ACT) or emphasized (e.g., MB-EAT) mindfulness-based practices in their meta-analysis. A total of 19 studies met criteria for inclusion in their study. The researchers conducted a within-group random effects meta-analysis to determine the average effect size of mindfulness-based interventions in reducing binge eating. The results suggest mindfulness-based interventions exhibit a large effect in decreasing binge eating (mean Hedges $g = -1.12$). Godfrey

and colleagues also conducted a between-group random effects analysis, which suggested mindfulness-based interventions have a medium to large effect in decreasing binge eating (mean Hedges *g* = -0.70). Their results suggest mindfulness-based interventions have great promise in the treatment of BN and BED.

Summary. Standard psychological treatments for BN and BED are ineffective for many individuals trying to recover from an eating disorder. One possible explanation is the failure of these approaches to address the emotion regulation difficulties that often serve as a strong maintaining mechanism. A new and enhanced form of CBT has been developed in an attempt to improve treatment outcomes and while it does attempt to address emotion dysregulation, CBT-E has been found to have little impact on mood intolerance (Byrne et al., 2011).

Recognition of the importance of addressing emotional processing deficits when treating BN and BED has led to the led to a growing interest in mindfulness and acceptance-based approaches. Research investigating the efficacy of these approaches in the treatment of eating disorders is in its infancy and has often been conducted on small samples. Despite these limitations, results have been very positive and mindfulness-based eating disorder treatments are continually gaining support. Encouraged by these results, practitioners and researchers alike are exploring the effects of different types of mindfulness practices on individuals with eating disorders. Mindfulness practices include any activities performed with mindful awareness. Formal mindfulness practices include mindful meditation (e.g., mindfulness of the breath, mindfulness of sound, open awareness meditation), mindful walking, Yoga, and body scanning (Kabat-Zinn, 1990). The burgeoning acceptance of mindfulness and other contemplative practices has seen the introduction of Yoga into the treatment of eating disorders.

Yoga

Yoga's increasing popularity in North America can be understood in the context of the current climate wherein there is growing appreciation of and desire for complementary and alternative medicines (CAM). A national survey conducted between 2001 and 2005 revealed that 12.4% of Canadians had accessed CAM services within the past year (Metcalfe et al., 2010). The most frequent users of CAM services were young women between the ages of 25 and 44, and the most commonly used services were mind-body therapies (Barnes et al., 2008). Yoga is one mind-body therapy that has acquired a rapidly growing following in North America over the past decade and a half. The most recent survey found that 1.4 million Canadians practiced Yoga in 2005, a 15% increase from 2004 and a 45% increase from 2003 (Namasta, 2005). The survey also found that one in twelve individuals not already practicing Yoga intended to try Yoga within the next year (Namasta, 2005).

People gravitate to Yoga for a variety of reasons, ranging from a desire for improved physical fitness to a desire for stress relief or a deeper spiritual connection with oneself. North Americans are starting to recognize the potential benefits of Yoga on their psychological well-being. Mental health professionals are also beginning to recognize and utilize the power of Yoga to help address a variety of mental health issues. Researchers have found Yoga has beneficial applications for depression (Brown & Gerbarg, 2005; Shapiro et al., 2007; Woolery et al., 2004), anxiety (Gupta et al., 2006), PTSD (Carter & Byrne, 2003), substance abuse (Khalsa et al., 2008) and ADHD (Harrison et al., 2004). Yoga is also being incorporated into the treatment of eating disorders. While further evidence in support of this practice is needed, the incorporation of Yoga has the potential to attract individuals who may be unlikely to seek out traditional therapies but would be willing to seek out CAM and mind-body therapies.

Despite Yoga's increasing popularity, many individuals are unaware of the many branches of Yoga or its long, complex history and deep spiritual roots. Yoga was developed on the Indian subcontinent five thousand years ago as a spiritual, psychological, and philosophical framework for the development of the self (Feuerstein, 2002). The Sanskrit word Yoga means *to yoke* or *to join* (Cope, 1999) and has been interpreted to have many meanings including "the union of the physical self with the supreme self" (Pankhania, 2005, p. 247) and "the interconnection between body, mind and spirit" (Salmon, Lush, Jablonski, & Sephton, 2009, p. 59). Yoga developed independently out of three religious-spiritual cultures: Hinduism, Buddhism, and Jainism (Feuerstein, 2002). Yoga is difficult to define because there are many forms, branches, schools, and lineages of Yoga (Cope, 1999). "In its most specific meaning, the word Yoga refers to the most widely accepted codification of the practices of Yoga, the path laid out by the sage Patanjali in his concise Yoga Sutras" (Cope, 1999, p. 312). Patanjali Yoga is a Hindu form of Yoga (Feuerstein, 2002).

Classical Yoga: philosophy and practice. The Yoga Sutras is a foundational text on Yoga. This text outlines Yogic philosophy and practices in its description of the Eight-Fold Path of Ashtanga Yoga (Cope, 1999; Feuerstein, 2002), also referred to as Classical Yoga or Patanjala Yoga. The Eight-Fold Path of Ashtanga Yoga is a workable system for reaching enlightenment that consists of eight steps that each build upon one another. Steps one (yamas) and two (niyamas) form the foundation of Yoga and consist of moral principles that Yogis (i.e., Yoga practitioners) are expected to endorse. The yamas serve to create an ethical universe and consist of five restraints or ethical practices including non-violence, truthfulness, non-stealing, moderation, and non-possessiveness (Feuerstein, 2002). The niyamas outline moral observances that practitioners are meant to endorse on a regular basis. These observances include knowing

one's soul (purity), relaxing into life and trusting how it unfolds (contentment), following through with intentions (austerity), developing witness consciousness and learning which inner voice to follow (self study), and surrendering to God (Feuerstein, 2002). These practices help Yogis to develop the qualities of equanimity and awareness (Cope, 1999).

The third step of Classical Yoga consists of physical postures (asanas) and the fourth step consists of breath work (pranayama; Feuerstein, 2002). These practices help practitioners to develop and purify the physical body and the energy body. They also further cultivate awareness and equanimity, and develop the capacity to focus and sustain attention, which is necessary to be able to perform the last four steps (Cope, 1999). The fifth step on the path to enlightenment is sense withdrawal (pratyahara), which involves internalizing consciousness so that the practitioner is not distracted by external stimuli (Feuerstein, 2002). Pratyahara helps Yogis to overcome identification with their thoughts (Cope, 1999).

The final three steps develop the ability to reach and maintain deep meditative states (Cope, 1999). In the sixth step (dharana), practitioners develop concentration by focusing the mind on, for example, a physical object or the breath (Feuerstein, 2002). This practice, in addition to sense withdrawal, helps prepare practitioners for the next step by cultivating mental focus, control, and clarity (Cope, 1999). Meditation (dhyana) is the seventh step and it involves an undisturbed flow of thought around the object of meditation (Cope, 1999). Meditation requires great concentration and works to help practitioners reach a place of self-awareness and non-judgment (Feuerstein, 2002). The first seven steps work toward and culminate in the final step, Samadhi, also known as bliss or enlightenment (Feuerstein, 2002). This is a state of complete absorption that is characterized by "the union of the physical self with the supreme self" (Pankhania, 2005, p. 247).

Hatha Yoga. Hindu Yoga is the most diverse form of Yoga (Feuerstein, 2007). There are a multitude of different lineages, branches, and schools of Yoga within the Hindu Yoga tradition, most of which evolved out of Classical Yoga, as described above. Hatha Yoga is the most commonly practiced branch of Yoga in North America (Forfylow, 2011). It was developed in order to create balance between the mind and body, enhancing emotional and physical well-being (Feuerstein, 2002). Hatha Yoga mainly consists of three practices: physical postures, breath work, and meditation (Riley, 2004). Hatha Yoga places greater emphasis on the physical postures than other branches of Yoga, some of which do not even involve physical postures or movement. There are many different schools or styles of Hatha Yoga but they typically require practitioners to engage in specific breathing practices as they concentrate on their internal experiences while moving through a series of postures. Hatha Yoga sessions generally end with relaxation and/or meditation practice (Austin & Laeng, 2003). The increased emphasis on the physical body in the hatha Yoga tradition helped Yoga to be accepted in the western world and has greatly shaped North Americans understanding and experience of Yoga.

Asanas. Asanas are the physical postures that have come to be synonymous with Yoga in the Western world. Asanas combined with breath work were traditionally developed as a means of preparing the body and mind to sit in meditation (Iyengar, 2002). Each Yoga posture was also designed to strengthen and stretch specific body parts, remove toxins, and create free flowing energy lines through the body (Feuerstein, 2002; Schiffman, 1996). A typical Hatha Yoga session consists of several different types of postures including: seated, standing, and balancing postures, which are followed by back bends, forward folds, inversions, and twists (Austin & Laeng, 2003). Depending on the sequencing of postures, the asanas can be used to "induce a variety of effects, such as to ground, soothe, stimulate, or revitalize one's energy level"

(Austin & Laeng, 2003, p. 287). Asana practice improves strength, coordination, balance, flexibility, and circulation (Austin & Laeng, 2003). It also positively influences mental and emotional health (Iyengar, 2002). By focusing on internal sensations while moving through a series of postures, practitioners learn to be aware of and guided by their internal experiences (Salmon, Lush, Jablonski, & Sephton, 2009). Asana practice teaches individuals to find their *edge*—the place of balance in a pose between experiencing no intensity and experiencing too much intensity or any sensation of pain (Schiffman, 1996). In this way practitioners learn to notice and respect their physical and psychological limits (Schiffman, 1996), which has the added benefit of greatly reducing the likelihood of injury or overuse (Salmon et al., 2009).

Pranayama. Breathing practices are also central to Hatha Yoga. The Sanskrit word *prana* means life force or energy (Iyengar, 1966) and *pranayama* refers to yogic practices of voluntary breath control or breath expansion (Sovik, 2000). These practices involve "focusing attention on breathing, and then deliberately using breathing patterns and rhythms of breath for the control, direction and distribution of prana, or vital energy" (Simpkins & Simpkins, 2011, p. 82). As is the case with asanas, specific breathing practices can be used to energize or calm the mind and body (Simpkins & Simpkins, 2011). Additionally, attending to breathing during the physical practice helps practitioners to determine how deeply to go into a pose (Schiffman, 1996), and helps to develop concentration and focus (Feuerstein, 2002).

Meditation. Meditation is the last major component of Hatha Yoga. It has been defined as "intentional self-regulation of attention" (Aftanas & Golosheykin, 2005, p. 894). Hatha Yoga fosters the capacity of practitioners to become fully absorbed and attentive through the practice of formal meditation, as well as through pranayama, asana, and pratyahara (withdrawing attention) practices (Simpkins & Simpkins, 2011). Through these practices, practitioners learn to

engage in a focused attention on the breath, physical movements, or body sensations, becoming deeply absorbed in the experience (Schiffman, 1996; Simpkins & Simpkins, 2011). In this way, pranayama, asana, and pratyahara serve as building blocks to being able to engage in dhyana, which involves "a free flow of attention in the present moment" (Simpkins & Simpkins, 2011, p. 30). Most Hatha Yoga classes end with savasana, a relaxation pose during which practitioners meditate (Austin & Laeng, 2003).

Hatha Yoga as a mindfulness practice. Hatha Yoga is a mindfulness practice (Kabat-Zinn, 2003). Mindfulness has become popularized in the western world, most notably through the work of Jon Kabat-Zinn and his mindfulness-based stress reduction (MBSR) program (Kabat-Zinn, 1990). One of the key components of the MBSR program is Hatha Yoga (Kabat-Zinn, 1990). Kabat-Zinn (2003) is careful to emphasize that Hatha Yoga is a mindfulness practice, differentiating it from other forms of "physical fitness dressed up in spiritual clothing" (p. 87). Kabat-Zinn (2003) defines mindful Yoga as a "specific attitude and attentional stance that we bring to our practice, both on the mat and in daily life: namely, a refined, moment-to-moment non-judgmental, non-striving attending to the entire range of our experience" (p. 89).

Mindful Yoga is a form of "mindfulness in motion" (Salmon et al., 2009, p. 68). The movements and accompanying sensations provide a continual stream of sensory stimuli on which the practitioner can mindfully focus (Salmon et al., 2009). The assertion that Yoga is a mindfulness practice is further corroborated by research demonstrating that Hatha Yoga increases mindfulness skills in the same way that sitting mindfulness meditation is known to increase mindfulness skills (e.g., Carmody & Baer, 2008; Nyklicek & Kuijpers, 2008). For example, one study investigated the effects of a four-month residential Kripalu Yoga program on individuals in the program in comparison to control subjects who did not participate in the Yoga

program (Gard, Brach, Hölzel, Noggle, Congle, & Lazar, 2011). Participation in the Yoga program experienced increases in mindfulness skills and self-compassion, whereas controls did not. Similarly, Carmody and Baer (2008) found that the amount of time participants spent practicing the three formal mindfulness practices in the MBSR program (i.e., body scan, sitting meditation, Hatha Yoga) was associated with increases in the various facets of mindfulness (i.e., observing, describing, acting with awareness, non-judging of inner experience, and non-reacting to inner experience). Surprisingly, Yoga practice was related to increases in more facets of mindfulness than either the sitting meditation or body scan, and was the only formal practice associated with increases in the non-judging facet of mindfulness. This finding supports the notion that Yoga may be a good fit for individuals with eating disorders as this population is known to judge internal experiences, particularly emotions, as threatening (Anestis et al., 2007; Ioannou & Fox, 2009).

Research on Yoga for Eating Disorders

Giles (1985) was the first to propose incorporating Yoga practice into a multi-faceted treatment approach for eating disorders. He believed that Yoga delivered before or after meals could help to reduce food preoccupation. Giles' suggestion was likely rooted in researchers findings that Yoga practices could be used to initiate the relaxation response.

During the late 1970s researchers began investigating the medical and physiological benefits of Yoga. Since this time a host of such benefits have been found. For example, researchers have found evidence that Yoga is effective at reducing cortisol levels (e.g., Carlson, Speca, Patel, & Goodey, 2004), increasing parasympathetic nervous system activity (e.g., Khattab, Khattab, Ortak, Richardt, & Bonnemeier, 2007), increasing heart rate variability (van

der Kolk, 2006), increasing GABA (e.g., Streeter et al., 2007), serotonin and dopamine (e.g., Joseph et al., 1981) levels, and lowering blood pressure (e.g., Cohen, 2013).

The medical field's findings of the positive physiological effects of Yoga have lent credibility to the study of Yoga in other disciplines. The recent proliferation of research into Yoga's impact on a myriad of psychological issues has further fueled the popular culture's growing interest in Yoga. Individuals are increasingly choosing mind-body therapies to treat mental health issues (Barnes et al., 2008). The desire for CAM, especially mind-body therapies, makes Yoga an exciting and important direction in the mental health field at this time.

Decades after Giles (1985) first suggested using Yoga with the eating disorder population, Yoga is increasingly been incorporated into eating disorder treatment. Despite the potential for Yoga to attract individuals who are reluctant to try traditional eating disorder treatments, or who have experienced limited success with these approaches, there has been surprisingly little investigation into the efficacy of incorporating Yoga into eating disorder treatment. It is only over the past decade that researchers have begun to study the effects of Yoga on eating disorder attitudes and behaviours.

Yoga and self-objectification. Researchers have uncovered evidence of a negative association between regular Yoga practice and levels of self-objectification, which is "characterized by vigilant monitoring of the body's outward appearance" (Fredrickson, Roberts, Noll, Quinn, & Twenge, 1998, p. 270). In a two-part study, Daubenmier (2005) explored the relationship of Yoga, body awareness, and body responsiveness to self-objectification and disordered eating in women. In Study One, Yoga practitioners not taking aerobic classes, aerobic exercisers not taking Yoga classes, and a control group of females who had not practiced Yoga or aerobics within two years completed questionnaires measuring body satisfaction, self-

objectification, body awareness, body responsiveness, and eating disorder symptomology. The Yoga practitioners demonstrated higher levels of body awareness, body responsiveness, and body satisfaction than both other groups. They also reported lower levels of self-objectification and disordered eating attitudes. Daubenmier (2005) theorized that the emphasis in Yoga on "gaining sensitivity and responsiveness to bodily cues, including hunger and satiety [helped] Yoga practitioners increasingly regulate food intake more based on bodily needs and less on emotional, situational, or other factors" (p. 209). Of note, more regular Yoga practice was correlated with lower experiences of self-objectification and a higher degree of body satisfaction.

In Study Two, 133 female undergraduate students completed the same questionnaires (Daubenmier, 2005). Both body responsiveness and body awareness mediated the relationship between self-objectification and eating disorder symptoms. Body responsiveness refers to the extent that an individual is responsive to her bodily sensations and feelings. These results suggest that Yoga may be an effective tool in reducing self-objectification by increasing body awareness and body responsiveness, and thus may be helpful in the treatment of eating disorders (Beck, 2008).

Impett and colleagues (2006) expanded on the findings of Daubenmier (2005). They conducted the first study to document a decrease in self-objectification following participation in a Yoga intervention. This group of researchers explored the effects of participation in a Yoga program on levels of embodiment (body awareness and body responsiveness), self-objectification, affect, and life satisfaction (Impett, Daubenmier, & Hirschman, 2006). Seventeen women and two men participating in a two-month Anusara Yoga immersion program completed short surveys measuring these variables at six points throughout the Yoga program. Female participants experienced decreases in self-objectification following participation in the Yoga

program. More frequent Yoga practice was also associated with larger increases in positive affect and larger decreases in negative affect. Lastly, increases approaching statistical significance were observed in life-satisfaction and body awareness (Impett et al., 2006).

The findings from these two research studies provide support for the proposition that Yoga helps to counteract self-objectification. These results are relevant to the eating disorder population—self-objectification has been shown to lead to restrained eating (Fredrickson et al., 1998) and higher levels of self-objectification are associated with a greater degree of disordered eating (Fredrickson et al., 1998; Miner-Rubino, Twenge, & Fredrickson, 2002; Noll & Fredrickson, 1998). The results of these two studies also suggest that the benefits of Yoga increase with more regular practice. A limitation of the studies by Daubenmier (2005) and Impett et al. (2006) is their failure to study the effects of Yoga in clinical populations. While these studies suggest possible beneficial applications of Yoga in the treatment of eating disorders, these benefits cannot be generalized to the eating disorder population.

Yoga and body satisfaction. Yoga has also been linked to greater body satisfaction. As mentioned, Daubenmier (2005) found that Yoga practice was associated with higher levels of body satisfaction. This finding is consistent with the findings of Scime, Cook-Cottone, Kane, and Watson (2006) who investigated the impact of a ten-week group program aimed at preventing the development of eating disorders in fifth grade girls. The weekly 90-minute program consisted of Yoga, interactive discourse, and guided relaxation. Pre-treatment and post-treatment data were collected from participants in three groups run over a 13-month time period. Decreases in body dissatisfaction, drive for thinness, and media influence were seen following completion of the program. While the findings provide further rationale for incorporating Yoga into the treatment

of eating disorders, the results again cannot be generalized to individuals with clinical eating disorders.

Not all researchers have found a positive association between Yoga practice and body satisfaction. Mitchell, Mazzeo, Rausch, and Cooke (2007) conducted an RCT in which they compared two types of interventions to a no-intervention control condition in a sample of college women reporting body dissatisfaction. Participants consisted of 93 undergraduate females who were randomly assigned to one of three conditions: a Yoga and meditation intervention, a cognitive dissonance-based intervention, or a control condition. The members in the dissonance group discussed the origin and consequences of several social constructs involved in eating disorders including the thin ideal, self-objectification, and fattism. The dissonance group was also exposed to feminist views of these social constructs and their oppression of women. The participants in the Yoga and dissonance groups attended 45-minute weekly sessions for six weeks. All participants in the study completed measures of body dissatisfaction, thin-ideal internalization, eating disorder pathology, alexithymia, depression, and anxiety before being randomly assigned to one of the three conditions. They completed these measures again following completion of the program. The control group did not receive any type of treatment and completed the posttest measures at the same time as the other two groups.

The researchers hypothesized that participants in the two treatment groups would experience greater decreases in all of the variables measured in comparison to those in the control; however, no statistically significant differences between the Yoga and control groups were found (Mitchell et al., 2007). In contrast, participants in the dissonance group demonstrated decreases in eating disorder symptomology (i.e., eating disorder attitudes and behaviours), drive for thinness, body dissatisfaction, alexithymia, and anxiety post-intervention. In making sense of

these findings, Mitchell et al. (2007) speculated that participating in six 45-minute Yoga classes was insufficient to lead to changes. This speculation is supported by research demonstrating that more Yoga practice (i.e., greater frequency and duration) is associated with greater benefits (e.g., Carmody & Baer, 2008). Mitchell et al. (2007) also conjectured that the Yoga intervention would have been more effective if it had been more specifically geared toward increasing body satisfaction. Another potential limitation of this study is that the measure of body dissatisfaction (the Body Dissatisfaction subscale of the Eating Disorder Inventory; EDI-BD) may have lacked the sensitivity to detect participant changes in levels of body dissatisfaction (Clancy, 2010).

The idea that the EDI-BD is not sensitive to change is corroborated by a recent study that examined the effects of a ten-week Yoga program on body dissatisfaction, self-objectification, and mindfulness of the body in college women. Mindfulness of the body was defined as "the self-regulation of present focused attention on the body within a flexible state of mind that facilitates the awareness, receipt and integration of emerging sensations, emotions, or thoughts about the body in a manner that consistently exudes curiosity, openness, and acceptance, and forgoes judgment and/or evaluation of this information" (Clancy, 2010, p. 8). Clancy (2010) recruited 32 females experiencing body dissatisfaction who had no or limited Yoga experience to participate in her study. The study utilized three measures of body dissatisfaction; two of the measures detected changes among participants following participation in the Yoga program, whereas the EDI-BD did not. This finding lends support to the speculation that the EDI-BD may not be sensitive enough to detect changes in levels of body dissatisfaction, which may help to explain the lack of change detected in the study by Mitchell et al. (2007). Furthermore, despite the limitations of the study by Clancy (2010), most notably the small sample size and lack of a control group, the finding that Yoga was associated with improvements in levels of body

satisfaction is consistent with the findings of Daubenmier (2005) and Scime et al. (2006). Once again the lack of a clinical sample makes it difficult to generalize the study's findings to the eating disorder population.

Yoga for eating disorder populations. Cook-Cottone, Beck, and Kane (2008) were among the first researchers to investigate the effect of Yoga on individuals suffering from an eating disorder. They investigated the effectiveness of a manualized eating disorder group treatment consisting of interactive discourse/psychoeducation focusing on specific content (i.e., emotion regulation, distress tolerance, interpersonal effectiveness, mindfulness, and positive psychology), Yoga, and meditation. Each group session lasted for two hours and consisted of four components: a 50-minute Yoga practice, a short journal activity, 45 minutes of psychoeducation/interactive discourse, and 15 minutes of relaxation. Twenty-four women ranging between the ages of 14 to 35 with a diagnosis of AN or BN completed the eight-week Yoga and Wellness group. Participants completed the drive for thinness, body dissatisfaction, and bulimia subscales of the Eating Disorder Inventory-2 (EDI-2) before and after the eight-week program.

Participants experienced decreases on the drive for thinness and body dissatisfaction subscales following the treatment program (Cook-Cottone et al., 2008). In contrast, they did not experience changes on the bulimia subscale, which measures episodes of binge eating and purging. The results of this study are limited by the small sample size and lack of a control group. It is also difficult to distill the specific effects of the Yoga components of the treatment program. Curiously, the finding that body dissatisfaction scores, as measured by the EDI-BD, diminished contradicts the hypothesis that the EDI-BD lacks the sensitivity to detect change in this population (Clancy, 2010). Further investigation of this measure's ability to detect

meaningful changes in levels of body dissatisfaction is needed. Nevertheless, the inclusion of individuals with eating disorders in the study by Cook-Cottone et al. (2008) extended existing literature, however; it is impossible to ascertain if the benefits of the treatment program were due to Yoga practice.

Clarke (2008) was another pioneer in investigating the effects of Yoga on a clinical eating disorder sample. Her pilot study explored the effects of a ten-week Yoga group emphasizing mindfulness on individuals with BED. Seventeen men and women ranging in age between 19 and 47 participated in the study, which involved attending a one-hour weekly Yoga class. Participants completed the Eating Disorder Examination Questionnaire with Instructions (EDE-Q) as well as measures of mindfulness, and body responsiveness before participating in the Yoga program and following its completion. Participants were also encouraged to engage in regular Yoga practice on their own and used logs to record home practice. Results from this study were positive. Most notably, the average number of objective binges per week decreased, with two participants reporting a complete cessation of binge eating by the end of the group. The observed decrease in binge eating not only remained stable at the eight-week follow-up but actually decreased further. Participants' EDE-Q global scores decreased, as did scores on the eating concern, shape concern, and weight concern subscales.

While it is difficult to ascertain why the results of this study found an association between Yoga practice and decreases in binge eating frequency whereas the study by Cook-Cottone et al. (2008) did not, there are several possible explanations. First, the study by Cook-Cottone et al. (2008) had a small sample size and therefore may have had inadequate power to detect differences. Second, the EDI-2 bulimia subscale measures tendencies toward binge eating rather than objective binge eating episodes (Garner, 1991). Lastly, it is possible that mindfulness

may have been a factor. Clarke (2008) found that participants experienced increases in mindfulness skills following completion of the Yoga group. Mindfulness skills were not measured in the study by Cook-Cottone and colleagues (2008) and it is possible that the program did not lead to an increase in mindfulness skills.

Participants in Clarke's (2008) study also reported increases in body awareness and body responsiveness as measured by the Body Responsiveness Questionnaire, non-reactivity to inner experiences as measured by the Five Facets of Mindfulness Questionnaire, and increases approaching statistical significance in their ability to act with awareness. These findings are consistent with results from other studies that have shown a positive association between Yoga and both body awareness and body responsiveness (Daubenmier, 2005; Impett et al., 2006).

Clarke's (2008) finding that Yoga can decrease binge eating frequency has since been supported by an RCT conducted by McIver and colleagues (2009). These researchers compared the effects of a 12-week Yoga program to a waitlist comparison control on the frequency of binge eating among women identifying with BED. Fifty women completed the study, defined as completing assessment measures at three time periods: pre-treatment, post-treatment, and at three-month follow-up. The Yoga condition was comprised of 12 weekly 60-minute Yoga classes, which included pranayama, asanas, and Yoga nidra (deep relaxation). Participants were also encouraged to engage in home practice using a CD containing a 30-minute pre-recorded Yoga practice. Participants in the Yoga condition experienced decreases in binge eating frequency, as measured by the Binge Eating Scale, whereas participants in the control group did not (McIver, O'Halloran, & McGartland, 2009). The effect size associated with this change was large (d = 2.2). Encouragingly, the decreases in binge eating frequency were maintained three months later (McIver et al., 2009).

McIver and colleagues (2009) improved on the limitations of previous research exploring the effects of Yoga on individuals with eating disorders. Namely, their study had a larger sample size, thus increasing power, included a control group, and used random assignment. A significant limitation of this study was its failure to ascertain whether participants met diagnostic criteria for BED. The BES (Gormally, Black, Daston, & Rardin, 1982) was developed to detect binge eating among obese individuals. It was not designed to determine if individuals meet diagnostic criteria of BED. Furthermore, McIver and colleagues did not examine whether the amount of home practice impacted results in the Yoga group, nor did they assess if their Yoga program increased mindfulness skills.

Clarke (2008) was the first to explore the effects of Yoga on mindfulness skills in the eating disorder population. Her results lend support to the notion that Yoga can be used to increase mindfulness skills in this population. Furthermore, regular home Yoga practice appeared to increase the benefits experienced by participants. Statistical analyses were not performed on the frequency and duration of home practice because only 30% of participants reported practicing Yoga at home; however, it is noteworthy that the participant who reported the most regular home practice also experienced the highest gains in body responsiveness and mindfulness of any of the participants, as well as the greatest decrease in eating disorder psychopathology (Clarke, 2008). These findings underline the importance of home practice and echo the findings of Daubenmier (2005), and Impett, Daubenmier, and Hirschman (2006), that more frequent Yoga practice is associated with greater benefits. It appears that practicing Yoga once a week is sufficient to bring about improvement for individuals with eating disorders, lending further support to the incorporation of Yoga into eating disorder treatment. Nevertheless, it also appears that gains can be maximized with more frequent practice. While Clarke's (2008)

findings are promising, they are limited by the small sample size and lack of a control group.

The most recent study to provide evidence for the efficacy of incorporating Yoga into eating disorder treatment is the most methodologically rigorous study conducted on the topic to date. Carei and colleagues (2010) conducted the first RCT investigating the effects of Yoga on a sample of eating disorder patients. They investigated the effect of eight weeks of Yoga practice on eating disorder psychopathology, depression, anxiety, and food preoccupation. Fifty-four adolescents between the ages of 10 and 21 who were attending a hospital outpatient eating disorder program for treatment of AN, BN, or EDNOS participated in the study. Participants were randomly assigned to either a Yoga condition or a wait-list control condition. While both groups continued to receive standard care during the study (i.e., regular meetings with physicians and dietitians), participants in the Yoga condition also attended two one-hour individually instructed gentle Yoga classes per week.

To investigate the effects of Yoga practice on eating disorder symptoms, psychopathology was measured using global scores on the Eating Disorder Examination. Participants in the Yoga group experienced larger decreases in eating disorder psychopathology than those in the control group. This change exhibited a large effect ($\eta_2 = .16$). Levels of psychopathology in the control group returned to baseline levels at one-month follow-up, whereas this was not the case for the Yoga group. Both groups experienced decreases in anxiety and depression over time; however, contrary to expectation, no differences were observed between groups or as an interaction of group and time. The lack of difference between groups is surprising because other studies have demonstrated that Yoga has a beneficial impact on depression (e.g., Brown & Gerbarg, 2005; Shapiro et al., 2007; Woolery, Myers, Sternlieb, & Zeltzer, 2004) and anxiety (e.g., Gupta, Khera, Vempati, Sharma, & Bijlani, 2006). It is possible

that improvements in anxiety and depression scores experienced by participants in both groups may have been due to their ongoing participation in standard care (Carei et al., 2010).

The study by Carei and colleagues (2010) also investigated the effects of Yoga practice on food preoccupation, defined as being fixated on food, eating, or calories (Cooper & Fairburn, 1987). Participants in the Yoga group completed a measure of their level of food preoccupation before and after each of the 16 Yoga sessions. There were decreases in food preoccupation following all 16 Yoga sessions. The effect sizes associated with these changes ranged from medium to large. Food preoccupation is a common characteristic in the eating disorder population (Cooper & Fairburn, 1987) and the finding that Yoga helped to decrease fixation on food lends further support for the incorporation of Yoga into the treatment of eating disorders.

To date, the study by Carei et al. (2010) is the only previous RCT conducted to investigate the effects of a Yoga program on individuals known to be suffering from an eating disorder. The methodological rigor of this study has helped to establish support for the use of Yoga as an adjunct to treatment for eating disorders. Further studies with similar methodological rigor are needed to investigate the effects of Yoga on adults meeting eating disorder diagnostic criteria.

Summary of research on Yoga for eating disorders. In summary, research into the effects of Yoga on eating disorder symptoms is in its early stages but preliminary results have been encouraging. Yoga practice is associated with decreases in eating disorder psychopathology (Carei et al., 2010; Clarke, 2008; Cook-Cottone et al., 2008; McIver, O'Halloran, & McGartland, 2009) and self-objectification (Daubenmier, 2005; Impett et al., 2006). Researchers have also demonstrated a connection between Yoga practice and increased levels of body satisfaction

(Clancy 2010; Scime et al., 2008), body awareness (Daubenmier, 2005; Impett et al., 2006), body responsiveness (Daubenmier, 2005; Impett et al., 2006), and mindfulness (Clarke, 2008).

The majority of these studies have used correlational or quasi-experimental designs. Unfortunately, much of the existing research has suffered significant methodological limitations. A majority of the studies have used small sample sizes, making interpretation of the findings difficult. Many of these studies have also used non-clinical samples, preventing generalization to the eating disorder population. Furthermore, the majority of studies have either not included a control group or have failed to randomize participants when a control group was included. Despite the call for RCTs to investigate the use of Yoga in eating disorder treatment, to date only two RCTs have been conducted. The first did not ensure participants met diagnostic criteria for BED and the second investigated Yoga's impact on individuals with eating disorders, but focused solely on adolescents. Finally, most of the studies conducted to date have failed to use a manualized Yoga program, making attempts at replication impossible.

The results of the existing literature lend preliminary support to the continued incorporation of Yoga into the treatment of eating disorders; however further research is needed to corroborate these findings and address methodological shortcomings. One area that has yet to be investigated and warrants exploration is determining Yoga's impact on emotion dysregulation and self-criticism in individuals with an eating disorder. Both emotion dysregulation and self-criticism are characteristic of BN and BED and serve to perpetuate these disorders (Bydlowski et al., 2005; Fennig et al., 2008; Telch et al., 2001). Mindfulness practices have been shown to improve emotion regulation skills (Lutz, Brefczynski-Lewis, Johnstone, & Davidson, 2008; Perlman, Salomons, Davidson, & Lutz, 2010; Teper, Segal, & Inzlicht, 2013) and increase self-compassion (Farb, Anderson, & Segal, 2012; Germer, 2009; Leary et al., 2007). Self-compassion

counteracts the negative effects of self-criticism (Neff & McGhee, 2009) and enhances emotion regulation capabilities (Diedrich, Grant, Hoffman, Hiller, & Berking, 2014; Eifert & Heffner, 2003; Jazaieri et al., 2014; Twohig, Hayes, & Masuda, 2006; Weinrib, 2011). One school of Yoga that is particularly well-suited to address self-criticism and emotion dysregulation is Kripalu Yoga.

Kripalu Yoga

Kripalu Yoga emerged out of the Hindu Yoga tradition. This school of Yoga is based on the teachings of Swami Kripalu, who emphasized the importance of *witness consciousness,* and compassion for self and others (Faulds, 2005). Witness consciousness is defined as "the ability to closely observe what is occurring without reactivity" (Faulds, 2005, p. 291). Witness consciousness is cultivated during Kripalu Yoga practice (and later in everyday life) through the practice of five steps: breathing, relaxing, feeling, watching, and allowing (BRFWA; Faulds, 2005). This practice is consistent with the standard definition of mindfulness, which involves two main components: 1) paying attention to the present moment and 2) not judging the unfolding experience (Kabat-Zinn, 2003). It therefore seems reasonable to predict that Kripalu Yoga would have the same effects as other mindfulness practices: decreased experiential avoidance (Twohig, Hayes, & Masuda, 2006; Weinrib, 2011), increased distress tolerance (Eifert & Heffner, 2003; Twohig et al., 2006), and increased capacity for emotion regulation (Lutz, Brefczynski-Lewis, Johnstone, & Davidson, 2008; Perlman, Salomons, Davidson, & Lutz, 2010; Teper, Segal, & Inzlicht, 2013), thus making it an excellent fit for individuals with BN or BED.

Compassion is the second core teaching in the Kripalu Yoga tradition. The Sanskrit word *Kripalu* literally means being compassionate (Faulds, 2005). "Self-compassion is simply compassion directed inward" (Germer & Neff, 2013, p. 1). As operationalized by Neff (2003),

self-compassion consists of three components: self-kindness, common humanity, and mindfulness. Self-kindness refers to "being kind and understanding toward oneself in instances of pain or failure rather than being harshly self-critical" (Neff, 2003, p. 85). Common humanity refers to "perceiving one's experiences as part of the larger human experience rather than seeing them as separating and isolating" (Neff, 2003, p. 85). Lastly, mindfulness, in this context means "holding painful thoughts and feelings in balanced awareness rather than over-identifying with them" (Neff, 2003, p. 85). Self-compassion is continually emphasized in Kripalu Yoga teachings through the compassionate and gentle language of teachers, encouragement of non-judgmental awareness of one's internal experiences, and respect for differing physical capabilities among students (Faulds, 2005).

The emphasis on self-compassion in Kripalu Yoga is well-suited for individuals with BN and BED because these individuals are typically highly self-critical (Fennig et al., 2008; Steiger, Goldstein, Mongrain, & Van der Feen, 1989). Developing self-compassion helps to counter negative self-talk (Neff & McGehee, 2010). It also helps to foster resilience—people who are self-compassionate are less reactive to distressing situations, demonstrating fewer negative emotions and more accepting thoughts in response (Leary Tate, Adams, Allen, & Hancock, 2007). Rather than pushing difficult emotions away, self-compassionate individuals approach emotions and hold them in mindful awareness, which helps them to understand their emotions and step out of aversive emotional reactions (Neff, 2003). Mindfulness in turn helps to foster self-kindness and self-understanding, further lessening self-criticism (Jopling, 2000).

Self-compassion has been linked to a myriad of benefits that may be especially helpful for individuals with eating disorders. It is associated with greater body image acceptance and fewer dysfunctional attitudes about eating (Prowse, Bore, & Byer, 2013), lower levels of body

surveillance and shame (Daye, Webb, & Jafari, 2014), and lower binge eating severity (Webb & Foreman, 2013). Self-compassion has also been found to protect against self-objectification by moderating the relationship between body surveillance and self-objectification (Liss & Erchull, 2015).

Considering these findings, it is not surprising that self-compassion has been shown to impact treatment outcomes among individuals with eating disorders. In a recent study, low levels of self-compassion and high fear of self-compassion predicted poor treatment outcomes among women receiving outpatient treatment for a variety of eating disorder diagnoses (Kelly, Carter, Zuroff, & Borairi, 2013). This relationship may be explained in part by the finding that lower levels of self-compassion and higher levels of fear of self-compassion were associated with greater eating disorder psychopathology (Kelly et al., 2013). Furthermore, increasing self-compassion appears to improve treatment outcomes by decreasing levels of shame. Kelly, Carter, and Borairi (2014) found that attaining decreases in shame early in treatment predicted a faster reduction in eating disorder symptoms. They also found that greater increases in self-compassion early in treatment predicted faster decreases in feelings of shame (Kelly, Carter, & Borairi, 2014). These findings suggest that increasing self-compassion may be an important focus in treatment as self-compassion decreases feelings of shame, which appears to contribute to the maintenance of eating disorder pathology (Kelly et al., 2014).

Stages of Kripalu Yoga. Kripalu Yoga is taught in three stages, consisting of progressively deeper practices (Faulds, 2005). The first stage focuses on present-moment breath and body awareness, emphasizing self-compassion, the proper alignment of poses, and coordination of breath and movement (Faulds, 2005; Feuerstein & Payne, 1999). During the second stage, practitioners begin to hold poses for longer periods of time while paying attention

to their arising thoughts, emotions, and sensations. Holding poses serves several purposes: to strengthen the physical body, induce a meditative state, and release emotions stored in the body. It also provides opportunities for individuals to recognize they can tolerate discomfort. In the final stage, practitioners learn to engage in meditation-in-motion, which is marked by a state of deep relaxation, wherein individuals allow the "body to move spontaneously as guided from within" (Faulds, 2005, p. 6). Kripalu Yoga encourages its practitioners to listen to their body for feedback and stresses the application of yogic principles both on and off the mat (Faulds, 2005).

Rationale for the Present Study

The present study examined the effects of an eight-week Kripalu Yoga program on women with BN or BED. While these disorders are known to cause many debilitating psychological and physical consequences, standard psychological treatments do not help up to half of those who receive treatment (Wilson, Grilo, & Vitousek, 2007). Discouragingly, the majority of women with BN and BED do not even seek treatment (Mond et al., 2007; NEDA, 2013). Clearly there is a need for more effective treatments and a way of both reaching and engaging individuals who are choosing not to seek help. Incorporating Yoga into the treatment of eating disorders may help to address both of these issues.

CAM services are gaining increasing popularity in Canada. Currently millions of Canadians are using CAM services (Metcalfe et al., 2010) and individuals are increasingly choosing mind-body therapies to address their mental health concerns (Barnes et al., 2008). People are choosing these alternative approaches for a number of reasons. Mind-body therapies are often viewed as being more holistic, involving lower levels of physical or emotional risk, being cheaper alternatives to traditional approaches, and allowing individuals greater involvement in directing their own treatment (Wahbeh, Elsas, & Oken, 2008). Yoga is one type

of mind-body therapy that has surged in popularity in recent years. A survey conducted in 2005 revealed that 1.4 million Canadian were practicing Yoga, a rise of 15% from the previous year and 45.4% from the year before that (Namasta, 2005). The growing interest in Yoga appears to be continuing. One in twelve individuals not already practicing Yoga reported planning to try Yoga within the next year (Namasta, 2005). For these reasons incorporating Yoga into eating disorder treatment options may attract individuals who would not seek treatment otherwise, such as those who are reluctant to talk about their eating disorders or who are looking for a more holistic approach.

Yoga may also be able to improve treatment outcomes. While emotional processing deficits and self-criticism are known to contribute to the maintenance of BN and BED (Fennig, Hadas, Itzhaky, Roe, Apter, & Shahar, 2008; Fox & Froom, 2009; Hayaki, 2009), standard psychological treatments either fail to address these deficits, or do so inadequately. In contrast, mindfulness practices have been shown to increase effective management of emotions (Lutz, Brefczynski-Lewis, Johnstone, & Davidson, 2008; Perlman, Salomons, Davidson, & Lutz, 2010; Teper, Segal, & Inzlicht, 2013). Mindfulness-based approaches have also been shown to increase self-compassion (Farb, Anderson, & Segal, 2012; Germer, 2009; Leary et al., 2007), which not only serves to improve emotion regulation (Diedrich, Grant, Hoffman, Hiller, & Berking, 2014), but also helps to counteract self-criticism (Neff & McGhee, 2009). Enhancing self-compassion is especially important for individuals with BN and BED because these individuals are typically very self-critical (Fennig et al., 2008). Their high levels of self-criticism contribute to global negative affect (Zuroff, Stotland, Sweetman, Craig, & Koestner, 1995) and feelings of shame (Gilbert et al., 2010; Whelton & Greenberg, 2005), which also contribute to the perpetuation of these disorders (Goss & Allan, 2009). Furthermore, self-compassion has been linked to decreases

in binge eating frequency (Webb & Foreman, 2013) and better treatment outcomes among individuals with eating disorders (Kelly, Carter, & Borairi, 2014)

Hatha Yoga is itself a mindfulness practice. This makes it possible to draw on the wealth of research highlighting the benefits of mindfulness practices for individuals with eating disorders when generating hypotheses about the benefits of Yoga for this population. The research on mindfulness-based practices provides a strong rationale for the incorporation of Yoga into eating disorder treatment.

Yoga is increasingly being incorporated into eating disorder treatments; however, research into this practice is in its early stages. To date, there is relatively little empirical support for this practice. It is necessary to investigate the merits of the continued incorporation of Yoga into the treatment of eating disorders. While existing research on the effects of Yoga for individuals with eating disorders is promising, the majority of studies have suffered significant methodological limitations. The present study addresses these methodological limitations and expands on existing research by investigating Yoga's impact on self-criticism and emotion dysregulation, both of which have been shown to contribute to episodes of binge eating (Bydlowski et al., 2005; Fennig et al., 2008; Telch, Agras, & Linehan, 2001), as well as self-compassion and mindfulness, which have demonstrated benefits in the treatment of eating disorders (e.g., Kelly et al., 2013; Kelly et al., 2014; Kristelle et al., 2006; Kristeller et al., 2014, Masson et al., 2013; Telch et al., 2001). Investigating Yoga's impact on emotion-regulation, self-criticism, self-compassion, and mindfulness allows for a greater understanding of the benefits Yoga has demonstrated for individuals with eating disorders.

The present study is also the first to investigate the effects of Kripalu Yoga on individuals with BN and BED. Kripalu Yoga emphasizes the cultivation of witness consciousness (i.e.,

mindfulness) and self-compassion, making it a good fit for these individuals. Researchers have found that Kripalu Yoga follows through on its aim of enhancing mindfulness skills and self-compassion (Gard et al., 2011). Thus, it is likely that Kripalu Yoga will help to address the self-criticism and emotion regulation difficulties that drive episodes of binge eating and work to maintain BN and BED.

Hypotheses

This study examines six hypotheses. The study's hypotheses, corresponding outcome measures, and analyses are presented in Table 1.

Table 1

Hypotheses and Corresponding Analyses

Hypothesis	Outcome Measure	Analyses
There will be a larger reduction in binge eating frequency for participants in the Yoga group over time in comparison to control participants.	EDE-Q binge eating frequency questions (i.e., reported number of binge days and reported number of times binge eating)	Two 2 X 3 Mixed Model ANOVAs
There will be a larger reduction in emotion regulation difficulties for individuals in the Yoga group across time in comparison to participants in the control group.	DERS total score	2 X 3 Mixed Model ANOVA
Participants in the Yoga group will experience a larger increase in self-compassion across time in comparison to control participants.	SCS-SF total score	2 X 3 Mixed Model ANOVA
There will be a larger reduction in self-criticism for participants in the Yoga group across time in comparison to controls.	FSCRS Inadequate Self and Hated Self subscale scores	Two 2 X 3 Mixed Model ANOVAs
Yoga participants will experience an increase in their ability to invoke a mindfulness state across time.	TMS Decentering and Curiosity subscale scores	Two One-Way Repeated Measures ANOVAs
Greater amount of Yoga home practice will be associated with lesser binge eating frequency and self-criticism, greater self-compassion and mindfulness skills, and fewer emotion regulation difficulties in participants in the Yoga group.	Yoga logs, EDE-Q binge eating frequency questions, DERS total score, SCS-SF total score, FSCRS IS and HS subscale scores, TMS Decentering and Curiosity subscale scores	Pearson product correlations

Note. EDE-Q = Eating Disorder Examination Questionnaire with Instructions; DERS = Difficulties in Emotion Regulation Scale; SCS-SF = Self-Compassion Scale-Short Form; FSCRS = Forms of Self-Criticizing/Attacking and Self-Reassuring Scale; TMS = Toronto Mindfulness Scale.

Method

Participants

Participants were recruited using advertisements posted on local university campuses (i.e., University of Alberta, MacEwan University, Concordia University, Norquest College, and Northern Alberta Institute of Technology), fitness centres, coffee shops, local Yoga studios, supermarkets, and mental health centres. Participants were also recruited using online advertisements posted on social media sites (i.e., Kijiji, Craigslist, and Facebook). Additionally, one of the psychiatrists working in the University of Alberta Hospital's Eating Disorder Program posted a flyer in her office. These flyers and online advertisements solicited individuals with BN and BED who had no or limited Yoga experience (i.e., never having practiced more than the occasional random class) to participate in an eight-week Yoga program. The study also garnered media attention and was featured in newspaper articles (i.e., Metro News and the Edmonton Examiner) and television news broadcasts (i.e., CTV Edmonton and NAIT NewsWatch).

Inclusion and exclusion criteria. To be eligible for inclusion in the study, participants needed to: be 18 years of age or older, meet DSM-5 criteria for BN or BED, and have no or limited Yoga experience (defined as having practiced less than six times in the past year, and less than six times per year in the past five years). Exclusion criteria were used in an attempt to reduce the possibility of risk to participants and to control for participant characteristics that could have interfered with interpretation of the effect of the Yoga program. Exclusion criteria included: physical inability to participate in a Yoga program, active psychoses, substance abuse, suicidal or homicidal ideation, or a comorbid borderline personality disorder.

Sample demographics. The final sample consisted of 53 women. Demographic characteristics of the sample can be seen in Table 2. The age of participants ranged from 18 to 59

years, with an average age of 29 years. Ethnicity of participants was 71.7% (*n* = 38) Caucasian, 7.5% (*n* = 4) Asian Canadian, 5.7% (*n* = 3) Aboriginal/Metis, 3.8% (*n* = 2) East Indian, 1.9% (*n* = 1) Hispanic, 1.9% (*n* = 1) Chinese, and 1.9% (*n* = 1) South East Asian, and 5.7% (*n* = 3) Other (one individual identified as both East Indian and Hispanic, and two participants identified as both Caucasian and Asian Canadian). The majority of participants (45.3%; *n = 24*) reported high school as the highest level of education completed, 11.3% (*n* = 6) had a college diploma, 30.2% (*n* = 16) had an undergraduate degree, and 13.2% (*n* = 7) had a graduate degree. Of the participants, 50.9% (*n* = 27) were students, 7.5% (*n* = 4) were unemployed, and 41.5% (*n* = 22) were employed. The working participants reported a variety of occupations (e.g., college instructor, administrative assistant, medical technologist, fitness trainer, financial assistant, teacher, outreach worker, and manager).

Of the 53 participants in the final sample, 24.5% (*n* = 13) met diagnostic criteria for binge eating disorder and 75.5% (*n* = 40) met criteria for bulimia nervosa. The Body Mass Index (BMI) of participants ranged from 20.10 to 44.6, with an average BMI of 27.0 (*SD* = 6.82). According to BMI guidelines, 52.8% (*n* = 28) of participants fell within the normal weight range, 15.1% (*n* = 8) were overweight, and 32.1% (*n* = 17) were obese. At the beginning of the study, 41.5% (*n* = 22) of participants reported currently being in therapy and 58.5% (*n* = 31) reported having seen a therapist in the past. Approximately 21% (*n* =11) of participants reported never having seen a therapist before. The average number of therapy sessions attended to date was 27, ranging from 0 (*n* = 11) to more than 100 (*n* = 8). Twenty-four participants attended therapy at some point throughout the twelve weeks of the study. The number of therapy sessions participants attended during the duration of the study ranged from zero to 16, with an average of three sessions (*M* = 2.77, *SD* = 4.30).

Additionally 30% (*n* = 16) of participants reported taking psychotropic medication at the beginning of the study. The most common medications were antidepressants; 24.5% (*n* = 12) of participants reported being on an antidepressant. The most frequently taken antidepressants were SSRIs (*n* = 11). A number of participants were taking antipsychotic or mood-stabilizing medication (*n* = 6), or central nervous stimulants (*n* = 2) in addition to their antidepressant medication. Other medications reported included benzodiazepines (*n* = 1) and anticonvulsant medication (*n* = 1).

Table 2

Participant Demographics

Variable	*n*	%
Ethnicity		
Caucasian	38	71.7
Asian Canadian	4	7.5
Aboriginal/Metis	3	5.7
East Indian	2	3.8
Hispanic	1	1.9
Chinese	1	1.9
South East Asian	1	1.9
Other	3	5.7
Education		
High School	24	45.3
College Diploma	6	11.3
Undergraduate Degree	16	30.2
Graduate Degree	7	13.2
Employment		
Unemployed	4	7.5
Employed	22	41.5
Student	27	50.9
BMI		
Normal Weight	28	52.8
Overweight	8	15.1
Obese	17	32.1
Diagnosis		
Bulimia Nervosa	40	75.5
Binge Eating Disorder	13	24.5
Previous Therapy		
Yes	42	79.2
No	11	20.8
Psychotropic Medication		
Yes	16	30.19
No	37	69.81

Measures

Screening instruments. Screening instruments were used to ensure participants met the inclusion/exclusion criteria for this study.

Eating Disorder Diagnostic Scale. The Eating Disorder Diagnostic Scale (EDDS; Stice, Telch, & Rizvi, 2000) is a 22-item self-report measure used to diagnose AN, BN, and BED. This scale was used to ensure participants met the diagnostic criteria of BN or BED. The scores of the EDDS have demonstrated high internal consistency ($\alpha = .89$), high test-retest reliability ($r = .87$), and good convergent validity with other measures of eating pathology (Krabbenborg et al., 2011; Stice, Fisher & Martinez, 2004; Stice & Ragan, 2002; Stice, Telch & Rizvi, 2000). An overall symptom composite score of 16.5 or higher has been shown to accurately distinguish clinical populations from healthy controls (Krabbenborg et al., 2011). As such, the EDDS is a useful tool for treatment research. As in other research studies (e.g., Berg, Stiles-Shields, Swanson, Petersen, Lebow, & LeGrange, 2012), the criteria for frequency and duration of binge eating and compensatory behaviours were adjusted to meet DSM-5 criteria as the EDDS uses DSM-IV-TR diagnostic criteria.

Alcohol Use Disorder Identification Test. The Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, De La Fuente, & Grant, 1993) is a ten-item self-report instrument used to screen for alcohol-related problems. The instrument was developed by the World Health Organization over two decades. Each of its ten items presents a set of responses to choose from, and each response corresponds to a score between zero (e.g., never) and four (e.g., daily or almost daily). The final three questions have three responses, which correspond to a score of zero (no), two (yes, but not during the past year), or four (yes, during the past year). The AUDIT assesses three domains of problematic drinking: hazardous alcohol use, symptoms of

dependence, and harmful alcohol use. Scores on the AUDIT have demonstrated adequate reliability, with Cronbach's alpha of .70 or higher for each of the three domains (Saunders et al., 1993). Evidence for validity comes from the scale's ability to correctly discriminate between alcoholics and non-alcoholics. For example, a cutoff score of eight correctly identified 99% of known alcoholics and 99.5% of non-drinkers in one study (Saunders et al.). Accordingly a total score of eight or more was used as the cutoff score for identifying problematic drinking in the present study.

Drug Abuse Screening Test. The Drug Abuse Screening Test-10 (DAST-10; Skinner, 1982) is a ten-item self-report measure of problematic substance use (not including alcohol) over the past twelve months. The DAST-10 is a short form version of the 28-item DAST. All ten items use a yes/no format, with yes answers receiving a score of one, except for item three which is reverse scored. The scores on the DAST-10 have demonstrated good internal consistency (alpha = .94; Carey, Carey, & Chandra, 2003) and temporal stability (test-retest intraclass correlation coefficient = .71; Cocco & Carey, 1998). Researchers have found that the DAST-10 accurately discriminates between psychiatric outpatients with and without drug use disorders (Cocco & Carey, 1998). Ranges of scores are used to identify the level of problematic drug use. Scores of three to five indicate a moderate level, scores of six to eight indicate a substantial level, and scores of nine to ten suggest a severe level of problems due to drug use (Maistro et al., 2000). The present study used a total score of three as the cutoff for identifying problematic drug use among participants.

Psychosis Screener. The Psychosis Screener (PS; Degenhardt, Hall, Korten, & Jablensky, 2005) is a self-report questionnaire used to assess the presence of psychotic symptoms. The PS consists of seven items, three of which are asked only if the respondent

endorses a previous question. Items 1 and 1a assess for delusions of control, thought interference and passivity, items 2 and 2a assess for delusions of reference or persecution, and items 3 and 3a assess for grandiose delusions. The final item assesses whether the respondent has ever been diagnosed with schizophrenia. The scores on the PS have demonstrated adequate internal consistency ($\alpha > .74$), and correlations between each item and the total score are generally strong ($r > .50$), with the exception of the items assessing grandiose delusions (Degenhardt et al., 2005). A score of one or higher is indicative of psychotic symptoms using a broad definition of psychosis, and a score of three or higher is indicative of psychosis when using the narrow definition of schizophrenia or schizoaffective disorder. The PS scores demonstrated strong sensitivity (> .97) but poor specificity (< .40). Accordingly, it was decided that any participants in the present study who received a score of one or higher on the PS would be contacted and questioned further to determine whether they were experiencing psychotic symptoms.

Suicide Behaviors Questionnaire-Revised. The Suicide Behaviors Questionnaire-Revised (SBQ-R; Osman et al., 2001) is a four-item self-report measure of suicidality. Each item evaluates a different dimension of suicidality. The first item assesses lifetime suicidal ideation and/or past suicide attempts. It is rated on a four-point Likert scale ranging from one (never) to four (I have attempted to kill myself and really hoped to die). The second item assesses the frequency of suicidal ideation over the past 12 months. It is measured on a five-point Likert scale ranging from one (never) to five (very often—which is defined as five or more times). The third item evaluates the threat of a suicide attempt. It asks if the respondent has ever told someone they were going to, or possibly going to, commit suicide. It is measured on a three-point Likert scale ranging from one (no) to three (yes, more than once). The fourth item evaluates the likelihood of future suicidal behaviour. This item is measured on a seven-point Likert scale

ranging from zero (never) to six (very likely). The scores on the SBQ-R have demonstrated acceptable internal consistency reliability estimates. A coefficient alpha of .87 was observed for a sample of adult psychiatric inpatients and an alpha of .76 was observed for a sample of undergraduate students (Osman et al., 2001). In accordance with the recommendations for the SBQ-R, a total score of seven was used as the cutoff score for identifying risk for suicide among participants in the present study. This cutoff score has demonstrated strong sensitivity (.93) and specificity (.95; Osman et al., 2001).

MacLean Screening Instrument for Borderline Personality Disorder. The MacLean Screening Instrument for Borderline Personlity Disorder (MSI-BPD; Zanarini et al., 2003) is a ten-item self-report screening instrument for borderline personality disorder. The ten items are based on the DSM-IV criteria for BPD and are all answered using a yes/no format. "Yes" answers indicate the presence of the criteria in question and are given a score of one, whereas "no" answers indicate the absence of the criteria and receive a score of zero. The scores on the MSI-BPD have demonstrated adequate internal consistency (alpha = .74), good test-retest reliability (r = .72), and good convergent validity with the Diagnostic Interview for the DSM-IV Personality Disorders (phi coefficient values ranged from .59 to .30; Zanarini et al., 2003). The range of possible scores for the MSI-BPD is zero to ten, and scores of seven or higher suggest the respondent meets the diagnostic criteria of BPD. The cutoff score of seven allows for high sensitivity (.81) and specificity (.85; Zanarini et al.) and was used in the present study.

Outcome measures. The following measures were used to assess changes in the dependent variables and to ensure participants were participating in the Yoga classes as instructed.

Eating Disorder Examination Questionnaire. The Eating Disorder Examination Questionnaire (EDE-Q 6.0; Fairburn & Beglin, 2008) is a 31-item self-report measure used to diagnose eating disorders. The EDE-Q has been found to more more accurately measure frequency of binge eating than other eating disorder assessments (Celio, Wilfley, Crow, Mitchell, & Walsh, 2004). Goldfein, Devlin, and Kamenetz (2005) improved the performance of the EDE-Q through their development of a one-page instruction sheet explaining the definition of an objective binge episode through use of examples. This instruction sheet was developed in order to address previous inconsistencies demonstrated by the EDE-Q in its measurement of binge eating episodes. Two items on the EDE-Q assess binge eating frequency over the past 28 days: number of times binge eating and number of binge days. These two items were administered to measure frequency of objective binge eating episodes in the present study, along with the instruction sheet developed by Goldfein and colleagues (2005).

Difficulties in Emotion Regulation Scale. The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) is a 36-item self-report scale designed to measure emotional processing. Respondents are asked to rate their responses on a five-point Likert scale ranging from one (almost never) to five (almost always). The DERS generates a total score as well as six subscale scores: non-acceptance of emotional responses, difficulties engaging in goal-directed behaviour (while experiencing negative emotions), impulse control difficulties (while experiencing negative emotions), lack of emotional awareness, limited access to emotion regulation strategies, and lack of emotion clarity. Higher scores are indicative of more difficulties with emotion regulation. Gratz and Roemer (2004) have demonstrated that scores on the DERS have sound psychometric properties. The total score on the DERS has demonstrated good test-retest reliability (r = .88), good construct validity with other measures of emotion

dysregulation, and good internal consistency (α = .93; Gratz & Roemer, 2004). The subscale scores have also demonstrated adequate internal consistency (α > .80). The total score was used in the present study as the general construct of emotion regulation difficulties was of greater interest than specific difficulties with emotions.

The Forms of Self-Criticizing/Attacking and Self-Reassuring Scale. The Forms of Self-Criticizing/Attacking and Self-Reassuring Scale (FSCRS; Gilbert, Clark, Hempel, Miles, & Irons, 2004) is a 22-item self-report measure of self-criticism and self-reassurance. The items are rated on a five-point Likert scale ranging from zero (not at all like me) to four (extremely like me). The FSCRS yields three subscale scores. The first subscale measures self-reassurance and the other two subscales measure different forms of self-criticism: self-criticism characterized by a sense of personal inadequacy and self-criticism characterized by self-hatred. The scores of the FSCRS have been shown to have sound psychometric properties. Cronbach's alpha values for the subscales range from .86 to .90, demonstrating good internal consistency. The hated self and inadequate self subscale scores also correlated strongly with other measures of self-criticism ($p < .05$), demonstrating good convergent validity (Gilbert et al., 2004). Being able to differentiate between forms of self-criticism is a strength of the FSCRS as research has demonstrated that self-criticism is not a single process (Gilbert et al., 2004). The two self-criticism subscales, inadequate self and hated self, were used as separate dependent variables in the present study.

Self-Compassion Scale–Short Form. The Self-Compassion Scale–Short Form (SCS-SF; Raes, Pommier, Neff, & Van Gucht, 2011) is a self-report measure of self-compassion. Its scores have demonstrated sound psychometric properties and it is considered a valid and reliable alternative to the longer form version of the SCS (Raes et al., 2011). The SCS-SF consists of

twelve items rated on a five-point Likert scale ranging from one (almost never) to five (almost always). The SCS-SF computes a total self-compassion score, as well as six subscale scores: self-kindness, self-judgment, common humanity, isolation, mindfulness, and over-identification. These are the same subscales that are found in the original SCS. The total SCS-SF scores have demonstrated good internal consistency ($\alpha = .87$) but the subscale scores have demonstrated more variability in internal consistency (Cronbach's alpha ranged from .54 to .75). The SCS-SF total score has demonstrated a near-perfect correlation with the SCS total score ($r = 0.98$; Raes et al., 2011). The total score of the SCS-SF was employed in the present study.

Toronto Mindfulness Scale. The Toronto Mindfulness Scale (TMS; Lau et al., 2006) is a self-report measure of an individual's ability to invoke a mindfulness state. It consists of thirteen items ranked on a five-point Likert scale ranging from zero (not at all) to four (very much). Responses yield two subscale scores, each representing a separate factor of mindfulness. The curiosity subscale measures whether an individual brings an attitude of curiosity, openness, and acceptance to his or her present moment experience (i.e., thoughts, feelings, sensations). In contrast, the decentering subscale measures an individual's ability to be aware of his or her present moment experience (i.e., thoughts, sensations, emotions) without overly-identifying with this experience. The scores on the TMS have demonstrated good psychometric properties and sensitivity in detecting change. (Lau et al., 2006). Internal consistency for the two subscales ranges from .88 to .84 (Lau et al., 2006). Evidence of criterion validity comes from the finding that subscale scores increased following participation in an eight-week mindfulness program (Lau et al., 2006). Further evidence comes from the finding that experienced meditators reported higher scores on the TMS than non-meditators (Lau et al., 2006). Both the curiosity and decentering subscale scores of the TMS were used in the present study.

Attitudes Toward Seeking Professional Psychological Help–Short Form. The Attitudes Toward Seeking Professional Psychological Help–Short Form (ATSPPH-SF; Fischer & Farina, 1995) is a ten-item self-report measure of an individual's attitudes toward seeking help. The ATSPPH-SF is an adaption of the original 29-item measure (Fischer & Turner, 1970). Items on the measure are rated on a four-point Likert scale ranging from one (disagree) to four (agree). The measure produces a total score, with higher scores indicating a more positive attitude toward help seeking. Scores on the ATSPPH-SF have demonstrated sound psychometric properties. A coefficient alpha of .84 and a one-month test-retest reliability coefficient of .80 provide evidence of reliability (Fischer & Farina, 1995). High correlations with help-seeking behaviours provide evidence of criterion-related validity (Fischer & Farina, 1995). Furthermore, scores on the AATSPPH-SF are highly correlated with scores on the original ATSPPH (Fischer & Farina, 1995). While attitudes toward help seeking was not one of the dependent variables in the present study, the total score of the ATSPPH-SF was used to get a sense of whether the individuals who chose to participate would have been open to other types of treatment.

Yoga Log. Participants in the Yoga group were encouraged to develop a daily Yoga practice on their own time. They were asked to keep a Yoga Log (Appendix A), in which they recorded the date and number of minutes of home practice.

Yoga-Rating Scale. Participants were also asked to complete a five-item self-report measure assessing whether they practiced Yoga as instructed (see Appendix B). Items were answered on a five-point Likert scale ranging from zero (never) to four (always). Items were summed with scores of 2.6 or higher indicating that Yoga was practiced as intended.

Procedures

Advertisements (i.e., recruitment posters as described on page 62) invited those interested in participating in the study to visit the study's website. The website provided a detailed description of the nature of the study and requirements of participation. Recruitment posters also provided the researcher's contact information (phone number and email address) in case potential participants had any questions. Interested individuals were instructed to click on a link that was displayed on the study website, which redirected them to another website where they could complete Phase One of the two-phase study. An overview of participants' movement through the two phases of the study is depicted in Figure 1.

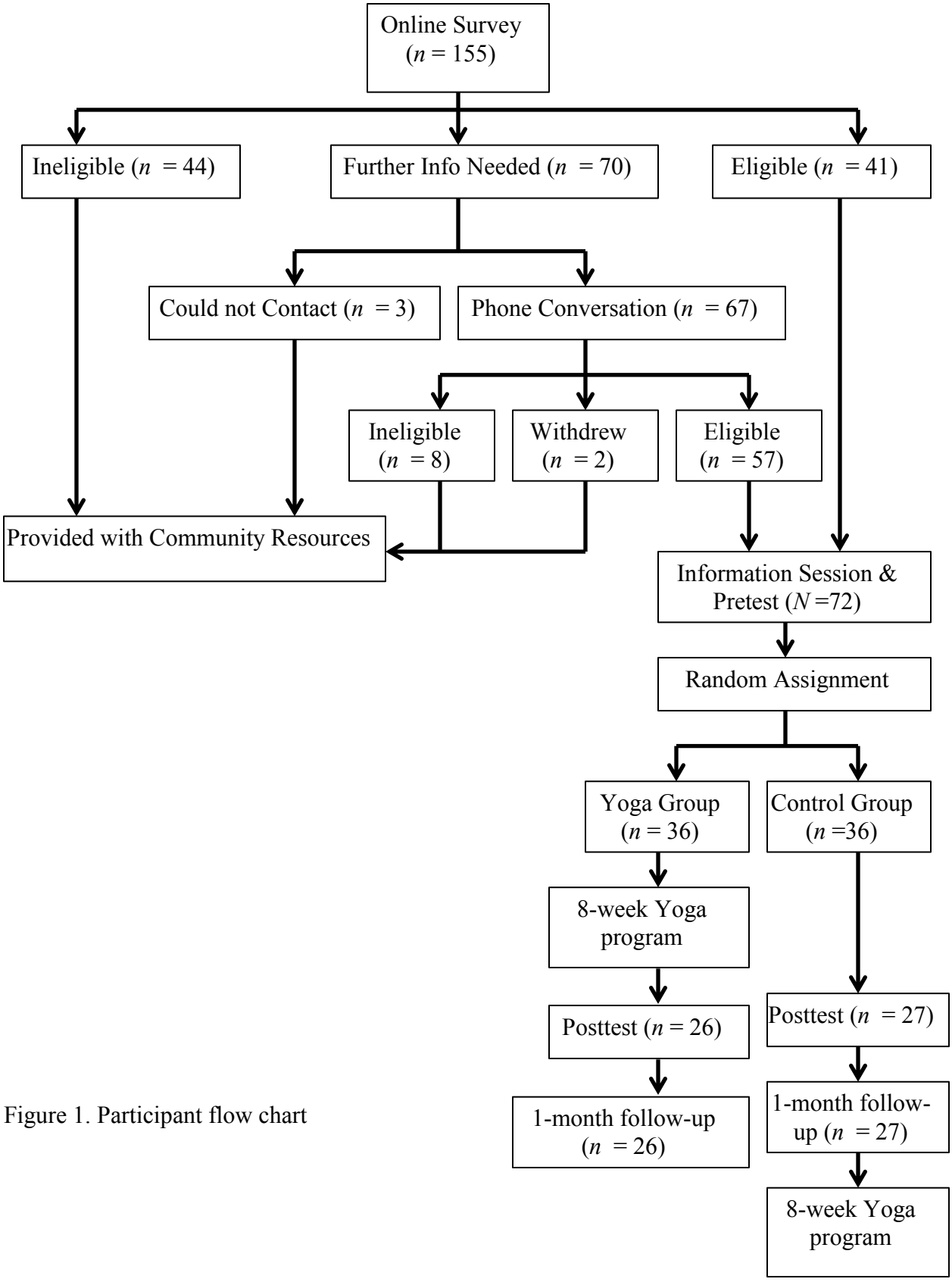

Figure 1. Participant flow chart

Phase One. During Phase One, participants were asked to answer a series of questions and complete a series of questionnaires in order to determine their eligibility for participation in Phase Two of this study. Phase One was administered electronically using a survey presented on Fluid Surveys. The homepage of the survey consisted of the Phase One information and consent form (see Appendix C), which was also available on the study website. In order to proceed to the screening questions, participants had to check a box indicating that they had read the information and consent form, and were providing free and informed consent to participate in Phase One of the study. Upon providing consent, participants were presented with initial questions asking for their name, contact information (phone number and email address), age, gender, and amount of Yoga experience. If participants reported being younger than 18 years-of-age, being a gender other than female, or if their amount of Yoga experience exceeded the cut-off for the present study (i.e., currently practicing more than six times this year or having practiced more than six times per year in the past five years), they were determined to be ineligible to participate in Phase two of the study and were automatically redirected to the termination page of the online survey (see Appendix D). The termination page informed them of their ineligibility to participate in Phase Two and they were directed to contact the primary investigator if they had any questions.

Participants who were eligible after answering the initial questions progressed to the second part of the online survey—an assessment battery consisting of the Eating Disorder Diagnostic Scale, Alcohol Use Disorder Identification Test, Drug Abuse Screening Test, Psychosis Screener, Suicide Behaviors Questionnaire-Revised, and the MacLean Screening Instrument for Borderline Personality Disorder. Upon completing the online assessment battery, participants were presented with a message informing them that the principal investigator would

contact them within a few days to inform them whether they were eligible to participate in Phase Two of the study.

A total of 155 individuals completed Phase One of the study. Of these 155 individuals, 32 were deemed ineligible to participate in Phase Two of the study after completion of the initial questions. Accordingly, 123 participants completed the full assessment battery. On average, it took these participants 25 minutes to complete the survey. The researcher received an email notification each time an individual completed the online survey. The Fluid Survey software was programmed to score the questionnaires, with the exception of the EDDS, which the primary investigator scored by hand.

Of the 123 women who completed the online screening questions, 41 were deemed eligible to proceed to Phase Two without further questioning. These participants were informed of their eligibility via email and were provided with the Phase Two information form, also available on the study website, and were given the dates, times, and locations of the information sessions. Twelve women were ineligible to proceed to Phase Two and were sent a list of community resources via email. They were also encouraged to contact the primary investigator if they had any questions.

Further questioning was required to determine eligibility to proceed to Phase Two of the study for the remaining 70 participants. The primary investigator telephoned these individuals and asked follow-up questions to determine their eligibility. The women were informed of their eligibility at the end of this conversation. A few women were deemed ineligible (n = 8) for a variety of reasons (e.g., not meeting diagnostic criteria for BN or BED, engaging in significant alcohol or drug abuse, reporting active suicidal ideation, or having been diagnosed with borderline personality disorder). These women were provided with a list of community

resources. Those who were eligible (n = 57) to proceed to Phase Two of the study were provided with the Phase Two information form, as well as the dates, times, and locations of the information sessions. Three individuals did not respond to attempts to contact them and two individuals chose to withdraw from the study (one for geographical reasons). These individuals were also sent the list of community resources.

Phase Two. Eligible participants were asked to attend one of several information sessions presented by the researcher. At this meeting, a detailed review of the nature of the study, foreseeable risks and expectations for participation, as well as the rights and responsibilities of participants were provided. The primary investigator then answered any remaining questions after which participants were asked to sign the Phase Two consent form (see Appendix E). The researcher then left the room and a research assistant administered the research package consisting of a demographic form, the ATSPPH-SF, and a baseline assessment battery that included the SCS-SF, DERS, two items from the EDE-Q, and the FSCRS. On one occasion, the research assistant failed to show up. In this instance, the primary investigator asked participants to leave their questionnaires in an envelope, which the participant who was the last to leave sealed shut.

A total of 72 women attended an information session. All of them provided informed consent and completed the research package. Following completion of the final information session, participants were randomly assigned to either the Yoga group (n = 36) or the waitlist control group (n = 36) using the *Research Randomizer* computer software program (Urbiniak & Plous, 2013). Using their study codes, participants were first randomly assigned a value of one or two in order to create two groups. After the two groups were created, they were randomly assigned a treatment condition. It was only at this point that the researcher learned which

participants were in which group. Participants were informed about the start date of their Yoga classes and the three class times. They were asked to state their availability and rank their preferences for class times. Regardless of their group assignment, all participants completed the same assessment battery again after eight weeks, during which time the treatment group had completed the eight-week Yoga program, and again one month later. Individuals assigned to the Yoga condition were asked to fill out the TMS immediately after the first, third, sixth and eighth/final Yoga classes. If participants missed a class where the TMS was administered, they completed the questionnaire the following class. For ethical reasons, as an incentive to participate in the study, and in an attempt to prevent dropouts, individuals assigned to the control group were provided with the opportunity to participate in the eight-week Yoga program following the completion of the study.

Participants were requested to undergo a physical examination and receive a physician's authorization to participate in a Yoga program before commencing the study. Those assigned to the Yoga condition were expected to attend eight 90-minute weekly Yoga sessions held on the University of Alberta campus. Participants were required to pay a $20 fee that covered the cost of supplies (i.e., Yoga straps, bolsters, and blocks) and a Yoga mat that was theirs to keep. As mentioned earlier, participants were asked to indicate their preference for the three possible class times when they were informed of their eligibility to participate in Phase Two of the study. Class sizes were capped at twelve in order to ensure participants would receive proper and personalized instruction. Participants were assigned to a class time based on their availability and preferences, and fortunately everyone was able to attend their assigned time. On occasion, participants were given permission to attend a different class time when they had missed a class or knew they were going to miss a class. Each week participants were asked to keep a written

record of their home Yoga practice using the Yoga logs provided. These logs were collected at the following week's class. If a participant failed to submit a Yoga log, she was recorded as having completed zero minutes of home practice for the week.

The Yoga classes followed a pre-determined format as outlined in the Yoga manual (see Appendices F–L). Each class consisted of pranayama, asana, and meditation practices, and the program gradually introduced new postures and breathing practices, progressing toward more advanced practices. The primary researcher, a registered Yoga teacher who was trained in the Kripalu Yoga tradition, led all of the Yoga classes. Throughout the Yoga classes, mindfulness and self-compassion were emphasized. Participants were guided to focus on their breathing and postural alignment, while attending to their inner experiences, noticing sensations, thoughts, and emotions without judgment. They were also continually reminded to listen to their bodies, respecting their physical and psychological limitations.

Each of the eight classes was also given a theme. The eight themes were: present moment awareness, breathe, relax, feel, watch, allow, self-compassion, and gratitude. Each class was structured around the theme and built on the following week's theme. The first class emphasized present moment awareness, a necessity for mindfulness practice. Classes two to six focused on building participants' ability to practice mindfully, using Kripalu Yoga's BRFWA model. The seventh class specifically emphasized self-compassion both on and off the mat. The final class encouraged gratitude, emphasizing gratitude for one's body and its abilities.

Participants assigned to the Yoga condition were also encouraged to engage in regular home Yoga practice. To aid in this practice, they were given free access to three 30 minute Kripalu Yoga classes designed specifically for this study that were available online, as well as a pre-recorded video of the first two classes. Participants were asked to keep a log of their home

Yoga practice. These logs were collected weekly at the group Yoga classes. Additionally, participants completed the Yoga Rating Scale following each of the eight group Yoga classes. Lastly, participants in the Yoga group completed a feedback form at the end of the final class. The feedback form asked the participants open-ended questions about what they found helpful about the Yoga program and to what they attributed any benefits they may have experienced as a result of participating in the eight-week Yoga program. Feedback was reviewed from ten participants who were randomly sampled using the *Research Randomizer* computer software program (Urbiniak & Plous, 2013). These feedback forms were reviewed in an attempt to tease apart the effects of the Yoga program from the effects of the instructor.

Results

Sample demographics, descriptive statistics, and the results of each research hypothesis are presented in this section. Results were analyzed utilizing the Statistical Package for Social Sciences (IBM SPSS 22.0).

Preliminary Analyses

Sample characteristics. A total of 72 individuals participated in Phase Two of the study, with an attrition rate of 26% (n = 19). Participants who did not complete the study (i.e., failing to complete the assessment battery at all three time periods) had their data removed from the dataset. Participants assigned to the Yoga group needed to attend a minimum of five Yoga classes for their data to be included in the analyses. The Yoga participants attended an average of seven Yoga classes, however the modal number of classes attended was eight. The number of classes attended by participants included in the analysis ranged from five (n = 2) to eight (n = 10). In order for their data to be included in analysis, participants in the Yoga group also needed to practice as intended. YRS scores indicated that in all but four instances participants met the

minimum required YRS score of 2.6. The four instances where YRS scores were lower than 2.6 occurred early in the study and were spread out among different participants. The decision was made to retain the data from these participants because in subsequent Yoga classes these participants practiced as intended and no participants were observed to consistently have scores below 2.6.

Independent samples t-tests confirmed that randomization was successful as there were no statistically significant differences between groups on any of the demographic variables or the pretest scores on the dependent variables. The difference between groups at baseline was assessed using t-tests and these values are reported in Table 3. We also used t-tests to determine whether the number of therapy sessions attended throughout the study differed between the two groups. No statistically significant differences between groups were observed for the number of therapy sessions attended by week eight, $t(51) = 0.37$, $p = .71$, or by week twelve, $t(51) = 0.50$, $p = .62$. In order to determine whether any systematic differences existed between the participants who completed the study and those who did not, independent samples t-tests were used to compare these two groups' scores on continuous demographic variables and the dependent variables (Appendix M). Participants who completed the study ($M = 20.49$, $SD = 6.07$) scored lower on the ATSPPH-SF than participants who dropped out of the study ($M = 23.11$, $SD = 3.90$), demonstrating they had less positive attitudes toward seeking psychological help. No other statistically significant differences were observed, suggesting participant attrition did not systematically bias the results.

As a measure of reliability, Cronbach's alpha was calculated for each measure. Alpha values and number of items for each measure are shown in Table 4. Reliability was found to be acceptable for all measures.

Table 3

Group Comparisons at Baseline

	Yoga Group		Control Group				
Variable	*M*	*SD*	*M*	*SD*	*t*	*df*	*p*
IS	26.39	6.24	26.67	6.41	-0.16	51	.87
HS	7.96	5.08	8.52	4.27	-0.43	51	.67
SCS-SF	2.20	0.50	2.16	0.57	0.26	51	.80
DERS	108.73	22.58	108.11	24.88	0.10	51	.93
TB	11.46	7.46	12.93	7.79	-0.70	51	.49
BD	11.63	6.90	11.70	7.70	-0.03	37	.98
Age	27.50	8.78	31.07	11.62	-1.22	51	.21
BMI	28.04	7.18	27.76	6.59	0.15	51	.88
NTS	28.88	35.78	25.44	6.78	0.35	50	.73
ATSPPH-SF	20.96	6.28	20.04	5.94	0.55	51	.58

Note. IS = Inadequate Self; HS = Hated Self; SCS-SF = Self-Compassion Scale-Short Form; DERS = Difficulties in Emotion Regulation Scale; TB = number of times binge eating; BD = number of binge days; BMI = Body Mass Index; NTS = number of therapy sessions; ATSPPH-SF = Attitudes Toward Seeking Professional Psychological Help-Short Form.

Table 4

Cronbach's Alpha for Research Measures

Measures	Time	Alpha	Items
Difficulties in Emotion Regulation	Week 0	.94	36
	Week 8	.95	
	Week 12	.95	
Self-Compassion Scale	Week 0	.82	12
	Week 8	.93	
	Week 12	.89	
Inadequate Self subscale of the FSCRS	Week 0	.87	9
	Week 8	.90	
	Week 12	.90	
Hated Self subscale of the FSCRS	Week 0	.77	5
	Week 8	.80	
	Week 12	.79	
Decentering subscale of the TMS	Week 1	.73	7
	Week 3	.81	
	Week 6	.84	
	Week 8	.88	
Curiosity subscale of the TMS	Week 1	.90	6
	Week 3	.89	
	Week 6	.88	
	Week 8	.88	

Data cleaning. Prior to hypothesis testing, a preliminary examination of the dependent variables was conducted to assess for data entry accuracy, missing data, outliers, and distributions. The only missing datum found was from one participant who failed to answer one of 36 items on the DERS on the first administration of the scale. The group mean for that item was substituted in place of the missing score. Over the three administrations of the question asking about number of binge days, fourteen participants (seven in the treatment group and seven in the control group) provided erroneous answers. For example, their answers were outside of the possible range of scores (e.g., binge eating on 31 days over the past 28 days). It appears that these participants misread the question as they provided the same response for the number of times binge eating and the number of binge days (e.g., reporting 31 for both questions). Because it was impossible to know their true scores, these participants were dropped from analyses involving number of binge days, leaving a total of 19 participants in the treatment group and 20 participants in the control group for these analyses.

Fifteen outliers were found in the dataset. Outliers were defined as cases with values less than or equal to the first quartile minus 1.5 times the interquartile range, or greater than or equal to the third quartile plus 1.5 times the interquartile range. Decisions about how to handle outliers were made on a case-by-case basis. In order to prevent missing data, outliers were not excluded from the analysis. Most outliers had their scores changed to the next most extreme score in order to prevent their scores from disproportionately influencing the analyses (Osborne & Overbay, 2004). Six outliers were retained because they were believed to be accurate representations of the population being studied.[1]

[1] All retained outliers were participants' scores on the EDE-Q. Three participants reported binge eating 40 times in the past 28 days. Similarly, three participants reported 24, 25, and 28 binge days respectively in the past 28 days. While these scores were found to be outliers, they were retained because binge eating of this frequency is not uncommon in women with BN and BED.

Histograms, boxplots, and Q-Q plots were examined visually along with skew and kurtosis values, and Kolmogorov-Smirnov statistics to assess for normality of the dependent variables. Because participants were assigned to two groups, distributions for each variable were examined for each group separately (Field, 2013). Considering all of the visual, numerical, and statistical data, the distributions for each of the variables, with the exception of number of binge days and times binge eating, were determined to approximate normality.

By contrast, the distributions of the number of times binge eating and the number of binge days were positively skewed and also exhibited leptokurtosis at some time periods. Square root transformations were used to correct for violations of the assumption of normality. The transformation was applied to all scores at all three times in order to be able to compare the groups across time. Following the transformation, the distributions of these two variables were found to approximate a normal distribution for both groups.

Descriptive statistics. Means, standard deviations, skew, kurtosis, and ranges for the data on self-criticism (inadequate self and hated self subscales), self-compassion, difficulties in emotion regulation, and binge eating frequency (number of times binge eating and number of binge days) for the total sample can be found in Appendix N. This information separated by group is shown in Tables 5 and 6. Descriptive statistics for the untransformed binge eating frequency scores can be found in Appendix O. Means, standard deviations, skew, kurtosis, and ranges for the data on mindfulness can be found in Table 7. Participants in the Yoga group completed an average of 381 minutes of home practice over the eight weeks of the Yoga program ($M = 381.04$; $SD = 277.01$). The amount of home practice reported by participants ranged from zero minutes ($n = 1$) to 922 minutes ($n = 1$).

Table 5

Descriptive Statistics for the Treatment Group

Time	Outcome Measure	*M*	*SD*	Skew	Kurtosis	Range
Week 0	IS	26.38	6.24	-0.76	0.39	25
	HS	7.96	5.08	0.39	-0.63	19
	SCS-SF	2.20	0.50	0.39	0.73	2.25
	DERS	108.73	22.58	-0.51	0.34	90
	TB[a]	3.17	1.21	-0.29	-0.76	4.29
	BD[a]	3.24	1.09	-0.31	-0.09	4.29
Week 8	IS	22.88	7.15	0.07	-0.89	25
	HS	6.04	3.98	-0.05	-1.16	13
	SCS-SF	2.75	0.67	-0.40	-0.29	2.42
	DERS	92.50	20.66	0.48	-0.62	70
	TB[a]	1.89	1.26	0.25	-0.55	4.47
	BD[a]	1.78	1.23	0.40	-0.19	4.47
Week 12	IS	21.5	7.65	0.32	-0.75	26
	HS	5.5	4.20	0.36	-0.27	16
	SCS-SF	2.67	0.78	-0.23	-1.05	2.5
	DERS	92.54	20.72	0.15	-0.39	79
	TB[a]	1.70	1.54	0.94	0.57	5.29
	BD[a]	1.77	1.62	0.97	0.58	5.29

Note. IS = Inadequate Self; HS = Hated Self; SCS-SF = Self-Compassion Scale-Short Form; DERS = Difficulties in Emotion Regulation Scale; TB = number of times binge eating; BD = number of binge days.
[a]These variables have been square root transformed.

Table 6

Descriptive Statistics for the Control Group

Time	Outcome Measure	*M*	*SD*	Skew	Kurtosis	Range
Week 0	IS	26.67	6.41	-0.92	0.49	24
	HS	8.52	4.27	-0.19	-0.74	16
	SCS-SF	2.16	0.57	0.46	0.15	2.25
	DERS	108.11	24.88	-0.06	-0.33	89
	TB[a]	12.93	7.79	0.32	-0.69	27
	BD[a]	11.70	7.70	0.50	-0.48	27
Week 8	IS	26.30	8.20	-0.99	-0.25	27
	HS	9.59	5.33	-0.38	-0.80	17
	SCS-SF	2.17	0.82	1.8	2.88	3.09
	DERS	110.44	27.32	-0.62	-0.55	101
	TB[a]	12.11	10.22	1.05	0.52	40
	BD[a]	10.60	8.58	0.73	-0.67	40
Week 12	IS	25.96	8.06	-1.05	0.10	28
	HS	8.74	4.90	-0.26	-0.73	17
	SCS-SF	2.26	0.74	0.92	1.11	3.16
	DERS	112.15	27.99	-0.11	-0.41	109
	TB[a]	13.63	11.96	0.88	-0.21	40
	BD[a]	11.50	10.46	0.61	-1.24	28

Note. IS = Inadequate Self; HS = Hated Self; SCS-SF = Self-Compassion Scale-Short Form; DERS = Difficulties in Emotion Regulation Scale; TB = number of times binge eating; BD = number of binge days.
[a]These variables have been square root transformed.

Table 7

TMS Descriptive Statistics for the Treatment Group

Time	Outcome Measure	*M*	*SD*	Skew	Kurtosis	Range
Week 1	Decentering	15.85	4.18	-0.47	-0.05	15
	Curiosity	12.89	5.72	0.13	-0.63	22
Week 3	Decentering	16.96	5.10	-0.20	-0.09	22
	Curiosity	15.15	5.19	-0.13	-1.09	18
Week 6	Decentering	19.92	4.16	-0.02	-0.65	14
	Curiosity	17.04	4.25	-0.01	-0.96	14
Week 8	Decentering	19.92	5.21	-0.50	-0.61	18
	Curiosity	16.50	5.01	-0.52	-0.44	18

Note. TMS = Toronto Mindfulness Scale.

Comparisons with existing research. Participants' mean scores and standard deviations were comparable to previous researchers' findings for groups of individuals with eating disorders for the FSCRS (Barrow, 2007), SCS-SF (Kelly & Carter, 2014), DERS (Whiteside et al., 2007), ATSPPH-SF (Hackler, Vogel, & Wade, 2010), and binge eating frequency (Goldfein et al., 2005). Comparative data for the TMS with an eating disorder population was not available, so instead participants' scores were compared to individuals with less than one year of mindfulness practice (Lau et al., 2006). Similarly, home practice has not been reported in other eating disorder studies. For this reason, participants' amount of home practice was compared to the amount of Yoga practiced by a group of women with early-state breast cancer who were completing an MBSR program (Carlson et al., 2004). Comparisons with existing research are presented in greater detail in Appendix P.

Correlational analyses. Pearson correlation coefficients were computed to determine the extent to which the dependent variables were associated with one another. Correlations were computed for both the total sample (Appendix Q) and separately for each group. Group correlations are shown in Tables 8 and 9. The correlations between the dependent variables were quite similar between the two groups. While the correlations between the binge eating frequency scores and the other dependent variables were not statistically significant, the other dependent variables were strongly associated with each other. Participants' mindfulness scores did not correlate strongly with their baseline scores of self-compassion, self-criticism, or difficulties with emotion regulation, but demonstrated stronger relationships with these variables at posttest and one-month follow-up. The decentering subscale of the TMS exhibited stronger relationships with the other dependent variables than the curiosity subscale of the TMS. The correlations of TMS scores with the other dependent variables can be found in Table 10.

Table 8

Correlational Analyses for the Treatment Group

Variable	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. IS Week 0	.49*	.58**	.69**	.39*	.43*	-.80**	-.43*	-.43*	.68**	.34	.35	.04	.14	.18	.08	.18	.19
2. IS Week 8	_	.88**	.46*	.82**	.75**	-.34	-.70**	-.62**	.37	.80**	.60**	.02	.16	.14	-.04	.11	.14
3. IS Week 12		_	.52**	.73**	.71**	-.52**	-.81**	-.79**	.37	.69**	.66**	.05	.24	.26	.04	.19	.25
4. HS Week 0			_	.63**	.54**	-.69**	-.40*	-.32	.69**	.29	.32	.29	.16	.34	.39	.16	.36
5. HS Week 8				_	.88**	-.27	-.72**	-.49*	.41*	.72**	.57**	.16	.27	.32	.08	.15	.29
6. HS Week 12					_	-.36	-.61**	-.60**	.46*	.67**	.63**	.05	.05	.10	-.07	-.04	.12
7. SCS Week 0						_	.36	.50**	-.76**	-.23	-.46*	.22	-.08	-.18	-.44	-.21	-.30
8. SCS Week 8							_	.68**	-.23	-.67**	-.64**	-.10	-.39*	-.41*	-.06	-.35	-.39
9. SCS Week 12								_	-.36	-.57**	-.72**	-.04	-.25	-.29	-.08	-.27	-.37
10. DERS Week 0									_	.46*	.51**	.28	.16	.29	.49*	.26	.34
11. DERS Week 8										_	.69**	-.04	.21	.14	-.09	.19	.15
12. DERS Week 12											_	.17	.35	.36	.22	.40	.46*
13. TB Week 0[a]												_	.55**	.59**	.98**	.55*	.68
14. TB Week 8[a]													_	.86**	.51**	.98**	.88**
15. TB Week 12[a]														_	.66**	.88**	.99**

Variable	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
16. BD Week 0[a]															_	.53*	.67**
17. BD Week 8[a]																_	.89**
18. BD Week 12[a]																	_

Note. IS = Inadequate Self; HS = Hated Self; SCS = Self-Compassion Scale-Short Form; DERS = Difficulties in Emotion Regulation Scale; TB = number of times binge eating; BD = number of binge days.

[a]These variables have been square root transformed.

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

Table 9

Correlational Analyses for the Control Group

Variable	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. IS W0	.79**	.87**	.83**	.75**	.82**	-.82**	-.79**	-.85**	.72**	.72**	.66**	.04	.15	.10	-.15	.05	-.01
2. IS W8	_	.92**	.72**	.87**	.81**	-.67**	-.75**	-.71**	.47*	.57**	.50**	.22	.27	.39*	.06	.22	.28
3. IS W12		_	.82**	.85**	.90**	-.75**	-.83**	-.84**	.60**	.69**	.67**	.18	.33	.35	.03	.21	.25
4. HS W0			_	.81**	.90**	-.77**	-.74**	-.78**	.72**	.66**	.68**	.09	.32	.21	.04	.24	.17
5. HS W8				_	.93**	-.70**	-.74**	-.71**	.57**	.65**	.65**	.21	.32	.31	-.02	.19	.12
6. HS W12					_	-.78**	-.78**	-.82**	.68**	.72**	.78**	.17	.32	.30	-.03	.20	.15
7. SCS W0						_	.79**	.87**	-.84**	-.71**	-.74**	-.04	-.11	-.16	.15	-.09	-.03
8. SCS W8							_	.85**	-.59**	-.74**	-.66**	-.25	-.27	-.33	-.07	-.22	-.24
9. SCS W12								_	-.80**	-.78**	-.81**	-.21	-.36	-.31	-.03	-.29	-.21
10. DERS W0									_	.75**	.85**	.04	.19	.10	-.13	.18	-.03
11. DERS W8										_	.89**	.06	.13	.13	-.20	.08	-.04
12. DERS W12											_	.11	.23	.17	-.13	.18	.02
13. TB W0[a]												_	.75**	.81**	.98**	.89**	.80**
14. TB W8[a]													_	.76**	.83**	.97**	.80**
15. TB W12[a]														_	.76**	.79**	.99**

Variable	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
16. BD W0[a]															_	.89**	.81**
17. BD W8[a]																_	.80**
18. BD W12[a]																	_

Note. IS = Inadequate Self; HS = Hated Self; SCS = Self-Compassion Scale-Short Form; DERS = Difficulties in Emotion Regulation Scale; TB = number of times binge eating; BD = number of binge days; W0 = Week 0; W8 = Week 8; W12 = Week 12.

[a]These variables have been square root transformed.

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

Table 10

TMS Correlational Analyses for the Treatment Group

Variable	DE W1	DE W3	DE W6	DE W8	CU W1	CU W3	CU W6	CU W8
TB Week 0[a]	-.09	-.08	.06	.04	-.17	-.16	.12	.16
TB Week 8[a]	-.28	-.14	.03	-.09	-.09	-.17	-.09	-.22
TB Week 12[a]	-.26	-.06	.15	-.07	-.04	-.15	-.04	-.19
BD Week 0[a]	.13	.07	.15	.17	.15	.09	.28	.32
BD Week 8[a]	-.23	-.14	-.01	-.11	-.38	-.34	-.34	-.33
BD Week 12[a]	-.19	-.05	-.10	-.07	-.20	-.23	-.14	-.20
DERS Week 0	-.25	-.26	-.13	-.25	-.06	-.14	-.01	-.10
DERS Week 8	-.43*	-.51**	-.53**	-.63**	-.22	-.38	-.45*	-.51**
DERS Week 12	-.40*	-.44*	-.41*	-.41*	-.23	-.23	-.39*	-.43*
SCS-SF Week 0	.10	.19	-.10	.06	.18	.14	.05	.16
SCS-SF Week 8	.47*	.55**	.19	.58**	.25	.25	.34	.56**
SCS-SF Week 12	.44*	.35	.14	.30	.20	.29	.14	.40*
IS Week 0	-.31	-.29	-.05	-.28	-.30	-.31	-.135	-.30
IS Week 8	-.27	-.47*	-.45*	-.51**	-.22	-.37	-.33	-.46*
IS Week 12	-.26	-.39	-.23	-.41*	-.18	-.25	-.24	-.44*
HS Week 0	-.15	-.19	.00	-.18	-.01	-.02	.05	-.14
HS Week 8	-.24	-.33	-.33	-.42*	.04	-.16	-.16	-.31
HS Week 12	-.21	.32	-.37	-.39*	-.05	-.17	-.16	-.24

Note. W0 = Week 0; W8 = Week 8; W12 = Week 12; TB = times binge eating; BD = binge days; DERS = Difficulties with Emotion Regulation Scale; SCS-SF = Self-Compassion Scale-Short Form; IS = Inadequate Self; HS = Hated Self; DE = Decentering; CU = Curiosity.

[a]These variables have been square root transformed.

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

Primary Analyses

The following section reviews each hypothesis separately and will report whether or not the hypotheses were supported by the findings. The corresponding assumptions were assessed as part of the analysis for each hypothesis. Mauchly's test was used to assess for violations to the assumption of sphericity. The sphericity assumption states that variances and covariances for all pairs of levels of the repeated factor (i.e., time) are equal. Violations of the assumption of sphericity were corrected using the appropriate adjustment to the degrees of freedom for the *F*-ratios affected by the violation. It is recommended to use the Huynh-Feldt adjustment when epsilon values are greater than .75 (Field, 2013). The Huynh-Feldt adjustment was used throughout this study to correct violations to the assumption of sphericity because epsilon values were greater than .75 in all cases. Levene's test was used to test the homogeneity of variance assumption for between-subjects factors. The homogeneity of variances assumption states that variances should be equal for both groups and was met in all cases. Mauchly's and Levene's statistics can be found in Tables 11 and 12 respectively. Effect sizes were evaluated using Cohen's (1988) guidelines for partial eta squared: .01 indicates a small effect, .06 indicates a medium effect, and .14 indicates a large effect.

Hypotheses one to four were analyzed using mixed model ANOVAs. Time was the within-subject factor in all mixed model ANOVAs conducted in this study. Accordingly, main effect analyses of time determined whether participants experienced differences on the dependent variable of interest across time, ignoring their group assignment. Main effect analyses of time for hypotheses one through four are shown in Table 13. Similarly, group assignment was the between-subject factor in all mixed model ANOVAs conducted in this study. Main effect

analyses of group determined whether there were differences between the Yoga group and control group on the dependent variable of interest, ignoring time. Main effect analyses of group for hypotheses one through four are shown in Table 14. Interaction effects examined whether the two groups had a different pattern of responses over time. Hypothesis five was analyzed using a repeated-measures ANOVA and correlational analyses were used to investigate hypothesis six.

In order to control experimentwise error, follow-up analyses were grouped into the following families for each hypothesis separately: main effect contrasts, simple main effect contrasts, and interaction contrasts. As there were only two groups in the study, no follow-up analyses were required for the between-subjects effects. Statistically significant main effects of time were further examined using main effect contrasts and simple main effect contrasts. As suggested by Jaccard and Guilamo-Ramos (2002), both main effect contrasts and simple main effect contrasts were conducted for time using paired *t*-tests. Main effect contrasts examined whether differences existed between week zero and week eight, week zero and week twelve, and week eight and week twelve, when ignoring group assignment. Simple main effect contrasts looked at the two groups separately and examined whether differences existed between week zero and week eight, and week zero and week twelve. Statistically significant interaction effects were followed up with interaction contrasts. These interaction contrasts compared the differences between two time periods in the Yoga group versus the control group. A first interaction contrast examined whether the difference between week zero and week eight varied between the two groups. A second interaction contrast examined whether the difference between week zero and week twelve for the Yoga group varied from the difference between week zero and week twelve for the control group.

Table 11.

Mauchly's Test of Sphericity for the Dependent Variables

Variable	X^2	*df*	*p*
TB[a]	2.03	2	.363
BD[a]	2.64	2	.268
DERS[b]	7.48	2	.024*
SCS-SF	1.44	2	.486
HS[b]	17.83	2	.001**
IS[b]	21.99	2	.001**
Decentering	8.17	5	.148
Curiosity	7.95	5	.159

Note. TB = times binge eating; BD = binge days; DERS = Difficulties with Emotion Regulation Scale; SCS-SF = Self-Compassion Scale-Short Form; IS = Inadequate Self; HS = Hated Self; DE = Decentering; CU = Curiosity. [a]These variables have been square root transformed. [b]The Hyundt-Feldt correction was used to correct violations to the assumption of sphericity.
*$p < .05$. **$p < .01$.

Table 12.

Levene's Test of Equality of Variances for the Dependent Variables

Variable	Time	*F*	*df*	*p*
TB[a]	Week 0	0.03	1, 51	.862
	Week 8	1.27	1, 51	.264
	Week 12	1.34	1, 51	2.53
BD[a]	Week 0	0.29	1, 37	.597
	Week 8	0.77	1, 37	.385
	Week 12	0.84	1, 37	.365
DERS	Week 0	0.27	1, 51	.603
	Week 8	3.70	1, 51	.060
	Week 12	1.84	1, 51	.181
SCS-SF	Week 0	0.84	1, 51	.363
	Week 8	0.27	1, 51	.609
	Week 12	0.51	1, 51	.477
IS	Week 0	0.03	1, 51	.860
	Week 8	0.34	1, 51	.561
	Week 12	0.004	1, 51	.949
HS	Week 0	1.08	1, 51	.304
	Week 8	1.97	1, 51	.167
	Week 12	0.25	1, 51	.622

Note. TB = times binge eating; BD = binge days; DERS = Difficulties with Emotion Regulation Scale; SCS-SF = Self-Compassion Scale-Short Form; IS = Inadequate Self; HS = Hated Self; DE = Decentering; CU = Curiosity.
[a]These variables have been square root transformed.
*$p < .05$. **$p < .01$.

Table 13.

Main Effect of Time Analyses

Variable	Week 0 *M* (*SD*)	Week 8 *M* (*SD*)	Week 12 *M* (*SD*)	*n*	*F*	*df*	*p*	*Partial* η^2	Observed Power
TB[a]	3.29 (1.19)	2.52 (1.40)	2.49 (1.63)	53	18.61	2, 102	.001**	.27	1.00
BD[a]	3.23 (1.15)	2.36 (1.34)	2.37 (1.65)	39	20.17	2, 74	.001**	.35	1.00
DERS	108.42 (23.78)	101.47 (24.29)	102.34 (24.70)	53	4.63	1.849, 94.312	.014**	.08	.75
SCS-SF	2.18 (.53)	2.45 (0.79)	2.46 (0.78)	53	9.25	2, 102	.001**	.15	.97
IS	26.53 (6.33)	24.59 (7.70)	23.73 (7.86)	53	8.49	1.608, 82.018	.001**	.14	.93
HS	8.24 (4.69)	7.82 (4.72)	7.12 (4.57)	53	3.46	1.538, 78.446	.048*	.06	.56

Note. TB = times binge eating; BD = binge days; DERS = Difficulties with Emotion Regulation Scale; SCS-SF = Self-Compassion Scale-Short Form; IS = Inadequate Self; HS = Hated Self; DE = Decentering; CU = Curiosity.

[a]These variables have been square root transformed.

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

Table 14.

Main Effect of Group Analyses

Variable	Yoga Group *M (SD)*	Yoga Group *n*	Control Group *M (SD)*	Control Group *n*	*F*	*df*	*p*	*Partial* η^2	Observed Power
TB[a]	2.25 (1.27)	26	3.28 (1.27)	27	8.59	1, 51	.005**	.14	.82
BD[a]	2.26 (1.28)	19	3.04 (1.27)	20	3.60	1, 37	.066	.09	.46
DERS	97.92 (21.89)	26	110.24 (21.89)	27	4.19	1, 51	.046*	.08	.08
SCS-SF	2.54 (0.61)	26	2.20 (0.61)	27	4.25	1, 51	.044*	.08	.53
IS	23.59 (6.72)	26	26.31 (6.72)	27	2.17	1, 51	.147	.04	.30
HS	6.50 (4.29)	26	8.95 (4.30)	27	4.31	1, 51	.043*	.08	.53

Note. TB = times binge eating; BD = binge days; DERS = Difficulties with Emotion Regulation Scale; SCS-SF = Self-Compassion Scale-Short Form; IS = Inadequate Self; HS = Hated Self; DE = Decentering; CU = Curiosity.

[a]These variables have been square root transformed.

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

As suggested by Jaccard and Guilamo-Ramos (2002), each family of contrasts was assessed both with and without a Holm-based modified Bonferroni correction. The Holm method is more powerful than the Bonferroni correction and was chosen in order to prevent Type II error. In this sequential *step-down* method, the statistical significance values in a given family of contrasts are first calculated and ordered from smallest to largest. The smallest *p* value is then tested against an adjusted alpha value of .05/k, where k is the number of contrasts in a family. If the comparison is statistically significant, the second smallest *p* value is then evaluated against an alpha value of .05/(k-1), and so on until the largest *p* value is reached and evaluated against an alpha level of .05. Any time a *p* value is equal to or greater than the adjusted alpha level, it is concluded that the comparison is not statistically significant, the procedure is stopped, and none of the comparisons with a larger *p* value are statistically significant (Holm, 1979).

Hypothesis one. The first hypothesis predicted that there would be a larger reduction in the frequency of binge eating episodes for participants in the Yoga group over time in comparison to control participants. This hypothesis was tested using two 2 x 3 mixed model analysis of variance (ANOVA), with groups (Yoga Group/Control Group) as a two level between-subjects factor, and time of test (pre/post/one-month follow-up) as a three level within-subjects factor. The dependent variable was the reported frequency of binge eating episodes, as measured by two questions on the EDE-Q: number of times binge eating and number of binge days, both of which were square root transformed. All participants from the final sample (n = 53) were included in this analysis of number of times binge eating and a smaller subset (n = 39) was used in the analysis of number of binge days.

Number of times binge eating. There was a statistically significant main effect of group, which demonstrated a large effect size. Participants in the Yoga group reported fewer times binge eating over the past 28 days than participants in the waitlist control group. There was also a statistically significant main effect of time, which also had a large effect size. Main effect contrasts revealed statistically significant differences between week zero and week eight, $t(52) = 4.61$, $p < .001$, and week zero and week twelve, $t(52) = 4.26$, $p < .001$, but not between week eight and week twelve, $t(52) = 0.17$, $p = .864$.

These main effects and main effect contrasts are better understood in the context of the statistically significant interaction effect of treatment by time, $F(2, 102) = 11.44$, $p < .001$, partial $\eta^2 = .18$, which was associated with a large effect size. Observed power was .99. The interaction is plotted in Figure 2. Simple main effects analyses indicated statistically significant differences between week zero and week eight, $t(25) = 5.54$, $p < .001$, and week zero and week twelve, $t(25) = 5.90$, $p < .001$, for the treatment group, whereas for the control group, week zero did not differ from week eight, $t(26) = 1.33$, $p = .195$, or week twelve, $t(26) = 0.58$, $p = .568$.

To formally test if the change scores differed between the two groups, two interaction contrasts were evaluated. The first interaction contrast compared the week zero and week eight mean difference for Yoga participants with that of waitlist controls, $t(51) = 3.44$, $p = .001$, and found a statistically significant interaction. The second interaction contrast compared the week zero and week twelve mean difference for the Yoga group with that of the control group, $t(51) = 4.29$, $p < .001$, and also found a statistically significant interaction. Tests of statistical significance for all of the follow-up analyses were performed both with and without experimentwise controls across the family contrasts using the Holm-Bonferroni procedure, and

the conclusions were comparable in all cases. Thus, hypothesis one was supported when using the number of times binge eating as the measure of binge eating frequency. Participants in the Yoga group experienced a larger decrease in the number of times binge eating between both week zero and week eight, and week zero and week twelve, than participants in the control group.

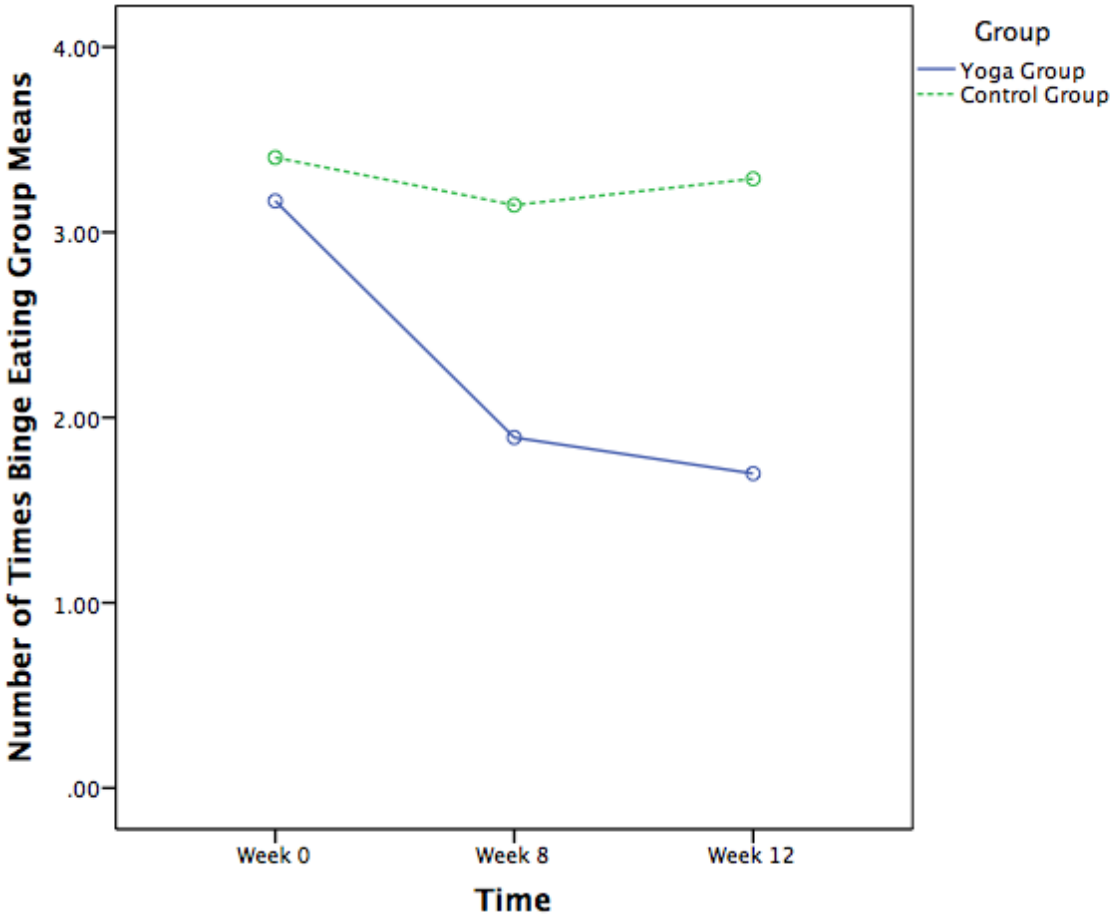

Figure 2. Interaction effect plot for number of times binge eating. Group means have been square root transformed.

Number of binge days. The main effect of group was not statistically significant, although it did demonstrate a moderate effect size. The reported number of binge days did not differ between the Yoga group and the control group. In contrast, the main effect of time was statistically significant and demonstrated a large effect size. Main effect contrasts revealed statistically significant differences between week zero and week eight, $t(38) = 4.89$, $p < .001$, and week zero and week twelve, $t(38) = 4.19$, $p < .001$, but not between week eight and week twelve, $t(38) = 0.11$, $p = .914$.

The main effects can be better understood in the context of the statistically significant interaction effect of treatment by time, $F(2, 74) = 9.86$, $p < .001$, partial $\eta^2 = .21$, which had a large effect size. Observed power was .98. The interaction is plotted in Figure 3. Simple main effects analyses indicated that for the treatment group, week zero differed from both week eight, $t(18) = 5.66$, $p < .001$, and week twelve, $t(18) < 5.34$, $p = .001$, whereas for the control group, week zero did not differ from week eight, $t(19) = 1.82$, $p = .083$, or week twelve, $t(19) = 1.09$, $p = .291$.

In order to better understand the statistically significant interaction effect, two interaction contrasts were evaluated. The first interaction contrast compared the week zero and week eight mean difference for Yoga participants with that of waitlist controls, $t(37) = 4.02$, $p < .001$, and found a statistically significant interaction. The second interaction contrast compared the week zero and week twelve mean difference for the Yoga group with that of the control group, $t(37) = 3.51$, $p = .001$, and also found a statistically significant interaction. Tests of statistical significance for all of the follow-up analyses were performed both with and without the modified Bonferroni method across each family of contrasts using the Holm test, and the conclusions were

comparable in all cases. These results provide further support for hypothesis one in so far as participants in the Yoga treatment group experienced larger decreases in the number of binge days between both week zero and week eight, and week zero and week twelve, than controls.

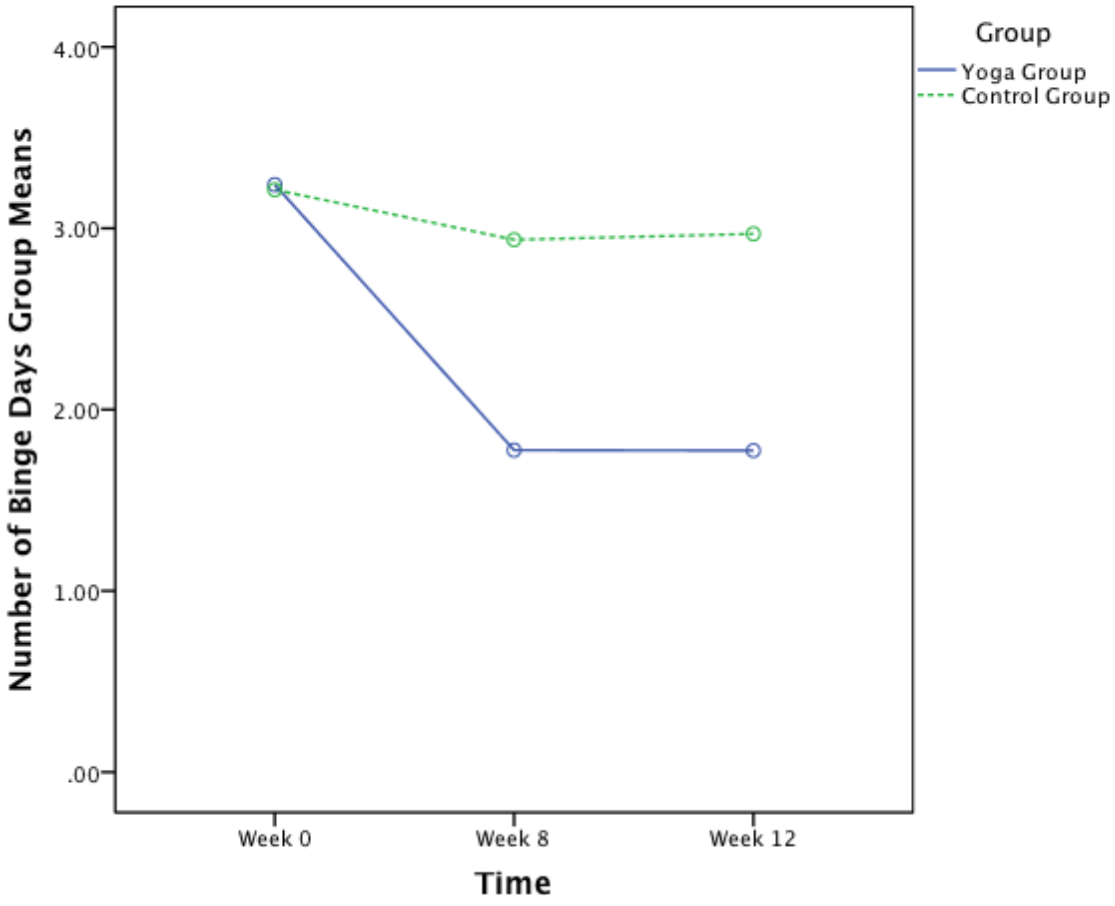

Figure 3. Interaction effect plot for number of binge days. Group means have been square root transformed.

Hypothesis two. The second hypothesis asserted that there would be a larger reduction in emotion regulation difficulties for individuals in the Yoga Group across time in comparison to participants in the Control Group. This hypothesis was tested using a 2 (Group) x 3 (Time) mixed model ANOVA. The total score on the DERS was used to measure difficulties in emotion regulation and all participants ($N = 53$) were included in the analysis.

There was a statistically significant main effect of group, with a moderate effect size. Participants in the Yoga group reported lower levels of emotion regulation difficulties than participants in the control group. There was also a statistically significant main effect of time, which had a moderate effect size. In order to better understand the main effect of time, main effect contrasts were conducted. These contrasts revealed differences between week zero and week eight, $t(52) = 2.19$, $p = .033$, and week zero and week twelve, $t(52) = 2.06$, $p = .045$, that were statistically significant without the Holm test but were not statistically significant with this correction for Type I error. The difference between week eight and week twelve, $t(52) = 0.44$, $p = .661$, was not statistically significant.

These main effects are subsidiary to the statistically significant interaction effect, $F(1.849, 94.312) = 10.19$, $p < .001$, partial $\eta^2 = .17$, which demonstrated a large effect size. Observed power was .98. This interaction indicates that DERS scores varied across time differently for the two groups. The interaction is plotted in Figure 4. Simple main effects analyses indicated that for the treatment group, week zero differed from both week eight, $t(25) = 3.67$, $p < .001$, and week twelve, $t(25) = 3.85$, $p < .001$, whereas for the control group, week zero did not differ from week eight, $t(26) = 0.65$, $p = .523$, or week twelve, $t(26) = 1.42$, $p = .167$.

To formally test if the change scores differed between the two groups, two interaction contrasts were evaluated. The first interaction contrast compared the week zero and week eight mean difference for Yoga participants with that of controls, $t(51) = 3.26$, $p = .002$, and found a statistically significant interaction. The second interaction contrast compared the week zero and week twelve mean difference for the Yoga group with that of the control group, $t(51) = 4.01$, $p < .001$, and similarly found a statistically significant interaction. The simple main effects and interaction contrasts were statistically significant both with and without Holm-based modified Bonferroni correction. Thus, hypothesis two was supported in so far as participants in the Yoga group experienced larger decreases in difficulties with emotion regulation between both week zero and week eight, and week zero and week twelve, than the participants in the control group.

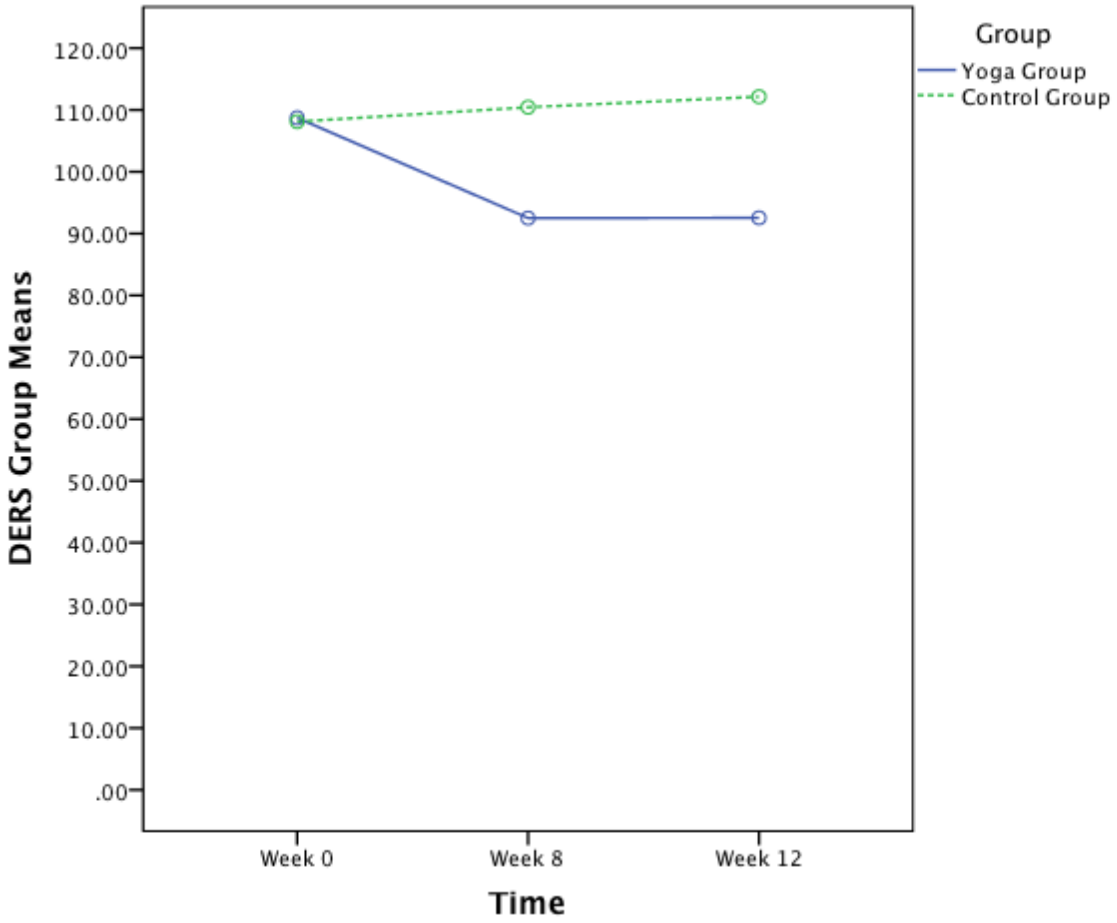

Figure 4. Interaction effect plot for difficulties in emotion regulation. DERS = Difficulties in Emotion Regulation Scale.

Hypothesis three. Hypothesis three predicted that participants in the Yoga Group would experience a greater increase in self-compassion across time in comparison to control participants. This hypothesis was tested using a 2 (Group) x 3 (Time) mixed model ANOVA. Global scores of the Self-Compassion Scale-Short Form (SCS-SF) were used to measure self-compassion. All participants ($N = 53$) were included in the analysis.

There was a statistically significant main effect of group, which demonstrated a moderate effect size. Participants in the Yoga group reported higher scores on self-compassion than participants in the control group. There was also a statistically significant main effect of time, which demonstrated a large effect size. In follow-up to this finding, main effect contrasts revealed statistically significant differences between week zero and week eight, $t(52) = 3.07$, $p = .003$, and week zero and week twelve, $t(52) = 3.59$, $p = .001$, but not between week eight and week twelve, $t(52) = 0.152$, $p = .880$.

The main effects are subsidiary to the statistically significant interaction effect, $F(2, 102) = 6.71$, $p = .002$, partial $\eta^2 = .12$, which demonstrated a large effect size. Observed power was .91. The interaction is plotted in Figure 5. Simple main effects analyses indicated that for the treatment group, week zero differed from both week eight, $t(25) = 4.16$, $p = .001$, and week twelve, $t(25) = 3.56$, $p = .002$, whereas for the control group, week zero did not differ from week eight, $t(26) = 0.069$, $p = .946$, or week twelve, $t(26) = 1.36$, $p = .185$.

To formally test if the effect of group differed at two times, two interaction contrasts were evaluated. The first interaction contrast compared the week zero and week eight mean difference for Yoga participants with that of waitlist controls, $t(51) = -3.31$, $p = .002$, and found a statistically significant interaction. The second interaction contrast compared the week zero and

week twelve mean difference for the Yoga group with that of the control group, $t(51) = -2.47$, $p = .017$, and also found a statistically significant interaction. Conclusions about tests of statistical significance for all of the follow-up analyses for this hypothesis were comparable in all cases both with and without experimentwise controls. Thus, hypothesis three was supported—participants in the Yoga treatment group experienced larger increases in self-compassion between both week zero and week eight, and week zero and week twelve, than the participants in the control group.

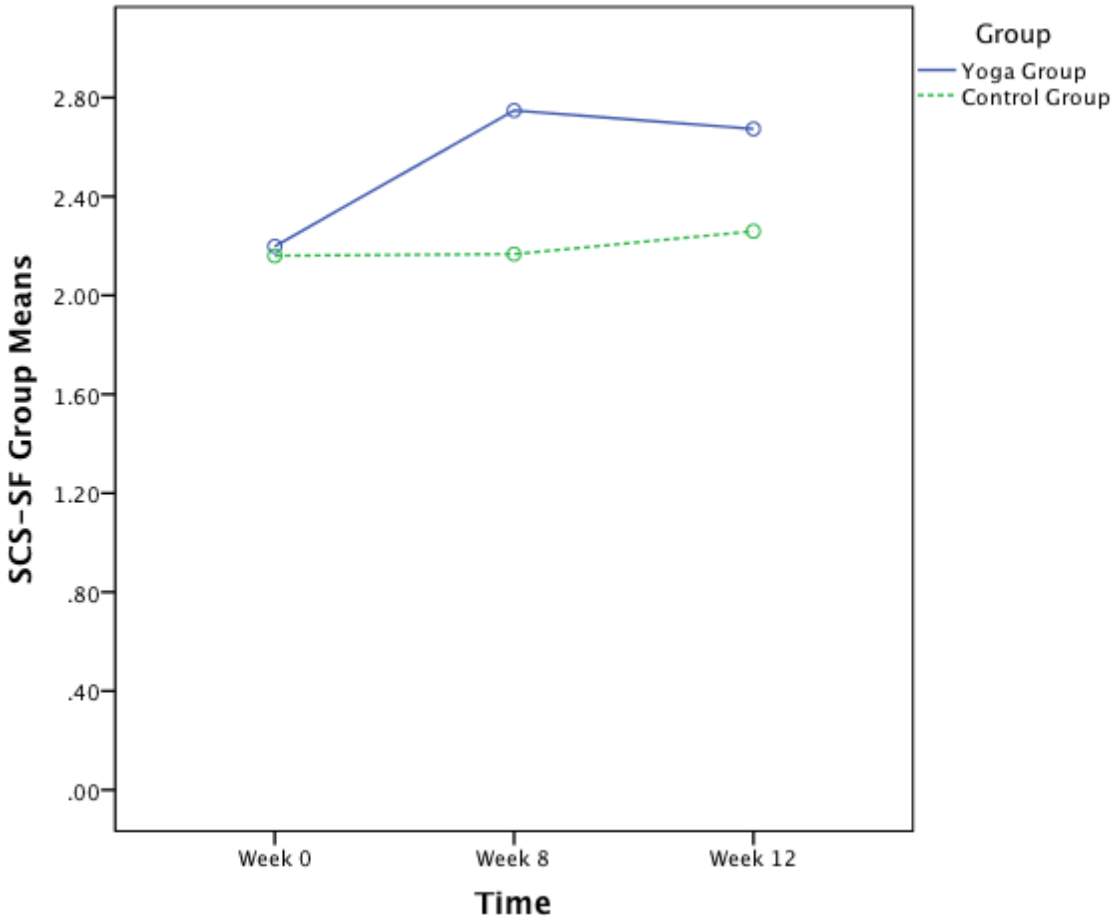

Figure 5. Interaction effect plot for self-compassion. SCS-SF = Self-Compassion Scale-Short Form.

Hypothesis four. The fourth hypothesis predicted that there would be a larger reduction in self-criticism for participants in the Yoga group across time in comparison to control participants. The Inadequate Self and Hated Self subscales of the Forms of Self-Criticism/Attacking and Self-Reassuring Scale (FSCRS) were used to measure self-criticism, and each was analyzed separately. Two 2 (Group) x 3 (Time) mixed model ANOVAs were used to test this hypothesis. All participants ($N = 53$) were included in the analyses.

Inadequate self. The main effect of group was not statistically significant, but did demonstrate a small effect size. Participants in the Yoga group did not report different Inadequate Self subscale scores than participants in the control group. There was, however, a statistically significant main effect of time, which demonstrated a large effect size. Main effect contrasts indicated that the difference between week zero and week eight, $t(52) = 2.27$, $p = .027$, was statistically significant when an alpha of .05 but just failed to attain statistical significant when the Holm correction was used. In contrast, the difference between week zero and week twelve, $t(52) = 3.49$, $p = .001$, was statistically significant both with and without the application of the Holm procedure, whereas the difference between week eight and week twelve, $t(52) = 0.178$, $p = .081$, was not statistically significant in either case.

The main effect of time can be better explained by the statistically significant interaction effect, $F(1.608, 82.018) = 4.90$, $p = .015$, partial $\eta^2 = .09$, which demonstrated a moderate effect size. Observed power was .73. The interaction is plotted in Figure 6. Simple main effects analyses indicated that for the Yoga group, week zero differed from both week eight, $t(25) = 2.62$, $p = .015$, and week twelve, $t(25) = 3.82$, $p = .001$, whereas for the control group, week zero did not differ from week eight, $t(26) = 0.39$, $p = .703$, or week twelve, $t(26) = 0.90$, $p = .376$.

Results of these tests of statistical significance were comparable both with and without the Holm procedure.

To formally test if change scores differed between the two groups, two interaction contrasts were evaluated. The first interaction contrast compared the week zero and week eight mean difference for Yoga participants with that of controls, $t(51) = 1.91$, $p = .062$, and failed to attain statistical significance. The second interaction contrast compared the week zero and week twelve mean difference for the Yoga group with that of the control group, $t(51) = 2.82$, $p = .007$ and found a statistically significant interaction. Conclusions about tests of statistical significance for the interaction contrasts were comparable both with and without experimentwise controls. Thus, hypothesis four was supported in so far as participants in the Yoga treatment group experienced larger decreases in the Inadequate Self form of self-criticism between week zero and week twelve than the participants in the control group.

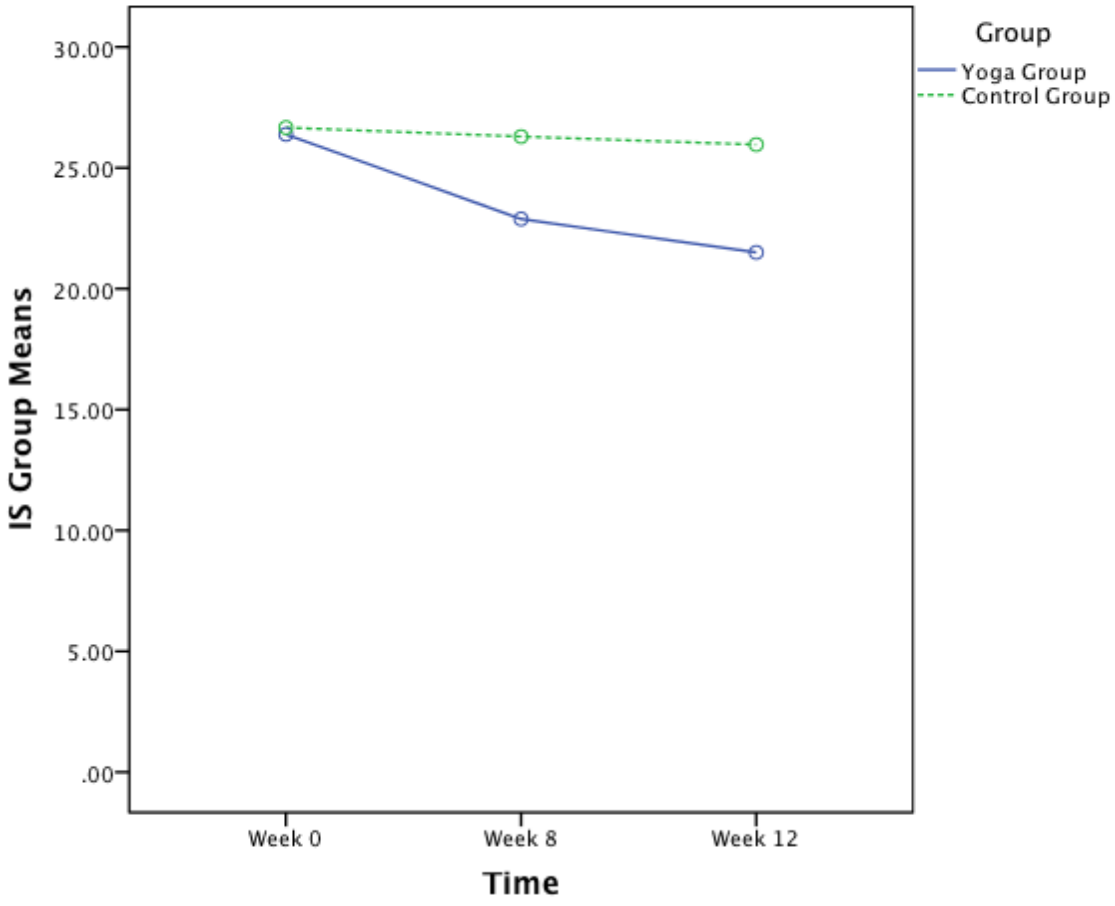

Figure 6. Interaction effect plot for Inadequate Self. IS = Inadequate Self scores on the Forms of Self-Criticizing/Attacking and Self-Reassuring Scale.

Hated self. There was a statistically significant main effect of group, which demonstrated a moderate effect size. Participants in the Yoga group reported lower Hated Self subscale scores than participants in the control group. There was also a statistically significant main effect of time, which also had a moderate effect size. Main effect contrasts indicated that while the difference between week zero and week twelve, $t(52) = 2.13$, $p = .038$, was statistically significant when compared to an alpha of .05, it just failed to attain statistical significant when the Holm correction was used. Conversely, the difference between week eight and week twelve, $t(52) = 2.57$, $p = .013$, was statistically significant both with and without the Holm method. The difference between week zero and week eight, $t(52) = 0.74$, $p = .461$, was not statistically significance in either case.

The main effects are subsidiary to the statistically significant interaction effect, $F(1.538, 78.446) = 7.35$, $p = .003$, partial $\eta^2 = .13$, which also demonstrated a moderate effect size. Observed power was .88. The interaction is plotted in Figure 7. Simple main effects analyses indicated that for the treatment group, week zero differed from both week eight, $t(25) = 2.43$, $p = .022$, and week twelve, $t(25) = 2.78$, $p = .010$, whereas for the control group, week zero did not differ from week eight, $t(26) = 1.77$, $p = .088$, or week twelve, $t(26) = 0.532$, $p = .600$. These results were statistically significant both with and without Holm-based modified Bonferroni correction.

To formally test if change scores differed between the two groups, two interaction contrasts were evaluated. The first interaction contrast compared the week zero and week eight mean difference for Yoga participants with that of controls, $t(51) = 3.02$, $p = .004$, and found a statistically significant interaction. The second interaction contrast compared the week zero and

week twelve mean difference for the yoga group with that of the control group, $t(51) = 2.77$, $p = .008$, and similarly found a statistically significant interaction. Conclusions about tests of statistical significance for the interaction contrasts were comparable both with and without the Holm-based correction. These results provide support for hypothesis four in so far as participants in the Yoga group experienced larger decreases in the Hated Self form self-criticism between week zero and week eight, and between week zero and week twelve than the participants in the control group.

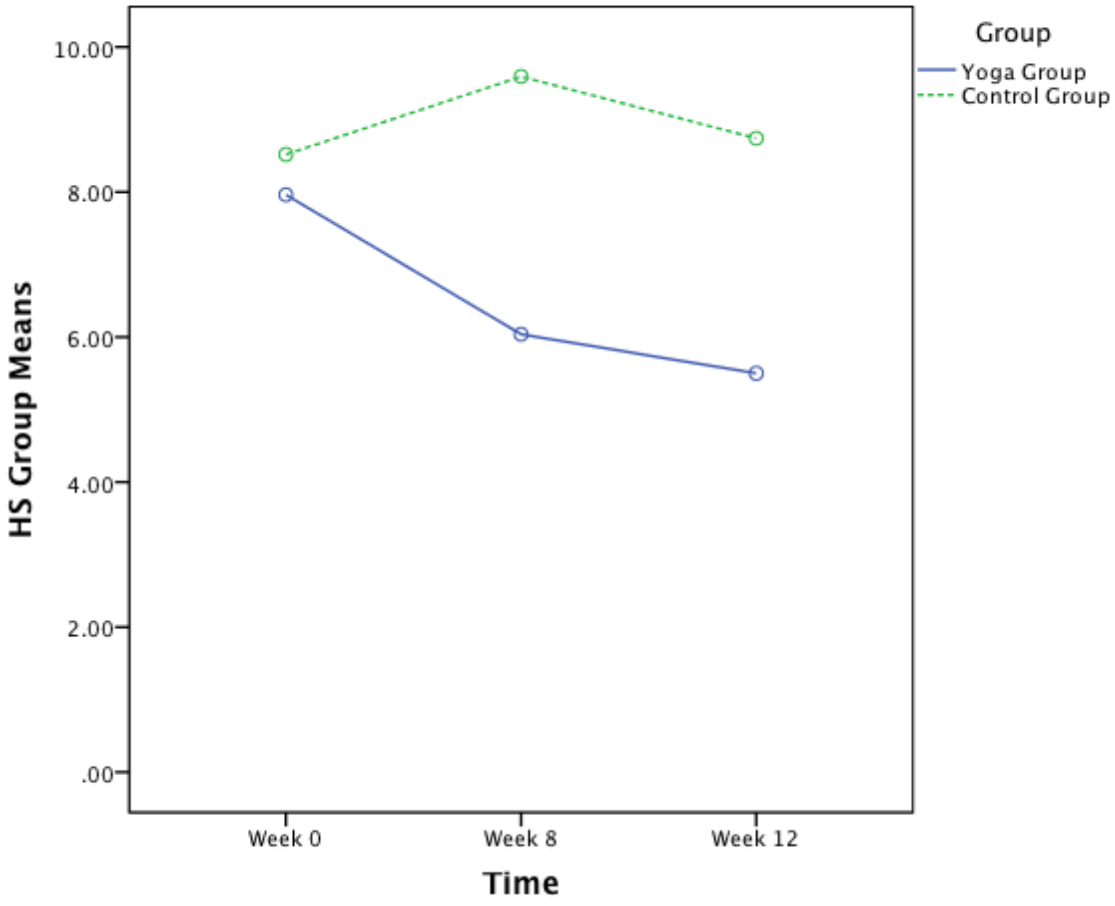

Figure 7. Interaction effect plot for Hated Self. HS = Hated Self scores on the Forms of Self-Criticizing and Self-Reassuring Scale.

Hypothesis five. The fifth hypothesis predicted that Yoga participants would experience an increase in their ability to invoke a mindfulness state across time. The two subscales on the Toronto Mindfulness Scale (TMS), decentering and curiosity, were used to assess mindfulness states and each participant in the Yoga group ($n = 26$) was assessed at four different times (weeks one, three, six, and eight). If a participant missed a class during one of these weeks, she completed the TMS the following week. The Decentering and Curiosity subscale scores of the TMS were each analyzed using repeated-measures ANOVAs.

Decentering. There was a statistically significant effect of time, $F(3, 75) = 15.45$, $p = .001$, partial $\eta^2 = .38$, which had a large effect size. Participants experienced changes in their decentering skills between week one ($M = 15.85$, $SD = 4.18$), week three ($M = 16.96$, $SD = 5.10$), week six ($M = 19.92$, $SD = 5.21$), and week eight ($M = 19.92$, $SD = 5.21$). Observed power was 1.00. Trend analysis revealed a statistically significant linear trend, $F(1, 25) = 40.35$, $p = .001$, partial $\eta^2 = .62$, indicating that mindfulness skills as measured by the Decentering subscale of the TMS increased over the Yoga sessions. This trend is plotted in Figure 8. Contrasts revealed statistically significant differences between week one and week six, $F(1, 25) = 18.32$, $p = .001$, week one and week eight, $F(1, 25) = 30.02$, $p = .001$, but not between and week one and week three, $F(1, 25) = 2.24$, $p = .146$. Conclusions about statistical significance were the same across all follow-up analyses both with and without the Holm procedure. These results support hypothesis five in so far as participants in the Yoga group experienced increases in their ability to be aware of their present moment experience (i.e., thoughts, sensations, emotions) without identifying with these experiences across the eight-week Yoga program.

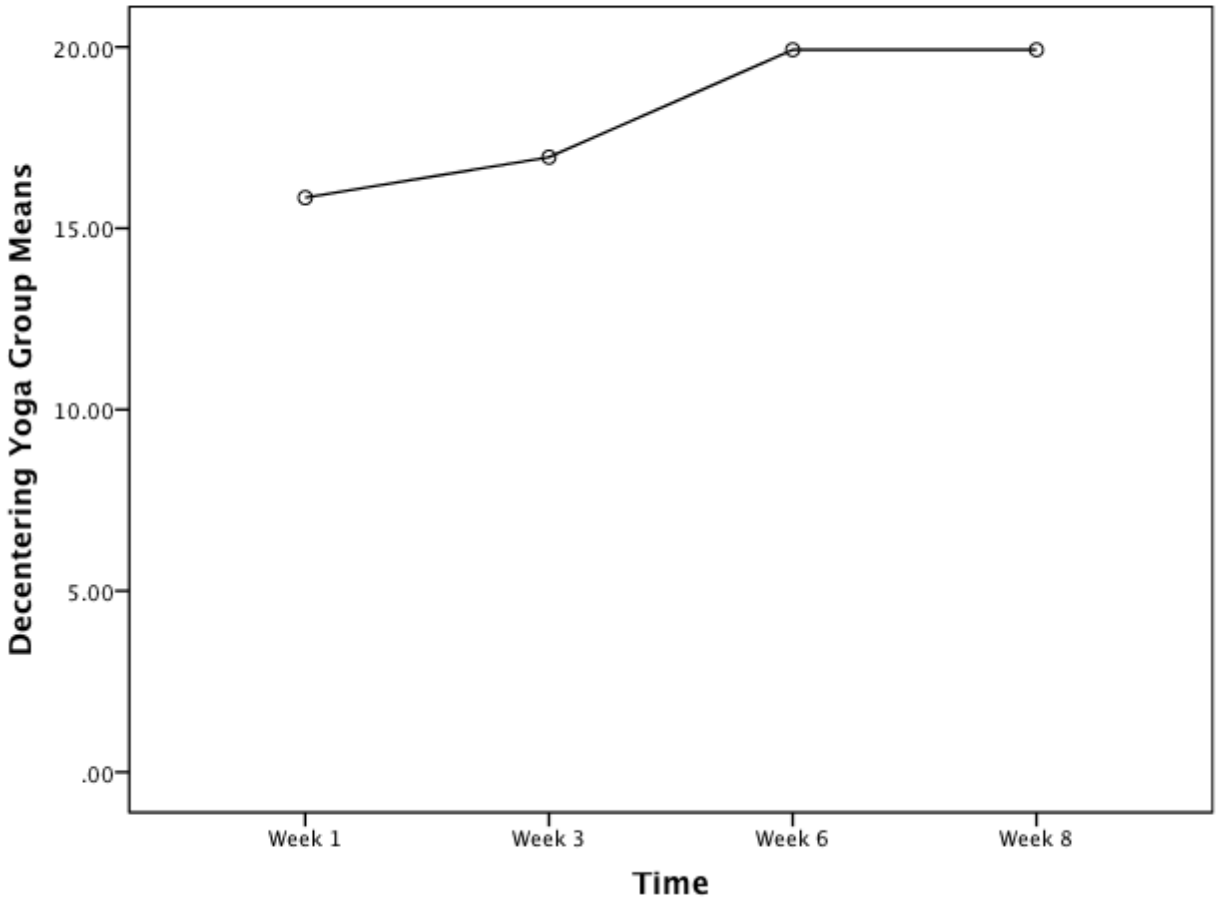

Figure 8. Decentering trend analysis. Decentering refers to decentering scores on the Toronto Mindfulness Scale.

Curiosity. There was a statistically significant effect of time for curiosity, $F(3, 75) = 10.31$, $p = .001$, partial $\eta^2 = .29$, which demonstrated a large effect size. Participants in the treatment group experienced increases in their curiosity skills between week one ($M = 12.88$, $SD = 5.72$), week three ($M = 15.15$, $SD = 5.19$), week six ($M = 17.04$, $SD = 4.25$) and week eight ($M = 16.50$, $SD = 5.01$). Observed power was 1.00. Trend analysis revealed a statistically significant linear trend, $F(1, 25) = 15.01$, $p = .001$, partial $\eta^2 = .38$, demonstrating that mindfulness as measured by the Curiosity subscale of the TMS increased over Yoga sessions. The means are plotted in Figure 9. Contrasts revealed statistically significant differences between week one and week three, $F(1, 25) = 8.88$, $p = .006$, partial $\eta^2 = .26$, week one and week six, $F(1, 25) = 26.12$, $p = .001$, partial $\eta^2 = .51$, and week one and week eight, $F(1, 25) = 13.40$, $p = .001$, partial $\eta^2 = .35$. Conclusions about statistical significance were the same across all follow-up analyses both with and without the Holm procedure. These results provides further support for hypothesis five in so far as participants in the Yoga group experienced increases in their ability bring an attitude of curiosity, openness, and acceptance to their present moment experience (i.e., thoughts, feelings, sensations) across the eight-week Yoga program.

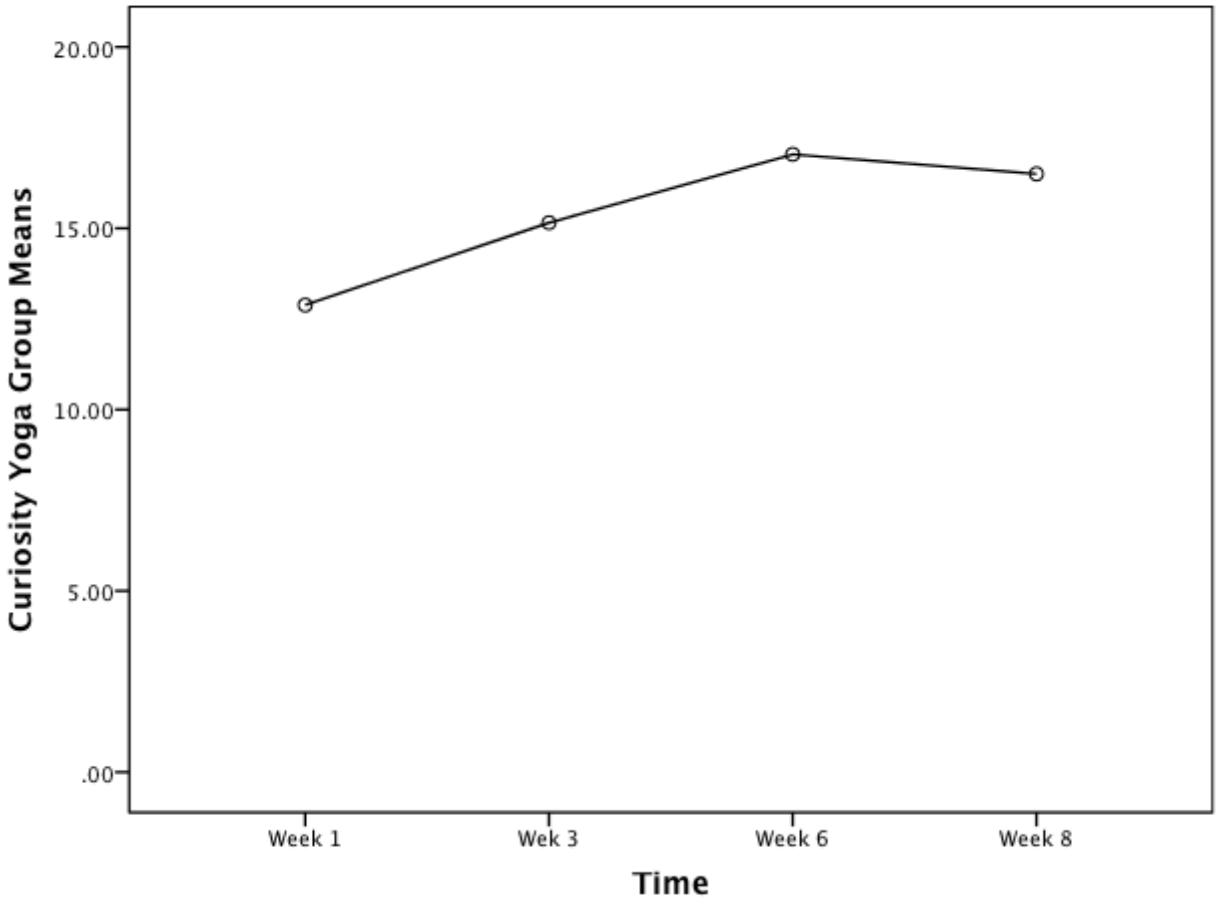

Figure 9. Curiosity trend analysis. Curiosity refers to curiosity scores on the Toronto Mindfulness Scale.

Hypothesis six. The final hypothesis asserted that greater Yoga home practice (i.e., number of minutes of reported home practice on the Yoga Log) would be associated with lesser binge eating frequency and self-criticism, greater self-compassion and mindfulness skills, and fewer emotion regulation difficulties in the Yoga group participants (n = 26). Correlations are presented in Table 15.

Based on these results, the amount of home practice was correlated with lower DERS scores at both weeks eight and twelve, lower Inadequate Self subscale scores at both weeks eight and twelve, lower Hated Self subscale scores at week twelve, and higher self-compassion scores at week 12, but home practice was not correlated with binge eating frequency, for either the reported number of times or days binge eating, at weeks eight or twelve, SCS-SF scores at week eight, Hated Self subscale scores at week eight, or Decentering or Curiosity skills at any time. These results provide limited support for hypothesis six. It appears that the amount of home practice predicted improvements in difficulties in emotion regulation and the Inadequate Self factor of self-criticism, as well as the Hated Self factor of self-criticism and self-compassion at one-month follow-up. It was not predictive of changes in Hated Self or self-compassion scores at posttest, nor binge eating frequency, or mindfulness skills at any time.

Table 15

Correlations of Home Practice with the Other Dependent Variables

Variable	*r*	*n*
Times Binge Eating Week 8[a]	-.03	26
Times Binge Eating Week 12 [a]	.04	26
Binge Days Week 8 [a]	-.05	19
Binge Days Week 12 [a]	-.09	19
DERS Week 8	-.60**	26
DERS Week 12	-.41*	26
SCS-SF Week 8	.28	26
SCS-SF Week 12	.42*	26
Inadequate Self Week 8	-.55**	26
Inadequate Self Week 12	-.43*	26
Hated Self Week 8	-.39	26
Hated Self Week 12	-.51**	26
Decentering Week 1	.20	26
Decentering Week 3	.30	26
Decentering Week 6	.31	26
Decentering Week 8	.37	26
Curiosity Week 1	.05	26
Curiosity Week 3	.09	26
Curiosity Week 6	-.01	26
Curiosity Week 8	.10	26

Note. DERS = Difficulties in Emotion Regulation Scale; SCS-SF = Self-Compassion Scale-Short Form; IS = Inadequate Self; HS = Hated Self.

[a]These variables have been square root transformed.

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

Exploratory Analyses

Exploratory analyses were conducted to investigate whether the number of therapy sessions participants attended throughout the study affected their results. Correlational analyses were conducted to determine whether the number of therapy sessions participants attended throughout the study was related to study outcomes. None of these relationships were statistically significant, suggesting that the number of therapy sessions attended by participants throughout the study did not impact their results (Appendix R).

Participant feedback was also reviewed in an attempt to tease apart the effects of the Yoga program from the effects of the instructor. Of the ten feedback forms randomly sampled, only three made any reference to the Yoga teacher. One participant appeared to strongly attribute the benefits she experienced to the instructor. Two other participants mentioned the instructor as having been helpful but also mentioned several other helpful aspects of the program. Based on these feedback forms, it does not appear that there was a strong therapist or Yoga teacher effect.

Participants more commonly attributed the benefits they experienced to developing a new relationship to their thoughts and feelings (n = 5), learning techniques to use when they get upset (n = 4), increased self-awareness (n = 4), their own commitment and/or willingness to participate in the program (n = 3), and a shift in perspective (n = 2). The meditations (n = 4), breathing practices (n = 3), having a routine (n = 2), and the progression in which poses were taught (n = 2) came up repeatedly as the most helpful aspects of the program. Individuals also mentioned finding it helpful having only women in the classes, realizing they were not alone, and recognizing that there is always help available.

Discussion

The aim of this study was to evaluate the efficacy of incorporating Yoga into the treatment of eating disorders. We used an RCT design to compare the effects of an eight-week Kripalu Yoga program with a waitlist control condition in a group of women with BN or BED. We investigated the impact of the eight-week Kripalu Yoga program on variables that are inherent in eating disorder psychopathology (i.e., binge eating frequency) and involved in the maintenance of BN and BED (i.e., emotion regulation difficulties, and self-criticism), as well as variables that are emphasized in Kripalu Yoga and have demonstrated effectiveness in the treatment of eating disorders (i.e., self-compassion and mindfulness).

The Yoga program was found to have several beneficial effects for women with BN and BED. Participants in the Yoga group experienced larger increases in self-compassion and larger decreases in binge eating frequency, self-criticism, and emotion regulation difficulties than control participants. Participants who completed the eight-week Yoga program also experienced increases in their ability to induce a mindfulness state. As part of the program, participants assigned to the Yoga condition were encouraged to engage in regular Yoga home practice. Amount of home practice was positively associated with self-compassion and negatively associated with emotion regulation difficulties and two forms of self-criticism—self-criticism characterized by a sense of personal inadequacy and self-criticism characterized by self-hatred—but it was not associated with the other dependent variables.

The study's hypotheses were largely supported. The hypotheses that participants in the Yoga condition would experience larger decreases in binge eating frequency, self-criticism, and emotion regulation difficulties across time in comparison to controls were supported. Participants

in the Yoga treatment group experienced larger decreases in binge eating frequency (when defined as the number of binge days or as the number of times binge eating over the past 28 days), emotion regulation difficulties, and the Hated Self form of self-criticism than participants in the control group between both pretest and posttest, and between pretest and one-month follow-up. The Yoga participants also experienced larger decreases in the Inadequate Self form of self-criticism between pretest and one-month follow-up than controls.

As hypothesized, participants in the Yoga group also experienced larger increases in self-compassion across time in comparison to waitlist controls. Specifically, participants in the Yoga group experienced larger increases in self-compassion between both pretest and posttest, and pretest and one-month follow-up than the participants in the control group.

The expectation that the Yoga participants would experience increases in mindfulness skills across the eight weeks of the Yoga program was supported as well. Specifically, participants in the Yoga group experienced increases in two factors of mindfulness: decentering and curiosity. Participants' improved curiosity scores demonstrate that they were increasingly able to be aware of their present moment experience with the qualities of curiosity, openness and acceptance. Their increased decentering scores demonstrate they were better able to be aware of their present moment experience without identifying with their thoughts and feelings.

The last hypothesis, which asserted that greater Yoga home practice (i.e., number of minutes of reported home practice on the Yoga Log) would be associated with lesser binge eating frequency and self-criticism, greater self-compassion and mindfulness skills, and fewer emotion regulation difficulties was only partially supported. Contrary to expectations, amount of home practice was not found to be associated with mindfulness scores or binge eating frequency

at any time. Similarly, amount of home practice was not associated with self-compassion or Hated Self scores at posttest. Amount of home practice was, however, associated with difficulties with emotion regulation and Inadequate Self scores at both posttest and one-month follow-up, as well as self-compassion and Hated Self scores at posttest.

Home Practice

The results suggest that developing a regular Yoga home practice can bolster improvements in self-compassion, self-criticism, and emotion regulation skills. It is unclear why greater home practice was associated with greater improvements on some variables and not others. One possible explanation is that the Yoga program had a ceiling effect on binge eating frequency and mindfulness skills. Researchers have found that eight-week mindfulness programs are sufficient to lead to increases in mindfulness skills (e.g., Carmody & Baer, 2008). Similarly, a ten-week Yoga program has been shown to decrease binge eating frequency in women with BED (Clarke, 2008) and an eight-week Yoga program was found to decrease eating disorder psychopathology (Carei et al., 2010). It is possible that our eight-week Kripalu Yoga program was sufficient to bring about increases in mindfulness and decreases in binge eating frequency without any additional home practice. In contrast, self-criticism, self-compassion, and difficulties with emotion regulation benefited from increased engagement in mindfulness practice, suggesting they may be less amenable to change in such a short period of time and benefit from additional practice.

Self-criticism is a deeply entrenched personality trait that requires long-term treatment in order for individuals to experience any real improvement (Blatt, 1995; Blatt et al., 1995). Brief psychotherapy and pharmacotherapy treatments have demonstrated very limited effectiveness

with self-critical individuals (Blatt et al., 1995). One might infer that while the eight-week Yoga program was sufficient to bring about modest improvements in self-criticism, additional Yoga practice was needed to strengthen these effects.

The finding that amount of home practice was associated with higher self-compassion scores at the one-month follow-up but not after completion of the eight-week Yoga program may be explained by participants' fear of self-compassion, which regrettably was not measured in this study. Despite the many demonstrated benefits of self-compassion, some individuals are wary of developing self-compassion because they fear it will lead to passivity or self-indulgence (Neff, 2003). Others do not feel deserving of self-compassion, view it as weakness, or doubt that self-compassion could be beneficial in any way (Gilbert & Procter, 2006). In contrast, some individuals recognize the benefits of self-compassion but struggle being compassionate with themselves (Pauley & McPherson, 2010). The development of self-compassion is especially difficult for highly self-critical individuals (Gilbert & Procter, 2006; Mayhew & Gilbert, 2008) who often exhibit a high degree of fear of self-compassion (Gilbert, McEwan, Matos, & Rivas, 2010).

Considering the high degree of self-criticism among individuals with eating disorders (APA, 2013; Dunkley, Masheb, & Grilo, 2010; Speranza et al., 2003), it is not surprising that they are more fearful of self-compassion than the general population (Kelly et al., 2014). It is possible that increases in self-compassion experienced by the Yoga participants were slower to occur due to fear of self-compassion. While we did not measure fear of self-compassion in our study, this variable has been shown to be positively associated with both the Inadequate Self and Hated Self forms of self-criticism (Gilbert et al., 2010). Participants who engaged in greater

Yoga home practice may have benefited from increased exposure to activities involving a self-compassionate stance. This added practice may have lessened their fear of self-compassion and allowed for even greater gains in their ability to be compassionate with themselves.

Individuals with eating disorders have also been found to perceive emotions as threatening (Ioannou and Fox, 2009). While the eight-week Kripalu Yoga program led to improvements in emotion regulation difficulties, the finding that greater home practice was associated with fewer difficulties with emotion regulation may speak to the prevalence of distress intolerance in the eating disorder population (Anestis, Selby, Fink, & Joiner, 2007). Continued exposure to emotions and body sensations during Yoga home practice may have helped the Yoga participants to become more comfortable with their feelings and experience their emotions as less threatening, thereby further increasing their distress tolerance and emotion regulation capabilities.

The lack of an association found between amount of home practice and frequency of binge eating contradicts existing research. In their investigation of the effects of the MB-EAT program, Kristeller and Hallett (1999) found a negative association between amount of practice and binge eating. Participants in their study attended seven sessions over a six-week time-period, which may help to explain the difference in their findings. If a ceiling effect mitigates the benefit mindfulness practice has on binge eating frequency, it is possible that six weeks was insufficient time for the effect of mindfulness on binge eating frequency to reach its full effect. Hence, additional mindfulness practice may have led to further decreases in binge eating frequency. In contrast, attending eight weekly Yoga classes may have maximized Yoga's impact on binge

eating frequency in our participants so that mindfulness practice above and beyond the eight weekly classes had no further effect on binge eating.

The finding that greater home practice was associated with greater improvements on some variables and not others also needs to be considered within the context of existing research on other mindfulness-based programs. While it is commonly asserted that regular home practice is essential to reaping the benefits of mindfulness-based programs (e.g., Kabat-Zinn, 1990), empirical evidence of this claim has been inconclusive. A review of the literature determined that eleven out of 24 studies examining the relationship between amount of mindfulness practice and program outcomes failed to find evidence for the expected benefits of home practice on program outcomes (Vettese et al., 2009). Vetesse et al. (2009) offer several possible explanations for this finding. First, the exploration of the impact of home practice in mindfulness studies has largely been a secondary focus of the research and has relied on correlational analyses. These authors argue that future studies are needed to directly compare a treatment condition wherein individuals engage in home practice with a control condition in which participants do not engage in home practice. Second, Vetesse et al. also suggest that the methods used to track home practice need to be improved, allowing for a more reliable and valid measure of home practice.

These concerns with research on home practice are applicable to our study. It is reasonable to question whether the Yoga log was a reliable measure of home practice. While some participants consistently completed their Yoga logs each week, others sometimes forgot to fill out their logs. Furthermore, when participants failed to submit a Yoga log, they were recorded as having completed zero minutes of home practice for the week. This conservative method may have underestimated unreported practice. The lack of control over how participants

completed their Yoga logs is another shortcoming of the Yoga log as a measure of Home practice. Some participants may have completed their log each day in real time, whereas others may have completed their log at the end of the week based on memory. The recommendations set forth by Vetesse and colleagues (2009), such as using more reliable measures of home practice and directly comparing a group instructed to engage in home practice with a control group that is not asked to engage in home practice, could work to greatly improve our understanding of the effects of Yoga home practice itself and its influence on changes in the variables being studied.

Self-Criticism

Individuals with eating disorders are known to be highly self-critical, a trait that unfortunately predicts poor psychotherapy outcomes (Blatt, Quinlan, Pilkonis, & Shea, 1995; Rector, Bagby, Segal, Joffe, & Levitt, 2000). The ability of our Yoga program to decrease self-criticism after just eight weeks is a significant finding. Specifically, the Yoga participants experienced larger decreases than controls in two forms of self-criticism—self-criticism characterized by a personal sense of inadequacy and self-criticism characterized by self-hatred—between pretest and one-month follow-up. They also experienced larger decreases in the Hated Self form of self-criticism between pretest and posttest than control participants. These findings are contrary to previous research findings that self-criticism requires long-term therapy and does not respond well to brief treatments (Blatt, 1995; Blatt et al., 1995).

How a short-term Yoga program led to decreases in self-criticism when short-term therapies have failed is unclear. One possible explanation is the Yoga program's emphasis on self-compassion—the antithesis of harsh self-criticism (Neff, 2003). Despite the frequent claims

that self-compassion decreases self-criticism, little research has actually investigated whether this is the case. Gilbert and Procter (2006) found that short-term therapy focusing on the development of self-compassion led to decreases in self-criticism. In their study, participants attended twelve two-hour sessions of compassionate mind training. Following completion of this program, participants experienced increases in their abilities to self-soothe and reassure themselves, as well as decreases in self-criticism (Gilbert & Procter, 2006). Our findings are consistent with these results in so far as the Yoga program, which focused on enhancing self-compassion, led to increases in self-compassion and decreases in self-criticism. More studies are needed to explore the effectiveness of decreasing self-criticism through the development of self-compassion.

Another possible explanation for the Yoga program's positive impact on self-criticism after just eight weeks is the modality of the program. Working through the body may be more effective at reducing self-criticism than psychotherapy. Jopling (2000) asserts that "the somatic sense of self is developmentally prior to explicitly worked-out self-understandings, and normally forms the unnoticed background of thought and action" (p.55). In other words, the somatic sense of self may be an important precursor to changing one's view of self. Throughout the Yoga practice, participants were asked to listen to, and be respectful of, their bodies' signals and limitations. They were continually encouraged to treat their bodies with kindness and compassion. Treating their bodies with compassion may have allowed for, and contributed to, the development of kinder thoughts about the self and actions toward the self. Furthermore, "distortions in the psychosomatic sense of self may interfere with more explicit forms of self-understanding" (Jopling, 2000, p. 56). Thus, changing an individual's view and treatment of self

may be more effective when this change is addressed from the bottom-up. Further research is needed to explore this possibility.

Regardless of how the Yoga program was able to positively impact self-criticism, its ability to do so in women with BN and BED is significant and corroborates Gilbert and Procter's (2006) finding that brief treatment can help ameliorate self-criticism. The ability to lessen self-criticism is particularly important for women with eating disorders. Self-criticism contributes to negative affect generally (Gilbert, 2009; Zuroff, Stotland, Sweetman, Craig, & Koestner, 1995) and internalized shame specifically (Gilbert et al., 2010; Whelton & Greenberg, 2005). When combined with emotional processing deficits, the experience of shame and other unpleasant emotions leads individuals with BN and BED to rely on eating disordered behaviours in order to manage their emotions (Gilbert, 2007). Unfortunately, while these behaviours may ameliorate feelings of shame temporarily, they are viewed as evidence of one's deficiency, further perpetuating self-critical thoughts and feelings of shame (Goss & Allan, 2009). Self-criticism also contributes to emotion regulation difficulties because self-critical individuals tend to overly identify with their thoughts and feelings (Nolen-Hoeksema, 1991). Additionally, self-criticism "closes down abilities to be open and explore one's feelings because one does not feel safe with them and may feel ashamed of them" (Gilbert et al., 2012, p. 378). Despite knowledge that self-criticism is involved in the maintenance of eating disorders it is not targeted in most eating disorder treatments (Fennig et al., 2008). The ability of our program to lessen self-criticism makes it a valuable adjunct to existing treatments that do not address self-criticism—its use could potentially improve treatment outcomes. Further research is needed to explore this possibility.

Self-Compassion

The finding that participants in the Yoga group experienced larger increases in self-compassion between pretest and posttest, and between pretest and one-month follow-up than control participants is an important finding for several reasons. First, self-compassion is believed to help counteract self-criticism and shame (Jopling, 2000), which are unfortunately common among individuals with eating disorders and often serve to maintain these disorders (Fennig et al., 2008; Goss & Gilbert, 2002; Kelly, Carter, & Borairi, 2014). Lower levels of self-compassion predict poorer treatment outcomes (Kelly, Carter, Zuroff, & Borairi, 2013). Additionally, self-compassion is associated with greater acceptance of one's body and fewer dysfunctional beliefs about eating (Prowse, Bore, & Byer, 2013), fewer body checking behaviours, less body shame (Daye, Webb, & Jafari, 2014), decreased self-objectification (Liss & Erchull, 2015), and lower severity of binge eating (Webb & Foreman, 2013). Lastly, self-compassion is known to help improve emotion regulation (Jazaieri, McGonigal, Jinpa, Doty, Gross, & Goldin, 2014; Leary Tate, Adams, Allen, & Hancock, 2007; Neff, 2003a). Neff and Dahm (in press) suggest "people suffering from severe shame or self-criticism … might need to first cultivate self-compassion in order to have the sense of emotional safety needed to fully turn toward their pain with mindfulness" (p. 28). Self-compassion can also be considered a component of emotion regulation in its own right (Diedrich, Grant, Hoffman, Hiller, & Berking, 2014).

The increase in self-compassion experienced by the participants who completed the Yoga program is consistent with the results from another study examining the effects of Kripalu Yoga. Gard and colleagues (2011) examined the effects of a four-month residential Kripalu Yoga

program. The participants who attended this Yoga program experienced greater increases in self-compassion than a group of controls. These findings suggests that Kripalu Yoga delivers on its aim of increasing self-compassion among its practitioners, supporting the assertion that Kripalu Yoga is a good fit for individuals with eating disorders. The finding that our Yoga program led to increases in self-compassion is important because few existing eating disorder treatments specifically aim to increase self-compassion. Using Kripalu Yoga programs as an adjunct to other forms of treatment may help improve treatment outcomes and is an exciting direction for further investigation.

Emotion Regulation Difficulties

Another promising result of this study was the finding that participants in the group experienced larger decreases in emotion regulation difficulties than controls between both pretest and posttest, and between pretest and one-month follow-up. These findings demonstrate that the eight-week Yoga program led to improvements in emotion regulation that were maintained one month later. These findings also lend support to the notion that Kripalu Yoga teaches individuals how to manage emotions more effectively.

Emotion regulation difficulties have been shown to predispose individuals to developing eating disorders and they also perpetuate these disorders by necessitating the reliance on eating disorder behaviours to manage emotions (APA, 2000; Stice, 2002). Distress tolerance is one aspect of emotion regulation. The eating disorder population often exhibits distress intolerance and the degree to which these individuals perceive emotions as threatening and intolerable predicts the degree to which they exhibit dysregulated eating (Anestis et al., 2007). Distress intolerance in turn leads to experiential avoidance, wherein individuals attempt to avoid or

escape from unpleasant feelings (Chawla & Ostafin, 2007, p. 871), which drives binge eating. The behaviour itself becomes a form of experiential avoidance, effectively allowing individuals to dissociate or distract themselves from their emotions (Heatherton & Baumeister, 1991; McManuss, Waller & Chadwick, 1996; Reiser, 1990).

The ability of the Kripalu Yoga program used in this study to decrease emotion regulation difficulties is consistent with existing research on the effects of mindfulness-based practices (e.g., e.g., Lutz, Brefczynski-Lewis, Johnstone, & Davidson, 2008; Perlman, Salomons, Davidson, & Lutz, 2010; Teper, Segal, & Inzlicht, 2013). It is possible that the Yoga program also led to decreases in distress intolerance and experiential avoidance, as has been demonstrated of other mindfulness-based practices (Eifert & Heffner, 2003; Twohig, Hayes, & Masuda, 2006; Weinrib, 2011). Further research is needed to investigate this possibility.

Despite widespread acknowledgement of the role of emotion regulation deficits in the eating disorder population (e.g., Bydlowski et al., 2005; Telch et al., 2001), standard psychological treatments have traditionally failed to address these deficits. Only recently, CBT-E has begun to address the difficulties individuals with eating disorders have with their emotions. To date, few studies have investigated the impact of CBT-E on emotion regulation. One group of researchers compared CBT-E to an integrative cognitive-affective therapy (ICAT) and found that while both groups experienced decreases in emotion regulation difficulties, no differences existed between groups (Wonderlich et al., 2014). Notably, Yoga participants in the present study experienced greater decreases in emotion regulation difficulties following treatment than participants in either the CBT-E group or ICAT group despite being a much shorter treatment. Another group of researchers found that distress tolerance, an emotion regulation skill

(Corstorphine, Mountford, Tomlinson, Waller, & Meyer, 2007), did not improve in women with eating disorders following completion of CBT-E treatment (Byrne, Fursland, Allen, & Watson, 2011).

The ability of the eight-week Kripalu Yoga program to improve emotion regulation skills offers a strong rationale for incorporating Yoga into the treatment of eating disorders. It appears that the Kripalu Yoga program used in the present study may be a valuable adjunct to other treatment approaches, especially CBT-E, which does not appear to adequately address emotion regulation deficits.

Binge Eating Frequency

Decreases in binge eating frequency were another significant finding of this study. Yoga participants experienced larger decreases in binge eating frequency between both pretest and posttest, and between pretest and one-month follow-up than control participants. These results are consistent with the findings of two recent meta-analyses investigating the use of mindfulness-based interventions in the treatment of binge eating (Godfrey, Gallo, & Afari, 2015; Katterman, Kleinman, Hood, Nackers, & Corsica, 2014). Both meta-analyses found that mindfulness-based interventions demonstrated medium to large effects in their ability to decrease the frequency of binge eating (Godfrey et al., 2015; Katterman et al., 2014). The decrease in the frequency of objective binge eating episodes experienced by participants who completed our Yoga program is also consistent with existing research exploring the use of Yoga in the treatment of BED (Clarke, 2008) and women reporting problematic binge eating (McIver, O'Halloran, & McGartland, 2009). Our results corroborate existing research and provide further evidence that Yoga can help women with BN and BED decrease the frequency of binge eating episodes.

Of note, a difference was observed between groups in the frequency of binge eating episodes depending on which definition of binge eating episode was used. While participants in the Yoga group demonstrated fewer episodes of binge eating than the control participants when measured by the number of times they binged over the past 28 days, this difference was not seen between groups when the frequency of binge eating was measured by the number of binge days over the past 28 days. This difference in ratings may have reflected true differences in behaviours. Researchers have suggested that the number of binge days is a more reliable measure of binge eating frequency for individuals with BED (Reas, Grilo, & Masheb, 2006). It is therefore possible that scores were more accurate when using the number of binge days as the measure of binge eating frequency. Alternatively, this difference in ratings may have been due to the fact that fewer participants were included in the analysis of the number of binge days. This was the case because several participants misinterpreted the question inquiring about number of binge days and provided nonsensical answers (e.g., answering that they binge ate on more days than were in question). Having fewer participants in the analysis inadvertently decreased the power for this analysis and may have impacted results.

Before the binge eating data was square root transformed, it was found that between 7.5% (measured using the number of times binge eating) and 15.8% (measured using the number of binge days) of the Yoga participants had completely stopped engaging in objective binge eating episodes by the end of the eight week Yoga program and between 13% (measured using the number of times binge eating) and 26.3% (measured using the number of binge days) had stopped this behaviour by the one-month follow-up point. While these results are encouraging, they are also less impressive than what has been observed following other forms of treatment.

For example, 42% of patients ceased binge eating following completion of a 20-week CBT-E treatment program and 44% were free of symptoms after 24 months (Poulsen et al., 2014). Similarly, 29% of participants stopped binge eating following completion of 20 sessions of DBT treatment and 40% has stopped after six months (Safer et al., 2001). It is noteworthy that both DBT for eating disorders and CBT-E consist of 20 sessions, which is substantially longer than the eight-week Yoga program in the present study. Further research is needed to determine whether lengthening the Yoga program could result in greater reductions in binge eating frequency. It is also worth exploring how combining our Yoga program with other treatments would impact outcomes. The Yoga program was not developed with the intention of being used a stand-alone treatment and it could easily be delivered as an adjunct to existing treatments.

Mindfulness

The improvements the Yoga participants experienced in their ability to induce a mindfulness state across the eight weeks of the Yoga program was not surprising. Yoga is itself a mindfulness practice and thus it naturally follows that repeated Yoga practice would result in increases in mindfulness. While Yoga has been shown to improve mindfulness skills in many studies (e.g., Carmody & Baer, 2008; Gard et al., 2011; Nyklicek & Kuijpers, 2008), the present study is just the second to investigate the impact of a Yoga-intervention on mindfulness skills in individuals meeting diagnostic criteria for an eating disorder. The increases in mindfulness skills experienced by the Yoga participants may help to explain Yoga's benefits for those struggling with an eating disorder.

The increase in mindfulness skills experienced by the Yoga group is consistent with Clarke's (2008) findings that a ten-week Yoga program led to increases in mindfulness skills

among women with BED. An important distinction between our study and Clarke's (2008) study is the investigation of Yoga on state versus trait mindfulness skills. The present study was the first to examine changes in state mindfulness among the eating disorder population following a Yoga intervention. While this improves our understanding of the immediate effects of Yoga practice, it will be important to examine whether the short-term effects of the eight-week Kripalu Yoga program transfer into longer-term changes over time. Research suggests that with prolonged practice mindfulness state changes may become trait changes (Lutz, Slagter, et al., 2009). It therefore seems likely that with sustained practice, individuals who complete the Yoga program could experience trait increases in mindfulness.

Existing research on the beneficial effects of mindfulness practices and mindfulness-based eating disorder treatments sheds light on the benefits experienced by the Yoga participants in our study. Developing a regular mindfulness practice has been shown to decrease emotional reactivity (Creswell et al., 2007; Ortner, Kilner, & Zelazo, 2007) and improve emotion regulation (Lutz, Brefczynski-Lewis, Johnstone, & Davidson, 2008; Perlman, Salomons, Davidson, & Lutz, 2010; Teper, Segal, & Inzlicht, 2013). Overly identifying with thoughts and feelings is common among self-critical individuals (Nolen-Hoeksma, 1991), and contributes to emotion regulation difficulties (Bennett-Goleman, 2001). The improved ability of the Yoga participants to bring an attitude of curiosity, openness, and acceptance to their present moment experience without identifying with their thoughts, feelings, or sensations may have led to increases in their ability to regulate their emotions.

Additionally, bringing the qualities of curiosity, openness, and acceptance to their experience may have helped to reduce participants' judgments of their experiences or of

themselves for having these experiences. This would be helpful as individuals with eating disorders are very self-critical (Fennig et al., 2008; Steiger et al., 1989) and often view their internal experiences, particularly emotions, are threatening (Anestis et al., 2007; Ioannou & Fox, 2009). Research has shown that Yoga practice helps to increase the non-judging facet of mindfulness (Carmody & Baer, 2008), which may help to counteract the harsh self-criticism and perceived threat of emotions that are so prevalent in women with BN and BED.

Viewing emotions as threatening and intolerable is called distress intolerance (Anestis, Selby, Fink, & Joiner, 2007). The level to which individuals experience distress intolerance has been found to predict dysregulated eating (Anestis et al., 2007). It also leads to experiential avoidance, or the "unwillingness to remain in contact with unpleasant cognitive, physical, and emotional processes" (Chawla & Ostafin, 2007, p. 871). Researchers have shown that binge eating is a form of experiential avoidance—it reduces one's awareness of distressing thoughts or feelings (McManuss, Waller & Chadwick, 1996). Decreasing distress intolerance and experiential avoidance may have contributed to the decrease in binge eating frequency among our Yoga participants.

The Kripalu Yoga program used in this study trained participants to be aware of their internal experiences (i.e., physical sensations, emotions, thoughts) whether pleasant, unpleasant, or neutral, with non-reactivity and acceptance. As the eight-week program progressed participants were instructed to hold poses for longer periods of time while paying attention to their arising thoughts, emotions, and sensations. It was emphasized that the quality of this attention should be curious, kind, open, and non-reactive. These practices directly countered the tendency to escape from unpleasant experiences that is known to lead to disordered eating

behaviours (Heatherton & Baumeister, 1991; McManuss, Waller & Chadwick, 1996; Reiser, 1990). In sitting with and attending to unpleasant internal experiences, participants learned to ride out feelings of discomfort, whether they were in the form of unpleasant physical sensations or emotions, or negative thoughts. In this way longer holdings of postures offered participants the opportunity to recognize they could tolerate discomfort and that these experiences would eventually pass.

The emphasis on accepting their moment-to-moment experience may have also contributed to the increase in self-compassion experienced by the Yoga participants. Not only has the emphasis on acceptance in mindfulness practices been shown to contribute to increases in self-compassion (Farb, Anderson, & Segal, 2012; Germer, 2009; Leary et al., 2007), it also helps to counteract self-criticism and facilitates greater regulation of internal experiences (Neff, 2003a; Neff & McGehee, 2010). Self-compassionate individuals demonstrate less reactive responses to distressing situations. They have fewer negative emotions and thoughts in response to these situations (Leary Tate, Adams, Allen, & Hancock, 2007). Rather than trying to avoid or escape from difficult emotions, self-compassionate individuals approach emotions and hold them in mindful awareness, which allows them to understand their reactions and choose healthy responses (Neff, 2003). In this way, mindfulness foster self-kindness and self-understanding, effectively lessening self-criticism (Jopling, 2000).

Research shows that mindfulness also helps to increase self-awareness and decrease impulsive behaviours (Fischer, Smith, & Anderson, 2003; Nasser, Gluck, & Geliebter 2003). As is hypothesized in the MB-EAT program, increases in self-awareness developed through mindfulness practice may have allowed participants to develop greater self-regulation skills

(Kristeller, 2003). It is possible that the skills they learned in the Yoga program transferred off the mat and into their daily lives. In this way participants may have gained greater awareness into their automatic patterns of behaviour, such as relying on food when they are distressed. Combined with their increased emotion regulation skills, this increased awareness may have enabled participants to choose alternate ways of responding to distressing situations.

Limitations

Despite the promising results of this study, there are also several limitations that need to be acknowledged.

Design. First, the study's design introduced a few potential confounding factors. Most importantly, having one Yoga instructor lead all of the Yoga classes in this study introduced the possibility of confounding therapist effects, or in this case confounding Yoga teacher effects. Therapist effects refer to the fact that "the person of the therapist him- or herself may make an important contribution to variance in treatment outcome" (Elkin, Falconnier, Martinovich, & Mahoney, 2006, p. 144). Therapist effects can account for up to 10% of the proportion of variability among outcomes (Wampold & Bolt, 2006). It is argued that failing to consider therapist effects may inflate Type I error and effect size estimates (Wampold & Serlin, 2000), resulting in the misinterpretation of outcome data (Wampold, 2001). For example, Elkin (1999) suggests that researchers may conclude treatment differences exist when, in reality, differences are due to the therapists themselves. Accordingly, there is a growing movement in psychotherapy research that stresses the importance of considering and controlling for therapist effects when analyzing results in therapy outcome studies (e.g., Wampold, 2001).

While having only one instructor ensured consistency in the way the classes were taught, it also introduced the possibility that positive changes were actually due to the effects of the Yoga teacher rather than the Yoga program. Ideally, four different Yoga teachers would have provided instruction to four different and equal size groups of participants. Having four Yoga instructors would have allowed the difference in scores between participants who were taught by different Yoga instructors to be compared, providing a measure of therapist effects. Unfortunately, this was not feasible in the present study for two insuperable reasons. First the financial constraints of doctoral research did not allow training and paying four Yoga instructors to lead the eight-week Yoga program. Second, the present study was specifically interested in investigating the effects of a Kripalu Yoga program on individuals with BN and BED and the primary researcher is the only registered Yoga teacher in Alberta trained in the Kripalu Yoga tradition.

In an attempt to address this limitation, a post-Yoga evaluation was conducted. A feedback form consisting of open-ended questions asked the Yoga participants what they found helpful about the Yoga program and to what they attributed any benefits they may have experienced as a result of participating in the eight-week Yoga program. Examination of ten randomly sampled feedback forms revealed minimal evidence of a teacher effect. However, future research is needed to more adequately address this limitation.

Another potential confounding factor is the possibility that uncontrolled non-specific factors may have influenced the study's outcomes. For example, the Yoga instructor's knowledge of the study's hypotheses could have unknowingly impacted her teaching, which could have impacted the study's results. Similarly participants' expectations could have also

impacted the study's results. Client expectation has been shown to predict psychotherapy outcomes (Constantino, Glass, Arnkoff, Ametrano, & Smith, 2011) and may have impacted the degree to which participants benefited from participating in the Yoga program. Wampold and Imel (2015) note the importance of differentiating specific effects from general effects. They caution that failing to do so may result in inaccurately concluding that specific elements of a treatment led to the observed outcomes, when in reality changes may have been due to general effects (i.e., common factors) or more likely a combination of general and specific effects. Future research is needed to address this limitation.

Another limitation of the study's design was its reliance on a waitlist control condition, which may have resulted in differential expectations between groups. For example, using a waitlist control condition could have resulted in time order confounds. Participants in the control group knew they would be participating in the Yoga program. This may have resulted in a sense of relief knowing they would get to participate in the program or conversely it could have resulted in frustration at having to wait. The lack of an active comparison condition made it impossible to test "the benefits, risks, burdens and effectiveness" (World Medical Association [WMA], 2013, para. 33) of the Yoga group against the best "current therapeutic methods" (WMA, 2013, para. 33).

The inclusion of an active comparison condition in addition to a waitlist control condition would have strengthened the present study. Ideally, a 2 X 2 factorial design would have been used. This would have allowed for the comparison of the Yoga program to a standard psychological treatment (e.g., CBT or IPT), as well as to a waitlist control. Using this type of design would also have made it possible to investigate the effects of the Yoga program in

conjunction with a standard psychological treatment—its intended use. Additionally, using a 2 X 2 factorial design would have eliminated the potential source of bias that is inherent in repeated measures designs. Repetitive testing with the same measures may have confounded participants' results in the present study. Adopting a 2 X 2 factorial design when investigating the effects of our Yoga program is an important direction for future research.

Finally, the follow-up period of one-month was inadequate to determine if there were any lasting effects of the Yoga program. Moreover, no record was kept as to whether participants continued to practice Yoga after the completion of the study, making it impossible to ascertain if maintenance or improvements in symptoms at one-month follow up were due to the eight-week Yoga program or to continued Yoga practice. If a repeated measures design is used in future research, a longer follow-up period and continued monitoring of Yoga practice throughout the follow-up period are recommended.

High attrition rate. The number of participant dropouts was another limitation of the present study. The attrition rate in this study was high at 26%—however, this is comparable to the number of dropouts in other studies. A review of the literature revealed that dropout rates ranged from 29%–73% for eating disorder outpatient treatments (Fassino, Pierò, Tomba, & Abbate-Daga, 2009). While the attrition rate of the present study is comparable to, or slightly lower than, other studies on eating disorder treatments, this attrition rate poses a limitation of the present study. We cannot know how the intervention affected individuals who withdrew from the study. Few participants provided a reason for their decision to withdraw, making it impossible to determine if participants who chose to leave the study would have benefited from the intervention. Nor do we know if these individuals shared similarities that contributed to their

decision to withdraw or that distinguished them from the other participants in a significant way. Exploratory analyses revealed that the individuals who withdrew from the study demonstrated more positive attitudes toward help seeking, as measured by the ATSPPH-SF, than the individuals who completed the study. This measure assesses an individual's attitude toward seeking professional psychological help. It is possible that the Yoga program did not align with the beliefs of study non-completers about what types of interventions would be beneficial, contributing to their decision to withdraw from the study. Future research is needed to explore the relationship between attitudes toward help seeking and Yoga program completion rates.

The high rate of attrition also led to a much smaller final sample size than was originally planned. A power analysis based on a medium effect size was conducted at the outset of the study. This power analysis suggested 90 participants were needed to achieve adequate power for the planned analyses. While having a smaller group of study completers did not seem to negatively impact results due to the large effects seen, a larger sample size would have increased power of the analyses conducted.

Lack of generalizability. The results of the present study also lack generalizability. Participants were self-selected as they volunteered to participate. The lack of random sampling limits the generalizability of the findings. Similarly, the study only investigated the effects of the Yoga program on women over the age of 18 who met diagnostic criteria of BN or BED. Thus the results cannot be generalized to males, children or adolescents, or those struggling with AN or other specified or unspecified feeding or eating disorders. Additionally, the study examined a specific form of Yoga and the benefits of the Kripalu Yoga program used in this study may not generalize to other types of Yoga.

While it appears that several styles of Yoga can aid in the treatment of eating disorders, this does not mean that all styles of Yoga are beneficial, or that Yoga is beneficial to all individuals with an eating disorder. Contrary to research espousing Yoga's benefits for the eating disorder population, the authors of one study found that body dissatisfaction and disordered eating behaviours were equally prevalent in females who practiced Yoga or pilates as those who did not, and were more prevalent in males practicing Yoga or pilates than those not practicing these activities (Neumark-Sztainer, Eisenberg, Wall, & Loth, 2009). Anecdotal explanations for this phenomenon can be found in the experiences of Yoga teachers. In a recent article, Roff (2014) explores the *shadow side of Yoga* and reports that Yoga teachers are seeing an increase in the number of underweight Yogis who are taking multiple classes per day, fainting, or engaging in juice fasts (which are encouraged by some Yoga studios). Roff (2014) warns "some eating-disorder experts worry that patients turn to Yoga to burn calories, suppress hunger, or numb emotional pain, but under the guise of a devoted practice and cleaning eating, their illness goes unnoticed" (p. 99). Thus, the type of Yoga used, the way and environment in which it is delivered, and the awareness of Yoga teachers about both the potential benefits and risks of Yoga for individuals with an eating disorder are important factors to consider when incorporating Yoga into the treatment of eating disorders.

Measures. Lastly, the measures used in this study created additional potential confounding factors. Using self-report measures to assess changes in the dependent variables introduced the possibility for potential forms of bias, such as reporting bias. Similarly, the Yoga logs used to measure home practice also introduced possible confounding factors as there was little control over how or when participants completed the Yoga log. Participants who failed to

return their Yoga logs each week were recorded as practicing no home practice for the week, which may have resulted in an underestimation of the amount of home practice. Additionally, some participants recorded practicing Yoga classes other than the Yoga videos created for the study. For example, a few participants recorded attending community Yoga classes or using videos found online in order to practice Yoga on their own time. While it is great that participants took the time and effort to not only practice Yoga, but also to record this practice, using classes other than the videos created for the study introduced unknown variables into the element of home practice.

Clinical Implications

The results of this study provide empirical support for the continued incorporation of Yoga into the treatment of eating disorders. The findings also enhance our understanding of how Yoga is beneficial for women with BN and BED. The results suggest that Yoga emphasizing self-compassion and mindfulness can be used to increase self-compassion and mindfulness skills in women with BN and BED. This is valuable information as both of these variables have been shown to improve treatment outcomes (Hepworth, 2011; Kelly, Carter, & Borairi, 2014). The results of this study also demonstrate the ability of Yoga to decrease emotion regulation difficulties and self-criticism in women with BED and BN, which serve to perpetuate these disorders (Bydlowski et al., 2005; Fennig et al., 2008; Telch, Agras, & Linehan, 2001). These findings aid in our understanding of how Yoga benefits individuals with eating disorders and provide further rationale for the inclusion of Yoga in treatment practices.

An important advantage of the Yoga program is that it can be implemented in groups, which has the potential to decease the costs associated with treatment. Using a group format may

also have the benefit of normalizing individuals' experiences of having an eating disorder, which could potentially decrease feelings of shame and isolation (Yalom & Leszcz, 2005). Furthermore, researchers have shown that contact with other individuals who are struggling with eating disorders is one of the most helpful contributors to recovery (Rorty, Yager, & Rossotto, 1993). Other benefits of the Yoga program include its ability to create change in a short period of time and its potential use as an adjunct to existing treatments. The nature of the program allows for it to be implemented along a wide variety of treatment approaches and orientations. Its ability to bring about early change and decrease factors involved in the maintenance of eating disorders that are not often addressed in existing treatments suggest the Yoga program has promise as an adjunct to treatment.

Participant feedback. A few participants in this study provided valuable feedback that offers insight into ways the success of the Yoga program could be improved. A couple of participants who were eligible to participate in Phase Two of the study shared choosing to withdraw from the study because they were too ashamed of their bodies to participate in the Yoga classes. The BMI of both of these participants was in the obese range. Another participant who completed the Yoga program disclosed struggling with being the only *bigger bodied* participant in her Yoga class. Based on these pieces of feedback, adjusting the delivery of the Yoga program may increase the likelihood of reaching individuals who would not participate in the program otherwise. One possibility would be to offer the program on an individual basis. Another option, which would be more cost effective than individual Yoga classes, would be to offer the program to different subgroups (e.g., based on BMI or diagnosis) separately. For example, offering separate classes for individuals who are overweight or obese and those who

are normal weight may decrease the shame experienced by overweight participants and increase the likelihood they would participate and/or complete the program. This possibility is similar to an emerging trend in Yoga studios offering Yoga classes specifically geared toward individuals with larger bodies. Either of these options may help to address barriers preventing individuals from participating in or completing the Yoga program.

Another piece of valuable feedback came from a participant who disclosed choosing to withdraw form the study because she found the experience triggering. She shared being highly aware that everyone in the study had an eating disorder and indicated that this knowledge heightened her dissatisfaction with her body. This individual reported comparing herself to the other participants, which contributed to feelings of guilt that she "no longer had the discipline" to continue with her eating disorder the way she had in the past (i.e., she was engaging in fewer compensatory behaviours than she had previously). This participant fortunately had the insight to realize what was happening and made the wise decision to withdraw from the study. Her experience suggests that individual Yoga classes may be a better option for some individuals.

Future Directions

An important direction for future research is replication of this study's findings. If other efficacy studies find support for the use of this Yoga program in the treatment of BN or BED, effectiveness trials should then also be conducted to examine the program's effects in real-world clinical settings.

Considering the movement in the field toward transdiagnostic treatment approaches, it will also be important to determine if the eight-week Kripalu Yoga program would have similar benefits for individuals with other eating disorders diagnoses, including AN, OSFED, and

UFED. Similarly, investigating the program's effects on adolescents and males with eating disorders will be important in discerning whether the program can benefit these clinical sub-populations. Another important direction for future research is to examine whether the eight-week Kripalu Yoga program could benefit individuals who are exhibiting disordered eating behaviours but whose symptoms are not severe enough to warrant a diagnosis. The program's positive impact on self-compassion, self-criticism, emotion regulation, and mindfulness skills suggest the program may be useful in the prevention of eating disorders.

While the Yoga program in this study was designed with the intention of being used an adjunct to treatment, we did not evaluate its use as an adjunct to existing treatments. An important direction for future research will be to examine if the Yoga program can improve treatment outcomes when it is used in addition to existing treatment approaches. Similarly, future research is needed to examine the characteristics of individuals who benefit from this program versus those who do not benefit. This inquiry would increase understanding of when the program is most likely or least likely to be beneficial and may guide decisions about whether to offer the program to specific individuals. Exploring whether the Yoga program appeals to individuals who are reluctant to seek help using standard treatment options is another important direction for future research. While we postulated that the Yoga program would appeal to individuals unlikely to seek help using other means it is unclear if this was the case. Approximately 15% of the participants in this study had never seen a therapist before, but it is unknown how much the focus on Yoga factored into their decision to participate.

Before the Yoga program is administered in an individual format, future research is needed to examine whether the program's effects differ when delivered to clients in a one-on-one

setting. It would also be beneficial to assess the program's effectiveness when it is delivered solely to specific groups of individuals, such as overweight women, or individuals with BED. This investigation would also help to determine whether altering the delivery of the program could decrease attrition rates. Similarly, lengthening the Yoga program will be essential in determining if the gains experienced by participants can be increased, especially in the case of self-compassion, self-criticism, and difficulties in emotion regulation, which benefited from additional home practice.

Lastly, future studies could improve on the limitations of the present study. Addressing the limitations in the study's design, increasing the sample size, using a better method to track home practice, and measuring Yoga practice during the follow-up period are all important directions for future research.

Conclusion

While the incorporation of Yoga into the treatment of eating disorders has been gaining popularity, study into this practice has been limited. The present study aimed to address the lack of empirical investigation into the use of Yoga in eating disorder treatment. We investigated the impact of an eight-week Kripalu Yoga program on women with BN or BED. Participants who completed the program experienced larger decreases in binge eating frequency, self-criticism, and emotion regulation difficulties, and larger increases in self-compassion and mindfulness than controls. These results provide empirical support for the continued incorporation of Yoga into the treatment of eating disorders.

The ability of the Yoga program to decrease emotion regulation difficulties and self-criticism, both maintaining mechanisms in BN and BED, and increase self-compassion and

mindfulness skills sheds light on the program's beneficial impact on binge eating frequency. As of yet, we have very limited understanding of Yoga's ability to help those struggling with an eating disorder. Continued investigation into the application of Yoga practice in eating disorder treatment will serve to provide greater clarity regarding Yoga's positive impact on this population. More research is needed to know how to best to make use of this ancient practice in order to help those struggling with an eating disorder.

References

Adolescent Medicine Committee, Canadian Paediatric Society. (2001). Eating Disorders in adolescents: principles of diagnosis and treatment. *Paediatrics and Child Health*, *3,* 189–92. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2851329/

Aftanas, L., & Golosheykin, S. (2005). Impact of regular meditation practice on EEG activity at rest and during evoked negative states. *International Journal of Neuroscience, 115,* 893–909. doi:10.1080/00207450590897969

Agras, W. S., & Apple, R. F. (1997). *Overcoming eating disorders: A cognitive- behavioral treatment for bulimia nervosa and binge-eating disorder*. San Antonia, TX: Psychological Corporation.

Agras, W. S., Crow, S. J., Halmi, K. A., Mitchell, J. E., Wilson, G. T., & Kraemer, H. C. (2000b). Outcome predictors for the cognitive behavioural treatment of bulimia nervosa: data from a multisite study. *American Journal of Psychiatry, 157,* 1302–1308. doi:10.1176/appi.ajp.157.8.1302

Agras, W.S., Walsh, B. T., Fairburn, C. G., Wilson, G. T., & Kraemer, H. C. (2000a). A multicenter comparison of cognitive-behavioral therapy and interpersonal psychotherapy for bulimia nervosa. *Archives of General Psychiatry, 57,* 459–466. doi:10.1001/archpsyc.57.5.459

American Psychiatric Association. (2000). *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.).Washington, DC: Author.

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.).Washington, DC: Author.

Anestis, M. D., Selby, W. A., Fink, E. L., & Joiner, T. E. (2007). The multifaceted role of distress tolerance in dysregulated eating behaviors. *International Journal of Eating Disorders, 40,* 718–726. doi:10.1002/eat.20471

Arcelus, J., Whight, D., Brewin, N., & McGrain, L. (2012). A brief form of interpersonal psychotherapy for adult patients with bulimic disorders: A pilot study. *European Eating Disorders Review, 20,* 326–330. doi:10.1002/erv.2164

Austin, S., & Laeng, S. (2003). Yoga. In J. L. Carlson (Eds.), *Complementary therapies and wellness: Practice essentials for holistic health care* (pp. 282–294). Upper Saddle River, NJ: Pearson Education.

Baer, R. A., Fischer, S., & Huss, D. B. (2005). Mindfulness-based cognitive therapy applied to binge eating: A case study. *Cognitive and Behavioral Practice, 12,* 351–358. doi:10.1016/S1077-7229(05)80057-4

Baer, R. A., Fischer, S., & Huss, D. B. (2006). Mindfulness and acceptance in the treatment of eating disorders. *Journal of Rational-Emotive & Cognitive-Behavior Therapy, 23,* 281–299. doi:10.1007/s10942-005-0015-9

Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment, 13,* 27–45. doi:10.1177/1073191105283504

Baer, R. A., Smith, G. T., Lykins, E., Button, D., Krietemeyer, J., Sauer, S., …Williams, J. M. G. (2008). Construct validity of the Five Facets of Mindfulness Questionnaire in meditating and non-meditating samples. Assessment, 15, 329–342. doi:10.1177/1073191107313003

Barnes, P. M., Bloom, B., & Nahin, R. L. (2008). Complementary and alternative medicine use among adults and children: United States, 2007. *National Health Statistics Reports, 10,* 1–23. Retrieved from: http://www.cdc.gov/nchs/data/nhsr/nhsr012.pdf

Barrow, A. (2007). Shame, self-criticism, and self-compassion in eating disorders. Unpublished dissertation. (UMI: U237171)

Beck, M. (2008). Manual-based group intervention for disordered eating: The innovative practice of integrating DBT, positive psychology, and Yoga. Unpublished dissertation. (UMI: 3307613)

Becker-Stoll, F., & & Gerlinghoff, M. (2004). The impact of a four-month day treatment programme on alexithymia in eating disorders. *European Eating Disorders Review, 12,* 159–163. doi:10.1002/erv.566

Bennett-Goleman, T. (2001). *Emotional alchemy: How the mind can heal the heart*. New York, NY: Three Rivers Press.

Berg, K. C., Stiles-Shields, E. C., Swanson, S. A., Petersen, C. B., Lebow, L., & Le Grange, D. (2012). Diagnostic concordance of the interview and questionnaire versions of the Eating Disorder Examination. *International Journal of Eating Disorders, 45*, 850–855. doi:10.1002/eat.20948

Blatt, S. J. (1995). The destructiveness of perfectionism: Implications for the treatment of depression. *American Psychologist, 12,* 1003–1020. doi:apa.org/journals/amp/50/12/1003.html

Blatt, S. J., Quinlan, D. M., Pilkonis, P. A., & Shea, M. T. (1995). Impact of perfectionism and need for approval on the brief treatment of depression: The National Institute of Mental Health Treatment of Depression Collaborative Research Program revisited. *Journal of Consulting and Clinical Psychology, 63,* 125–132. doi:10.1037//0022-006X.63.1.125

Brown, R. P., & Gerbarg, P. L. (2005). Sudarshan Kriya yogic breathing in the treatment of stress, anxiety, and depression: Part II – clinical applications and guidelines. *The Journal of Alternative and Complementary Medicine, 11,* 711–717. doi:10.1089/acm.2005.11.711

Bruch, H. (1962). Perceptual and conceptual disturbances in anorexia nervosa. *Psychosomatic Medicine, 24,* 187-194.

Bruch, H. (1973). *Eating disorders.* New York, NY: Basic Books.

Bulik, C. M., & Reichborn-Kjennerud, T. (2003). Medical morbidity in binge eating disorder. *International Journal of Eating Disorders, 34*, S39–S46. doi:10.1002/eat.10204

Bydlowski, S., Corcos, M., Jeammet, P., Paterniti, S., Berthoz, S., Luarier, C., Chambry, J., & Consoli, S. M. (2005). Emotion-processing deficits in eating disorders. *International Journal of Eating Disorders, 37*, 321-329. doi:10.1002/eat.20132

Byrne, S. M., Fursland, A., Allen, K. L., & Watson, H. (2011). The effectiveness of enhanced cognitive behavioural therapy for eating disorders: An open trial. *Behaviour Research and Therapy, 49,* 219-226. doi: 10.1016/j.brat.2011.01.006

Carei, T. R., Fyfe-Johnson, A. L., Breuner, C. C., & Brown, M. A. (2010). Randomized controlled clinical trial of Yoga in the treatment of eating disorders. *Journal of Adolescent Health, 46*, 346-351. doi:10.1016/j.jadohealth.2009.08.007

Carey, K., Carey, M., & Chandra, P. (2003). Psychometric evaluation of the Alcohol Use Disorders Identification Test and Short Drug Abuse Screening Test with psychiatric patients in India. *Journal of Clinical Psychiatry, 64,* 767–774. doi:10.4088/JCP.v64n0705

Carlson, L. E., Speca, M., Patel, K. D., & Goodey, E. (2004). Mindfulness-based stress reduction in relation to quality of life, mood, symptoms of stress and levels of cortisol, dehydroepiandrosterone sulfate (DHEAS) and melatonin in breast and prostate cancer outpatients. *Psychoneuroendocrinology, 29,* 448–474. doi:10.1016/S0306-4530(03)00054-4

Carmody, J., & Baer, R. A. (2008). Relationships between mindfulness practice and levels of mindfulness, medical and psychological symptoms and well-being in a mindfulness-based stress reduction program. *Journal of Behavioral Medicine, 31*, 23–33. doi:10.1007/s10865-007-9130-7

Carter, J., & Byrne, G. (2003). A two-year study of the use of Yoga in a series of pilot studies as an adjunct to ordinary psychiatric treatment in a group of Vietnam War veterans suffering from posttraumatic stress disorder. Unpublished manuscript. Retrieved from: http://www.therapywithyoga.com/Vivekananda.pdf

Cavanaugh, C. J., & Lemberg, R. (1999). What we know about eating disorders: Facts and statistics. In R. Lemberg & L. Cohn (Eds.), *Eating disorders: A reference sourcebook* (pp. 7–12). Phoenix, AZ: The Oryx Press.

Celio, A. A., Wilfley, D. E., Crow, S. J., Mitchell, J., & Walsh, B. T. (2004). A comparison of the binge eating scale, questionnaire for eating and weight patterns-revised, and eating disorder examination questionnaire with instructions with the eating disorder examination in the assessment of binge eating disorder and its symptoms. *International Journal of Eating Disorders, 36,* 434–444. doi:10.1002/eat.20057

Chawla, N., & Ostafin, B. (2007). Experiential avoidance as a functional dimensional approach to psychopathology: An empirical review. *Journal of Clinical Psychology, 63,* 871–890. doi:10.1002/jclp.20400

Clancy, S. E. (2010). The effects of Yoga on body dissatisfaction, self-objectification and mindfulness of the body in college women. Unpublished dissertation. (UMI Number: 3437155)

Clarke, D. P. (2008). Assessing Finding Om: A Yoga and discussion-based treatment for binge eating disorder. Unpublished doctoral dissertation. (UMI Number: 3329948)

Cocco, K., & Carey, K. (1998). Psychometric properties of the Drug Abuse Screening Test in psychiatric outpatients. *Psychological Assessment, 10,* 408–414. doi:10.1037/1040-3590.10.4.408

Cohen, D. L. (2013). Yoga and hypertension. *Journal of Physical Therapy, 3:* 144. doi:10.4172/2157-7595.10000145

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.

Constantino, M. J., Glass, C. R., Arnkoff, D. B., Ametrano, R. M., & Smith, J. Z. (2011). Expectations. In J. C. Norcross (Ed.), *Psychotherapy relationships that work: Evidence-based responsiveness (2nd ed.).* (pp. 354–376). New York: Oxford University Press.

Cook-Cottone, C., Beck, M., & Kane, L. (2008). Manualized-group treatment of eating disorders: Attunement in mind, body, and relationship (AMBR). *The Journal for Specialists in Group Work, 33,* 61–83. doi:10.1080/01933920701798570

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. doi:10.1002/1098-108X(198701)6:1<1::AID-EAT2260060102>3.0.CO;2-9

Cope, S. (1999). *Yoga and the quest for the true self*. New York, NY: Bantam Books.

Corstorphine, E., Mountford, V., Tomlinson, S., Waller, G., & Meyer, C. (2007). Distress tolerance in the eating disorders. *Eating Behaviors, 8,* 91–97. doi:10.1016/j.eatbeh.2006.02.003

Creswell, J. D., Way, B. M., Eisenberger, N. I., & Lieberman, M. D. (2007). Neural correlates of dispositional mindfulness during affect labeling. *Psychosomatic Medicine, 69,* 560–565. doi:10/1097/PSY.0b013e3180f6171f

Dall Grave, R., Calugi, S., Doll, H. A., & Fairburn, C. G. (2013). Enhanced cognitive behaviour therapy for adolescents with anorexia nervosa: An alternative to family therapy? *Behaviour Research and Therapy, 51,* R9–R12. doi:10.1016/j.brat.2012.09.010

Daubenmier, J. J. (2005). The relationship of Yoga, body awareness, and body responsiveness to self-objectification and disordered eating. *Psychology of Women Quarterly, 29,* 207–219. doi:10.1111/j.1471-6402.2005.00183.x

Daye, C. A., Webb, J. B., & Jafari, N. (2014). Exploring self-compassion as a refuge against recalling the body-related shaming of caregiver eating messages on dimensions of objectified body consciousness in college women. *Body Image, 11,* 547–556. doi:10.1016.j.bodyim.2014.08.001

DeAngelis, T. (2002). Binge-eating disorder: What's the best treatment? *Monitor on Psychology, 33.* Retrieved: http://www.apa.org/monitor/mar02/binge.html

Degenhardt, L., Hall, W., Korten, A., & Jablensky, A. (2005). Use of brief screening instrument for psychosis: Results of a ROC analysis. NDARC Technical Report No. 210. Sydney: National Drug and Alcohol Research Centre.

Diedrich, A., Grant, M., Hoffman, S. G., Hiller, W., & Berking, M. (2014). Self-compassion as an emotion regulation strategy in major depressive disorder. *Behaviour Research and Therapy, 58,* 43–51. doi:10.1016/j.brat.2014.05.006

Dingemans, A. E., Bruna, M. J., & van Furth, E. F. (2002). *Binge eating disorder: a review. International Journal of Obesity, 26,* 299–307. doi:10.1038/sj/ijo/0801949

Dolhanty, D. & Greenberg, L. (2007). Emotion-focused therapy in the treatment of eating disorders. *European Psychotherapy, 7,* 97–116.

Dunkley, D. M., Masheb, R. M., & Grilo, C. M. (2010). Childhood maltreatment, depressive symptoms, and body dissatisfaction in patients with binge eating disorder: the mediating role of self-criticism. *International Journal of Eating Disorders, 43,* 274–281. doi:10.1002/eat.20796

Dunkley, D. M., Zuroff, D. C., & Blankenstein, K. R. (2003). Self-critical perfectionism and daily affect: Dispositional and situational influences on stress and coping. *Journal of Personality and Social Psychology, 84,* 234–252. doi:10.1037/0022-3514.84.1.234

Eifert, G. H., & Heffner, M. (2003). The effects of acceptance versus control contexts on avoidance of panic-related symptoms. *Journal of Behavior Therapy and Experimental Psychiatry, 34*, 293–312. doi:10.1016/j.jbtep.2003.11.001

Elkin, I., Falconnier, L., Martinovich, Z., & Mahoney, C. (2006). Therapist effects in the National Institute of Mental Health Treatment of Depression Collaborative Research Program. *Psychotherapy Research, 16,* 144–160. doi:10.1080/10503300500268540.

Fairburn, C. G. (2008). Cognitive behavior therapy and eating disorders. New York, NY: Guilford Press.

Fairburn, C. G., & Beglin, S. J. (1994). The assessment of eating disorders: Interview or self-report questionnaire? *International Journal of Eating Disorders, 16,* 363–370. doi:10.1002/1098-108X(199412)16:4<363::AID-EAT2260160405>3.0.CO;2-#

Fairburn, C. G., Cooper, Z., Doll, H. A., O'Connor, M. E., Bohn, K., Hawker, D. M., Wales, J. A., & Palmer, R. L. (2009). Transdiagnostic cognitive-behavioural therapy for patients with eating disorders: A two-site trial with 60-week follow-up. *American Journal of Psychiatry, 166,* 311–319. doi.10.1176/appi.ajp.2008.08040608

Fairburn, C. G., Cooper, Z., & Shafran, R. (2003). Cognitive behavioral therapy for eating disorders: A "transdiagnostic" theory and treatment. *Behavioral Research and Therapy, 41*, 509–528. doi:10.1016/S0005-7967(02)00088-8

Fairburn, C. G., & Harrison, P. J. (2003). Eating disorders. *Lancet, 361*, 407–416. doi:10.1016/S0140-6736(03)12378-1

Fairburn, C. G., Jones, R., Peveler, R. C., Carr, S. J., Solomon, R. A., & O'Conner, M. (1991). Three psychological treatments for bulimia nervosa: A comparative trial. Archives of General Psychiatry, 48, 463–469. doi:10.1001/archpsyc.1991.01810290075014

Fairburn, C. G., Norman, P. A., Welch, S. L., O'Connor, M. E., Doll, H. A., & Peveler, R. C. (1995). A prospective study of outcome in bulimia nervosa and the long-term effects of three psychological treatments. *Archives of General Psychiatry, 52,* 304–312. doi:10.1001/archpsyc.1995.03950160054010

Farb, N. A. S., Anderson, A. K., & Segal, Z. V. (2012). The mindful brain and emotion regulation in mood disorders. *Canadian Journal of Psychiatry, 75,* 70-77.

Fassino, S., Pierò, A., Tomba, E., & Abbate-Daga, G. (2009). Factors associated with dropout from treatment for eating disorders: a comprehensive literature review. *BMC Psychiatry, 9,* 9–67. doi:10.1186/1471-244X-9-67

Faulds, R. (2005). *Kripalu Yoga.* New York, NY: Bantam Books.

Favaro, A., Caregaro, L., Tenconi, E., Bosello, R., & Santonastaso, P. (2009). Time trends in age at onset of anorexia nervosa and bulimia nervosa. *Journal of Clinical Psychiatry, 70,* 1715–1721. doi:10.4088/JCP.09m05176blu

Fennig, S., Hadas, A., Itzhaky, L., Roe, D., Apter, A., & Shahar, G. (2008). Self-criticism is a key predictor of eating disorder dimensions among inpatient adolescent females. *International Journal of Eating Disorders, 41,* 762–765. doi:10.1002/eat.20573.

Feuerstein, G. (2002). *The Yoga tradition: Its history, literature, philosophy and practice.* New Dehli, India: Bhavana Books & Print.

Feuerstein, G. (2007). *What is yoga?* Retrieved from: http://www.traditionalyogastudies.com/wp-content/uploads/2011/05/What-is-Yoga.pdf

Feuerstein, G., & Payne, L. (1999). *Yoga for dummies*. Hoboken, NJ: For Dummies.

Field, A. E., Sonneville, K. R., Micali, N., Crosby, R. D., Swanson, S. A., Laird, N. M., . Horton, N. J. (2012). Prospective association of common eating disorders and adverse outcomes. *Pediatrics 130,* e289–295. doi:10.1542/peds.2011-3663

Field, F. (2013). *Discovering statistics using IMS SPSS Statistics*. London, England: Sage Publications.

Fischer, E. H., & Farina, A. (1995). Attitudes toward seeking professional psychological help: A shortened form and considerations for research. *Journal of College Student Development, 36,* 368–373.

Fischer, S., Smith, G. T., & Anderson, K. G. (2003). Clarifying the role of impulsivity in bulimia nervosa. *International Journal of Eating Disorders, 33,* 406–411. doi:10.1002/eat.10165

Forfylow, A. L. (2011). Integrating Yoga with psychotherapy: A complementary treatment for anxiety and depression. *Canadian Journal of Counselling and Psychotherapy, 45,* 132–150. Retrieved from: http://cjc.synergiesprairies.ca/cjc/index.php/rcc/article/viewArticle/962

Fox, J. R., & Froom, K. (2009). Eating disorders: A basic emotion perspective. *Clinical Psychology and Psychotherapy, 16,* 328–335. doi:10.1002/cpp.622

Fredrickson, B., Roberts, T., Noll, S., Quinn, D. M., & Twenge, J. M. (1998). That swimsuit becomes you: Sex differences in self-objectification, restrained eating, and math performance. *Journal of Personality and Social Psychology, 75*, 269–284. doi:10.1037/0022-3514.75.1.269

Gard, T., Brach, N., Hölzel, B. K., Noggle, J. J., Conboy, L. A., & Lazar, S. W. (2012). Effects of a Yoga-based intervention for young adults on quality of life and perceived stress: The potential mediating roles of mindfulness and self-compassion. *The Journal of Positive Psychology, 7,* 165–175. doi.org/10.1080/17439760.2012.667144

Garner, D. M. (1991). *Eating disorder inventory-2. Professional manual*. Odessa, FL: Psychological Assessment Research, Inc.

Gelso, C. H., Williams, E. N., & Fretz, B. R. (2014) *Counseling psychology (*3rd ed*.).* Washington, DC: American Psychological Association.

Germer, C. K. (2009). *The mindful path to self-compassion*. New York, NY: Guildford Press.

Germer, C. K., & Neff, K. D. (2013). Self-compassion in clinical practice. *Journal of Clinical Psychology: In Session, 69,* 1–12. doi: 10.1002/jclp.22021

Gilbert, P. (Ed.). (2005). *Compassion: Conceptualisations, research, and use in psychotherapy*. London, England: Routledge.

Gilbert, P. (2007). *Psychotherapy and counselling for depression*. (3rd ed.) London, England: SAGE Publications.

Gilbert, P. (2009). Introducing compassion-focused therapy. *Advances in Psychiatric Treatment, 15*, 199–208. doi:10.1192/apt.bp.107.005264

Gilbert, P., Clark, M., Hempel, S., Miles, J. N. V. & Irons, C. (2004). Criticizing and reassuring oneself: An exploration of forms, styles and reasons in female students. *British Journal of Clinical Psychology, 43,* 31–50. doi:10.1348/014466504772812959

Gilbert, P., McEwan, K., Irons, C., Bhundia, R., Christie, R., Broomhead, C., & Rockliff, H. (2010). Self-harm in a mixed clinical population: The roles of self-criticism, shame, and social rank. British Journal of Clinical Psychology, 49, 563–576. doi:10.1348/014466509X479771

Gilbert, P., McEwan, K., Gibbons, L., Chotai, S., Duarte, J., & Matos, M. (2012). Fears of compassion and happiness in relation to alexithymia, mindfulness, and self-criticism. *Psychology and Psychotherapy: Theory, Research, and Practice, 85,* 374–390. doi: 10.1111/j.2044-8341.2011.02046.x

Gilbert, P., McEwan, K., Matos, M., & Rivas, A. (2011). Fears of self-compassion: Development of three self-report measures. *Psychology and Psychotherapy: Theory, Research, and Practice, 84,* 239–255. doi:10.1348/147608310X526511

Gilbert, P., & Procter, S. (2006). Compassionate mind training for people with high shame and self-criticism: Overview and pilot study. *Clinical Psychology and Psychotherapy*, *13*, 353–379. doi:10.1002/cpp.507

Giles, G. (1985). Anorexia nervosa and bulimia: An activity-oriented approach. *The American Journal of Occupational Therapy, 39*, 510–517. doi:10.5014/ajot.39.8.510

Godfrey, K. M., Gallo, L., & Afari, N. (2015). Mindfulness-based interventions for binge eating: a systematic review and meta-analysis. *Journal of Behavioural Medicine,* 38, 348–362. doi:10.1007/s10865-014-9610-5

Goldfein, J. A., Devlin, M. J., & Kamenetz, C. (2005). Eating Disorder Examination-Questionnaire with and without Instruction to assess binge eating in patients with binge eating disorder. *International Journal of Eating Disorders, 37*, 107–111. doi:10.1002/eat.20075

Gormally, J., Black, S., Daston, S., & Rardin, D. (1982). The assessment of binge eating severity among obese persons. *Addictive Behaviors, 7,* 47–55. doi:10.1016/0306-4603(82)90024-7

Goss, K., & Allan, S. (2009). Shame, pride and eating disorders. *Clinical Psychology & Psychotherapy, 16,* 303–316. doi:10.1002/cpp.627

Goss, K., & Gilbert, P. (2002). Eating disorders, shame and pride: A cognitive-behavioural functional analysis. In P. Gilbert, & J. Miles (Eds.), *Body shame: Conceptualisation, research and treatment* (pp. 219–255). New York, NY: Brunner-Routledge.

Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of Psychopathology & Behavioral Assessment, 26,* 41–54. doi:10.1007/S10862-008-9102-4

Groff, S. E. (2015). Is enhanced cognitive behavioral therapy an effective intervention in eating disorders? A review. *Journal of Evidence-Informed Social Work, 12,* 272–288. doi:10.1080/15433714.2013.835756

Gupta, N., Khera, S., Vempati, R. P., Sharma, R., & Bijlani, R. L. (2006). Effect of Yoga based lifestyle intervention on state and trait anxiety. *Indian Journal of Physiology and Pharmacology, 50,* 41–47. Retrieved from http://www.ijpp.com/IJPP%20archives/2006_50_1/41-47.pdf

Hackler, A. H., Vogel, D. L., & Wade, N. G. (2010). Attitudes toward seeking professional help for an eating disorder: The role of stigma and anticipated outcomes. *Journal of Counselling and Development, 88,* 424–432. doi:10.1002/j.1556-6678.2010.tb00042.x

Haedt-Matt, A. A., & Keel, P. K. (2011). Revisiting the affect regulation model of binge eating: a meta-analysis of studies using ecological momentary assessment. *Psychological Bulletin, 137,* 660–681. doi:10.1037/a0023660

Harrison, L. J., Manocha, R., & Rubia, K. (2004). Sahaja yoga meditation as a family treatment programme for children with attention deficit-hyperactivity disorder. *Clinical Child Psychology and Psychiatry, 9,* 479–497. doi:10.1177/1359104504046155

Hayaki, J. (2009). Negative reinforcement eating expectancies, emotion dysregulation, and symptoms of bulimia nervosa. *International Journal of Eating Disorders, 42,* 552–556. doi:10.1002/eat.20646

Hayes, S. C, Strosahl, K. D., & Wilson, K. G. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change*. New York, NY: Guilford Press.

Hayes, S. C., Wilson, K. G., Gifford, E. V., Follette, V. M., & Strosahl, K. (1996). Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology, 64*, 1152–1168. doi:10.1037/0022-006X.64.6.1152

Heatherton, T. F., & Baumeister, R.F. (1991). Binge-eating as an escape from awareness. *Psychological Bulletin, 110,* 86–108. doi:10.1037/0033-2909.110.1.86

Heffner, M., Sperry, J., Eifert, G. H., & Detweiler, M. (2002). Acceptance and commitment therapy in the treatment of an adolescent female with anorexia nervosa: A case example. *Cognitive and Behavioral Practice, 9,* 232–236. doi:10.1016/S1077-7229(02)80053-0

Herzog, D. B., Keller, M. B., Sacks, N. R., Yeh, C. J., & Lavori, P. W. (1992). Psychiatric morbidity in treatment-seeking anorexics and bulimics. *Journal of the American Academy of Child & Adolescent Psychiatry, 31*, 810–818. doi:10.1097/00004583199209000-00006

Hilbert, A., & Tuschen-Caffier, B. (2004). Body image interventions in cognitive behavioural therapy of binge–eating disorder: a component analysis. *Behaviour Research and Therapy, 42,* 1325–1339. doi:10.1016/j.brat.2003.09.001

Hoek, H. W. (2006). Incidence, prevalence and mortality of anorexia nervosa and other eating disorders. *Current Opinion in Psychiatry, 19*, 389–394. doi:10.1097/01.yco.0000228759.95237.78

Hoek, H. W., & van Hoeken, D. (2003). Review of prevalence and incidence of eating disorders. *International Journal of Eating Disorders 34*, 383–386. doi:10.1002/eat.10222

Holm, S. (1979). A simple sequentially rejective multiple test procedure. *Scandinavian Journal of Statistics, 6,* 65–70. doi:10.2307/4615733

Hudson, J. I., Hiripi, E., Pope, H. G., & Kessler, R.C. (2007). The prevalence and correlates of eating disorders in the National Comorbidity Survey Replication. *Biological Psychiatry, 61*, 348–58. doi:10.1016/j.biopsych.2006.03.040

Impett, E. A., Daubenmier, J. J., & Hirschman, A. L. (2006). Minding the body: Yoga, embodiment and well-being. *Sexuality Research and Social Policy 3,* 39–48. doi:10.1525/srsp.2006.3.4.39

Ioannou, K., & Fox, J. R. E. (2009). Perception of threat from emotions and its role in poor emotional expression within eating pathology. *Clinical Psychology and Psychotherapy, 16,* 336–347. doi:10.1002/cpp.632

Iyengar, B. K. S. (1966). *Light on Yoga*. New York, NY: Schocken Books.

Iyengar, B. K. S. (2002). *Light on the Yoga sutras of Patanjali*. London, UK: Thorsons.

Jazaieri, H., McGonigal, K., Jinpa, T., Doty, J. R., Gross, J. J., & Goldin, P. R. (2014). A randomized controlled trial of compassion cultivation training: Effects on mindfulness, affect, and emotion regulation. *Motivation and Emotion, 38,* 23–35. doi:10.1007/s11031-013-9368-z

Jopling, D. A. (2000). *Self-knowledge and the self.* New York, NY: Routledge.

Joraan, J. E., Myers, R. A., Layton, W. C., & Morgan, H. H. (1968). *The counseling psychologist*. Washington, DC: American Psychological Association. Retrieved from: http://files.eric.ed.gov/fulltext/ED143967.pdf

Joseph, S., Sridharan, K., Patil, S. K., Kumaria, M. L., Selvamurthy, W., Joseph, N. T., & Nayar, H. S. (1981). Study of some physiological and biochemical parameters in subjects undergoing yogic training. *The Indian Journal of Medical Research, 74,* 120–124. Retrieved from: http://www.ncbi.nlm.nih.gov/pubmed/7309176

Jurascio, A., Shaw, J., Forman, E., Timko, C. A., Herbert, J., Butryn, N., … Lowe, N. (2013). Acceptance and commitment therapy as a novel treatment for eating disorders: an initial test of efficacy and mediation. *Behavior Modification, 37*, 459–89. doi:10.1177/0145445513478633.

Kabat-Zinn, J. (1990). *Full catastrophe living: Using the wisdom of your body and mind to face stress, pain, and illness*. New York, NY: Delta.

Kabat-Zinn, J. (2003). Mindful Yoga movement & meditation. *Yoga International, 70*, 86–93. Retrieved from: http://www.makingsenseofmentalhealth.org/articles/mindfulyoga.pdf

Katterman, S. N., Kleinman, B. M., Hood, M. M., Nackers, L. M., & Corsica, J. A. (2014). Mindfulness meditation as an intervention for binge eating, emotional eating, and weight loss: A systematic review. *Eating Behaviors, 15,* 197–204. doi:10.1016/j.eatbeh.2014.01.005

Kelly, A. C., & Carter, J. C. (2014). Eating disorder subtypes differ in their rates of psychosocial improvement over treatment. *Journal of Eating Disorders, 2,* E-publication. doi:10.1186/2050-2974-2-2

Kelly, A. C., Carter, J. C., Zuroff, D. C., & Borairi, S. (2013). Self-compassion and fear of self-compassion interact to predict response to eating disorders treatment: A preliminary investigation. *Psychotherapy Research, 23,* 252–264. doi:10.1080/10503307.2012.717310

Kelly, A. C., Vimalakanthan, K., & Carter, J. C. (2014). Understanding the roles of self-esteem, self-compassion, and fear of self-compassion in eating disorder pathology: An examination of female students and eating disorder patients. *Eating Behaviors, 15,* 388–391. doi:10.1016/j.eatbeh.2014.04.008

Keski-Rahkonen, A., Hoek, H. W., Linna, M. S., Raevuori, A., Sihvola, E., Bulik, C. M., Rissanen, A., & Kaprio, J. (2009). Incidence and outcomes of bulimia nervosa: a nationwide population-based study. *Psychological Medicine, 39,* 823–831. doi:10.1017/S0033291708003942

Khalsa, S. B., Khalsa, G. S., Khalsa, H. K., & Khalsa, M. K. (2008). Evaluation of a residential Kundalini yoga lifestyle pilot program for addiction in India. *Journal of Ethnicity in Substance Abuse, 7*, 67–79. Retrieved from: http://www.ncbi.nlm.nih.gov/pubmed/19842301

Khattab, K., Khattab, A. A., & Ortak, J., Richardt,G., & Bonnemeier, H. (2007). Iyengar yoga increases cardiac parasympathetic nervous modulation among healthy yoga practitioners. *Evidence-Based Complementary and Alternative Medicine, 4,* 511–517. doi:10.1093/ecam/nem087

Kim, D-M., Wampold, B. E., & Bolt, D. M. (2006). Therapist effects in psychotherapy: A random-effects modeling of the National Institute of Mental Health Treatment of Depression Collaborative Research Program data. *Psychotherapy Research, 16,* 161–172. doi:10.1080/10503300500264911

Klerman, G. L., Weissman, M. M., Rounsaville, B. J., & Chevron, E. S. (1984). *Interpersonal psychotherapy of depression*. New York, NY: Basic Books.

Krabbenborg, M. A. M., Danner, U. N., Larsen, J. K., van der Veer, N., van Elburg, A. A., de Ridder, D. T. D., Evers, C., Stice, E., & Engels, R. C. M. E. (2011). The eating disorder diagnostic scale: Psychometric features within a clinical population and a cut-off point to differentiate clinical patients from healthy controls. *European Eating Disorders Review, 20*, 315–320. doi:10.1002/erv.1144

Kristeller, J. L. (2003). Mindfulness, wisdom and eating: Applying a multi-domain model of meditation effects. *Journal of Constructivism in the Human Sciences, 8,* 107–118. Retrieved from: http://www.metanexus.net/archive/conference2004/pdf/kristeller.pdf

Kristeller, J. L., Baer, R. A., & Quillian-Wolever, R. (2006): Mindfulness-based approaches to eating disorders. In R. Baer (Ed.), *Mindfulness and acceptance-based interventions: Conceptualization, application, and empirical support*. San Diego, CA: Elsevier.

Kristeller, J. L., & Hallett, C. B. (1999). An exploratory study of a meditation-based intervention for binge eating disorder. *Journal of Health Psychology, 4*, 357–363. doi:10.1177/135910539900400305

Kristeller, J., Wolever, R. Q., & Sheets,V. (2014). Mindfulness-Based Eating Awareness Treatment (MB-EAT) for Binge Eating Disorder: A randomized clinical trial. *Mindfulness*, 5, 282–297. doi:10.1007/ s12671-012-0179-1

Krumboltz, J. D. (1968). Future directions for counseling research. In J. M. Whiteley (Ed.), *Research in counseling: Evaluation and refocus (pp. 184—203).* Columbus, OH: Merrill.

Lau, M. A., Bishop, S. R., Segal, Z. V., Buis, T., Anderson, N. D., Carlson, L., Shapiro, S., & Carmody, J. (2006). The Toronto Mindfulness Scale: Development and validation. *Journal of Clinical Psychology, 62,* 1445–1467. doi:10.1002/jclp.20326

Leary, M. R., Tate, E. B., Adams, C. E., Allen, A. B., & Hancock, J. (2007). Self- compassion and reactions to unpleasant self-relevant events: the implications of treating oneself kindly. *Journal of Personality and Social Psychology, 92*, 887–904. doi:10.1037/0022-3514.92.5.887

Levine, M. D., & Marcus, M.D. (2003). Psychosocial treatments of binge eating disorder: an update. *Eating Disorders Review, 14*. Retrieved from: http://eatingdisordersreview.com/nl/nl_edr_14_4_1.html

Linehan, M. M. (1993). *Cognitive behavioral treatment of borderline personality disorder*. New York, NY: Guilford Press.

Liss, M., & Erchull, M. J. (2015). Not hating what you see: Self-compassion may protect against negative mental health variables connected to self-objectification in college women. *Body Image, 14,* 5–12. doi: 10.1016.j.bodyim.2015.02.06

Lutz, A., Brefczynski-Lewis, J., Johnstone, T., & Davidson, R. J. (2008). Regulation of the neural circuitry of emotion by compassion meditation: Effects of meditative expertise. *PloS one 3*: e1897. doi:10.1371/journal.pone.0001897

Lutz, A., Slagter, H. A., Rawlings, N. B., Francis, A. D., Greischar, L. L., & Davidson, R. J. (2009). Mental training enhances attentional stability: Neural and behavioral evidence. *Journal of Neuroscience, 29,* 13418–13427. doi:10.1523/JNEUROSCI.1614-09.2009

Maisto, S. A., Carey, M. P., Carey, K. B., Gordon, C. M., & Gleason, J. R. (2000). Use of the AUDIT and the DAST-10 to identify alcohol and drug use disorders among adults with a severe and persistent mental illness. *Psychological Assessment*, *12,* 186–192. doi:10.1037/1040-3590.12.2.186

Marcus, M. (1997). Adapting treatment for patients with binge eating disorder. In D. M. Garner & P. E. Garfinkel (Eds.), *Handbook of treatment for eating disorders* (2nd Ed.), (pp. 484–493). New York, NY: The Guilford Press.

Marcus, M. D, Wing, R. R., & Hopkins, J. (1988). Obese binge eaters: Affect, cognitions, and response to behavioral weight control. *Journal of Counseling and Clinical Psychology, 56,* 433–439. doi:10.1037/0022-006X.56.3.433

Marques, L., Alegria, M., Becker, A. E., Chen, C. N., Fang, A., Chosak, A., Diniz, J. B. (2011). Comparative prevalence, correlates of impairment, and service utilization for eating disorders across US ethnic groups: implications for reducing ethnic disparities in health care access for eating disorders. *International Journal of Eating Disorders, 44,* 412–420. doi:10.1002/eat.20787.

Masson, P. C., von Ranson, K. M., Wallace, L. M., & Safer, D. L. (2013). A randomized wait-list controlled pilot study of dialectical behaviour therapy guided self-help for binge eating disorder. *Behaviour Research and Therapy, 51,* 723–728. doi:10.1016/j.brat.2013.08.001

Mathers, C. D., Vos, E. T., Stevenson, C. E., & Begg, S. J. (2000). The Australian burden of disease study: Measuring the loss of health from diseases, injuries and risk factors. *Medical Journal of Australia, 172,* 592–596. Retrieved from: http://www.ncbi.nlm.nih.gov/pubmed/10914105

Mayhew, S., & Gilbert, P. (2008). Compassionate mind training with people who hear malevolent voices: A case series report. *Clinical Psychology and Psychotherapy*, *15*, 113–138. doi:10. 1002/cpp.566

McIver, S., O'Halloran, P., & McGartland, M. (2009). Yoga as a treatment for binge eating disorder: A preliminary study. *Complementary Therapies in Medicine, 17,* 196–202. doi:10.1016.j.ctim.2009.05.002

McManuss, F., Waller, G., & Chadwick, P. (1996). Biases in the processing of different forms of threat in bulimic and comparison women. *The Journal of Nervous and Mental Disease, 184,* 547–554. Retrieved from: http://www.ncbi.nlm.nih.gov/pubmed/8831645

Mehler, P. S. (2011). Medical complications of bulimia nervosa and their treatments. *International Journal of Eating Disorders, 44,* 95–104. doi:10.1002/eat.20825

Metcalfe, A., Williams, J., McChensey, J., Patten, S. B., & Jetté, N. (2010). Use of complementary and alternative medicine by those with a chronic disease and the general population - results of a national population based survey. *BMC Complementary and Alternative Medicine, 10*: 58. doi:10.1186/1472-6882-10–58

Micali, N., Hagberg, K. W., Peterson, I., & Treasure, J. (2013). The incidence of eating disorders in the UK in 2000–2009: findings from the General Practice Research Database. *BMJ Open, 3,* e002646. doi:10.1136/bmjopen-2013-002646

Miner-Rubino, K., Twenge, J. M., & Fredrickson, B. L. (2002). Trait self-objectification in women: Affective and personality correlates. *Journal of Research in Personality, 36,* 147–172. doi:10.1006/jrpe.2001.2343

Mitchell, K. S., Mazzeo, S. E., Rausch, S. M., & Cooke, K. L. (2007). Innovative interventions for disordered eating: evaluating dissonance-based and Yoga interventions. *International Journal of Eating Disorders, 40,* 120–128. doi:10.1002/eat.20282

Mond, J. M., Rodgers, B., Hay, P. J., & Owen C. (2007). Health service utilization for eating disorders: Findings from a community-based study. *International Journal of Eating Disorders, 40*, 399–409. doi:10.1002/eat

Murphy, R., Straebler, S., Cooper, Z., & Fairburn, C. G. (2010). Cognitive behavioral therapy for eating disorders. *The Psychiatric Clinics of North America, 33,* 611–627. doi:10.1016/j.psc.2010.04.004

Nasser, J. A., Gluck, M. E., & Geliebter, A. (2004). Impulsivity and test meal intake in obese binge eating women. *Appetite, 43,* 303–307. doi:10.1016/j.appet.2004.04.006

National Center for Complementary and Integrative Health. (2010). What is complementary and alternative medicine? Retrieved from: http://nccam.nih.gov/health/whatiscam/

National Eating Disorder Organization. (2013). Binge eating disorder: A new diagnosis in the Diagnostic and Statistical Manual of Mental Disorders. Retrieved from: https://www.nationaleatingdisorders.org/sites/default/files/ResourceHandouts/MultiPageRGB.pdf

Neff, K. D. (2003). Self-compassion: An alternative conceptualization of a healthy attitude toward oneself. *Self and Identity, 2,* 85–102. doi:10.1080/15298860390129863

Neff, K. D., & Dahm, K. A. Self-Compassion: What it is, what it does, and how it relates to mindfulness (in press). In B. D. Ostafin, M. D. Robinson, & B. P. Meier (Eds.), *Handbook of mindfulness and self-regulation* (pp. 1-40). New York, NY: Springer. Retrieved from: http://self-compassion.org/wp-content/uploads/publications/Mindfulness_and_SC_chapter_in_press.pdf

Neff, K.D., & McGehee, P. (2010). Self-compassion and psychological resilience among adolescents and young adults. *Self and Identity, 9,* 225–240. doi:10.1080/15298860902979307

Neumark-Sztainer, D., Eisenberg, M. E., Wall, M., & Loth, K. A. (2009). Yoga and pilates: Associations with body image and disordered-eating behaviors in a population-based sample of young adults. *International Journal of Eating Disorders, 44,* 276–280. doi:10.1002/eat.20858

NICE. (2005). *Eating disorders: core interventions in the treatment and management of anorexia nervosa, bulimia nervosa and related eating disorders*. London, England: National Institute for Clinical Excellence.

Nolen-Hoeksema, S. (1991). Responses to depression and their effects on the duration of depressive episodes. *Journal of Abnormal Psychology, 100*, 569–582. doi:10.1037/0021-843X.100.4.569

Noll, S., & Fredrickson, B. (1998). A mediational model linking self-objectification, body shame, and disordered eating. *Psychology of Women Quarterly, 21*, 173–206. doi:10.1111/j.1471-6402.1998.tb00181.x

North American Studio Alliance. (2005). *Canadian Yoga statistics*. Retrieved from: http://www.namasta.com/pressresources.php#7

Nyklicek, I., & Kuijpers, K.F. (2008). Effects of mindfulness-based stress reduction intervention on psychological well-being and quality of life: Is increased mindfulness indeed the mechanism? *Annals of Behavioral Medicine, 35,* 331–340. doi:10.1007/s12160-008-9030-2

Ortner, C. N. M., Kilner, S. J., & Zelazo, P. D. (2007). Mindfulness meditation and reduced emotional interference on a cognitive task. *Motivation and Emotion, 21,* 271–283. doi:10.1007/s11031-007-9076-7

Osborne, Jason W. & Amy Overbay (2004). The power of outliers (and why researchers should always check for them). *Practical Assessment, Research & Evaluation*, 9(6). Retrieved from: http://pareonline.net/getvn.asp?v=9&n=6

Osman, A., Bagge, C. L., Guitierrez, P. M., Konick, L. C., Kooper, B. A., & Barrios, F. X. (2001). The Suicidal Behaviors Questionnaire-Revised (SBQ-R): Validation with clinical and nonclinical samples, *Assessment, 5,* 443–454. doi:10.1177/107319110100800409

Pankhania, J. (2005). Yoga and its practice in psychological healing. In R. Moodley & W. West (Eds.), *Integrating traditional healing practices into counselling and psychotherapy: Multicultural aspects of counselling and psychotherapy* (pp. 246–256). Thousand Oaks, CA: Sage.

Pendleton, V. R., Goodrick, G. K., Poston, W. S. C., Reeves, R., & Foreyt, J. P. (2002). Exercise augments the effects of cognitive-behavioral therapy in the treatment of binge eating. *International Journal of Eating Disorders, 31,* 172–184. doi:10.1002/eat.10010

Perlman, D. M., Salomons, T. V., Davidson, R. J., & Lutz, A. (2010). Differential effects on pain intensity and unpleasantness of two meditation practices. *Emotion, 10,* 65–71. doi:10.1037/a0018440

Phillips, E., Greydanus, D. E., Pratt, H. D., & Patel, D. R. (2003). Treatment of bulimia nervosa: Psychological and psychopharmacologic considerations. *Journal of Adolescent Research, 18,* 261–279. doi:10.1177/0743558403018003005

Poulsen, S., Lunn, S., Daniel, S. I. F., Folke, S., Mathieson, B. B., Katznelson, H., & Fairburn, C. G. (2014). A randomized controlled trial of psychoanalytic psychotherapy or cognitive-behavioral therapy for bulimia nervosa. *American Journal of Psychiatry, 171,* 109–116. doi.org/10.1176/appi.focus.120410

Proulx, K. (2008). Experiences of women with bulimia nervosa in a mindfulness-based eating disorder treatment group. *Eating Disorders: The Journal of Treatment & Prevention, 16,* 52–72. doi:10.1080/10640260701773496

Prowse, E., Bore, M., & Dyer, S. (2013). Eating disorder symptomatology, body image, and mindfulness: Findings in a non-clinical sample. *Clinical Psychologist, 17,* 77–87. doi:10.1111.cp.12008

Raes, F., Pommier, E., Neff, K. D., & Van Gucht, D. (2011). Construction and factorial validation of a short form of the Self-Compassion Scale. *Clinical Psychology and Psychotherapy, 18,* 250–255. doi: 10.1002/cpp.702

Reas, D. L., Grilo, C. M., & Masheb, R. M. (2006). Reliability of the Eating Disorder Examination-Questionnaire in patients with binge eating disorder. *Behaviour Research and Therapy, 44,* 43–51. doi:10.1016/j.brat.2005.01.004

Rector, N.A., Bagby, R.M., Segal, Z.V., Joffe, R.T., & Levitt, A. (2000). Self- criticism and dependency in depressed patients treated with cognitive therapy or pharmacotherapy. *Cognitive Therapy and Research, 24,* 571–584. doi:10.1023/A:1005566112869

Reiser, L.W. (1990). The oral triad and the bulimic quintet: Understanding the bulimic episode. *International Review of Psycho-analysis, 17*, 238–248.

Riley, D. (2004). Hatha Yoga and the treatment of illness. *Alternative Therapies in Health and Medicine, 10*, 20–22. Retrieved from: http://www.ncbi.nlm.nih.gov/pubmed/15055088

Robertson, M., Rushton, P., & Wurm, C. (2008). Interpersonal therapy: An overview. *Psychotherapy in Australia, 14*, 46-54. Retrieved from: http://www.psychotherapy.com.au/fileadmin/site_files/pdfs/InterpersonalPsychotherapy.pdf

Rorty, M., Yager, J. & Rossotto, R. (1993). Why and how do women recover from bulimia nervosa? The subjective appraisals of forty women recovered for a year or more. *International Journal of Eating Disorders, 14*, 249–260. doi:10.1002/1098-108X(199311)14:3<249::AID-EAT2260140303>3.0.CO;2-O

Safer, D. L., Robinson, A. H., & Jo, B. (2010). Outcome from a randomized controlled trial of group therapy for binge eating disorder: Comparing dialectical behavior therapy adapted for binge eating to an active comparison group therapy. *Behavior Therapy, 41,* 106–120. doi:10.1016/j.beth.2009.01.006

Safer, D. L., Telch, C. F., & Agras, W. S. (2000). Dialectical behavior therapy adapted for bulimia: A case report. *International Journal of Eating Disorders. 30,* 101–106. doi:10.1002/eat.1059

Safer, D. L., Telch, C. F., & Agras, W. S. (2001). Dialectical behavior therapy for bulimia nervosa. *American Journal of Psychiatry, 158,* 632–634. doi:10.1176/appi.ajp.158.4.632

Salmon, P., Lush, E., Jablonski, M., & Sephton, S. E. (2009). Yoga and mindfulness: Clinical aspects of an ancient mind/body practice. *Cognitive and Behavioral Practice, 16*, 59–72. doi:10.1016/j.cbpra.2008.07.002

Sansone, R. A., Levitt, J. L. (2005). Borderline personality and eating disorders. *Eating Disorders: The Journal of Treatment & Prevention, 13*, 71–83. doi:10.1080 /10640260590893665

Schiffman, E. (1996). *Yoga: The spirit and practice of moving into stillness*. New York, NY: Pocket Books.

Schupak-Neuberg, E., & Nemeroff, C. J. (1993). Disturbances in identity and self-regulation in bulimia nervosa: Implications for a metaphorical perspective of "body as self." *International Journal of Eating Disorders, 13*, 335–347. doi:10.1002/1098-108X(199305)13:4<335::AID-EAT2260130402>3.0.CO;2-M

Scime, M., Cook-Cottone, C., Kane, L., & Watson, T. (2006). Group prevention of eating disorders with fifth-grade females: impact on body dissatisfaction, drive for thinness, and media influence. *Eating Disorders, 14,* 143–155.

Shapiro, D., Cook, I. A., Davydov, D. M., Ottaviani, C., Leuchter, & Abrams, M. (2007). Yoga as a complementary treatment of depression: effects of traits and moods on treatment outcome. *Evidence-Based Complementary and Alternative Medicine, 4*, 493–502. doi:10.1093/ecam/nel114

Shaw, J. A., Herzog, D. B., Clark, V. L., Berner, L. A., Eddy, K. T., Franko, D. L., & Lowe, M. R. (2012). Elevated pre-morbid weights in bulimic individuals are usually surpassed post-morbidly: Implications for perpetuation of the disorder. *International Journal of Eating Disorders, 45,* 515–523. doi:10.1002/eat.20985

Simpkins, A. M., & Simpkins, C. A. (2011). *Meditation and Yoga in psychotherapy*, Hoboken, NJ: John Wiley & Sons.

Skinner, H. (1982). The Drug Abuse Screening Test. *Addictive Behaviors,* 7, 363–371. doi:10.1016/S0306-4603(99)00030-1

Smink, F. R., van Hoeken, D., Hoek, H. W. (2012). Epidemiology of eating disorders: incidence, prevalence and mortality rates. *Current Psychiatry Reports, 14*, 406–414. doi:10.1007/s11920-012-0282-y

Smolak, L. (2004). Body image in children and adolescents: Where do we go from here? *Body Image, 1,* 15–28. doi:10.1016/S1740-1445(03)00008-1

Sovik, R. (2000). The science of breathing – The yogic view. *Progress in Brain Research, 122*, 491–505. doi:10.1016/S0079-6123(08)62159-7

Speranza, M., Atger, F., Corcos, M., Loas, G., Guilbaud, O., Stéphan, P., … Jeammet, P. (2003). Depressive psychopathology and adverse childhood experiences in eating disorders. *European Psychiatry, 18,* 377–383. doi:10.1016/j.eurpsy.2003.04.001

Steiger, H., Goldstein, C., Mongrain, M., & Van der Feen, J. (1989). Description of eating-disordered, psychiatric, and normal women along cognitive and psychodynamic dimensions. *International Journal of Eating Disorders, 9*, 129–140. doi:10.1002/1098-108X(199003)9:2<129::AID-EAT2260090202>3.0.CO;2-H

Stein, R. I., Saelens, B. E., Zoler Dounchis, J., Lewczyk, C. M., Swenson, A. K., & Wilfley, D.E. (2001). Treatment of eating disorders in women. *The Counseling Psychologist, 29*, 695–732. doi:10.1177/0011000001295004

Steinhausen H., C. (2002). The outcome of anorexia nervosa in the 20th century. *American Journal of Psychiatry, 159,* 1284–1293. doi:10.1176/appi.ajp.159.8.1284

Stewart, T. M. (2004). Light on body image treatment: Acceptance through mindfulness. *Behavior Modification, 28,* 783–811. doi:10.1177/0145445503259862

Stice, E. (2002). Risk and maintenance factors for eating pathology: A meta-analytic review. *Psychological Bulletin, 128,* 825–848. doi:10.1037//0033-2909.128.5.825

Stice, E., Fisher, M. & Martinez, E. (2004). Eating Disorder Diagnostic Scale: Additional evidence of reliability and validity. *Psychological Assessment, 16,* 60–71. doi:10.1037/1040-3590.16.1.60

Stice, E., & Ragan, J. (2002). A preliminary controlled evaluation of an eating disturbance psychoeducational intervention for college students. *International Journal of Eating Disorders, 31,* 159–171. doi:10.1002/eat.10018

Stice, E., Telch, C. F., & Rizvi, S. L. (2000). Development and validation of the Eating Disorder Diagnostic Scale: A brief self-report measure of anorexia, bulimia, and binge-eating disorder. *Psychological Assessment, 12*, 123–131. doi:10.1037//1040-3590.12.2.123

Streeter, C. C., Jensen, E., Perlmutter, R. M., Cabral, H. J., Tian, H., Terhune, D. B., … Frenshaw, P. F. (2007). Yoga asana sessions increase brain GABA levels: A pilot study. *The Journal of Alternative and Complementary Medicine, 13,* 419–426. doi: 10.1089/acm.2007.6338

Striegel-Moore, R. H., & Franko, D. L. (2008). Should binge eating disorder be included in the DSM-V? A critical review of the state of the evidence. *Annual Review of Clinical Psychology, 4,* 305–324. doi:10.1146/annurev.clinpsy.4.022007.141149

Sullivan, P. F., Bulik, C. M., Fear, J. L., & Pickering, A. (1988). Outcome of anorexia nervosa: a case-control study. *American Journal of Psychiatry, 155,* 939–946. doi.org/10.1176/ajp.155.7.939

Swanson, S. A., Crow, S. J., Le Grange, D., Swendsen, J., Merikangas, K. R. (2011). Prevalence and correlates of eating disorders in adolescents: results from the national comorbidity survey replication adolescent supplement. *Archives of General Psychiatry 68,* 714–723. doi:10.1001/archgenpsychiatry.2011.22

Telch, C. F., Agras, W. S., & Linehan, M. M. (2000). Group dialectical behavior therapy for binge-eating disorder: A preliminary, uncontrolled trial. *Behavior Therapy, 3,* 569–582. doi:10.1016/S0005-7894(00)80031-3

Telch, C. F., Agras, W. S., & Linehan, M. M. (2001). Dialectical behavior therapy for binge eating disorder. *Journal of Consulting and Clinical Psychology, 69*, 1061–1065. doi:10.1037/0022-006X.69.6.1061

Teper, R., Segal, Z. V., & Inzlicht, M. (2013). Inside the mindful mind: How mindfulness enhances emotion regulation through improvements in executive control. *Current Directions in Psychological Science, 22,* 449–454. doi:10.1177/0963721413495869

Tozzi, F., Thornton, L. M., Klump, K. L., Fichter, M. M., Halmi, K. A., Kaplan, A. S., . . . Kaye, W. H. (2005). Symptom fluctuation in eating disorders: Correlates of diagnostic crossover. *American Journal of Psychiatry, 162,* 732–740. doi:10.1176/appi.ajp.162.4.732

Tull, M. T., & Roemer, L. (2007). Emotion regulation difficulties associated with the experience of uncued panic attacks: Evidence of experiential avoidance, emotional nonacceptance, and decreased emotional clarity. *Behavior Therapy, 38,* 378–391. doi:10.1016/j.beth.2006.10.006

Twohig, M. P., Hayes, S. C., & Masuda, A. (2006). Increasing willingness to experience obsessions: Acceptance and commitment therapy for obsessive-compulsive disorder. *Behavior Therapy, 37,* 3–13. doi:10.1016/j.beth.2005.02.001

Urbaniak, G. C., & Plous, S. (2013). Research Randomizer (Version 4.0) [Computer software]. Retrieved from http://www.randomizer.org/

Van der Kolk, B. A. (2006). Clinical implications of neuroscience research in PTSD. *Annals of The New York Academy of Sciences, 1071,* 277—293. doi:10.1196/annals.1364.022

Venta, A., Hart, J., & Sharp, C. (2013). The relation between experiential avoidance, alexithymia and emotion regulation in inpatient adolescents. *Clinical Child Psychology and Psychiatry, 18,* 398–410. doi: 10.1177/1359104512455815

Vetesse, L. C., Toneatto, T., Stea, J. N., Nguyen, L., & Wang, J. J. (2009). Do mindfulness meditation participants do their homework? A review of the empirical evidence. *Journal of Cognitive Psychotherapy: An International Quaterly, 23,* 198–225. doi:10.1891/0889-8391.23.3.198

Vögele, C., Hilbert, A., & Tuschen-Caffier, B. (2009). Dietary restriction, cardiac autonomic regulation and stress reactivity in bulimic women. *Physiology & Behavior, 98*, 229–234. doi:10.1016/j.physbeh.2009.05.018

Wahbeh, H., Elsas, S. M., & Oken, B. S. (2008). Mind-body interventions: applications in neurology. *Neurology, 10,* 2321–2328. doi:10.1212/01.wnl.0000314667.16386.5e

Wampold, B. E. (2001). *The great psychotherapy debate: Models, methods, and findings*. Mahwah, NJ: Erlbaum.

Wampold, B. E., & Bolt, D. M. (2006). Therapist effects: Clever ways to make them (and everything else) disappear. *Psychotherapy Research, 16*, 184–187. doi:10.1080/10503300500265181

Wampold, B. E., & Imel, Z. E. (2015). *The great psychotherapy debate: The evidence for what makes psychotherapy work*. New York, NY: Routledge.

Wampold, B. E., & Serlin, R. C. (2000). The consequences of ignoring a nested factor on measures of effect size in analysis of variance. *Psychological Methods, 5,* 425–433. doi:10.1037//1082-989X.5.4.425

Webb, J. B., & Foreman, M. J. (2013). Evaluating the indirect effect of self-compassion on binge eating severity through cognitive-affective self-regulatory pathways. *Eating Behaviors, 14,* 224–228. doi:10.1016/j.eabeh.2012.12.005

Weinrib, A. Z. (2011). Investigating experiential avoidance as a mechanism of action in a mindfulness intervention. Unpublished doctoral dissertation. Retrieved from: http://ir.uiowa.edu/cgi/viewcontent.cgi?article=2489&context=etd

Whelton, W. J., & Greenberg, L. S. (2005). Emotion in self-criticism. *Personality and Individual Differences, 38,* 1583–1595. doi:10.1016/j.paid.2004.09.024

Whiteside, U., Chen, E., Neighbors, C., Hunter, D., Lo, T., & Larimer, M. (2007). Difficulties regulating emotions: Do binge eaters have fewer strategies to modulate and tolerate negative affect? *Eating Behaviors, 8,* 162–169. doi:10.1016/j.eatbeh.2006.04.001

Wilfley, D. E., Welch, R., Stein, R. I., Spurrell, E. B., Cohen, L. R., Saelens, B. E. …Matt, G. E. (2002). A randomized comparison of group cognitive-behavioral therapy and group interpersonal psychotherapy for the treatment of overweight individuals with binge-eating disorder. *Archives of General Psychiatry, 59*, 713–721. doi:10.1001/archpsyc.59.8.713.

Wilson, G. T., & Fairburn, C. G. (1993). Cognitive treatments for eating disorders. *Journal of Consulting and Clinical Psychology, 61*, 261–269. doi:10.1037/0022-006X.61.2.261

Wilson, G. T., Fairburn, C. G., Agras, W. S., Walsh, B. T., & Kraemer, H. D. (2002). Cognitive behavior therapy for bulimia nervosa: Time course and mechanisms of change. *Journal of Consulting and Clinical Psychology, 70*, 267–274. doi:10.1037/0022-006X.70.2.267

Wilson, G. T., Grilo, C. M., & Vitousek, K. M. (2007). Psychological treatment of eating disorders. *American Psychologist, 62*, 199–216. doi:10.1037/0003-066X.62.3.199

Wiser, S., & Telch, C. F. (1999). Dialectical behavior therapy for binge eating disorder. *Journal of Clinical Psychology, 55,* 755–768. doi.org/10.1002/(SICI)1097-4679(199906)55:6<755::AID-JCLP8>3.0.CO;2-R

Wonderlich, S. A., de Zwaan, M., Mitchell, J. E., Peterson, C., & Crow, S. (2003). Psychological and dietary treatments of binge eating disorder: Conceptual implications. *International Journal of Eating Disorders, 34,* S58–S73. doi:10.1002/eat.10206

Wonderlich, S. A., Joiner, T. E., Keel, P. K., Williamson, D. A., & Crosby, R. D. (2007). Eating disorder diagnoses: Empirical approaches to classification. *American Psychologist, 62,* 167–180. doi:10.1037/0003-066X.62.3.167

Wonderlich, S. A., Peterson, C. B., Crosby, R. D., Smith, T. L., Klein, M. H., Mitchell, J. E., & Crow, S. J. (2014). A randomized controlled comparison of integrative cognitive-affective therapy (ICAT) and enhanced cognitive-behavioral therapy (CBT-E) for bulimia nervosa. *Psychological Medicine, 44,* 543–553. doi:10.1017/S0033291713001098

Woolery, A., Myers, H., Sternlieb, B., & Zeltzer, L. (2004). A Yoga intervention for young adults with elevated symptoms of depression. *Alternative Therapies in Health and Medicine, 10,* 60–63. doi:10.1111/j.1360-0443.2010.03066.x

World Health Organization. (2008). *International classification of diseases* (10th rev.). New York, NY: Author.

World Medication Association. (2013, October). *Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects* (64th WMA General Assembly). Fortaleza, Brazil: Author. Retrieved from WMA website: http://www.wma.net/en/30publications/10policies/b3/

Yalom, I. D., & Leszcz, M. (2005). *The theory and practice of group psychotherapy* (5th ed.). New York, NY: Basic Books.

Yanovisky, S. Z. (2003). Binge eating disorder and obesity in 2003: Could treating an eating disorder have a positive effect on the obesity epidemic? *International Journal of Eating Disorders, 34,* S117-S120. doi:10.1002/eat.10211

Zanarini, M. C., Vujanovic, A. A., Parachini, E. A., Boulanger, J. L., Frankenburg, F. R., & Hennen, J. (2003). A screening measure for BPD: The McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD). *Journal of Personality Disorders,* 17, 568–573. doi: 10.1521/pedi.17.6.568.25355

Zhu A, J., Walsh, B., T. (2002). Pharmacologic treatment of eating disorders. *Canadian Journal of Psychiatry, 47,* 227–34. Retrieved from: http://www.ncbi.nlm.nih.gov/pubmed/11987473

Zuroff, D. C., Stotland, S., Sweetman, E., Craig, J. A., & Koestner, R. (1995). Dependency, self-criticism, and social interactions. *British Journal of Clinical Psychology, 34,* 543–553. doi:10. 1111/j.2044-8260.1995.tb01488.x

Appendix A

Yoga Log

Week _____ Participant _____

Date	Duration of Practice	Yoga Video Used

Appendix B

Yoga Rating Scale

Please rate each of the following statements using the scale provided. In the blank for each statement write the number that best reflects the degree to which you were able to do the following during your yoga practice today.

Never	Occasionally	Roughly half the time	Most of the time	All the time
0	1	2	3	4

_____ I listened to my Yoga teacher and understood her

_____ I practiced as my Yoga teacher instructed

_____ I focused my attention on my breath and body alignment

_____ I attended to my moment-by-moment experience

_____ I respected my physical limitations/boundaries

Appendix C

Phase One Information and Consent Form

Study Title: Yoga for Bulimia and Binge Eating Disorder

Principal Researcher:
Maggie Brennan, M.Ed.
Department of Educational Psychology
University of Alberta
1-888-260-4760 (toll free)
mabrenna@ualberta.ca

Supervising Researcher:
Dr. William Whelton, Ph.D.
Associate Professor
University of Alberta
780-492-7979
wwhelton@ualberta.ca

You are being invited to participate in a research study being conducted by Maggie Brennan in order to fulfil the dissertation requirement for the Doctor of Philosophy degree in Counselling Psychology. Women who have been diagnosed with bulimia nervosa or binge eating disorder are being recruited to participate in the study. The purpose of the study is to explore the effects of yoga on women with bulimia nervosa or binge eating disorder. This study will help to help inform the practices involved in the treatment of bulimia nervosa and binge eating disorder.

Participation in this study involves a two-phase process. During phase one, you will be asked to answer a series of online questions that will be used to determine your eligibility for participation in phase two of this study. These questions will relate to your eating behaviours, as well as your general thoughts and behaviours. It is anticipated that it will take you 30 minutes or less to complete these questions. You can stop answering questions at any time for any reason. If you choose to stop answering the questions, your answers will not be submitted and no record of them will be made. If you choose to complete the questions, your answers will be used to determine your eligibility for participation in phase two of the study. For information about stage two of this study please read the "Phase Two Information Form" which is available on the study website: www.yoga-study.com

Unfortunately, not everyone who completes phase one of this study will be eligible to participate in phase two. Decisions will be made based on pre-established criteria to ensure the safety of participants and the validity of the research study. If you are not eligible to participate in phase two of the study, you will be provided with a list of resources that may be helpful to you. You are encouraged to contact the primary researcher, Maggie Brennan, or the supervising researcher, William Whelton, if you have any questions.

If you are eligible to participate in phase two of the study, you will be contacted with details about upcoming information sessions. At these information sessions you will be provided with

additional information about phase two of the study, including the purpose of the study, the study procedures, your rights and responsibilities as a participant, the risks and benefits involved, and how confidentiality will be maintained. This will ensure that are fully informed in making your decision about whether or not to participate. All of this information is provided in the "Phase Two Information Form" which is available on the study website (www.yoga-study.com). If you are eligible to participate in phase two, you can choose not to participate. You are under no obligation to complete phase two of the study.

Your participation in this study will help to inform future practices in the treatment of bulimia nervosa and binge eating disorder. There are no costs associated with phase one of the study. While it is unlikely, there is a small possibility that answering the online questions could bring up uncomfortable thoughts or emotions that could lead to psychological discomfort or distress. If this happens, you are encouraged to contact Maggie Brennan or William Whelton, either of whom can refer you to appropriate services.

All of the information you provide throughout your participation in the study will be kept confidential. The only people who will have access to your answers are the principal researcher, Maggie Brennan, and the supervising researcher, Dr. William Whelton. All electronic data will be password protected. The information you provide during phase one will NOT be anonymous. This is necessary to allow the primary researcher to contact you in order to provide appropriate referrals. If your responses indicate an imminent personal emergency, Maggie Brennan will contact you with the intention of conducting a more thorough evaluation in order to connect you with appropriate services and supports.

The results of the study will be disseminated through professional conferences and through publication in scholarly journals. NO INFORMATION PROVIDED DURING PHASE ONE OF THE STUDY WILL BE INCLUDED IN THE DISSEMINATION OF THE RESEARCH FINDINGS. Should you wish to receive a report of the research findings or if you wish to comment about the research, please contact Maggie Brennan at mabrenna@ualberta.ca or 1-888-260-4760 (toll-free).

The answers you provide to the online questions during phase one will be used to determine your eligibility for phase two of the study "Yoga for Bulimia and Binge Eating Disorder." If you are ineligible to participate in phase two of the study your data will be deleted. If you are eligible and you choose to participate in phase two of the study, all identifying information will be removed from your data. This data and any data collected in phase two of the study will be securely stored electronically, using password protection, or in a locked office, to which only Maggie Brennan and William Whelton will have access. Your data will be kept for a period of 5 years after the study is completed. After this period, the data will be destroyed; all electronic data will be deleted and all hard data will be shredded.

Participation in this study is entirely voluntary. You are under no obligation to participate. Should you have any questions or concerns about your participation at any time throughout the course of this study, please contact Maggie Brennan or William Whelton using the contact

information above. Please be aware that you have the right to not participate and/or you may withdraw from the study at any point without penalty. If you choose to withdraw from the study, your data will not be included in the present study in any way. All data collected will be deleted from any electronic databases and all hard data will be shredded.

The plan for this study has been reviewed for its adherence to ethical guidelines and approved by the Research Ethics Board (REB 2) at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Coordinator of the REB2 at (780) 492-0302.

☐ I agree to participate in phase one of the study "Yoga for Bulimia and Binge Eating Disorder" conducted by Maggie Brennan and William Whelton of the University of Alberta. I have come to this decision based on the information provided above and I have been given the opportunity to ask any questions that I may have regarding the study. I understand that I am able to withdraw this consent at any time and through doing so my information will be deleted and I will not receive any penalty.

I understand that the information collected in phase one of the study will be used solely for the purposes of determining my eligibility to participate in phase two of the study and to ensure that I will be provided with appropriate resources if I am ineligible to participate in phase two. By filling out these questionnaires and submitting them I am expressing my consent to participate in phase one of the study.

I understand that this study has been reviewed for its adherence to ethical guidelines and approved by the Research Ethics Board (REB 2) at the University of Alberta. I also understand that I may contact this office if I have any comments or concerns resulting from my participation in this study.

NB: A copy of this consent form will be emailed to you for your records.

Appendix D

Online Survey Termination Page

Thank you for taking the time to complete this survey. Unfortunately, based on your responses you are not eligible to continue to phase 2 of the research study Yoga for Bulimia and Binge Eating Disorder. If you require referrals or have any questions please contact Maggie Brennan at mabrenna@ualberta or 1-888-260-4760.

Appendix E

Phase Two Information and Consent Form

Study Title: Yoga for Bulimia and Binge Eating Disorder

Principal Researcher:
Maggie Brennan, M.Ed.
Department of Educational Psychology
University of Alberta
1-888-260-4760 (toll free)
mabrenna@ualberta.ca

Supervising Researcher:
Dr. William Whelton, Ph.D.
Associate Professor
University of Alberta
780-492-7979
wwhelton@ualberta.ca

You are being invited to participate in a research study being conducted by Maggie Brennan in order to fulfil the dissertation requirement for the Doctor of Philosophy degree in Counselling Psychology. Women who have been diagnosed with bulimia nervosa or binge eating disorder are being recruited to participate in the study. The purpose of the study is to explore the effects of yoga on women with bulimia nervosa or binge eating disorder. This study will help to help inform the practices involved in the treatment of bulimia nervosa and binge eating disorder.

During phase two of the study, data will be collected through the use of pen-and-paper questionnaires. If you choose to participate, you will be asked to fill out several questionnaires that will record your thoughts, feelings, and behaviours related to eating and your sense of self. Surveys will take approximately 15-30 minutes to complete and will be provided and collected by a research assistant on the University of Alberta campus. Surveys will be completed at three different times (weeks 0, 8 and 12). In addition to the completion of surveys, you will also complete the Yoga program at some point before the summer, the timing of which will vary among participants. For the Yoga program, you will be asked to participate in a weekly 90-minute yoga class for eight consecutive weeks. Yoga classes will involve breathing practices, physical postures, and meditation practices. These practices will be geared toward beginners. All of the yoga classes will take place at the University of Alberta and will be led by Maggie Brennan, a Registered Yoga Teacher, or, if circumstances demand, an equivalently trained substitute. You will be asked to complete a Yoga rating scale following each yoga class. It is anticipated that it will take five minutes or less to complete this yoga rating scale. You will also be asked to complete one pen-and-paper questionnaire directly after the first, third, sixth, and eighth yoga class. It is anticipated that it will take you less than five minutes to complete this questionnaire. You will submit the rating scale and questionnaire anonymously into an envelope. This envelope will be sealed, ensuring your yoga instructor will not see your answers to the questions on this form until following the completion of the study.

As a participant in this study, you will also be requested to develop a home-based yoga practice and you will be provided with access to Yoga videos designed for this study that will be available online. You are encouraged to engage in 20-30 minutes of daily yoga practice, however, the frequency and duration of your home practice is up to you. You will be asked to

keep a log of your home-based practice that you will submit anonymously at each week's yoga class. It is anticipated that it will take five minutes or less to complete the yoga log.

Lastly, ten individuals from the study will be randomly selected to fill out a feedback form following completion of the eight-week yoga program. This feedback form will ask open-ended questions about what you found to be the most and least helpful about the yoga classes. Should you be randomly selected to complete this form, you will have the option to decline this request. If you, or another participant chooses not to fill out the feedback form, additional participants will be randomly selected until 10 feedback forms have been completed or all participants have declined to fill out this form.

Your information, and any information you share, will be private, anonymous, and confidential. The only people who will have access to the data you provide are Maggie Brennan, William Whelton, and the Research Ethics Committee. You will be given a study code that will be attached to all of your data and thus your legal name will *not* appear in any notes, reports, publications, or presentations resulting from this study. In addition, all electronic data will be encrypted. All data will be kept for a period of 5 years after the study is completed and will be securely stored in a locked office, to which only authorized researchers will have access. After this period, the data will be destroyed; all electronic data will be deleted and all hard data will be shredded.

Data from phase two will be disseminated through professional conferences and through publication in scholarly journals. Because all identifying information will be removed from the data and study codes will be used, your anonymity will be ensured when dissemination occurs. Should you wish to receive a report of the research findings or if you wish to comment about the research, please contact Maggie Brennan at mabrenna@ualberta.ca or 1-888-260-4760 (toll free).

Your participation in this study will help to inform future practices in the treatment of bulimia nervosa and binge eating disorder, potentially benefitting others suffering from these disorders. Your participation in phase two may also provide you with physical benefits (e.g., improved flexibility, balance, and strength). The only anticipated cost to you is the $20 fee to cover the cost of supplies (e.g., yoga mats, yoga straps). While it is unlikely, there is a small possibility that filling out the questionnaires or participating in the yoga classes could bring up uncomfortable thoughts or emotions that could lead to psychological discomfort or distress. If this occurs, you are encouraged to speak to Maggie Brennan or William Whelton, both of whom are Registered Psychologists and have been trained to help alleviate psychological discomfort and distress. You are also encouraged to modify any yoga practices (i.e., breathing practices, meditations, physical postures) as needed, or take a break if the practice is causing you discomfort or distress. Additionally, Maggie Brennan will be available before and after each yoga class. You are encouraged to speak with her if you experiencing any psychological discomfort or distress during your yoga practice.

There are very slight physical risks involved in participating in the yoga classes, as there are with any form of physical activity. In order to minimize this risk, you are asked to inform your yoga

instructor of any injuries. You are also encouraged to respect your physical limitations and ask the yoga instructor for assistance or modifications any time you experience more than minimal physical discomfort. You always have permission to move into a resting pose or take a break as needed. **We highly recommended that you check with your primary care physician before beginning this program.**

All of the yoga classes will be taught on the University of Alberta campus by Maggie Brennan, RYT, a Registered Yoga Teacher. Maggie is an experienced teacher, who has been trained in anatomy and physiology. Some discomfort is to be expected, however, if at any time during class you feel more than mild physical or psychological discomfort, please let Maggie know right away as she will **always** be willing to provide assistance and/or modifications.

Participation in this study is entirely voluntary. Should you have any questions or concerns about your participation at any time throughout the course of this study, please contact Maggie Brennan or William Whelton using the contact information above. Please be aware that you have the right to not participate and/or you may withdraw from the study at any point without penalty. If you choose to withdraw from the study, your data will not be included in the present study in any way. All data collected will be deleted from any electronic databases and all hard data will be shredded.

The plan for this study has been reviewed for its adherence to ethical guidelines and approved by the Research Ethics Board (REB 2) at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Coordinator of the REB2 at (780) 492-0302.

I agree to participate in phase two of the study "Yoga for Bulimia and Binge Eating Disorder" conducted by Maggie Brennan and Dr. William Whelton of the University of Alberta. I have come to this decision based on the information provided above and I have been given the opportunity to ask any questions that I may have regarding the study. I understand that I am able to withdraw this consent at any time and through doing so I will not receive any penalty.

I understand that this study has been reviewed for its adherence to ethical guidelines and approved by the Research Ethics Board (REB 2) at the University of Alberta. I also understand that I may contact this office if I have any comments or concerns resulting from my participation in this study.

Name: _____

Signature: _____

Date: _____

Witness Signature: _____

NB: One copy is to be kept by you, and the other is to be returned to the researcher.

Appendix F

YOGA MANUAL

Please note that modifications were offered on an as needed basis and are not included in this manual. Props such as blocks, bolsters, chairs, and straps were frequently used to help make the poses accessible to all participants. Variations of poses and alternative poses were also frequently offered to participants.

WEEK 1

THEME: Learning to listen to your body/Awareness

- Go at your own pace
- Focus on and honour your abilities – do not try to do something because your neighbor is doing it
- Ask for modifications as needed
- Focus on your internal experience

TODAY'S PRACTICE:

1. Centering
2. Introduce Theme
3. Intention Setting
4. Dhirga pranayama – teach in supine position
5. Reclined Warm-Ups
    a. Reclining Stick (Yastikasana)
        - Educate on neutral spine
        - Connect breath with movement Head Rolls
    b. Releasing Head, Neck and Shoulders
        - Grab the right elbow with the left hand, and pull the right arm out to the left, while turning the head towards the right side
        - Repeat on opposite side
    c. Dashrath's Twist (Dashrathasana)
    d. Angels in the Snow
        - Bring arms to sides, keeping feet on floor close to buttocks and hip-width apart. Inhale and press into the feet as you lift the hips and buttocks off the floor (option to simultaneously lift arms toward ceiling – coming all the way overhead as hips lift to their maximum). Exhale and slowly lower hips and sweep arms to the sides along the floor (like making snow angels) and back to sides.
    e. Reclined Leg Series – use strap

- Make circles with right leg
- Hold strap in right hand and lower right leg to the right
- Hold strap in left hand lower leg across the midline of the body to the left
- Lying Hamstring Stretch (Supta Padangushtasana)

f. Single leg lifts (Pavana Muktasana)

6. Standing Postures
    a. Standing Swinging Twists – 10X per side
    b. Mountain Pose (Tadasana) – teach with block
    c. Half Moon (Ardha Chandrasana)
    d. Chair Pose – (Utkatasana) – teach with block
    e. Standing Forward Fold (Uttanasana)
    f. Standing Half Forward Bend (Ardha Uttanasana)
    g. Mountain Pose (Tadasana)
    h. Tree Pose (Vrkshasana)
7. Floor Postures
    a. Lie Prone
    b. Baby Cobra Pose (Ardha Bhujangasana)
    c. Sphinx Pose (Salamba Bhujangasana)
    d. Child's Pose (Balasana)
    e. Staff Pose (Dandasana)
    f. Great Seal Pose (Maha Mudra) – teach with strap
    g. Bridge Pose (Setu Bandha Sarvangasana)
    h. Reclined Spinal Twist (Supta Matsyendrasana)
    i. Savasana
8. Mindfulness of the Breath Meditation – 15 minutes (Appendix G)
9. Closing
    a. 3 sun-breaths
    b. Gratitude (i.e., notice anything you feel gratitude for in this moment)
    c. Aum

WEEK 2

THEME: BREATH

"Feelings come and go like clouds in a windy sky. Conscious breathing is my anchor."

~ Thích Nhất Hạnh

- Maintain breath throughout practice
- Connect breath with movement
- Work on allowing the breath to guide movement
- Listen to the breath as an indication of whether to go deeper or pull back

TODAY'S PRACTICE:

1. Centering
2. Introduce Theme
3. Intention Setting
4. Dhirga Pranayama – seated position
5. Teach Ujjayi Pranayama
6. Seated Warm-Ups
    a. Sun Breaths
    b. Seated Hip Circles
    c. 6 Movements of the Spine Series
        - Extension and flexion of the spine
        - Lateral stretches
        - Gentle seated twists
    d. Bound Angle Pose (Baddha Konasana)
    e. Hip Series
        - Bend knees and bring feet to the floor
        - Use arms to support spine in being long, exhale and drop the knees to one side, inhale to centre, exhale and do the second side – follow breath & go slow
        - Option to incorporate arm: begin to sweep the non-supporting arm to the same side the legs are moving (right arm is dropping legs to the right), repeat on opposite side
        - Option 2: plant rear hand and push off the floor to take the front body towards the ceiling (lift buttock of back leg off the floor)
7. Standing Poses
    a. Swinging Twists
    b. Mountain Pose (Tadasana)
    c. Half Moon (Ardha Chandrasana)
    d. Standing Forward Fold – (Uttanasana)

   e. Standing Half Forward Bend (Ardha Uttanasana)
   f. Standing Halfway Lift (Ardha uttanasana)
   g. Mountain Pose (Tadasana)
   h. Warrior I (Virabhadrasana I) – right leg back
   i. Warrior II (Virabhadrasana I) – right leg back
   j. Standing Wide Legged Forward Bend (Prasarita Padottanasana)
   k. Warrior I (Virabhadrasana I) – left leg back
   l. Warrior II (Virabhadrasana II) – left leg back
   m. Mountain Pose (Tadasana)
   n. Tree Pose (Vrksasana)
   o. Standing Forward Fold (Uttanasana)
8. Floor Postures
   a. Child's Pose (Balasana)
   b. Baby Cobra Pose (Ardha Bhujangasana)
   c. Sphinx Pose (Salamba Bhujangasana)
   d. Cobra Pose (Bhujangasana) – option to do Baby Cobra or Sphinx pose again
   e. Half Locust (Ardha Salabhasana)
   f. Child's Pose (Balasana)
   g. Seated Forward Fold (Paschimottanasana) – teach with strap
   h. Happy Baby Pose (Ananda Balasana)
   i. Bridge Pose (Setu Bandha Sarvangasana) – teach with strap
   j. Reclined Spinal Twist (Supta Matsyendrasana)
   k. Fish Pose (Maysyasana) or Heart Opener using bolster (i.e. lie with bolster supporting head, neck, and lower back)
   l. Savasana
9. Closing
   a. 3 Sun Breaths
   b. Gratitude (i.e., (i.e., notice anything you feel gratitude for in this moment)
   c. Aum

WEEK 3

THEME: Relax

- Focus on relaxing into poses throughout today's practice
- Relax areas that do not need to work during a pose
- Breathe into and out of any sensations of mild discomfort (always make adjustments if the pose becomes too intense or you experience pain)
- Soften where you can

TODAY'S PRACTICE:

1. Centering
2. Introduce Theme
3. Intention Setting
4. Dhirga pranayama & Ujjayi pranayama
5. Table Position Warm-Ups
    a. All Fours Hip Circles
    b. Cat Pose (Bidalasana) & Dog Pose (Bitilasana)
    c. Table Pose with lateral flexion
    d. Thread the Needle (Parsva Balasana)
    e. Balancing Cat (Utthita Marjaryasana)
    f. Child's Pose (Balasana)
    g. Side Child's Pose
    h. Extended Puppy Pose (Uttana Shishosana)
    i. Toe Squat Pose
    j. Wrist Stretch Series
        - Make wrist circles
        - Outstretch one arm parallel to the floor, palm facing up, and pull palm down perpendicular to the floor with the other hand
        - Turn palm to face the floor and pull palm up perpendicular to the ceiling
        - Repeat on other side
6. Standing Poses
    a. Downward Facing Dog (Adho Mukha Svanasana)
    b. Standing Forward Fold (Uttanasana)
    c. Standing Half Forward Bend (Ardha Uttanasana)
    d. Mountain Pose (Tadasana)
    e. Gentle Sun Salutation
        - Mountain Pose (Tadasana)
        - Standing Forward Bend (Uttanasana)
        - Standing Half Forward Bend (Ardha Uttanasana)
        - High Lunge (Utthita Ashva Sanchalanasana) – right leg back

- Plank
- Modified Push-Up
- Baby Cobra (Ardha Bhujangasana)
- Downward Facing Dog (Adho Mukha Svanasana)
- High Lunge (Utthita Ashva Sanchalanasana) – left leg back
- Standing Forward Bend (Uttanasana)
- Standing Half Forward Bend (Ardha Uttanasana)
- Mountain Pose (Tadasana)

f. Balancing Pose – with hands at hips
   - Lift left knee to 90 degrees, straighten leg, repeat
   - Left leg up knee bent, turn knee out to side (keep hips squared)
   - Lift right knee to 90 degrees, straighten leg, repeat
   - Right leg up knee bent, turn knee out to side (keep hips squared)

7. Floor Poses
   a. Child's Pose (Balasana)
   b. Table Pose (Bharmanasana) or Downward Facing Dog (Adho Mukha Svanasana)
   c. Pigeon (Kapotasana) – right side
   d. Table Pose (Bharmanasana) or Downward Facing Dog (Adho Mukha Svanasana)
   e. Pigeon (Kapotasana) – left side
   f. Wide Angle Seated Forward Fold (Upavistha Konasana)
   g. Wind Relieving Series (Pawanmuktasana)
      i. Lie on back with legs extended
      ii. Draw right knee toward the right side of the chest and use hands or strap to pull the right thigh into the abdomen
      iii. Release right leg back extended along the ground
      iv. Draw left knee toward the right side of the chest and use hands or strap to pull the right thigh into the abdomen
      v. Release left leg back extended along the ground
      vi. Draw both knees to chest
      vii. Release both legs back extended along the ground
   h. Bridge Pose (Setu Bandha Sarvangasana)
   i. Reclined Spinal Twist (Supta Matsyendrasana)
   j. Legs in the air (block under sacrum)
   k. Savasana
8. Progressive Muscle Relaxation (Appendix H)
9. Alternate Nostril Breathing (Nadi Shodhana)
10. Closing
    a. 3 Sun Breaths
    b. Gratitude (i.e., notice anything you feel gratitude for in this moment)
    c. Aum

WEEK 4

THEME: Feel

- Sensing experience directly
- Notice sensations and emotions with a curious, kind, and open attention
- Notice if your feelings ebb and flow (i.e., move, change in intensity, pass)

TODAY'S PRACTICE:

1. Centering
2. Introduce theme
3. Read the poem The Guest House by Rumi
4. Intention Setting
5. Body Scan – 10 mins (Appendix I)
6. Dhirga & Ujjayi Pranayama
7. Seated Warm-ups
    a. Easy Pose (Sukhasana) with neck stretch series
        - Drop right ear to right shoulder
        - Keeping ear to shoulder, push chin away from chest (open front of neck)
        - Draw chin close to chest (open back of neck)
        - Bring head back to centre
        - Draw chin to chest
        - Repeat on left side
    b. Wrist Stretch Series
        - Make wrist circles
        - Outstretch one arm parallel to the floor, palm facing up, and pull palm down perpendicular to the floor with the other hand
        - Turn palm to face the floor and pull palm up perpendicular to the ceiling
        - Repeat on other side
    c. Shoulder series – using the strap
        - Hold strap with hands shoulder distance apart and arms straight
        - Lift arms overhead
        - Lower arms behind you toward the floor
        - Raise arms overhead
        - Lower arms in front of you toward the floor
        - Repeat 3 times
        - Narrow grip on strap, bringing hands shoulder width apart
        - Side stretches (lateral flexion)
        - Tricep stretch
    d. Sun Breaths
    e. 6 Movements of the Spine Series

- Extension and flexion of the spine
- Lateral stretches
- Gentle seated twists

f. Cat Pose (Bidalasana) & Dog Pose (Bitilasana)
g. Extended Puppy Pose (Uttana Shishosana)
h. Child's Pose (Balasana)
i. Child's Pose Side Stretch
j. Seated Yoga Seal (Upavistha Yoga Mudra**)**
k. Table Pose
l. Donkey Kicks X6 on both sides

8. Standing Postures
    a. Mountain Pose (Tadasana) with arms lifted – hold for 1 minute
    b. Downward Dog Series – left leg
        - Downward Facing Dog (Adho Mukha Svanasana)
        - One Legged Dog – lift left leg off the ground, keeping hips squared
        - Draw left knee to nose
        - One Legged Dog – left leg lifted
        - Draw left knee to nose
    c. Low lunge (Anjaneyasana) – left leg forward
    d. Low Lunge Twist Pose (Parivrtta Anjaneyasana)
    e. Child's pose (Balasana)
    f. Downward Dog Series – right leg
        - Downward Facing Dog (Adho Mukha Svanasana)
        - One Legged Dog – lift right leg, keeping hips squared
        - Draw right knee to nose
        - One Legged Dog – right leg lifted
        - Draw right knee to nose
    g. Low Lunge (Anjaneyasana) – right leg forward
    h. Low Lunge Twist Pose (Parivrtta Anjaneyasana)
    i. Standing Forward Fold (Uttanasana)
    j. Standing Half Forward Bend (Ardha Uttanasana) – hold for one minute and practice noticing sensations with curious, kind, and open attention
    k. Standing Wide Legged Forward Fold (Prasarita Padottanasana) – option to do Yoga mudra arms
    l. Toppling Tree Pose (Patanvkshasana) on both sides
9. Floor Postures
    a. Sphinx Pose (Salamba Bhujangasana)
    b. Cobra Pose (Bhujangasana) – option to do Baby Cobra or Sphinx Pose again
    c. Half Locust (Ardha Salabhasana)
    d. Eye of the Needle Pose (Sucirandrasana)
    e. Bridge Pose (Setu Bandha Sarvangasana) – hold for one minute
    f. Reclined Spinal Twist (Supta Matsyendrasana)

   g. Fish Pose (Maysyasana) or Heart Opener using bolster (i.e. lie with bolster supporting head, neck, and lower back)
   h. Savasana
10. Closing
   a. 3 Sun Breaths
   b. Gratitude (i.e., notice anything you feel gratitude for in this moment)
   c. Aum

WEEK 5

Theme: Watch (observing with a curious and kind attention)

- Self-talk can become intensified in contemplative practices like yoga
- What are you saying to yourself?
- Are you being self-critical? Judgmental? Comparing yourself others? Kind? Compassionate?
- Observe your thoughts/reactions with a curious and kind attention
- You do not need to try to change your self-talk – simply watch objectively and listen with compassion to what is being said

TODAY'S PRACTICE:

1. Centering
2. Introduce Theme
3. Intention Setting
4. Body scan – 10 minutes (Appendix I)
5. Dhirga & Ujjayi
6. Seated warm-ups
    a. Sun Breaths
    d. 6 Movements of the Spine Series
        - Extension and flexion of the spine
        - Lateral stretches
        - Gentle seated twists
    b. Eagle arms (or grab opposite shoulder) – hold and gently lean forward
    c. Table pose
    d. Cat Pose (Bidalasana) & Dog Pose (Bitilasana)
    e. Balancing Cat (Utthita Marjaryasana)
    f. Fire Hydrant Pose (option to make leg circles)
    g. Child's Pose (Balasana)
    h. Side Child's Pose
    i. Toe Squats
    j. Gate Pose (Parighasana)
7. Breath of Joy – 10 repetitions
8. Standing Postures:
    a. Mountain Pose (Tadasana)
    b. Half Moon (Ardha Chandrasana)
    c. Chair Pose – (Utkatasana) – teach with block
    d. Standing Forward Fold (Uttanasana)
    e. Standing Half Forward Bend (Ardha Uttanasana)
    f. Low Lunge (Anjaneyasana) – right leg back
    g. Runner's stretch (Ardha Hanumanasana) – right leg back

   h. High Lunge (Utthita Ashva Sanchalanasana) – right leg back
   i. Downward Facing Dog (Adho Mukha Svanasana)
   j. Standing Forward Fold (Uttanasana)
   k. Standing Half Forward Bend (Ardha Uttanasana)
   l. Mountain Pose (Tadasana)
   m. Low Lunge (Anjaneyasana) – left leg back
   n. Runner's stretch (Ardha Hanumanasana) – left leg back
   o. High Lunge (Utthita Ashva Sanchalanasana) – left leg back
   p. Downward Facing Dog (Adho Mukha Svanasana)
   q. Standing Forward Fold (Uttanasana)
   r. Standing Half Forward Bend (Ardha Uttanasana)
   s. Mountain Pose (Tadasana)
   t. Balance Pose – lift right leg to 90 degrees
   u. Toppling Tree Pose (Patanvrkshasana) – left leg as standing leg
   v. Balance Pose – lift right leg to 90 degrees
   w. Toppling Tree Pose (Patanvkshasana) – right leg as standing leg
   x. Mountain Pose (Tadasana)
   y. Wide Legged Forward Fold (Prasarita Padottanasana)
9. Floor Postures
   a. Child's Pose (Balasana)
   b. Table Pose
   c. Downward Facing Dog (Adho Mukha Svanasana) or Table Pose
   d. Pigeon Pose (Kapotasana) – right knee forward
   e. Downward Facing Dog (Adho Mukha Svanasana) or Table Pose
   f. Pigeon (Kapotasana) – left knee forward
   g. Downward Facing Dog (Adho Mukha Svanasana)
   h. Plank
   i. Push-up or modified push-up
   j. Sphinx Pose (Salamba Bhujangasana)
   k. Half Bow Pose (Ardha Dhamurasana)
   l. Staff Pose (Dandasana)
   m. Bound Angle Pose (Baddha Konasana)
   n. Great Seal Pose (Maha Mudra)
   o. Happy Baby Pose (Ananda Balasana)
   p. Reclined Spinal Twist (Supta Matsyendrasana)
   q. Savasana (option to do legs up the wall)
10. Mindfulness of the Breath Meditation
11. Closing
   a. 3 Sun Breaths
   b. Gratitude (i.e., notice anything you feel gratitude for in this moment)
   c. Aum

WEEK 6

THEME: Allow /Surrender

- Allow experiences to be as they already are
- Ride the wave of sensation – allow there to be discomfort, increasing sensation or emotions
- Pain, however, is always a sign to back off
- Work your edge (Be careful not to push too far)
- Adopt a willingness to accept things (i.e., thoughts, feelings, sensations) as they are in this moment

"Change is possible, but it must start with self-acceptance."

"Allow whatever this moment contains. No matter what event or happening or situation, say 'yes' to it. Allow it to be." Eckhart Tolle

TODAY'S PRACTICE:

1. Centering
2. Introduce Theme
3. Intention Setting
4. Dhirga and Ujayyi pranayama
5. Seated Warm-up
    a. Easy Pose (Sukhasana)
    b. Shoulder shrugs
    c. Eagle Arms – hold and hinge forward at hips
    d. Sun breaths
    e. 6 Movements of the Spine Series
        - Extension and flexion of the spine
        - Lateral stretches
        - Gentle seated twists
    e. Staff Pose (Dandasana)
    f. Bound Angle Pose (Baddha Konasana)
    g. Leg Cradle Pose
    h. Seated Spinal Twist (Ardha Matsyendrasana)
    i. Upward Boat Pose (Urdhva Navasana)
6. Standing Postures:
    a. Mountain Pose (Tadasana)
    b. Standing Half Moon Pose (Ardha Chandrasana)
    c. Mountain Pose (Tadasana)

d. Stargazer Pose – right foot back
   - Step feet 3-4 feet apart
   - Turn right foot out to the right 90 degrees and left foot in 65 degrees to the right
   - Align the right heel with the left heel and center of right knee cap in line with centre of the right ankle
   - Square hips to the front edge of the mat (turn left foot in more if necessary)
   - Isometrically squeeze thighs together and feet together
   - Draw shoulder blades back and down
   - Sweep arms behind the back (options: reverse prayer position, grab opposite elbow, or clasp hands behind the back)
   - Inhale and extend the spine upwards, lifting the heart, come into a gentle backbend
   - Hold for 2-4 breaths

e. Standing Runner's Stretch (Parsvottanasana) – right leg back
f. Stargazer Pose – left leg back
g. Standing Runner's Stretch (Parsvottanasana) – left leg back
h. Standing Wide Legged Forward Bend (Prasarita Padottanasana)
i. Mountain Pose (Tadasana)
j. Leg Series
   - Warrior I (Virabhadrasana I) – right leg back
   - Warrior II (Virabhadrasana II)– right leg back
   - Triangle Pose (Trikonasana) – right leg back
   - Plank
   - Push-up or modified push-up
   - Child's Pose (Balasana)
   - Table Pose
   - Downward Facing Dog (Adho Mukha Svanasana)
   - One Legged Dog
   - Pigeon (Kapotasana) – right leg back
   - Downward Facing Dog (Adho Mukha Svanasana)
   - Mountain Pose (Tadasana)
   - Repeat on Left Side
k. Tree Pose (Vrikshasana) – lift right leg
l. Tree pose (Vrikshasana) – lift left leg

7. Floor Postures
   f. Sphinx Pose (Salamba Bhujangasana)
   g. Half Locust (Ardha Salabhasana)
   a. Full Locust (Salabhasana)
   b. Child's Pose (Balasana)
   d. Great Seal Pose (Maha Mudra) – both sides
   e. Wide Angle Seated Forward Fold (Upavistha Konasana)
   f. Happy Baby Pose (Ananda Balasana)

   g. Bridge Pose (Setu Bandha Sarvangasana) – hold for 2 minutes, taking breaks if needed
   h. Reclined Spinal Twist (Supta Matsyendrasana)
   c. Legs in the air (use block)
   d. Savasana
8. Closing
   a. 3 Sun Breaths
   b. Gratitude (i.e., notice anything you feel gratitude for in this moment)
   c. Aum

WEEK 7

THEME: Compassion

- Aim to have compassion for yourself throughout today's class
- Approach yourself (your body, abilities, thoughts, feelings and sensations) with spaciousness, gentleness, and kindness
- Ahimsa – principle of non-violence

"Having compassion starts and ends with having compassion for all those unwanted parts of ourselves. The healing comes from letting there be room for all of this to happen: room for grief, for relief, for misery, for joy." Pema Chodron

"Self-compassion is approaching ourselves, our inner experience with spaciousness, with the quality of allowing which has a quality of gentleness. Instead of our usual tendency to want to get over something, to fix it, to make it go away, the path of compassion is totally different. Compassion allows." Robert Gonzales

"If your compassion does not include yourself, it is incomplete." Jack Kornfield

TODAY'S PRACTICE:

1. Supported Heart Opener
    a. Place bolster lengthwise along the mat
    b. Lie down with bolster supporting head, neck, and lower back
2. Centering
3. Introduce Theme
4. Intention Setting
5. Pranayama and ujjayi
6. Reclined Warm-Ups:
    a. Lying arm raise X2
        - Inhale raise arms overhead to the floor
        - Exhale lower arms back to sides (palms down)
    b. Double exhale lying arm raise X3
        - Inhale raise arms overhead to the floor
        - On second exhale return arms to sides (palms down)
    d. Releasing Head, Neck and Shoulders
        - Grab the right elbow with the left hand, and pull the right arm out to the left, while turning the head towards the right side
        - Repeat on opposite side
    e. Dashrath's Twist (Dashrathasana)
    c. Angels in the Snow

d. Wind Relieving Series (Pawanmuktasana)
    i. Lie on back with legs extended
    ii. Draw right knee toward the right side of the chest and use hands or strap to pull the right thigh into the abdomen
    iii. Release right leg back extended along the ground
    iv. Draw left knee toward the right side of the chest and use hands or strap to pull the right thigh into the abdomen
    v. Release left leg back extended along the ground
    vi. Draw both knees to chest
    vii. Release both legs back extended along the ground

f. Reclined Leg Series – use strap
- Make circles with right leg
- Hold strap in right hand and lower right leg to the right
- Hold strap in left hand lower leg across the midline of the body to the left
- Lying Hamstring Stretch (Supta Padangushtasana)

e. Toe Taps
- Lie on back and bend knees at a 90 degree angle
- Alternate tapping one toe to the floor at a time, while maintaining 90 degree bend in knees

f. Reclined rest

7. Breath of Joy x10
8. Standing Postures:
    a. Swinging Twists x10
    b. Mountain Pose (Tadasana)
    c. Chair Pose – (Utkatasana) – teach with block
    d. Standing Forward Fold (Uttanasana)
    e. Standing Half Forward Bend (Ardha Uttanasana)
    f. Mountain Pose (Tadasana)
    g. Leg Series
        - Low Lunge (Anjaneyasana) – right leg back
        - Low Lunge Twist Pose (Parivrtta Anjaneyasana)
        - Runner's Stretch (Ardha Hanumanasana) – right leg back
        - High Lunge (Utthita Ashva Sanchalanasana) – right leg back
        - Downward Facing Dog (Adho Mukha Svanasana) – option to go through table
        - Walk feet to hands
        - Standing Forward Fold (Uttanasana)
        - Mountain Pose (Tadasana)
        - Repeat on left side
    h. Warrior Series
        - Warrior I (Virabhadrasana I) – right leg back
        - Warrior II (Virabhadrasana II) – right leg back
        - Triangle Pose(Trikonasana) – right leg back
        - Plank

- Push-up or modified push-up
- Prone resting pose – head resting on backs of hands
- Cobra Pose (Bhujangasana) or Baby Cobra Pose (Ardha Bhujangasana)
- Child's Pose (Balasana)
- Downward facing dog
- Standing Forward Fold (Uttanasana)
- Standing Half Forward Bend (Ardha Uttanasana)
- Mountain Pose (Tadasana)
- Repeat on left side

i. Sphinx Pose (Salamba Bhujangasana)
j. Half Locust (Ardha Salabhasana)
k. Full Locust (Salabhasana)
l. Child's Pose (Balasana)
m. Easy Pose (Sukhasana)
n. Bound Angle Pose (Baddha Konasana)
o. Wide Angle Seated Forward Fold (Upavistha Konasana)
p. Bridge Pose (Setu Bandha Sarvangasana)
q. Reclined Spinal Twist (Supta Matsyendrasana)
r. Savasana
    - Read quote on compassion from Swami Kripalu toward the end of Savasana (Appendix J)

9. Compassion Meditation (Appendix K)
10. Closing
    a. 3 Sun Breaths
    b. Gratitude (i.e., notice anything you feel gratitude for in this moment)
    c. Aum

WEEK 8

THEME: Gratitude

- Focus on what your body can do rather than what it looks like
- Appreciate your body's abilities rather than its limits
- Notice the progression you have made throughout the eight weeks of this group

TODAY'S PRACTICE:

1. Centering
2. Introduce Theme
3. Intention Setting
4. Body Gratitude Meditation (Appendix L)
5. Dhirga and Ujayyi Pranayama
6. Warm-ups:
    a. Hip Circles
    b. Cat Pose (Bidalasana) & Dog Pose (Bitilasana)
    c. Table Pose with lateral flexion
    d. Thread the Needle (Parsva Balasana)
    e. Balancing Cat (Utthita Marjaryasana) – right leg back and left arm lifted
    f. Side Plank Pose (Vasisthasana)
        - Keep right foot behind you, bring foot to floor, pivot and plant the foot and come into side plank with left knee on floor (option to bring left foot back to meet the right)
    g. Table Pose
    h. Balancing Cat (Utthita Marjaryasana) – left leg back and right arm lifted
    i. Side Plank Pose (Vasisthasana) on opposite side
    j. Child's Pose (Balasana)
    k. Side Child's Pose
    l. Extended Puppy Pose (Uttana Shishosana)
        - Option to bring hands into prayer position over head
        - Toe Squat with Eagle arms or grabbing opposite shoulders
    i. Gate Pose (Parighasana)
7. Standing Postures
    a. Gentle Sun Salutation x2
        - Mountain Pose (Tadasana)
        - Standing Forward Bend (Uttanasana)
        - Standing Half Forward Bend (Ardha Uttanasana)
        - High Lunge (Utthita Ashva Sanchalanasana) – right leg back
        - Plank
        - Modified Push-Up

- Baby Cobra Pose (Ardha Bhujangasana), Cobra Pose (Bhujangasana) or Upward Facing Dog (Urdhva Mukha Svanasana)
- Downward Facing Dog (Adho Mukha Svanasana)
- High Lunge (Utthita Ashva Sanchalanasana) – left leg back
- Standing Forward Bend (Uttanasana)
- Standing Half Forward Bend (Ardha Uttanasana)
- Mountain Pose (Tadasana)

b. Toppling Tree Pose (Patanvkshasana) – both sides
c. Child's Pose (Balasana)
d. Downward Dog series – right side
   - Table
   - Bent Knee Downward Facing Dog (Adho Mukha Svanasana)
   - Walk the Dog
   - One Legged Dog Pose
   - Bent knee 3-legged dog, externally rotate hip
   - Pigeon Pose (Kapotasana) – hold for 3 minutes
   - Repeat on left side

8. Floor Postures
   a. Sphinx Pose (Salamba Bhujangasana)
   b. Half Locust Pose (Ardha Salabhasana)
   c. Locust Pose (Salabhasana)
   d. Prone rest
      - Rest face on stacked hands
   e. Staff Pose (Dandasana)
   d. Bound Angle Pose (Baddha Konasana)
   f. Great Seal Pose (Maha Mudra) – both sides
   g. Happy Baby Pose (Ananda Balasana)
   h. Bridge Pose (Setu Bandha Sarvangasana) – teach with strap
   i. Reclined Spinal Twist (Supta Matsyendrasana)
   j. Legs in the air (use block) or Legs Up the Wall Pose (Viparita Karani)
   k. Savasana
      - Read poem Love After Love by Derek Walcott toward the end of Savasana
9. Closing
   a. 3 Sun Breaths
   b. Gratitude
      - Take a moment to feel gratitude to your body for completing this practice
      - Feel gratitude to yourself for completing this eight-week Yoga program
      - Think of 3 things in your life for which you feel grateful
   c. Aum

Appendix G

Mindfulness of the Breath

Begin by noticing the support of the mat and floor. Notice where they come into contact with your body and take a moment to feel those points of contact. Notice that you are fully supported in this moment.

Now begin to draw your attention to the breath. Notice the sensations of the breath in your body. You may notice the natural rise and fall of your chest and abdomen. Or perhaps you will feel the sensation of the air at the tip of your nose or the space above your upper lip. You may even notice the slight difference in the temperature of the air between the inhale and the exhale. Now choose one area in your body to focus on the sensations of the breath. Perhaps choosing the area where you feel the breath most strongly. Simply observe the breath flowing in and out without trying to control or modify it in any way...

When you notice that your mind has wandered, which it surely will, you may also notice that when you realize your mind has wandered your attention is back in the present moment. When you find your attention back in the present moment, gently redirecting it back to the breath. Focusing once again on the sensations of the breath as they are happening in this moment. Simply observing the breath flowing in and out...

The next time you notice your mind has wandered, as minds do, notice with a curious and kind attention where it has gone. Noticing if it's thinking, worrying, planning, imagining, feeling bored, or whatever. Simply noticing. Then gently redirecting your attention back to the breath and once again feeling the sensations of the breath as they are happening in this moment. As you focus on the breath you may begin to notice its natural cycle. The inhale is followed by a slight pause, where your lungs feel relatively full. This is followed by the exhale, which is followed by another slight pause, where your lungs feel relatively empty. This leads to the inhale and around it goes. Focusing on your breath as it naturally flows through this cycle....until the next time your mind wanders. When you notice your mind has wandered, again noticing with a curious and kind attention where it has gone and this time labeling where it has gone. Labeling it as thinking,

feeling, imagining, or sensing. Then gently returning your attention to the breath. Noticing where the breath is in its cycle when your return.

You may begin to notice that you are not your thoughts, feelings, sensations, or images. In the same way that the sky is not the rain, the sun, the clouds, or the wind, your thoughts, feelings, sensations, and images are experiences that you are having, but they are not you. All of these experiences pass but you remain. One thought leads to the next. We get distracted. Emotions and sensations may increase in intensity but they will eventually crest and pass. Images come and go. So the next time you realize your mind has wandered, notice with a curious and kind attention where it has gone, label the experience as thinking, feeling, sensing or imagining, and this time you may imagine seeing the experience as a cloud in the sky. Not so you can push it away but so you can notice its transient nature. Allowing these clouds to come and go on their own, because they will come and go on their own, as you bring your attention back to the breath. Some clouds may pass more quickly than others, some may come back repeatedly, but each time they will pass. And each time choosing to come back to the breath. Allowing the breath to be your anchor amongst these cloudy and windy skies...

Each time the mind wanders, gently noticing and labeling where it's gone, allowing these clouds to come and go as they will, as you redirect your attention back to the sensations of the breath as they are happening in this moment.

Each time, as if for the first time, coming back to the breath…

[Leave in silence for 5 minutes]

Now letting go of this meditation. As you lay here, take a moment to notice the effects of this practice on your physical body, your mental body, your emotional body, and if it fits for you, on your spiritual body.

Now gently beginning to come back to the room. Feeling the support of the ground and gently opening your eyes.

Appendix H

Progressive Muscle Relaxation

Instructions: During this exercise you will be asked to apply tension to particular muscles and then relax them. We will move through the major muscle groups of the body. For each area, you will be asked to tighten the muscle for about five seconds, focusing on the tension this creates in the muscle. You will then be asked to relax the muscle, feeling the difference between the tension and the relaxation. Be careful not to strain too much when you tense your muscles. Try your best to tense only the muscle being targeted, keeping the surrounding muscles soft and limp. If any muscles are already very tight, or if you experience any pain or discomfort, feel free to omit tensing that area and simply focusing on relaxing the muscle. You may find it helpful visualize the muscles tensing and tightening in your mind's eye and imagine a wave of relaxation washing over the muscle as you release that tension. If your mind begins to wander during the practice, simply redirect it back to the muscle we are focusing on. Remember to keep breathing throughout the practice.

Begin by finding a comfortable position lying down. Take a deep breath all the way down into your abdomen and exhale slowly. Feel your abdomen and chest rising as your lungs fill with air and deflating as you exhale.

With each exhale, invite your body to let go more and more, allowing yourself to sink further into the support of the mat. Invite your body to relax and allow any tension or tightness to melt away like water dripping off an ice cube.

Now begin to tighten the muscles in your forehead by raising your eyebrows as high as you can. Feel the tension this creates in your forehead. As you relax your forehead, feel that tension melt away.

Next, tighten your eye muscles by squinting your eyelids tightly shut. Hold for about 5 seconds, and release, noticing the contrast. Imagine sensations of deep relaxation spreading over your eyes.

Now smile widely, feeling the tension this creates in your mouth and cheeks. Hold, and release, feeling the softness in your face.

Gently open your mouth as wide as you can, tensing your jaw muscles. Hold, and as you release, feel the tension flowing out of the jaw. Allow your jaw muscles to become relaxed and loose.

Now jut your bottom jaw forward. Feel how this tightens the muscles in your neck. Hold, and as you release feel the neck muscles become soft. Imagine a wave of relaxation spreading across your neck.

Pause here and take a moment to feel the relaxed softness of your head and face. Allow the weight of your head to sink into the mat. Letting go a bit more on each exhale.

Now, tightly, but without straining, draw your shoulders up to your ears. Feel the tension this creates in your neck and shoulders. Focus on squeezing these muscles. Hold. And now focus on letting these muscles go loose and limp as you release the tension.

Draw in a big breath now and hold your breath. Notice how this tightens your chest muscles. Feel the buildup of tension as you hold your breath. And enjoy the release as you exhale. Feel the contrast between the contraction and the softening of your chest muscles.

Now draw your shoulder blades together behind your back, feeling the muscles in your upper back tense. Focus on this tension as you hold. And now allow the back muscles to become slack. Notice the contrast.

Now gently arch your lower back, tightening the lower back muscles. Hold for a few seconds and then let the back muscles relax and release.

Bring your awareness to your abdomen. Draw your navel in toward your spine. Contract your abdominal muscles and feel the tension. As you exhale, allow the belly to soften and notice the sensation of relief that comes from letting go.

As you lay here, feel the sensations of relaxation spreading through your body. Notice the softness in your upper body.

Bring your attention now to your arms. Gently tighten your bicep muscles as you bend your elbows and draw your forearms toward your shoulders. Focus on tightening your upper arm muscles. And then let the biceps go limp and loose as you release your arms slowly back down to your sides. Feel the contrast of the letting go.

Now tighten your triceps by lifting your arms just off the ground. Keep your arms straight as you intentionally tighten the backs of your upper arms. Hold. And enjoy the feeling of relief as you gently lower your arms back to the floor.

Now, keeping your arms on the floor, gently bend your wrists and draw your hands toward your forearms as if you were reaching for your elbows. Hold for a moment, and then release. Feel the tension melting away.

And now clench your fists, tensing your hands. Hold for a few seconds and then release. Allow your hands to gently uncurl and your palms and fingers to soften and go limp.

Take a few breaths here to feel the wave of relaxation spreading down your arms and hands. Allow yourself to relax further with each exhale. Simply letting go.

Now bring your attention to your legs. Begin by tightening your gluteal muscles. Firmly clench your buttocks and hold, feeling the tension build. Hold for five seconds, and then release, enjoying the sense of relief as you relax your buttocks. Focus on letting these muscles go slack.

Tighten your thighs by drawing your kneecaps upward. Hold and then release the tension as you exhale. Feeling your upper legs relax completely.

Direct your attention now to your calf muscles. Flex your feet and pull your toes toward your shins. Feel the tension building in your calves as you hold. Feel the relaxation spread across your calf muscles as you release.

Lastly curl your toes, tensing your feet. Hold. Enjoy the relief as you relax your feet.

Take a moment now to scan your entire body. You may want to gently contract and relax any muscles that are still carrying tension. Take your time, and invite these muscles to let go when you release the tension.

Now imagine a wave of relaxation washing over your entire body. Feel it spread all the way from the crown of your head down to the tips of your fingers and toes. Take a few more minutes to rest. Gently breathe in and out as your enjoy these feelings of relaxation and peace.

Appendix I

Body Scan

Begin by drawing your attention to your breath. Notice how it has always been there, in the background, throughout your whole life. Slowly begin to deepen the breath. Notice how your belly, side body, and chest expand as your lungs fill with air. And how your body naturally relaxes and lets go on the exhale. Draw in a deep breath and let it out with a sigh. Allow yourself to land on your mat. Leaving your day, any plans you may have, or any concerns you may be carrying at the door. Draw in another deep breath and again let it out with a sigh. Feel where your body comes into contact with and it support by the floor. Feel your sitz bones grounded on the mat or block. Now release any conscious control of the breath. Simply allow the body to breathe itself. Even if the breath feels jagged or tense, it's OK. Allow it to be just as it is.

And now repeat this mantra silently to yourself. *Everything is OK right now*. *I do not need to try to change anything about this moment. I can make space for whatever this moment holds.*

And now gently bring your awareness to the top of your head. Notice any sensations you may be feeling there. Allow your awareness to slowly move down your head and face. Feeling and allowing any sensations that are present as you begin to scan your body. Feel your forehead, your eyebrows, the space between the eyebrows, and the eyelids. Become aware of your nose. Feel the breath as it moves in and out at the nostrils. Notice the slight difference in the temperature of the air between the inhale and the exhale. Notice your cheeks, your jaw, and chin, just experiencing them as they are in this moment. Feel any sensations that are present, without trying to change them. Become aware of your lips, your mouth, the teeth and the gums, your tongue, and the roof of your mouth. Now notice your temples and ears, experiencing the sensations on the side of your head.

With each breath sinking even deeper into a state of relaxed observation and awareness. Letting go of any thoughts or impulses that arise, simply experiencing yourself as you are in this

moment. And now let the focus of your attention move onto the neck and the throat. Experience what it feels like when you swallow, when you breathe. Feel the air move down into the chest region. Use your awareness to explore any sensations here. You may even feel the beating of your own heart. Feel now the entirety of the front body – the lungs, the ribcage, and the belly. Experience the expansion of the front body on the in-breath and the contraction of the body on the out-breath.

Now begin to feel your back body. Gently scan the upper back, the mid-back and the lower back. Notice any and all sensations that are present. Feel your shoulders, noticing any tension you may be carrying here. Breathe into and out of any tension that may be present. Now gently direct your attention down your arms. Directly sense your biceps, triceps, and forearms. Notice your hands. Feel where they come into contact with your lap. Feel the fingers. See if you can feel each finger separately.

And become aware now of the pelvis, hips, groin, and buttocks. Being present with any sensations, or lack of sensations, and allowing them to be just as they already are. Notice the sensations of contact with the floor or block. Allow your awareness to slowly move down your legs, directly sensing the quadriceps, hamstrings, knees, shins, and calf muscles. Now feel your feet and toes. Be totally present in each moment.

Now shift your attention to the body as a whole… Feel the breath move through the entire body. Notice how the perimeter of the body subtly expands on the inhale and subtly releases on the exhale. *Everything is OK right now*. *I do not need to try to change anything about this moment. I can make space for whatever this moment holds.*

Take one final deep full breath and let it out with a sigh.

Appendix J

Swami Kripalu's Teachings on Compassion

"My beloved child, break your heart no longer. Each time you judge yourself, you break your own heart. You stop feeding on the love, which is the wellspring of your vitality. The time has come. Your time. To live. To celebrate, and to see the goodness that you are… Do not fight the dark. Just turn on the light. Let go, and breathe into the goodness that you are."

~ Swami Kripalu

Appendix K

Compassion Meditation

Take a moment to feel the signs of life in your body. Feel your breath, your beating heart, and the life force within you. Notice how you value your own life, how you contract in the face of pain, and strive to avoid suffering. Now, think of someone you love. Picture this person and feel how your heart naturally opens toward him or her. Now think of your loved one's struggles, pains, and sorrows in life. Notice the caring you feel for this person. Feel your natural inclination to want to comfort your loved one and meet his or her suffering with compassion. This is the natural response of the heart. As you think of your loved one, inwardly recite the phrases:

May you be well.

May you be free from pain and sorrow.

May you be peaceful and at ease.

May you be filled with loving kindness.

May you be happy.

Now turn your compassion toward yourself. Notice the struggles, pains, and sorrows you have endured. Recite the same phrases:

May I be well.

May I be free from pain and sorrow.

May I be peaceful and at ease.

May I be filled with loving kindness.

May I be happy.

Now begin to extend compassion to others in your life. Slowly think of your friends and loved ones. Hold each of these people in your heart, reflecting on their difficulties. Now send them compassionate thoughts.

May you be well.

May you be free from pain and sorrow.

May you be peaceful and at ease.

May you be filled with loving kindness.

May you be happy.

Now allow your compassion to extend further. First to the suffering of your neighbours, and then to members of your community. Now open your heart to all who suffer. Including difficult people and even those who have caused you pain and hurt you or those you love. Finally extend compassion to all beings. Sense your connection with every living being. Your common humanity. Inwardly recite the same phrases.

May all beings be well, as I wish to be well.

May all beings be free from pain and sorrow, as I wish to be free from pain and sorrow.

May all beings be peaceful and at ease, as I wish to be peaceful and at ease.

May all beings be filled with loving kindness, as I wish to be filled with loving kindness.

May all beings be happy, as I wish to be happy.

Appendix L

Body Gratitude Meditation

Adapted from Dr. Debora Durand and the Body Positive Website

Begin by drawing your attention to the breath. Do not try to control or modify the breath in any way. Simply observe it flowing in and out. Allowing the body to breathe itself. Now begin to scan your body, becoming aware of any sensations that are present in your body in this moment. Acknowledge any pleasant, unpleasant, or neutral sensations without trying to change them. Breathe into what is.

Now take some time to notice any recent gifts you have received from your body. Perhaps your body has: transported you someplace important or special; learned a new physical skill like Yoga; become stronger; allowed you to embrace a loved one; given you sensual pleasure; healed a bruise or fought off an infection; stayed awake when you needed to finish a task despite being tired; allowed you to appreciate the sights and sounds of spring; used pain, sadness, or frustration to alert you to something that needed your attention; rejuvenated itself through sleep; defended you when you were in danger; allowed you to comfort someone you care about or to receive comfort yourself; allowed you to express yourself and say yes to things you wanted to do or say no to things you could not or did not want to do.

Notice any feelings that arise as you allow the awareness of these gifts from your body to come and go in your awareness. You may be experiencing some positive feelings toward your body, and you may be experiencing some angry or frustrated feelings toward it too. Allow all of these feelings to be present in your awareness and gently hold them in compassion.

Now think of one gift from your body that you especially appreciate. Take your time and try to find one gift to focus on.

Allow yourself to feel gratitude to your body for this gift. Think about what you might like to say to your body to express this appreciation. Take some time to develop a phrase that captures the appreciation you feel.

Now say this phrase to your body. Notice what it feels like both to say and receive these words.

Perhaps this is something you could say to yourself more often. You may want to set an intention to acknowledge your body's gifts more frequently. Think of a time in your day when you would like to start acknowledging and appreciating your body's gifts of service. Set an intention to acknowledge and appreciate your body's gifts each day.

Appendix M

Table A1.

Comparisons of Study Completers and Non-Completers at Week Zero

	Completers			Non-Completers					
Variable	*M*	*SD*	*n*	*M*	*SD*	*n*	*t*	*df*	*p*
Age	29.32	10.39	53	33.11	14.67	19	-1.04 [a]	24.77	.311
BMI	27.90	6.82	53	29.39	8.26	19	-0.77	70	.443
ATSPPH-SF	20.49	6.07	53	23.11	3.90	19	-2.14 [a]	49.79	.037*
NTS	27.09	35.20	52	37.67	39.30	15	-1.47	67	.145
IS	26.53	6.27	53	25.16	7.17	19	0.79	70	.434
HS	8.25	4.65	53	9.11	5.23	19	0.67	70	.506
SCS-SF	2.18	0.53	53	2.48	0.96	19	-1.31[a]	22.01	.204
DERS	108.42	23.55	53	103.63	25.17	19	0.75	70	.458
TB	12.21	7.59	53	12.74	9.05	19	-0.25	70	.805
BD	11.67	7.22	39	11.32	10.12	19	0.15	56	.880

Note. IS = Inadequate Self; HS = Hated Self; SCS-SF = Self-Compassion Scale-Short Form; DERS = Difficulties in Emotion Regulation Scale; TB = number of times binge eating; BD = number of binge days; ATSPPH-SF = Attitudes Toward Seeking Professional Psychological Help-Short Form; NTS = number of therapy sessions.
[a] Equal variances not assumed.
*$p < .05$. **$p < .01$.

Appendix N

Table A2.

Descriptive Statistics for the Total Sample

Time	Outcome Measure	*M*	*SD*	Skewness	Kurtosis	Range
Week 0	IS	26.53	2.27	-0.82	0.28	25
	HS	8.25	4.65	.013	-0.73	19
	SCS	2.18	0.53	0.41	0.25	2.25
	DERS	108.42	23.55	-0.03	-0.16	90
	TB[a]	3.29	1.19	-0.29	-0.77	4.29
	BD[a]	3.23	1.14	-0.20	-0.62	4.29
Week 8	IS	24.62	7.82	-0.44	-0.98	27
	HS	7.85	5.01	0.04	-0.89	17
	SCS	2.45	0.80	0.65	-0.30	3.09
	DERS	101.64	25.70	0.01	-1.06	101
	TB[a]	2.53	1.52	0.33	-0.33	6.32
	BD[a]	2.37	1.45	0.23	-0.63	5.29
Week 12	IS	23.77	8.10	-0.33	-1.02	28
	HS	7.15	4.81	0.12	-0.81	17
	SCS	2.46	0.78	0.31	-0.68	3.16
	DERS	102.53	26.38	0.26	-0.36	113
	TB[a]	2.51	1.80	0.44	-0.71	6.32
	BD[a]	2.39	1.74	0.42	-0.91	5.29

Note. IS = Inadequate Self; HS = Hated Self; SCS-SF = Self-Compassion Scale-Short Form; DERS = Difficulties in Emotion Regulation Scale; TB = number of times binge eating; BD = number of binge days.
[a]These variables have been square root transformed.

Appendix 0

Table A3.

Descriptive Statistics for Untransformed Binge Eating Frequency Scores

		Total Sample			Yoga Group			Control Group		
Time	Outcome Measure	*M*	*SD*	Range	*M*	*SD*	Range	*M*	*SD*	Range
Week 0	TB	12.21	7.59	27	11.46	7.46	27	12.93	7.79	27
	BD	11.67	7.22	27	11.63	6.90	27	11.70	7.70	27
Week 8	TB	8.68	8.89	40	5.12	5.44	20	12.11	10.22	40
	BD	7.67	7.67	28	4.58	5.20	20	10.60	8.58	40
Week 12	TB	9.47	10.91	40	5.15	7.80	28	13.63	11.96	40
	BD	8.64	9.91	28	5.63	8.55	28	11.50	10.46	28

Note. TB = number of times binge eating; BD = number of binge days.

Appendix P

Comparisons with Existing Research

Self-criticism

Participant scores on the FSCRS were compared to normative data for this measure (Whiteside et al., 2007). As discussed in the method section, the FSCRS measures two factors of self-criticism: inadequate self and hated self. As expected, participants in both the Yoga group (M = 26.38, SD = 6.24) and control group (M = 26.67, SD = 6.41) scored higher than a sample of non-clinical females at week zero on the Inadequate Self subscale of the FSCRS (M = 18.11, SD = 8.50). Participants in the Yoga group (M = 7.96, SD = 5.08) and control group (M = 8.52, SD = 4.27) also scored higher than the sample of non-clinical females on the Hated Self subscale of the FSCRS (M = 3.88, SD = 4.59). Interestingly, participants in this study scored lower than the normative data for females from a clinical sample for both inadequate self (M = 27.51, SD = 7.89) and hated self (M = 11.91, SD = 6.10). This clinical sample consisted of mixed diagnoses but did not include individuals with eating disorders. In order to determine if participants' scores on self-criticism were comparable to other individuals with eating disorders, their scores were also compared to those of participants in the only other study in which researchers examined both FSCRS subscale scores in a sample of women with eating disorders (Barrow, 2007). In comparison, women in the present study scored slightly higher than the participants in Barrow's (2007) study on Inadequate Self (M = 25.35, SD = 7.47) and slightly lower than these participants on Hated Self (M = 9.59, SD = 5.76) indicating the women in the present study had higher levels of personal inadequacy and lower levels of self-hatred.

Self-compassion

Participants in the present study also scored comparably to existing research on SCS-SF scores of women with eating disorders. Participants in both the Yoga group (M = 2.18, SD = .50) and control group (M = 2.16, SD = .57) scored slightly higher at week zero than a sample of female eating disorder patients in a recent study by Kelly and Carter (2014; M = 2.04, SD = .68). As expected, these scores are all below 2.5, which is considered to be indicative of low self-compassion (Neff, 2009).

Emotion Regulation Difficulties

Participants in the present study scored higher on the DERS when compared to a group of binge-eating students in a recent study by Whiteside and colleagues (2009). The Yoga group (M = 108.73, SD = 22.58) and the control group (M = 108.11, SD = 24.88) both scored higher than the binge-eating students (M = 96.19, SD = 24.96), but within the range of scores from the study by Whiteside et al. (2009). Participants in both studies were well above the average scores of 81 for males and 78 for females found in the sample used by Gratz and Roemer (2004) in the development of the DERS. This corroborates existing research suggesting that individuals with eating disorders have difficulty regulating their emotions (Bydlowski et al., 2005; Telch et al., 2001), as higher scores indicate greater difficulty with emotion regulation.

Binge Eating Frequency

By definition, individuals with BN or BED engage in binge eating episodes at least once per week (APA, 2013). At week zero of the present study, participants in the Yoga group reported an average of 11.46 *(SD* = 7.46) times binge eating and 11.63 (SD = 6.90) binge days over the past 28 days (SD = 7.46); participants in the control group reported an average of 12.93

(*SD* = 7.79) times binge eating and 11.70 (*SD* = 7.70) binge days over the past 28 days. These numbers are lower than the frequency of binge days reported by a sample of women with BED (*M* = 16.2, *SD* = 7.76) in a study conducted by Goldfein and colleagues (2005). This difference may be attributable to DSM-IV-TR diagnostic criteria for BED being used in the study by Goldfein and colleagues, which may have resulted in screening out women who reported fewer binge eating episodes but would have meet DSM-5 criteria for the disorder.

Mindfulness

To date no researchers have measured mindfulness states in individuals with BN or BED using the TMS, making comparison of participant scores on the TMS impossible. Instead, participants' TMS scores were compared to a sample of participants with less than one year of mindfulness practice (Lau et al., 2006). The Yoga group participants scored lower on both the decentering (*M* = 15.85, *SD* = 4.18, compared to *M* = 23.29, *SD* = 7.81) and curiosity (*M* = 12.89, *SD* = 5.72 compared to *M* = 16.42, *SD* = 9.42) subscales of the TMS. This difference in scores may be attributed to the participants in the present study having no or very limited previous mindfulness experience, whereas the participants in Lau et al.'s (2006) study had between zero mindfulness experience and up to just under a year of experience.

Attitudes Towards Seeking Professional Psychological Help

Participants in the present study scored lower on attitudes towards seeking professional psychological help, as measured by the ATSPPH-SF, than participants exhibiting disordered eating attitudes and behaviours in a recent study (Hackler, Vogel, & Wade, 2010). The Yoga group (*M* = 20.98, *SD* = 6.28) and the control group (*M* = 20.04, *SD* = 5.94) both scored lower

than the women in the other study (M = 26.00, SD = 6.37), indicating they had less positive attitudes toward help seeking.

Home Practice

The Yoga participants reported practicing an average of 381 minutes, which equates to 6.35 hours, of home practice over the eight weeks of the Yoga program (M = 381.04, SD = 277.01). The range in the amount of home practice across participants was considerable. One participant reported engaging in no home practice over the eight weeks, whereas four participants reported acquiring 922 minutes (15 hours and 37 minutes) of home practice over the eight weeks. A review of the literature found that other studies have also had a considerable range in the amount of home practice reported by participants (Vettese, Toneatto, Stea, Nguyen, & Wang, 2009). This wide range in the amount of home practice, as well as the lack of consistency in the way home practice is tracked, the lack of data on compliance of home practice, and the many different forms of mindfulness practices engaged in at home by participants, make comparisons difficult (Vetesse et al., 2009). One study examined the effects of the MBSR program on patients with early-stage breast cancer and found that participants engaged in 13 minutes of Yoga practice per day over the eight-week program (Carlson et al., 2004). By averaging out the 381 minutes of home practice over the eight weeks of the Yoga program it can be approximated that participants in the present study engaged in 47.68 minutes of home practice per week, or roughly 6.8 minutes per day. While this method of determining the amount of daily home practice is far from ideal, it suggests that the participants in the present study engaged in approximately half the amount of Yoga home practice as the participants in Carlson et al.'s (2004) study.

Appendix Q

Table A4.

Correlational Analyses Using the Total Sample

Variable	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. IS W0	.64**	.71**	.75**	.56**	.61**	-.81**	-.60**	-.62**	.70**	.53**	.50**	.04	.14	.13	-.04	.10	.08
2. IS W8	_	.91**	.59**	.85**	.79**	-.53**	-.74**	-.68**	.41**	.68**	.57**	.15	.29*	.35*	.01	.22	.26
3. IS W12		_	.65**	.81**	.83**	-.63**	-.83**	-.87**	.48**	.71**	.69**	.14	.37**	.39**	.03	.27	.31
4. HS W0			_	.68**	.69**	-.72**	-.55**	-.52**	.70**	.47**	.49**	.20	.24	.28*	.21	.20	.27
5. HS W8				_	.92**	-.51**	-.76**	-.64**	.46**	.72**	.67**	.20	.40**	.42**	.01	.28	.28
6. HS W12					_	-.58**	-.75**	-.74**	.55**	.74**	.76**	.14	.32*	.33*	-.05	.22	.24
7. SCS W0						_	.59**	.67**	-.80**	-.50**	-.60**	-.13	-.11	-.17	-.10	-.16	-.17
8. SCS W8							_	.79**	-.42**	-.75**	-.70**	-.20	-.42**	-.47**	-.06	-.37*	-.38*
9. SCS W12								_	-.56**	-.71**	-.78**	-.15	-.38**	-.38**	-.05	-.35*	-.35*
10. DERS W0									_	.58**	.66**	.15	.16	.16	.15	.19	.13
11. DERS W8										_	.84**	.05	.28*	.27	-.15	.24	.15
12. DERS W12											_	.16	.39**	.37**	.00	.38*	.30
13. TB W0[a]												_	.64**	.67**	.98**	.66**	.68**
14. TB W8[a]													_	.84**	.64**	.98**	.86**
15. TB W12[a]														_	.67**	.85**	.99**

Variable	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
16. BD W0[a]															_	.67**	.70**
17. BD W8[a]																_	.86**
18. BD W12[a]																	_

Note. IS = Inadequate Self; HS = Hated Self; SCS = Self-Compassion Scale; DERS = Difficulties in Emotion Regulation Scale; TB = Times Binge eating; BD = Binge Days; W0 = Week 0; W8 = Week 8; W12 = Week 12.
[a]These variables have been square root transformed.
*p < .05. **p <.01.

Appendix R

Table A5.

Correlations of Number of Therapy Sessions with the Other Dependent Variables

Variable	*r*	*n*
Times Binge Eating Week 0	.01	53
Times Binge Eating Week 8	.05	53
Times Binge Eating Week 12	.13	53
Binge Days Week 0	-.04	53
Binge Days Week 8	-.01	53
Binge Days Week 12	.12	53
DERS Week 0	-.15	53
DERS Week 8	-.21	53
DERS Week 12	-.29*	53
SCS-SF Week 0	.04	53
SCS-SF Week 8	-.02	53
SCS-SF Week 12	.10	53
Inadequate Self Week 0	.07	53
Inadequate Self Week 8	.07	53
Inadequate Self Week 12	-.08	53
Hated Self Week 0	.08	53
Hated Self Week 8	.10	53
Hated Self Week 12	-.02	53
Decentering Week 1	-.32	26
Decentering Week 3	-.09	26
Decentering Week 6	.19	26

Variable	*r*	*n*
Decentering Week 8	-.10	26
Curiosity Week 1	.02	26
Curiosity Week 3	-.26	26
Curiosity Week 6	-.07	26
Curiosity Week 8	-.34	26

Note. DERS = Difficulties in Emotion Regulation Scale; SCS-SF = Self-Compassion Scale.