

An Investigation of the Pertinent Factors Associated with Overweight and Obesity

Submitted by

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BA (Honours), BBSocSc (Psychology)

Submitted in total fulfilment of the requirements for the degree of

Doctor of Philosophy

School of Psychology

Faculty of Arts and Sciences

Australian Catholic University

June, 2012

Statement of Authorship and Sources

This thesis contains no material published elsewhere or extracted in whole or in part from a thesis by which I have qualified for or been awarded another degree or diploma.

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June, 2012.

Abstract

The prevalence of obesity is increasing at such an alarming rate worldwide that the World Health Organisation (WHO) has declared it a global epidemic. Recent epidemiological data from WHO forecasts that by 2015, approximately 2.3 billion people will be overweight or clinically obese. Obesity is stigmatised on both health and aesthetic grounds, and is associated with serious health impairments, psychosocial consequences, and a shortened life span. As a result, eating pathology has become a central focus of current health prevention.

Adding further strain to the pandemic is the pervasive finding that obesity is largely resistant to treatment. Research has shown that losing 5-10% of body weight produces significant physical and psychosocial effects, provided the weight-loss is maintained. However, extant research has consistently found that weight-loss is almost always regained over time. Participants in obesity treatment programs typically regain approximately 50% in the first year following the cessation of treatment, and by three to five years following treatment, 80% of participants have regained all of the weight lost, and have frequently exceeded their pre-treatment weight. These results have necessitated new approaches to the treatment of obesity.

Recent research has revealed that targeting the psychological factors associated with body weight and training individuals in acceptance and mindfulness skills have been effective for weight-loss. The aims of this thesis were twofold. First, it aimed to investigate the pertinent factors that are associated with overweight and obesity. Second, it aimed to examine the efficacy of a pilot obesity treatment program using dialectical behaviour therapy principles. Three studies are included in this thesis. First, a broad range of biological, social, environmental, and psychological factors that have been shown to be associated with body weight were explored. The results from Study 1 indicated that the psychological influences on body weight were the most pertinent factors differentiating

healthy weight individuals from overweight and obese individuals. In particular, overweight and obese individuals demonstrated lower levels of self-efficacy for weight related and health behaviours, greater difficulty in controlling overeating in response to negative affect and to different social contexts. Moreover, overweight and obese participants were shown to be less likely to employ self-monitoring techniques.

Subsequently, Study 2 investigated additional psychological factors by examining whether there were differences between healthy weight individuals and overweight and obese individuals with regard to self-esteem, body esteem, and sociocultural attitudes towards appearance. The findings from this study revealed that body esteem was the most prominent factor distinguishing healthy weight individuals from their overweight or obese counterparts.

Thereafter, the results of Study 1 and Study 2 formed the rationale for the development of a pilot DBT-informed obesity treatment program using six case studies. Study 3 investigated whether dialectical behaviour therapy may be useful in addressing these psychological factors to achieve slow weight-loss that can be maintained over time. There were four main findings from this study. First, the trend in scores highlighted a positive link between body esteem and weight-loss. As participants lost weight over time, their satisfaction with body weight and appearance also increased. Second, five out of six participants demonstrated an increase in self-monitoring, which suggests that self-monitoring of weight and health-related behaviours is relevant to weight-loss. Third, the results reveal that a two-day workshop is insufficient time to adequately address the negative emotions that individuals reported experiencing. Finally, five out of six participants demonstrated weight-loss between baseline and six-months post-treatment. Notably, two participants from the treatment group reported substantial weight-loss of nine kilograms and twelve kilograms. Participants in the active control group reported small weight-loss of two kilograms, three kilograms, and five kilograms, respectively. These

results suggest that the treatment had some impact on weight-loss, although it is unknown which aspect of the treatment that may be. It is recommended that future research use a randomised controlled trial to investigate the efficacy of a DBT-informed of longer duration with a large sample size, expert DBT clinicians facilitating the treatment groups, and exclude comorbid mental health disorders. While it is expected that obesity treatments will continue to improve, a focus on prevention and early intervention is recommended to halt the current global obesity epidemic.

Acknowledgements

Numerous people have helped me throughout the course of my studies and leading up to the completion of this thesis. To all of you, I offer my sincere gratitude and appreciation. Specifically, I would like to acknowledge and thank the following individuals for their contribution to my achievement and success.

Dr. David Hamilton. Your constructive feedback, calmness, and encouragement were greatly appreciated. I am thankful for your input and assistance; you got me to the end!

Associate Professor Cecelia Winkelman. Thank you for sharing your insight and knowledge into the clinical aspects of this project and the therapeutic factors surrounding group process. Your contributions to the final edits of this thesis were very important and I am appreciative of your input.

Dr. Lisa Eisen. Your practicality, foresight, and wisdom were invaluable. I am indebted to you for getting both my research and myself back on track when I was in the midst of thesis despair.

Carlee Mark. You are an incredible sister, faithful friend, and beautiful woman. Thank you for your continual encouragement and understanding. Your generosity and selflessness inspires me greatly. It is a privilege to call you sister and friend.

Keara Blundell. You are the most fun-loving woman I know, and you have been a constant source of laughter and fun. Thank you for being such an amazing friend. Your encouragement and faith have motivated me to continue living my dreams.

Emily Musgrove. Your friendship, laughter, wisdom, and calmness have not only made this journey bearable, they have made it worthwhile. Thank you for sharing the stress, emotional dysregulation, trauma, and tears that frequented this process. You are a constant source of love and friendship.

To all my *friends* who have helped me out in many different ways. Thank you for continuing to love and support me even though I have been missing in action and largely

only in contact via cyberspace. I look forward to finally spending quality time with you all and being a real friend now that this thesis is finished.

To my late Nanna and Grandad, *Doris and Peter Roberts*. Not a day goes by that I do not think about you. I love and miss you both greatly. Thank you for taking extra-special care of me while my parents lived interstate. Your wonderful meals, hospitality, and wisdom were greatly appreciated. I will always miss you.

Above all, to *The King*; Psalm 23. My hope is in You.

A thing is not impossible merely because it is inconceivable

(Lewis Carroll)

Courage is love's miraculous face. It achieves its miracles through transformation. It allows the impossible to become possible; the unendurable to be endured; trust to be renewed; and the unexpected to become the inevitability that opens you to unprecedented insights about who you are, about what life is.

(Stephanie Dowrick)

Dedication

This thesis is dedicated to my parents, *Cheryl and Lance Thomas*. Throughout my life you have modelled the courage, discipline, and determination that I have needed in myself to fulfil my dreams. Thank you for instilling in me a confidence that I can do anything I put my mind to, and that my dreams are only as far away as I am willing to reach out and seize them. Thank you for not giving up on me, even when I was giving up on myself. Your stability and love have often been the only constants in my life. I am immensely grateful for your unwavering support and encouragement, which has allowed me to continue with postgraduate study and complete this thesis. Thank you for giving me the liberty to wander freely. I love, adore, and cherish both of you. You have, together, been my rock and place of shelter.

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Chapter 1: General Introduction

Overview of the problem

The World Health Organisation (WHO) has declared the increasing prevalence of overweight and obesity a global epidemic. Obesity is associated with serious medical and mental health impairments and a shortened life span (Stroebe, Mensink, Aarts, Schut, & Kruglanski, 2008). Eating pathology has subsequently become a central focus of current health prevention. Adding further strain to this weight pandemic is the fact that weight-loss is almost always regained over time (Ash et al., 2006; Wilson, 1996; Yanovski, Bain, & Williamson, 1999). At present, obesity is largely resistant to current treatments, which predominantly include pharmacological and behavioural methodologies (Byrne, Cooper, & Fairburn, 2003). To accept that people are unable to lose weight and maintain that weight loss, means that by 2015, approximately 2.3 billion people will be overweight or obese, and that there is nothing that health professionals, the community, or the individuals themselves, can do about it (WHO, 2008). These results suggest that a new approach is required for the treatment of obesity.

Thesis organisation

This thesis is organised into five chapters. Chapter 1 includes a general introduction to the research topic and outlines the overall rationale and aims of the thesis as a whole, and each study separately. Chapter 2 is a report on Study 1, which investigated whether there were differences between healthy weight and overweight or obese individuals with regard to a range of biological, social, environmental, and psychological factors that are associated with overweight and obesity. Chapter 3 is a report on Study 2, which examined whether there were differences between healthy weight and overweight and obese individuals with regard to self-esteem, body esteem, and sociocultural attitudes towards appearance. Chapter 4 details Study 3, which outlines a pilot study using six case studies to investigate whether dialectical behaviour therapy may be an effective treatment approach

for overweight and obesity. The overall summary of this thesis, including the theoretical and practical implications, future research directions, limitations, and final conclusions are presented in Chapter 5.

Prevalence of obesity

Global trends over the past two decades indicate that the prevalence of obesity is continually increasing worldwide, affecting people of all ages, levels of economic status, and racial and ethnic groups (Ash et al., 2006; Atlantis, Barnes, & Singh, 2006; Curioni & Lourenco, 2005; Labib, 2003; Ozmen et al., 2007; WHO, 2008). Although the obesity epidemic was previously understood to only be a major public health concern in developed nations such as Australia, the United States, and the United Kingdom (Catford & Caterson, 2003; Popkin & Doak, 1998), body mass and size are now concurrently escalating within low- and middle-income countries such as Brazil, Cuba, and Egypt, particularly for those living in urban settings (Ash et al., 2006; Popkin & Doak, 1998; WHO, 2008). Unless this trend is curtailed, by 2015 obesity-related disease, disability, and death are projected to affect 2.3 billion overweight adults and 700 million clinically obese individuals worldwide (WHO, 2008).

Costs associated with obesity

Obesity is associated with a host of deleterious medical and psychosocial consequences and contributes to numerous increases in chronic disease morbidity (Ash et al., 2006; Catford & Caterson, 2003; Curioni & Lourenco, 2005; WHO, 2008). Research evidence confirms that excessive body weight is predictive of chronic diseases ranging from chronic medical and psychological conditions to premature death (Catford & Caterson, 2003; Huang, Frangakis, & Wu, 2006; WHO, 2008). Obesity severely increases the risk of non-communicable diseases, including diabetes mellitus, cardiovascular disease, hyperlipidemia, hypertension, coronary heart disease, osteoarthritis, sleep apnea, respiratory problems, gallbladder disease, diabetes, and cancers (endometrial, breast, and

colon) (Atlantis et al., 2006; Catford & Caterson, 2003; Curioni & Lourenco, 2005; Douketis, Macie, Thabane, & Williamson, 2005; Huang et al., 2006; Stice, Shaw, & Marti, 2006; WHO, 2008).

In addition to the health risks and comorbid conditions that are linked to obesity, excessive body weight is associated with various psychosocial consequences including low self-esteem, poor body esteem, interpersonal difficulties, stigmatisation, discrimination, and a broad range of mental health problems (Brownell & Puhl, 2003; Dove, Byrne, & Bruce, 2009; Friedman & Brownell, 1995; Ozmen et al., 2007). All of these conditions adversely impact the overall quality of life and are associated with an increased risk of mortality (Huang et al., 2006). Among all risk factors, obesity is second to smoking as a leading cause of death (Huang et al., 2006).

Operational definition and methodological considerations

Obesity is characterised by elevated fat masses in the body, which is attributable to an energy intake in excess of energy expenditure (Atlantis et al., 2006). Fundamentally, when an individual's energy intake from food and drinks is greater than the amount of energy expended, the unused energy is converted into fat and deposited in the body. At present, the most common and effective technique of estimating an individual's adiposity is the body mass index (BMI), a value derived from dividing body weight in kilograms by height in meters squared (kg/m^2). Using the WHO criteria, individuals with a BMI less than $18.5\text{kg}/\text{m}^2$ are deemed to be *underweight*, a BMI between 18.5 and $24.9\text{kg}/\text{m}^2$ considered to be of *normal weight*, a BMI between 25 and $29.9\text{kg}/\text{m}^2$ regarded as *overweight*, a BMI greater than $30\text{kg}/\text{m}^2$ *obese*, and *very obese* with a BMI greater than $40\text{kg}/\text{m}^2$ (Huang et al., 2006; Thompson, Cook, Clark, Bardia, & Levine, 2007; WHO, 2008).

Since the underweight group is not of interest to the current investigation, and to assist in readability and practicality, the term “unhealthy weight” will be used to describe all individuals who are considered to be overweight or obese using the BMI classificatory

system. Thus, the term “unhealthy weight” includes all individuals with a BMI greater than $25\text{kg}/\text{m}^2$ as the WHO has identified that the greater the BMI the more health risks an individual is susceptible to. The term “healthy weight” will be used to refer to those individuals who have a BMI between 18.5 and $24.9\text{kg}/\text{m}^2$.

The obesity epidemic is one of the most major public health concerns of the 21st century (Flood, Webb, Lazarus, & Pang, 2000). In 2005, it was estimated that globally, more than 1.6 billion adults were overweight with at least 400 million clinically obese, along with 20 million overweight children under the age of five (WHO, 2008). In Australia, the problem has also increased at an exponential rate, affecting millions of people. Currently, an estimated 60% of the adult Australian population are overweight or obese, along with 27% of children and adolescents (Ash et al., 2006; Catford & Caterson, 2003). In Australia alone, obesity contributes to approximately 4% to the burden of disease, which when combined with physical inactivity is increased to 11% (Ash et al., 2006). However, these statistics are deemed to be underestimates of the current obesity crisis in Australia. In 2008, Hayes, Kortt, Clarke, and Brandrup (2008) conducted a national population survey that found 54.4% of people to be overweight or obese. Yet when these self-report data were compared with accurately measured BMIs, it was found that 66.4% of the Australian population were considered to be overweight or obese (Hayes et al., 2008).

Accordingly, Hayes et al. (2008) devised a set of equations to correct the under-reporting of height and weight in population-based studies. When these equations were applied to the aforementioned overweight and obesity statistics, the prevalence of overweight and obesity in men increased to 75.5%, compared to the self-report figure of 63.2%, and increased to 57.2% in women, compared to the self-report figure of 45.5% (Hayes et al., 2008). These discrepancies indicate the inherent problems in utilising self-report data to gain an accurate understanding of the true prevalence of obesity in Australia.

Although the BMI classificatory system provides the most useful population-level measure of obesity as it is the same for both sexes and for all ages of adults (Fairburn, 1995), there are inherent limitations in its use. Using the same scale to estimate body weight in both males and females does not take into account the higher percentage of muscle mass in males, nor does it provide an accurate estimation of body fat in people who have a high proportion of muscle mass (i.e. elite athletes). Also, Fairburn (1995) and Cheng (2011) argue that health risks only reach significance when an individual has a BMI over 27, and markedly increase for those with a BMI over 30. The thresholds for determining the BMI categories have been disputed among researchers, where BMI scores between 18-20 are grey areas of being slightly underweight, and BMI scores between 25-27 are grey areas of being slightly overweight (Cheng, 2011; Fairburn, 1995).

Notwithstanding these caveats, the BMI is the most efficient tool to gauge an individual's adiposity and associated health risks, and given its widespread use by the World Health Organisation has therefore been used in this thesis. Both Study 1 and Study 2 comprised of a total of 890 participants, which, given the constraints of a project of this kind, would have been impossible if direct measures of body weight were utilised. Also, since BMI is the most widely used tool measuring body weight, using this classificatory system allows for easier comparisons between past and future research. However, given the limitations that arise from self-report height and weight, Study 3 utilised accurate measures of body weight by weighing participants on calibrated scales and measuring height using a stadiometer.

Treatment for obesity

Obesity treatment efforts have primarily focused on weight-loss using behavioural strategies, including dietary restriction, nutrition, self-monitoring, and increased physical activity (Ash et al., 2006; Foster, Wadden, Vogt, & Brewer, 1997; Wilson, 1996). However, corroborative research has indicated that these treatment programs are largely

ineffective (Blackburn, 1999; Byrne, Cooper, & Fairburn, 2004). At best, obese individuals can realistically achieve a body weight reduction of 5-10%. The National Weight Control Registry (2012) has shown that their members have been successful in losing approximately 30kg and have maintained their weight-loss over 5.5 years. However, these are averaged figures for over 10,000 registry members. Weight-loss has ranged between 13 and 130kg and duration successful weight-loss has ranged between 1 year and 66 years. Most registry participants indicated that their weight-loss was precipitated by a modification of food intake, increased physical activity, eating breakfast, and regular self-monitoring.

Longitudinal data indicate that this weight-loss is rarely maintained long-term and generally is not of clinical significance (Ash et al., 2006; Byrne et al., 2003; Gillison, Standage, & Skevington, 2009). Statistics have shown that in many cases these individuals regained all of the weight that was initially lost, and exceeded the starting weight three years post-treatment (Byrne et al., 2003). Even the most extensive programs, which may span over six months, offering weekly contact with participants wanting to lose weight, have not shown maintenance or improvements beyond the intervention, and have not been successful long-term (Ash et al., 2006; Gillison et al., 2009).

At present, bariatric surgery, which is a surgical procedure designed to decrease food intake and consequently promote weight-loss in obese individuals, has been demonstrated to be the only treatment capable of producing sustainable long-term weight-loss (Buchwald et al., 2004). Although bariatric surgery is known to be curative of obesity-related co-morbidities, such as diabetes and obstructive sleep apnea (Thompson et al., 2007; Virji & Murr, 2006), it is an extreme weight loss method that attracts medical complications. Thus, seeking less invasive solutions to the current obesity epidemic is necessary.

Given the lack of efficacy of the most widely used obesity treatment programs (i.e. behaviour therapy, cognitive-behavioural therapy, transtheoretical model of change), new

treatment programs based on different theoretical understandings of the development and maintenance of obesity are required. It seems futile to keep trialling the same programs in the hope that they will yield different outcomes, when these programs have already shown limited success. For a comprehensive discussion on the results of these treatment programs please refer to Chapter 4.

Rationale for the current research

An increased awareness and understanding of the adverse and varied health outcomes associated with obesity has not reduced, or even halted, the prevalence of obesity in Australia. The media is replete with information regarding the medical impairments and consequences of obesity (i.e. hypertension, diabetes, sleep apnea), and recent statistics confirm a continual increase in obesity prevalence (Atlantis et al., 2006; Labib, 2003; Ozmen et al., 2007). Efficacious methods for obesity treatment are required if this health epidemic is to be addressed on a serious public and local level.

Although obesity is a serious disease associated with deleterious sequelae, its development is not inevitable. Approximately 60% of the Australian population are of an unhealthy body weight, yet 40% of individuals are still able to maintain a healthy body weight. This suggests that an interplay of factors enables some individuals to avoid excessive weight gain. Extant research has identified a range of biological, social, environmental, and psychological factors contributing to the aetiological basis of obesity. However, it is unrealistic to expect a treatment program to systematically address all of these factors. Research focusing on the factors that differentiate healthy weight individuals from unhealthy weight individuals is important for effective obesity treatment.

Moreover, research has typically focused on the behavioural, social, and environmental factors impacting on body weight, yet it is also important to examine some of the underlying attitudinal factors contributing to, and maintaining, excessive body weight. As such, the final study included in this thesis will attempt to address the current research

disparity in this area by using a small pilot study to investigate the effectiveness of dialectical behaviour therapy in achieving and maintaining weight reduction. It is expected that this study will provide preliminary evidence for future research. This treatment approach aimed to target some of the psychological factors associated with excessive body weight to determine whether this method is capable of producing lasting behavioural change. Such changes may include teaching participants adaptive coping skills to deal with negative emotions and decrease emotional eating, techniques to tolerate distress and self-soothe, and focus on increasing body esteem and self-efficacy for weight and health-related changes.

Thesis aims and research questions

Study 1 aimed to determine the critical factors that are associated with an unhealthy body weight in order to assist in the development of an improved treatment option for weight loss. On the basis of prior research, one research question was posited: Are there differences between healthy and unhealthy weight participants with regard to biological, environmental, social, and psychological factors?

Study 2 aimed to determine the critical psychological factors that are associated with an unhealthy body weight in order to assist in the development of an improved treatment option for weight-loss. On the basis of prior research, one research question was posited: Are there differences between healthy and unhealthy weight participants with regard to self-esteem, body esteem, and sociocultural attitudes towards appearance?

Accordingly, the results from Study 1 and Study 2 highlighted the most salient factors implicated in the aetiology and maintenance of obesity and therefore assisted in developing a pilot treatment program. Study 3 aimed to investigate the effectiveness of a brief DBT-informed two-day workshop designed to target the factors that were identified in Study 1 and Study 2. Study 3 was comprised of a series of six case studies. Three participants attended a two-day DBT-informed intervention and three participants attended a two-day

workshop based on psychoeducation and supportive therapy. It is important to note that attitudinal and behavioural change were considered as the primary targets of the intervention, and weight-loss was considered as a consequence of the intervention and an indirect effect.

Chapter 2: Factors Contributing to Weight

Research has demonstrated that biological, environmental, social, and psychological factors are associated with body weight (Atlantis et al., 2006; Ball & Crawford, 2006; Cadzow & Servoss, 2009; Gallo & Matthews, 2003; Kubzansky & Kawachi, 2000; Sallis, & Brown, 2002; Sobel & Stunkard, 1989; Zhang & Wang, 2004). This chapter will review the current literature pertaining to these factors. The theoretical framework underpinning this study will also be discussed. Although many correlates of obesity have been identified in the literature, including anxiety and depression, the initial focus of the current investigation is on the aetiological basis of this phenomenon. It is expected that this will assist in subsequently developing a weight-loss treatment program incorporating these pertinent factors.

Theoretical framework

There is a lack of coalescence within the psychological field to theoretically explain the obesity epidemic. Several psychological perspectives, including transtheoretical models, self-efficacy models, the theory of planned behaviour, self-determination theory, and self-regulation theory, have explained an interdependent aspect of obesity, but have failed to consider a broad range of factors known to influence body weight (Atlantis et al., 2006; Ball & Crawford, 2006; de Bruijn, Kremers, de Vries, van Mechelen, & Brug, 2007). Many of these theories are oversimplified and do not offer a holistic model of eating behaviour (Ball & Crawford, 2006).

A paucity of research has investigated the psychological factors while simultaneously examining the broader social and environmental influences affecting the development of obesity (Ball & Crawford, 2006). Since social and environmental factors are known to be associated with body weight, it is necessary to operate from a theoretical framework which considers all of these contributing factors. Social ecological models have included social and environmental influences on obesity, but have typically not included the cognitive and

psychological elements of behavioural change, despite the converging evidence demonstrating the influence these elements have on body weight (Baranowski, Cullen, Nicklas, Thomsson, & Baranowski, 2003).

Similar to the conceptual model used in Ball and Crawford's (2006) study, which investigated the correlates of body weight, the current study was based on several psychological and social ecological theories, in order to consider the importance of broader factors within the social and physical environments that might impact on obesity. Given the factors that have emerged from previous research, the current study will investigate genetic and biological factors (previously ignored in behavioural models), environmental factors (ecological models), social factors (social ecological models), and psychological factors (primarily drawn from social cognitive theory) (Ball & Crawford, 2006). Since this study is exploratory in nature, and is utilising a range of models, the results from the current research will guide the theoretical paradigm for the pilot treatment program in Study 3.

Genetic and biological factors

Current research suggests that obesity is a complex disorder of appetite dysregulation and metabolic dysfunction, understood to be attributable to genetic influences (Atlantis et al., 2006; Ball & Crawford, 2006; Labib, 2003; Maffeis, 2000; Ozmen et al., 2007; Smith, 2008). At present, more than 200 genes have been identified as playing a role in obesity, and some scientists are insisting that genetic factors are equally as powerful as non-genetic factors in the development and maintenance of excessive weight (Labib, 2003; Smith, 2008). Labib (2003) estimates that approximately 25-70% of variations in body weight are attributable to genes, and argues for a stronger focus on the genetic factors involved in the aetiopathogenesis of obesity. However, at present, research has not been able to elucidate a causal link between genetics and obesity, and numerous researchers argue that the current literature is scientifically unclear and highly disputable (Labib, 2003; Smith, 2008).

Leptin is a protein hormone which has been shown to be a key component in regulating energy intake and expenditure and in maintaining body homeostasis (Labib, 2003; Maffei, 2000). Single gene defects, which result in leptin deficiency, have been discovered in human subjects, which impact the balance among an individual's neuropeptides and the ability to effectively regulate energy requirements (Labib, 2003; Maffei, 2000). Thus, leptin may explain why some obese individuals struggle with body weight regulation, which subsequently increases the likelihood of excessive weight gain. However, these results are far from conclusive, and leptin deficiencies do not account for the increasing prevalence of obesity. In particular, it is unclear how differences in the energy regulation feedback systems between individuals affect energy consumption and metabolism (Smith, 2008).

The glycemic index is a theory that has shown to parallel the obesity epidemic (Ludwig, 2002). The glycemic index is an alternative system that defines how carbohydrates and other dietary factors affect the ability for nutrients to be absorbed and for insulin secretion (Augustin, Franceschi, Jenkins, Kendall, & La Vecchia, 2002; Ludwig, 2002). Research has shown that the glycemic index significantly affects hormonal and metabolic responses that can lead to overeating, subsequently increasing the risk for obesity, type 2 diabetes, coronary heart disease, cancer and heart disease (Augustin et al., 2002; Ludwig, 2002).

Family studies have consistently demonstrated that BMI is highly correlated among first degree relatives (Sorensen, Price, Stunkard, & Schulsinger, 1989; Labib, 2003; Maffei, 2000). Genetic studies comprising twins, adopted siblings and family cohorts have affirmed that inheritance can account for 25% to 40% of inter-individual difference in obesity, even when lifestyle similarities for monozygotic twins are taken into consideration (Maffei, 2000; Smith, 2008). Studies of adoptees have also shown that children are likely to have a BMI more similar to the BMI of their biological parents rather than to that of

their adopted parents (Maffeis, 2000). Although these findings provide support for a genetic link to obesity, twin studies are more likely to overestimate the influence of the genetic impact given the similarity of the environment (Sorensen et al., 1989; Labib, 2003; Maffeis, 2000). In addition, although genetics has been shown to account for approximately 25% to 40% of inter-individual difference in obesity, 60-70% of the variance must come from other factors (i.e. environmental, social, or psychological factors).

Bulik, Sullivan, and Kendler (2003) explored the relationship between genetic and environmental risk factors for obesity and binge eating using bi-variate twin modelling. A total of 2163 female twins (mean age of 35.1 years) participated in this study and the results provided further support for a genetic contribution to both obesity and binge eating (Bulik et al., 2003). Bulik et al. asserted that their “bivariate twin analysis confirmed prior reports that obesity is a highly heritable condition with little influence from common environmental factors (Maes et al., 1997). Binge eating is also a moderately heritable trait, with little contribution from common environment (Sullivan et al., 1998, p. 297)”.

Sorensen et al. (1989) agree with this assertion. Adoptees separated from their biological parents early in life were compared with their biological full and half siblings who were reared by their biological parents. Weight and height were obtained for 115 full siblings of 57 adoptees and for 850 half siblings of 341 adoptees. Results indicated that the BMIs of the adoptees were similar to the BMI of their full siblings, providing support for a genetic influence on body weight. Moreover, these results were consistent for those adoptees with a healthy weight, as well as for those who were overweight.

Evidently, biological relatives have a tendency to resemble one another in terms of body weight (Smith, 2008). Maffeis (2000) affirms that children who have obese parents are more likely to become obese than are children whose parents have a healthy weight.

However, this does not necessarily reflect the genetic contribution, rather it suggests that similarities in body weight may be attributable to social and environmental influences.

Although considerable research has been devoted to the genetic correlates of obesity, the results are discordant and inconclusive. Moreover, given that the gene pool of the human race has not changed over the past 60 years, genetic and biological factors can be discounted as fuelling the obesity endemic (Astrup, 2006; de Bruijn et al., 2007; Stroebe, 2008). Instead, it has been argued that the increasing prevalence of obesity is due to environmental changes, or to the interaction of genetic dispositions with environmental and behavioural factors (de Bruijn et al., 2007). A consensus regarding the explication of the gene-environment interaction and its impact on obesity prevalence is unknown. Understanding biological factors and the genetic link with obesity cannot be fully explicated without also considering the environmental, social, and psychological influences (Sobel & Stunkard, 1989).

Environmental factors

Understanding how environmental factors have impacted the obesity epidemic is challenging given its multilevel (e.g. nations, states, cities, and neighbourhoods), multistructural (e.g. physical environment, socioeconomic status), multifactorial (e.g. diet, physical activity, smoking) and multi-institutional (e.g. local government, family) composition (Baranowski et al., 2003). Although research has been hindered by these various influences and the interrelationships among these factors, identification and subsequent modification of the environmental factors that are contributing to the onset and maintenance obesity is required (Blackburn, 1999).

Socioeconomic status.

Research has consistently revealed that individuals of lower socioeconomic status (SES) are likely to experience greater morbidity and mortality (Cadzow & Servoss, 2009; Paeratakul, Lovejoy, Ryan, & Bray, 2002; Sobel & Stunkard, 1989; Stunkard & Sorensen,

1993; Zhang & Wang, 2004). Generally, in developed nations, low-SES individuals are more likely to be obese than high-SES individuals, but in developing countries, high-SES individuals are more likely to be obese (Zhang & Wang, 2004). However, the measurement of SES has impeded the ability to reliably compare and contrast the results of different studies (Sobel & Stunkard, 1989). At present, a global measurement of SES has not been agreed upon among researchers (Sobel & Stunkard, 1989). For example, studies have frequently used income or education as an indicator of SES, while others have used occupation or housing. In addition, many studies have used one measure to ascertain an individual's SES, while others have used a variety of measures (Sobel & Stunkard, 1989). These inconsistencies in the measurement of SES compound the reliability with which the current research can be evaluated.

Paeratakul et al. (2002) examined the prevalence of obesity-related comorbidities according to gender, race, and socioeconomic status with a sample of 10,164 adults from the United States of America. The study population was divided into three racial groups: non-Hispanic white ($n=7481$), non-Hispanic black ($n=1112$), and Hispanic ($n=821$). Although there were insufficient Asians, Pacific Islanders, American Indians, and Alaskan natives ($n=229$) to provide reliable prevalence estimates for each ethnic group, individuals from these groups, were nevertheless, included in the study for data weighting purposes. Results showed that low income individuals and those with less education were more likely to suffer from both obesity and obesity-related comorbidities, such as diabetes, hypertension, heart disease, and high serum cholesterol (Paeratakul et al., 2002).

Sobel and Stunkard (1989) conducted a review of 144 published studies that have investigated the link between SES and obesity in both developed and developing nations. Results indicated that individuals of lower-SES in developed nations were more likely to be of an unhealthy weight. In particular, obesity was found to be six times more prevalent among females of lower-SES when compared with females of higher-SES (Sobel &

Stunkard, 1989). This finding was consistent across a total of 30 studies conducted in the United States of America and for other developed countries, including Belgium, Britain, Canada, Norway, and New Zealand (Sobel & Stunkard, 1989). However, for men, the relationship between SES and obesity was not as clear; an inverse relationship between SES and obesity was found in 22 studies, a direct relationship was found in eight studies, and no relationship was found in eight studies. These contradictory results may reflect the differences in the measurement of SES or obesity, or could be due to discrepancies between samples in food intake, energy expenditure, or a number of demographic variables (Sobel & Stunkard, 1989).

Conversely, a strong direct relationship was found between SES and obesity for both men and women in developing countries (Sobel & Stunkard, 1989). This relationship was deemed to be as strong and consistent as the relationship found between SES and obesity for women in developed countries, but in the opposite direction. These results need to be interpreted with caution, as the methodological quality is rarely equivalent to those in developed nations (Sobel & Stunkard, 1989). For example, SES was frequently measured by geographical location, rather than indicators of income or education (Sobel & Stunkard, 1989). Notwithstanding these limitations, 22 reports showed a direct relationship between SES and obesity among both men and women; only three studies failed to find a direct relationship, and none found an inverse relationship (Sobel & Stunkard, 1989). Moreover, these findings were not limited to one geographical location, but were present in research conducted in Africa, Asia, North and South America, Australia, and the Pacific Islands (Sobel & Stunkard, 1989).

Sobel and Stunkard (1989) explain these contrasting findings in terms of attitudes towards obesity in developed and developing nations. In developing nations, obesity is rare due to insufficient food and higher levels of energy expenditure. Therefore, within these societies, obesity is more likely to increase with financial wealth and availability of food

(Sobel & Stunkard, 1989). However, in developed nations, obesity is more stigmatised among women than it is men, and higher-SES women are also more likely to be motivated to pursue a thin body shape, which is considered to be ideal for women (Sobel & Stunkard, 1989). A major limitation of their study is that it was conducted more than twenty years ago, and the observed relationship between obesity and SES may no longer be as strong within either developed or developing nations.

For this reason, Zhang and Wang (2004) investigated whether the relationship between obesity and SES has changed over time, and whether there were differences across sociodemographic (i.e. gender and ethnic) groups. A total sample of 28,543 adults from the United States of America completed a National Health and Nutrition Examination Survey between 1971 and 2000. Results indicated that the relationship between obesity and SES has weakened over the last thirty years, despite the prevalence of obesity dramatically increasing. These findings suggest that individual characteristics such as employment status and income may not be the main cause of the obesity epidemic (Zhang & Wang, 2004).

Food-rich environment.

Research has attributed the obesity epidemic to increases in food availability, food accessibility, and sedentariness over the past twenty years (Crawford & Ball, 2002; Elinder & Jansson, 2008; Giskes et al., 2007; Holsten, 2008). Scientists have labelled the food-rich environment that permeates Western society as “obesogenic”, or even “toxic”, and have identified it as a major cause of the obesity epidemic (Ball & Crawford, 2006; Stroebe, 2008). Research has identified causal links between obesity and a high consumption of soft drinks, large portions of cheap, convenient, high-calorie food, skipping breakfast, and a low intake of fruits and vegetables (Dove et al., 2009; Elinder & Jansson, 2008; Holsten, 2008). In addition to this food-rich environment, there have also been fewer opportunities for physical activity and increased television viewing within households (Elinder &

Jansson, 2008; Giskes et al., 2007; Holsten, 2008). Poor access to recreational facilities, foot paths, and local shops, an increased use of computers, remote control devices, microwave ovens, and cars, are also among those environmental influences which are understood to impact the likelihood of a child later becoming overweight or obese (Ball & Crawford, 2006; Labib, 2003; Maffeis, 2000).

Obesity and weight-related comorbidities would decline if behavioural change was initiated, such as consuming fewer fat-rich foods, increasing physical activity, and reducing the portion sizes of meals (Astrup, 2006). However, these environmental factors are interactive, complex, and remain vague, scientifically undefined, and inconsistent in the literature (Ball & Crawford, 2006; Byrne et al., 2003). In addition, some of the studies which have found lifestyle factors to correlate strongly with obesity have failed to simultaneously investigate the psychological factors (Ball & Crawford, 2006).

Elinder and Jansson (2008) agree that differences in health behaviours can be linked to the opportunities that individuals have around the local neighbourhood for healthy eating and physical activity. This suggests that individuals who have better access to opportunities to eat healthily, and are more readily able to access physical activities, are more likely to be of a healthy weight. Elinder and Jansson (2008) argue that obese individuals may be exposed to certain environments that do not encourage healthy weight behaviours, predisposing them to the risk of obesity more so than healthy weight individuals.

Holsten (2008) conducted a comprehensive literature search to examine the relationship between obesity and the community and/or consumer food environment. Seven studies were identified for review. They measured BMI and environmental variables related to food outlets, including geographic arrangement and consumer conditions. Mixed results were found. Two studies did not find any significant relationship between obesity rates and the density of takeaway outlets and restaurants. Five studies found significant

results relating to the presence of different types of food stores, fruit and vegetable prices, disadvantages of the food store neighbourhood, distance travelled to the food store, and the distribution of fast-food restaurants on a state-wide basis. The studies included in this research used a variety of methods for calculating the density of takeaway outlets and restaurants, which impedes the ability to make reliable comparisons between the results of each study. In addition, these studies were all conducted in the United States of America, and only one was conducted in regional Australia. A more systematic and consistent way of measuring the food rich environment is necessary to compare the results of different studies.

Numerous researchers have attributed the escalating increases in obesity prevalence to a food rich environment. Yet despite this “obesogenic” environment not all people are of an unhealthy weight. Although the environment may be a powerful influence, Elinder and Jansson (2008) assert that some people are resilient and are able to adapt to it. On the other hand, it is possible that thin people are able to overeat in response to this “obesogenic” environment and not gain weight. This could suggest that biological factors may be contributing to their stability of body weight, or the individual may be compensating for the excess of calories with exercise or purging. Undoubtedly, research examining the link between obesity and the community food environment is in its infancy (Holsten, 2008), and a better understanding of how environmental influences impact on body weight is warranted.

Social factors

Social support.

Insufficient perceived social support and social isolation are associated with an increased risk of obesity, morbidity, and mortality (Cadzow & Servoss, 2009). Individuals with a low level of social support report feeling alienated, cynical, have poorer coping resources, perceive social networks as less reliable and supportive, are more reluctant to

discuss any problems with others, and have reported more distress than individuals with higher levels of social support (Coyne & DeLongis, 1986; House, Landis, & Umberson, 1988). Socially isolated individuals are also more likely to commit suicide than those who are more integrated in social networks (House et al., 1988). In addition, mortality rates among unmarried individuals are consistently higher than for their married counterparts, and they experience higher rates of tuberculosis, accidents, and psychiatric disorders (House et al., 1988).

Social support is defined as the resources provided by other people (Parham, 1993). While research has predominantly focused on the positive aspects of social support, some studies have documented the harmful effects of social networks. Ball and Crawford (2006) utilised a large sample of 790 women (mean age of 26.8 years) and found that, akin to previous research, social support was a correlate of health and weight-related behaviours. The critical factor associated with weight gain was friends' sabotage of an individual's physical activity. This demonstrates a key role that friends play in either encouraging or thwarting healthy behaviours.

Cadzow and Servoss (2009) examined the association between perceived social support and the prevalence of physical and mental health conditions. A total of 289 patients attending an urban free medical clinic completed a health risk assessment that addressed a number of medical and social issues, including perceived social support. For those participants with insufficient perceived social support, there were higher rates of obesity and other obesity-related comorbidities, including heart conditions, anxiety, and depression (Cadzow & Servoss, 2009; Dove et al., 2009).

A distinction can be made between social support in general and using social support as a component of a weight-loss intervention. Gierszewski (1983) investigated the relationship between weight-loss and social support. A total of 46 female participants from a six-class nutrition and weight control program completed a battery of questionnaires,

including a social support scale that was developed by the author. The findings did not support the prediction that social support would increase weight loss for participants. It is possible that participants perceived strong levels of social support when a family member offered them unhealthy food, which would later jeopardise weight-loss (Gierszewski, 1983). The results of this research were limited by the lack of established reliability and validity of the social support questionnaire and the small sample size. This finding highlights the need to explore the effects of both helpful and harmful social support, which will be investigated in the current study.

Similarly, Wing and Jeffery (1999) evaluated the effectiveness of social support for weight-loss and maintenance. A total of 166 participants (82 males and 84 females) were recruited either alone or with three friends or family members. Participants were randomly allocated to either a control group (standard behavioural treatment) alone or to a treatment group (standard behavioural treatment with social support strategies) with friends or family members. Results indicated that those who were recruited with friends or family members had greater weight loss at the end of a four-month treatment program and ten months after the end of treatment. A total of 76% of participants who were recruited alone and received the standard behavioural treatment completed treatment, and 24% had maintained their weight loss at the ten-month follow up. However, 95% of participants who were recruited with friends and received the standard behavioural treatment with social support strategies completed treatment, and 66% had maintained their weight loss at the ten-month follow-up. Results of this kind lend support to the role that positive social support can have on health and weight-related behaviours.

The role of social support for health and weight-related behaviours remains unclear. Although it is quite possible that the personality of the support person/s may impact on the quality of the support offered to the obese individual, past research has not differentiated

between encouraging health-related behaviours and sabotaging health-related behaviours.

As such, future research is required.

Behavioural factors

Behavioural strategies designed to promote diet and health-related activities have shown to be effective for weight-loss (Boutelle, Kirschenbaum, Baker, & Mitchell, 1999; Giesen, Havermans, & Jansen, 2010; Mahoney, Moura, & Wade, 1973). Behaviour modification approaches typically involve altering the type and quantity of food consumption, limiting calorie intake, increasing physical activity, and increasing the self-monitoring of food and health-related activities (Boutelle et al., 1999; Mahoney et al., 1973).

Self-monitoring, in particular, has been shown to be correlated with weight-loss and is defined as an individual paying deliberate attention to a specific aspect of behaviour (Boutelle et al., 1999; Kitsantas, 2000). Common self-monitoring strategies for weight-loss and weight maintenance include keeping daily records of food eaten during the day, comparing one's weight with a healthy weight as indicated on the BMI charts, or frequent weighing to monitor any weight fluctuations (Kitsantas, 2000). Research has generally shown self-monitoring strategies are an integral aspect of successful weight control (Kitsantas, 2000).

Boutelle et al. (1999) examined the efficacy of a typical cognitive-behavioural intervention with self-monitoring. A total of 57 participants (41 females and 16 males) were randomly assigned to a standard cognitive-behavioural treatment group or to the intervention group, which consisted of cognitive-behavioural treatment with a self-monitoring intervention. The cognitive-behavioural treatment comprised of one session per week conducted by three therapists. Although all participants were encouraged to monitor their daily food intake, participants in the intervention group received one to two phone calls per week by the group facilitators, reminding participants to self-monitor. Results

from this study indicated that the intervention group were self-monitoring more regularly than the comparison group, managed their weight more effectively, and subsequently lost more weight (Boutelle et al., 1999).

Similarly, Baker and Kirschenbaum (1993) examined the usefulness of self-monitoring among 56 participants attending an 18-week cognitive behavioural weight loss program. The results indicated that individuals who consistently used self-monitoring techniques on a regular basis lost more weight than individuals who were inconsistently, or not at all, self-monitoring their eating behaviours (Baker & Kirschenbaum, 1993).

Kitsantas (2000) examined the effectiveness of behavioural self-regulatory strategies in losing, maintaining, or managing body weight among 33 undergraduate college students (11 males and 22 females). Participants were divided into three groups: 1) overweight participants who had tried to lose weight but had been unsuccessful; 2) participants who had been successful in losing 10% of their body weight and had maintained that weight-loss for at least six months; and 3) participants with a healthy weight. The findings of this study indicated that all three groups differed in their use of self-monitoring techniques. Specifically, healthy weight individuals and previously overweight individuals who had been successful in losing 10% of their body weight and had maintained that weight-loss for at least six months utilised self-monitoring techniques more than overweight participants who had tried to lose weight but had been unsuccessful. Kitsantas (2000) asserts that although there were numerical differences between the three groups, these differences were not found to be statistically significant, thus the results need to be interpreted with caution. The small sample size and the effect on the power of the statistical tests may have affected the results (Kitsantas, 2000). Nonetheless, these findings suggest that previously overweight participants may be able to maintain their weight-loss by employing self-monitoring techniques. If this study was to be replicated in future research with larger sample sizes, weight-loss programs should include self-monitoring strategies.

Although these results support the role of self-monitoring in weight-loss, research has generally shown behavioural techniques, alone, are not able to sustain the individual once the treatment has ceased (Wadden, Foster, & Letizia, 1994). In addition, severe behavioural modification (i.e. severe caloric restriction) often results in participants exceeding their starting weight after the initial weight-loss during treatment (Wadden et al., 1994). Behavioural factors warrant mention, and certainly some attention, but they have not shown to be effective in achieving and maintaining long-term weight reduction, and therefore were not a primary focus of the current study.

Psychological factors

There is a lack of consensus in the literature regarding the psychological influences on excessive weight gain. Collective results from a variety of studies are discordant and inconclusive. Moreover, only a limited number of these obesity-related studies have focused exclusively on adults. Considerable research has instead targeted children and adolescents (Judge & Jahns, 2007; Munsch et al., 2008; Vlierberghe, Braet, Goossens, & Mels, 2009), postmenopausal women (Provencher et al., 2007; Sammel et al., 2003), or ethnic groups, including Latino adults (Alegria et al., 2007; Boutin-Foster & Rodriguez, 2009). At present, there does not appear to be a specific set of psychological correlates that are known to play a role in the development and maintenance of excessive body weight among Caucasian adults.

Self-efficacy.

Self-efficacy has been shown to be a strong predictor of weight-related and health behaviours (Ball & Crawford, 2006; Baranowski, Cullen, & Baranowski, 1999; Linde, Rothman, Baldwin, & Jeffery, 2006; Trost, Owen, Bauman, Sallis, & Brown, 2002). Self-efficacy is defined as the confidence and perceived beliefs that an individual has in his or her own ability to execute a desired behaviour in challenging situations (Glynn & Ruderman, 1986; Linde et al., 2006; Luszczynska, Scholz, & Schwarzer, 2005). To

achieve behavioural change, an individual is required to have the belief that the change will result in the desired outcome (outcome expectancies) while simultaneously having the belief that the individual is indeed capable of making the change (efficacy expectations) (Luszczynska et al., 2005). As such, self-efficacy may have important implications for the development of effective weight-loss interventions.

Self-efficacy is considered to be *prospective* and *operational* in nature (e.g. “I am certain I will continue attending the gym each morning, even if my exercise partner does not”). It can be defined as either task or domain specific. Some researchers have conceptualised a generalised sense of self-efficacy, which refers to a broad and stable belief in an individual’s personal competence to manage various stressful situations.

Glynn and Ruderman (1986) developed an Eating Self-Efficacy Scale (ESES) which assesses an individual’s confidence in controlling overeating in response to negative affect and in socially acceptable circumstances for the examination of eating self-efficacy and its relation to weight change. They used the ESES in a clinical setting with participants who were attending weight control clinics in Chicago, United States. A total of 32 participants, including 30 females and 2 males, aged between 25 and 50 years, attended a series of treatment programs (for 10 weeks run by a psychology graduate, for 13 weeks run by nurses and nutritionists, or over six therapy sessions run by a social worker).

Results indicated that weight-loss was significantly correlated with increases in ESES scores. Self-efficacy was measured during different phases of the treatment, and surprisingly, there was no significant relationship between previous weight-loss and subsequent weight-loss during treatment. Given the variability among treatment programs which ranged from six to thirteen weeks, a more consistent approach is required to compare self-efficacy scores and weight-loss. Also, the sample in this study consisted of a heterogeneous group of participants enrolled in different types of weight control programs.

Likewise, Irwin and Guyton (1997) examined differences in eating self-efficacy with a cohort of university students who were participating in weight control and lifestyle improvement programs in Arkansas, United States. A total of 63 students participated in the Overcoming Overeating Program and 56 students were in the active control group, which was a Lifestyle Improvement Program. Both programs ran for a total of eight weeks. This study utilised Glynn and Ruderman's (1986) ESES. No significant differences were found across the ESES scores on the pre-test and post-test comparison of data between subjects in the two groups. However, the trend indicated that students in the Overcoming Overeating Program changed in the desired direction on the ESES over time, with greater levels of self-efficacy at the post-test.

In addition, there were no significant differences between ESES scores and weight-loss and fat-loss for students in the Overcoming Overeating Program. The difference between this study and other studies is that this was a young population of university students. Irwin and Guyton (1997) assert that it is likely that respondents likely attended only to gain course credit, which may have affected weight-loss and eating self-efficacy. Thus, the motivation of the individual to engage in the weight-loss program may have played a role in the findings.

As part of a larger study, Ball and Crawford (2006) explored the psychological correlates of BMI with a cohort of young women aged 18-23 years (mean age = 26.8 years). A total of 790 participants self-reported height and weight and completed a series of measures reflecting the biological, psychological, social, and environmental correlates of body weight. Results of this study demonstrated that self-efficacy was the strongest correlate of participants' current BMI for avoiding future weight gain. However, this sample comprised of young women, thus a more heterogeneous sample may be more useful in eliciting the true nature of these associations with BMI.

Similarly, Linde et al. (2006) investigated the link between self-efficacy beliefs, weight control behaviours, and weight change for individuals participating in a weight-loss trial. This trial included 349 participants, of which 87% were females. The mean age of participants was 46.9 years and participants' mean BMI was 33.9. Individuals who were approximately 13-45 kg over healthy weight, as deemed by the BMI standards, participated in a randomised clinical trial that involved eight one-hour group sessions led by a trained facilitator. Eating self-efficacy and exercise self-efficacy were assessed with a modified version of the Weight Efficacy Life-Style Questionnaire (Clark, Abrams, Niaura, Eaton, & Rossi, 1991), which included additional items to assess individual's confidence in ability to follow exercise as well as eating plans in difficult situations.

Findings revealed that self-efficacy for eating and exercise behaviours were significantly associated with weight-loss program monitoring behaviours. Thus, it is evident that those who engage in weight control behaviours self-report higher levels of perceived self-efficacy. Further, analysis showed evidence for a prospective effect of self-efficacy on individual's weight control efforts, such that self-efficacy for eating and exercise behaviours the week prior to treatment significantly predicted engagement in weight loss program monitoring behaviours during the treatment period. However, these behaviours were not sustained following cessation of treatment. Similar results were also found for self-efficacy associations with weight change, whereby initial self-efficacy beliefs predicted weight loss during the treatment phase, but not during the post-treatment phase.

This pattern of results is consistent with the notion that self-efficacy is an important determinant for an individual deciding to initiate a new behavioural repertoire and to maintain the weight-loss. There could be a range of factors that impinge on an individual's decision to continue with a range of health and weight-related behaviours, including motivation, self-esteem, body esteem, and social support. Linde et al. (2006) contend that

future research is required to investigate more fully the link between self-efficacy and weight change.

Negative emotions and coping.

Emotions comprise affective, cognitive, and behavioural components and serve an adaptive function by mediating between an individual's behaviour and constant environmental changes (Gallo & Matthews, 2003; Kubzansky & Kawachi, 2000). Specific emotions are a result of the interaction between an individual and the environment (Kubzansky & Kawachi, 2000). Emotions are motivating in that they prompt an individual to respond to environmental cues; for example, fear communicates to an individual the need to escape from danger (Kubzansky & Kawachi, 2000).

Kubzansky and Kawachi (2000) outline that negative emotions generally occur when the perceived demands of a situation outweigh an individual's perceived ability to cope in that situation. Research has shown that negative emotions are risk factors for adverse health-related outcomes including coronary heart disease, cardiovascular disease, and all-cause mortality (Gallo & Matthews, 2003; Kubzansky & Kawachi, 2000; Tugade, Fredrickson, & Barrett, 2004). Moreover, positive emotions are known to buffer the effects of stress and have been linked to improvements in immune system functioning and cardiovascular disease (Gallo & Matthews, 2003). Although significant attention has been paid to the link between emotions and physical well-being, extant research has not investigated whether there are differences between obese individuals and those of healthy weight with regard to their experiences of negative emotions. Given that negative emotions have shown to adversely impact physical health, it is important to understand how negative emotions may impact obese individuals, in order to tailor effective weight-loss treatments.

Current research has shown that obese individuals are more likely than healthy weight individuals to react to negative emotions by eating (Byrne et al., 2003; Chesler, Harris, & Oestreicher, 2009; Seamoore, Buckroyd, & Stott, 2006). Past research indicates that

approximately 40% of individuals who self-reported that they have “serious binge eating behaviours” had a BMI between 31 and 42 (Seamoore, Buckroyd, & Stott, 2006). Binge eating is understood to be comprised of frequent periods of overeating with a perceived loss of control overeating behaviour without subsequent use of compensatory behaviours (i.e. physical activity, restrained eating) (Seamoore et al., 2006). This suggests that obese individuals feel unable to cope with stressors or particular situations, and therefore mediate that stress with emotional eating. Research by Byrne et al. (2003) revealed that individuals who had lost weight and then regained the weight they had lost were more likely to report using food as a way to self-regulate mood or to cope with distressing thoughts and moods, when compared to individuals who had maintained their weight loss or were of a healthy weight.

Binge eating is understood to occur in 30% of obese individuals seeking weight-loss treatment (Friedman, Reichman, Costanzo, & Musante, 2002). The literature has suggested that emotional eating is an automatic reaction to negative affect and emotional distress (Chesler et al., 2009). There is some controversy as to whether this cognitive process is conscious or unconscious (Chesler et al., 2009), however it is undisputed that the behavioural outcome of negative affect is frequently eating in response to these emotional cues. An overreliance on passive coping strategies can contribute to emotional eating in women (Balfour, 1996). Although negative emotions are a reason for the consumption of food, it is difficult to determine the true nature of overeating, as this information often relies on self-report measures, in which individuals are known to underreport their caloric intake (Adriaanse, de Ridder, & de Wit, 2009).

Heatherton and Baumeister (1991) developed the Escape Model, which is a comprehensive model of binge eating. They postulate that binge eaters experience elevated levels of negative self-awareness and dysphoric mood states which, when combined, create a negative view of the self that the individual ultimately tries to escape. Blackburn,

Johsnton, Blampied, Popp, and Kallen (2006) tested the applicability of the Escape Model to binge-eating in a non-clinical sample of women. Results of this study indicated that the Escape Model provided a comprehensive framework for understanding the processes that can lead an individual to engage in binge eating behaviour, and help explain the function that binge eating serves for the individual at that particular time in that particular situation. For example, in this study, perfectionist ideals (although not a focus of this theses) were found to lead to higher levels of aversive self-awareness for the individual, which, in turn, lead to higher levels of negative affect.

Subsequently, the individual coped with the inflated levels of negative affect by engaging in cognitive narrowing, which assists the individual in escaping from the negative emotionality. Thus, cognitive narrowing was found to be predictive of binge eating, whereby higher levels of binge eating predicted lower levels of cognitive narrowing (Blackburn et al., 2006). Cognitive narrowing is characterised by an individual focusing his or her attention on concrete aspects of the immediate environment, like food, by which the individual's ideals and implications of future actions are no longer readily accessible, thus no longer cognitively salient. In this way, negative affect is alleviated because self-awareness has been reduced (Blackburn et al., 2006). Given the reinforcing nature of this cycle, the more negative the affect experienced, the greater the incentive to escape this aversive state through eating.

Similarly, Schwarze, Oliver, and Handal (2003) investigated Heatherton and Baumeister's (1991) theory of binge eating. They found that binge eaters used more avoidance coping than non eating disordered individuals, while also displaying high levels of depression, self-consciousness, and substance use. This finding is indeed consistent with previous research which has investigated coping for individuals who binge eat, and demonstrates that individuals attempt to escape from negative self-awareness as described in Heatherton and Baumeister's (1991) theory. It is important to note, however, that these

results were obtained within a cohort of undergraduate university students, thus may only apply to similar groups.

Collective results suggest that treatment which focuses on tolerating negative self-awareness and the presence of strong negative emotions, and teaching individuals how to cope in a non-avoidant manner, may help alleviate emotional eating, while increasing the presence of positive emotions. Chesler et al. (2009) assert the need for a therapeutic approach that addresses the determining and maintaining factors of overeating to effectively develop a treatment approach that will address these difficulties in affect regulation. In order to understand the link between obesity and psychological functioning, it is important to consider mediating variables, such as emotional eating (Friedman et al., 2002).

Motivation.

The relationship between motivation and weight loss is a strong factor that has been empirically grounded in the literature. Previous research has demonstrated that an individual's level of self-determination can predict behavioural, cognitive, and affective outcomes, and that individuals with a greater level of self-determination are understood to also have a greater level of adaptive psychological functioning (Gillison et al., 2006; Pelletier & Dion, 2007).

The term *motivation* refers to a general drive or proclivity to execute a desired behaviour (Baumeister & Vohs, 2007). Motivation, whether self-prescribed or externally driven, is fundamental to life, and facilitates goal pursuits that are associated with crucial motivations. *Urges* and *impulses* characterise an individual's tendency to respond in a certain way in particular situations on particular occasions. Self-regulation refers to an individual's capacity to override and alter these responses in order to achieve behavioural change which is consistent with an ideal or goal. Frequently, individuals seek to change these urges and impulses to gain control of the incipient response (Baumeister & Vohs,

2007), by engaging in physical activity or adopting a healthier diet. Behavioural change to match an individual's ideals or pursue certain goals is a very useful form of self-regulation. To control the conflicts between an individual's inner motivations to achieve his or her ideals or goals and external factors (i.e. the environment, social influences), self-regulation is a vital function of the agentic self to achieve weight change (Baumeister & Vohs, 2007).

It is likely that motivation will change according to the circumstance and situation, whereby an individual's goals and ideals will also change depending on what is required for that particular situation and that given time. However, Baumeister and Vohs (2007) maintain that a paucity of data are available regarding the issues of how strongly (if at all) individuals are motivated to regulate themselves. It is likely that motivation would oscillate according to anticipated desirable outcomes, expected utility, and efficacy expectations. Effective self-regulation will involve sacrificing something (or many things) in order to achieve an ideal or a greater goal. This means that to pursue a goal or incentive, an individual is required to delay gratification and be willing to make the sacrifice of the instant gratification in pursuit of the greater goal.

Ryan and Deci (2000) propose six motivational categories (Ryan and Deci, 2000). Figure 1 illustrates the classification of these motivational types arranged from left to right in terms of the degree to which the motivation is nonself-determined to self-determined (motivations emanating from the self). At the far left of the self-determination continuum is *amotivation*, which refers to a state of inaction. There may be various reasons for an individual to be motivated, including not valuing an activity, feeling incompetent, or not expecting it to yield a desired outcome (Ryan & Deci, 2000). At the far right of the continuum is *intrinsic motivation*, which comprises of the innate tendency to seek out novelty and challenges, to extend and challenge an individual's known capacities, to explore, and to learn (Ryan & Deci, 2000). Intrinsic motivation is essential to adaptive cognitive and social development of an individual, and represents a principal source of

enjoyment and vigour throughout life (Ryan & Deci, 2000). Individuals with high levels of intrinsic motivation are highly autonomous and self-driven, irrespective of external rewards. Conversely, *extrinsic motivation* refers to the execution of activity in order to attain a separable and external outcome (i.e. losing weight for the approval of a romantic partner). Evident in Figure 1, extrinsic motivation covers the continuum between amotivation and intrinsic motivation, however they vary according to the extent to which regulation is autonomous (Ryan & Deci, 2000).

Furia, Lee, Strother, and Huang (2009) assert that motivational factors are known to contribute to weight loss and the management of a healthy weight, and thus are important modifiable targets for weight-loss interventions. Furia et al. (2009) examined university students' motivations to achieve and maintain a healthy weight. A total of 300 university students aged between 18-24 years (102 males, 198 females) completed a self-administered survey which involved a series of demographic questions (i.e. gender, ethnicity) and nineteen motivation items which were developed based on literature reviews and from existing inventories. Healthy weight individuals showed greater levels of intrinsic motivation and self-efficacy than overweight participants. Greater perceived competence and increased autonomous self-regulation are important predictors in the maintenance of a healthy weight.

Given the promising findings in the field of obesity which have shown that human motivation (either volitional or prescribed) mediates functional and dysfunctional eating behaviour, investigating and comparing the utility of motivation in body weight regulation is necessary. A positive relationship between level of self-determination and an autonomous regulation of eating behaviours has been found by Pelletier and Dion (2007). However, further research is required to investigate the relationship between motivation and weight status in order to provide valuable information for weight-loss treatment programs.

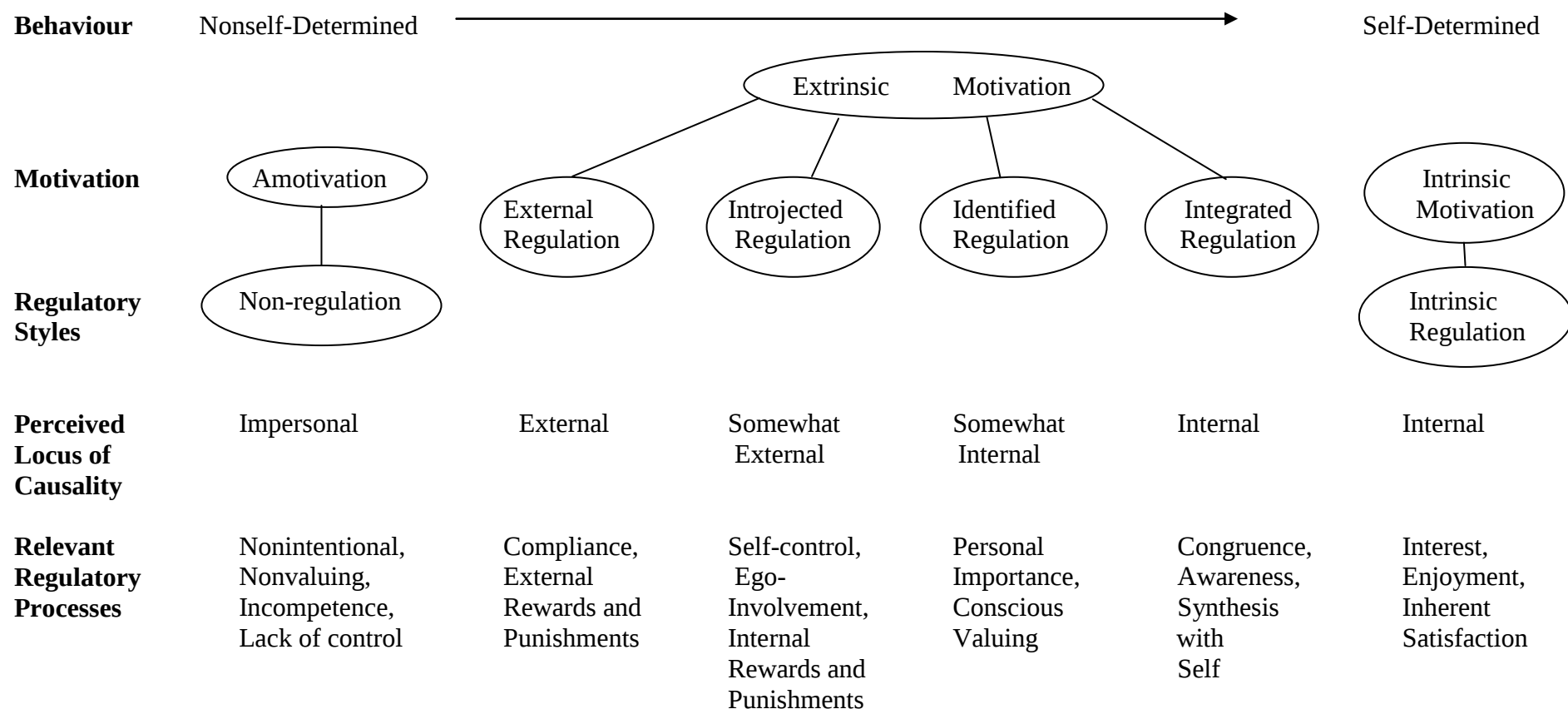


Figure 1. The Self-Determination Continuum Process Showing Types of Motivation with Their Regulatory Styles, Loci of Causality, and Corresponding Processes (Ryan & Deci, 2000)

Rationale

Fundamentally, the aetiology of obesity is attributable to a positive energy balance, in which energy intake exceeds energy expenditure (Atlantis et al., 2006; de Bruijn et al., 2007). Although this conception of obesity is simple enough, the pathological basis underpinning obesity is vague and empirically inconsistent. To date, a collective set of factors which have been shown to differentiate individuals of healthy weight from their unhealthy weight counterparts is unavailable. Furthermore, understanding the interrelation between these factors and how they may be addressed and investigated in a treatment program to produce long-lasting health-related behavioural change in terms of eating and lifestyle, is nonexistent.

Undoubtedly, the relationship between obesity status and the pertinent factors contributing to an unhealthy body weight is still under debate. To date, a paucity of research has utilised a cohort of older adults, of either gender. A myriad of factors have been implicated in the aetiology of obesity and its many sequelae, but there is a lack of consensus in the literature regarding the key influences on energy expenditure and dietary intake. It is therefore essential that research efforts focus on the pertinent factors that differentiate healthy weight individuals from unhealthy weight individuals, so that between-group differences in attitudes and behaviours can inform the development of weight-loss treatments.

Ball and Crawford's (2006) study which investigated the biological, social, psychological, and environmental correlates of obesity have formed the basis of the current investigation. In addition, Pelletier et al.'s (2004) model of motivation, Izard's et al.'s (1993) conceptualisation of emotions, and Glynn and Ruderman's (1986) assessment of eating self-efficacy were used to assess motivation, emotional experiences, and self-efficacy.

Aim and research question

The current study aimed to determine the critical factors that are associated with an unhealthy body weight, in order to develop an improved treatment option for weight loss. On the basis of prior research, one research question was posited in Study 1: Are there differences between healthy weight participants and unhealthy weight participants with regard to biological, environmental, social, and psychological factors?

Method

Participants

A total of 590 respondents started the questionnaire, but some respondents failed to complete the entire questionnaire package. Following a conservative process of screening and cleaning the data which involved omitting respondents who were missing in excess of 5% of data, and deleting all cases that yielded multivariate outliers or unreliable BMI scores, a total of 373 (81 males and 292 females) participants were used in subsequent analyses (63% completion rate). An unreliable BMI score included values that appeared to be entered using pounds for weight and feet and inches for height. If the value was clear then the values were converted to centimetres and kilograms and if they were ambiguous it was assumed to be an unreliable score, and thus deleted.

With regard to marital status, 162 participants were single (43.4%), while 211 were partnered (56.6%). In terms of geographical residence, 282 respondents resided in an urban location (75.6%), while 91 respondents lived in a rural or remote community (24.4%). The majority of participants, 293 in total (78.6%), had completed further education beyond high school (i.e. TAFE or university), while 80 respondents had completed high school, or had left school, prior to the completion of the final year (21.4%).

Design

This study was a survey design with analyses of both group variables and between group differences. One research question was tested: Are there differences between healthy weight participants and unhealthy weight participants with regard to biological, environmental, social, and psychological factors?

First, descriptive statistics have been presented to show the distribution for gender, age, and weight categories. Second, demographic analyses were conducted to determine whether there were significant differences between healthy weight and unhealthy weight individuals for age, education level, marital status, physical health, and diet behaviours. Third, Pearson product moment intercorrelations were calculated to determine the strength of the relationship between the dependent variables used in the analyses and the relationship between age, gender, and BMI.

Subsequently, a two (BMI: healthy weight vs. unhealthy weight) x two (gender: males vs. females) x two (age: 18-31 years vs. 32-84 years) analysis of variance was calculated to determine whether there were significant mean differences between these independent variables across the 17 dependent variables from the EQ (Ball & Crawford, 2006), GMS (Pelletier et al., 2004, as cited in Pelletier & Dion, 2007), ESES (Glynn & Ruderman, 1986), and DES (Izard et al., 1993). The dependent variables were biological influences, self-efficacy, self-monitoring, attention, beliefs, partner history, social influences from family, sabotage from family, social influences from friends, sabotage from friends, environmental influences, intrinsic motivation, extrinsic motivation, over-eating in response to negative affect, over-eating in socially acceptable circumstances, positive emotions, and negative emotions. Finally, multiple regression analysis was conducted to determine which variables contributed unique variance to BMI.

Measures

A battery of questionnaires was compiled to obtain the pertinent demographic data, and measure the reporting of the influence of psychological, social, biological, and environmental factors. In addition, levels of intrinsic and extrinsic motivation, eating self-efficacy, and differential emotions were acquired for all respondents.

For the purposes of the present study, a 12-item background questionnaire was constructed (see Appendix A). The demographic questionnaire ensured that data could be compared with subsequent studies, and served two additional functions. First, seven items specifically addressed descriptive information including participant gender, age, education level, geographical residence (which is relevant in terms of access to nutritional food and exercise), marital status, height, and weight. Second, five items focused on respondents' previous diet and weight loss attempts, medical conditions, and a personal opinion of his or her current physical health and shape.

The *Eating Questionnaire* (EQ; Ball & Crawford, 2006) examines biological, psychological, social, and environmental influences on weight and weight change through a set of structured questions derived from Ball and Crawford's (2006) paper (see Appendix B). The *biological* subscale consisted of six items assessing respondents' weight history (e.g. "are you the kind of person who never puts on weight no matter what you do?") and past or present parental obesity (e.g. "has your biological mother ever been overweight or obese?"). Response options were dichotomised and scored 1=yes vs. 2=no. Lower scores on the biological subscale indicate higher levels of biological influences on body weight.

The second set of questions (31 items) relate to the degree to which *psychological* factors may contribute to body weight. Nine questions assessed respondents' level of *self-efficacy* for preventing weight gain, physical activity, and healthy eating. Questions were prefaced with the statement "How confident are you that you could do the

following?” and included two items for preventing weight gain (e.g. how confident are you that you could avoid putting on extra weight over the next five years?); four items regarding physical activity (e.g. “how confident are you that you could exercise for 30 minutes most days of the week, for the next year?”); and three items relating to healthy eating (e.g. “how confident are you that you could stick to eating healthy nutritious food over the next year?”). Response options for all self-efficacy questions ranged from 1 (not at all confident) to 4 (very confident). Scores on the three self-efficacy scales were summed to give one summary score, with higher scores representing greater self-efficacy. Ball and Crawford (2006) reported Cronbach’s α values for these scales range from 0.68 to 0.91. The Cronbach’s α values for these scales for the current study were 0.90, 0.71, and 0.92, respectively, suggesting good to excellent internal reliability.

Four questions assessed respondents’ level of *self-monitoring* of weight and related health behaviours. Questions were prefaced with the statement “Over the past 2 years, on average, how often have you done the following?” with response options ranging from 1 (not at all) to 6 (every day). Items assessed self-monitoring of weight, physical activity, the time you spent sitting, and eating patterns. Examples were provided for each (e.g. “for physical activity, counted how many times you exercised, so you knew if you were doing enough”). Response options ranged from 1=not at all to 6 = every day. Responses were summed across the four questions to give a total self-monitoring score, with higher scores indicate greater self-monitoring of weight-related behaviours. Ball and Crawford (2006) reported a Cronbach’s α value for this scale of 0.69. The Cronbach’s α value for this subscale for the current study was 0.72, suggesting good internal reliability.

The degree of *attention paid to weight-related health behaviours* was assessed with four questions relating to personal health habits, physical activity, eating a healthy nutritious diet, and controlling weight. Questions were prefaced with the statement

“Over the past 2 years, how much attention have you paid to the following?” with response options ranging from 1 (very much attention) to 4 (none). These items were summed to give a single scale score with higher scores indicating less attention paid to weight-related health behaviours. Ball and Crawford (2006) reported a Cronbach’s α value for this scale of 0.71. The Cronbach’s α value for this subscale for the current study was 0.81, suggesting excellent internal reliability.

Respondents’ *beliefs about weight gain* were established with a total of 14 items, which assessed endorsement of beliefs toward weight control. Questions were prefaced with the statement “Thinking about what has happened to your weight over the past two years, do you agree with the following statement?” Statements included beliefs about the outcomes of different behaviours in terms of effective weight control (e.g. “doing physical activity alone will prevent me from gaining weight”) as well as items on perceived weight locus of control (e.g. “my weight, to a large extent, is controlled by fate”). Response options were dichotomised and scored 1=agree vs. 2=disagree. These items were summed to give a single scale score with higher scores indicating that higher levels of control are required to prevent weight gain.

To assess the *social* correlates of weight, partner/spouse weight history and perceived social support for weight-related behaviours were both considered. Two items assessed partner/spouse weight history (e.g. “is your partner/spouse currently overweight or obese?”). Response options were dichotomised into 1=yes vs. 2=no with higher scores indicating a lack of partner/spouse weight history.

In addition, 18 items assessed respondents’ *perceived social support* for physical activity and healthy eating, and comprised of two sets (one for family and one for friends). Questions were prefaced with the statement “During the past two years, how often have your family or friends” and included support for healthy eating (six items: e.g., “how often have family, e.g., partner, children, parents, complimented me on my

eating habits”); sabotage of healthy eating (three items: e.g., “offered me high fat or unhealthy foods”); support for physical activity (six items: e.g., “participated in physical activity with me”); and sabotage of physical activity (three items: e.g., “suggest we do things that are physically inactive”). Response options ranged from 1 (never or not applicable) to 4 (often). Scores on the sabotage scale items were reversed so that for all subscales, a higher score reflected great social support (either greater support or less sabotage). Scores were then summed to produce four subscales each for family and friends. Ball and Crawford (2006) reported Cronbach’s α values for these scales ranging from 0.58 to 0.78 for family and 0.67 to 0.81 for friends. The internal reliability of the four subscales for the current study were 0.81, 0.74, 0.80 and 0.61 for family, and 0.85, 0.77, 0.86, and 0.73 for friends, respectively, representing good internal reliability for these scales.

For the purpose of this research, the two subscales assessing perceived social support for physical activity and healthy eating from family were summed to give one Social Support Family variable score (12 items). The Cronbach’s α value for this variable was 0.87. The two subscales assessing perceived social sabotage for physical activity and healthy eating from family were summed to give one Social Support Family Sabotage variable score (6 items). The Cronbach’s α value for this variable was 0.77. Likewise, the two subscales assessing perceived social support for physical activity and healthy eating from friends were summed to give one Social Support Friends variable score (12 items). The Cronbach’s α value for this variable was 0.91. The two subscales assessing perceived social sabotage for physical activity and healthy eating from friends were summed to give one Social Support Friends Sabotage variable score (6 items). Higher scores for each variable reflected greater social support from family or friends (either greater support or less sabotage). The Cronbach’s α value for this variable was 0.85.

The *environmental* correlates that may influence body weight comprised 19 items assessing the perceived ease or difficulty respondents experienced in undertaking healthy eating (eight items) and physical activity behaviours (11 items) in an individual's local environment. Questions were prefaced with the statement "Over the past 2 years, thinking about your daily routine and where you have spent your time, how easy or difficult has it been for you to do the following?" The 19 behaviours included the perceived ease or difficulty in buying good quality of fresh fruit and vegetables, buying healthy meals at good cafes or restaurants, or going for a walk or run safely. Response options ranged from 1 (very easy) to 4 (very difficult). These items were summed to give a single environmental scale score with higher scores reflecting more environmental influences on an individual's body weight. The Cronbach's α value for this subscale for the current study was 0.86, suggesting excellent internal reliability.

The *Global Motivation Scale* (GMS; Pelletier et al., 2004, as cited in Pelletier & Dion, 2007) is a 24 item questionnaire used to assess the diverse reasons for why people engage in various life activities. The GMS is comprised of six subscales that represent the six subtypes of motivation: intrinsic motivation, integrated regulation, identified regulation, introjected regulation, external regulation, and amotivation. Questions are prefaced with the statement, "In general I do things..." and respondents are asked to indicate the extent to which each item corresponds to their own motives for performing different activities on a 7-point Likert-type scale where 1=not agree at all and 7=completely agree (see Appendix C). The subscales are summed to give six subscale scores on the GMS. High scores on the intrinsic motivation, integrated regulation, and identified regulation subscales indicate self-determined forms of motivation, while high scores on introjected regulation, external regulation and amotivation subscales indicate non-self-determined forms of motivation. The reliability and validity of the GMS has been substantiated in five independent studies which have all shown support for the six-

factor structure of this scale and the self-determination continuum. In addition, internal consistency and the construct validity of this scale have been established, with separate administrations of this scale also revealing adequate test-retest reliability (Pelletier et al., 2004).

Three items assess respondents' level of *intrinsic motivation* which refers to doing an activity for inherent satisfaction, rather than relying on or requiring external reinforcement (e.g. "for the pleasant feeling I get while I am doing them"). These items are summed to give a single intrinsic motivation scale score, with higher scores reflecting more self-determined forms of motivation. Pelletier et al. (2004) reported a Cronbach's α value for this scale of 0.89. The Cronbach's α value for this subscale for the current study was 0.79, suggesting good internal reliability.

Integrated regulation, which is where identified regulations are fully assimilated to the self and brought into congruence with one's other values and needs, is examined through three items (e.g. "because they are in line with my main beliefs"). These items were summed to give a single integrated regulation scale score, with higher scores reflecting more self-determined forms of motivation. Pelletier et al. (2004) reported a Cronbach's α value for this scale of 0.92. The Cronbach's α value for this subscale for the current study was 0.76, suggesting good internal reliability.

In addition, three items assess respondents' level of *identified regulation*, which refers to a conscious valuing of a behavioural goal or regulation, whereby the action is accepted or owned as personally important (e.g. "in order to help myself become the person I aim to be"). These items were summed to give a single identified regulation scale score, with higher scores reflecting more self-determined forms of motivation. Pelletier et al. (2004) reported a Cronbach's α value for this scale of 0.83. The Cronbach's α value for this subscale for the current study was 0.81, suggesting excellent internal reliability.

Three items assessed respondents' level of *introjected regulation*, which refers to the degree to which behaviour is performed to avoid guilt or anxiety or to attain ego enhancements such as pride (e.g. "because otherwise I would feel guilty for not doing them"). These items were summed to give a single introjected regulation scale score, with higher scores reflecting more nonself-determined forms of motivation. Pelletier et al. (2004) reported a Cronbach's α value for this scale of 0.82. The Cronbach's α value for this subscale for the current study was 0.69, suggesting at least acceptable internal reliability.

Three items assessed respondents' level of *external regulation*, which includes controlled behaviours that are performed to satisfy external demand/s or reward contingencies, and has an external perceived locus of causality (e.g. "because I do not want to disappoint certain people"). These items were summed to give a single external regulation scale score, with higher scores reflecting more nonself-determined forms of motivation. Pelletier et al. (2004) reported a Cronbach's α value for this scale of 0.83. The Cronbach's α value for this subscale for the current study was 0.72, suggesting good internal reliability.

Finally, *amotivation*, where an individual lacks the intention to act and just simply going through the motions, which usually results from not valuing an activity, not feeling competent to do it, or not expecting it to yield a desired outcome, was assessed through three items (e.g. "even though I do not see the benefit in what I am doing"). These items were summed to give a single amotivation scale score, with higher scores reflecting more nonself-determined forms of motivation. Pelletier et al. (2004) reported a Cronbach's α value for this scale of 0.77. The Cronbach's α value for this subscale for the current study was 0.70, suggesting good to excellent internal reliability.

For the purpose of this research, the three subscales assessing self-determined forms of motivation (intrinsic motivation, integrated regulation, and identified regulation)

were summed to give one *intrinsic motivation* variable score (nine items), with higher scores on the intrinsic motivation variable reflecting greater self-determined forms of motivation. Moreover, the three subscales assessing non-self-determined forms of motivation (introjected regulation, extrinsic motivation, and amotivation) were summed to give one *extrinsic motivation* variable score (nine items), with higher scores on the extrinsic motivation variable reflecting greater non-self-determined forms of motivation. The Cronbach's α value for the intrinsic motivation variable was 0.90 and for the extrinsic motivation variable was 0.78, suggesting good internal reliability for both variables.

The *Eating Self-Efficacy Scale* (ESES; Glynn & Ruderman, 1986) is a 25-item questionnaire used to assess the perceived control over food consumption and weight. Questions are prefaced with the statement, "Please rate the likelihood that you would have difficulty controlling your overeating below in response to 'How difficult is it to control your...'", Respondents are asked to indicate the difficulty they experience in controlling overeating in response to a variety of emotional responses (e.g. "overeating when you feel upset") and in response to different social contexts (e.g. "overeating with family members"). The ESES is comprised of two subscales: a total of 15 items are concerned with *eating when experiencing negative affect* (NA) and the other 10 items are concerned with *eating during socially acceptable circumstances* (SAC). Response options range from 1=no difficulty controlling eating to 7= most difficulty controlling eating (see Appendix D). These items were summed to give a single NA scale score and a SAC scale score. Higher scores on the NA and SAC subscales indicate greater difficulty in controlling overeating in response to negative emotions or in socially acceptable circumstances. Previous research has demonstrated that this scale has high internal consistency and adequate test-retest reliability.

In addition, previous research has also substantiated the construct validity of the ESES using principal components factor analysis (Glynn & Ruderman, 1986). Glynn and Ruderman (1986) reported a Cronbach's α value for the NA subscale of 0.94. The Cronbach's α value for the NA subscale for the current study was 0.98. Glynn and Ruderman (1986) reported a Cronbach's α value for the SAC subscale of 0.85. The Cronbach's α value for the SAC subscale for the current study was 0.91, suggesting excellent internal reliability for both scales.

The *Differential Emotions Scale* (DES; Izard, Libero, Putnam, & Haynes, 1993) is a 36-item questionnaire used to assess how often respondents experience a range of emotions (see Appendix E). The DES is comprised of 12 subscales: *interest* (three items; e.g., “feel like what you’re doing or watching is interesting”); *enjoyment* (three items; e.g., “feel joyful, like everything is going your way, everything is rosy”); *surprised* (three items; e.g., “feel surprised, like when something suddenly happen you had no idea would happen”); *sadness* (three items; e.g., “feel discouraged, like you can’t make it, nothing is going right”); *anger* (three items; e.g., “feel like screaming at something or banging on something”); *disgust* (three items; e.g., “feel like something stinks, puts a bad taste in your mouth”); *contempt* (three items; e.g., “feel like somebody is a low-life, not worth the time of day”); *fear* (three items; e.g., “feel scared, uneasy, like something might harm you”); *guilt* (three items; e.g., “feel regret, sorry about something you did”); *shame* (three items; e.g., “feel embarrassed when anybody sees you make a mistake”); *shyness* (three items; e.g., “feel sheepish, like you do not want to be seen”); and *hostility inward* (three items; e.g., “feel you can’t stand yourself”).

Izard et al. (1991) reported Cronbach's α values ranging from 0.50 to 0.78. The Cronbach's α values for this study ranged from 0.82 to 0.94 for all subscales, suggesting excellent internal reliability. Questions are prefaced with the statement, “In your daily life, how often do you...” and respondents are asked to indicate how frequently they

experience a variety of emotions in their daily life. Response options range from 1=very often to 7= not at all often. Scores on the interest, enjoyment, and surprise scale items were reversed so high scores on these subscales of the DES form a positive emotionality factor, while high scores on the sadness, anger, disgust, contempt, fear, guilt, shame, shyness, and hostility inward subscales of the DES form a negative emotionality factor. For the purpose of this research the three subscales of the positive emotionality variable (nine items) were summed to give an overall score on positive emotionality, with higher scores on this subscale reflecting a greater presence of positive emotions. The nine subscales of the negative emotionality variable (27 items) were summed to give an overall score, with higher scores on the *negative emotionality* subscale reflecting a greater presence of negative emotions. The Cronbach's α value for the negative emotionality variable was 0.96 and for the *positive emotionality* variable was 0.89, suggesting excellent internal reliability for both variables.

Procedure

The Australian Catholic University Human Research Ethics Committee gave permission for the current study to be undertaken (see Appendix F). Methods of recruitment for this study predominantly involved targeting a community sample in urban Melbourne, Australia, approached through a snowball technique. Online sources such as the social networking site Facebook (facebook.com), and an online obesity support group known as Daily Strength (dailystrength.org), were also used to invite people to participate in the web based survey. Online recruits responded to a personal email or to an advertisement seeking people interested in participating in a study about eating habits and body weight. Interested participants were then asked to follow a hyperlink hosted through PsychData.com. PsychData is an online survey software tool which is specifically designed for social science researchers. It is an easy tool to use

which allows a quick and professional construction of a survey. All of the data stored on PsychData is protected and secure.

Prior to completing the questionnaire, participants were presented with a detailed information sheet (see Appendix G). Completing the online questionnaires through PsychData.com (which took approximately 30 minutes) constituted consent to participate in the study. The researcher made every attempt to ensure that strict confidentiality and anonymity were upheld and maintained, by using web based software that does not record the email address of participants and by not asking any personally identifying questions. Results were collected and analysed using the SPSS statistical software, version 15.0. An alpha level of .05 was used for all statistical tests.

Data analysis

Firstly, a series of preliminary analyses were conducted to ensure the pertinent statistical assumptions were upheld. Data were cleaned using the procedures described in Field (2005) and Tabachnick and Fidell (2007). Following appropriate adjustments of the data, the main analyses were conducted. Research has shown that both age and gender impact on the prevalence of overweight and obesity (Finkelstein, Brown, Trogon, Segel, & ben-Joseph, 2007; Flegal, Carroll, Ogden, & Johnson, 2002; Wang & Beydoun, 2007). Obesity statistics significantly increase with age, and women are more likely to be overweight or obese (Flegal et al., 2002; Wang & Beydoun, 2007). Therefore, descriptive statistics were used to investigate the distribution of all variables and to determine whether age and gender needed to be controlled for in later analyses. Predictors of BMI were examined using correlational analyses.

Results

Data cleaning and screening

Data were collected electronically through an online questionnaire package hosted by PscyhData.com, and analysed using the Statistical Package for Social Sciences

(SPSS, 2006), version 15.0. To ensure the main analyses were an honest and conservative evaluation of the data, a series of preliminary analyses were conducted; stringent data screening and assumption testing was upheld.

Accuracy of data file

Screening for accuracy of the data file involved examination of the descriptive statistics and graphic representations for the distribution of all 173 items and subscale scores for the EQ, GMS, ESES, and DES. Consideration of the univariate descriptive statistics ensured that respective data ranges, measures of central tendency, measures of variability, means, and standard deviations, were all plausible.

Missing data

Data were collected initially from 590 respondents, but inspection of the data revealed that 177 respondents were missing in excess of 5% of data. In addition, eight respondents failed to reliably self-report height and/or weight, and a further 27 cases had a BMI less than 18.5 and were deemed underweight. These data were deleted and the remaining 386 respondents were included in subsequent analyses. Although there are no firm guidelines regarding the tolerable amount of missing data in samples of different sizes (Tabachnick & Fidell, 2007), rather than assume that the data were missing at random, the most conservative process was to delete all respondents with missing items. Furthermore, given the nature of this online survey, a response needed to be entered for each item before the respondent could move on to answer the next question. This meant that the missing values were not random. However, the respondents with missing data were compared with the respondents with complete data to determine whether there were any systematic between-group differences across the measures. No significant differences were obtained. In addition, the results did not change when the analyses were conducted on the whole sample. Therefore the incomplete data were not used. No significant differences were obtained. In addition,

the results did not change when the analyses were conducted on the whole sample.

Therefore the incomplete data were not used.

Outliers

Standard approaches for evaluating the existence of outliers were completed in line with current recommendations (see Field, 2005; Tabachnick & Fidell, 2007). To detect any univariate outliers present in the data sample, standardised z-scores were computed for each respondent on all of the subscales of the EQ, GMS, ESES, and DES. To detect all the cases that had extreme values on one or more of the subscales, any cases yielding a z-score in excess of a positive or negative value of 3.29 ($p < .001$) were deemed to be outliers and could potentially distort the statistics of this study (Field, 2005; Tabachnick & Fidell, 2007). Tabachnick and Fidell (2007) present four reasons for the presence of an outlier in a data set, including; 1) the data was entered incorrectly; 2) missing value codes are incorrectly coded such that they are regarded as real data; 3) the outlier is not a member of the intended sample population; and 4) the case is from the intended sample population but yields a much higher score than would be assumed given a normal distribution.

In the current study, it was assumed that outliers were cases from the intended population with more extreme values than a normal distribution. However, it is also possible that some of these outliers were due to respondents entering incorrect values, particularly when self-reporting height and weight. For this reason, Tabachnick and Fidell's (2007) suggestion of retaining the case but changing the values to within normal ranges was applied. Any subscale yielding a z-score greater than 3.29 was adjusted to the preceding case with a z-score value less than 3.29. Analyses were then re-run to ensure that when the values were changed and the new z-scores were computed, all were still within the 3.29 range.

A total of three BMI scores were deemed to be extreme and were subsequently adjusted. In addition two cases were adjusted on the biological subscale of the EQ, one case was adjusted on the environmental subscale of the EQ, and three cases were adjusted on the beliefs subscale of the EQ. A frequency table was then generated to check that all new z-scores were within the 3.29 range.

Furthermore, to detect any multivariate outliers (which differ from univariate outliers by comprising of not just one unusual score, but a combination of unusual scores), Mahalanobis distance values were computed and examined as recommended by Tabachnick and Fidell (2007). The evaluation for outliers requires the probability for the Mahalanobis D^2 and not the scores themselves. Examination of the chi-squared distribution whereby the degrees of freedom equal the number of predictor variables used was conducted for data sets with 17 (EQ), 6 (GMS), 2 (ESES), and 12 (DES) independent variables. Tabachnick and Fidell (2007) suggest a conservative probability estimate of $p < .001$ for a case being an outlier. As such, critical values above 40.79, 22.46, 13.82, and 32.91, respectively, were considered as potential multivariate outliers. Given the frequency of some outliers hiding behind other outliers, it was important to screen for outliers several times until no new outliers were identified (Tabachnick & Fidell, 2007). The final screening for multivariate outliers detected a total of four multivariate outliers on the EQ, four multivariate outliers on the GMS, and five multivariate outliers on the DES. To preserve conservative analyses, all 13 cases were deleted. Consequently, 373 respondents were included in subsequent analyses.

Normality

Given the relatively large sample size in this study, the distribution of respondents' scores on all of the subscales of the EQ, GMS, ESES, and DES were graphically inspected to judge the departure from normality (Field, 2005; Tabachnick & Fidell, 2007). Histograms for each subscale revealed that each subscale (37 in total) for the EQ,

GMS, ESES, and DES moderately violated the assumption of normality. In addition, a histogram depicting the distribution of BMI scores for each respondent also violated this assumption. In particular, the BMI distribution was positively skewed, which meant that more respondents had lower BMI scores. Conversely, the intrinsic motivation, integrated regulation, and identified regulation subscales of the GMS, and the disgust, fear, guilt, and shame subscales of the DES were negatively skewed, which meant that more respondents had higher scores on these variables.

Tabachnick and Fidell (2007) and Field (2005) suggest several methods for dealing with violations of normality and extreme scores. When distributions moderately depart from normal, a square root transformation is initially recommended. Inspection of the normal curves and skewness and kurtosis scores indicated a moderate departure from normality for most of the variables. However, Pallant (2005) states that multivariate analysis of covariance is robust to modest violations of normality, and that with a sample size which includes at least 20 in each cell should ensure that assumption of normality is upheld. Given the extensive manual process of data cleaning and screening as outlined above, the untransformed data were considered appropriate to use in the analysis of results.

Linearity

To uphold the assumption of linearity, it is assumed that there is a straight line relationship between two variables. Linearity between the dependent variables of the current data set was assessed through inspection of scatterplots. When both variables are normally distributed and linearly related, the scatterplot will be oval-shaped (Tabachnick and Fidell, 2007). Taking into consideration that not all relationships between variables will be linear (Tabachnick and Fidell, 2007), inspection of the scatterplots for this data set was deemed to uphold the assumption of linearity.

Descriptive statistics

The means and standard deviations for the entire sample and for each weight group on each variable are presented in Table 1. The self-reported height and weight responses allowed for the calculation of respondents' body mass index (BMI). Based on BMI they were allocated into the corresponding weight status groups. BMI scores were calculated by dividing weight in kilograms by height in centimetres squared (weight in kg/height²). Individuals with a BMI between 18.5 and 24.9 are considered to be of healthy weight and individuals with a BMI greater than 24.9 are considered to be of an unhealthy weight. BMI scores for the current sample ranged between 18.51 and 55.10, with an average BMI of 28.41 ($SD = 6.70$), which falls in the overweight category.

The sample comprised 81 males and 292 females. There were 157 participants in the healthy weight category, of which 37 were males and 120 were females. There were 216 participants in the overweight category, of which 44 were males and 172 were females. A total of 187 respondents were aged between 18 and 31 years and 186 respondents were aged between 32 and 84 years. The age of participants ranged from 18 to 84 years of age with a mean age of 34.92 ($SD = 13.73$).

Demographic analyses

Consideration was initially given to demographic variables. As demonstrated in Table 2, there were significant differences between healthy weight and unhealthy weight individuals on some of the demographic variables. When comparisons were made between healthy weight and unhealthy weight respondents, there appeared to be differences in age, education level, marital status, physical health, and diet behaviours. Therefore chi square goodness of fit analyses were performed to examine whether the proportion of cases in the different categories were significantly different than would be expected by chance. Significantly more of the older age group (32-84 years) were of an unhealthy weight $\chi^2(1, N = 373) = 43.07, p < .01$. With regard to education level,

significantly more of the unhealthy weight participants had an education level of high school or less $\chi^2 (1, N = 373) = 2.91, p < .05$. In addition, significantly more unhealthy weight respondents were partnered $\chi^2 (1, N = 373) = 8.54, p < .01$. There were also significant differences between respondents with regard to diet attempts. Compared to healthy weight respondents, more of the unhealthy weight group had previously dieted to lose weight, $\chi^2 (1, N = 373) = 27.46, p < .001$. In addition, when respondents' physical health was considered, significantly more unhealthy weight respondents deemed their physical health to be "poor", $\chi^2 (3, N = 373) = 33.91, p < .001$. There were no apparent differences between the two BMI groups in relation to gender and geographical residence.

Correlational analyses

Pearson product moment intercorrelations were calculated to determine the strength of the relationship between the dependent variables used in the analyses and the relationship between age, gender, and BMI. Although BMI is a continuous variable, for the purposes of this study, it is treated as a dichotomous variable. Since age, gender, and the BMI categories (healthy weight vs unhealthy weight) are dichotomous variables, biserial correlations were calculated. Evident in Table 3, there were medium correlations between BMI and age, BMI and negative affect, self-efficacy and monitoring, self-efficacy and intrinsic motivation self-efficacy, monitoring and intrinsic motivation, attention and intrinsic motivation, social family and social friends, sabotage family and sabotage friends, social friends and sabotage friends, intrinsic motivation and extrinsic motivation, and intrinsic motivation and positive emotion. In addition, there were large correlations between self-efficacy and attention, monitoring and attention, and negative affect and socially acceptable.

Main analyses

Analysis of variance (ANOVA)

Preliminary assumption testing revealed that the assumption of homogeneity of variance-covariance matrices and the assumption of equality of variance was upheld. A two (BMI: healthy weight vs. unhealthy weight) x two (gender: males vs. females) x two (age: 18-31 years vs. 32-84 years) ANOVA was conducted to determine whether there were significant mean differences between these independent variables across the 17 dependent variables.

There was a significant difference between 18-31 year olds and 32-84 year olds for the biological subscale $F(1, 365) = 7.44, p < .01$, partial $\eta^2 = .02$. Neither BMI group nor gender was statistically significant. There was also an interaction effect between age and BMI group for this subscale $F(1, 365) = 6.80, p < .01$, partial $\eta^2 = .02$. This interaction was analysed with a test of simple effects. There was no significant difference for age among healthy weight participants $F(1, 365) = 0.02, p = .89$. However, there was a significant difference for age among unhealthy weight participants, such that the older age group indicated a higher level of biological influence on their weight $F(1, 365) = 13.03, p < .001$.

There was a significant difference between healthy weight participants and unhealthy weight participants for self-efficacy $F(1, 365) = 14.93, p < .001$, partial $\eta^2 = .04$. Healthy weight participants had greater self-efficacy for preventing weight gain, and engaging in physical activity, and eating healthily. Neither age nor gender was statistically significant for self-efficacy. There were no interaction effects.

There was a significant difference between healthy weight participants and unhealthy weight participants for self-monitoring, such that healthy weight participants utilised greater self-monitoring of weight-related behaviours $F(1, 365) = 4.26, p < .05$, partial $\eta^2 = .01$. Female participants were also more likely to monitor their weight-

related behaviours than males $F(1, 365) = 9.82, p < .05$, partial $\eta^2 = .03$. There was no statistically significant difference for age on this subscale. There was also an interaction effect between gender and BMI group for this subscale $F(1, 365) = 5.75, p < .05$, partial $\eta^2 = .02$. This interaction was analysed with a test of simple effects. There was no significant difference for gender among unhealthy weight participants $F(1, 365) = 0.66, p = .42$. However, there was a significant difference for gender among healthy weight participants, such that females were shown to self-monitor more than males $F(1, 365) = 20.29, p < .001$.

With regard to the attention subscale, males were shown to pay less attention to weight-related behaviour behaviours compared to females $F(1, 365) = 5.44, p < .05$, partial $\eta^2 = .02$. Neither BMI group nor age was statistically significant for self-efficacy. There were no interaction effects.

Finally, there was a significant difference between males and females for the beliefs subscale, such that males were more likely to believe that higher levels of control are required to prevent weight gain $F(1, 365) = 5.10, p < .05$, partial $\eta^2 = .01$. Neither BMI group nor age was statistically significant for self-efficacy. There were no interaction effects.

When considering the partner history subscale, results indicated that 18-31 year olds had less partner/spouse weight history compared to the 32-84 year olds $F(1, 365) = 18.77, p < .001$, partial $\eta^2 = .05$ and males had less partner/spouse weight history compared to females $F(1, 365) = 4.16, p < .05$, partial $\eta^2 = .01$. There was no significant difference for BMI group on this subscale. There was also an interaction effect between age and BMI group for this subscale $F(1, 365) = 5.66, p < .05$, partial $\eta^2 = .02$. A simple effects analysis revealed that there was no significant difference for age among unhealthy weight participants $F(1, 365) = 3.73, p = .06$. However, there was a significant difference for age among healthy weight participants, such that 18-31 year

Table 1.

Mean (SD) Variable Findings for the Entire Sample, Each Weight Group, Age Group, and Gender

Variable	Entire Sample (N=373) M (SD)		Healthy Weight (n=157) M (SD)		Unhealthy Weight (n=216) M (SD)		18-31 years (n = 187) M (SD)		32-84 years (n = 186) M (SD)		Male (n = 81) M (SD)		Female (n = 292) M (SD)	
Biol	1.73	(.31)	1.74	(.29)	1.73	(.31)	1.69	(.29)	1.77	(.31)**	1.74	(.29)	1.73	(.31)
SE	2.64	(.60)	2.85	(.51)	2.50	(.61)**	2.74	(.58)	2.55	(.60)	2.73	(.59)	2.62	(.60)
SM	2.95	(1.12)	3.17	(1.12)	2.78	(1.10)*	2.95	(1.08)	2.94	(1.17)	2.66	(1.06)	3.03	(1.13)*
Attent	2.19	(.70)	2.09	(.63)	2.26	(.73)	2.18	(.68)	2.19	(.72)	2.32	(.63)	2.15	(.71)*
Beliefs	1.66	(.19)	1.65	(.19)	1.66	(.19)	1.66	(.18)	1.66	(.19)	1.71	(.25)	1.64	(.16)*
PH	2.02	(.70)	2.18	(.66)	1.91	(.71)	2.19	(.65)	1.85	(.72)**	2.16	(.74)	1.98	(.69)*
EAFam	2.38	(.63)	2.44	(.60)	2.34	(.65)	2.46	(.62)	2.30	(.63)	2.34	(.64)	2.39	(.63)
SEAFam	2.57	(.63)	2.59	(.53)	2.56	(.70)	2.50	(.60)	2.65	(.65)	2.64	(.59)	2.55	(.64)
EAF	2.16	(.67)	2.18	(.60)	2.15	(.72)	2.22	(.65)	2.10	(.69)	2.04	(.66)	2.20	(.67)
SEAF	2.69	(.70)	2.57	(.60)	2.77	(.75)	2.56	(.67)	2.82	(.70)	2.67	(.71)	2.69	(.69)
Enviro	1.98	(.49)	1.88	(.44)	2.06	(.51)	1.93	(.46)	2.04	(.51)	1.91	(.47)	2.00	(.50)**
Intrinsic	4.71	(1.22)	4.98	(1.08)	4.51	(1.28)	4.82	(1.10)	4.59	(1.32)	4.69	(1.28)	4.71	(1.20)**
Extrinsic	3.58	(1.03)	3.62	(1.06)	3.55	(1.01)	3.82	(1.00)	3.35	(1.02)**	3.27	(.86)	3.67	(1.06)**
NA	3.38	(1.83)	2.67	(1.54)	3.90	(1.85)**	3.28	(1.78)	3.48	(1.87)	2.64	(1.60)	3.59	(1.84)**
SA	3.95	(1.44)	3.61	(1.39)	4.20	(1.43)**	4.04	(1.42)	3.86	(1.46)	3.60	(.40)	4.05	(1.43)
PE	3.12	(.97)	3.07	(.91)	3.16	(1.00)	3.12	(.92)	3.12	(1.01)	3.16	(1.00)	1.00	(.96)
NE	4.22	(1.13)	4.40	(1.04)	4.09	(1.18)*	4.12	(1.13)	4.32	(1.13)	4.28	(1.05)	4.20	(1.16)

Note: * indicates statistical significant difference between the two groups ($p < .05$)** indicates statistical significant difference between the two groups ($p < .01$)

Biol = biological subscale from the EQ; SE = self-efficacy variable from the EQ; SM = self monitoring subscale from the EQ;

PH = partner history subscale from the EQ; EAFam = eating activity family subscale from the EQ; SEAFam = sabotage eating activity family subscale from the EQ

EAF = eating activity friends subscale from the EQ; SEAF = sabotage eating activity friends subscale from the EQ; Enviro = environmental subscale from the EQ

Intrinsic = intrinsic variable from the GMS; Extrinsic = extrinsic variable from the GMS; NA = negative affect subscale from the ESES;

SA = socially acceptable subscale from the ESES; PE = positive emotion subscale from the DES; NE = negative emotion subscale from the DES

Table 2.

Analysis of Differences between the Normal and Unhealthy Weight Groups in Relation to Each Demographic Variable

Variable	Level	Healthy Weight n (%)	Unhealthy Weight n (%)	Analysis Results
Gender	Male	37 (45.7 %)	44 (54.3 %)	$\chi^2(1, N=373)=.55, p>.05$
	Female	120 (41.1 %)	172 (58.9 %)	
Age	18-31	110 (58.8 %)	77 (41.2 %)	$\chi^2(1, N=373)=43.07, p<.01$
	32-84	47 (25.3 %)	139 (74.7 %)	
Education level	High school or less	27 (33.8 %)	53 (66.3 %)	$\chi^2(1, N=373)=2.91, p<.05$
	Post high school	130 (44.4 %)	163 (55.6 %)	
Geographical residence	Urban	122 (43.3 %)	160 (56.7 %)	$\chi^2(1, N=373)=0.65, p>.05$
	Rural/remote	35 (38.5 %)	56 (61.5 %)	
Marital status	Single	82 (50.6 %)	80 (49.4 %)	$\chi^2(1, N=373)=8.54, p<.01$
	Partnered	75 (35.5 %)	136 (64.5 %)	
Previously dieted to lose weight	Yes	86 (33.2 %)	173 (66.8 %)	$\chi^2(1, N=373)=27.46, p<.001$
	No	71 (62.3 %)	43 (37.7 %)	
Physical health	Poor	0 (.0 %)	17 (100.0 %)	$\chi^2(3, N=373)=33.91, p<.001$
	Fair	33 (28.0 %)	85 (72.0 %)	
	Good	94 (49.7 %)	95 (50.3 %)	
	Excellent	30 (61.2 %)	19 (38.8 %)	

Table 3.

Correlations Between Each Variable, Age, Gender, and BMI

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
(1) Age		-.02	.34**	.13*	-.16**	-.00	.01	-.01	-.24**	-.13*	.12*	-.09	.20**	.11*	-.09	-.23**	.06	-.06	.00	.09
(2) Gender			.04	-.01	-.08	.13**	-.10	-.14**	-.11*	.04	-.06	.09	.01	.08	.01	.16**	.21**	.13*	-.02	-.03
(3) BMI				-.02	-.29**	-.17**	.12*	.01	-.19**	-.08	-.02	-.02	.14**	.18**	-.19**	-.04	.33**	.21**	.05	-.14**
(4) Biological					-.04	-.0	.06	.02	.04	-.07	.15**	-.04	.07	.02	-.15**	-.11*	-.11*	-.14**	-.04	.08
(5) Self-efficacy						.41**	-.51**	.07	.10	.20**	-.06	.20**	-.17**	-.26**	.47**	.01	-.28**	-.29**	-.31**	.17**
(6) Monitoring							-.63**	-.03	.03	.19**	-.06	.22**	-.15**	-.16**	.39**	.21**	-.05	-.14**	-.17**	.10*
(7) Attention								.06	.01	-.14**	.09	-.19**	.15**	.17**	-.38**	-.12*	.13*	.16**	.21**	-.16**
(8) Beliefs									.09	-.08	-.01	-.13*	.10	.04	-.03	-.16**	-.06	-.09	-.04	.10
(9) Partner history										-.08	.10*	-.02	.01	-.10	.05	.05	-.03	-.06	.14	-.02
(10) Social family											.15**	.45**	-.24**	-.12*	.21**	.15**	.02	.02	-.18**	-.07
(11) Sabotage family												-.12*	.42**	-.02	-.19**	-.20**	-.09	-.12*	.04	.10
(12) Social friends													-.47**	-.15**	.19**	.17**	.03	.01	-.20**	-.02
(13) Sabotage friends														.10	-.19**	-.23**	-.04	-.14**	-.00	.03
(14) Environmental															-.25**	-.04	.23**	.09	.16**	-.15**
(15) Intrinsic																.39**	-.17**	-.10	-.32**	.19**
(16) Extrinsic																	.14**	.17**	.06	-.21**
(17) Negative affect																		.57**	.24**	-.26**
(18) Socially acceptable																			.21**	-.16**
(19) Positive emotion																				-.27**
(20) Negative emotion																				1

Note: Pearson Correlation (2-tailed) * = .05; **=.01; N=373

Variables 4-14 are from the EQ; Variables 15-16 are from the GMS; Variables 17-18 are from the ESES; Variables 19-20 are from the DES

Age, Gender, and BMI = biserial correlation coefficient

olds indicated higher levels of partner/spouse weight history $F(1, 365) = 29.56, p < .001$.

There was a significant difference between males and females on the extrinsic motivation subscale, such that females exhibited greater non-self-determined forms of motivation than males $F(1, 365) = 7.91, p < .01$, partial $\eta^2 = .02$. In addition, 18-31 year olds had greater non-self-determined forms of motivation than 32-84 year olds $F(1, 365) = 11.83, p < .01$, partial $\eta^2 = .03$. There was no significant difference for BMI group on this scale. There were no interaction effects.

There was a significant difference between healthy weight participants and unhealthy weight participants on the negative affect subscale, with unhealthy weight participants indicating more difficulty in controlling overeating in response to negative affect than their healthy weight counterparts $F(1, 365) = 24.78, p < .001$, partial $\eta^2 = .06$. Females were also shown to experience greater difficulty in controlling overeating in response to negative affect than males $F(1, 365) = 10.70, p < .01$, partial $\eta^2 = .03$. There was no significant difference between age groups on this subscale. There were no interaction effects.

There was a significant difference between healthy weight participants and unhealthy weight participants for the socially acceptable subscale, with unhealthy weight participants experiencing more difficulty in controlling overeating in socially acceptable circumstances than healthy weight participants $F(1, 365) = 16.64, p < .001$, partial $\eta^2 = .05$. Neither gender nor age was statistically significant. There were no interaction effects.

Finally, results revealed that healthy weight participants experience a greater presence of negative emotions than unhealthy weight participants $F(1, 365) = 5.84, p < .05$, partial $\eta^2 = .02$. Neither gender nor age was statistically significant. There were no interaction effects.

Multiple regression

Although it is useful to examine the relationship between the independent variables and BMI category, one of the expected outcomes of this study was to assist in the development of an intervention. Since there were intercorrelations among the variables, multiple regression analysis was also conducted to determine which variables contributed unique variance to BMI. One of the benefits of this analysis was that BMI was used as a continuous variable rather than in two discrete categories. The results of the previous analyses found five independent variables to be statistically significant between the two weight groups. These factors were negative emotions, self-efficacy in controlling overeating in response to negative affect, self-efficacy in controlling overeating in socially acceptable circumstances, self-monitoring, and self-efficacy for weight and health-related behaviours. Based on the results, these independent variables were simultaneously entered into the regression model to determine which ones significantly predicted BMI. Demographic variables were not controlled for in this analysis.

Results indicated that self-efficacy significantly predicted BMI scores, $\beta = -.29$, $t(372) = -5.85$, $p < .001$. Self-efficacy for controlling overeating in response to negative affect also predicted BMI scores, $\beta = .34$, $t(372) = 6.16$, $p < .001$.

Discussion

The current study aimed to investigate which critical factors contribute to an unhealthy body weight, in order to develop an improved treatment option for weight-loss. On the basis of previous research, one research question was posited: Are there differences between healthy weight participants and unhealthy weight participants with regard to biological, environmental, social, and psychological factors?

The findings of the present study revealed that there were no significant differences between healthy weight individuals and unhealthy weight individuals with regard to

biological factors. This finding contradicts some previous research which has demonstrated that genetic factors are equally as important as non-genetic factors in terms of their influences on body weight (Labib, 2003; Maffeis, 2000; Smith, 2008). However, the demographic analyses revealed that there was a significant difference for age among unhealthy weight participants, such that the older age group indicated a higher level of biological influence on their weight. This may be indicative of the increased difficulty of weight-loss with age and a decreasing metabolic rate.

Research conducted by both Maffeis (2000) and Smith (2008) indicates that the biological correlates of weight gain are just as influential on body weight as the psychological and environmental factors. Both authors argue that biological relatives are likely to resemble one another in terms of body weight, indicative of the heritability of obesity. Bulik et al. (2003) agree, stating that obesity is a highly heritable condition largely unaffected by environmental factors.

Family studies (Labib, 2003; Maffeis, 2000) have demonstrated that BMI is highly correlated among first degree relatives. The results of the current study are surprising given the large body of literature which has shown that inheritance can account for 25% to 40% of inter-individual difference in obesity (Maffeis, 2000; Smith, 2008). However, the degree to which the environmental similarities compound the familial obesity rate is unknown. Sorensen et al. (1989) notes that the genetic impacts are often overestimated in twin studies, given the identical environments in which they are raised.

Interestingly, Ball and Crawford (2006) found that biological variables in addition to psychological variables were the most significant predictors of BMI and weight change. In this study, all of the biological variables (six in total) were found to have significant associations with BMI in bivariate regression analyses. Those individuals who reported difficulty in keeping their weight at its current level were those with a higher BMI,

while individuals who reported that they never put on weight no matter what they did were those with a lower BMI (Ball & Crawford, 2006).

In addition, having a biological parent who was overweight or obese, and having given birth, was also indicative of a higher BMI. Ball and Crawford (2006) also assessed what factors were correlated with weight change, which was assessed retrospectively over the preceding two years. Although fewer of the previous variables remained significant, of the biological influences, participants who reported difficulties in maintaining current weight had gained relatively more weight over the previous two years, while those who stated that they never putting on weight under any circumstance, had gained relatively less weight over the preceding two years (Ball and Crawford, 2006).

Since the current study utilised the questionnaire developed by Ball and Crawford (2006) and thus assessed the biological influences of body weight in exactly the same manner, the contradictory findings are surprising. Two distinctions may explain the discrepant findings. First, Ball and Crawford (2006) used a cohort of females, while the current study had a sample comprised of both males and females. Second, Ball and Crawford (2006) were primarily interested in the correlations between biological variables and BMI and used regression analyses; thus, BMI was a continuous variable. In the present study, the aim was to determine which (if any) biological factors influence unhealthy weight participants, in comparison to healthy weight participants. Therefore, BMI was used as a categorical variable which may have led to a loss of information.

However, the influence of biological and genetic factors on body weight is inconclusive. A large body of literature has shown that biological and genetic factors, alone, cannot justify the current obesity epidemic (Anderson, 2004; de Bruijn et al., 2007; Labib, 2003; Smith, 2008). Although it is clear that genetic factors can predispose

certain individuals to weight gain, considerable research supports the stress-diathesis model, which acknowledges the underlying effect that biological influences can have on weight gain, but not in isolation (Anderson, 2004; Atlantis et al., 2006). This model supports the current findings such that biological factors alone did not distinguish healthy weight individuals from unhealthy weight individuals, but they may have predisposed some people to weight gain.

The results of the present study show that there were no significant differences between healthy weight individuals and unhealthy weight individuals with regard to environmental factors. This finding is not consistent with the large body of literature which has consistently documented the influence of “obesogenic” environments on the obesity epidemic. These include: poor access to recreational facilities, foot paths, and local shops, an increased use of computers, remote control devices, microwave ovens, and cars that now permeate Western society (Elinder & Jansson, 2008; Giskes et al., 2007; Holsten, 2008).

Researchers contend that it is not surprising the obesity epidemic has coincided with the introduction of a time-pressured society thriving on quick and easy food that often lacks nutritional value and is high in caloric and fat content (Elinder & Jansson, 2008; Giskes et al., 2007). Ball and Crawford (2006) contend that although some research has shown the lifestyle factors correlate with excessive body weight, these studies have not simultaneously investigated the role that psychological factors play. The results of the current study certainly support that proposition, and suggest that environmental factors are not the most pertinent correlates of obesity.

In addition, there were no significant differences between healthy weight individuals and unhealthy weight individuals with regard to social factors. There is a lack of research which has specifically examined the link between social support and obesity, hence this finding only adds to extant literature which has assessed the link between

social support and obesity. Cadzow and Servoss (2009) investigated the link between social support and obesity, and found that insufficient perceived social support was associated with obesity and obesity-related comorbidities. Similarly, Wing and Jeffery (1999) found that among a cohort of 166 volunteers, participants who were in a weight-loss group with friends and received social support strategies were more likely to lose weight and maintain the weight-loss, than those who participated alone.

Conversely, research conducted by Gierszewski (1983) did not find a link between social support and weight-loss. However, this study lacked a reliable measure of social support, hence the results are questionable. Although it is quite possible that the personality of the support person/s may impact on the quality of the support offered to the obese individual, Gierszewski (1983) did not distinguish between encouraging health-related behaviours and sabotaging health-related behaviours. What seems clear from the current investigation is that social support is not the most pertinent factor impacting on body weight for this cohort of individuals.

The results also indicated that self-monitoring was a key factor that distinguished healthy weight individuals from unhealthy weight individuals. Specifically, healthy weight individuals were more likely to self-monitor their weight and related health behaviours than were unhealthy weight individuals. This finding is consistent with previous research by Kitsantas (2000) who found that among a sample of 33 participants, healthy weight individuals and previously overweight individuals who had successfully lost 10% of their body weight, and had maintained that weight-loss, used more self-monitoring techniques than overweight participants who had been unsuccessful in losing weight (Kitsantas, 2000). Although it was a non-significant trend, this finding indicates that previously overweight participants may be able to maintain their weight-loss by employing self-monitoring techniques as frequently as healthy weight individuals (Kitsantas, 2000).

An important outcome of this study is evidence that the psychological factors showed the greatest discrepancy between healthy weight and unhealthy weight participants. It is clear from the results that self-efficacy was the most pertinent factor that distinguished the two weight groups. There were significant differences between the two weight groups for the self-efficacy scale on the Eating Questionnaire (Ball & Crawford, 2006) and on both subscales of the Eating Self-Efficacy Scale (Glynn & Ruderman, 1986). These results are not surprising given the research which has previously demonstrated the critical role that self-efficacy plays in the maintenance of a healthy body weight (Glynn & Ruderman, 1986; Linde et al., 2006; Luszczynska et al., 2005).

In addition, the finding that unhealthy weight participants were more likely to overeat in response to negative affect supports the research indicating that obese individuals are more likely than healthy weight individuals to react to negative emotions by eating (Byrne et al., 2003; Chesler et al., 2009; Seamoore et al., 2006). This suggests that obese individuals are more likely to feel unable to cope with negative emotions, and therefore mediate that stress by eating. Specifically, results indicated that females were more likely to experience greater difficulty in controlling overeating in response to negative affect.

Moreover, the results of the current study revealed that healthy weight participants experience a significantly greater presence of negative emotions, when compared to their unhealthy weight counterparts. Given the lack of empirical evidence which has investigated the link between negative emotions and weight status, this finding requires further investigation in a treatment program for obesity. This is an interesting finding given that the current study found that unhealthy weight participants have greater difficulty in controlling overeating when experiencing negative emotions. This result may suggest that healthy weight participants employ more adaptive coping strategies to

manage these experiences of negative emotions. Alternatively, another possible explanation is that healthy weight individuals may use less defensive coping and thus allow themselves to be aware of their negative emotions. Appropriate management of these negative emotions may facilitate desirable change for unhealthy weight individuals.

Furthermore, results from this study failed to find a significant difference between healthy weight participants and unhealthy weight individuals with regard to intrinsic motivation. This finding contradicts previous research which has shown that volitional and prescribed motivation play a role in regulating eating behaviours and body weight. Research has demonstrated that global motivation has strong predictive validity of an autonomous regulation of healthy eating behaviours and that an individual's level of self-determination determines behavioural, cognitive, and psychological outcomes (Gillison et al., 2009; Pelletier & Dion, 2007).

One reason for the discrepancy in results may be that all individuals, regardless of body weight and size, desire to reach their weight and health-related goals and feel satisfaction in working towards these goals. However, the inherent results in changing health-related behaviours are not immediate and may not be quick enough for overweight individuals to continue to be motivated to eat healthily and exercise. Overweight individuals may seem to have similar levels of intrinsic motivation to healthy weight individuals when responding to a questionnaire, but if levels of intrinsic motivation were measured at different time points, results may show that over the long-term healthy weight individuals have greater levels of self-determination and therefore are more successful in regulating their healthy eating behaviours.

Limitations and future research

This study has considerable strengths, including the exploratory nature of this research and the inclusion of various factors that have been empirically validated in the

literature. A primary limitation of this study is the exclusive use of an online questionnaire to collect data and the use of self-report measures. Since Study 1 and Study 2 have both used self-report questionnaires, a more detailed explanation of the associated limitations is presented in the discussion section of Study 2 (see page 100). Moreover, the results of the current study may be affected by demographic variables and psychopathological confounds which were not controlled for in the analyses. Future researchers may consider testing the effect these variables have on body weight.

Finally, although the current study included various psychological factors which enabled assessment of self-efficacy, motivation, and coping with negative emotions, attitudinal aspects of weight status, including the societal pressures to be thin, self-esteem, and body esteem were not investigated. Understanding whether there are attitudinal differences relating to weight and appearance between healthy weight and unhealthy weight individuals may provide a more comprehensive examination and enable a profile to be developed of healthy weight and unhealthy weight individuals. This profile could potentially serve as a guide in developing an effective weight-loss treatment program.

Conclusions

Although the evidence reviewed in this study has suggested that various factors correlate with body weight, the findings of the present study show that it is predominantly psychological factors that predict body weight. These findings highlight the complex interplay of different factors which are understood to affect body weight. While a collection of factors were examined, divergent from previous research, there appears to be a combination of psychological factors that emerge as the crucial determinants in differentiating healthy weight from unhealthy weight respondents. Notably, responses indicated that unhealthy weight individuals were more likely to have lower levels of self-efficacy for weight and health-related behaviours, greater difficulty

in controlling overeating in response to negative affect and in different social contexts, and less self-monitoring of weight and related health behaviours.

This research suggests that psychological influences may need to be at the forefront of weight-loss treatment programs. In addition to these psychological factors, beliefs and attitudes concerning body weight, shape, and appearance warrant investigation. Research has shown that the Western emphasis on a thin body shape for females and a muscular body shape for males affects an individual's perception and acceptance of his or her own body weight, shape, and appearance (Friedman & Brownell, 1995; Hill & Williams, 1998). Narrowing the focus of investigation on the psychological aspects of body weight may provide better long-term results for weight-loss treatment programs.

Accordingly, the next chapter outlines the second study that was conducted as part of this thesis. Study 2 investigated whether there were differences between healthy weight and unhealthy weight participants with regard to self-esteem, body esteem, and sociocultural attitudes towards appearance. It is expected that these first two studies will provide information about the pertinent factors involved in the development and maintenance of obesity, and subsequently contribute to the design of a pilot weight-loss treatment program

Chapter 3: The Influence of Self-Esteem, Body Esteem, and Sociocultural Attitudes on Weight

It was demonstrated in Study 1 that psychological influences predominantly differentiated healthy weight individuals from unhealthy weight individuals. Specifically unhealthy weight individuals had lower levels of self-efficacy for weight and health-related behaviours, lower levels of self-efficacy for controlling overeating in response to negative affect and in different social contexts, and less self-monitoring of weight and related health behaviours. Since psychological factors were shown in Study 1 to be associated with body weight to a greater extent than other factors, the aim of the Study 2 was to consider additional psychological factors that may also contribute to body weight. It has been well established in the literature that societal attitudes and norms regarding health and body weight affect an individual's feelings and appraisal of his or her own body weight, shape, and appearance (see Baumeister, Campbell, Krueger, & Vohs, 2003; Friedman & Brownell, 1995; Hill & Williams, 1998). For this reason, self-esteem, body esteem, and sociocultural attitudes towards weight and appearance were the focus of the current investigation.

A major shortcoming of current research is its focus on the effects of societal values on children and adolescents. A paucity of data examining the link between self-esteem, body esteem, and sociocultural attitudes towards appearance exists for an adult population. In addition, some of the research has investigated the interplay between these factors among cohorts of obese individuals, which, while providing valuable information about the effects of societal attitudes on obese individuals, has at the same time failed to consider whether these factors are also influencing the psychological health of healthy weight participants. The current study attempted to redress this research gap by investigating the influence of all these factors for both healthy weight and unhealthy weight individuals. As is evident in the following review of the literature,

low self-esteem, body esteem, and sociocultural attitudes towards appearance can all be associated with body dissatisfaction.

Self-esteem

Self-esteem can be defined by an individual's feeling of personal self-worth and value (Baumeister et al., 2003; Crocker & Brenda, 1989; Muhlenkamp & Sayles, 1986). Individuals with high levels of self-esteem report a more favourable global self-evaluation, are more confident and motivated to try new activities, make friends more easily, and report feeling happier than individuals with low levels self-esteem, who have an unfavourable global evaluation of themselves (Baumeister et al., 2003).

However, self-esteem is perceptual, rather than reality-based (Baumeister et al., 2003). This means that an individual's belief about his or her weight, shape, and appearance, is not necessarily an objective or accurate self-appraisal (Baumeister et al., 2003). It is important to distinguish between an individual's perception of self-worth and how contingent this evaluation is on body weight and shape. For example, if individuals perceive their self-worth to be linked to body weight, and they are indeed obese, treatment would need to focus on self-acceptance of oneself to increase happiness and subsequently reduce the likelihood of overeating, and increasing self-esteem.

To demonstrate that self-esteem adversely affects the psychological functioning of an individual, research must show that beliefs about oneself have important consequences (Baumeister et al., 2003). Accordingly, researchers have investigated the link between self-esteem and health outcomes. Considerable research has shown that higher levels of self-esteem are predictive of positive health outcomes, including lower levels of substance abuse, less disordered eating, and more physical activity (Dielman, Campanelli, Shope, & Butchart, 1987; Fisher, Schneider, Pegler, & Napolitano, 1991; Friedman & Brownell, 1995; McGee & Williams, 2000). Given that self-esteem is

based on an individual's perception of his or her own self-worth and the value they hold of themselves, it is logical that individuals with higher levels of self-esteem would be more likely to consider it worthwhile to invest in their physical health, compared to individuals with lower levels of self-esteem (Muhlenkamp & Sayles, 1986).

Muhlenkamp and Sayles (1986) examined the relationship between self-esteem and positive health practices with a sample of 98 adults (55 males and 43 females). The Coopersmith Self-Esteem Inventory and a Personal Lifestyle Questionnaire, developed by Muhlenkamp and Brown (1983, as cited in Muhlenkamp & Sayles, 1986), were used to assess positive health practices, which included questions about nutrition, exercise, relaxation, safety, substance abuse, and health promotion. Results from this study indicated that respondents with higher levels of self-esteem were more likely to maintain positive health practices, compared to respondents with lower levels of self-esteem. Moreover, statistical techniques involving path analysis indicated that self-esteem had a direct effect on lifestyle (Muhlenkamp & Sayles, 1986). However, this sample comprised of residents in an apartment complex in the United States, and may therefore not be applicable to other populations. It does corroborate previous research, however, supporting the view that self-esteem is associated with both physical and psychological health.

Similarly, Hill and Williams (1998) evaluated the relationship between obesity and self-esteem. A total of 179 obese women (mean age of 45.1 years) completed a battery of questionnaires, including the Rosenberg Self-Esteem Scale. Self-reported height and weight enabled participants to be grouped into three weight groups: BMI between 30 and 35, BMI between 35 and 40, and BMI greater than 40. Results indicated that there were significant differences between the three weight groups on the self-esteem measure, such that those in the lowest weight group (BMI between 30-35) reported higher levels of self-esteem than participants in the remaining two weight groups. In

addition, participants in the middle weight group (BMI between 35-40) reported higher levels of self-esteem than participants in the highest weight group (BMI > 40). These results suggest that there is a negative association between obesity and self-esteem, whereby individuals with higher BMI scores are more likely to exhibit lower levels of self-esteem.

One can only speculate as to why this may be the case as many factors may be involved in this finding. First, Western societies endorse a societal ideal of an unrealistically thin body for women, while for men this societal ideal is a body that is lean and muscular. Such ideals have been shown to cause body dissatisfaction (Barlow & Durand, 2005; Kostanski, Fisher, & Gullone, 2004; Piran, 2005). It is likely that individuals that greatly deviate from these societal standards (i.e. an obese individual), are more likely to feel poorly about themselves. Second, obese individuals frequently report that they are subject to widespread weight bias, stigma, and discrimination, all of which are believed to stem from society's value of thinness and health (Brownell & Puhl, 2003; Friedman & Brownell, 1995). Although investigating all of these factors is beyond the scope of this project, if self-esteem was found to be strongly associated with obesity, it would be integral to treatment. This could be by making it a target factor included in an intervention study for weight-loss, or it could be an outcome of weight-loss. Nonetheless, given the sociocultural emphasis on a thin or muscular body, it is likely that self-esteem and obesity are linked.

The Western emphasis on individualism encourages individuals to judge other people's weight, as well as their own, in terms of either achieving or failing to achieve a body shape endorsed by society (i.e. thin for females and muscular for males; Klaczynski, Goold, & Mudry, 2004). Accordingly, research has shown that individuals who fail to achieve this ideal body shape are likely to be perceived by themselves, their peers, and the wider community, as personal failures with many undesirable character

traits (Klaczynski et al., 2004). Not surprisingly, obese individuals more frequently report poor peer relationship, social marginalisation, and institutional and interpersonal discrimination (Carr & Friedman, 2005; Ozmen et al., 2007).

When these prejudices are internalised, it is likely that self-esteem is adversely affected. Research over the last thirty years has shown that the stigma of obesity is pervasive in Western culture (Friedman & Brownell, 1995). Obese individuals are still regarded as acceptable targets of denigration in Western society (Carr & Friedman, 2005). Unflattering pictures of obese individuals pervade popular culture. Compared to healthy weight individuals, reports frequently document that individuals regard obese people as unattractive, aesthetically displeasing, morally and emotionally impaired, alienated from sexuality, unlikable, frequently described as “weak-willed”, “lazy”, “stupid”, and “ugly”, and discontent with themselves (Brownell & Puhl, 2003; Carr & Friedman, 2005; Crandall, 1994; Ozmen et al., 2007).

Furthermore, research has revealed a pervasive implicit bias against obese individuals among health professionals who specialise in its treatment. Such attitudes include a belief that obese individuals lack self-control, that obesity is caused by character flaws, and that failure to lose weight is due only to noncompliance (Friedman & Brownell, 1995). Not surprisingly, the stigma of obesity stands out from other marginalised groups in that obese individuals report internalising society’s prevalent anti-fat attitudes and pro-thin biases (Brownell & Puhl, 2003). These beliefs of obese individuals are thought to arise from the popular belief that obesity is due to a lack of willpower and personal shortcoming (Brownell & Puhl, 2003).

At present, it is unknown whether the internalisation of these beliefs adversely affects self-esteem. It is possible that these biases would affect the self-esteem of individuals whose self-worth is contingent on the acceptance and endorsement of others. However, it is also likely that these biases may not affect the self-esteem of

individuals whose self-worth is not linked to body weight, but it may impact on body esteem. Research investigating the influence of both self-esteem and body esteem warrants attention. Current literature which has explored the link between obesity and body esteem is outlined in the next section.

Brownell and Puhl (2003) reviewed various studies investigating the stigma and discrimination associated with obesity. In one study, 28% of teachers stated the becoming obese was considered to be the worst thing that could happen to a person, while 24% of nurses admitted that they were repulsed by obese individuals (Brownell & Puhl, 2003). These attitudes encourage prejudice and discrimination against obese individuals (Friedman & Brownell, 1995). Discrimination has been frequently reported by obese individuals in employment, housing, and university admissions (Friedman & Brownell, 1995). In addition, obese individuals are also less likely to be married, report lower household incomes, and have higher rates of household poverty compared to their healthy weight counterparts (Friedman & Brownell, 1995). Given this anti-fat bias which is prevalent in Western culture, it is not surprising that these negative attitudes and subsequent discrimination also increases the emotionally suffering of obese individuals (Friedman & Brownell, 1995).

Body esteem

Body esteem is closely linked to self-esteem and is also referred to as body image in the literature. Body esteem can be defined as individuals' mental representations of their body and how they believe they appear to others, and any psychological experiences that are associated with these evaluations (Friedman et al., 2002). Body esteem is presupposed to be multidimensional and comprised of (1) perceptual body image (i.e. an estimation of one's size), and (2) attitudinal body image (i.e. affective, cognitive, and behavioural concerns related with one's body size) (Friedman et al., 2002). In Western society, where a thin body is endorsed for females and a muscular body for males, there

are detrimental consequences for those that deviate from this ideal body shape, particularly for overweight and obese individuals. Given the contrast between their actual weight and ideal weight, body image is likely to be associated with obesity (Friedman & Brownell, 1995). Friedman and Brownell (1995) maintain that an abundance of research has consistently shown that obese adolescents and young women report greater body dissatisfaction than non-obese adolescents and older women. These results have also been consistent irrespective of socioeconomic status (Friedman & Brownell, 1995).

The judgments an individual makes related to weight and appearance has been shown to be associated with time spent on physical health and looking after oneself (Friedman et al., 2002). For example, individuals who have positive feelings about their body weight and appearance are more likely to focus on their nutritional and health needs. It is therefore likely that body esteem may be linked to obesity. If obese individuals feel poorly about their weight and appearance, then they are likely to reflect these feelings by making poor weight- and health-related decisions, such as a lack of vigilance of their nutritional and exercise needs.

Accordingly, research has shown that body dissatisfaction is a risk factor for obese individuals as they experience negative psychological consequences related to their dissatisfaction with their body and appearance (Friedman et al., 2002). Friedman et al. (2002) explored whether body dissatisfaction mediates the relationship between dysphoric psychological states (i.e. depression, low self-esteem) and obesity in a treatment-seeking population. This study included 110 obese participants (80 females and 30 males) with a mean BMI of 41.6 who were self-referred to a residential weight-loss facility for weight control and lifestyle change. Two components of the Multidimensional Body-Self Relations Questionnaire were used to assess body-image satisfaction: the Appearance Evaluation Factor subscale and the Body Areas

Satisfaction subscale; both scales assess an individual's emotional and evaluative experiences of appearance. Psychological functioning was assessed using the Beck Depression Inventory and the Rosenberg Self-Esteem Scale. The Binge Eating Scale was also used to measure disordered eating.

First, the findings of this study demonstrated that treatment-seeking obese individuals' body-image evaluations were related to depression and self-esteem, such that individuals who rated more negative evaluations on appearance demonstrated higher levels of depression, and lower levels of self-esteem. Second, individuals with higher BMIs reported less satisfaction with their appearance. Third, heavier participants also reported higher levels of psychological distress. It is plausible that these significant findings may be explained by the fact that these individuals were treatment seeking, and treatment seeking has been associated with higher levels of psychological distress (Friedman et al., 2002).

In addition, it was found that the relationship between body weight, depression and self-esteem was partially mediated by body image, suggesting that body dissatisfaction accounts for some of the relationship between the degree of obesity, and is also likely to lead to negative affect and lower levels of self-esteem. For this reason, Friedman et al. (2002) assert that body image dissatisfaction should be a factor investigated in obese individuals who are seeking treatment, and should be included in intervention efforts. However, this sample comprised of a Caucasian sample of treatment-seeking individuals and included individuals of predominantly middle to upper class socioeconomic status. Thus, these results may not be generalisable to those of differing ethnic backgrounds, non-treatment seeking obese individuals, and those of lower socioeconomic status. Nonetheless, these findings suggest that further investigations are needed to clarify the effect that both self-esteem and body esteem have on body weight.

Similarly, Hill and Williams (1998) evaluated the relationship between obesity and body dissatisfaction. A total of 179 obese women (mean age of 45.1 years) completed a battery of questionnaires which included the Body Shape Satisfaction questionnaire. Participants were allocated on the basis of self-reported height and weight, to one of three weight groups: BMI between 30 and 35 ($n = 54$); BMI between 35 and 40 ($n = 55$); and BMI greater than 40 ($n = 70$). Results indicated that participants in the heaviest weight category reported the most body dissatisfaction with body weight, shape, and appearance. Participants in the lowest weight group (BMI between 30-35) reported higher levels of body satisfaction compared to participants in the remaining two weight groups. In addition, participants in the middle weight group (BMI between 35-40) reported higher levels of body satisfaction than participants in the highest weight group. These results suggest a positive association between obesity and body dissatisfaction. This finding confirms previous research in that the more individuals stray from a normal body weight and the “thin ideal”, the more they are likely to feel negatively about themselves.

Sociocultural attitudes

Both men and women are affected by society’s attitudes towards body weight and shape. Research has predominantly focused on the cultural pressures on women to have a slender figure and achieve the “thin ideal”. Corroborative research indicates that overweight and obese women experience higher levels of prejudice than men. However, recent evidence has shown that men are becoming increasingly preoccupied with their body weight and shape and feel pressured to conform to the cultural ideal of a lean, toned, muscular build (Grogan & Richards, 2002; Kostanski et al., 2004).

Internalisation of the “thin ideal” refers to the extent to which a woman adopts the societal standard of exaggerated thinness as her own benchmark of attractiveness, and engages in subsequent weight-loss behaviours attempting to meet that standard

(Derenne & Beresin, 2006; Harrison & Hefner, 2006; Lovejoy, 2001; Stein & Colditz, 2003). Research shows that many women internalise self-worth as being contingent on body shape and size as a result of the thin models which permeate media outlets in Western societies (Barlow & Durand, 2005; Evans, 2003; Lovejoy, 2001 Piran, 2005). Research investigating the link between social comparison, body image, and the media has shown that women who are more likely to compare themselves with thin-ideal female media images report significantly more anger, anxiety, and depression, when compared to women who viewed non-appearance related commercials (Evans, 2003).

The weight and size of these models are believed to be linked with happiness and success, thus many women aspire to be thin in order to attain these secondary gains. Research has shown that internalisation of the “thin-ideal” encourages social comparison processes to occur, such that women attempt to gain information about how their body compares to others (Fitzsimmons-Craft et al., 2011; Fredrickson & Roberts, 1997; Tiggemann & Kuring, 2004). Body objectification occurs when internalisation of the thin-ideal has occurred and a woman’s body is perceived to be separate from her person; her body is believed to represent her (Fitzsimmons-Craft et al., 2011; Fredrickson & Roberts, 1997; Tiggemann & Kuring, 2004). If she perceives her body to be incongruent with thinness, then it is likely to lead to body dissatisfaction (Fitzsimmons-Craft et al., 2011; Tiggemann & Kuring, 2004). Not surprisingly, these oppressive beliefs about beauty and cultural emphasis on thinness has been casually linked to the increasing prevalence of disordered eating in Western nations such as Australia, the United Kingdom, and the United States (Barlow & Durand, 2005; Morry & Staska, 2001; Shisslak, Crago, Neal, & Swain, 1987).

Although this research is not recent, Fallon and Rozin (1985) outline that females are more likely than males to weigh themselves frequently, describe themselves as fat, diet often, and seek treatment for problems associated with weight. Not surprisingly,

women report higher levels of body dissatisfaction than men (Fallon & Rozin, 1985). Given that this “thin ideal” is not easily attainable (nor is it healthy), body dissatisfaction is so widespread that it is now considered “normative discontent” (Barlow & Durand, 2005; Kostanki & Gullone, 1998; Piran, 2005). Body dissatisfaction has been shown to increase the likelihood of negative psychological consequences associated with obesity, including low levels of self-esteem and body esteem (Ozmen et al., 2007). Although research has predominantly focused on adolescents (Harrison & Hefner, 2006; Klaczynski et al., 2004; Ozmen et al., 2007) or university students (Fallon & Rozin, 1985), it is equally important to understand the way in which the “thin ideal” affects healthy weight and unhealthy weight adults.

Body image factors have been shown to discriminate obese individuals from their healthy weight counterparts (Friedman et al., 2002). Obese individuals report greater levels of body dissatisfaction, are more preoccupied with their appearance, and avoid more social interactions because of their appearance (Friedman et al., 2002). Overall, obese individuals report more negative evaluations of body shape and weight than non-obese individuals (Friedman et al., 2002). Body image is thus likely to be an important consideration in designing a treatment program for obesity.

Friedman et al. (2002) propose that these thin body ideals would have a greater influence on obese individuals, since their deviation from the societal standard of attractiveness is associated with heightened levels of psychological distress. Moreover, as the pressure to be thin increases, the discrepancy between desired body weight and actual body weight also increases (Friedman et al., 2002). Three decades ago the body weight of the average female fashion model was 8% less than the average woman; however, at present this discrepancy has increased to 23%. Although this increase reflects the rise in obesity rates, it is also assumed that this also reflects the progressively thinner ideals espoused by society (Derenne & Beresin, 2006). The media

is replete with images of thin models, which encourages women to think that they are not pretty enough or thin enough (Derenne & Beresin, 2006).

Likewise, Grogan and Richards (2002) assert that male figurines now exceed the muscularity of the largest human bodybuilders. This increased cultural concern with the appearance of the male body has been linked with an increase in the use of anabolic steroids and human growth hormones (Grogan & Richards, 2002). Mishkind, Rodin, Silberstein, and Striegel-Moore (1986) found that when males were exposed to silhouette drawings of male figures ranging from very thin to very fat, 75% of participants reported that their ideal was discrepant from their current size. Approximately 50% of participants indicated that they strived to be bigger than their current size, while 50% indicated that they were striving to be smaller than their current size.

In consequence, these social comparisons foster widespread body dissatisfaction and encourage individuals to feel more negatively about themselves (Evans, 2003). Evans (2003) reported on a meta-analysis examining the effect that these thin ideal images can have on women. Results indicated that following exposure to media images depicting this thin ideal, women felt significantly worse about themselves, than after exposure to media images containing women of an average or above-average weight. Research of this kind indicates the vulnerability of an individual's body esteem and self-esteem as a result of the cultural ideals that are not readily achievable. Understanding the effect of societal standards of attractiveness and the emphasis placed on females to be thin and males to be muscular are important for effective obesity treatment.

Rationale

Currently, there is a paucity of research which has investigated the association between self-esteem, body esteem, cultural ideals, and body weight in an adult sample. Rather, a considerable number of studies has used cohorts of children and adolescents,

and has demonstrated that self-esteem and body esteem among low- and middle-weight groups is significantly higher than in individuals in the higher weight groups (Friedman & Brownell, 1995). Since adolescence is a critical developmental phase, and appropriate interventions are required due to the increasing prevalence of obesity in childhood, it is understandable that research efforts have primarily focused on children and adolescents. However, it is equally important to understand the link between obesity and self-esteem, body esteem, and societal attitudes towards appearance among adults, and to design effective weight-loss treatments.

In addition, a model describing the pertinent factors involved in the onset and maintenance of obesity is currently unavailable. Study 1 was useful in identifying that psychological factors are the most important variables which distinguish healthy weight individuals from unhealthy weight individuals. Specifically, the study demonstrated that self-efficacy, negative emotions, intrinsic motivation, and self-monitoring have a disproportionate influence on body weight. However, although Study 1 provided valuable information regarding the influence that psychological factors have on body weight, it would be beneficial to understand more of the attitudinal factors that may be involved. For this reason, the current study explored whether self-esteem, body esteem, and sociocultural influences on body weight, shape, and appearance are associated with body weight. Gaining a greater understanding of a range of psychological factors will assist in the development of a weight-loss treatment program.

Aims and research question

The aim of Study 2 was to further examine the psychological factors that are associated with an unhealthy body weight, in order to assist in the development of an improved treatment option for weight loss. On the basis of prior research, one research question was posited: Are there differences between healthy weight participants and

unhealthy weight participants with regard to self-esteem, body esteem, and societal attitudes towards weight and appearance?

Method

Participants

A total of 300 respondents started the questionnaire, but some respondents were missing more than 5% of data or had a BMI score of less than 18.5 (underweight). Following a conservative process of screening and cleaning the data which involved omitting respondents who were missing in excess of 5% of data, and deleting all cases that yielded multivariate outliers or unreliable BMI scores, a total of 215 (57 males and 158 females) participants were used in subsequent analyses (72% completion rate). These participants were not used in Study 1.

With regard to marital status, 92 participants (42.8%) were single, 15 participants (7%) were separated or divorced, 35 participants (16.3%) were in a defacto relationship, and 73 participants (34%) were married. In terms of geographical residence, 160 respondents (74.4%) resided in an urban location, while 55 respondents (25.6%) lived in a rural or remote community. The majority of participants, 173 in total (80.5%), had completed further education beyond high school (i.e. TAFE or university), while 42 respondents (19.5%) had completed high school or less.

Design

This study was a survey design with analyses of both group variables and between group differences. One research question was tested: Are there differences between healthy weight participants and unhealthy weight participants with regard to self-esteem, body esteem, and societal attitudes towards weight and appearance?

First, descriptive statistics have been presented to show the distribution for gender, age, and weight categories. Second, demographic analyses were conducted to determine whether there were significant differences between healthy weight and

unhealthy weight individuals for age, education level, marital status, physical health, and diet behaviours. Third, Pearson product moment intercorrelations were calculated to determine the strength of the relationship between the dependent variables used in the analyses and the relationship between age, gender, and BMI.

Subsequently, one research question was tested using a two (BMI: healthy weight vs. unhealthy weight) x two (gender: males vs. females) x two (age: 18-31 years vs. 32-84 years) analysis of variance was calculated to determine whether there were significant mean differences between these independent variables across the eight dependent variables from the RES (Rosenberg, 1965), BES (Mendelson, 1995), and the SATAQ-3 (Heinberg et al., 1995). The eight dependent variables were self-esteem, body esteem-weight, body esteem-appearance, body esteem-attribution, internalisation – general, internalisation – athlete, pressure, and information. Finally, multiple regression analysis was conducted to determine which variables contributed unique variance to BMI.

Measures

A battery of questionnaires was compiled to obtain the pertinent demographic data, and measure self-esteem, body esteem, and sociocultural attitudes towards appearance for all participants. For the purposes of the present study, a 12-item demographic questionnaire was constructed (see Appendix H). The demographic questionnaire ensured that data could be compared with subsequent studies, and served two functions. First, seven items specifically addressed descriptive information including participant gender, age, education level, geographical residence (urban or remote), marital status, height, and weight. Second, five items focused on respondents' previous diet and weight loss attempts, medical conditions, and a personal opinion of respondents' current physical health and shape.

The *Rosenberg Self-Esteem Scale* (RSE; Rosenberg, 1965) is 10-item questionnaire used to assess global *self-esteem* (see Appendix I). Participants were asked to indicate their agreement to five positively phrased statements regarding general feelings about themselves (e.g. “on the whole, I am satisfied with myself”) and five negatively phrased statements regarding general feelings about themselves (e.g. “I certainly feel useless at times”). Responses are rated using a 4-point Likert Scale ranging from 1 = strongly agree to 4 = strongly disagree. The negatively phrased items were reverse scored to give a total self-esteem score. Lower scores on the RSE indicate higher levels of self-esteem. The RSE is the most widely used measure of global self-esteem and has undergone substantial psychometric analysis and validation (Robins, Hendin, & Trzesniewski, 2001). The Cronbach’s α value for RSE for the current study was 0.89, suggesting excellent internal reliability.

The *Body Esteem Scale* (BES; Mendelson, White, & Mendelson, 1997) is a 23-item questionnaire used to assess the extent to which individuals have positive feelings and beliefs about their physical characteristics, particularly those characteristics related to attractiveness. The BES is comprised of three subscales: eight items are concerned with *body esteem weight* (BE-weight; e.g., “I am satisfied with my weight”); ten items are concerned with *body esteem appearance* (BE-appearance; e.g., “I wish I looked like someone else”); and five items are concerned with *body esteem attribution* (BE-attribution; e.g., “other people consider me good looking”). Respondents were asked to indicate agreement with a series of statements which are all rated on a 5-point Likert scale ranging from 1 (never) to 5 (always) (see Appendix J). Nine items on the BES are reversed to ensure participants are responding to the item content in a consistent fashion. Items were summed to give a single BE-weight score, a single BE-appearance score, and a single BE-attribution score. Higher scores on the BE-weight subscale indicate higher levels of body satisfaction; higher scores on the BE-appearance subscale

indicate higher levels of appearance-related feelings, and higher scores on the BE-attribution subscale indicate more positive evaluations attributed to others about one's body and appearance. All negatively phrased items were reverse scored. Mendelson, Mendelson, and White (2001) reported a Cronbach's α for the BE-weight subscale as .94, for the BE-appearance subscale as .92, and for BE-attribution subscale as .81, suggesting excellent internal reliability. The Cronbach's α value for the BE-weight subscale for the current study was 0.94, for the BE-appearance subscale was 0.94, and for the BE-attribution subscale was 0.74, indicating adequate internal reliability for all subscales.

The *Sociocultural Attitudes Toward Appearance Questionnaire* (SATAQ-3; Heinberg, Thompson, & Stormer, 1995) is a 30-item questionnaire which assesses respondents' internalisation of societal standards of appearance as well as evaluating the influence of media on internalisation (see Appendix K). Respondents were asked to indicate their level of agreement with a series of statements on a 5-point Likert scale ranging from 1 = definitely disagree to 5 = definitely agree. The SATAQ-3 is comprised of four subscales: internalisation-general, internalisation-athlete, pressures, and information.

The *internalisation-general* subscale has nine items which measure the extent to which the thin-ideal as promoted by the media has been internalised and the individual consequently strives to meet these ideals (e.g. "I would like my body to look like the models who appear in magazines"). The *internalisation-athlete* subscale has five items which measure internalisation and endorsement of an athletic body (e.g. "I try to look like sports athletes"). The *pressures* subscale consists of seven items which assess the respondent's feeling of pressure to conform and modify one's appearance to the societal standards of attractiveness that are portrayed by the media (e.g. "I've felt pressure from TV or magazines to be thin"). The *information* subscale includes nine items which

measure a respondent's acknowledgement that information about appearance and societal standards is available from the media (e.g. "movies are an important source of information about fashion and "being attractive"). Items were summed to give three subscale scores. Higher scores indicate greater internalisation of the thin ideal.

Thompson, van den Berg, Roehrig, Guarda, and Heinberg (2004) reported a Cronbach's alpha of .96 for the internalisation-general subscale, .95 for the internalisation-athlete subscale, .96 for the information subscale, and .92 for the pressures subscale, indicating excellent internal reliability for all subscales. For the current study, Cronbach's alpha for the internalisation-general subscale was .90, .85 for the internalisation-athlete subscale, .88 for the information subscale, and .93 for the pressures subscale, confirming strong internal reliability for all subscales of this questionnaire.

Procedure

The Australian Catholic University Human Research Ethics Committee gave permission for the study to be undertaken (see Appendix L). Prior to completing the questionnaire, participants were presented with a detailed information sheet (see Appendix M). Methods of recruitment for the study were the same as for Study 1. Please see page 47 for a detailed description of the procedural process.

Data analysis

Preliminary analyses ensured the necessary statistical assumptions were upheld. The procedures for data cleaning outlined in Field (2007) and Tabachnick and Fidell (2007) were used. Once adjustments of the data were applied, the main analyses were conducted. Descriptive statistics were used to investigate the distribution of all variables.

Results

Data cleaning and screening

A detailed summary of the procedures for data cleaning and screening are outlined in Study 1 on page 48. Examination of the univariate descriptive statistics demonstrated that the data ranges, measures of central tendency, measures of variability, means, and standard deviations, were all plausible.

While data were collected from 300 respondents, inspection of the data revealed that 70 respondents were missing in excess of 5% of data. In addition, 13 participants had a BMI less than 18.5 and were considered to be underweight, thus these cases were deleted. As a result, 217 respondents were included in subsequent analyses.

Standardised z-scores were computed for each respondent on the self-esteem scale and all of the subscales of the BES and SATAQ. Any subscale yielding a z-score greater than 3.29 was adjusted to the preceding case with a z-score value less than 3.29. Analyses were then re-run to ensure that when the values were changed and the new z-scores were computed, all were still within the 3.29 range. Most of the outliers in this data set came from the BMI scores. A total of seven BMI scores were deemed to be extreme and were subsequently adjusted. In addition, two cases were adjusted on the RES. A frequency table was then generated to check that all new z-scores were within the 3.29 range.

To detect any multivariate outliers, Mahalanobis distance values were computed. The final screening for multivariate outliers detected a total of two multivariate outliers on the BES. To preserve conservative analyses, both cases were deleted. The resultant 215 participants were included in subsequent analyses.

Histograms for the RES, BES, and SATAQ scales revealed that each subscale moderately violated the assumption of normality. In addition, a histogram depicting the distribution of BMI scores for each respondent also violated this assumption. In

particular, the BMI distribution was positively skewed, which meant that more respondents had lower BMI scores. However, given the extensive manual process of data cleaning and screening as outlined above, the untransformed data were considered the most appropriate. Finally, inspection of the scatterplots for this data set was deemed to uphold the assumption of linearity.

Descriptive statistics

The means and standard deviations for the entire sample and for each weight group on each variable are presented in Table 4. The self-reported height and weight responses allowed for the calculation of respondents' body mass index (BMI) for allocation into the corresponding weight status groups. BMI scores were calculated by dividing weight in kilograms by height in centimetres squared (weight in kg/height²). Individuals with a BMI between 18.5 and 24.9 were considered to be of a healthy weight and individuals with a BMI greater than 24.9 were considered to be of an unhealthy weight.

For the current sample, BMI scores ranged between 18.51 and 51.34, with an average BMI of 27.66 ($SD = 7.50$) which falls in the overweight category. There were a total of 103 participants in the healthy weight category (BMI=18.5-24.99), of which 21 were males and 82 were females, and a total of 112 participants in the overweight category (BMI>24.99), of which 36 were males and 76 were females. A total of 82 respondents were aged between 18 and 31 years and 186 respondents were aged between 32 and 84 years. The age of participants ranged from 18 to 84 years of age with a mean age of 34.92 ($SD = 13.73$).

Demographic analyses

The percentage of respondents from the healthy weight and unhealthy weight groups with significant differences indicated on the demographic variables are presented in Table 5. When comparisons were made between healthy weight and unhealthy weight respondents, there appeared to be differences in age, smoking status, marital status, and

physical health. Therefore chi square goodness of fit analyses were performed to examine whether the proportion of cases in the different categories were significantly different from what would be expected by chance. More of the younger age group (18-31 years) were of healthy weight $\chi^2 (1, N=215) = 16.12, p < .001$. In addition, more healthy weight respondents were single $\chi^2 (3, N=215) = 15.28, p < .01$. When respondents' physical health was considered, more healthy weight respondents deemed their physical health to be "good", $\chi^2 (3, N=215) = 23.29, p < .001$. There were no apparent differences between the two BMI groups in relation to gender, education level, geographical residence, and occupation.

Correlational analyses

Pearson product moment intercorrelations were calculated to determine the strength of the relationship between the dependent variables used in the analyses, and the relationship between age, gender, and BMI. Evident in Table 6, there were low correlations between gender and pressure, BMI and body esteem appearance, and body esteem weight and internalisation general, moderate correlation between BMI and body esteem weight, self-esteem and body esteem attribution, self-esteem and internalisation general, self-esteem and pressure, body esteem weight and body esteem attribution, body esteem weight and pressure, internalisation general and information, internalisation athlete and pressure, internalisation athlete and pressure, internalisation athlete and information, and pressure and information.

There were large correlations between self-esteem and body esteem weight, self-esteem and body esteem appearance, body esteem weight and body esteem appearance, body esteem appearance and body esteem attribution, body esteem attribution and internalisation general, body esteem appearance and internalisation athlete, body esteem appearance and pressure, internalisation general and internalisation athlete, and internalisation general and pressure.

Table 4.

Mean (SD) Variable Findings for the Entire Sample, Each Weight Group, Age Group, and Gender

Variable	Entire Sample (N=215) M (SD)		Healthy Weight (n=103) M (SD)		Unhealthy Weight (n=133) M (SD)		18-31 years (n = 82) M (SD)		32-84 years (n = 186) M (SD)		Male (n = 57) M (SD)		Female (n = 158) M (SD)	
SE	2.00	(.51)	1.95	(.44)	2.04	(.57)	2.02	(.49)	1.96	(.54)	1.98	(.57)	2.00	(.49)
BEwe	2.83	(1.00)	3.31	(.88)	2.38	(.89)**	2.89	(.98)	2.72	(1.04)	3.08	(.96)	2.73	(1.00)**
BEapp	3.15	(.84)	3.43	(.73)	2.90	(.87)**	3.19	(.81)	3.09	(.89)	3.29	(.86)	3.10	(.83)*
BEatt	3.03	(.68)	3.17	(.69)	2.90	(.66)	3.05	(.72)	2.99	(.63)	3.06	(.84)	3.02	(.62)
IntGen	2.86	(.92)	2.92	(.92)	2.80	(.92)	3.01	(.91)	2.63	(.89)*	2.74	(.87)	2.90	(.94)
IntAth	3.10	(.91)	3.19	(.91)	3.02	(.91)	3.21	(.89)	2.93	(.93)	3.22	(.81)	3.06	(.95)
Press	2.99	(1.08)	3.02	(1.04)	2.96	(1.12)	3.12	(1.06)	2.80	(1.09)	2.44	(.96)	3.19	(1.06)**
Inform	2.66	(.88)	2.75	(.90)	2.58	(.86)	2.67	(.91)	2.66	(.84)	2.59	(.90)	2.69	(.87)

Note: * indicates statistical significant difference between the two groups ($p < .05$)

** indicates statistical significant difference between the two groups ($p < .01$)

SE = Self Esteem from the RSE; BEwe = Body Esteem – weight from the BES; BEapp = Body Esteem – appearance from the BES;

BEatt = Body Esteem – attribution from the BES; IntGen = Internalisation – general from the SATAQ-3;

IntAth = Internalisation – athlete from the SATAQ-3; Press = Pressure from the SATAQ-3; Inform = Information from the SATAQ-3

Table 5.

Analysis of Differences between the Normal and Unhealthy Weight Groups in Relation to Each Demographic Variable

Variable	Level	Healthy Weight n (%)	Unhealthy Weight n (%)	Analysis Results
Gender	Male	21 (36.8 %)	36 (63.2 %)	$\chi^2(1, N=215)=3.81, p>.05$
	Female	82 (51.9 %)	76 (48.1 %)	
Age	18-31	78 (58.6 %)	55 (41.4 %)	$\chi^2(1, N=215)=16.12, p<.001$
	32-84	25 (30.5 %)	57 (69.5 %)	
Education level	High school or less	16 (38.1 %)	26 (61.9 %)	$\chi^2(1, N=373)=9.20, p>.05$
	Post high school	87 (44.2 %)	86 (55.8 %)	
Geographical residence	Urban	81 (50.6 %)	79 (49.4 %)	$\chi^2(1, N=215)=1.85, p>.05$
	Rural/remote	22 (40.0 %)	33 (60.0 %)	
Marital status	Single	49 (53.3 %)	43 (46.7 %)	$\chi^2(3, N=215)=15.28, p<.01$
	Separated/divorced	1 (6.7 %)	14 (93.3 %)	
	Defacto	22 (62.9 %)	13 (37.1 %)	
	Married	31 (42.5 %)	42 (57.5 %)	
Physical health	Poor	13 (37.1 %)	22 (62.9 %)	$\chi^2(3, N=215)=23.29, p<.001$
	Fair	3 (11.1 %)	24 (88.9 %)	
	Good	67 (54.0 %)	57 (46.0 %)	
	Excellent	20 (69.0 %)	9 (31.0 %)	

Table 6.

Correlations Between Each Variable, Age, Gender, and BMI

	1	2	3	4	5	6	7	8	9	10	11
(1) Age		.04	.27**	-.05	-.08	-.05	-.04	-.19**	-.15*	-.14*	-.01
(2) Gender			.13	.02	-.15*	-.09	-.03	.08	-.08	.31**	.05
(3) BMI				.08	-.46**	-.32**	-.19**	-.06	-.09	-.03	-.09
(4) Self-esteem					-.56**	-.73**	-.49**	.42**	.21**	.40**	.20**
(5) BE-weight						.84**	.48**	-.36**	-.16*	-.40**	-.09
(6) BE-appearance							.50**	-.49**	-.30**	-.46**	-.17*
(7) BE-attribution								-.04	-.06	-.07	.00
(8) Internalisation-general									.56**	.72**	.49**
(9) Internalisation-athlete										.38**	.32**
(10) Pressure											.38**
(11) Information											1

Note: Pearson Correlation (2-tailed) * = .05; **=.01; N=215

Age, Gender, and BMI = biserial correlation coefficients

Main analyses

Analysis of variance (ANOVA)

Preliminary assumption testing revealed that the assumption of homogeneity of variance-covariance matrices and the assumption of equality of variance was upheld. A two (BMI: healthy weight vs. unhealthy weight) x two (gender: males vs. females) x two (age: 18-31 years vs. 32-84 years) ANOVA was conducted to determine whether there were significant mean differences between these independent variables across the eight dependent variables.

There was a significant difference between healthy weight participants and unhealthy weight participants for body esteem weight, such that healthy weight participants had higher levels of body satisfaction $F(1, 207) = 40.86, p < .001$, partial $\eta^2 = .17$. Males were also shown to experience higher levels of body satisfaction compared to females $F(1, 207) = 11.07, p < .01$, partial $\eta^2 = .05$. There was no statistically significant difference for age on this subscale. There were no interaction effects.

Additionally, healthy weight participants were significantly more likely to have higher levels of appearance-related feelings compared to unhealthy weight participants $F(1, 207) = 15.16, p < .001$, partial $\eta^2 = .07$. There was also a significant difference between males and females for body esteem appearance, such that males experienced higher levels of appearance-related feelings compared to females $F(1, 207) = 4.32, p < .05$, partial $\eta^2 = .02$. There was no statistically significant difference for age on this subscale. There were no interaction effects.

There was a significant difference between 18-31 year olds and 32-84 year olds for the internalisation-general subscale, with 18-31 year olds exhibiting greater internalisation of the thin-ideal $F(1, 207) = 3.92, p < .05$, partial $\eta^2 = .02$. Neither BMI

group nor gender was statistically significant for this subscale. There were no interaction effects.

There was also significant difference between males and females for pressure subscale, with females more likely to feel greater pressure to conform and modify one's appearance to the societal standards of attractiveness $F(1, 207) = 15.83, p < .001$, partial $\eta^2 = .07$. There were no interaction effects.

Multiple regression

To assist in the development of an intervention, and given there were intercorrelations among the variables, multiple regression analysis was also conducted to determine which variables contributed unique variance to BMI. Body esteem weight, body esteem appearance, and body esteem attribution were simultaneously entered into the regression model to determine which variables significantly predicted BMI.

Multiple regression analysis was also conducted to determine which variables significantly predicted BMI. Body esteem weight significantly predicted BMI scores, $\beta = -.49, t(214) = -6.62, p < .001$. Body esteem appearance also predicted BMI scores, $\beta = .21, t(214) = 2.78, p < .01$.

Discussion

The aim of Study 2 was to investigate additional psychological factors that contribute to an unhealthy body weight to assist in the development of an improved treatment option for weight-loss. On the basis of prior research, one research question was posited: Are there differences between healthy weight participants and unhealthy weight participants with regard to self-esteem, body esteem, and sociocultural attitudes towards appearance?

Results from this study revealed no significant differences in terms of self-esteem between healthy weight and unhealthy weight participants. Given the widely documented social repercussions of obesity, including discrimination and stigmatisation

(Brownell & Puhl, 2003; Friedman & Brownell, 1995), it is likely that the further an individual deviates from a healthy weight the more likely he or she will be discriminated against, which is likely to impact on self-esteem. As such, the findings of the current study are surprising. Although research has predominantly focused on the link between self-esteem and obesity with children and adolescents, the finding in the current study contradicts previous research reporting a negative association between self-esteem and obesity (Hill & Williams, 1998).

Hill and Williams (1998) examined the association between obesity and self-esteem with obese women. Results indicated that women with higher BMIs were found to have lower levels of self-esteem, while women with lower BMIs demonstrated higher levels of self-esteem. Hill and Williams (1998), however, used an exclusive cohort of women considered to be overweight or obese (a BMI greater than 24.9), thus their results are not directly comparable to the current study, which utilised a cohort of healthy weight and unhealthy weight participants.

The results of the current study also contradict research by Muhlenkamp and Sayles (1986) who found that individuals with higher levels of self-esteem were more likely to engage in positive health practices, including better nutrition, more exercise, relaxation, safety behaviours, less substance abuse, and greater health promotion. These findings show that self-esteem has a direct effect on lifestyle (Muhlenkamp & Sayles, 1986), which in turn may be associated with obesity. Those with higher levels of self-esteem were more likely to look after themselves and have a healthier lifestyle, compared to individuals with lower levels of self-esteem. This is a logical finding, given that those with higher levels of self-esteem would consider it more worthwhile to invest in their health.

Several reasons may explain the lack of between-group differences for the self-esteem measure in the current study. First, the current sample is comprised of an online

internet sample. The questionnaire package was exclusively available online, which may affect the generalisability of the results. It may be that those who are more likely to respond to an online advertisement and participate in research have lower levels of self-esteem, irrespective of their body weight. Second, body dissatisfaction has been shown to be widespread irrespective of body size and shape (Barlow & Durand, 2005; Piran, 2005). This could influence the self-esteem of all individuals regardless of whether they are of a healthy weight or an unhealthy weight.

This unexpected finding questions whether self-esteem is socially derived, as suggested by Hill and Williams (1998). If self-esteem is socially derived then it would be expected that obese individuals would have lower levels of self-esteem. Examining this link and establishing the pertinent factors that impact on self-esteem may elucidate important information that could later be used in the formulation of a weight-loss treatment program.

A notable finding of the current study was the significant differences between healthy weight and unhealthy weight participants on each of the three subscales of the body esteem measure. The results indicated that unhealthy weight individuals were significantly less satisfied with their weight and appearance, and were more likely to believe that other people consider them to be unattractive compared to healthy weight participants. This finding is consistent with previous research by Friedman et al. (2002) who found that among a sample of 110 obese individuals, those with higher BMIs reported higher levels of psychological distress and less satisfaction with their appearance. Similarly, Hill and Williams (1998) found a positive association between BMI and body dissatisfaction among a sample of 179 obese women. This suggests that the greater the BMI and the greater the deviation from a healthy weight, the greater an individual experiences body dissatisfaction. These results indicated that body

dissatisfaction and its link with self-worth, self-image, and self-acceptance, warrants attention in an obesity treatment program.

In addition, this study also showed that unhealthy weight individuals were more likely to believe that other people considered them to be unattractive, when compared to healthy weight individuals. Previous research has shown that other people do in fact consider obese individuals to be unattractive, and they remain a denigrated group who are frequently labelled as “lazy”, “stupid”, and “ugly” (Friedman & Brownell, 1995). Moreover, it is a common perception that people become obese due to a lack of willpower and self-control (Brownell & Puhl, 2003; Friedman & Brownell, 1995). Changing this situation requires a two-pronged approach and would include for educating the public about obesity and the effect that criticism, stigmatisation, and discrimination have on people. In addition, treatment programs may also be bolstered by including resilience training, assertiveness skills training, and focus on increasing self-esteem and body-image such that other people’s perceptions will not be so influential on obese individuals’ appraisal and acceptance of themselves.

The results demonstrated no significant differences between healthy weight participants and unhealthy weight participants with regard to internalisation of the “thin ideal” and striving to meet those ideals, internalisation and endorsement of an athletic body, feeling of pressure to conform and modify one’s appearance to the societal standards of attractiveness that are portrayed by the media, and acknowledgement that information about appearance and societal standards is available from the media. There is a lack of research specifically investigating the link between internalisation of the “thin ideal” and obesity. Rather, research efforts have mainly focused on the widespread body dissatisfaction and the impact that this has on individuals’ psychological health, including lower levels of self-esteem, and negative evaluations of one’s weight, shape, and appearance (Friedman et al., 2002).

However, Friedman et al. (2002) report that societal attitudes towards appearance have a greater influence on obese individuals because they deviate further from society's benchmark of attractiveness. Internalisation of the "thin ideal" has certainly been shown to arouse greater levels of psychological distress among obese individuals than healthy weight individuals (Friedman et al., 2002). It is also possible that differences would have been obtained in this study if there had been a cohort of underweight individuals with whom to compare healthy weight and unhealthy weight participants.

There was a trend in the mean scores for these four subscales. Healthy weight participants had higher mean scores on all subscales than unhealthy weight participants. Although no inference can be made from these scores, it suggests that healthy weight individuals may internalise society's standards of attractiveness more. If future research was to utilise a larger sample of participants and explore this link further, it may be that internalising cultural norms (thin for females and muscular for males) motivates healthy weight participants to more closely monitor their dietary intake and energy expenditure. Although it is only speculative, healthy weight participants may perceive themselves to be closer to the ideal, and thus engage in dietary restriction or ingest metabolic steroids endeavouring to move closer to this coveted ideal that is advertised in the media. In addition, although the results were not significant so trends can only be discussed tentatively, mean scores were higher for males on the internalisation and endorsement of an athletic body scale, while women had higher mean scores for the remaining three scales. This implies that this measure is tapping into the construct of the "thin ideal" and the pressure that women feel to be thin, and that men feel to be muscular and athletic.

Limitations and future research

The current study provided information regarding the pertinent attitudinal factors that are associated with obesity, specifically the link between body esteem and body

weight. Considered together, Study 1 and Study 2 have highlighted the influence that psychological factors have on body weight, and provide scope for developing a pilot intervention to investigate how well these factors can be addressed in a psychological treatment program.

One limitation of this study was the absence of screening for psychopathological confounds that may have affected the results. For example, depression, anxiety, and different affective states may affect the responses an individual provides for each of the questionnaires.

Furthermore, a major limitation of both Study 1 and Study 2 was the exclusive reliance on internet-based data collection. Both the advantages and disadvantages of this sampling method warrant discussion. An advantage of internet based data collection is that it provides an efficient and cost-effective way to recruit a large cohort of participants to complete an online questionnaire or respond with interest to any given study. A questionnaire can be translated into HTML (hypertext mark-up language) which then provides respondents with a point and click interface, whereby they can respond to a web based survey that is visually and functionally similar to the traditional paper copy of the survey (Rhodes, Bowie, & Hergenrather, 2002). Additionally, collecting data online provides an easy way to advertise and expose the study to a large number of people in a relatively short period of time. This method of data collection also eliminates the need to enter the data manually, which can be time consuming for the researcher, and can increase the risk of error in the data (Rhodes et al., 2002).

For Study 1 and Study 2, online data collection proved to be a fast process for recruiting participants, which enabled the researcher access to large sample sizes. Not only is online data collection easier for the researcher, it has also shown itself to be an efficient manner for respondents to complete the survey online. Given the large amount

of time that people now spend online, it appears to be much easier for researchers to recruit participants online (Rhodes et al., 2002).

Also, the privacy afforded by the computer gives respondents more freedom to respond in a more honest manner (Rhodes et al., 2002). Given the anonymity of completing a questionnaire online, respondents are free to admit to socially proscribed feelings or behaviours, which can increase the likelihood that participants are going to answer more honestly (Rhodes et al., 2002). This is particularly important given the discomfort that some participants may have felt in disclosing their weight. In addition, some of the questions asked may have been difficult and confrontational for some participants, thus the internet may have assisted in respondents answering more honestly to sensitive content.

However, there are also several challenges and ethical considerations to consider when using a data sample collected online. Targeted recruitment can result in individuals self-selecting themselves into a study for a particular reason, which does not ensure true random sampling, thus comprising the generalisability of the results (Rhodes et al., 2002). Although the internet uses a self-administered format that may minimise response bias, these results remain based on self-reported data with their potential limitations. The literature generally highlights the failures of recall and social desirability effects as the two main limitations of self-report data (Crockett, Schulenberg, & Petersen, 1987).

Failures of recall include the problems with an individual's capacity to encode and accurately recall information about themselves. This means that the accuracy of these reports may be reduced. However, Crockett et al. (1987) maintain that it can be generally assumed that these recall errors reflect random error, rather than systematic error. Nonetheless, social desirability effects are understood to pose a serious threat to the validity of the responses, since they are by definition systematically biased (Crockett

et al., 1987). When respondents desire to present themselves in a favourable light, irrespective of whether this occurs consciously or unconsciously, they may respond to the questionnaire content in a more socially desirable manner. Crockett et al. (1987) assert that it is unreasonable to expect a respondent to provide a truthful and objective account of his or her experience by being detached and impartial.

There is also the possibility that individuals can submit their questionnaire multiple times. Although the research has shown this has not proved to be a major problem to date (Rhodes et al., 2002), there is the potential. However, given the specific questions at the beginning of the questionnaire package which assess demographic variables, this is not a problem that is assumed to have affected the quality of the data included in this thesis.

Another limitation of these studies was the categorisation of BMI into two weight groups. Individuals were classified as “healthy weight” if their BMI was between 18.5 and 24.9kg/ m² and “unhealthy weight” if their BMI is greater than 25kg/ m². These BMI values were based on the criteria set by the World Health Organisation. The WHO has set these values as their research has shown that health risks associated with obesity are significantly increased when an individual’s BMI is above 25kg/ m². However, important information may have been analysed out of the equation by not including it as continuous variable.

Finally, inherent in a study of this kind are the limitations that arise from an inaccurate reporting of body weight and height. It has been widely established in the literature that individuals are more likely to under-report their weight and over-report their height, thus jeopardising a real indication of the prevalence of obesity, and in the case of this research potentially affecting group assignment. Future research should consider accurate measurement of height and weight for each participant to ensure

accurate BMI scores are obtained, however, this is also likely to reduce the number of participants willing to take part in the research.

Conclusions

The results of this study have highlighted that body esteem is an important factor which distinguishes healthy weight participants from unhealthy weight participants. In particular, unhealthy weight participants were found to be significantly less satisfied with their weight and appearance, and were more likely to believe that other people considered them to be unattractive, compared to healthy weight participants. This research demonstrates that an individual's thoughts and feelings about his or her body weight, shape, and appearance are important considerations for the development of a weight-loss intervention program. This study also demonstrated that society's portrayal of a svelte female body being linked with self-worth and feelings of inadequacy were not important factors for unhealthy weight individuals who participated in this study.

Considered together, Study 1 and Study 2 have provided a list of factors to be investigated in a weight-loss treatment program. Specifically, self-efficacy for weight and health-related behaviours, self-efficacy for controlling overeating in response to negative emotions and in socially acceptable circumstance, the frequency of negative emotions, self-monitoring of weight and health-related behaviours, and body esteem, are important variables which warrant consideration in the development of future weight-loss interventions. These results suggest that a treatment program might be more effective in focusing on the psychological mechanisms involved in maintaining and losing excessive body weight, rather than the behavioural aspects of weight control.

Given that current obesity treatments have shown disappointing weight-loss results which have been maintained long term (Ash et al., 2006), a new approach was required. At present, most weight-loss studies have utilised behavioural or cognitive-behavioural approaches. Although participants in these program have shown themselves able to

reduce their body weight by 5-10% (Ash et al., 2006), the research has revealed that this weight-loss is rarely maintained. Moreover, these programs have predominantly focused on weight-loss as the primary outcome measure, rather than targeting the prominent psychological factors.

Accordingly, the third and final study outlined in this thesis is comprised of a pilot treatment program utilising dialectical behavioural therapy (DBT). Three out of the four original DBT modules (core mindfulness skills, emotion regulation, and distress tolerance) could address self-efficacy, negative emotions, self-monitoring, and body esteem, factors arising out of Study 1 and Study 2. DBT has been shown to be an efficacious treatment option for anorexia nervosa and bulimia nervosa (Chen, Matthews, Allen, Kuo, & Linehan, 2008; Robins & Chapman, 2004), but is yet to be trialled with a cohort of overweight participants. Study 3 outlines the findings from various studies examining the efficacy of various treatment options for obesity. A detailed description of DBT and the rationale for its use in the subsequent study is provided in the next chapter.

Chapter 4: Treatment for Obesity

Obesity in adults is largely resistant to treatment (Ash et al., 2006; Blackburn, 1999; Byrne et al., 2004; Foster et al., 1997; Wilson, 1996; Yanovski et al., 1999). Evidence-based guidelines have recommended that obese individuals need to reduce calorie intake and simultaneously increase physical activity levels to achieve weight loss in the vicinity of 5-10% (Ash et al., 2006). Provided the weight-loss is maintained, losing 5-10% of body weight produces significant physical and psychosocial effects (Blackburn, 1999).

The most common treatments for obesity are largely based on pharmacological and behavioural methods (Byrne et al., 2003). Well-designed studies using pharmacological or behavioural interventions have shown that individuals can achieve approximately 8-10% reduction in body weight (Yanovski et al., 1999). However, part of the problem with weight-loss maintenance is that caloric restriction reduces lean body mass and resting metabolic rate, which increases the difficulty of maintaining that weight-loss over time (Villanova et al., 2006).

Lost weight is almost always regained over time (Ash et al., 2006; Wilson, 1996; Yanovski et al., 1999). Participants in these obesity treatment programs typically regain approximately 50% in the first year following the cessation of treatment, and three to five years following treatment, 80% of patients have regained all weight lost, and have frequently exceeded pre-treatment weight (Byrne et al., 2003; Yanovski et al., 1999). A new approach for the treatment of obesity is required.

Given the increasing prevalence of obesity and the obesity-related comorbid conditions in the adult population, interventions that focus on long-term weight loss are necessary. Although body weight is a result of biological, behavioural, social, environmental, and psychological factors, research has indicated that the current obesity epidemic is a result of energy intake exceeding energy expenditure (Faghri et al., 2008).

Enabling individuals to explore some of the underlying reasons for an energy intake in excess of energy requirements may assist in weight loss. However, as is evident in the following review of literature, most treatment programs have focused on the behavioural aspects associated with obesity.

The collective results of Study 1 and Study 2 indicated that the factors associated with body weight are self-efficacy for weight and health-related behaviours, self-efficacy for controlling overeating in response to negative affect and in socially acceptable circumstances, the frequency of negative emotions, self-monitoring of weight and health-related behaviours, and body esteem. The goal of the current study was to run a pilot study which targeted these psychological factors rather than utilising traditional methods of treatment which primarily focus on weight-loss.

Theoretical framework

Study 1 and Study 2 explored several biological, social, environmental, and psychological factors that have been shown to be associated with body weight. At present there is a lack of theoretical agreement in the psychological field to explain the pandemic of obesity. Subsequently, researchers have failed to offer a holistic model of eating behaviour (Ball & Crawford, 2006). As such, Study 1 and Study 2 were based on several psychological and social ecological theories to ensure both the psychological correlates and broader social and environmental correlates were simultaneously considered. Given the broad range of factors that were investigated in these initial studies, it was expected that the results of Study 1 and Study 2 would guide the theoretical paradigm of Study 3.

As a result of the findings of these two studies, it became clear that the theoretical framework for a weight-loss intervention required reconsideration. Since self-efficacy was found to be the strongest factor differentiating healthy weight participants from unhealthy weight participants, social cognitive theory was deemed to be an appropriate

theory underpinning this subsequent study. The aim of formulating an intervention program within this theoretical framework was to shift the focus from immediate weight-loss that can only be maintained in the short-term, to gradual weight-loss that can be maintained over the long-term.

Social cognitive theory considers self-efficacy to be a crucial determinant of behaviour (Luszczynska et al., 2005). Self-efficacy predicts which challenges individuals decide to face, and the kinds of goals they set for themselves. Individuals with higher levels of self-efficacy in a specific domain are more likely to set higher goals and pursue greater challenges (Luszczynska et al., 2005). Self-efficacy not only improves goal setting, it generates a greater belief that the individual can persist in pursuing the goal (Luszczynska et al., 2005).

According to social cognitive theory, individuals with higher levels of self-efficacy are more likely to anticipate positive outcomes from any anticipated behaviours, and fewer negative outcomes (i.e. the prospect of discomfort), compared to individuals with lower levels of self-efficacy (Luszczynska et al., 2005). Self-efficacy has a regulatory function and can predict adherence to medical recommendations (i.e. adopting a physically active lifestyle), coping with negative affect, pain, and stress (Luszczynska et al., 2005). The likelihood of an individual adopting health-promoting behaviours depends on the perceived belief in being able to perform a specific behaviour (Luszczynska et al., 2005). Thus, individuals with higher levels of self-efficacy are more likely to adopt healthy behaviours, to maintain a new behavioural repertoire, and recover after setbacks (Luszczynska et al., 2005). In addition, optimistic beliefs about an individual's perceived competence in executing a particular behaviour creates positive affective states, instead of negative affective states, and as a result these individuals feel more capable of mastering the situation (Luszczynska et al., 2005). Accordingly, social cognitive theory may be useful in the treatment of obesity.

Bandura (1977) maintains that beliefs of personal efficacy are the most central and pervasive mechanisms of human agency. Although other factors may also guide or facilitate change, he argues that these factors are rooted in the core belief and confidence that the individual has the power to intentionally produce desired behaviour (Bandura, 1977). An individual's perceived self-efficacy regulates functioning through a series of cognitive, motivational, affective, and decisional processes (Bandura, 2002). Self-efficacy can be the determining factor in whether individuals think in self-enhancing or self-debilitating ways, motivational strategies and the ability to persevere through challenges, emotionality, and the choices they make at important decisional points (Bandura, 2002). These can impede or enhance the life of an individual (Bandura, 2002). Bandura (1977) contends that if psychotherapy targets individuals' self-efficacy, behavioural change will result. Given that self-efficacy was shown to differentiate healthy weight individuals from unhealthy weight individuals across three measures in Study 1 and Study 2, operating within this theoretical framework for the current study was appropriate.

Cognitive-behaviour therapy (CBT)

CBT is founded on the principles of classical and operant conditioning, and cognitive and social learning principles, which aims to change and modify maladaptive thoughts, feelings, and behaviour (Wilson, 1996). For obesity treatment, CBT seeks to promote weight loss through dietary reduction or restriction, while simultaneously increasing the individual's physical activity to achieve a caloric deficit (Wilson, 1996).

Ash et al. (2006) used a randomised-controlled 12-month trial which studied the effects of three different groups for three-, six-, and twelve-months. This study was a cognitive-behavioural group-based intervention which aimed to change weight and other weight-related variables. The first group was an eight-week lifestyle behaviour management group, the second group provided participants with weekly contact with a

dietician for eight weeks, which included an initial nutrition assessment, an individualised diet prescription, and a prescribed exercise regime, and the third group was a control group in which participants were not provided with any nutritional information other than a nutrition resource booklet.

Results of this study did not find any significant differences between the two treatment groups 12-months post-treatment. There was, however, a trend for the first group, which was based on CBT, to maintain more of the weight lost, suggesting that CBT strategies assisted in weight maintenance. The group CBT-based intervention was more cost effective and more applicable to real practice settings than the second intervention, which utilised an individualised assessment and intervention plan with a nutritionist. Minimal inclusion and exclusion criteria were applied, and incentives were not provided for participants. This may also suggest that the participants included in this study were more motivated to engage in treatment, thus there was a greater possibility of the treatment being effective (Ash et al., 2006).

Foster et al. (1997) examined the effectiveness of a diet- and exercise-controlled treatment program, which also included examination of participants' goals and evaluations of any weight-loss. A total of 60 obese women (mean age = 40 years) participated in 48 weeks of group therapy. During the first 16 weeks, participants consumed a restricted diet totalling 925 calories per day. From weeks 17-22, the structured diet was replaced with conventional foods, which participants were able to select, totalling 1500 calories per day. Thereafter, from weeks 23-48 participants consumed different diets according to the specified weight-loss goals. All participants received a cognitive-behavioural treatment program, but were randomly assigned to one of four groups: diet alone, diet plus aerobic training, diet plus strength training, and diet plus aerobic and strength training.

Results from this study revealed several notable findings. Overall, participants reported goal weights to be an average weight-loss of 32% of body weight, compared to the recommended 5-10% reduction in body weight recommended by expert panels and government guidelines. Given that participants were able to achieve only half of the ideal weight-loss after 48 weeks of treatment, participants are at an increased risk of viewing their weight-loss as disappointing or inadequate, even though it was above the weight-loss recommended by health experts, and achieved in various other treatment programs. This may adversely affect an individual's motivation to continue focusing on nutrition and physical activity and impede subsequent weight-loss efforts.

In addition, this study found that participants perceived the goal weight to be associated with self-esteem and body image. This finding implies that individuals may perceive self-worth and self-acceptance as contingent on their body weight. For this reason, a treatment program which focuses on increasing self-esteem and body esteem may be treatment goals that could subsequently assist participants in choosing and focusing on more reasonable goal weights. Accordingly, treatments that focus on educating participants about setting realistic and achievable goals are important. Ideally, treatment would remove the focus on weight-loss, and instead concentrate on increasing self-esteem and body image, and other correlates of obesity such as regulating negative affect. Therefore, rather than treatment programs primarily focusing on weight-loss, targeting individuals' body image, body dissatisfaction, and self-esteem should instead be the focal components in an obesity treatment program.

Irwin and Guyton (1997) investigated the relationship between eating self-efficacy and weight control with a cohort of university students who were participating in weight control and lifestyle improvement programs in the United States. All participants attended group programs for a total of eight weeks, with 63 students participating in the Overcoming Overeating Program and 56 students in the active control group, which was

a Lifestyle Improvement Program. The findings from this study indicated that there were no significant differences for all participants on eating self-efficacy scores pre-treatment and post-treatment. However, Irwin and Guyton (1997) outline that there was a trend for students in the treatment group for self-efficacy scores to increase over time, with greater levels of self-efficacy at the post-test. Moreover, there were also no significant differences between eating self-efficacy scores and weight-loss and fat loss for students in the treatment.

On the other hand, Glynn and Ruderman (1986) examined the relationship between self-efficacy and weight-loss among a cohort of 32 individuals (30 females and 2 males) who were attending weight-loss clinics in the United States. Participants were required to attend a series of treatment programs (10 weeks with a psychology graduate; 13 weeks with nurses and nutritionists; or six sessions with a social worker). Despite the small sample size, results demonstrated that weight loss was significantly correlated with increases in eating self-efficacy scores.

Similarly, Linde et al. (2006) investigated the link between self-efficacy beliefs, weight control behaviours, and weight change for 349 participants in a randomised clinical trial for weight-loss that involved eight one-hour group sessions led by a trained facilitator. Results indicated that self-efficacy was significantly associated with weight-loss, such that self-efficacy beliefs measured at baseline predicted weight loss during the treatment phase; however this finding was not found during the post-treatment phase.

Villanova et al. (2006) evaluated whether a treatment comprising of CBT and physical activity would be effective for weight-loss maintenance for obese participants. A total of 200 overweight or obese adults (164 females and 36 males; mean age of 46 years) participated in a physical activity program following a CBT treatment program. The CBT treatment program consisted of 12 weekly sessions facilitated by dieticians or

doctors. The general topics taught over the course of the 12 sessions included regular weight control strategies like counting calories, self-monitoring food intake, stimulus control, and homework assignments to monitor daily eating. Nine months after the completion of the CBT program, participants were then able to self-select into a fitness program which included 12 bi-monthly sessions with groups of 8-12 participants. The fitness program consisted of motivational strategies and aimed to increase participants' levels of self-efficacy by setting fitness goals that could be readily attained. Participants were also given the opportunity to discuss any barriers they have faced with regard to physical activity, and develop problem-solving techniques. In addition, they were encouraged to incorporate family members in the physical activity program.

Results from this study revealed that the fitness program significantly improved weight-loss, weight-loss maintenance, and components of metabolic syndrome for obese participants. However, this study did not include a control group, thus the results must be interpreted with caution. The fitness program promoted additional weight-loss post-treatment, which is noteworthy given that most participants start to regain weight following the cessation of treatment. Although body weights were reported to remain stable for one year following treatment, it is unknown whether this weight-loss was maintained for more than one year. Given the research reporting that most participants typically regain all weight lost during the treatment phase four years following treatment, it may be unlikely that this program would be any different.

Behaviour therapy

Behaviour therapy explicitly focuses on behavioural and lifestyle change, and is believed to be fundamental to the treatment of obesity (Villanova et al., 2006; Wilson, 1996). Behaviour therapy differs from CBT in that there is no emphasis on modifying maladaptive thoughts, feelings, and behaviours that may be exacerbating weight and health-related issues (Wilson, 1996). After a systematic search of the literature by Jain

(2008), lifestyle interventions or treatments combining diet and exercise were the most common weight-loss programs. Weight-loss interventions based on behavioural therapy typically include a hypoenergetic diet, increased physical activity, and various behavioural techniques such as self-monitoring, stimulus control, and relapse prevention (Villanova et al., 2006; Yanovski et al., 1999). Some studies evaluating the effectiveness of behavioural treatment for obesity have shown that weight loss averages 8-10% over a period of 26 weeks, with participants reporting an average of 6% weight-loss one year after treatment (Yanovski et al., 1999). However, other studies reveal that most participants in weight-loss treatment programs completely regain weight over a three year period, and only a small minority of participants have maintained any weight-loss four years post-treatment (Villanova et al., 2006). These types of obesity treatment programs have not demonstrated that this modality of treatment is effective for long-term weight-loss.

Obesity interventions that aim to increase physical activity patterns and resting metabolic rate through strength-based fitness are considered effective means of inducing a caloric deficit (Atlantis et al., 2006). Prescribing an exercise regime to an individual not only increases total energy expenditure, it also serves to maintain fat-free mass, and is effective in decreasing body mass and fat (Atlantis et al., 2006). However, studies have generally only reported findings after a one-year follow-up, thus the effectiveness of these programs in producing long-term behavioural change is unknown. It is likely that similar to other behavioural treatments, the weight-loss (if any) is not maintained over time.

Another component of behavioural programs relying on the use of physical activity for weight-loss is to consider some of the barriers to exercise that obese individuals encounter. For example, obese individuals may perceive themselves to be “too fat” to exercise (Yancey, Simon, McCarthy, Lightstone, & Fielding, 2006), thus programs

focusing on one behaviour like exercise would likely be irrelevant to these individuals. Instead, it may be more useful to adopt an integrative treatment approach that focuses on exploring individual's body image, self-esteem, and motivation, before adopting behavioural and lifestyle changes.

Perri et al. (1988) evaluated the effects of five weight-loss maintenance programs aimed to evaluate whether post-treatment contact would boost weight-loss. A total of 123 obese adults (26 males and 97 females) were randomly assigned to one of five treatment conditions: 1) behaviour therapy; 2) behaviour therapy plus a therapist-contact maintenance program (fortnightly weighing, reviewing self-monitoring data, and problem solving with a therapist); 3) behaviour therapy plus a therapist-contact maintenance program plus a social influence maintenance program (social influence strategies that were expected to improve motivation and weight-loss); 4) behaviour therapy plus a therapist-contact maintenance program plus an aerobic exercise maintenance program (exercise goals and aerobic exercise program, and therapist-led exercises during the biweekly meetings); or 5) behaviour therapy plus a therapist-contact maintenance program plus the aerobic exercise program plus the social influence maintenance program. The main components of this therapy included self-monitoring, stimulus control strategies, self-reinforcement, cognitive restructuring, and techniques to slow the pace of eating (Perri et al., 1988). Participants were also actively encouraged to start brisk walking and stationary cycling for approximately 80 minutes per week.

Results demonstrated that participants in all four conditions that comprised of behaviour therapy with an additional maintenance program experienced greater long-term weight-loss than participants who received behavioural therapy with no post-treatment follow-up. Participants in the post-treatment conditions sustained, on average, 82.7% of weight-loss during the treatment phase after 18 months, compared to 33.3%

for those who only received behavioural therapy. However, treatments of this kind are resource-dependent and expensive. It is also not known whether participants continued to regain the weight lost during the treatment phase after 18-months of follow-up. Also, participants in the treatment conditions who also received social support and/or aerobic exercise did not experience greater weight-loss than those who received behaviour therapy plus a therapist-contact maintenance program. However, those who received behaviour therapy, therapist-contact post-treatment, aerobic exercise programs, and social support, demonstrated significantly more weight-loss at the 18-month follow-up, with participants in this conditioning sustaining 99% of the weight lost during the initial treatment phase (Perri et al., 1988). Results of this kind signal the need for long-term follow-up and support for obese individuals undergoing weight-loss treatment and therapy.

Alternatively, Curioni and Lourenco (2005) evaluated the effectiveness of treatment interventions comprising of dietary and physical activity modifications to achieve long-term weight loss. A total of 33 randomly controlled trials which evaluated the effects of diet, exercise, or diet and exercise, were included in the meta-analysis. In 32 of the trials, participants attended a weekly group session. Results indicated that interventions which included both diet and exercise were effective in producing increased weight-loss in both the treatment period and one year post-treatment. However, participants in both interventions regained 50% of the weight-loss during treatment; exercise did not assist in reducing the weight regain (Curioni & Lourenco, 2005).

The findings of this meta-analysis confirm that weight maintenance remains the critical issue in the management of obesity. While studies indicate that weight-loss is attainable, maintaining this weight-loss does not appear to be commonly achievable. In addition, it is unknown whether blinding procedures were used in the various

interventions (Curioni & Lourenco, 2005). More stringent reporting on the design and implementation of intervention programs are necessary for future research.

Dunn et al. (2006) contend that dietary changes and a reduction in the overall consumption of calories are more effective for weight-loss than increased physical activity. A total of 962 obese adults (288 males and 674 females) with a mean age of 52.7 years and a mean BMI of 33.6 were enrolled in a two year weight-loss program in a managed care setting. This intervention consisted of 10 lessons on behavioural change strategies, behaviour change goals, and homework tasks like self-monitoring of diet and health-related behaviour, and topics covering nutrition, physical activity, and behaviour management techniques (see Jeffery et al., 2003).

Results revealed that restricting fat intake was more effective for weight-loss than increasing physical activity. Dunn et al. (2006) assert the superiority of reducing fat intake over increasing physical activity, given that participants who made moderate to substantial dietary changes lost more weight, regardless of physical activity levels. However, the benefits of reducing fat intake and overall calorie consumption, while simultaneously increasing physical activity patterns, are widespread. In addition, given that physical activity preserves lean body mass and can increase an individual's resting metabolic rate (Curioni & Lourenco, 2005), it seems incongruous to interpret these results such that individuals should focus on nutritional and dietary needs rather than increasing physical activity levels.

Friedman et al. (2002) explored whether body dissatisfaction mediates the relationship between dysphoric psychological states and obesity among 110 obese participants (80 females and 30 males) who were self-referred to a residential weight-loss facility for weight control and lifestyle change. The findings from this study revealed that individuals with higher BMIs reported less satisfaction with appearance (Friedman et al., 2002). In addition, Friedman et al. (2002) found that heavier

participants also reported higher levels of psychological distress. It is plausible that these significant findings may be explained by the fact that these individuals were treatment seeking, and treatment seeking has been associated with higher levels of psychological distress (Friedman et al., 2002). Friedman et al. (2002) state that body image dissatisfaction should be a factor investigated in obese individuals who are seeking treatment, and should be a target of intervention efforts.

Kitsantas (2000) investigated the relationship between self-regulatory strategies and weight-loss among 33 undergraduate college students (11 males and 22 females). Results indicated that there were no statistically significant differences between overweight participants who had tried to lose weight but had been unsuccessful; participants who had been successful in losing 10% of body weight and had maintained that weight-loss for at least six months; and participants with a healthy weight (Kitsantas, 2000).

However, Kitsantas (2000) emphasises the numerical (but non-significant) differences between the three groups. Specifically, healthy weight individuals and previously overweight individuals who had been successful in losing 10% of body weight and had maintained that weight-loss for at least six months utilised self-monitoring techniques more than overweight participants who had tried to lose weight but had been unsuccessful. It is possible that the small sample size and the effect on the power of the statistical tests may have affected the results. Nonetheless, these findings suggest that previously overweight participants may be able to maintain weight-loss by employing self-monitoring techniques as frequently as healthy weight individuals. Although these findings only offer a trend in scores, they suggest that self-monitoring may warrant attention for future research.

Similarly, Boutelle et al. (1999) investigated the relationship between self-monitoring and weight-loss. A total of 57 participants (41 females and 16 males) were

randomly assigned to a standard cognitive-behavioural treatment group or to the intervention group consisting of cognitive-behavioural treatment with a self-monitoring intervention. Results from this study indicated that participants in the intervention group had a higher frequency of self-monitoring than the comparison group, thus lost more weight. These results suggest that self-monitoring is integral to weight-loss and weight maintenance, which requires consideration in the development of an obesity treatment program.

Transtheoretical model of change (TTM)

The TTM is a stage-based model that was initially designed to describe a process of behaviour change for addictive behaviours (Povey, Conner, Sparks, James, & Shepherd, 1999; Prochaska & DiClemente, 1983). This model proposes that behavioural change occurs through movement through a linear sequence of different stages whereby the behaviour starts at “unhealthy” and ends in “healthy” (Prochaska & DiClemente, 1983). The first three stages are motivational, and the last two stages are actional stages.

The stages include *precontemplation* (no intention to change behaviour); *contemplation* (intention to change in the next six months); *preparation* (intending to take action in the immediate future); *action* (execution of behaviour); *maintenance* (individual is working to prevent relapse); and *termination* (individual reports no temptation and high levels of self-efficacy) (Kraft, Sutton, & Reynolds, 1999; Prochaska & DiClemente, 1983). The TTM has two factors: self-efficacy (a belief that one can execute a particular behaviour) and decisional balance (the notion that people make decisions based on a cost-benefit analysis of the situation) (Wakui et al., 2002). This model has been useful in promoting the adoption of health-related behaviours and in understanding an individual’s likelihood of adhering to different programs.

With regard to intervention development, it is assumed that different individuals will be at different stages of change. Therefore, different interventions may be required

depending on the respective position along the stages of change continuum. The TTM originated in the study and treatment of addictive behaviours but has also been useful in studying adherence to rehabilitation programs (Kraft, Sutton, & Reynolds, 1999; Prochaska & DiClemente, 1983). Although there are numerous reasons for treatment failure, it is possible that treatment and rehabilitation programs fail because of an individual's lack of readiness to change (Jensen, Nielson, Romano, Hill, & Turner, 2000). This model predicts that individuals who are in a different stage of change will experience different treatment success (Jensen et al., 2000). This assertion has been widely supported for both smoking cessation and weight control (Jensen et al., 2000).

Stage-based processes of change such as the TTM have achieved widespread approval due to the supposed face validity of the model, applicability of the model to a variety of health-related behaviours, and the practical utility of the model (Adams & White, 2005; Archie, Goldberg, Akhtar-Danesh, McColl, & McNiven, 2007). The TTM has been successfully applied to alter a wide variety of behaviours including cigarette smoking, problem drinking, irregular physical activity, low fruit and vegetable consumption, and poor stress management (Adams & White, 2005; Archie et al., 2007).

However, akin to other intervention programmes which have not shown to be successful long term, a review conducted by Adams and White (2003) showed that 11 out of 15 (73%) of studies which followed participants for less than six-months, showed that stage-based intervention programmes were more effective than control conditions. However, when participants were followed for more than six-months, only two out of seven (29%) studies found that stage-based interventions were more effective than control conditions.

Additional research on the effectiveness of stage-based intervention programmes in all areas of behavioural change have shown that a review of randomised controlled trials found that three out of seven studies had a significantly greater effect on behavioural

change, compared to the control group, however these reported effects did not extend beyond three months (Adams & White, 2005). Results of this kind affirm that stage-based intervention programmes which are based on stages of change are no more effective than control conditions in promoting long-term adherence to increased activity levels.

Although the TTM has been used for a variety of behavioural targets, Adams and White (2005) assessed the applicability of the TTM to promote increased activity levels. This intervention model supposes that researchers are able to determine which stage of change an individual is at, and then tailor the intervention accordingly. However, few validated algorithms have been used to determine an individual's position along the stages of change model, which is crucial to intervention delivery (Adams & White, 2005). Numerous tools have been used to determine where to position an individual within the stages of change model, including self-report questionnaires and interview techniques, however the validity of these methods is unknown. In addition, the TTM suggests that stage progression is associated with a significant outcome, yet this has not always shown to correlate with behaviour change (Adams & White, 2005).

The TTM also focuses exclusively on the role of personal motivation on behavioural change, yet considerable research has shown that additional external and social factors, including age, gender, socioeconomic status influence behaviour and motivation to change (Adams & White, 2005). Thus, a more comprehensive model which incorporates a variety of empirically validated factors which impact change is required. As such, the TTM is too simplistic in its stage-based intervention approach, and does not account for, or address, other external factors which are required to understand and address intervention development.

Archie et al. (2007) used the TTM to identify the diet and physical activity behavioural patterns for individuals suffering from a psychotic disorder, while

simultaneously identifying participants who were ready to make necessary diet- and health-related lifestyle changes. A total of 101 participants (64 males and 37 females) were recruited from a clinic in Canada which specialises in treating patients with schizophrenia or other psychotic disorders. The findings from this study revealed that the TTM was useful in identifying patients with psychotic disorders that were in the contemplation stage of changing eating and physical activity habits. Individuals who reported to be in the contemplation-preparation stages for eating habits reported increases in perceived satisfaction with body function, overall fruit and vegetable intake, and physical activity patterns. Additionally, individuals found to be in the contemplation-preparation stages for physical activity had lower BMIs, a readiness to change current physical activity patterns, and increases in individuals' perceived satisfaction with body function and appearance.

Similarly, Wakui et al. (2002) used the TTM to examine the relationship between the different stages of change for physical activity and exercise- or dieting-related behavioural factors. A total of 450 female university students (mean age = 18.4 years) participated in the study, of which all were of Asian race. Results from this study indicated that exercise, dieting, weight, and eating concerns were significantly related to exercise self-efficacy and decisional balance. These results are not surprising. If an individual believes that they are able to execute a desired behaviour, then they are more likely to engage in that particular behaviour. Likewise, if an individual believes that there is more benefit than cost associated with exercise and dieting-related behaviours, then they are also more likely to exercise and diet. Furthermore, participants who were deemed to be in the higher stages of the change model also had higher levels of self-efficacy, perceived benefits of exercise, and healthy dieting behaviours. Conversely, those in the higher stages also had to have higher rates of obesity-phobia were more obsessed with food, than those who were in the lower stages of change. While this

model appears to explicate the role between exercise and diet-related behaviours in relation to the TTM well, these results are only generalisable to young Japanese women.

Furthermore, Faghri et al. (2008) examined how well the TTM could assist in increasing physical activity levels within a workplace setting. Since regular periods of moderate physical activity can reduce cardiovascular disease and overall mortality in adults, 206 (164 females and 42 males) employees with sedentary jobs participated in a 10-week walking program aimed to increase activity during working hours. Participants wore a pedometer each day upon arrival at work and logged the amount of steps they took each day.

The study findings revealed that there were significant improvements in the number of steps taken and the stages of change, with time, indicating that a study of this kind may be useful in increasing physical activity levels at work. A notable finding of this study is that of the 206 participants, only 115 completed the whole 10-week program. The investigators state that the attrition rate increased dramatically after week seven, which coincided with Thanksgiving and Christmas holidays.

Although it has been proposed that stage-based interventions are more effective than nonspecific interventions (Wakui et al., 2002), it seems that the TTM has failed to account for the true complexity of behavioural change. It is likely that applying the TTM to diet-related behaviours may be problematic due to the stark difference in addictive behaviours and diet-related behaviours (Povey et al., 1999).

Dialectical behaviour therapy (DBT)

Simply focusing on the behavioural aspects of obesity is limited in effectiveness (Wilson, 1996). Instead, it has been argued that the principle of acceptance is integral to change, and this relationship should consequently be a focus of treatment (Baer, Fischer, & Huss, 2005; Wilson, 1996). DBT is the most empirically validated treatment for clients with borderline personality disorder, with nine randomised controlled trials

demonstrating the efficacy of DBT (Chen et al., 2008). Although DBT was originally developed to treat chronically parasuicidal women with borderline personality disorder, it has since been adapted to treat a variety of disorders, including binge eating disorder, bulimia, substance abuse, elderly depressed patients, attention-deficit/hyperactivity disorder, and inmates in correctional settings (Chen et al., 2008; Robins & Chapman, 2004).

DBT comprises of four treatment components: core mindfulness skills, emotion regulation skills, distress tolerance skills, and interpersonal effectiveness. The mindfulness component of DBT aims to decrease the judgement and criticism of self and others while increasing one's awareness, and acceptance of, current experiences. Emotion regulation skills are designed to teach individuals how to reduce emotional vulnerability and assist in altering negative affect. Distress tolerance skills aim to increase an individual's ability to adaptively tolerate negative affect by decreasing negative responses to distress. Finally, interpersonal effectiveness skills are aimed at clarifying an individual's interpersonal priorities and increasing assertiveness (Wiser & Telch, 1999).

Robins and Chapman (2004) state that many of the difficulties faced by patients with borderline personality disorder are deficits or disruptions in emotion regulation skills, which can then impact and impair interpersonal relationships and skills, the ability to tolerate distress, and mindfulness skills (Robins & Chapman, 2004). It is assumed that by teaching and practicing these skills would assist the patient in his or her ability to interact assertively, to regulate emotions, adaptively tolerate distress, be more aware of internal states and stimuli, be more attuned to the patient's external environment, and to be less judgemental (Robins & Chapman, 2004). By developing and rehearsing these skills, and having them reinforced by the environment, it is expected that individuals will cope with daily or chronic stressors in a more adaptive

manner, which in turn will produce a host of positive health and mental health outcomes (Robins & Chapman, 2004).

Chen et al. (2008) examined the efficacy of DBT for treating binge eating disorder ($n=5$) or bulimia nervosa ($n=3$) with borderline personality disorder. Given funding and time restrictions, only 24 sessions of standard DBT treatment (see Linehan, 1993) over six-months, compared to the standard 1-year of treatment, were provided. Chen et al. (2008) adapted the standard DBT treatment manual to specifically target binge eating. Results indicated that DBT was successful in reducing the amount of binge-eating episodes, nonsuicidal self-injury and suicidal behaviour, eating disorder concerns, and improved social functioning.

DBT group therapy for binge eating has predominantly focused on three of the four components of the traditional DBT program, including mindfulness skills, distress tolerance, and emotion regulation skills (Wiser & Telch, 1999). Building from a case study which stated that DBT was efficacious in treating binge eating disorder, Telch, Agras, and Linehan (2000) examined the efficacy of DBT for binge eating disorder in an uncontrolled study. A total of 11 female participants (mean age = 45 years) agreed to participate in a brief 20-session DBT-orientated group for binge eating disorder. The primary aim of treatment was to ameliorate all binge-eating by teaching participants to emotionally regulate using a 20-session treatment manual which was adapted from Linehan's DBT manuals (see Telch et al., 2000). Each session lasted for two hours and consisted of mindfulness skills, emotion regulation skills, and distress tolerance skills.

Since this study was an uncontrolled trial, results must be interpreted with caution. Firstly, all group members completed the entire course of therapy, and 82% of the group had ceased binge eating by the end of treatment. Given that CBT reports a 50% abstinence rate after a course of therapy (Telch et al., 2000), these results are promising. Additionally, these abstinence rates were maintained over a six-month period. However,

without a control group it is not possible to conclude that the DBT was responsible for this change. Participants also lost a small amount of weight post-treatment and maintained those losses over follow-up. Moreover, there were also improvements in participants' eating, weight, and shape concerns. This is an important finding given the results in Study 2, which highlight the degree of body dissatisfaction that obese individuals report.

In terms of affect regulation, participants indicated that they were less likely after treatment to respond to emotional distress with food or binge eating episodes. Further, participants demonstrated greater positive affect post-treatment. Although data showing long-term maintenance is required, the results are promising nonetheless. This finding has implications for the design of future obesity treatment programs. Research has shown that negative emotions are associated with body weight and health-related behaviours (Blackburn et al., 2006; Byrne et al., 2003; Chesler, Harris, & Oestreicher, 2009; Seamoore, Buckroyd, & Stott, 2006). The results of Study 1 certainly demonstrated that unhealthy weight participants were more likely to overeat in response to negative affect and were more likely to experience emotional distress, compared to individuals of a healthy weight. Given the regulatory effect that DBT can have on an individual's emotional state, DBT may be an effective treatment option for weight-loss and weight maintenance.

Following on from this preliminary uncontrolled study, Telch, Agras, and Linehan (2001) conducted a randomised controlled trial with 44 participants with binge eating disorder. A total of 22 participants were randomly allocated to DBT skills-training treatment and 22 participants were randomly allocated to a wait-list control condition. Results from this study indicated that DBT was superior for the treatment of binge eating than the control group. A total of 89% of the DBT group had stopped binge eating at least four weeks prior to the end of treatment, compared to 12.5% in the

control group. However, abstinence rates were reduced to 56% at six-months follow-up. Dissimilar to the previous uncontrolled trial by Telch et al. (2000), there were no significant differences between the treatment and control group on the weight, mood, and affect regulation scales. These findings warrant further investigation.

Implications for the present study

Several propositions have been made future weight-loss interventions. Byrne et al. (2003) assert that unrealistic weight loss goals, poor coping or problem-solving skills, and low levels of self-efficacy are all aspects of treatment that will hinder any change in obese individuals. Similarly, Blackburn et al. (2006) suggest that therapeutic strategies need to focus on increasing an individual's capacity to manage negative affect.

Although current treatments predominantly focus on a reduction in dieting and instructing participants on how to control any urges to binge-eat, it is equally important to consider why the individual is binge-eating and the function that that behaviour serves (Blackburn et al., 2006). The Escape Model (Heatherton & Baumeister, 1991) suggests that binge eating provides a means for the individual to escape from any distressing emotions that are believed to originate from a negative self-evaluation through cognitive narrowing. If this is true, coping with negative affect and negative self-evaluation requires investigation in future obesity treatment programs.

The results of Study 1 certainly confirm the credibility of the Escape Model explaining binge-eating behaviour. Results from Study 1 demonstrated that healthy weight individuals experienced a greater frequency of negative emotions than unhealthy weight individuals, and that they felt less able to manage and cope with these negative emotions by not overeating. Without treating the underlying mechanisms that perpetuate the overeating, weight-loss and maintenance will be difficult, if not impossible.

Blackburn et al. (2006) suggest that the long-term weight-loss outcomes of current treatment programs may be improved if participants were taught how to manage and

dispute the cycle of negative self-evaluation and consequential eating to escape the negative affect, and provide adaptive coping strategies to deal with the emotional distress.

Furthermore, given the high proportion of binge eating inherent in obese cohorts, Wadden, Brownell, and Foster (2002) propose that a non-dieting approach may be useful in the treatment of obesity. A non-dieting approach does not place the primary emphasis of treatment on weight-loss. This is in contrast to many diets emphasising the primary goal of weight-loss, rather than skill acquisition like emotion regulation or distress tolerance. Although diets are known to lead to short-term weight loss, these losses are certainly not maintained long-term, and in most cases participants not only regain the initial weight loss, but exceed the starting weight (Mann et al., 2007). Accordingly, the intervention outlined in this chapter will utilise a non-dieting approach. This means that the primary target of the intervention sessions will be on self-efficacy, the management of negative emotions, body esteem, and self-monitoring. The purpose of this approach is to strive to achieve weight-loss as an indirect effect.

Efficacious treatment options that are able to impart knowledge and skills to participants but place the responsibility and the outcomes with the individual are needed. Not only is this method more cost effective, it also builds on the resources that are inherent in the client (Ash et al., 2006). Focusing on the individual and any individual goals have resulted in a greater adherence to treatment protocols, have shown a decrease in morbidity, and report an increase in individuals' perceived quality of life (Ash et al., 2006). Moreover, employing patient-centred care approaches has been a useful method for the development of obesity treatments, which include goal setting, developing action plans, teaching skills, and regular follow-up (Ash et al., 2006). Interventions that focus on the inner resources and skills inherent in the individual will

also increase his or her self-efficacy. Given the results of Study 1, this is an important focus of obesity treatment that should be applied.

In addition, the time individuals spend in these intervention programs has also shown to affect treatment outcomes. One argument has been to increase the length of treatment to increase weight-loss, however these programs have not resulted in much more weight-loss (Wadden et al., 2002). Instead, Linde et al. (2006) assert that individuals can achieve significant weight loss using a more focused treatment format.

Stice et al. (2006) conducted a meta-analysis with a total of 64 obesity treatment programs for school-aged children. Although this study is not generalisable to the adult population, a notable feature shared between treatment programs yielding weight-loss was that these programs ranged from 3-120 hours (mean treatment time = 40 hours) of intervention time, and were considered to be “intensive”. Although the mean is 40 hours, it is difficult to ascertain from these results what the most effective treatment time would be, given the wide range of hours that different programs offered. Moreover, larger effect sizes were evident for interventions with a relatively shorter treatment time. Stice et al. (2006) assert that this may be due to shorter interventions being more attractive to participants, with a smaller dropout rate; it is also possible that participants in longer treatments lose motivation and interest over time, and consequently disengage. Research evaluating the effectiveness of intensive treatment programs within an adult population is warranted.

Furthermore, this meta-analysis found that for those weight-loss programs yielding significant effect sizes for weight-loss were more effective when there was an all-female cohort, rather than a mixed-gender sample (Stice et al., 2006). It is theorised that females may be more comfortable discussing any weight and diet-related issues with other women and may feel more self-conscious or feel a need to censor her contributions to a group when males are present in the group. It is also possible that

women may find these groups to be more effective given the pressure they face in a society that espouses the “thin ideal” (Stice et al., 2006). Further, females may also be more motivated to adopt weight and diet-related changes, than men, thus may find this group more motivating.

Also, intervention programs producing larger effect sizes for weight-loss also comprised of participants who had self-selected into the obesity program (Stice et al., 2006). It is likely that these participants are more motivated and ready to make some of the necessary changes to induce weight-loss (Stice et al., 2006). The current study was therefore comprised of participants who self-selected into the intervention program.

Swinburn, King, Magaray, O’Brien, and Waters (2007) identified the main evaluative components of obesity intervention programs that need to be included to ensure adequate evaluation of these programs: comparison groups, measured height and weight, and sufficient process evaluation and contextual information. Without a comparison group not receiving treatment, it is impossible to determine the true effects of the intervention (Swinburn et al., 2007). Given that self-reported height and weight are unreliable (individuals are prone to over-report height and under-report weight), it is necessary for research to accurately and reliably measure height and weight (Swinburn et al., 2007). Finally, it is essential for any intervention to include sufficient detail pertaining to the program’s implementation and contextual factors to ensure adequate comparison can be made between the treatment group and other populations (Swinburn et al., 2007).

Research has shown that group therapy is an effective therapeutic approach due to the benefits of group cohesion and chance for interpersonal learning and growth (Seamoore et al., 2006). Research has substantiated the use of group therapy in treating binge-eating and obese populations (see Seamoore et al., 2006), and have been substantiated in clinical research as a successful weight-loss treatment (Wadden,

Brownell, & Foster, 2002). Irwin and Guyton (1997) state that numerous studies have demonstrated that group therapy has been successful in helping adult participants lose modest amounts of weight loss and generate positive outcomes for health behavioural factors.

Seamoore et al. (2006) conducted a pilot study to assess the effectiveness of group therapy among women who binge-eat. Since binge eating is known to occur in approximately 40% of the obese population, treatment approaches that integrate awareness about the possible factors that may be encouraging and maintaining the binge eating behaviour, while in a group with others who may be experiencing similar problems, may be effective (Seamoore et al., 2006). A total of nine obese adults were recruited between the ages of 24 and 56 years of age to attend a weekly group for 24 weeks over six months. Each meeting lasted for 90 minutes and was based on a series of treatment modalities, including exploration of weight and personal history, psychoeducation, cognitive-behavioural therapy, interpersonal conflicts, emotions, self-image, and body image.

Results from this pilot study showed that the group offered social support and a supportive environment for participants. Four participants reported that following this treatment eating behaviours and life satisfaction had significantly improved, with reported higher levels of confidence, emotional well-being, and improvements in interpersonal functioning. Furthermore, three participants experienced significant weight-loss, however they attributed this weight-loss to the work they had done on the underlying issues (like body image, confidence, emotions, interpersonal distress) that were causing the overeating or binge eating.

Rationale

Previous research has shown that participants in weight-loss treatment programs do not lose weight after six months of treatment, even if they continue with treatment (Ash

et al., 2006; Foster et al., 1997; Wilson, 1996; Yanovski et al., 1999). For this reason, new obesity interventions that focus on long-term weight-loss and maintenance of the weight loss are required. Research has demonstrated that substantial weight-loss can be achieved, yet the studies which have yielded these findings have been conducted in tightly controlled clinical settings, have provided financial incentives for attendance, and have advocated the use of meal replacements or medications (Ash et al., 2006). However, studies of these kinds have failed to clarify the long-term effects of the treatment and the sustainability of the weight loss. When these methods are translated to real practice settings, the results have been disappointing (Ash et al., 2006). Research is needed which has strong external validity, and can be generalisable and applied to real practice settings in the community (Ash et al., 2006).

Following the results of the meta-analysis conducted by Stice et al. (2006), it was recommended that future treatment programs randomly assign participants to groups, use blinded assessment procedures, take direct measures of body weight, utilise procedures that minimise attrition, and use active control groups. Accordingly, the current research project consisted of a pilot study using six case studies and has addressed four out of five of these recommendations: participants were randomly allocated to groups, blinded assessment procedures were used, all efforts were taken to minimise attrition, and an active control group was used.

Given all of the aforementioned future research recommendations, a pilot study using a brief two-day workshop based on dialectical behaviour therapy was trialled. Research has shown that regardless of treatment time, the results are strikingly similar (Stice et al., 2006). This suggests that participants who attend an eight-week treatment program are just as likely to lose weight and achieve the same psychological changes as participants who are in treatment programs over a six-month period.

Some researchers have argued that weight-loss programs need to extend to the weight maintenance phase (Perri et al., 1988; Telch et al., 2000). However, these programs are expensive both in money and time and have not shown to be more successful in improving the maintenance of weight loss (Lillis, Hayes, Bunting, & Masuda, 2009). Consequently, research has examined the psychological factors that are predictive of successful and unsuccessful weight maintenance to design treatment programs to target these psychological factors (Lillis et al., 2009). Factors predictive of unsuccessful weight maintenance have predominantly been poor coping skills (Lillis et al., 2009).

Lillis et al. (2009) assert that although various studies have targeted the psychological variables associated with weight maintenance, better outcomes have not been achieved. As a result, they argue that the problem may be the type of training and intervention provided to overweight and obese individuals. While behavioural control-based approaches have been largely ineffective, acceptance strategies have had a large impact (Lillis et al., 2009). Acceptance and commitment therapy (ACT) has been successful in encouraging individuals to work through experiential avoidance and thus reduce emotional eating, and improve cognitive functioning (Lillis et al., 2009).

Accordingly, Lillis et al. (2009) designed a one-day workshop based on ACT. It focused on targeting the psychological variables of stigma and distress rather than weight control by teaching acceptance and mindfulness skills. Results of this study indicated that three-months after a one-day workshop of six hours, individuals in the ACT treatment group improved significantly more on all outcome measures than those in the control group. Specifically, ACT participants had larger reductions in weight-control stigma, higher adaptive psychological functioning, a higher perceived quality of life, and had lost more weight. Importantly, analyses revealed that the changes in

stigma, distress, and quality of life could not be attributed to weight change, indicating that the ACT workshop had a direct positive influence on the ACT participants.

ACT and DBT are considered to be part of the “third wave” of cognitive-behavioural therapies which pay more attention to secondary change in the area of thoughts and feelings (Harris, 2009). Both ACT and DBT emphasise acceptance, mindfulness, and effective action. However, these therapies contrast in their use of theory. ACT heavily relies on Relational Frame Theory which is necessary to understand to be an effective ACT therapist (Harris, 2009). However, DBT is more pragmatic and manualised which means that there is less variability in treatment delivery (Linehan, 1993). Furthermore, DBT has a much stronger empirical base than ACT. For this reason, DBT was the treatment used for the current study.

In light of this research, a pilot study was conducted using six case studies to investigate whether a two-day workshop would be effective for obesity treatment. Since current weight control programs are costly and time intensive, it is necessary to design brief interventions for overweight and obese individuals. Participants attending a two-day workshop would be receiving similar therapist-participant contact hours as those participants attending a six- to eight-week program. Moreover, research has also shown that more intense interventions have yielded positive results (McTigue et al., 2003). It is possible that an intense weekend of group therapy addressing some of the core variables that were identified in Study 1 and Study 2 (self-efficacy, negative emotions, body esteem, and self-monitoring) may be effective in achieving and maintaining weight reduction. DBT has shown to be effective with anorexia nervosa and bulimia nervosa, however a workshop of this kind has not previously been examined with a group of overweight or obese individuals.

DBT conceptualises pathological behaviour such as self-harm and anger outbursts as an individual's inability to emotionally regulate (Wiser & Telch, 1999). Since poor

affective regulation is known to correlate with obesity (for a detailed explanation see Chapter 2), and DBT is primarily a treatment of adaptive affect regulation (Wiser & Telch, 1999), it may be a useful treatment approach for obesity. Since DBT for binge eating disorder is based on the theoretical understanding of negative affect maintaining the disorder, it is assumed that DBT may be an effective treatment option for obesity. The results from Study 1 and Study 2 certainly support this proposition. However, current treatment programs have not focused on affect regulation.

The aim of Study 3 was to determine whether a brief DBT-informed pilot study consisting of a two-day workshop focusing on the factors that were identified in Study 1 and Study 2 would lead to slow weight-loss that could be maintained long-term. These factors were self-efficacy, negative emotions, self-monitoring, and body esteem. It was anticipated that teaching participants core mindfulness skills, emotion regulation skills and distress tolerance skills would assist in 1) increasing their self-efficacy for weight and health-related change, 2) decrease the frequency and intensity of negative emotions and teach individuals how to cope in an adaptive manner with these emotions, 3) increase self-monitoring, and 4) increase body esteem.

This study comprised of six case studies. Three participants attended a two-day DBT-informed workshop and three participants attended a two-day workshop based on psychoeducation and supportive therapy, which served as an active control group. It was expected that the DBT-informed components of treatment would be more effective for attitudinal and behavioural change than psychoeducation.

Method

Participants

Given that this study utilises a case study approach, a total of six participants completed a two-day workshop. Information pertaining to participant age and demographics is provided in the Results section starting on page 139. Participants were

invited to participate in a two-day workshop to test the efficacy of a brief DBT-informed treatment program for obesity. Completing an online battery of questionnaires in the week prior to the workshop served as the baseline measure. Participants were eligible to participate in the current study if they were female, aged between 18 years and 65 years of age, considered to be of an unhealthy weight and had a BMI of more than 25kg/m^2 , interested in losing more than five kilograms, able to give informed consent, and were willing to attend a two-day workshop, and complete a battery of questionnaires at baseline, two-, four, and six-months post-treatment.

Participants were ineligible to participate in the current study if they were currently engaged in a traditional weight-loss program, currently receiving psychological therapy for weight loss, or have insufficient knowledge of English to enable adequate assessment and understanding of the treatment approach.

Measures

For the purposes of the present study, a 12-item demographic questionnaire was constructed (see Appendix Q). The demographic questionnaire ensured that data could be compared with subsequent studies, and served three functions. First, eight items specifically addressed descriptive information including age, education level, geographical residence (urban or remote), marital status, housing, height, and weight, and a personal opinion of her current physical health and shape. Second, three items focused on respondents' previous diet and weight loss attempts including the success of these weight-loss attempts, programs that helped respondents lose this weight, and maintenance of the weight-loss. Finally, three questions assessed any factors that may affect weight, including gym membership, any medical or psychological conditions, and medications that affect appetite. Height was measured with a stadiometer and weight was measured with the participants in light clothing and without shoes on, on a balance

beam scale. These measurements allowed for the calculation of participants' BMI scores.

The following questionnaires were used in Study 1 and Study 2, and were also administered to participants in the current study at baseline, two-months, four-months, and six-months post-treatment: *Eating Questionnaire* (EQ; Ball & Crawford, 2006), for a detailed description of this questionnaire please see page 38; *Global Motivation Scale* (GMS; Pelletier et al., 2004), for a detailed description of this questionnaire please see page 42; *Eating Self-Efficacy Scale* (ESES; Glynn & Ruderman, 1986), for a detailed description of this questionnaire please see page 45; *Differential Emotions Scale* (DES; Izard et al., 1993), for a detailed description of this questionnaire please see page 46; and *Body Esteem Scale* (BES; Mendelson et al., 1995), for a detailed description of this questionnaire please see page 85.

Procedure

The Australian Catholic University Human Research Ethics Committee gave permission for the current study to be undertaken (see Appendix N). The pilot study was carried out at Australian Catholic University, Melbourne, Australia. A flyer advertising the project with the details to contact the researcher for further information about the study was advertised at a variety of doctor clinics in Melbourne and around the campus of Australian Catholic University. In addition, an advertisement for the intervention was posted on the social networking site Facebook (facebook.com) to invite people to indicate any interest in participating in this project by contacting the researcher.

After contact was made with the student researcher, participants were provided with additional information about the study and the dates for the intervention. Prior to completing the battery of questionnaires, participants were presented with a detailed information sheet (see Appendix O) and a consent form (see Appendix P). Those

participants who met the inclusion criteria and who agreed to give written informed consent to participate in the study were weighed and had their height measured.

They were then invited to complete the baseline assessments and were randomly allocated to either a treatment group or the active control group. Participants in the treatment group were told which room they were in and were met there by their two group facilitators, while participants in the control group were shown a different room with different group facilitators. The group facilitators outlined the structure of each day and then started taking participants through the respective manuals.

Participants were contacted by the researcher after the weekend and were invited to comment on their experiences at the workshop. They were subsequently contacted two-, four-, and six-months after the workshop and invited to complete the battery of questionnaires and to provide any information about their weight and health and whether the workshop has helped or hindered their weight-loss efforts in any way.

Design

Data were collected from six participants. Three participants were randomly allocated into a treatment group whereby they attended a two-day DBT-informed workshop and three participants were randomly allocated into an active control group whereby they attended a two-day psychoeducation workshop. Participants were invited to complete the battery of questionnaires at baseline, two-months, four-months, and six-months. Participants were also asked to provide an e-mail address so that the questionnaires could be emailed to all participants at two-, four-, and six-months post-treatment.

To ensure the principal researcher who was responsible for the recording of outcomes and the administration of all baseline and follow-up measures was unaware of the treatment allocated or received, a research assistant was responsible for the random allocation of participants to the active control group or the treatment group. In addition,

the two research assistants who were responsible for recording the height and weight of each participant were unaware of group allocation.

There was a total of four group facilitators; two were allocated to the treatment group and two were allocated to the active control group. All facilitators were provisional psychologists and in their last year of either masters or doctoral training. To ensure that all groups were following the same format, facilitators were familiarised with the group facilitators' manual, which is presented in Appendix R and Appendix S, respectively.

Participants in the treatment group attended a two-day DBT-informed workshop. Each day was broken into three sessions with a break between each session. All of the information provided was taken directly from Linehan's (1993) Skills Training Manual for Treating Borderline Personality Disorder, and has been reproduced with permission from The Guilford Press. Participants were trained in core mindfulness skills, emotion regulation skills, and distress tolerance skills, in a socially supportive setting. Unlike the original DBT format that was created to treat borderline personality disorder, this workshop did not concentrate on interpersonal effectiveness skills training.

Participants in the active control group attended a two-day psychoeducation workshop, which followed the same format as the treatment group. Each day was broken into three sessions with a break between each session. All of the information provided was directly taken from www.nutritionaustralia.org and has been reproduced with permission from The Australian Nutrition Foundation Inc. The topics covered through the workshop included the Healthy Living Pyramid, information about overweight and obesity, physical activity, and diabetes.

Results

Participant 1(Mary) – treatment group

Mary was a single 54 year old woman who has completed studies post high-school and owns her own house in a rural or remote town. At baseline, she had a BMI of 41.33 and stated that she had previously tried Weight Watchers twice in an attempt to lose weight. Mary reported that Weight Watchers helped her to lose 20kg that she was able to maintain for five to six years. However, with age she has found maintenance of weight particularly difficult.

Evident in Figure 2, Mary demonstrated a decrease in self-efficacy at two-months, which was maintained at four- and six-months post-treatment. After the workshop, self-monitoring scores had decreased but by four-months had returned back to the baseline level and by six-months had exceeded pre-treatment levels. The reported frequency of negative emotions remained relatively stable between baseline and six-months.

Interestingly, at two-months post-treatment Mary had increased in body weight, and also exhibited decreases in body esteem weight, body esteem appearance, and less self-monitoring. However, at four-months she had lost weight and had higher body esteem weight, body esteem appearance, a lower level of negative emotions, and higher self-monitoring.

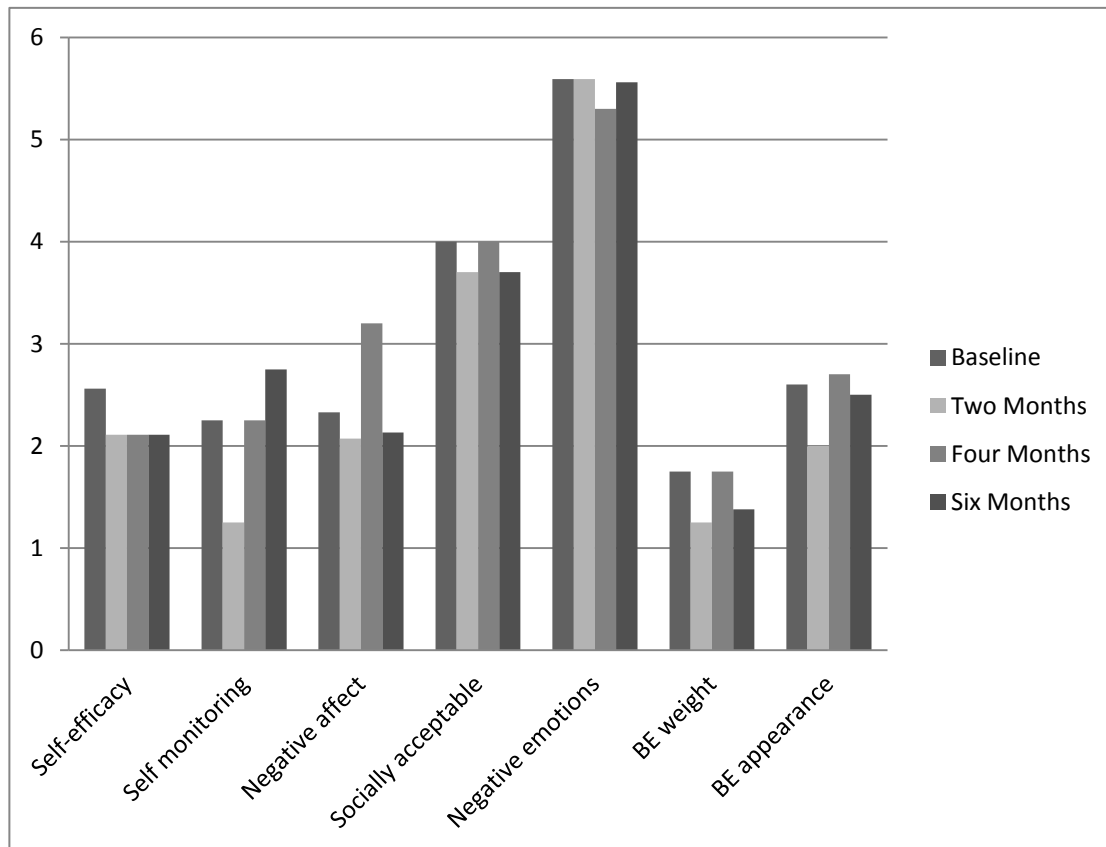


Figure 2. Mean scores on each factor for Mary at baseline, two-months, four-months, and six-months.

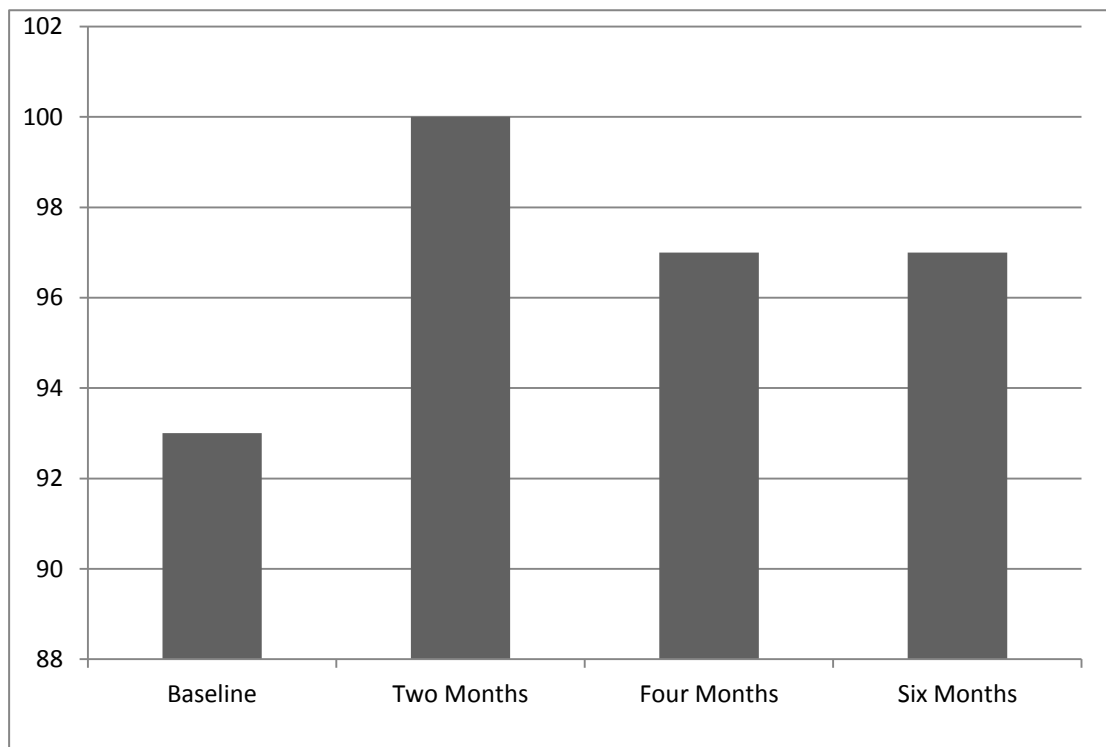


Figure 3. Mean scores for weight (in kilograms) for Mary at baseline, two-months, four-months, and six-months

Participant 2 (Joanna) – treatment group

Joanna was a partnered 22 year old female who has completed a bachelor's degree. She reported that she lives in an urban suburb in rental accommodation. At baseline, she had a BMI of 37.46 and stated that she had previously tried to lose weight on her own and had been successful in losing 10kg, however she started regaining the weight after 12 months.

Evident in Figure 4 and Figure 5, at the two-month follow-up, Joanna exhibited increased self-efficacy, self-monitoring, and decreased eating in response to negative affect and in socially acceptable circumstances. Although the scores for these variables were not sustained at six-months post-treatment, they were still higher than what was recorded at baseline. Over time, Joanna demonstrated a gradual decrease in body weight (a total of nine kilograms) while also experiencing increased body esteem weight which was maintained at six-months post-treatment.

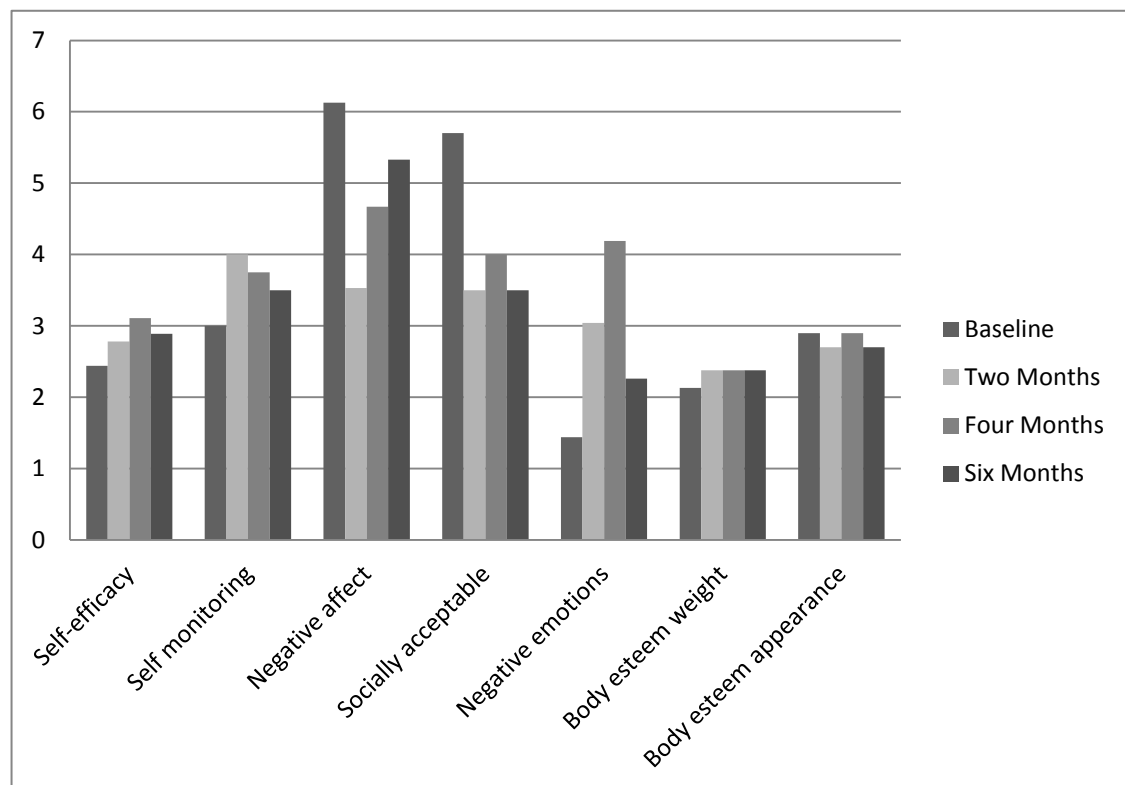


Figure 4. Mean scores on each factor for Joanna at baseline, two-months, four-months, and six-months.

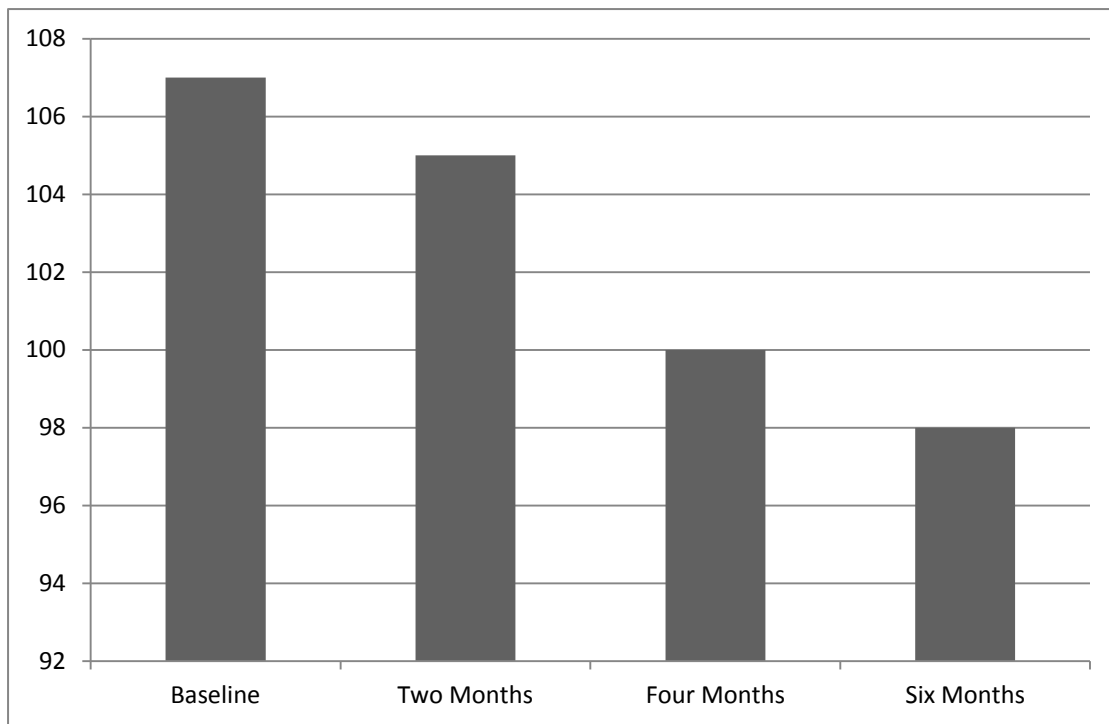


Figure 5. Mean scores for weight (in kilograms) for Joanna at baseline, two-months, four-months, and six-months.

Participant 3 (Fiona) - treatment group

Fiona was a 57 year old married woman with a bachelor's degree who had a BMI of 25.77 at baseline. She reported that she lives in an urban suburb in her own property. She stated that she has previously tried to lose weight on her own, but has been unsuccessful. Evident in Figure 6 and Figure 7, Fiona demonstrated fluctuations on all of the variables except for body weight and body esteem appearance. Over the six-month period she lost 12kg and demonstrated an increase in body esteem appearance at two-month post-treatment, which was maintained at all subsequent time points. Fiona showed a decrease in self-efficacy, self-monitoring, perceived difficulty in controlling overeating in response to negative affect and in socially acceptable circumstances, the frequency of negative emotions, and body esteem weight. However, changes for all of these variables fluctuated at different time points.

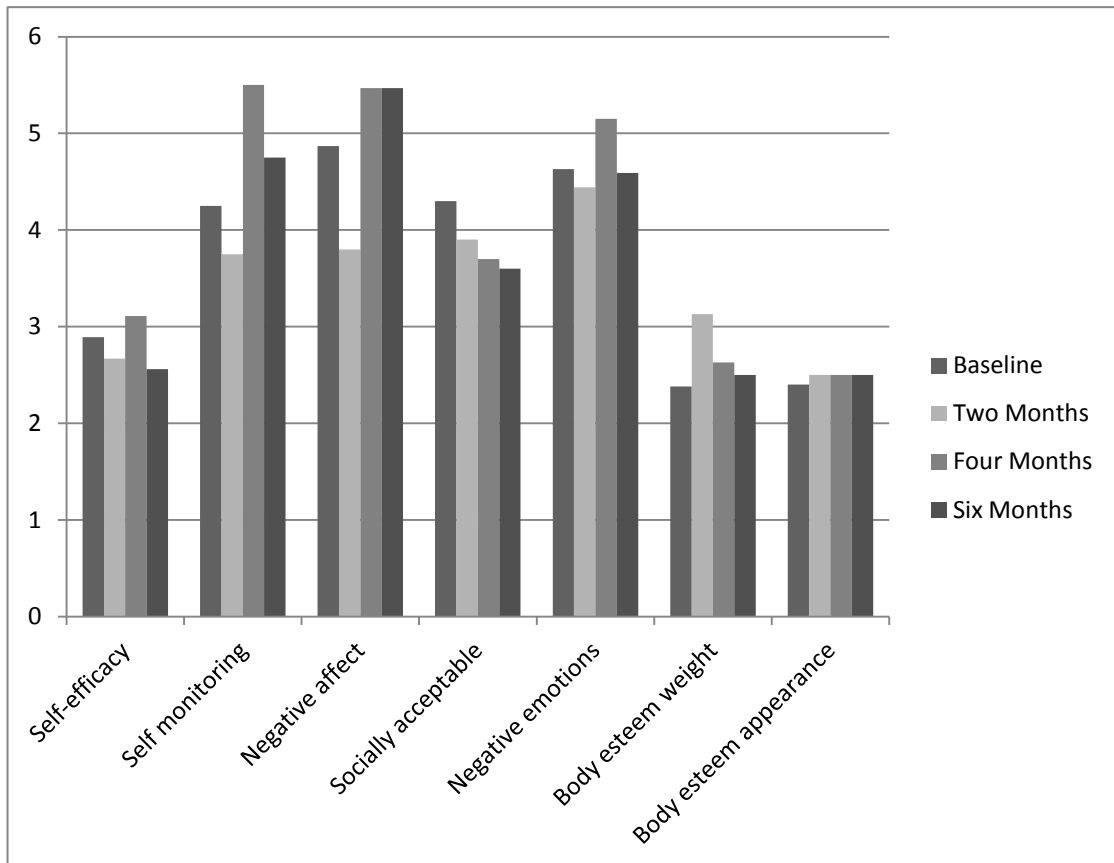


Figure 6. Mean scores on each factor for Fiona at baseline, two-months, four-months, and six-months

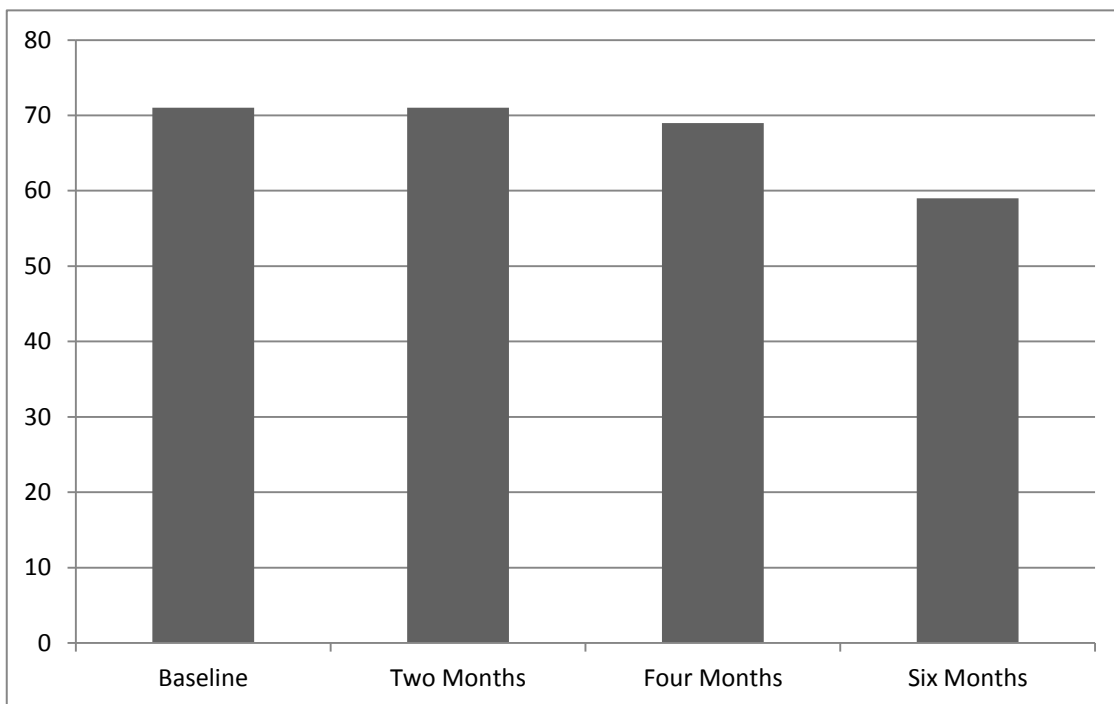


Figure 7. Mean scores for weight (in kilograms) for Fiona at baseline, two-months, four-months, and six-months

Participant 4 (Catherine) – active control group

Catherine was a 55 year old married female with a BMI of 32.03. She reported that she has completed high school and currently lives in an urban suburb and owns her own house. Catherine has had no prior weight-loss attempts. Evident in Figure 8 and Figure 9, Catherine demonstrated a decrease in self-efficacy at two-months and four-months and an increase at six-months. Her self-monitoring scores decreased at four-months and were maintained at six-months. There was no clear trend for her difficulty in overeating in response to negative affect and in socially acceptable circumstances. Scores for both of these variables fluctuated. There was an increasing trend for Catherine's frequency of negative emotions and body esteem weight. For body esteem appearance, it increased at two-months and was maintained at four-months but then decreased at six-months. Furthermore, Catherine did lose two kilograms between baseline and six-months, which also coincided with a gradual increase in body esteem weight over time.

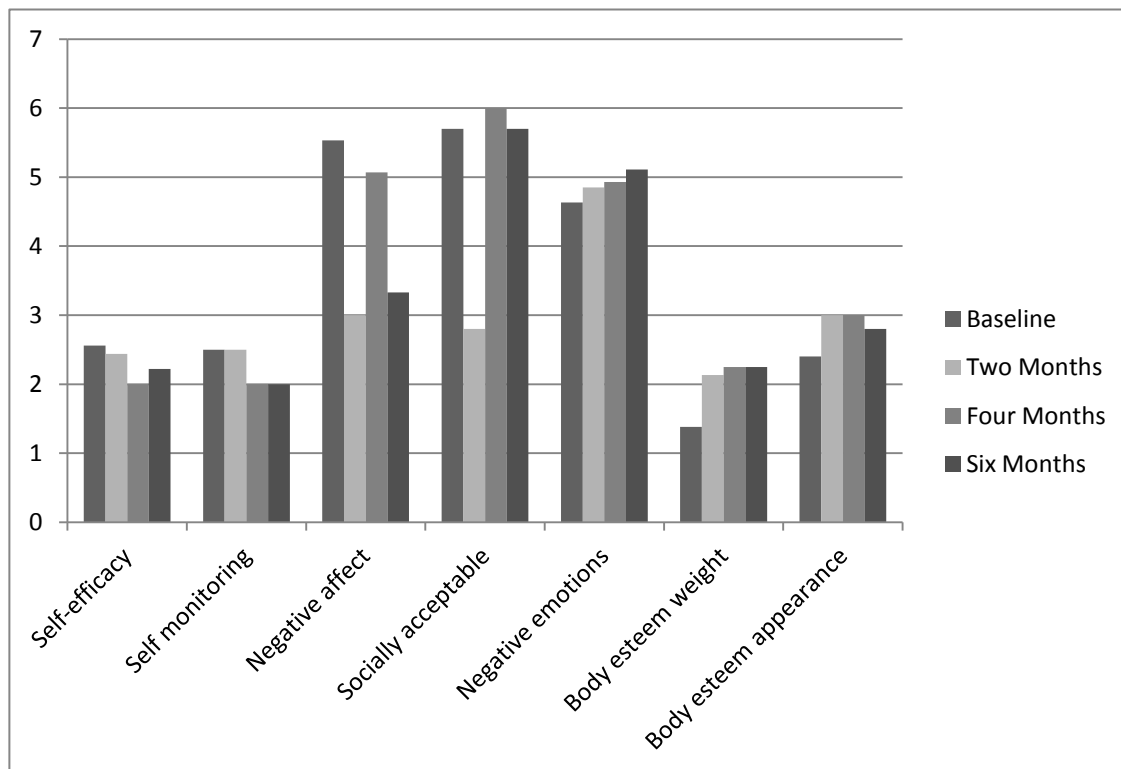


Figure 8. Mean scores on each factor for Catherine at baseline, two-months, four-months, and six-months

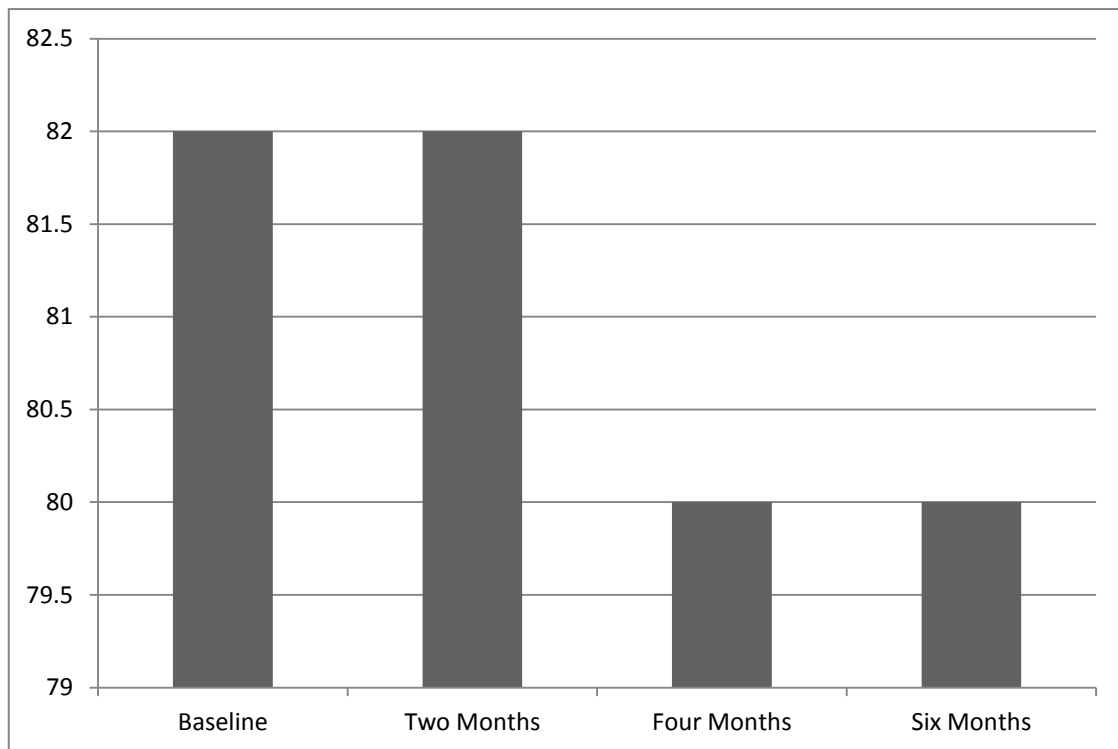


Figure 9. Mean scores for weight (in kilograms) for Catherine at baseline, two-months, four-months, and six-months

Participant 5 (Roseanna) – active control group

Roseanna was a partnered 35 year old female with a BMI of 27.18. She reported that she has successfully completed a bachelor's degree. She lives in a rented property in a remote community. Roseanna has previously tried to lose weight with Weight Watchers and was successful in losing 4.5 kg and has maintained that weight-loss for four years. Evident in Figure 10 and Figure 11, Roseanna experienced an increase in self-efficacy at two-months post-treatment, however this change was not sustained. Over time, she demonstrated a continual increase in self-monitoring and the frequency of negative emotions, and a gradual decrease in body esteem appearance. There was no clear trend for eating in response to negative affect and in socially acceptable circumstances, or for body esteem weight, as they randomly fluctuated over the six-months. Roseanna was gradually losing weight at two- and four –month follow-up, and was able to achieve partial weight maintenance.

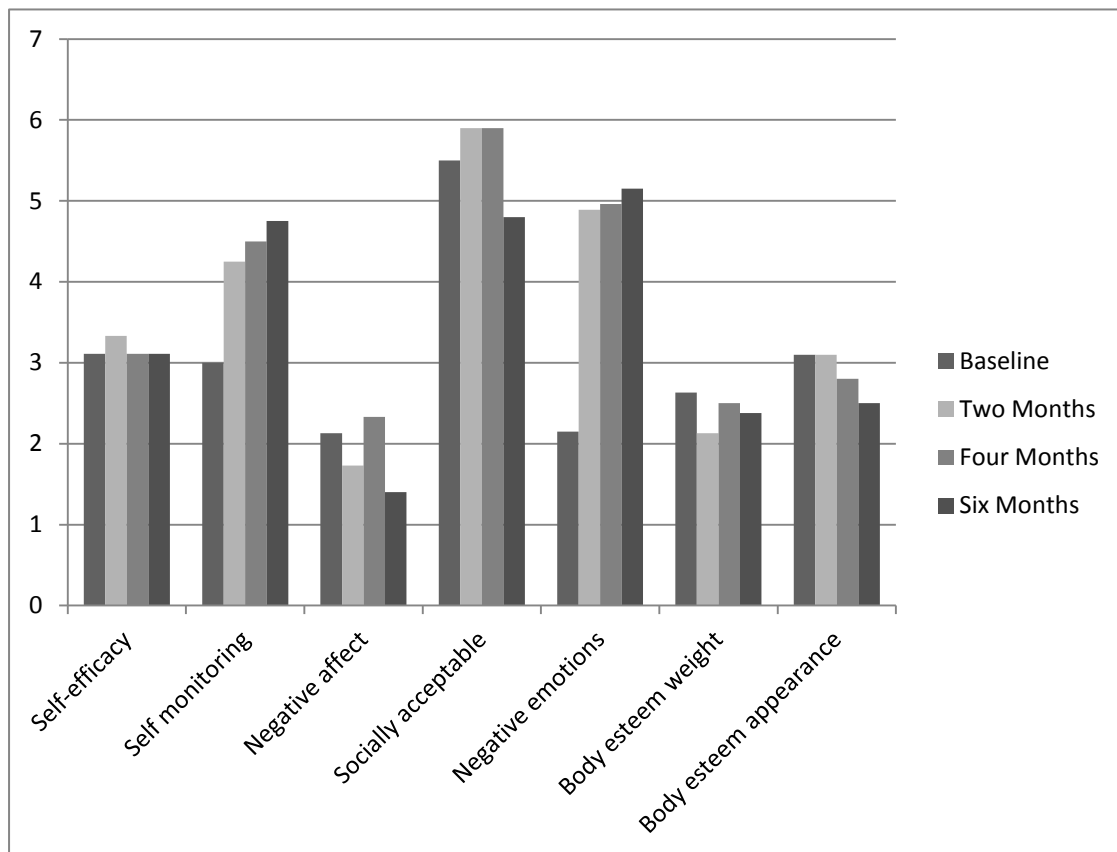


Figure 10. Mean scores on each factor for Roseanna at baseline, two-months, four-months, and six-months

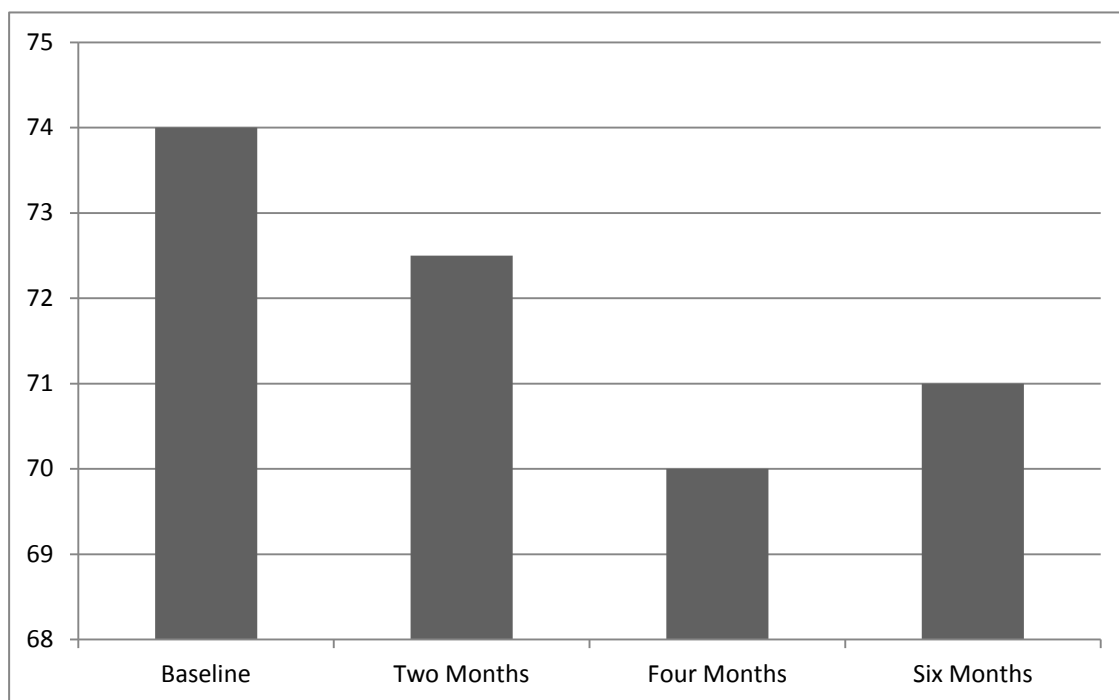


Figure 11. Mean scores for weight (in kilograms) for Roseanna at baseline, two-months, four-months, and six-months

Participant 6 (Anna) – active control group

Anna was a 33 year old married female with a BMI of 43.50. She has completed a bachelor's degree at university and currently resides in an urban suburb in a rental property. She reported that she has previously lost 25 kg on her own but only maintained that weight-loss for one year. Evident in Figure 12 and Figure 13, Anna had higher levels of self-monitoring at two-month follow-up which was sustained at subsequent data points. She reported a continual increase in difficulty with eating in response to negative affect. Anna exhibited a gradual decrease in body weight over time, losing a total of five kilograms. There was no clear trend for self-efficacy, reported difficulty in overeating in socially acceptable circumstances, the frequency of negative emotions, body esteem weight, or body esteem appearance, as the changes on these variables fluctuated over the six-months.

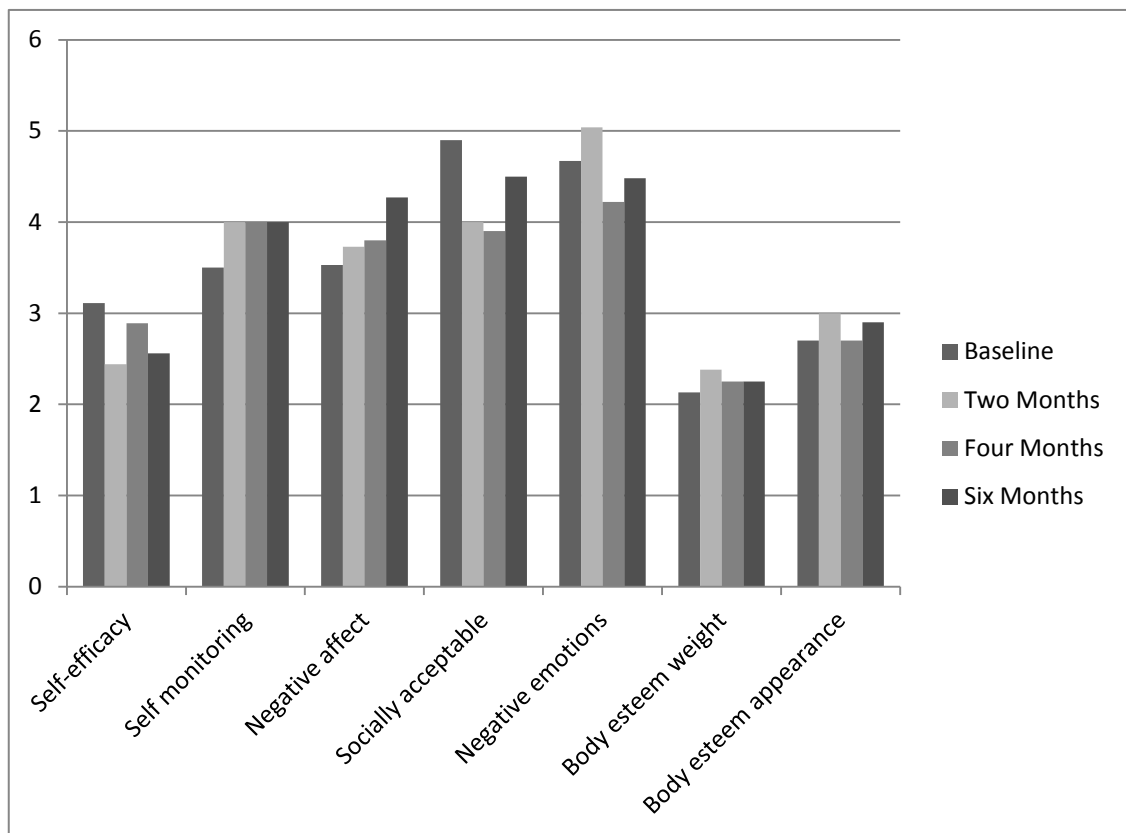


Figure 12. Mean scores on each factor for Anna at baseline, two-months, four-months, and six-months

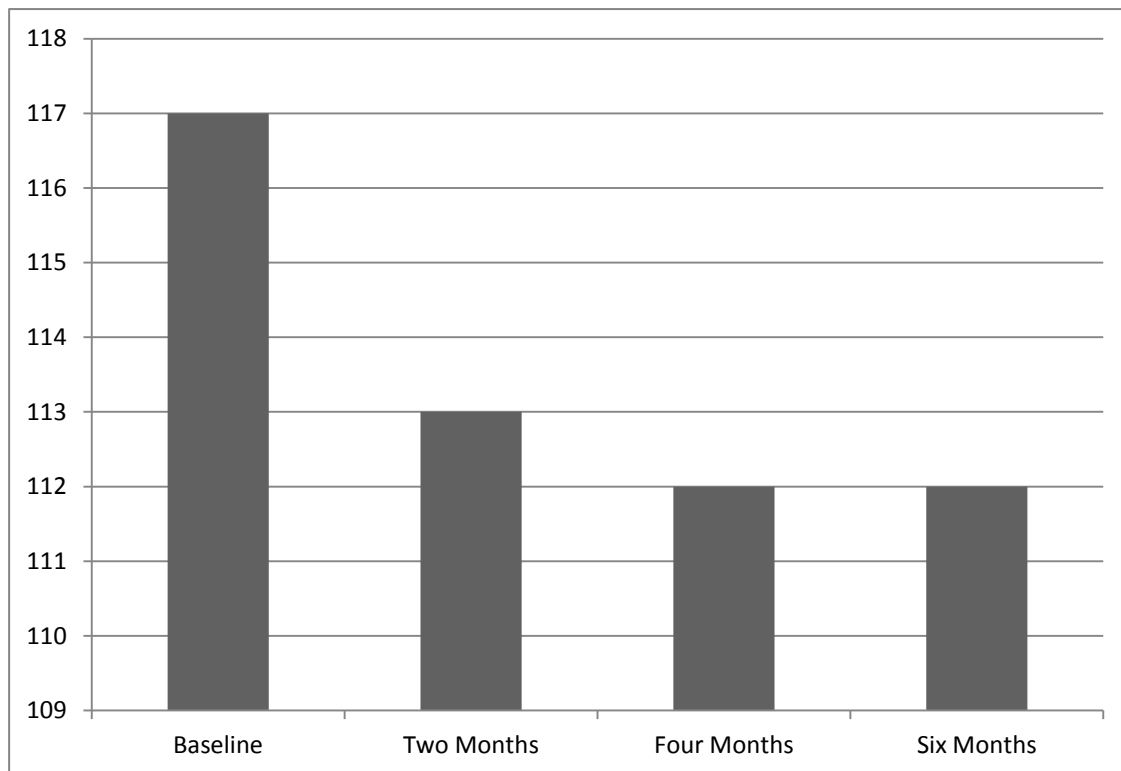


Figure 13. Mean scores for weight (in kilograms) for Anna at baseline, two-months, four-months, and six-months

Discussion

The aim of Study 3 was to determine whether a pilot intervention using DBT-informed treatment principles which focused on the factors that were identified in Study 1 and Study 2 would lead to slow weight-loss that could be maintained long-term. It was expected that the preliminary evidence from this study would assist in the development of future research for obesity treatment programs.

This study was comprised of six case studies whereby three participants were allocated to the treatment group and three participants were allocated to an active control group. Participants in the treatment group attended a two-day DBT-informed workshop which taught mindfulness skills, emotional regulation skills, and distress tolerance skills. Participants in the active control group attended a two-day workshop based on nutritional and physical activity psychoeducation. It was expected that the DBT-informed components of treatment would be more effective for attitudinal and behavioural change than psychoeducation about nutrition and physical activity.

Results from this study did not distinguish a clear trend in scores for the treatment group or the active control group with regard to self-efficacy scores. Mary from the treatment group experienced a decrease in self-efficacy for preventing weight gain, physical activity, and healthy eating at two-months and then maintained this lower level for subsequent data points. Alternatively, Joanna from the treatment group demonstrated a gradual increase in self-efficacy over time, with a slight decline at six-months. Self-efficacy scores for Fiona, who was also in the treatment group, fluctuated. For the active control group, all three participants fluctuated, but over time they experienced a decline in self-efficacy. Interestingly, Joanna from the treatment group experienced an increase in self-efficacy over time while also losing nine kilograms of weight between baseline and six-months.

When considering participants' change in self-efficacy scores for controlling overeating in response to negative affect and in socially acceptable circumstances, two participants from the treatment group indicated that they had less difficulty controlling overeating in response to negative affect and in socially acceptable circumstances from baseline to six-months. Fiona in the treatment group exhibited an increase in difficulty for controlling overeating in response to negative affect, but had experienced a continual decrease in difficulty for controlling overeating in socially acceptable circumstances.

For the active control group, one participant experienced less difficulty for controlling overeating in response to negative affect and did not experience a change in self-efficacy for controlling overeating in socially acceptable circumstances. Roseanna from the active control group experienced a decrease in difficulty for controlling overeating in response to negative affect and in socially acceptable circumstances, while Anna from this group exhibited an increase in difficulty for controlling overeating in

response to negative affect, but had experienced a decrease in difficulty for controlling overeating in socially acceptable circumstances.

Conceptually, these results may suggest that participants who perceived their efforts to have a positive outcome (i.e. less difficulty controlling overeating in response to negative affect) may be more likely to continue to adopt a healthy lifestyle and subsequently lose more weight over time. Social cognitive theory would suggest that those participants who experienced an increased difficulty in perceived control of overeating in response to negative affect or in socially acceptable circumstances will be less likely to pursue higher goals and set challenges and thus less likely to adopt health-promoting behaviours (Luszczynska et al., 2005).

The findings from previous research have been mixed. Irwin and Guyton (1997) examined the relationship between eating self-efficacy and weight control with a cohort of university students and found that there were no significant pre-post-treatment differences on eating self-efficacy for any of the participants. However, Irwin and Guyton (1997) outlined that there was a trend for students in the treatment group for self-efficacy scores to increase over time, with greater levels of self-efficacy at the post-test. Moreover, there were also no significant pre- to post-test differences between eating self-efficacy scores and weight-loss and fat-loss for students in the treatment.

Conversely, considerable research has shown that self-efficacy is a predictor of weight-related and health behaviours (Ball & Crawford, 2006; Baranowski et al., 1999; Linde et al., 2006; Trost et al., 2002). Glynn and Ruderman (1986) examined the relationship between self-efficacy and weight-loss with a small sample of 32 individuals and found that weight loss was significantly correlated with increases in eating self-efficacy scale scores. The results from their study suggested future research consider a more controlled weight-loss program and less variability among the treatment offered. Evident in the results of the current study, Joanna from the treatment group, who

experienced the largest weight-loss of nine kilograms over six months, was also the only participant who exhibited an increase in self-efficacy for preventing weight gain, physical activity, and healthy eating. In addition, this participant indicated that she had less difficulty controlling overeating in response to negative affect and in socially acceptable circumstances from baseline to six-months.

Although these results do not provide convincing evidence for the use of a DBT-informed treatment program to increase self-efficacy levels, Joanna's change in scores may be explained by social cognitive theory. Social cognitive theory considers self-efficacy to be the primary determinant of behaviour (Luszczynska et al., 2005). Within this framework, individuals are more likely to pursue greater challenges, expect positive outcomes from their behaviours, adopt healthy behaviours, and recover after setbacks (Luszczynska et al., 2005). As such, it is possible that Joanna will be more likely to maintain her new behavioural repertoire and continue to gradually lose weight and maintain the weight-loss.

With regard to self-monitoring of weight and related health behaviours, there was no clear trend for change in scores between the two groups. Although the self-monitoring scores did fluctuate with time, five out of six participants exhibited an increase in self-monitoring between baseline and six-months. Catherine from the active control group exhibited a gradual decrease in self-monitoring behaviour over time. Research has shown that behavioural strategies which promote diet and health-related activities are effective for weight-loss (Boutelle et al., 1999; Giesen et al., 2010; Mahoney et al., 1973). These activities generally include altering the type and quantity of food consumption, limiting calorie intake, increasing physical activity, and increasing self-monitoring of food and health-related activities (Boutelle et al., 1999; Mahoney et al., 1973). Baker and Kirschenbaum (1993) found that individuals who consistently used

self-monitoring techniques lost more weight than individuals who self-monitored eating behaviours inconsistently, or not at all.

Given the nature of the content in the active control group and the emphasis on nutrition and exercise and strategies for weight control, it is perhaps not surprising that the active control group experienced an increase in levels of self-monitoring. An increase in self-monitoring scores for most participants was observed, and all participants, except Mary from the treatment group, experienced weight-loss over time. Thus, self-monitoring may be a chief component of weight-loss.

The DBT-informed treatment intervention primarily focused on the psychological aspects of weight-loss. Participants and facilitators both acknowledged that the content over the course of the weekend was confronting and challenging; there was insufficient time to adequately process all of the material presented. One possible conceptual explanation for the finding that five out of six participants increased their self-monitoring behaviours between baseline and six-months is that participants felt some degree of control and self-efficacy in increasing their self-monitoring. It is a tangible behaviour offering immediate feedback about their health and lifestyle choices.

Previous research has identified self-monitoring as a correlate of weight loss and weight control (Boutelle et al., 1999; Kitsantas, 2000). Boutelle et al. (1999) found that in a treatment involving CBT and self-monitoring strategies, those individuals who were in the treatment group exhibited higher levels of self-monitoring behaviours and lost more weight. Similarly, Kitsantas (2000) found that there were no statistically significant differences for self-monitoring between overweight participants who had tried to lose weight but had been unsuccessful, participants who had been successful in losing 10% of body weight and had maintained that weight-loss for at least six months, and participants with a healthy weight.

Results from Study 3 also failed to demonstrate either a within-group trend or a between-group trend in scores on the body esteem measure. Mary from the treatment group experienced a decrease in satisfaction with body weight and appearance; however, she also gained four kilograms over the six month period. Joanna from the treatment group experienced an increase in body weight satisfaction, but her satisfaction with appearance fluctuated over time. This participant lost nine kilograms between baseline and six-months, thus it is not surprising that her satisfaction with her weight increased. Fiona from the treatment group exhibited an increase in satisfaction with body weight and appearance, and also exhibited the largest weight-loss over time (twelve kilograms).

These results could be theoretically explained by the effect that weight gain may have on an individual's self-esteem. When individuals gain weight they are less likely to feel good about their body weight, shape, and appearance. This is evident in the case of Mary whose body esteem decreased as her body weight increased. Moreover, lower levels of body-esteem may cause individuals to feel less able to control or change their behavioural repertoire; instead of positive health outcomes (i.e. higher body esteem and weight-loss), they are more likely to lead to decreased levels of self-esteem.

Friedman et al. (2002) examined the relationship between body dissatisfaction, dysphoric psychological states, and obesity. They found that individuals with higher BMIs reported less satisfaction with appearance and that heavier participants reported higher levels of psychological distress. The results for Mary, who experienced a decline in body esteem and also gained four kilograms, are consistent with the findings of Friedman et al.

For the active control group, two participants who lost two kilograms and five kilograms, respectively, experienced increased satisfaction with body weight and appearance. Roseanna from the active control group lost three kilograms over the six-

month period and had a decline in satisfaction with body weight and appearance. These results do not indicate a convincing trend for change over time. They do suggest that body esteem may be associated with weight-loss, such that body esteem increases as body weight decreases. Although there was no differentiation between the treatment group and the active control group with regard to change in scores, compared to the three participants in the active control group, Joanna and Fiona who were both from the treatment group experienced substantial weight-loss over time.

Moreover, there was very little change with regard to the frequency of negative emotions for all participants. Mary from the treatment group experienced no change in her reportedly high frequency of negative emotions, while Joanna from the treatment group and Catherine and Roseanna from the active control group all exhibited an increase in negative emotions over time. Both Fiona from the treatment group and Anna from the active control group demonstrated a decrease in the frequency of negative emotions over time. There does not appear to be a clear theoretical explanation for this finding. None of the participants had higher levels of negative emotions that could be explained by lower levels of self-efficacy. Social cognitive theory does suggest that those individuals with higher levels of self-efficacy are better able to manage negative affect, pain, and stress (Luszczynska et al., 2005). This has implications given the high frequency of negative emotions present across the six case studies. Whilst a DBT-informed treatment program may assist individuals in decreasing their frequency of negative emotions, it may also help to focus on increasing self-efficacy so that these negative emotions can be tolerated and managed in an adaptive manner.

The treatment group spent substantial time examining strategies to promote emotion regulation. The group facilitators also noted the resistance from group members to this content (see Appendix T for the qualitative data). A comparison between groups however is difficult since content presented to the treatment group was different to that

presented to the active control group. It is impossible to determine whether the participants in the active control group would have also exhibited similar resistance to the content of the treatment group.

Using foods as a means of emotional regulation and binge eating behaviours are understood to occur in 30% of obese individuals seeking weight-loss treatment (Friedman et al., 2002). Previous research by Seamoore et al. (2006) has shown that approximately 40% of individuals who self-reported that they have “serious” binge eating behaviours had a BMI between 31 and 42. Similarly, Adriaanse et al. (2009) assert that negative emotions can be a reason for the consumption of food.

There is a need for treatment programs that focus on tolerating negative self-awareness and the presence of strong negative emotions, and that teach individuals how to cope in a non-avoidant manner. Accordingly, the emotion regulation and distress tolerance components of DBT were believed to provide skills to participants on how to effectively manage emotional states without food. Balfour (1996) has suggested that an overreliance on passive coping strategies can contribute to emotional eating in women (Balfour, 1996). It is difficult however to determine the true nature of overeating, as this information often relies on self-report measures, in which individuals are known to underreport caloric intake (Adriaanse et al., 2009).

Finally, five out of six participants experienced weight-loss between baseline and six-months post-treatment. Joanna and Fiona from the treatment group demonstrated the largest weight-loss of nine kilograms and twelve kilograms, respectively. The treatment group adopted a non-dieting approach and instead focused on promoting slow weight-loss that can be maintained over time, and these participants exhibited substantial weight-loss. The three participants in the active control group lost two kilograms, three kilograms, and five kilograms, respectively. Joanna and Fiona both had increased levels of self-efficacy for controlling overeating in response to negative affect, higher levels of

self-monitoring, and higher levels of body esteem weight. Given the high frequency of negative emotions experienced by the six participants, there may be merit in focusing on participants' self-efficacy in managing these emotions. Joanna and Fiona were both in the treatment group which had a focus on emotion regulation strategies. This is an outcome of the current study.

Limitations

The small sample size hinders the interpretation of results and the generalisability of the findings. In addition to the quantitative data that were collected, qualitative data were also collected (see Appendix T). To enhance learning and processing of skills taught and insights gained, it was initially considered that the program would be two days over two weekends, rather than two consecutive days. However, prospective participants indicated that this would be too difficult for childcare and social arrangements. Given the time constraints, and in an attempt to minimise attrition, it was considered to be more feasible to have participants commit to only one weekend.

Some participants commented that they enjoyed the two days and felt the time was spent well. Others commented that one day would have been sufficient. However, the facilitators of the treatment group commented that two days were not adequate time for the processing of the content. Given the complex nature of emotions and the reports detailing participant resistance to this content, perhaps more time would have been beneficial.

Two participants commented that one of the facilitators working with the treatment group was inexperienced. The therapists were provisional psychologists and had experience with group therapy and DBT. Reports from the participants and their dissatisfaction with one of the therapists highlights the complex needs with which some participants present and demonstrates the difficulties that can arise when working in a group format. It is possible that resistant participants elicit more negative therapist

styles and thus affect their treatment outcomes. Given the size of this study and the lack of available resources that other studies may have, provisional psychologists were the most appropriate facilitators to use. Nonetheless, these facilitators were only provisional psychologists and despite having experience with DBT, their inexperience is a limitation of this study.

Research has shown that therapeutic style affects treatment outcomes (Miller, Benefield, & Tonigan, 1993). Empathy is understood to be the primary therapeutic ingredient of the participant-therapist interaction (Miller et al., 1993; Poser, 1966). Studies investigating therapist characteristics reveal that more positive outcomes were associated with an empathetic therapist. Furthermore, empathy has shown to be a prominent factor for brief interventions that have had positive outcomes (Miller et al., 1993; Poser, 1966).

However, Christoph et al. (1991) conducted a meta-analysis to examine therapist effects in psychotherapy outcome studies. Their results revealed that when a treatment manual was used and when the therapists were experienced, there were only small differences between therapist effects. Given that Study 3 utilised a treatment manual but used inexperienced therapists, it is unknown how the therapists may have affected treatment outcomes.

As mentioned previously, self-report measures are subject to errors and bias. The results indicated that the reporting of height and weight were inaccurate; specifically, participants over-reported height and under-reported weight. It was assumed that if participants in the treatment group and active control group had weight and height measured at baseline then they may be more likely to accurately report at subsequent testing. However, participants were still unable to accurately report height at subsequent data points. This meant that the changes in BMI scores over time were not an accurate

representation of participant weight-loss. It is likely that participants lost less weight than they reported, thus affecting the reliability of the current results.

Additionally, the results may have been affected by participants being required to provide responses to the same measures every two months. This familiarity response bias may mean that individuals' responses are linked to their memory and previous response to the same question/s. Hence, repeated questionnaires are more likely to be subject to familiarity response bias.

Another factor, which may have affected the results of the current study, is the therapeutic relationships and group cohesion that developed over the course of the weekend. One of the active control group facilitators commented on the relationships that emerged between participants over the weekend. Although it is unknown how much these relationships affect the outcomes, it is possible that the active control group benefited just as much as the treatment group from supportive therapy.

Finally, external situational factors may have also affected participants' scores on each of the variables. For example, illness, death, and a change in medication can all impact on the success of treatment and weight-loss. These variables were not considered in the current project, and may be worthy of future research attention.

Future research recommendations

According to the National Health and Medical Research Council (2009) the current study would be considered as level IV evidence for the treatment of overweight and obesity with a two-day DBT-informed intervention. Future research interventions require larger sample sizes with longer data collections and longer follow-up periods. With a large enough sample size, future research could consider a shorter version of the full DBT program, which is normally run over a period of one year (see Linehan, 1993). The facilitators from the treatment group asserted that condensing DBT skills into two consecutive days did not provide enough time to process the information, particularly,

the emotion regulation skills. Future research designs may consider, for example, trialling a weekly DBT-informed skills group over a period of eight weeks, for example. This may provide sufficient time for participants to acquire new skills and practice these skills in-between sessions.

Additionally, it may be more helpful to interview participants about their experiences in the program and gain valuable information about their struggles with the intervention and what worked particularly well and what information or skills were not helpful. Whilst some of this information was gathered in the current study, a more in-depth exploration of participant's experiences may provide more useful information than quantitative measures.

Finally, future research could also explore whether some of the relationships are causal. For example, do obese people experience negative emotions as a result of being obese, or does the experience of negative emotions ultimately lead to obesity? This would impact on the design of an intervention and determine whether a variable would be a target of the intervention or an outcome of the weight-loss.

Conclusions

Results from this pilot intervention have provided information about the applicability of an intense weekend workshop for future obesity intervention programs. In particular, there were four main findings from this study. First, the trend in scores suggested a link between body esteem and weight-loss. As participants lost weight over time, their satisfaction with body weight and appearance also increased. Second, five out of six participants demonstrated increased self-monitoring, suggesting that self-monitoring of weight and health-related behaviours is linked to weight-loss. Third, a two-day workshop is insufficient time to adequately address the negative emotions that individuals are reportedly experiencing. Finally, five out of six participants demonstrated weight-loss between baseline and six-months post-treatment. Notably,

two participants from the treatment group reported substantial weight-loss of nine kilograms and 12 kilograms, respectively. Participants in the active control group reported small weight-loss of two kilograms, three kilograms, and five kilograms, respectively. These results suggest that the treatment had some impact on weight-loss, although the relative efficacy of the individual components is unknown. Further research investigating the efficacy of a DBT-informed intervention with a larger sample size is recommended.

Chapter 5: General Discussion

Summary of results

The aim of this thesis was to investigate the pertinent factors that are associated with overweight and obesity and subsequently develop an obesity treatment program to improve the long-term outcomes of weight-loss. The first section of this chapter will provide a summary of the results obtained from each of the three studies separately. The second section will then present possible theoretical explanations for the results obtained in the three studies. Subsequent practical implications which arise from the findings of the current research will then be discussed in the third section. The fourth and fifth sections will then outline the primary limitations of this thesis and provide future research recommendations. Finally, an overall conclusion for this thesis will be presented.

Study 1 aimed to determine the critical factors that are associated with an unhealthy body weight in order to assist in the development of an improved treatment option for weight loss. Results revealed that unhealthy weight individuals were more likely to have lower levels of self-efficacy for weight related and health behaviours, greater difficulty in controlling overeating in response to negative affect and in different social contexts, and less self-monitoring of weight and related health behaviours. Study 2 aimed to determine the critical psychological factors that are associated with an unhealthy body weight in order to assist in the development of an improved treatment option for weight-loss. The results from this study indicated that body esteem is associated with overweight and obesity. In particular, compared to healthy weight participants, unhealthy weight participants were significantly less satisfied with their weight and appearance and were more likely to believe that other people considered them to be unattractive.

Accordingly, the results from Study 1 and Study 2 highlighted the need for psychological factors to be at the forefront of a treatment program. The aim of Study 3 was to investigate the effectiveness of a brief DBT-informed two-day workshop designed to target the factors that were identified in Study 1 and Study 2. Study 3 was comprised of a series of six case studies. This study yielded four main findings. First, the trend in scores highlighted a positive link between body esteem and weight-loss. As participants lost weight over time, their satisfaction with body weight and appearance also increased. Second, five out of six participants demonstrated an increase in self-monitoring, suggesting that self-monitoring of weight and health-related behaviours is relevant to weight-loss. Third, it seems that a two-day workshop is insufficient time to adequately address the negative emotions that individuals reported experiencing. Finally, five out of six participants demonstrated weight-loss between baseline and six-months post-treatment. Notably, two participants from the treatment group reported substantial weight-loss of nine kilograms and 12 kilograms, while participants in the active control group reported a small weight-loss of two kilograms, three kilograms, and five kilograms, respectively.

One research question was posited for Study 1: Are there differences between healthy and unhealthy weight participants with regard to biological, environmental, social, and psychological factors? Although research has shown that various biological, social, environmental, and psychological factors correlate with body weight, the results from Study 1 indicated that it is predominantly psychological factors that are associated with body weight. In particular, there were significant differences between unhealthy and healthy weight participants with regard to self-efficacy on the Eating Questionnaire (Ball & Crawford, 2006) and on both subscales of the Eating Self-Efficacy Scale (Glynn & Ruderman, 1986). Previous studies have shown that self-efficacy plays a key role in the maintenance of a healthy body weight (Glynn & Ruderman, 1986; Linde et

al., 2006; Luszczynska et al., 2005). Individuals with higher levels of self-efficacy have been shown to be more likely to expect positive outcomes from anticipated behaviours, and fewer negative outcomes, when compared to individuals with lower levels of self-efficacy (Luszczynska et al., 2005). The likelihood that an individual will adopt new health-promoting behaviours depends on the perceived belief in being able to perform the necessary behaviour/s. For this reason, individuals with higher levels of self-efficacy are more likely to adopt healthy behaviours, to maintain their new behavioural repertoire, and recover after setbacks (Luszczynska et al., 2005).

Moreover, compared to healthy weight participants, unhealthy ones were shown to be more likely to overeat in response to negative affect. This finding is consistent with previous research indicating that obese individuals are more likely than healthy weight individuals to react to negative emotions with food (Byrne et al., 2003; Chesler et al., 2009; Seamoore et al., 2006). Specifically, Study 1 indicated that compared to males, females were more likely to experience difficulty in controlling overeating in response to negative affect. One possible explanation for this gender difference is that women may be more likely to use food as a way of escaping negative emotions. In addition, women spend more time at home and if they are taking care of children they have greater access and exposure to food. Heatherton and Baumeister's (1991) Escape Model which helps explain the process and function of binge eating has been useful in understanding how food can mediate negative emotionality. Research has confirmed the applicability of this model and reveals that many individuals, particularly women, cope with negative affect by engaging in cognitive narrowing, which assists the individual in escaping from the negative emotionality (Blackburn et al., 2006). Cognitive narrowing is characterised by an individual focusing his or her attention on concrete aspects of the immediate environment, like food, by which the individual's ideals and implications of future actions are no longer readily accessible, thus no longer cognitively salient. In this

way, negative affect is alleviated because self-awareness has been reduced (Blackburn et al., 2006). Cognitive narrowing has been found to be predictive of binge eating, whereby higher levels of binge eating predicted lower levels of cognitive narrowing (Blackburn et al., 2006).

The results from Study 1 also indicated that self-monitoring was a factor that distinguished healthy from unhealthy weight individuals. Specifically, healthy weight individuals were more likely to self-monitor their weight and related health behaviours than were unhealthy weight individuals. It may be that healthy weight individuals place a greater importance on their weight and health and therefore monitor the associated behaviours. Also, healthy weight individuals may have higher levels of self-efficacy and believe that if they self-monitor their weight and health-related behaviours they will effectively achieve their health goals. Previous research has shown that self-monitoring strategies are an integral aspect of successful weight control (Boutelle et al., 1999; Kitsantas, 2000).

In addition, the results of Study 1 revealed that healthy weight participants experience a significantly greater presence of negative emotions than do unhealthy weight ones. Although previous research has not specifically investigated the frequency of negative emotions between healthy weight and unhealthy weight individuals, the literature has shown that unhealthy weight individuals are more likely to mediate negative emotions by eating (Byrne et al., 2003; Chesler, Harris, & Oestreicher, 2009; Seamoore, Buckroyd, & Stott, 2006). This finding is unexpected since healthy weight participants in the current study reported higher levels of self-efficacy for controlling overeating in response to negative affect. One reason for this finding may be that healthy weight participants have learnt how to employ more adaptive coping strategies to manage their experiences of negative emotions. For example, healthy weight individuals may be more likely to distract themselves from the negative emotion by

engaging in an activity like playing a computer game, exercising, or working.

Alternatively, it is possible that healthy weight individuals may use fewer defensive coping mechanisms and thus allow themselves to be more aware of their negative emotions. Nonetheless, appropriate management of these negative emotions may facilitate desirable change for unhealthy weight individuals.

These findings indicate that the psychological factors linked to body weight may need to be at the forefront of future weight-loss treatment programs. Given the Western emphasis on a thin body shape for females and a muscular body shape for males, it was considered important to investigate individuals' perceptions and acceptance of their own body weight, shape, and appearance. It was assumed that if the weight-loss interventions focused on the psychological aspects of body weight, weight-loss treatment programs may yield better long-term outcomes.

Accordingly, the aim of Study 2 was to investigate some of the psychological factors that contribute to an unhealthy body weight. One research question was posited: Are there differences between healthy and unhealthy weight participants with regard to self-esteem, body esteem, and sociocultural attitudes towards appearance?

The results from Study 2 revealed that, of those three factors, it was only body esteem that differentiated healthy from unhealthy weight individuals. Specifically, unhealthy compared to healthy weight participants had lower levels of body esteem weight and were found to be significantly less satisfied with their weight and appearance, and were more likely to believe that other people considered them to be unattractive. This research has highlighted that an individual's thoughts and feelings regarding body shape, weight, and appearance, which are components of body esteem, are important variables to be considered in the development of a weight-loss program. Given the sociocultural emphasis on a thin body for females and a muscular body for males, this result was not surprising as it is logical to expect that overweight and obese

individuals are going to be less satisfied with their body weight and appearance given their deviation from the cultural standard of attractiveness. Research has shown that body dissatisfaction is a risk factor for obese individuals as they experience negative psychological consequences related to their dissatisfaction with their body and appearance (Friedman et al., 2002).

Study 1 and Study 2 demonstrated that unhealthy weight participants had lower self-efficacy for weight and health-related behaviours, lower self-efficacy for controlling overeating in response to negative affect and in socially acceptable circumstances, and lower body esteem. These results indicated that treatment programs need to focus primarily on the psychological mechanisms involved in the maintenance of excessive body weight, rather than on the behavioural aspects of weight control.

Recent research has shown that brief interventions have been effective for improved psychological functioning and weight-loss. Lillis et al. (2009) investigated the efficacy of a one-day workshop based on acceptance and commitment therapy which utilised mindfulness-based strategies to target the psychological variables of stigma and distress, rather than weight control. Results indicated that three-months after a one-day workshop of six hours, individuals in the treatment group had larger reductions in weight-control stigma, higher adaptive psychological functioning, a higher perceived quality of life, and had lost more weight.

Since self-efficacy and negative affect states were more strongly associated with unhealthy weight participants than healthy weight participants, it was apparent that dialectical behaviour therapy which centres on emotional regulation may be useful for the treatment of overweight and obesity. Three out of the four original DBT modules (core mindfulness skills, emotion regulation, and distress tolerance) were used by the treatment group in Study 3 to determine whether they may help increase an individual's level of self-efficacy, self-monitoring behaviours, and body esteem, while decreasing

the frequency of negative emotions. DBT has been shown to be an efficacious treatment option for anorexia nervosa and bulimia nervosa (Chen et al., 2008; Robins & Chapman, 2004), but has not previously been trialled with a cohort of overweight and obese participants. As such Study 3 was a novel approach to current weight treatments and would inform future research investigations.

The results for Study 3 were mixed. With regard to self-efficacy scores, the treatment group demonstrated a more positive trend in scores over time. For example, one participant from the treatment group experienced a gradual increase in self-efficacy over time, with a slight decline at six-months; she lost nine kilograms over six months. In addition, this participant indicated that she had less difficulty controlling overeating in response to negative affect and in socially acceptable circumstances from baseline to six-months. For the active control group, all three participants fluctuated, but over time they experienced a decline in self-efficacy.

Similarly, self-efficacy scores for controlling overeating in response to negative affect and in socially acceptable circumstances varied, however the treatment group again displayed promising trends for change in scores over time. Two participants from the treatment group indicated that they had less difficulty controlling overeating in response to negative affect and in socially acceptable circumstances from baseline to six-months. This was a promising finding given the literature documenting the prevalence of binge eating in response to negative affect (see Byrne et al., 2003; Chesler et al., 2009; or Seamoore et al., 2006). One participant in the treatment group exhibited an increase in difficulty for controlling overeating in response to negative affect, but a decrease in difficulty for controlling overeating in socially acceptable circumstances.

For the active control group, one participant experienced less difficulty for controlling overeating in response to negative affect but did not experience a change in self-efficacy for controlling overeating in socially acceptable circumstances. A second

participant experienced a decrease in difficulty for controlling overeating both in response to negative affect and in socially acceptable circumstances, while another exhibited an increase in difficulty for controlling overeating in response to negative affect, but a decrease in difficulty for controlling overeating in socially acceptable circumstances. These results do not indicate a clear trend for a change in scores between groups.

When changes on the scale measuring self-monitoring of weight and related health behaviours was considered, five out of six participants exhibited an increase in self-monitoring between baseline and six-months. Only one participant from the active control group exhibited a gradual decrease in self-monitoring behaviour over time.

There were no clear differences between individuals in the treatment group and individuals in the active control group for the body esteem measure between baseline and six-months. One participant from the treatment group experienced a decrease in satisfaction with body weight and appearance, while another experienced an increase in body weight satisfaction, but not in appearance. A third participant from the treatment group exhibited an increase in satisfaction with both body weight and appearance; this participant also exhibited the largest weight-loss over time (12 kilograms).

For the active control group, two participants experienced increased satisfaction with both body weight and appearance as well as losing two kilograms and five kilograms, respectively. A third participant had a decline in satisfaction with both body weight and appearance, while losing three kilograms over the six-month period. While these results do not indicate a convincing trend for change over time, they suggest that body esteem may be related to weight-loss.

Results indicated that the frequency of negative emotions for all participants did not decrease over time. One participant experienced no change in her reportedly high frequency of negative emotions; three participants had an increase in negative emotions

over time and two participants a decrease. Interestingly, it was part of the program in the treatment group to spend substantial time examining strategies to promote emotion regulation. Of note was the facilitators' feedback on the resistance from the treatment group participants to the emotion regulation content. For participants in the treatment group, this resistance may have resulted in little change for managing negative emotions (see Appendix T for the qualitative data). Given the different content presented to the treatment group and the active control group, a comparison between groups is unable to be made. Thus it is impossible to determine whether the participants in the active control group would have also exhibited similar resistance to the emotional content.

Finally, five out of six participants experienced weight-loss between baseline and six-months post-treatment. Participants in the treatment group demonstrated the largest weight-loss. A non-dieting approach was emphasised in the treatment group in an attempt to promote and achieve slow weight-loss that can be maintained over time. Accordingly, the treatment program focused on self-efficacy, the management of negative emotions, body esteem, and self-monitoring, and only used weight-loss as a consequential and indirect measure. Evidently, the treatment group lost the largest amount of weight overall. These participants exhibited substantial weight-loss, while the three participants in the active control group lost two kilograms, three kilograms, and five kilograms, respectively. This may suggest that the treatment offered was effectively tapping in to some of the psychological factors associated with body weight. All three participants exhibited a decrease between baseline and six-month follow-up for difficulty in controlling overeating in socially acceptable circumstances. Furthermore, two out of three participants reported less difficulty in controlling overeating in response to negative affect between baseline and six-months. A decrease in emotional eating may have assisted in the weight-loss.

Rather than focusing on behavioural aspects of weight control, the aim of the treatment group was to focus on increasing individuals' self-efficacy, management of negative emotions, and body esteem. The only behavioural technique taught was self-monitoring and this was through mindfulness, rather than the typical method of individuals keeping food and weight diaries. Contrary to other weight-loss programs, changes in the aforementioned variables were considered to be the primary target outcomes, while weight-loss was regarded only as an indirect effect.

Theoretical interpretation of results

The three studies outlined in this thesis cumulatively add to the conceptual understanding of overweight and obesity. Since research has failed to examine simultaneously the impact of psychological factors and the broader social and environmental factors (Ball & Crawford, 2006), Study 1 and Study 2 took an exploratory approach, drawing upon a range of psychological and social ecological theories. In particular, genetic, environmental, social, psychological and behavioural factors formed the basis of the theoretical framework for Study 1 and Study 2.

Although previous research has shown that obesity and excessive weight gain are compounded by a range of factors, the results of Study 1 and Study 2 indicated that it is predominantly psychological factors that are associated with body weight. In particular, compared to healthy weight individuals, unhealthy weight participants were more affected by lower levels of self-efficacy for weight and health-related behaviours, lower levels of self-efficacy for controlling overeating in response to negative affect and in socially acceptable circumstances, less self-monitoring of weight and health-related behaviours, and lower levels of body esteem.

The results of Study 1 and Study 2 have provided a set of factors that appear to be associated with excessive body weight. Although the data included in this thesis are correlational in nature, causal relationships between variables are likely.

Notwithstanding this caveat, despite investigating a range of biological, social, environmental, and psychological factors, it was clear that the psychological factors were the most pertinent influences associated with overweight and obesity. Compared to healthy weight participants, unhealthy weight participants displayed lower levels of self-efficacy for weight and health-related behaviour, lower levels of self-efficacy for controlling overeating in response to negative affect and in socially acceptable circumstances, and decreased body.

The discovery of these specific factors suggests that there is a relationship between psychological factors and the development and maintenance of excessive body weight. Although the literature has investigated some of these relationships (but not all), the results of Study 1 and Study 2 may indicate that there is a reinforcing cycle operating between self-efficacy and negative emotions (see Figure 14 below).

Previous research has indicated that healthy weight individuals who are successful in controlling their weight are more likely to have an autonomous and self-motivated cognitive style (Ball & Crawford, 2006). Study 1 showed that unhealthy weight participants have significantly lower levels of self-efficacy and body esteem, while also having a greater frequency of negative emotions. If individuals have low levels of self-efficacy, thus less belief that they have control over their weight and health-related habits and less belief that their behaviours will actually lead to positive outcomes, then ostensibly this could increase the frequency of negative emotions for those individuals. Increasing the frequency of negative emotions may then also increase the likelihood of emotional eating, which in turn could lead to weight gain and decrease body esteem. Weight gain and lowered body esteem could then consequently reinforce individuals' beliefs that it is out of their control to change the situation and avoid the weight gain. These assertions are only hypotheses at present, but they warrant future investigation in a controlled setting with large sample sizes.

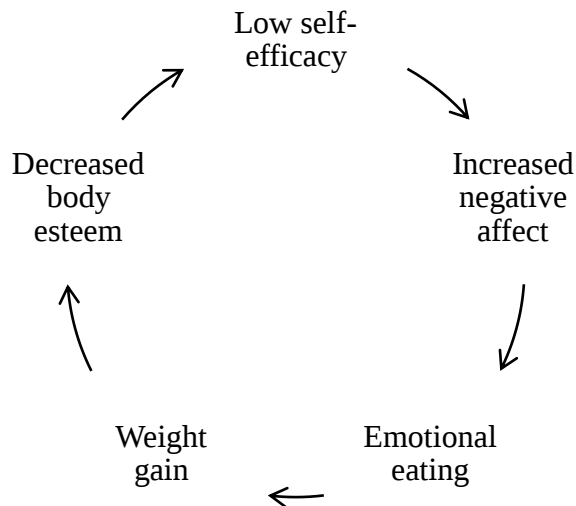


Figure 14. Flowchart demonstrating the possible cyclical and reinforcing nature of low self-efficacy, negative emotions, and body esteem.

The finding that self-efficacy was the strongest factor to be associated with body weight is consistent with, and extends, previous research, which has shown that self-efficacy is strongly related to diet and physical activity and is predictive of positive health outcomes (Ball & Crawford, 2006; Luszczynska et al., 2005). It was expected that the findings of Study 1 and Study 2 would guide the theoretical framework for Study 3. Since the main findings of Study 1 and Study 2 were that self-efficacy for diet and health-related behaviours and for controlling overeating in response to negative affect and in different social contexts was the strongest factor associated with unhealthy weight participants, social cognitive theory (Bandura, 1977) was the theoretical paradigm which served as the basis for the design of Study 3.

Social cognitive theory provides a conceptual framework for understanding human behaviour. At the core of this theory is the role of self-efficacy, which is the belief that an individual has in the ability to exert control over the events of his or her life to produce desirable results. Individuals with higher levels of self-efficacy are more likely to pursue challenges, set higher goals, anticipate positive outcomes from their

behaviour, and have shown to be better able to cope with negative affect, pain, and stress (Luszczynska et al., 2005).

According to social cognitive theory (Bandura, 1977), if individuals do not feel that they are able to produce desired change (i.e. losing weight, eating healthily, exercising) and prevent undesired effects (i.e. weight gain), then they will not have the motivation to change their behaviour/s (Bandura, 1977). Self-efficacy influences whether people think in self-enhancing or self-debilitating ways. Bandura (1977) asserts that if psychotherapy targets individuals' self-efficacy, behavioural change will result.

Consistent with this theory, the results of Study 3 provide evidence for the applicability of using DBT strategies to increase individuals' self-efficacy. Since Study 3 utilised a case study approach, the following suggestions as to the implications for the results are only tentative. Nonetheless, individuals in the treatment group demonstrated a more promising trend in scores for self-efficacy over time. More participants are needed to draw firm conclusions from the data, however, the three participants in the treatment group demonstrated the most positive changes across the measures. It is possible that after the weekend DBT-informed workshop, participants were feeling more hopeful and positive about being able to make the desired changes in their lives to achieve weight-loss.

Accordingly, the greater an individual's level of self-efficacy the more positive he or she will feel, and the greater likelihood of positive health and weight-related behavioural change. Study 1 indicated that healthy weight participants have higher levels of self-efficacy for weight and health-related behaviours and have higher levels of self-efficacy for controlling overeating in response to negative affect and in socially acceptable circumstances. It is possible that individuals of a healthy weight are more likely to believe that they are able to maintain their body weight and thus are more likely to anticipate positive outcomes from their health-related behaviours. Conversely,

unhealthy weight participants may be less likely to believe that they have the inner resources to cope with negative affect and thus exhibit lower levels of self-efficacy for controlling overeating when experiencing negative emotions. In line with the association between self-efficacy, negative emotions, and body esteem, as represented in Figure 14, if weight-loss interventions target self-efficacy there may be a decreased frequency in negative emotions and thus less chance of excessive weight gain.

When considering the finding that all participants, except one, exhibited an increase in self-monitoring scores between baseline and six-months, the role of self-efficacy may explain these results. Self-monitoring is a behavioural strategy that is easy to implement and is not psychologically taxing. Participants may have felt a sense of control over the situation and a belief that they are indeed competent in executing this particular behaviour. Luszczynska et al. (2005) assert that this feeling of competency is an important determinant in predicting whether or not an individual will engage in a new behaviour. Accordingly, the notion that individuals can self-monitor their weight and health-related behaviours is more likely to generate positive affective states and, as a consequence, individuals are more likely to feel competent and capable of mastering the situation.

Moreover, the finding that body esteem is largely associated with body weight is consistent with previous research (see Baumeister et al., 2003; Friedman & Brownell, 1995; Hill & Williams, 1998). The fact that individuals' body weight satisfaction increased when body weight decreased is to be expected. If participants are unhappy with their current weight, which was the main reason for their attending the two-day workshop, when they are able to accomplish a set of behavioural changes that lead to weight-loss it is likely that they will have greater levels of body weight satisfaction. This, in turn, may lead to higher levels of self-efficacy, which this study has shown may be a primary factor associated with overweight and obesity.

Study 3 revealed that participants experienced a high frequency of negative emotions at most data points. This has implications given the finding in the current study that unhealthy weight participants have lower levels of self-efficacy for controlling overeating in response to negative affect. Numerous researchers have shown that there is a link between obesity and emotional eating (Balfour, 1996; Byrne et al., 2003; Friedman et al., 2002; Seamoore et al., 2006). Seamoore et al. (2006) found that approximately 40% of individuals who self-reported that they have “serious binge eating behaviours” had a BMI between 31 and 42. Research by Byrne et al. (2003) revealed that when compared with individuals who had maintained their weight loss or were of a healthy weight, individuals who had lost weight and then regained the weight they had lost were more likely to report using food as a way to self-regulate mood or to cope with distressing thoughts and moods. This suggests that compared with healthy weight individuals, unhealthy weight individuals are more likely to feel unable to cope with stressors or particular situations and, therefore, mediate that stress with emotional eating.

Binge eating is understood to occur in 30% of obese individuals seeking weight-loss treatment (Friedman et al., 2002). The facilitators of the treatment group commented on the difficulty that participants had with the emotional regulation component of the DBT-informed workshop. It seems that negative affective states may have been experienced by these participants as too overwhelming, and that they were unable to process them within the treatment group. As a result, the ability to consolidate their learning and incorporate the skills taught was probably minimal, which may explain why there was little difference for change in negative emotions between the two groups over time.

Considered together, the results for Study 1, Study 2, and Study 3 indicate that self-efficacy may be a pertinent factor associated with overweight and obesity. Study 1 and

Study 2 were useful in identifying some of the psychological factors (self-efficacy, negative emotions, body esteem) that are related to the maintenance of excessive body weight. It is possible that these factors are associated with one another, such that change on one factor is likely affect another factor. The results of these studies may suggest a self-perpetuating cycle with three psychological factors (self-efficacy, negative emotions, and body esteem) that are involved in the maintenance of overweight and obesity. These factors may play a role in the ability to achieve weight-loss.

Accordingly, the aim of Study 3 was to examine whether including these factors in a treatment program would be associated with positive behavioural change and subsequent weight-loss and maintenance of the weight-loss. Although no firm conclusions can be made, this pilot study provides preliminary evidence. It suggests a model that would require testing for causal relationships between the factors. If there are causal relationships, then a treatment program should be successful in identifying set factors and anticipating change in other factors. For example increasing self-efficacy could lead to fewer negative emotions which would subsequently decrease the frequency of emotional eating that is widely report in the overweight and obese population.

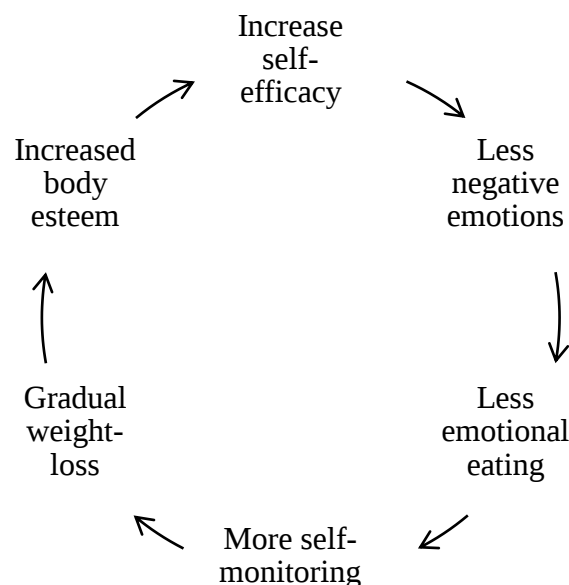


Figure 15. Flowchart demonstrating the anticipate outcomes of using a DBT-informed intervention for the treatment of overweight and obesity.

The cumulative results in this thesis provide support for operating within a social cognitive framework (Bandura, 1977) which views self-efficacy as the most central and pervasive mechanism of human agency. Unhealthy weight participants were shown to have lower levels of self-efficacy for preventing weight gain, engaging in physical activity, eating healthily, controlling overeating in response to negative affect, and controlling overeating in socially acceptable circumstances.

Practical interpretation of results

The aim of the current research was to determine the factors associated with overweight and obesity, and subsequently trial a pilot intervention program to address these factors. It was expected that the results of this research would assist in improving the long-term outcomes of weight reduction and weight-loss maintenance. The main result from the three studies is the role that self-efficacy plays with overweight and obesity. As shown in Figures 14 and 15, self-efficacy, negative emotions, self-monitoring, and body esteem are the four core factors associated with an unhealthy weight.

Accordingly, the practical implications of this finding would suggest that a focus on self-efficacy should be fundamental to treatments, irrespective of the treatment approach. The effectiveness of current treatments has been undermined by the lack of weight-loss maintenance, with weight reduction generally not extending beyond the treatment time (Ash et al., 2006; Gillison et al., 2009). It could be useful for participants to first undergo a calorie reduction treatment approach for the initial phase of weight-loss and then transfer to a psychotherapy group focusing on the factors identified in this research and depicted in Figure 15.

One implication arising from the series of studies reported in this thesis is that the aim of any psychotherapy program for treating overweight and obesity should focus on enhancing individuals' level of self-efficacy. Bandura's (1988, 2002) research

delineates three ways to enhance self-efficacy. First, experience is a fundamental component of self-efficacy. If individuals engage in behaviours and perceive those behaviours to produce positive effects then they are more likely to persist. In practical terms, it may be useful for individuals to set small achievable goals that they can readily master. In this way they can build up their sense of self-efficacy in order to pursue greater challenges and goals.

Second, modelling behaviour is a factor in an individual's adopting behavioural change (Gierszewski, 1983; Wing & Jeffery, 1999). When an individual witnesses someone else implementing behavioural change and gaining subsequent positive results, the witnessing by the observer can increase his or her own self-efficacy in doing the same thing. Conversely, if individuals witness people failing, it is likely that their own sense of self-efficacy will decrease. For this reason, group therapy can be particularly important to observe the modelling of new behaviours and to witness others that are facing the same difficulties but are able to achieve change.

Third, social influences can also play a role in increasing self-efficacy. Previous research has shown that insufficient perceived social support and social isolation are associated with an increased risk of obesity, morbidity, and mortality (Cadzow & Servoss, 2009). Individuals with a low level of social support report feeling alienated, cynical, have poorer coping resources, perceive social networks as less reliable and supportive, are more reluctant to discuss any problems with others, and have reported more distress than individuals with higher levels of social support (Coyne & DeLongis, 1986; House et al., 1988). Individuals who have positive support networks and receive encouragement for their health and weight-related activities are more likely to have higher levels of self-efficacy and thus are more likely to adopt a healthier lifestyle, which can yield better health outcomes. Conversely, research has also shown that unsupportive and discouraging social networks decrease an individual's self-efficacy

(Ball & Crawford, 2006). Research by Ball and Crawford (2006) found that the critical factor associated with weight gain was friends' sabotage of physical activity. Thus, social support networks play a role in either encouraging or thwarting healthy behaviours.

It may also be useful for clinicians to consider using a self-efficacy scale, such as the Eating Self-Efficacy Scale (Glynn & Ruderman, 1986), as a baseline measure before the treatment begins. This would allow assessment of self-efficacy throughout the treatment program and allow obtaining feedback about change in self-efficacy levels over time. If self-efficacy levels are increasing, then it is possible that some of the other maintaining factors, including negative emotions, self-monitoring, and body esteem, are also improving. There is scope for future research to further explore the use of DBT strategies in working with overweight and obese individuals. Targeting individuals' self-efficacy may provide a foundation for greater change.

Limitations

Several limitations are inherent in research of this kind. Study 1 exclusively relied on an internet-based data collection using a battery of questionnaires. As outlined in Chapter 3, the advantages of this sampling method include an efficient and cost-effective recruitment strategy that can attract large sample sizes in a short period of time, and internet questionnaire responses that give participants the privacy to respond more freely and honestly (Rhodes et al., 2002).

However, online data collections can also compromise the generalisability of the sample in that participants are self-selecting in a study for a particular reason (Rhodes et al., 2002). This can affect the results by participants being motivated to participate in a study for an unknown reason. For example, if participants were expecting a two-day workshop focusing on the psychological nature of obesity and instead were presented with psychoeducation about nutrition and exercise, then the potential disappointment

may have reduced their motivation to make the necessary lifestyle changes and achieve weight-loss.

The inaccuracy of using self-report data has been widely documented and has typically focused on both individuals' failure to accurately recall information and on the social desirability effects (Crockett et al., 1987). Despite the limitations inherent in self-report measures, it remains the most widely used method for research and allows for large sample sizes and enhanced statistical power. It also allows for the pooling of a more representative and generalisable sample. Study 1 and Study 2 employed a self-report methodology, while Study 3 also used self-report along with qualitative data from both the group facilitators and the participants (see Appendix T). Although the researcher acknowledges the bias that may be present in these observations, they provide information regarding the facilitation of these workshops and both the positive effects and some of the difficulties encountered.

Moreover, self-report BMIs are unreliable, as individuals over-report height and under-report weight (Swinburn et al., 2007). Since BMI is the most widely reported estimate of body weight, and to ensure the results of this project were comparable to previous and future research, the studies included in this thesis calculated BMI based on the criteria set by the World Health Organisation. For Study 3, all participants had their height and weight measured by an assessor who was blinded to the treatment conditions. Only participants with a BMI score of more than 24.9 kg/m^2 were considered eligible to participate. Although it would have been ideal to accurately measure participants' weight at two-, four-, and six-months post-treatment, given the difficulty with attrition it was not considered a viable option.

There were also no measures to ascertain treatment fidelity for participants in either the DBT or active control group. It is possible that participants in the treatment group may have learnt new skills in mindfulness and emotion regulation during the workshop

but not applied these skills after the workshop. Conversely, participants in the active control group may have learnt new skills or experimented with a different treatment program during the six months that they were followed up for the current study. These factors would certainly confound the results. It would be useful to know how committed the DBT participants were to applying their new skills in their everyday life.

Finally, research has shown that therapeutic style affects treatment outcomes (Miller, Benefield, & Tonigan, 1993). Previous investigations have shown that more positive outcomes are associated with an empathetic therapist. Miller et al. (1993) assert that empathy has shown to be a prominent factor for brief interventions that have had positive outcomes. In addition, the level of experience of the facilitators may have had an adverse impact on participants. Christoph et al. (1991) have shown that when studies have used a treatment manual and when the therapists were experienced, there were only small differences between therapist effects. Since Study 3 utilised a treatment manual but used inexperienced therapists, it is unknown how the therapists may have affected treatment outcomes.

Future research recommendations

The collective findings of the three studies included in this thesis have implications for future research directions. The finding that predominantly psychological factors are associated with overweight and obesity highlights the need for intervention programs to focus on these factors. Since self-efficacy was shown to be a consistent factor associated with overweight and obesity, social cognitive theory is an appropriate theoretical paradigm upon which to base future research. This finding also suggests that self-efficacy may be an essential component of treatment programs for overweight and obesity.

Moreover, the case studies from Study 3 suggest that a DBT-informed treatment approach requires further research to investigate whether it is an effective treatment

choice. It would be worthwhile for future research to assess the efficacy of a DBT-informed treatment approach with a larger sample of participants and over a longer time period. In line with the guidelines provided by National Health and Medical Research Council (2009), Study 3 is considered to provide level IV evidence to the body of obesity research. Level IV evidence provides valuable information about the applicability of a research design with a population group. Based on these results, future investigations are then able to utilise larger cohorts and have access to greater resources to provide Level II evidence by running a randomised control trial.

Future research may demonstrate that DBT-informed treatment is useful in helping individuals maintain weight-loss, but not helpful in producing any initial weight-loss. If this is the case, then a stepwise approach could be beneficial, such that participants attend to a diet and exercise focused programme to lose weight and then participate in a treatment programme targeting the psychological factors that will assist in weight maintenance and prevention of relapse. The diet industry has a large market with slimming materials that have been shown to achieve considerable weight-loss in the short-term (Yanovski et al., 1999). However, factors that affect the ability to achieve permanent weight-loss has eluded researchers. A pharmacological or strict calorie reduction treatment approach may be useful for the initial phase of weight-loss, followed by a psychotherapy component to assist the individual in maintaining the weight-loss and preventing relapse. Adopting both of these modalities in future research is recommended. If the results of a controlled trial were to yield promising results for the treatment of obesity with a DBT-informed intervention, subsequent research could focus on identifying the mediators and/or moderators of outcomes to determine which individuals respond best to which treatment.

Future researchers may also consider assessing for treatment fidelity in the follow-up phases of a program. It would be helpful to know how many participants were

actively applying new skill sets to their health and weight-related activities and how skill acquisition impacts the results. Investigating the link between treatment fidelity and weight-loss may reveal significant findings not only about the strength of a treatment program overall, but also about specific aspects of a program that impact on weight-loss.

The data presented in this thesis are correlational in nature, hence the direction of the relationships between the variables are yet to be determined. To extend and advance these findings it would be useful to explore whether any of these factors act as moderating variables (i.e. does the thin ideal moderate self-esteem in overweight and obese individuals?), or whether any of these relationships are causal (i.e. is body image a cause or an outcome of overweight and obesity?), which would provide further evidence for their inclusion in an obesity treatment program. Furthermore, testing the relationship between various components of the model may be more effective in targeting specific factors to interrupt the reinforcing nature of the cycles presented in Figures 14 and 15. For example, if an intervention targeted self-efficacy and effectively modified this factor by increasing self-efficacy scores over time, then do individuals experience less negative emotions and make less use of emotional eating as a coping mechanism? Investigating the causal relationships between these factors may assist in future weight-loss interventions.

Although the sample size in Study 3 was too small to draw any firm conclusions, it would be interesting to follow all of the participants over another six to twelve months to track whether their weight-loss was maintained over a longer period of time. Future investigations may consider a longer follow-up time to determine whether the weight-loss was sustained.

Finally, future research may benefit from considering the effect that extraneous variables have on body weight. Previous studies have shown that depression and anxiety

are associated with overweight and obesity (Cadzow & Servoss, 2009; Dove et al., 2009; Friedman et al., 2002). Mental illness may influence the effectiveness of a treatment program and may add an additional barrier to weight-loss success. Although the current study did not have the scope to investigate the effects of mental illness on body weight, it warrants further exploration.

Conclusions

The results of Study 1 and Study 2 suggest that the pertinent factors differentiating healthy weight individuals from unhealthy weight individuals are self-efficacy for weight and health-related behaviours, self-efficacy for controlling overeating in response to negative emotions and in socially acceptable circumstances, self-monitoring of weight and health-related behaviours, and body esteem. Given the lack of efficacious treatment options for obesity, these factors were considered in the development of a weight-loss intervention. Since current obesity treatments employ a cognitive-behavioural or behavioural approach, it was considered appropriate to trial an intervention based on dialectical behaviour therapy (Linehan, 1993). Research indicates that DBT has been effective in the treatment of anorexia nervosa and bulimia nervosa (Chen et al., 2008; Robins & Chapman, 2004), however, it has not been applied to the treatment of obesity.

There are three main conclusions from the current study. First, the results of this thesis indicate that social cognitive theory is a useful paradigm from which overweight and obesity can be explained. A major shortcoming of the obesity literature is a lack of theoretical coalescence. The current research has attempted to redress this research disparity and offers support for the inclusion of future research to operate from a social cognitive framework. Second, Study 1 and Study 2 have demonstrated that compared to biological, social, and environmental factors, psychological factors are most strongly associated with overweight and obesity. In particular, compared with healthy weight

participants, unhealthy weight participants had lower levels of self-efficacy for weight and health-related behaviours, self-efficacy for controlling overeating in response to negative emotions and in socially acceptable circumstances, and body esteem. Third, Study 3 provides evidence from a pilot treatment program which suggests future investigations trial a DBT-informed intervention with a larger sample and investigate the optimal time length for participants to make the most gains over the shortest period. For example, it might be beneficial to trial the effectiveness of this intervention run one day a week over a period of six weeks. While it is expected that obesity treatments will continue to improve, a focus on prevention and early intervention is recommended to halt the current global obesity epidemic.

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Appendix A: Demographic Questionnaire for Study 1

DEMOGRAPHIC QUESTIONNAIRE

Gender Male Female

Age _____

Education Level High School or less Post high school (i.e. tafe, university etc)

Geographical Residence Urban Rural/Remote

Marital Status Single Partnered

Height (in cm) _____

Weight (in kg) _____

Have you previously dieted to lose weight? Yes No

If so, were you successful? Yes No

If yes, how much weight did you lose (in kg)? _____

For how long have you maintained this lower weight for? _____

Do you have any medical conditions? Yes No

If yes, please list. _____

In general, I would say my physical health is? Poor Fair Good Excellent

How would describe yourself physically?

Appendix B: Eating Questionnaire (EQ; Ball & Crawford, 2006).

The Eating Questionnaire (EQ; Ball & Crawford, 2006)

1 Please answer the following:

(Circle one on each line)

		Yes	No
a	Do you find it hard to keep your weight at its current level?	1	2
b	Are you the kind of person who NEVER puts on weight no matter what you do?	1	2
c	Is your biological mother CURRENTLY overweight or obese?	1	2
d	Has your biological mother EVER been overweight or obese?	1	2
e	Is your biological father CURRENTLY overweight or obese?	1	2
f	Has your biological father EVER been overweight or obese?	1	2
g	Is your partner/spouse CURRENTLY overweight or obese?	1	2
h	Has your partner/spouse EVER been overweight or obese?	1	2

2 How confident are you that you could do the following?

(Circle one on each line)

		Not at all confident	Not very confident	Quite confident	Very confident
a	Avoid putting on any extra weight over the next year?	1	2	3	4
b	Avoid putting on any extra weight over the next five years?	1	2	3	4
c	Exercise for 30 minutes most days of the week, for the next year?	1	2	3	4
d	Play organized sport regularly for the next year?	1	2	3	4
e	Go to the gym regularly for the next year?	1	2	3	4
f	Go for a walk for exercise regularly for the next year?	1	2	3	4
g	Shop regularly for healthy nutritious foods over the next year?	1	2	3	4
h	Prepare/cook healthy nutritious meals regularly over the next year?	1	2	3	4
i	Stick to eating healthy nutritious food over the next year?	1	2	3	4

Your weight and health over the past two years

We are interested in what has happened to your weight, eating and physical activity behaviours and health over the PAST TWO YEARS. We know that sometimes your behaviours and health might have changed over this time, and so these questions may be difficult to answer, but we'd like to know about how what has happened ON AVERAGE over the past two years.

For example, if you weighed yourself ONCE A WEEK last year, but NOT AT ALL the year before, you would answer that ON AVERAGE over the past two years you weighed yourself once or twice a month.

3 Over the past TWO YEARS, on average, how often have you done the following?

(Circle one on each line)

	Not at all	Less than once a month	Once or twice a month	Once or twice a week	Most days	Every day
a Weighed yourself?	1	2	3	4	5	6
b Monitored your physical activity? (eg counted how many times you exercised, so you knew if you were doing enough)	1	2	3	4	5	6
c Monitored the time you spent sitting (eg counted how much time you spent sitting watching television or working, so you knew if you were doing too much)	1	2	3	4	5	6
d Monitored your eating patterns? (eg kept track of how healthy your meals were so you knew if you were eating healthily enough)	1	2	3	4	5	6

4 Over the past TWO YEARS, how much attention have you paid to the following?

(Circle one on each line)

		Very much	Much	A little	None
a	Your personal health habits	1	2	3	4
b	Getting enough physical activity	1	2	3	4
c	Eating a healthy nutritious diet	1	2	3	4
d	Controlling your weight	1	2	3	4

Your beliefs about weight gain

5

		Agree	Disagree
a	Doing physical activity alone will prevent me from gaining weight	1	2
b	Eating a healthy diet alone will prevent me from gaining weight	1	2
c	I must do physical activity AND eat a healthy diet to prevent weight gain	1	2
d	Only vigorous activity will prevent me gaining weight	1	2
e	I must cut out fat in my diet to prevent weight gain	1	2
f	Walking for 30 minutes a day would prevent me from gaining weight	1	2
g	Each of us is directly responsible for our weight	1	2
h	Controlling my weight is simply a matter of wanting to do it and applying myself	1	2
i	Unsuccessful weight control is due to a lack of effort	1	2
j	My weight, to a large extent, is controlled by fate	1	2
k	Most people are at their present weight because that is the weight level that is natural for them	1	2
l	In order to prevent weight gain people must get a lot of encouragement from others	1	2
m	Most people can only successfully control their weight when other people push them to do it	1	2
n	It is normal for adults to continue to gain weight with age	1	2

Your family and friends

6 During the past TWO YEARS, how often have your family or friends:

i		How often have your FAMILY (eg partner, children, parents) said or done this?				i		How often have your FRIENDS said or done this?			
		(Circle one <u>on each line</u>)						(Circle one <u>on each line</u>)			
		Never/No t applic- able	Rarel y	Some - times	Ofte n			Never/No t applic- able	Rarel y	Some - times	Ofte n
a	Complimente d me on my eating habits	1	2	3	4			1	2	3	4
b	Ate healthy or low-fat foods with me	1	2	3	4			1	2	3	4
c	Encouraged me not to eat unhealthy or high fat foods when I'm tempted to do so	1	2	3	4			1	2	3	4
d	Refused to eat healthy or low-fat foods with me	1	2	3	4			1	2	3	4
e	Reminded me not to eat unhealthy or high fat foods	1	2	3	4			1	2	3	4
f	Offered me high fat or unhealthy foods	1	2	3	4			1	2	3	4
g	Ate high fat or unhealthy foods in front of me	1	2	3	4			1	2	3	4

h	Reminded me to eat healthy or low-fat foods	1	2	3	4	1	2	3	4
i	Offered to eat healthy foods with me	1	2	3	4	1	2	3	4
j	Complimented me on my physical activity habits	1	2	3	4	1	2	3	4
k	Participated in physical activity with me	1	2	3	4	1	2	3	4
l	Encouraged me to be more physically active	1	2	3	4	1	2	3	4
m	Refused to participate in physical activity with me	1	2	3	4	1	2	3	4
n	Reminded me not to be too inactive	1	2	3	4	1	2	3	4
o	Suggested we do things that are physically inactive	1	2	3	4	1	2	3	4
p	Spent time being inactive around me	1	2	3	4	1	2	3	4
q	Reminded me to be physically active	1	2	3	4	1	2	3	4
r	Offered to participate in physical activity with me	1	2	3	4	1	2	3	4

Your environment

- 7 Over the PAST TWO YEARS, thinking about your DAILY ROUTINE and WHERE YOU HAVE SPENT YOUR TIME, how easy or difficult has it been for you to do the following? (For instance, you might consider how convenient these are to your home, work/place of study, or other places you have spent your time)**
(Circle one on each line)

	How easy or difficult has it been to:	Very easy	Somewhat easy	Somewhat difficult	Very difficult
a	Buy good quality fresh fruit and vegetables	1	2	3	4
b	Buy fruit and vegetables at a good price (ie inexpensive)	1	2	3	4
c	Buy other good quality food groceries	1	2	3	4
d	Buy other food groceries at a good price	1	2	3	4
e	Buy low-fat grocery products (eg low-fat milk, lean meat)	1	2	3	4
f	Buy healthy low-fat snack foods	1	2	3	4
g	Buy fast food	1	2	3	4
h	Eat healthy meals at good cafes or restaurants	1	2	3	4
i	Play organized sport	1	2	3	4
j	Play non-organized sport	1	2	3	4
k	Attend a gym or fitness centre	1	2	3	4
l	Go for a walk or run safely	1	2	3	4
m	Go for a bicycle ride safely	1	2	3	4
n	Go for a swim safely	1	2	3	4
o	Use exercise equipment (eg stationery bike, treadmill, weights)	1	2	3	4
p	Watch a lot of television	1	2	3	4
q	Walk or cycle to where you need to get to (eg shops, work, friends' houses)	1	2	3	4
r	Go to the park	1	2	3	4
s	Walk up flights of stairs (eg as opposed to taking the elevator)	1	2	3	4

Appendix C: Global Motivation Scale (GMS; Pelletier et al., 2004).

Global Motivation Scale (GMS; Pelletier et al., 2004).

Please indicate the extent to which you agree or disagree with each of the following statements below in response to, "IN GENERAL, I DO THINGS..." by circling the correct number.						
Not agree at all	Very slightly agree	Slightly agree	Moderately agree	Mostly agree	Strongly agree	Completely agree
1	2	3	4	5	6	7

1	Because I do not want to disappoint certain people.	1	2	3	4	5	6	7
2	In order to help myself become the person I aim to be.	1	2	3	4	5	6	7
3	Because they represent who I am.	1	2	3	4	5	6	7
4	Even though I do not see the benefit in what I am doing.	1	2	3	4	5	6	7
5	Because I want other people to see me in a positive way.	1	2	3	4	5	6	7
6	Because I chose them as a way to reach my goals.	1	2	3	4	5	6	7
7	For the pleasure of learning something new.	1	2	3	4	5	6	7
8	Because otherwise I would feel guilty for not doing them.	1	2	3	4	5	6	7
9	Because they are in line with my main beliefs.	1	2	3	4	5	6	7
10	Even though it does not make a difference whether I do them or not.	1	2	3	4	5	6	7
11	For the pleasant feelings I get while I am doing them.	1	2	3	4	5	6	7
12	To show others what I am capable of.	1	2	3	4	5	6	7
13	Because I force myself to do them.	1	2	3	4	5	6	7
14	Because of the satisfaction I feel in trying to excel in what I do.	1	2	3	4	5	6	7
15	Even though I do not have a good reason for doing them.	1	2	3	4	5	6	7
16	Because I choose to make a commitment to what is important to me.	1	2	3	4	5	6	7
17	Because I would be upset with myself if I did not do them.	1	2	3	4	5	6	7
18	Because they reflect what I value most in life.	1	2	3	4	5	6	7

Appendix D: Eating Self-Efficacy Scale (ESES; Glynn & Ruderman, 1986).

Eating Self-Efficacy Scale (ESES; Glynn & Ruderman, 1986).

Please rate the likelihood that you would have difficulty controlling your overeating below in response to “HOW DIFFICULT IS IT TO CONTROL YOUR ...” by clicking the correct number.						
No difficulty controlling eating			Moderate difficulty controlling eating			Most difficulty controlling eating
1	2	3	4	5	6	7

1	Overeating after work or school	1	2	3	4	5	6	7
2	Overeating when you feel restless	1	2	3	4	5	6	7
3	Overeating around holiday time	1	2	3	4	5	6	7
4	Overeating when you feel upset	1	2	3	4	5	6	7
5	Overeating when tense	1	2	3	4	5	6	7
6	Overeating with friends	1	2	3	4	5	6	7
7	Overeating when preparing food	1	2	3	4	5	6	7
8	Overeating when irritable	1	2	3	4	5	6	7
9	Overeating as part of a social occasion dealing with food-like at a restaurant or dinner party	1	2	3	4	5	6	7
10	Overeating with family members	1	2	3	4	5	6	7
11	Overeating when annoyed	1	2	3	4	5	6	7
12	Overeating when angry	1	2	3	4	5	6	7
13	Overeating when you are angry at yourself	1	2	3	4	5	6	7
14	Overeating when depressed	1	2	3	4	5	6	7
15	Overeating when you feel impatient	1	2	3	4	5	6	7
16	Overeating when you want to sit back and enjoy some food	1	2	3	4	5	6	7
17	Overeating after an argument	1	2	3	4	5	6	7
18	Overeating when you feel frustrated	1	2	3	4	5	6	7
19	Overeating when tempting food is in front of you	1	2	3	4	5	6	
20	Overeating when you want to cheer up	1	2	3	4	5	6	
21	Overeating when there is a lot of food available to you (refrigerator is full)	1	2	3	4	5	6	
22	Overeating when you feel overly sensitive	1	2	3	4	5	6	
23	Overeating when nervous	1	2	3	4	5	6	
24	Overeating when hungry	1	2	3	4	5	6	
25	Overeating when anxious or worried	1	2	3	4	5	6	

Appendix E: Differential Emotions Scale (DES; Izard, Libero, Putnam & Haynes, 1993).

Differential Emotions Scale (DES; Izard, Libero, Putnam & Haynes, 1993)

Please indicate the extent to which you agree or disagree with the statements below in response to “IN YOUR DAILY LIFE, HOW OFTEN DO YOU ...” by clicking the correct number.					
Very often					Not at all often
1	2	3	4	5	6

1	Feel like what you're doing or watching is interesting	1	2	3	4	5	6
2	Feel so interested in what you're doing, get caught up in it	1	2	3	4	5	6
3	Feel alert, curious, kind of excited about something	1	2	3	4	5	6
4	Feel glad about something	1	2	3	4	5	6
5	Feel happy	1	2	3	4	5	6
6	Feel joyful, like everything is going your way, everything is rosy	1	2	3	4	5	6
7	Feel surprised, like when something suddenly happens you had no idea would happen	1	2	3	4	5	6
8	Feel amazed, like you can't believe what's happened, it was so unusual	1	2	3	4	5	6
9	Feel like you feel when something unexpected happens	1	2	3	4	5	6
10	Feel unhappy, blue, downhearted	1	2	3	4	5	6
11	Feel sad and gloomy, almost like crying	1	2	3	4	5	6
12	Feel discouraged, like you can't make it, nothing is going right	1	2	3	4	5	6
13	Feel like screaming at something or banging on something	1	2	3	4	5	6
14	Feel angry, irritated, annoyed	1	2	3	4	5	6
15	Feel mad at somebody	1	2	3	4	5	6
16	Feel like something stinks, puts a bad taste in your mouth	1	2	3	4	5	6
17	Feel disgusted, like something is sickening	1	2	3	4	5	6
18	Feel like things are so rotten they could make you sick	1	2	3	4	5	6
19	Feel like somebody is a low-life, not worth the time of day	1	2	3	4	5	6
20	Feel like somebody is a “good-for-nothing”	1	2	3	4	5	6
21	Feel like you are better than somebody	1	2	3	4	5	6
22	Feel scared, uneasy, like something might harm you	1	2	3	4	5	6
23	Feel fearful, like you're in danger, very tense	1	2	3	4	5	6
24	Feel afraid, shaky, and jittery	1	2	3	4	5	6

25	Feel regret, sorry about something you did	1	2	3	4	5	6
26	Feel like you did something wrong	1	2	3	4	5	6
27	Feel like you ought to be blamed for something	1	2	3	4	5	6
28	Feel embarrassed when anybody sees you make a mistake	1	2	3	4	5	6
29	Feel like people laugh at you	1	2	3	4	5	6
30	Feel like people always look at you when anything goes wrong	1	2	3	4	5	6
31	Feel sheepish, like you do not want to be seen	1	2	3	4	5	6
32	Feel shy, like you want to hide	1	2	3	4	5	6
33	Feel bashful, embarrassed	1	2	3	4	5	6
34	Feel you can't stand yourself	1	2	3	4	5	6
35	Feel mad at yourself	1	2	3	4	5	6
36	Feel sick about yourself	1	2	3	4	5	6

Appendix F: Ethics Approval for Study 1

Australian Catholic University
Brisbane Sydney Canberra Ballarat Melbourne



Human Research Ethics Committee

Committee Approval Form

Principal Investigator/Supervisor: Dr Lisa Eisen Melbourne Campus

Co-Investigators: Melbourne Campus

Student Researcher: Miss Kerri Thomas Melbourne Campus

Ethics approval has been granted for the following project:

An investigation of the pertinent psychological, social and environmental factors of overweight and obesity.

for the period: 1st May 2008 - 31st May 2010 (subject to annual renewal)

Human Research Ethics Committee (HREC) Register Number: V200708 79

The following standard conditions as stipulated in the *National Statement on Ethical Conduct in Research Involving Humans (2007)* apply:

- (i) that Principal Investigators / Supervisors provide, on the form supplied by the Human Research Ethics Committee, annual reports on matters such as:
 - security of records
 - compliance with approved consent procedures and documentation
 - compliance with special conditions, and
- (ii) that researchers report to the HREC immediately any matter that might affect the ethical acceptability of the protocol, such as:
 - proposed changes to the protocol
 - unforeseen circumstances or events
 - adverse effects on participants

The HREC will conduct an audit each year of all projects deemed to be of more than low risk. There will also be random audits of a sample of projects considered to be of negligible risk and low risk on all campuses each year.

Within one month of the conclusion of the project, researchers are required to complete a *Final Report Form* and submit it to the local Research Services Officer.

If the project continues for more than one year, researchers are required to complete an *Annual Progress Report Form* and submit it to the local Research Services Officer within one month of the anniversary date of the ethics approval.

Signed: Date:
(Research Services Officer, Melbourne Campus)

Appendix G: Information Letter for Study 1

INFORMATION LETTER TO PARTICIPANTS

TITLE OF PROJECT: An Investigation of the Pertinent Psychological, Social and Environmental Factors of Overweight and Obesity.

PRINCIPAL INVESTIGATOR: Dr Lisa Eisen

STUDENT RESEARCHER: Kerri Thomas

PROGRAMME IN WHICH ENROLLED: PhD

Dear Participant,

You are invited to participate in a study which is investigating the pertinent biological, social, environmental, and psychological correlates of weight status. Gaining an informed understanding of these factors are critical in identifying some of the pertinent factors that differentiate healthy weight individuals from overweight or obese individuals. The research will be conducted by Kerri Thomas, a PhD student, and supervised by Dr Lisa Eisen from the School of Psychology at the Australian Catholic University.

There are no foreseen risks to participating in the current study and it is anticipated that you will not experience any inconvenience or discomfort. **If you feel distressed about anything as a result of participating in this research, however, please contact Lisa Eisen for assistance, advice, or direction on (03) 9953 3119 or email on l.eisen@patrick.acu.edu.au**

Participation involves completing a battery of questionnaires that will take approximately 30 minutes to complete.

Participation in this research will be personally beneficial to you as it will provide you with an opportunity to reflect on some of the factors that contribute to your own body weight. It is also likely that this research will be published and hence is valuable to practitioners and the research community in understanding some of the prevalent weight-related beliefs that individuals hold, and some of the consequences of these beliefs.

You are free to refuse consent altogether without having to justify that decision, or to withdraw consent and discontinue participation in the study at any time without giving a reason. Consent will be indicated by your willingness to complete the questionnaire and returning it to the researcher via post, online, or in the appropriate box in the Psychology department at ACU. Since all questionnaires are non-identifiable, once the questionnaire has been received, withdrawal of data will not be possible.

The results of this research will be kept confidential and will form part of the PhD thesis of the student investigator and ongoing research. The results from the study may also be presented at conferences and as mentioned above, will be published. All reports will be

about average (group) findings and no individuals will be identifiable. Public record standards require that we store data for at least 5 years following completion of the project. All information obtained from you will be securely stored in the store room of the School of Psychology located on the university campus.

Any questions regarding this project should be directed to the Principal Investigator/Supervisor:

Dr Lisa Eisen
(03) 9953 3119
School of Psychology
St Patrick's Campus, Locked Bag 4115,
Fitzroy, Victoria, 3056

Once data collection has completed and the results are analysed, appropriate feedback is available should you wish to be informed of the findings from the study. In order to do this, please contact the principal investigator or the student researcher on the details provided above.

This study has been approved by the Human Research Ethics Committee at Australian Catholic University.

In the event that you have any complaint or concern about the way you have been treated during the study, or if you have any query that the Investigator or Supervisor and Student Researcher have not been able to satisfy, you may write to the Chair of the Human Research Ethics Committee care of the nearest branch of the Research Services Unit.

Chair, HREC
C/o Research Services
Australian Catholic University
Melbourne Campus
Locked Bag 4115
FITZROY VIC 3065
Tel: 03 9953 3158
Fax: 03 9953 3315

Any complaint or concern will be treated in confidence and fully investigated. The participant will be informed of the outcome. If you agree to participate in this project, you may proceed to complete the accompanying questionnaires and then return in to the principal investigator or the student researcher by post, with the accompanying self-addressed and stamped envelope.

.....

Dr Lisa Eisen (Principal Investigator)	Kerri Thomas (Student Researcher)
--	-----------------------------------

Appendix H: Demographic Questionnaire for Study 2

DEMOGRAPHIC QUESTIONNAIRE

Gender	Male	Female		
Age	18-24	25-30	31-40	41-50
	51-60	61-70	71-80	81-90
Education Level	High School	Diploma	TAFE	Bachelor Degree
	Masters Degree	Doctoral Degree	Other _____	
Do you smoke?	Yes	No		
Geographical residence	Urban	Rural/Remote		
Marital Status	Single	Separated/divorced	Widowed	
	Defacto	Married		
Occupation	_____			
Ethnicity	_____			
Height (in cm)	_____			
Weight (in kg)	_____			

In general, how would you describe your physical health?

Poor Fair Good Excellent

How would describe yourself physically?

Appendix I: The Rosenberg Self-Esteem Scale (Rosenberg, 1965)

THE ROSENBERG SELF-ESTEEM SCALE

Circle the appropriate number for each statement depending on whether you strongly agree, agree, disagree, or strongly disagree with it.

1	On the whole I am satisfied with myself.	Strongly Agree	Agree	Disagree	Strongly Disagree
2	At times I think that I am no good at all.	Strongly Agree	Agree	Disagree	Strongly Disagree
3	I feel that I have a number of good qualities.	Strongly Agree	Agree	Disagree	Strongly Disagree
4	I am able to do things as well as most other people.	Strongly Agree	Agree	Disagree	Strongly Disagree
5	I feel I do not have much to be proud of.	Strongly Agree	Agree	Disagree	Strongly Disagree
6	I certainly feel useless at times.	Strongly Agree	Agree	Disagree	Strongly Disagree
7	I feel that I am a person of worth, at least the equal of others.	Strongly Agree	Agree	Disagree	Strongly Disagree
8	I wish I could have more respect for myself.	Strongly Agree	Agree	Disagree	Strongly Disagree
9	All in all, I am inclined to feel that I am a failure.	Strongly Agree	Agree	Disagree	Strongly Disagree
10	I take a positive attitude toward myself.	Strongly Agree	Agree	Disagree	Strongly Disagree

Appendix J: The Body Esteem Scale (BES; Mendelson et al., 1995)

BODY ESTEEM SCALE FOR ADOLESCENTS AND ADULTS

Please read each of the following items carefully and indicate the number that best reflects your agreement with the statement.				
Never 0	Seldom 1	Sometimes 2	Often 3	Always 4

1	I like what I look like in pictures.	0	1	2	3	4
2	Other people consider me good looking.	0	1	2	3	4
3	I'm proud of my body.	0	1	2	3	4
4	I am preoccupied with trying to change my body weight.	0	1	2	3	4
5	I think my appearance would help me get a job.	0	1	2	3	4
6	I like what I see when I look in the mirror.	0	1	2	3	4
7	There are lots of things I'd change about my looks if I could.	0	1	2	3	4
8	I am satisfied with my weight.	0	1	2	3	4
9	I wish I looked better.	0	1	2	3	4
10	I really like what I weigh.	0	1	2	3	4
11	I wish I looked like someone else.	0	1	2	3	4
12	People my own age like my looks.	0	1	2	3	4
13	My looks upset me.	0	1	2	3	4
14	I'm as nice looking as most people.	0	1	2	3	4
15	I'm pretty happy about the way I look.	0	1	2	3	4
16	I feel I weigh the right amount for my height.	0	1	2	3	4
17	I feel ashamed of how I look.	0	1	2	3	4
18	Weighing myself depresses me.	0	1	2	3	4
19	My weight makes me unhappy	0	1	2	3	4
20	My looks help me to get dates.	0	1	2	3	4
21	I worry about the way I look.	0	1	2	3	4
22	I think I have a good body.	0	1	2	3	4
23	I'm looking as nice as I'd like to.	0	1	2	3	4

**Appendix K: The Sociocultural Attitudes Towards Appearance Scale
(SATAQ-3; Heinberg et al., 1995)**

**SOCIOCULTURAL ATTITUDES TOWARDS APPEARANCE SCALE-3
(SATAQ-3)**

Please read each of the following items carefully and indicate the number that best reflects your agreement with the statement.				
Definitely Disagree 1	Mostly Disagree 2	Neither Agree Nor Disagree 3	Mostly Agree 4	Definitely Agree 5

1	TV programs are an important source of information about fashion and "being attractive."	1	2	3	4	5
2	I've felt pressure from TV or magazines to lose weight.	1	2	3	4	5
3	I <u>do not</u> care if my body looks like the body of people who are on TV.	1	2	3	4	5
4	I compare my body to the bodies of people who are on TV.	1	2	3	4	5
5	TV commercials are an important source of information about fashion and "being attractive."	1	2	3	4	5
6	I <u>do not</u> feel pressure from TV or magazines to look pretty.	1	2	3	4	5
7	I would like my body to look like the models who appear in magazines.	1	2	3	4	5
8	I compare my appearance to the appearance of TV and movie stars.	1	2	3	4	5
9	Music videos on TV are <u>not</u> an important source of information about fashion and "being attractive."	1	2	3	4	5
10	I've felt pressure from TV and magazines to be thin.	1	2	3	4	5
11	I would like my body to look like the people who are in movies.	1	2	3	4	5
12	I <u>do not</u> compare my body to the bodies of people who appear in magazines.	1	2	3	4	5
13	Magazine articles are <u>not</u> an important source of information about fashion and "being attractive."	1	2	3	4	5
14	I've felt pressure from TV or magazines to have a perfect body.	1	2	3	4	5
15	I wish I looked like the models in music videos.	1	2	3	4	5
16	I compare my appearance to the appearance of people	1	2	3	4	5

	in magazines.					
17	Magazine advertisements are an important source of information about fashion and "being attractive."	1	2	3	4	5
18	I've felt pressure from TV or magazines to diet.	1	2	3	4	5
19	I <u>do not</u> wish to look as athletic as the people in magazines.	1	2	3	4	5
20	I compare my body to that of people in "good shape."	1	2	3	4	5
21	Pictures in magazines are an important source of information about fashion and "being attractive."	1	2	3	4	5
22	I've felt pressure from TV or magazines to exercise.	1	2	3	4	5
23	I wish I looked as athletic as sports stars.	1	2	3	4	5
24	I compare my body to that of people who are athletic.	1	2	3	4	5
25	Movies are an important source of information about fashion and "being attractive."	1	2	3	4	5
26	I've felt pressure from TV or magazines to change my appearance.	1	2	3	4	5
27	I <u>do not</u> try to look like the people on TV.	1	2	3	4	5
28	Movie stars are <u>not</u> an important source of information about fashion and "being attractive."	1	2	3	4	5
29	Famous people are an important source of information about fashion and "being attractive."	1	2	3	4	5
30	I try to look like sports athletes.	1	2	3	4	5

Appendix L: Ethics Approval for Study 2

Australian Catholic University
Brisbane Sydney Canberra Ballarat Melbourne



Human Research Ethics Committee

Committee Approval Form

Principal Investigator/Supervisor: Dr Lisa Eisen Melbourne Campus
Co-Investigators: Melbourne Campus
Student Researcher: Kerri Thomas Melbourne Campus

Ethics approval has been granted for the following project: Investigating the relationship between culture, obesity stereotypes, self-esteem, body-esteem and internalisation of the 'thin ideal'.
--

for the period: 1st July 2008 - 3rd July 2010 (subject to annual renewal)

Human Research Ethics Committee (HREC) Register Number: V200708 97
--

The following standard conditions as stipulated in the *National Statement on Ethical Conduct in Research Involving Humans* (2007) apply:

- (i) that Principal Investigators / Supervisors provide, on the form supplied by the Human Research Ethics Committee, annual reports on matters such as:
 - security of records
 - compliance with approved consent procedures and documentation
 - compliance with special conditions, and
- (ii) that researchers report to the HREC immediately any matter that might affect the ethical acceptability of the protocol, such as:
 - proposed changes to the protocol
 - unforeseen circumstances or events
 - adverse effects on participants

The HREC will conduct an audit each year of all projects deemed to be of more than low risk. There will also be random audits of a sample of projects considered to be of negligible risk and low risk on all campuses each year.

Within one month of the conclusion of the project, researchers are required to complete a *Final Report Form* and submit it to the local Research Services Officer.

If the project continues for more than one year, researchers are required to complete an *Annual Progress Report Form* and submit it to the local Research Services Officer within one month of the anniversary date of the ethics approval.

Signed: Date:
(Research Services Officer, Melbourne Campus)

Appendix M: Information Letter for Study 2

INFORMATION LETTER TO PARTICIPANTS

TITLE OF PROJECT: An Investigation of Weight-Related Beliefs and Perceptions

PRINCIPAL INVESTIGATOR: Dr Lisa Eisen

STUDENT RESEARCHER: Kerri Thomas

PROGRAMME IN WHICH ENROLLED: PhD

Dear Participant,

You are invited to participate in a study which is investigating prevalent weight-related beliefs, and the psychosocial correlates of weight status. Gaining an informed understanding of the social and psychological determinants of weight are critical in identifying some of the prevalent attitudes that individuals hold regarding overweight and obesity, to lower the reported stigmatisation and discrimination that overweight and obese individuals report. The research will be conducted by Kerri Thomas, a PhD student, and supervised by Dr Lisa Eisen from the School of Psychology at the Australian Catholic University.

There are no foreseen risks to participating in the current study and it is anticipated that you will not experience any inconvenience or discomfort. **If you feel distressed about anything as a result of participating in this research, however, please contact Lisa Eisen for assistance, advice, or direction on (03) 9953 3119 or email on l.eisen@patrick.acu.edu.au**

Participation involves completing a battery of questionnaires that will take approximately 30 minutes to complete.

Participation in this research will be personally beneficial to you as it will provide you with an opportunity to reflect on and gain insight into the attitudes that you hold toward your own weight, and in your perceptions of overweight and obese people. It is also likely that this research will be published and hence is valuable to practitioners and the research community in understanding some of the prevalent weight-related beliefs that individuals hold, and some of the consequences of these beliefs.

You are free to refuse consent altogether without having to justify that decision, or to withdraw consent and discontinue participation in the study at any time without giving a reason. Consent will be indicated by your willingness to complete the questionnaire and returning it to the researcher via post, online, or in the appropriate box in the Psychology department at ACU. Since all questionnaires are non-identifiable, once the questionnaire has been received, withdrawal of data will not be possible.

The results of this research will be kept confidential and will form part of the PhD thesis of the student investigator and ongoing research. The results from the study may also be presented at conferences and as mentioned above, will be published. All reports will be about average (group) findings and no individuals will be identifiable. Public record

standards require that we store data for at least 5 years following completion of the project. All information obtained from you will be securely stored in the store room of the School of Psychology located on the university campus.

Any questions regarding this project should be directed to the Principal Investigator/Supervisor:

Dr Lisa Eisen
(03) 9953 3119
School of Psychology
St Patrick's Campus, Locked Bag 4115,
Fitzroy, Victoria, 3056

Once data collection has completed and the results are analysed, appropriate feedback is available should you wish to be informed of the findings from the study. In order to do this, please contact the principal investigator or the student researcher on the details provided above.

This study has been approved by the Human Research Ethics Committee at Australian Catholic University.

In the event that you have any complaint or concern about the way you have been treated during the study, or if you have any query that the Investigator or Supervisor and Student Researcher have not been able to satisfy, you may write to the Chair of the Human Research Ethics Committee care of the nearest branch of the Research Services Unit.

Chair, HREC
C/o Research Services
Australian Catholic University
Melbourne Campus
Locked Bag 4115
FITZROY VIC 3065
Tel: 03 9953 3158
Fax: 03 9953 3315

Any complaint or concern will be treated in confidence and fully investigated. The participant will be informed of the outcome. If you agree to participate in this project, you may proceed to complete the accompanying questionnaires and then return in to the principal investigator or the student researcher by post, with the accompanying self-addressed and stamped envelope.

.....
Dr Lisa Eisen (Principle Investigator)

.....
Kerri Thomas (Student Researcher)

Appendix N: Ethics Approval for Study 3

Australian Catholic University
Brisbane Sydney Canberra Ballarat Melbourne



Human Research Ethics Committee

Committee Approval Form

Principal Investigator/Supervisor: Dr Lisa Eisen Melbourne Campus

Co-Investigators: Melbourne Campus

Student Researcher: Kerri Thomas Melbourne Campus

Ethics approval has been granted for the following project:

How accurately can a behavioural change model predict successful weight loss? A longitudinal study.

for the period: 30.03.2009 to 01.09.2010

Human Research Ethics Committee (HREC) Register Number: V2009 13

The following standard conditions as stipulated in the *National Statement on Ethical Conduct in Research Involving Humans (2007)* apply:

- (i) that Principal Investigators / Supervisors provide, on the form supplied by the Human Research Ethics Committee, annual reports on matters such as:
 - security of records
 - compliance with approved consent procedures and documentation
 - compliance with special conditions, and
- (ii) that researchers report to the HREC immediately any matter that might affect the ethical acceptability of the protocol, such as:
 - proposed changes to the protocol
 - unforeseen circumstances or events
 - adverse effects on participants

The HREC will conduct an audit each year of all projects deemed to be of more than low risk. There will also be random audits of a sample of projects considered to be of negligible risk and low risk on all campuses each year.

Within one month of the conclusion of the project, researchers are required to complete a *Final Report Form* and submit it to the local Research Services Officer.

If the project continues for more than one year, researchers are required to complete an *Annual Progress Report Form* and submit it to the local Research Services Officer within one month of the anniversary date of the ethics approval.

Signed: Date:
(Research Services Officer, Melbourne Campus)

Appendix O: Information Letter for Study 3

INFORMATION LETTER TO PARTICIPANTS

TITLE OF PROJECT: Investigating Weight-Loss

PRINCIPAL INVESTIGATOR: Dr Lisa Eisen

STUDENT RESEARCHER: Kerri Thomas

PROGRAMME IN WHICH ENROLLED: PhD

Dear Participant,

You are invited to participate in a study investigating weight loss. Gaining an informed understanding of the correlates and risk factors for weight change are critical in identifying persons at an increased risk of becoming overweight or obese, and in developing effective obesity prevention and intervention initiatives. The research will be conducted by Kerri Thomas, a PhD student, and supervised by Dr Lisa Eisen from the School of Psychology at the Australian Catholic University.

There are no foreseen risks to participating in the current study and it is anticipated that you will not experience any inconvenience or discomfort. **If you feel distressed about anything as a result of participating in this research, however, please contact Lisa Eisen for assistance, advice, or direction on (03) 9953 3119 or email on l.eisen@patrick.acu.edu.au**

Participation in this study will be based on individual body mass index (BMI) scores. Participants in this research study are required to have a BMI over 25. Participation in this study involves attending a two-day workshop and completing a battery of questionnaires. Participants will also be asked to complete the questionnaires at baseline, two months, four months, and six months after the completion of the workshop.

Participation in this research will be personally beneficial to you as it will provide you with an opportunity to reflect on and gain insight into your personal experience of weight change. It may also provide you with information and/or support that may assist you to personally lose weight. It is also likely that this research will be published and hence is valuable to practitioners and the research community in understanding some of the important factors that contribute to overweight and obesity. It is intended that the results of this study will provide valuable information regarding possible interventions for overweight and obese individuals.

You are free to refuse consent altogether without having to justify that decision, or to withdraw consent and discontinue participation in the study at any time without giving a reason, until data analysis occurs. Your responses to all questions will be kept confidential.

Further, the identities of participants in this research will be kept confidential. The results will form part of the PhD thesis of the student investigator and ongoing research. The results from the study may also be presented at conferences and as mentioned above, will be published. All reports will be about average (group) findings and no individuals will be identifiable. Public record standards require that we store data for at least 5 years following completion of the project. All information obtained from you will be securely stored in the store room of the School of Psychology located on the university campus.

Any questions regarding this project should be directed to the Principal Investigator/Supervisor:

Dr Lisa Eisen

(03) 9953 3119

School of Psychology

St Patrick's Campus, Locked Bag 4115,

Fitzroy, Victoria, 3056

Once data collection has completed and the results are analysed, appropriate feedback is available should you wish to be informed of the findings from the study. In order to do this, please contact the principal investigator or the student researcher on the details provided above.

This study has been approved by the Human Research Ethics Committee at Australian Catholic University. In the event that you have any complaint or concern about the way you have been treated during the study, or if you have any query that the Investigator or Supervisor and Student Researcher have not been able to satisfy, you may write to the Chair of the Human Research Ethics Committee care of the nearest branch of the Research Services Unit.

Chair, HREC

C/o Research Services

Australian Catholic University

Melbourne Campus

Locked Bag 4115

FITZROY VIC 3065

Tel: 03 9953 3158

Fax: 03 9953 3315

Any complaint or concern will be treated in confidence and fully investigated. The participant will be informed of the outcome. If you agree to participate in this project, you may proceed to complete the accompanying questionnaires and then return in to the principal investigator or the student researcher by post, with the accompanying self-addressed and stamped envelope.

.....
Dr Lisa Eisen (Principle Investigator)

.....
Kerri Thomas (Student Researcher)

Appendix P: Consent Form for Study 3

CONSENT FORM
Copy for Participant to Keep

TITLE OF PROJECT: Investigating the Factors Associated with Successful Weight-Loss and Maintenance

(NAME OF) PRINCIPAL INVESTIGATOR (or SUPERVISOR): Dr Lisa Eisen

(NAME OF) STUDENT RESEARCHER (if applicable): Kerri Thomas

I *(the participant)* have read (or, where appropriate, have had read to me) and understood the information provided in the Letter to Participants. Any questions I have asked have been answered to my satisfaction. I agree to participate in this six month study and complete a battery of questionnaires before the study commences, after two months, four months, and again at six months. I agree to attend the scheduled workshop. I realise that I can withdraw my consent at any time (without comment or penalty/without affecting my future studies/relationship with researchers). I understand that all my responses to all of the questions will be kept confidential. I agree that research data collected for the study may be published or may be provided to other researchers in a form that does not identify me in any way.

NAME OF PARTICIPANT: _____

SIGNATURE _____

DATE _____

SIGNATURE OF PRINCIPAL INVESTIGATOR _____

DATE: _____

SIGNATURE OF STUDENT RESEARCHER: _____

DATE _____

Appendix Q: Demographic Questionnaire for Study 3

DEMOGRAPHIC QUESTIONNAIRE

Gender	Male	Female
Age	_____	
Education Level	High School or less	Post high school (i.e. tafe, university etc)
Geographical Residence	Urban	Rural/Remote
Marital Status	Single	Partnered
Height (in cm)	_____	
Weight (in kg)	_____	
Have you previously dieted to lose weight?	Yes	No
If so, were you successful?	Yes	No
If yes, how much weight did you lose (in kg)?	_____	
For how long have you maintained this lower weight for?	_____	

**Do you have
any medical
conditions?**

Yes

No

**If yes, please
list.**

In general, I would say my physical health is? Poor Fair Good Excellent

How would describe yourself physically?

Dialectical Behaviour Therapy Workshop Manual for Obesity

**adapted from Marsha M. Linehan's Skills Training Manual for
Treating Borderline Personality Disorder**

Reprinted with permission of Guilford Press

The only material that has been developed by the author for this workshop is
highlighted.

INTRODUCTION

OUTLINE OF WORKSHOP

This two-day DBT workshop will comprise of three sessions of two hours duration (both days) with a break in-between each session.

900am-930am: Session Start-up

930am-1130am: Session 1

1130am-1230pm: Lunch

1230pm-230pm: Session 2

230pm-300pm: Afternoon tea

300pm-500pm: Session 3

Each session will follow a similar format. Group leaders will present material, and then there will be in-session practice of new skills, and time to discuss any questions. Although strict time management is required to cover all of the necessary skills training material, this format remains somewhat flexible, to ensure the material lends itself to the natural therapeutic process that takes place in a group. The most important aspect of a group is connection, and this connection must be related to the purpose they have come for; remaining flexible for this natural connection to occur will enhance the therapeutic outcomes.

“A 10-minute break has been allocated in each module after the first hour of the skills presentation. A break can also be an important aspect of the session as it provides an unstructured period of time for participants to interact with one another. It is recommended that the group leaders stay near but somewhat separated from the group members. This may also be an opportunity for participants to leave if they are having a particularly hard time. Please be attentive to anyone who may be leaving, so that intervention can be attempted before they walk out” (Linehan, 1993, p. 20).

Participants may be overwhelmed with the amount of information that will be presented during the day. Encourage participants to take notes and to expand the handouts in their booklets during the sessions with any of their own ideas or other participants’ ideas. However, please reassure participants not to worry if they do not get all the information, as they can collect a booklet at the start of the workshop to take home and refer to in order to practice the skills in their everyday lives.

Three of the four skills training modules for DBT as developed by Linehan (1993) will be covered. Interpersonal Effectiveness skills will not be a focus of this workshop. The central premise of any skills therapy is that acquiring the necessary behavioural skills takes time and extensive practice. Problems that may seem really hard at one point may not seem so difficult to overcome if they persevere in their efforts. It may be tempting to divert skills training time in order to attending to individual needs, crises, and process issues. Although this is somewhat necessary, please avoid this as much as possible to

ensure that skills training remains the focus of the workshop, and not supportive process therapy.

“Since the *core mindfulness skills* are woven throughout each of the training modules, mindfulness is the first module presented. In the current program, the *emotion regulation* and *distress tolerance* modules follow, in that order. The rationale for this is based on the increasing abstractness of the skills and principles over the modules. In addition, the modules in this order can be viewed as decreasing in their degree of validation of participants’ sense of emotional pain” (Linehan, 1993, p. 12).

GROUP LEADERS

“Linehan (1993) uses a model of a primary group leader and a co-leader. The function of the two leaders during a typical session differ somewhat. The primary leader begins the meetings, presents new skills material, is responsible for the timing of the session, moving from person to person as time allows. This, the primary group leader has overall responsibility for skills acquisition. The co-leader’s functions are more diverse. First, he or she mediates tensions that arise between members and the primary leader, providing a balance from which a synthesis can be created. Second, while the primary group leader is looking at the group as a whole, the co-leader keeps a focus on each individual member, noting any need for individual attention and either addressing that need directly during group sessions or consulting with the primary leader during breaks. Third, the co-leader serves as a co teacher and tutor, offering alternate explanations, examples, and so on. As long as both leaders keep the dialectical perspective of the whole, this division of labour and roles can be quite therapeutic” (Linehan, 1993, p. 17).

SETTING

The group should take place in a room of adequate size for the group members to break up into dyads. The room should be sound proof for confidentiality or at least ensure that outsiders will not be able to hear what is going on in the group. Sufficient chairs for all members and leaders should be placed in a circle with nothing in front of the members (i.e. table). Members can hold booklets provided on their laps and take notes on their laps. A table separating group members serves as a barrier and as such is not recommended.

SATURDAY

SESSION START-UP

900am-930am:

Please have each participant collect a booklet which contains all of the handouts that will be discussed during the sessions. This will also provide participants with paper to take notes throughout the sessions.

The goal of this session is to enhance the bonding between group members and the leaders and to begin the process of group cohesion. Group leaders are encouraged to greet participants and interact individually (but only briefly) with each person. This can be helpful for participants who are fearful or reluctant, and provide an opportunity for leaders to refute plans for any participants who are wanting to leave early.

Group leaders will introduce themselves to the group and how they came to be leading the group, explain the format of the workshop and the upcoming sessions, duration of each session, breaks, etc. This is also a chance to outline the boundaries of the group. Please inform participants of the 'group rules', and discuss each rule with the group.

1. Confidentiality – anything shared in the group is not to be discussed with anyone at any time, outside of the group.

2. Time – please mention that the facilitators will make sure the groups run to schedule and on time. There is a short break allocated in the middle of each session.

900am-930am: Session Start-up

930am-1130am: Session 1

1130am-1230pm: Lunch

1230pm-230pm: Session 2

230pm-300pm: Afternoon tea

300pm-500pm: Session 3

3. Respect – discuss with participants the importance of using 'I' statements in the group (i.e. when you said, I felt.....). Encourage participants to avoid judging one another and making interpretations of one another's behaviour.

Participants will then be asked to introduce themselves to the group. **Go around the group and ask each participant to give their name, a brief statement of why she is here, and what she hopes to get out of the workshop.** Try not to spend too much time on any one member.

Review General Handout 1: Goals of Workshop

Answer any general questions, however for any specific questions that will be covered later in the sessions, simply assure group members that this will be addressed later and there will be other opportunities to ask questions as the workshop progresses.

SESSION 1: CORE MINDFULNESS SKILLS

930am-1015am:

“Mindfulness skills are central to DBT. The skills are psychological and behavioural versions of meditation practices from Eastern spiritual training” (Linehan, 1993, p. 63).

“The focus of core mindfulness skills is learning to be in control of your own mind, instead of letting your mind be in control of you” (Linehan, 1993, p. 65).

Review Mindfulness Handout 1: Taking Hold of Your Mind

“In DBT, three primary states of mind are presented: “reasonable mind”; “emotion mind”; and “wise mind”. A person is in “reasonable mind” when she is approaching knowledge intellectually, is thinking rationally and logically, attends to empirical facts, is planful in her behaviour, focuses her attention, and is “cool” in her approach to problems. Reasonable mind is easier when people feel good and much harder when they don’t” (Linehan, 1993, p. 63).

“You are in “emotion mind” when your emotions are in control – when they influence and control your thinking. In “emotion mind”, cognitions are hot; reasonable, logical thinking is difficult; facts are amplified or distorted to be congruent with current affect; and the energy of behaviour is also congruent with the current emotional state. Problems with emotion mind occur when the results are positive in the short term but negative in the long term” (Linehan, 1993, p. 63) (i.e. binge eating feels good right now, but it has negative consequences in the long term). “Emotion mind is exacerbated by 1) illness; 2) sleep deprivation, tiredness; 3) drugs, alcohol; 4) hunger, bloating, overeating, poor nutrition; 5) environmental distress; 6) environmental threats” (Linehan, 1993, p. 66).

“Discussion point: Discuss the pros and cons of both types of mind. Draw from participants their experience of ‘reasonable mind’ and of ‘emotion mind’” (Linehan, 1993, p. 66).

““Wise mind” is the integration of “emotion mind” and “reasonable mind”. “Wise minds” adds intuitive knowing to emotional experiencing and logical analysis. Mindfulness skills are the vehicles for balancing “emotion mind” and “reasonable mind” to achieve “wise mind”. Wise mind is that part of each person that can know and experience truth. It is where the person knows something to be true or valid. It is almost always quiet; it has a certain peace. Everyone has wise mind; some simply have never experienced it” (Linehan, 1993, p. 66).

“Discussion point: Get feedback from participants on their own experiences of “wise mind”” (Linehan, 1993, p. 66).

““Wise mind” is sometimes experienced in the centre of the body (the belly) or in the centre of the head, or between the eyes. Sometimes a person can find it by following the breath in and out” (Linehan, 1993, p. 66).

“Practice Exercise: Have participants go into themselves and experience wise mind. Explain: “Finding wise mind is like riding a bike; you can only learn it by experience”. Instruct them to follow their breath (attend to their breath coming in and out) as they breathe naturally and deeply, and after some time to try to let their attention settle into their centre, at the bottom of their inhalation. That very centred point is wise mind” (Linehan, 1993, p. 66). Leaders should talk participants through this exercise very slowly repeating instructions several times and allowing appropriately spaced pauses for them to sit in the moment. This should take approximately 5 minutes.

Following this exercise, **have participants to share their experiences.** Prompts can include: What was that like for you? How did it feel when you breathed in? How did it feel when you breathed out?

“Wise mind may be the calm that follows the storm – an experience immediately following a crisis or enormous chaos. It is suddenly getting to the heart of a matter, seeing or knowing something directly and clearly. It is grasping the whole picture when before only parts were understood. It is “feeling” the right choice in a dilemma, when the feeling comes from deep within rather than from a current emotional state. **Elicit similar experiences and other examples from participants**” (Linehan, 1993, p. 66).

“Emotion mind versus wise mind: how do you know the difference? Emotion mind and Wise mind both have a quality of ‘feeling’ something to be the case. The intensity of emotions can generate experiences of certainty that mimic the stable, cool certainty of wisdom. Suggest: if intense emotion is obvious, suspect emotion mind. Give it time; if certainty remains, especially when you are feeling calm and secure, suspect wise mind. **Ask participants for other ideas on how to tell the difference**” (Linehan, 1993, p. 66).

1015am-1025am: Quick break.

1025am-1115am

Review Mindfulness Handout 2: Taking Hold of Your Mind: “What” Skills.

There are three WHAT skills and three HOW skills to learn “wise mind”.

Mindfulness WHAT skills

“The mindfulness “what” skills include learning *observe*, to *describe*, and to *participate*. The goal is to develop a lifestyle of participating with awareness; an assumption of DBT is that participation without awareness is a characteristic of impulsive (i.e. binge eating) and mood dependent behaviours. Generally, observing and describing one’s own behavioural responses are only necessary when new behaviour is being learned, there is some sort of problem, or a change is necessary” (Linehan, 1993, p. 63). For example, *mindful eating* (i.e. learning to pay close attention to the food that we eat; observing and describing the taste of the food, the smell, and its texture. “As skill improves, however, such observing and describing cease. It is important to note that a person can only do ONE thing at a time – either observe, or describe, or participate. A person cannot do all three at once” (Linehan, 1993, p. 63).

“The first “what” skill is observing – that is, attending to events, emotions, and other behavioural responses, without necessarily trying to terminate them when painful or prolong them when they are pleasant. What the client learns here is to allow herself to experience with awareness, in the moment, whatever is happening, rather than leaving a situation or trying to terminate an emotion. Generally, the ability to attend to events requires a corresponding ability to step back from the event. Observing an event is separate or different from the event itself. For example, observing walking and walking, are two different responses; observing your thinking and thinking are two different responses” (Linehan, 1993, p. 63).

“Practice Exercise: Have participants try some of the following:

- 1.Experience your bottom on the chair
- 2.Experience your hand on a warm surface (i.e. your other hand)
- 3.Attend to and try to sense your stomach, your shoulders
4. ‘Watch’ in your mind the first two thoughts that come in
- 5.Imagine that your mind is a conveyor belt, and that thoughts and/or feelings are coming down the belt. Put each thoughts and/or feeling in a box near the belt
- 6.Imagine that your mind is the sky and thoughts, sensations and/or feelings are clouds. Gently notice each cloud as it drifts by (or scurries by)
- 7.If you find yourself describing thoughts, sensations, or feelings, ‘step back’, in your mind so to speak, and observe your describing
- 8.If you find yourself distracted, observe that; observe yourself as you become aware that you were distracted” (Linehan, 1993, p. 67).

“Note to Leaders:

It is essential to help participants observe in a non-attached way. Thus, whatever happens in their minds is ‘grist for the mill’ so to speak. No matter what they do, they can just ‘step back’ and observe” (Linehan, 1993, p. 67).

“Remind participants to step back within themselves, not outside of themselves to observe. Observing is not dissociating. **Get some feedback from participants. Work with them until they get the idea of observing. Check how long each person can observe**” (Linehan, 1993, p. 67).

1115am-1130am: Wind-Down

“Lead participants through a visualisation exercise. The focus of this time is for participants to observe internal events (body sensations, breath, thoughts, feelings, etc). Begin this time by asking participants to get themselves in a comfortable position in their chair with their backs straight. Then instruct them to close their eyes or to keep them only partially opened. If they choose to keep them partially opened then ask them to find a place to look that is not too distracting. Then instruct participants to focus their attention on their breathing, as they take three very deep breathes, hold each for one or two seconds, and let each out in a long, slow, exhalation. Three deep breaths allow

participants time to settle down and direct their attention to their inner experiences” (Linehan, 1993, p. 21).

The group leader will then lead participants through a mindfulness body scan. See the sheet provided for the instructions.

SESSION 2: CORE MINDFULNESS SKILLS

1230pm-115pm

“A second mindfulness “what” skill is that of describing events and personal responses in words. The ability to apply verbal labels to behavioural and environmental events is critical in acquiring impulse control skills. By learning to describe these events, participants learn not to take emotions and thoughts literally. For example, feeling afraid does not necessarily mean that the situation is threatening to life or welfare. Many people confuse emotional responses with precipitating events. Thoughts are often taken literally (i.e. ‘I feel unloved’) and are confused with empirical facts (i.e. “I am unloved”)” (Linehan, 1993, p. 64).

“While observing is like sensing, noticing, and attending, describing is a reaction to observing. It is when a person labels what they observe. Discuss with participants how describing a thought as a thought requires recognition that it is a thought instead of a fact. Give examples of the differences between thinking i.e. “I am a failure” and being a failure. **Get feedback and examples from participants.** It is crucial that participants get this distinction” (Linehan, 1993, p. 64).

“Have participants practice observing thoughts and labelling them as thought. Suggest labelling them into categories (i.e. thoughts about myself; thoughts about others, etc). Ask participants to sort their thoughts and feelings into categories. E.g. you could have one box for thoughts, one box for sensations in your body, and one box for urges to do something (for example, urges to stop)” (Linehan, 1993, p. 67).

“Now discuss the difference between describing and judging. Judging is labelling something in an evaluative way. Describing is “just the facts”. Participating is entering wholly into an activity, becoming one with the activity. The reason we observe and describe things is so that we have insight and can change things; participating is the ultimate goal. **Share some examples of participating (e.g. driving a car, when we switch our old car with a new one we need to stop, observe, and describe). Get some other examples from participants**” (Linehan, 1993, p. 67).

“The third mindfulness “what” skill is the ability to participate without self-consciousness. A person who is participating is entering completely into the activities of the current moment, without separating herself from ongoing events and interactions. The quality of action is spontaneous; the interaction between the individual and the environment is smooth and based in some part on habit. Participating can, of course, be mindless (i.e. eating lunch while busily trying to finish a presentation). But it can be mindful (i.e. taking the time to stop and enjoy the food). Mindfulness is participating with attention. Participating is the ultimate goal. The only reason we observe and describe is to understand and improve things” (Linehan, 1993, p. 64).

115pm-125pm: Quick break

125pm-215pm:**Review Mindfulness Handout 3: Taking Hold of Your Mind: “How” Skills.**

In contrast to the WHAT skills where a person can only do ONE thing at a time the ‘HOW’ skills can be applied all at once.

Mindfulness HOW skills

“The goal of the mindfulness HOW skills have to do with how participants *observe*, *describe*, and to *participate*, by taking a nonjudgmental stance, focusing on only one thing in the moment, and doing what works and being effective” (Linehan, 1993, p. 64).

“Taking a *nonjudgmental stance* is when individuals take a non-evaluative approach and do not judge something as good or bad. Judging things as either positive or negative should be avoided and dropped altogether. There is no such thing as ‘good’ food or ‘bad’ food, and no such thing as a good or bad body. Instead, DBT stresses a focus on the consequences of behaviour and events. For example, a person’s behaviour may lead to painful consequences for herself, or the outcome of events may be destructive. A nonjudgmental approach observes these consequences and may suggest changing behaviours or events, but they would not be labelled ‘bad’” (Linehan, 1993, p. 68).

“Practice Exercise: Ask participants for examples between judging and noticing consequences (i.e. “your behaviour is terrible” versus “your behaviour is hurting me”). Ask participants for examples from when other people have applied judgments to them when they felt what they were doing, thinking, or feeling was neither good nor bad. Judging can sometimes be a way of putting a label on a behaviour that is not necessarily ‘bad’ but that THEY just don’t agree with or want someone else to stop. **Ask participants for examples of times when other people have tried to control their behaviour in this way. When have participants tried to control other people’s behaviour by stating judgments as facts?”** (Linehan, 1993, p. 68).

215pm-230pm: Wind-Down. See the attached sheet for the instructions for a visualisation exercise. **Visualisation Script 1.**

SESSION 1: CORE MINDFULNESS SKILLS AND EMOTION REGULATION SKILLS

300pm-345pm:

“Mindfulness in its totality has to do with the quality of the awareness that a person brings to activities. *Focusing on only one thing in the moment* requires control of attention to achieve such a focus. This is instead of splitting attention among several activities or thinking about something else rather than the current activity. Participants need to learn to focus their attention on one task at a time, engage in it with alertness, awareness, and wakefulness, and not be distracted by thoughts or images of the past, worry about the future, or current negative moods” (Linehan, 1993, p. 64).

Reiterate that mindfulness requires LOTS OF PRACTICE

“Being *effective* is aimed at reducing the tendency to be more concerned with what is ‘right’ rather than doing what is actually needed or required in a particular situation. Focusing on developing effectiveness is using skilful means to accomplish goals; emphasising the principle over the outcome can often result in people being disappointed or alienating others. At the end of the day we all have to “give in” some of the time. Being effective requires knowing the actual situation and reacting to it, not to what one thinks should be the situation. Effectiveness sometimes requires sacrificing principles to achieve a goal” (Linehan, 1993, p. 64).

“Mindful Eating

Mindful eating, as opposed to mindless eating, is the experience of full participation in eating. It is eating with full awareness and attention but without self-consciousness or judgment. When the mindfulness “what” skills of observe, describe, and participate are applied to eating, this is labelled mindful eating” (Dimeff & Koerner, 2007, p. 212).

Ask participants about their experiences with mindful eating. What are some of the challenges to eating mindfully?

“Urge Surfing

Urge Surfing involves mindful, non-attached observing of urges to binge or eat mindlessly. Mindfulness skills teach one to accept the reality that there are cues in the world that will trigger the urge to binge eat. Educate participants about how urges and cravings are classically conditioned responses that have been associated with a particular cue. Mindful urge surfing involves awareness without engaging in impulsive mood-dependent behaviour. One simply notices and then describes the ebb and flow of the urge. One is “letting go” or “detaching” from the object of the urge, being fully in the moment “riding the wave” of the urge. Though bearing similarities to mindfulness of the current emotion, urge surfing is a mindfulness skill that involves nonjudgmental observing and describing of urges, cravings, and food preoccupation” (Dimeff & Koerner, 2007, p. 212).

What are some situations that participants find trigger emotional eating? What are some ways that participants can “ride the wave” and resist the urge of responding to these triggers with food?

“Alternate Rebelling”

This mindfulness skill involves using the “how” mindfulness skill of *effectively* to satisfy a wish to rebel without destroying one’s overriding objective of stopping binge eating. The purpose is not to suppress or judge the rebelling but to find creative ways to rebel that do not involve “cutting off your nose to spite your face”. Many clients with binge eating problems have described the desire to “get back” at society, friends, and/or family whom they perceive to be judgmental about their weight. For these individuals, “getting back” can involve rebelling by consuming even more food, but in the process compromising achieving their own goals. Alternative rebelling involves finding effective ways to rebel in a fashion that does not compromise their long-term goals. One can encourage clients to observe the need to rebel, label it as such, and then, if they decide to act on the wish, to do so effectively” (Dimeff & Koerner, 2007, p. 212). Go around the group and ask participants to think up alternate rebelling strategies. “For example, a client who feels judged by society for being obese might “rebel” by buying and wearing lacy lingerie” (Dimeff & Koerner, 2007, p. 212).

What are some ways that participants can rebel without destroying their goals?

•Summarise content presented – states of mind, mindfulness “what” skills (observing, describing, participating), mindfulness “how” skills (taking a nonjudgmental stance, focusing on one thing in the moment, and being effective).

Develop practice commitments: go around the room and discuss with each group member what she is going to practice over the coming week. Troubleshoot any problems in implementing practice.

345pm-355pm: Quick break

355pm-430pm:

“From a DBT perspective, difficulties in regulating painful emotions are central to the behavioural difficulties. Even though a situation may be generating pain, it is the individual’s response to this situation that is more painful that has to change, and be changed. From the individual’s perspective, painful feelings are most often the “problem to be solved”. Binge eating and other dysfunctional behaviours including substance abuse, are often behavioural solutions to intolerably painful emotions. Emotional regulation requires application of core mindfulness skills, which in this case is the application of nonjudgmental observation and a describing one’s current emotional responses. The theoretical idea is that emotional distress is a result of secondary responses (i.e. shame, anxiety, guilt) to primary emotions. The reduction of this secondary distress requires exposure to the primary emotion in a nonjudgmental

atmosphere. In this context, mindfulness to one's own emotional responses can be thought of as an exposure technique" (Linehan, 1993, p. 84).

There are seven specific DBT Emotion Regulation Skills:

"Identifying and labelling emotions – the first step in being able to regulation emotions is learning to identify and label current emotions. Emotions, however, are complex behavioural responses. Their identification often requires the ability not only to observe one's own responses but to also to describe accurately the context in which the emotion occurs. Thus, learning to identify as emotional response is aided enormously if one can observe and describe 1) the event prompting the emotion; 2) the interpretations of the event that prompt the emotion; 3) the phenomenological experience, including the physical sensation, of the emotion; 4) the behaviours expressing the emotion; and 5) the aftereffects of the emotion on other types of functioning" (Linehan, 1993, p. 84).

"Review Emotion Regulation Handout 1: Goals of Emotion Regulation Training. It is important to learn to identify emotions as they are experienced and to apply the mindfulness skills of observing and describing to emotions. It is important to identify what gets in the way of reducing intense negative emotions by analysing the function of emotions – the purposes they serve or the needs they fulfil" (Linehan, 1993, p. 86).

"Facilitators Note:

It is very important to get across the idea that the goal of emotion regulation is not to get rid of emotions or make people zombies. The idea is to reduce suffering and learn how to control emotions rather than allowing their emotions to control them. Determine which participants are afraid of losing all their emotions and which are trying to get rid of all their emotions" (Linehan, 1993, p. 86).

430pm-500pm: Wind down

"This is an important part of the session that allows for participants to reflect on the skills learned and the session as a whole. It may be emotionally charged and painful for some participants. This period of time also allows for those participants who may have dissociated during the session, often because of the emotional intensity of the session. The topics presented may be very stress-provoking for group members, so this time may provide critical closure to the topics discussed" (Linehan, 1993, p. 21).

"Processing-observing wind-down involves spending 15 minutes sharing individual observations of how things went in the session. Participants may offer observations about themselves, each other, group leaders, or the group as a whole. Group leaders may have to model these observations at the start before participants pick up on the method and join in. At times it may be appropriate for group leaders to facilitate more in-depth observations and comments by asking general questions like "what do you make of that?". Another important aspect is for group leaders to ask participants who do not spontaneously offer feedback and observations. Each participant should be encouraged to offer at least one observation" (Linehan, 1993, p. 21).

SUNDAY

SESSION 4: EMOTION REGULATION SKILLS

900am-1015am:

“Review Emotion Regulation Handout 2: Myths About Emotions. Use the devil’s advocate technique to discuss myths about emotions. The task of participants is to develop challenges or counterarguments to the myths. These challenges can be used as cheerleading statements later to help the participants feel better” (Linehan, 1993, p. 86).

“Have participants come up with challenges and write them down if they wish” (Linehan, 1993, p. 87).

“Present a theory of emotions. There are probably eight or so primary emotions (anger, sorrow, joy, surprise, fear, disgust, guilt/shame, interest). People are born with the potential, or biological readiness, for these. All others are learned, and are usually some combination of the basic emotions. Emotions are particular types of patterned reactions to events. They are complex and involve lots of components. Emotions come and go. They are like waves in the sea. Most emotions only last from seconds to minutes. Emotions are also self-perpetuating. Once an emotion starts, it keeps restarting itself. When an emotion seems to stay around, it is called a ‘mood’” (Linehan, 1993, p. 87).

“Review Emotion Regulation Handout 5: What Good Are Emotions? Emotional behaviour is very immediate and efficient. In fact, it is probably necessary for survival. If there were no function or need for emotions, they would be easy to change. But because they have a purpose and serve a need, they can be very hard to change” (Linehan, 1993, p. 90).

“Emotions communicate to (and influence) others, whether a person intends it or not. Emotions prepare for and motivate behaviours. The action urge connected to specific emotions is hard-wired” (Linehan, 1993, p. 90).

“Get participants to give examples of their emotions influencing others and of their being influenced by other people’s emotions, and discuss. Ask participants when their expression of emotions got them something they didn’t want” (Linehan, 1993, p. 90).

1015am-1025am: Quick break

1025am-1115am:

“Review Emotion Regulation Handout 6: Reducing Vulnerability to Negative Emotions: How to Stay out of Emotion Mind.

1. Treat physical illness: Being sick lowers your resistance to negative emotions
2. Balance eating: Try to eat the amounts and kinds of foods that help you feel food – not too much or too little.

Discuss: Discuss the research on restrained eaters that shows the negative effects of eating too little. The idea is also for people to stay away from foods that make them feel bad. Stress avoiding these. Ask participants about foods that make them feel good, calm, or energized. Stress the role of such foods, in moderation.

3.Avoid mood-altering drugs: Alcohol and drugs, like certain foods, can lower resistance to negative emotions.

4.Balance sleep: try to get the amount of sleep that helps you feel good – not too much or too little.

5.Get exercise: Aerobic exercise, done consistently, is an antidepressant. In addition, a regular exercise schedule can build mastery.

Discuss: Ask what forms of exercise participants are engaging in. This discussion is an opportunity to discuss the principles of self-management, exercise schedules, mastery, motivation, self-efficacy, etc.

6.Build Mastery: Do things that make you feel competent, self-confident, in control, and capable of mastering things. Doing so builds a resistance to negative emotions. Building mastery usually requires doing something that is at least a little bit hard or challenging.

Discuss: Elicit activities that give participants a sense of mastery. These will probably differ for each person” (Linehan, 1993, p. 92).

1115am-1130am: Wind down

Ask participants to reflect on and share some new insights gained regarding negative emotions. What are some of their practice commitments?

SESSION 5: EMOTION REGULATION SKILLS

1230-115pm:

“Review Emotion Regulation Handout 7: Steps for Increasing Positive Emotions.

Increase the number of events that prompt positive emotion, such as love, joy, pride, self-confidence, and calm. **Give out the Emotion Regulation Handout 8: Adult Pleasant Events Schedule.** The goal in the short-term is to do pleasant things that are possible now. Increase daily positive experiences. Encourage participants to do as many as possible of those things on the schedule that make them feel happy or joyful” (Linehan, 1993, p. 92).

“Ask participants little things that they find pleasant. Be creative” (Linehan, 1993, p. 92).

“The goal in the long-term is to make changes in your life that positive events will occur more often” (Linehan, 1993, p. 93).

“Ask participants to make a list of positive events that they want in their life. These are their goals. Encourage them to work towards their goals” (Linehan, 1993, p. 93).

“No-one is very happy if they don’t have many positive events in their lives. Building a life that is satisfying and one that brings happiness is like saving pennies in a piggy bank. A person has to accumulate positives” (Linehan, 1993, p. 93).

“Encourage participants to attend to **relationships**, repair old relationships, and make new relationships. Most people need good relationships to be happy. Many people are not very happy unless they are in one or more close relationships. The secret is to not put all your eggs in one basket and not just depend on one person to make you happy” (Linehan, 1993, p. 93).

“Explain: be mindful of positive experiences and events that occur. Focus your attention on positive events that happened. Refocus on positive parts of events when your mind wanders to the negative” (Linehan, 1993, p. 93).

Ask participants about their recent positive experiences.

115pm-125pm: Quick break.

125pm-215:

“Review Emotion Regulation Handout 9: Letting Go of Emotional Suffering:

Mindfulness of Your Current Emotion. Mindfulness of emotions means observing and describing them just as they are. This strategy is useful because it allows you to get distance from your emotions. Distance is crucial for figuring things out and for problem solving in regard to emotions. By exposing yourself to emotions, but not necessarily acting on them, you will find that they are not so catastrophic. You will stop being so afraid of them. Once you are less afraid, all the fear, panic, anger and so forth that results from your emotions being as they are will dissipate” (Linehan, 1993, p. 93).

“The best way to get rid of negative and painful emotions is to let them go. But learning to let them go is extremely difficult. The trick is to find a new way of relating to

negative emotions so that they do not induce so much suffering. The way is through acceptance. Accepting painful emotions eliminates the suffering, leaving only the pain. At times, acceptance even reduces the pain. Fighting emotions ensures that they stay. The basic steps in letting go are” (Linehan, 1993, p. 93):

1. “Observe your emotions. Acknowledge its presence. Step back. Get unstuck from the emotion.
2. Try to experience your emotion as a wave coming and going. Try not to block or suppress the emotion. Open yourself to the flow of the emotion. Do not try to get rid of the emotion. Don’t push it away. Don’t judge or reject it. Do not try to keep the emotion around. Don’t cling to it. Don’t rehearse it. Don’t hold on to it. Don’t amplify it.
3. Recognise that you are not your emotion. Do not necessarily act on the emotion.
4. Practice loving your emotions. Be willing to have them. Loving means accepting them. Accepting emotions allows a person to do something about them” (Linehan, 1993, p. 93-94).

Have the group discuss the role of acceptance and emotional suffering.

“Have participants share times when radical acceptance of emotions has reduced suffering. Share your own experiences. Discuss the idea of ‘loving’ one’s own emotions” (Linehan, 1993, p. 94).

“Review Emotion Regulation Handout 10: Changing Emotions by Acting Opposite to the Current Emotion. Some psychotherapy researchers believe that when treatments for emotional disorders work, they do so because they reverse the expressive and action components of emotional responses. For example, when you are afraid, approach what you are afraid of rather than avoid it. When you are feeling sad or depressed, get active. Do things that make you feel competent and self-confident rather than acting passive. Again, approach, don’t avoid” (Linehan, 1993, p. 94-95).

“The idea here is to act contrary to an emotion, not to mask or hide the emotions. You have to throw your entire self into acting opposite to the emotions. But you do not have to suppress your feelings. Your behaviour or actions communicate to the brain, and the effect is a slow but steady change in your emotions. This procedure works when your emotions are not realistic for the situation” (Linehan, 1993, p. 95).

“Practice exercise: have participants pay attention to sensations in their faces. Guide them in noting any areas of tension. Now instruct each person to imagine a situation during the past week when she felt angry or sad or worried. While she is thinking about it, she should again notice sensations in the face. Instruct participants to raise a hand slightly to signal to you when they have the situation in mind. Now, as they continue to imagine, instruct them to try to make the feelings so that no-one else in the room would know the feeling or even realise the feelings exist. Have them notice the sensations in their face, have them notice what happens to their emotions. Next, instruct each participant to relax her facial muscles, smoothing them out as much as she can. Have

participants notice how emotions change or don't change, have them notice how different the face feels. It is common for people to report that when they relax their faces, they feel much more vulnerable. Explain that this means that they are allowing feelings to come and go. They are not holding them on or pushing them out" (Linehan, 1993, p. 95).

- Summarise the content presented.**

215pm-230pm: Wind-Down

Go around the room and discuss the most salient points learnt for each participant. What will each participant work on?

SESSION 6: DISTRESS TOLERANCE SKILLS

300pm-345pm:

This module assumes that although an individual may be experiencing pain, it can be tolerated, and life can be accepted and lived despite the pain. The goal of this module is to provide alternatives to unhealthy behaviors that they may currently engage in when they find themselves in distress, such as comfort eating.

“The goal of this module is to learn to bear pain skilfully. It is essential to learn to tolerate and accept pain and distress because 1) pain and distress are a part of life and they cannot be totally removed or avoided, an inability to accept this fact only leads to more pain and suffering; and 2) distress tolerance is an important skill to learn to change oneself, otherwise impulsive behaviours will interfere with efforts to achieve the desired change” (Linehan, 1993, p. 96).

“Burning Bridges

This skill involves accepting at the deepest and most radical level the idea that one is really not going to binge eat, or eat mindlessly, or abuse oneself with food ever again – thus, burning the bridge to those behaviours. One accepts that one will no longer block, deny, or avoid reality with binge eating. Instead, one makes a covenant from deep within to accept reality and one’s experiences” (Dimeff & Koerner, 2007, p. 213). **Go around the room and ask participants if they can make this commitment. What are some of the obstacles they foresee in making this commitment.** This is an opportunity for group leaders to troubleshoot any issues.

“Distress tolerance skills constitute a natural progression from core mindfulness skills. Distress tolerance skills teach participants to develop the ability to accept current situations in a nonjudgemental and nonevaluative manner. Distress tolerance is the ability to perceive the environment without demanding it be different, to experience one’s current emotional state without demanding them to stop, and to observe one’s own thoughts and actions without trying to stop or control them. Although DBT advocates for a nonjudgmental approach, that does not assume that it is a stance of approval. Acceptance of reality is NOT approval of reality” (Linehan, 1993, p. 96).

“The goal of distress tolerance skills is for participants to learn to tolerate and survive crises and accept life as it is in the moment. There are four sets of crisis survival strategies taught: 1) distracting; 2) self-soothing; 3) improving the moment; and 4) thinking of pros and cons. Acceptance skills include radical acceptance (i.e. *complete* acceptance from deep within), turning the mind towards acceptance (i.e. *choosing* to accept reality as it is), and willingness versus wilfulness. Willingness involves the immersion of one’s self into the deepest process of life itself. It embodies commitment to a part of the cosmic process. Willingness says yes to the mystery of living in each moment. Alternatively, wilfulness attempts to master, control, and manipulate existence. Wilfulness refuses to live in the moment and enjoy the mystery, it says no or it says yes but with conditions” (Linehan, 1993, p. 96).

“Review Distress Tolerance Handout 1: Crisis Survival Strategies. Elicit from participants crisis situations they need to tolerate” (Linehan, 1993, p. 97).

“There are four categories of crisis survival strategies: distracting, self-soothing, improving the moment, and focusing on pros and cons. Each is a series of methods for short-circuiting or coping with overwhelming negative emotions and intolerable situations. They are intended for getting through crisis situations and overwhelming emotions. These are not strategies to reduce or end painful emotions, they are ways to survive painful emotions” (Linehan, 1993, p. 97).

Ask participants to discuss where and why such strategies might be a good idea?

1. “Distracting: reducing contact with emotional stimuli. There are seven distracting skills. A useful way to remember these skills is the phrase **“Wise Mind ACCEPTS”**

Activities: they distract attention and fill short-term memory with thoughts, images, and sensations counteractive to the thoughts, images, and sensations that activate the negative emotion.

• **Contributing:** refocuses attention from oneself to what we can do for others. It can also increase the meaning of life, improve the moment, and enhance self-respect (for some)

• **Making Comparisons:** also refocuses attention from oneself to others, but in a different way. In this case, the situations of others – those coping in the same way or less well, or the less fortune in general – are used to recast one’s own situation in a more positive light.

• **Generating Opposite Emotions:** replaces the current negative emotion with other, less negative emotions. This strategy interferes with the current mood state. This technique requires the person to first figure out the current emotion so that activities to generate an opposite one can be sought.

• **Pushing Away:** physically leaving a situation. Leaving the situation decreases contact with the emotional cues associated with the situations.

• **Distracting with other Thoughts:** fills short-term memory with other thoughts so that thoughts activated by the negative emotion do not continue to reactivate the emotion.

• **Intense other Sensations:** can interfere with the physiological component of the current negative emotion. The sensations may work to focus attention on something other than the stimuli arousing the emotion. Holding ice cubes can be helpful” (Linehan, 1993, p. 98).

Ask participants to discuss which techniques they would be most likely to use. Share ideas.

345pm-355pm: Quick break

355pm-430pm: session continued...

2. **“Self-Soothing:** has to do with comforting, nurturing, and being gentle and kind to oneself. A way to remember these skills is to think of soothing each of the **Five senses**.

- **Vision**
 - **Hearing**
 - **Smell**
 - **Taste**
 - **Touch**” (Linehan, 1993, p. 98)
- (the idea is not to self-soothe with excessive eating though)

3. **“Improving the Moment:** replacing immediate negative events with more positive ones. Some strategies for improving the moment are cognitive techniques having to do with changing appraisals of oneself (encouragement), or the environment (positive thinking, meaning, imagining). Some involve changing body responses to events (relaxing). Prayer and focusing on one thing in the moment have to do with acceptance and letting go. A way to remember these skills is the word **IMPROVE:**

- **Imagery:** can be used to distract, soothe, bolster courage, and confidence and make future rewards more salient. Can create a situation different from the actual one. It is like leaving the situation. With imagery, though, you can be sure that the place you go to is one of security and safety and happiness.
- **Meaning:** people need to find meaning in their lives to survive suffering. Finding or creating meaning is similar to the dialectical strategy of making lemonade out of lemons.
- **Prayer:** you do not have to be religious. Prayer is the complete opening of oneself to the moment.
- **Relaxation:** changing how the body responds to stress and crises. Often people tense their bodies as if by keeping them tense, they can actually make the situation change. The goal here is to accept reality with the body. The idea here is that the body communicates with the mind, accepting with the body can help in accepting the mind.
- **One thing in the moment:** although it can be very difficult to do, focusing on one thing in the moment can be very helpful in the middle of a crisis; it can provide time to settle down. The secret of this skill is to remember that the only pain one has to survive “just this moment”.
- **Vacation:** it is ceasing to cope actively and either retreating into oneself or allowing oneself to be taken care of for the moment. Everyone needs a vacation from adulthood once in a while. The vacation should be brief and should only last from a few minutes to no longer than a day.

•**Encouragement:** cheerleading oneself. The idea is to talk to yourself as you would talk to someone you care about who is in crisis. Or talk to yourself as you would like someone else to talk to you” (Linehan, 1993, p. 99-100).

4. “Pros and Cons: thinking about the positive and negative aspects of tolerating distress and the positive and negative aspects of not tolerating it. The eventual goal is to fact that fact that accepting reality and tolerating distress lead to better outcomes than do rejecting reality and refusing to tolerate distress” (Linehan, 1993, p. 100).

430pm-500pm: Wind-Down.

“This is an important part of the session that allows for participants to reflect on the skills learned and the session as a whole. It may be emotionally charged and painful for some participants. This period of time also allows for those participants who may have dissociated during the session, often because of the emotional intensity of the session. The topics presented may be very stress-provoking for group members, so this time may provide critical closure to the topics discussed” (Linehan, 1993, p. 21).

This time can also be used for participants to give feedback to one another – to build each other up.

“Processing-observing wind-down involves spending 15 minutes sharing individual observations of how things went in the session. Participants may offer observations about themselves, each other, group leaders, or the group as a whole. Group leaders may have to model these observations at the start before participants pick up on the method and join in. At times it may be appropriate for group leaders to facilitate more in-depth observations and comments by asking general questions like “what do you make of that?”. Another important aspect is for group leaders to ask participants who do not spontaneously offer feedback and observations. Each participant should be encouraged to offer at least one observation” (Linehan, 1993, p. 21).

It is imperative that participants are relaxed and have closure to all that has occurred during the day. Encourage participants to take an active part in the *Processing-observing wind-down*.

References

- Linehan, M. (1993). Skills Training Manual for Treating Borderline Personality Disorder. New York: The Guilford Press.
- Dimeff, L.A., & Koerner, K. (2007). Dialectical Behaviour Therapy in Clinical Practice. New York: The Guilford Press.

Psychoeducation Workshop Manual for Overweight and Obesity

adapted from The Australian Nutrition Foundation Inc.

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**Excerpts from other resources have been referenced accordingly.
The only material that has been developed by the author for this workshop is highlighted.**

INTRODUCTION

OUTLINE OF WORKSHOP

This 2-day weight-loss workshop will comprise of three sessions of two hours duration with a break between each session.

900am-930am: Session Start-up

930am-1130am: Session 1

1130am-1230pm: Lunch

1230pm-230pm: Session 2

230pm-300pm: Afternoon tea

300pm-500pm: Session 3

Although strict time management is required to cover all of the necessary skills training material this format remains somewhat flexible, to ensure the material lends itself to the natural therapeutic process that takes place in a group. The most important aspect of a group is connection, and this connection must be related to the purpose they have come for; remaining flexible for this natural connection to occur will enhance the therapeutic outcomes.

“A 5-10 minute break has allocated in each module after the first hour of the skills presentation. A break can also be an important aspect of the session as it provides an unstructured period of time for participants to interact with one another. It is recommended that the group leaders stay near but somewhat separated from the group members. This may also be an opportunity for participants to leave if they are having a particularly hard time. Please be attentive to anyone who may be leaving, so that intervention can be attempted before they walk out” (Linehan, 1993, p. 20).

Participants may be overwhelmed with the amount of information that will be presented during the day. Participants should be encouraged to take notes and to expand the handout materials further during sessions with their own ideas or other participants' ideas.

Group Leaders

Linehan (1993) uses a model of a primary group leader and a co-leader. “The function of the two leaders during a typical session differ somewhat. The primary leader begins the meetings, presents new skills material, is responsible for the timing of the session, moving from person to person as time allows. This, the primary group leader has overall responsibility for skills acquisition. The co-leader's functions are more diverse. First, he or she mediates tensions that arise between members and the primary leader, providing a balance from which a synthesis can be created. Second, while the primary group leader is looking at the group as a whole, the co-leader keeps a focus on each individual member, noting any need for individual attention and either addressing that need directly during group sessions or consulting with the primary leader during breaks. Third, the co-leader serve as a co-teacher and tutor, offering alternate explanations, examples, and so on. As long as both leaders keep the dialectical perspective of the whole, this division

of labour and roles can be quite therapeutic” (Linehan, 1993, p. 17). One of the main functions of the leaders in this workshop will be guiding the participants through problem solving, as such please make yourself familiar with the problem solving guidelines.

Problem solving

“Six step approach:

1. Identify specific problem/goal
2. List alternative solutions via brainstorming
3. Discuss merits of each suggestion, strengths and weakness of each
4. Selection of optimal solution – includes discussion of the ease in which each can be applied within the current resources available to the family, best solution is usually one which can be applied immediately with moderate effort of the family, straightforward solutions are favoured over complex ones that require extensive organization
5. Plan implementation of the solution – detailed plan mapping out steps that need to be taken, anticipating potential road blocks and ways of coping with them, can rehearse overtly or covertly all or selected step in the plan
6. Set out specific time to review all efforts, all efforts are praised even where implementation has fallen short of expectations. Failure of any attempt is then examined in terms of the partial success achieved: What went wrong?” (Falloon, 1988, p. 316-349)

Setting

The group should take place in a room of adequate size for the group members to break up into dyads. The room should be sound proof for confidentiality or at least ensure that outsiders will not be able to hear what is going on in the group. Sufficient chairs for all members and leaders should be placed in a circle with nothing in front of the members (i.e. table). Members can hold booklets provided on their laps and take notes on their laps. A table separating group members serves as a barrier and as such is not recommended.

SATURDAY SESSION START-UP

900am-930am:

Please have each participant collect a booklet which contains all of the handouts that will be discussed during the sessions. This will also provide participants with paper to take notes throughout the sessions.

The goal of this session is to enhance the bonding between group members and the leaders and to begin the process of group cohesion. Group leaders are encouraged to greet participants and interact individually (but only briefly) with each person. This can be helpful for participants who are fearful or reluctant, and provide an opportunity for leaders to refute plans for any participants who are wanting to leave early.

Group leaders will introduce themselves to the group and how they came to be leading the group, explain the format of the workshop and the upcoming sessions, duration of each session, breaks, etc. This is also a chance to outline the boundaries of the group. Please inform participants of the 'group rules', and discuss each rule with the group.

4. Confidentiality – anything shared in the group is not to be discussed with anyone at any time, outside of the group.

5. Time – please mention that the facilitators will make sure the groups run to schedule and on time. There is a short break allocated in the middle of each session.

900am-930am: Session Start-up

930am-1130am: Session 1

1130am-1230pm: Lunch

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230pm-300pm: Afternoon tea

300pm-500pm: Session 3

6. Respect – discuss with participants the importance of using 'I' statements in the group (i.e. when you said, I felt.....). Encourage participants to avoid judging one another and making interpretations of one another's behaviour.

Participants will then be asked to introduce themselves to the group. **Go around the group and ask each participant to give their name, how she heard about this group, a brief statement of why she is here, and any other information she cares to share.**

“The leaders’ task here is to convince the clients that the skills to be covered in the upcoming modules are relevant to their lives; that if they improve these particular skills

their lives will improve, and, most importantly, that they can actually learn the skills” (Linehan, 1993, p. 18).

SESSION 1: THE HEALTHY LIVING PYRAMID

930am-1015am:

The Healthy Living Pyramid

The Healthy Living Pyramid was developed to provide a simple guide to planning the types of foods we should eat and in what proportions. The pyramid represents food from the core food groups only. That is, it shows meat, fish, chicken, eggs, nuts, bread, cereals, vegetables, legumes, fruit, milk, etc. We all know though that at meal times, we don't eat these core food groups alone, we combine several of them together. For example, we mix meat with vegetables to make a stew or casserole, eggs with milk and sugar to make custard or flour with oil, cheese, vegetables and meat to make a pizza. While the pyramid can't possibly show all the different combinations, mixing foods, and adding herbs and spices to create flavours we enjoy, will help us to eat the food variety that we need, while keeping to the proportions outlined in the Pyramid.

The Healthy Living Pyramid encourages variety, minimum fat, adequate fibre, limited salt and adequate water to be balanced with physical activity. The 'Move more' layer at the base of the Pyramid shows moving legs that add the concept of physical activity as being an essential link with eating.



The Layers of the Pyramid – from the bottom up.

Move more

Every time we move we use up some of the kilojoules (or calories) that are in the food that we eat. The kilojoules that we do not use up in energy will be stored and changed to fat. ‘Move more’ reminds us that we need to balance the energy (kilojoules) that we take in with the energy we use. We eat daily so we need to be active daily.

Healthy Eating

Nutrition Australia promotes a varied diet that consists largely of fresh fruits, vegetables and whole grains. Variety is important and we are fortunate in Australia that our availability of foods is extensive, compared to world food prices food is relatively inexpensive in Australia and our food supply reflects our cultural diversity.

Some key tips to healthy eating are:

- Try and eat 30 different foods a day
- When choosing vegetables for a meal enjoy the different colored vegetables available as the colour of fruit and vegetables contain important antioxidants important for health and disease prevention.
- Chose water as your first choice to drink.
- Prepare food at home whenever possible.
- Take time out to enjoy meals with family and friends when possible. Families that eat together benefit from a range of health and social benefits.

Discussion questions:

What would you have difficulty with and why?

What are possible solutions for these difficulties? (engage the group in guided problem solving as needed).

What have participants found has worked previously?

Do participants have any other tips for healthy eating?

1015am-1025am: Quick break.

1025am-1115am:

Eat Moderately Foods

Meat

- Choose lean cuts of beef, pork, veal, lamb and chicken.
- Select red meats with less marbling as they are lower in fat.
- Visible fat should be removed before cooking.
- Remove skin from chicken, as this is fat.

- Watch bulk buys of meat – fatty meat and bony chops may be part of the package.
- Lean mince meat can be more expensive than fatty mince meat, but buy a can of legumes to add to it to make the meat go further.

Fish

- Most fish are low in fat, and all are low in saturated fat.
- Fish have essential and beneficial long chain omega 3 fatty acids, that necessary for normal growth and development, and beneficial in preventing coronary heart disease, hypertension, type 2 diabetes, renal disease, rheumatoid arthritis, ulcerative colitis, Crohn's disease, and chronic obstructive pulmonary disease.
- Canned fish is as nutritious as fresh. The best choices are those canned in water rather than brine (salt) or oil.
- Many frozen fish products are high in fat. Choose those that are not crumbed, can be prepared by means such as oven baking, microwave and steaming.

Dairy Foods

- There is a wide variety of milk and soy drinks available on the market. These products supply our easiest source of calcium.
- Yoghurt and custard are other excellent sources of calcium. Choose low fat varieties. Many yoghurts also provide healthy bacteria such as acidophilus, bifidus, and/or casei.
- Cheese is also a good source of calcium. Choose lower fat varieties by comparing fat content on the labels. Be careful, as 'reduced fat' varieties can still be high in fat. Jarlsburg, Edam, cottage cheese and ricotta have less fat than some fat reduced cheddars.

Nuts

- Nuts lower LDL (bad) cholesterol and total blood cholesterol, and help prevent heart disease.
- They contain phytochemicals and many minerals.
- They contain mostly monounsaturated and polyunsaturated fats, which are beneficial for the heart. An exception is coconuts, which are mostly saturated fat, and should only be eaten occasionally.
- Eat a small handful of nuts each day to help protect against chronic disease.

Eggs

- Eggs provide protein, vitamins A, D, E and K, and other nutrients.
- They are not high in saturated fat.
- Eggs can be enjoyed in moderate amounts, such as one a day.

Discussion questions:

What difficulties do you have with eating these foods only moderately?
What difficulties do you have with limiting portion size?

What are some ways you can overcome these difficulties?

1115am-1130am: Wind-Down.

What has each participant learnt from this session?

What are some strategies you will try to use in the future?

What will be the obstacles to following these strategies?

How may you be able to overcome these obstacles?

SESSION 2: THE HEALTHY LIVING PYRAMID CONT.

1230pm-115pm

Eat Most Foods

Fruit and Vegetables

- Fruits and vegetables provide a range of vitamins, minerals and phytochemicals (substances in plants that help protect against disease).
- All vegetables and fruit have almost no fat (except avocado and olives).
- Eating a wide variety of fruit and vegetables helps you get a range of essential nutrients
- Fresh fruit is a better choice than juices because fresh fruit is a good source of fibre and contains more nutrients.
- Frozen and canned fruits and vegetables are as good a choice as fresh. Choose fruits in natural juices rather than syrup as syrup contains added sugar.

Cereals

- Cereals are an important way to increase the fibre in your diet. Use wholegrain varieties to add interest and diversity.
- Most breakfast cereals are low in fat and are an ideal food to start the day. Some may be a source of hidden fat and sugar, so it is important to read the Nutrition Information Panel. Choose rolled oats, breakfast biscuits (Weet-bix®), wholegrain cereals, natural muesli, bran cereals.
- Rice, pasta and cous cous are all excellent 'eat most' choices.

Breads

- These foods are high in carbohydrates, the B vitamins and fibre.
- Best choices are wholegrain, multigrain, oat-bran, rye, and soy and linseed loaves/rolls; other good choices are wholemeal and white high fibre; for variety include interesting breads such as pita pockets or Turkish breads.

Legumes

- Includes dried and canned beans, peas and lentils; and tofu and tempeh (made from soy beans).
- Legumes could be called one of nature's wonder foods, as they provide carbohydrates, protein, fibre, vitamins and minerals and some very effective phytochemicals.

Discussion questions:

What are the difficulties people have eating these types of foods?

How could you overcome these difficulties?

115pm-125pm: Quick break

125pm-215pm:

Eat in small amounts

Oils

- Limit the use of added fats and oils. When choosing these products (e.g. cooking oils, margarines), look for those labelled ‘monounsaturated’ or ‘polyunsaturated’.
- If buying margarine, look for those with low levels of trans fats. Trans fats contribute to heart disease.
- High fat foods such as fried chips should be limited to special occasions only.

Sauces

- Limit use of sauces, dressings and condiments that are high in fat and salt. Choose items such as no oil salad dressings, tomato based instead of cream based pasta sauces, and reduced salt or no added salt sauces.

High Fat Snacks

- Most snack foods are high in fat, so have these on special occasions only. Fruit buns and scones can replace chips and biscuits, though should still be eaten sparingly as they provide energy without many nutrients.

Discussion questions:

Which foods from the “eat in small amounts” category do participants struggle with?

What are the difficulties you have in limiting how much you eat?

What are some ways you can overcome these difficulties?

Healthy snacks

- A snack between meals is fine if it is healthy! Bread and cereal based foods, and fruit and vegetables, form the healthiest snacks. Try these snack ideas:
- Low fat crackers, crispbreads or rice cakes with salsa.
- Carrot and celery sticks with hummus.
- Piece of fruit.
- Low fat yoghurt.

Discussion questions:

What difficulties do people have with eating healthy rather than unhealthy snacks? How can you overcome these difficulties?

Do participants find the Healthy Living Pyramid an effective tool to assist with planning the types and quantities of foods to eat?

215pm-230pm: Wind-Down.

Progressive Muscle Relaxation. See the attached sheet for instructions.

SESSION 3: OVERWEIGHT AND OBESITY

300pm-345pm:

Despite decades of research, we still don't fully understand why some people gain weight more easily than others, and also have greater trouble losing excess weight.

It is known that body fat levels are increasing in Australia, along with the rest of the developed world (and increasingly in the developing world too). Clearly, something is wrong with our diet and/or lifestyle. However, it is known that avoiding excessive energy (i.e. kilojoule) intake is critical to weight control. That is, you will inevitably gain weight if your energy intake exceeds your energy output. But this doesn't mean "crash dieting"—attempting to lose huge quantities of weight in a short time. Gradual weight loss, at a rate of 0.5–1.0 kg per month, is most likely to lead to sustainable weight loss, because the body hardly 'notices' such a low rate of change. A slow rate of weight loss also means that you can eat enough food to ensure adequate intake of essential nutrients such as vitamins, minerals and dietary fibre. Also, while reducing your food intake will help in weight control, it may not be sufficient in itself— you must still ensure that your level of physical activity takes your energy expenditure above your energy intake.

This will not be easy—the propensity (urge) to eat has been described by one obesity expert as "somewhere between the propensity to breathe and the propensity to have sex. It's much worse than stopping smoking." This means that people who have lost substantial quantities of body fat must learn (or relearn) to eat according to 'hunger' (the body's way of letting you know that you have a physiological need for food), rather than according to the desire to eat. Although the solution seems straightforward (eat less and increase physical activity), losing weight is difficult enough in the first place; keeping it off is even harder. If we fully understood the actual cause (or causes) of the worldwide increase in body fat levels, we would be in a better position to develop strategies to halt the epidemic (and perhaps even begin reversing it). Clearly, both diet and lifestyle (particularly physical activity—or rather a lack of activity) are involved in the obesity epidemic, but the exact role of diet is still very controversial.

Discussion questions:

Have participants tried to eat according to 'hunger'?

What challenges have participants faced in doing so?

What are some ways of overcoming these challenges?

Perhaps the best advice that can be given now to people who want to avoid gaining weight, or safely lose weight and keep it off is to follow the advice given above (gradually lose weight by slightly reducing food intake and increasing physical activity) and also adhere to the dietary guidelines for Australians:

Enjoy a wide variety of nutritious foods:

- Eat plenty of vegetables, legumes and fruits
- Eat plenty of cereals (including breads, rice, pasta and noodles), preferably wholegrain
- Include lean meat, fish, poultry and/or alternatives
- Include milks, yoghurts, cheeses and/or alternatives
- Reduced-fat varieties should be chosen, where possible
- Drink plenty of water
- Limit saturated fat and moderate total fat intake
- Choose foods low in salt
- Limit your alcohol intake if you choose to drink
- Consume only moderate amounts of sugars and foods containing added sugars

Prevent weight gain: Be physically active and eat according to your energy needs:**Discussion questions:**

Do participants think they would be able to incorporate these suggestions into their lifestyle?

What will make it difficult?

How can you overcome these difficulties?

345pm-355pm: Quick break

355pm-430pm:

Overweight and ObesityManaging Weight

Burning off kilojoules is the key to weight management, so the longer you can be active the better, but build it up slowly. A sudden large increase could cause injury. If it makes you uncomfortable slow down, stop or change to another way of being active. If you have an existing health problem or are overweight, consult your doctor before starting to increase your activity.

A good way to tell if your activity is at the right level is to use the 'talk test', i.e. you should still be able to talk whilst doing the activity (unless you are under water!); if you can't then you are working too hard. Feeling slightly puffed and sweaty is somewhere around the right intensity. At this level you are more likely to feel better, and feel able to stick with it because you enjoy the feeling.

Discussion question: How easy or hard is it to maintain body weight, i.e. not losing weight but not increasing in body weight?

What happens to the energy we get from food?

JUST BEING - Energy is used for all basic functions: heart beating, lungs breathing, and liver, kidney and brain performing their functions. This is your Basal (or Resting) Metabolic Rate (BMR or RMR). It keeps your body ticking and uses about 60-70% of your energy intake. BMR varies between individuals but for men the approximate BMR = 7000 kJ per day, for women 6000 kJ per day. Men have a higher BMR largely because they have a higher proportion of muscle cells that burn more energy than fat cells.

USING FOOD - When you digest food it takes energy to break it down into nutrients that the body can use. This uses about 10-15% of your energy intake.

MOVING - Every time you move you use up kilojoules - having a shower, brushing your teeth, combing your hair, collecting the mail, cutting up vegetables, ironing, walking up stairs, hanging washing, mowing the lawn, shopping. Even fidgeting uses energy - some studies have shown that people who fidget are less likely to be overweight! Activities such as sports, brisk walking or a bike ride will burn extra energy on top of that used in normal daily activities. 'Moving' burns up about 20% of your energy needs.

The Healthy Living Pyramid reminds you to "Move more"

Discussion questions:

What suggestions do participants have to find ways to 'move more' in their life?

What difficulties will people have with this? How can they overcome these difficulties?

How can they incorporate incidental exercise into their daily life, i.e. at work, at home?

430pm-500pm: Wind-Down.

What has each participant learnt from this session?

What are some strategies you will try to use in the future?

What will be the obstacles to following these strategies?

How may you be able to overcome these obstacles?

SUNDAY

SESSION 4: PHYSICAL ACTIVITY

900am-1015am:

Physical Activity

It is difficult to over-emphasise the importance of physical activity, not only in weight control but for general health and fitness as well. The simplest and most appropriate physical activity for most people is walking—just adding 30 minutes of brisk walking to your daily activity pattern may be enough to tip the ‘energy balance’ in favour of reducing weight. If you lose 0.5–1.0 kg of excess body fat per month, your weight will have come down by about 9 kg in a year. For someone whose initial weight was 90 kg, this represents a 10% weight reduction, enough to make a substantial difference to your health and ‘metabolic’ fitness (i.e. blood pressure, cholesterol, triglycerides and so on). Once your weight has stabilised at the new (lower) level, it is essential that you continue with your new lifestyle of slightly lower food intake and increased physical activity, or the weight will simply go back on. In other words, there is no point going on ‘a diet’; rather, the changes you made to lose weight must now be a permanent part of your life.

Get your body moving

Regular activity or sport is part of the healthy lifestyle that Nutrition Australia recommends for all people. For some, the benefits are to stay in shape or to enjoy the company of fellow exercisers. It is mostly personal satisfaction that drives us to achieve our sporting goals or to maintain good health through an active lifestyle. Special attention to nutrition will ensure that you get the best from the activities of your choice, and maximum benefits over the long term. Whether health, enjoyment or performance is at stake will depend on the situation, but each of these issues may be important to you.

The National Physical Activity Guidelines for Australians

1. Think of movement as an opportunity, not an inconvenience
2. Be active everyday in as many ways as you can
3. Put at least 30 minutes of moderate-intensity physical activity on most days
4. If you can, also enjoy some regular vigorous exercise for extra health and fitness

Discussion questions:

What difficulties are participants having in meeting these guidelines for physical activity?

How can they overcome these difficulties?

What are some of the barriers to being able to do enough physical activity?

How can you overcome these barriers?

For most of the time that humans have been on Earth there has been no need for anyone to be advised to ‘be physically active’. Our forebears, who were ‘hunters and gatherers’, did not have the luxury of being able to choose to be active or sedentary - not if they wanted to eat, anyway! After hundreds of thousands of years of required activity, most

people (at least in Western countries) are now free to be inactive if they so wish. The advent of aeroplanes, trains, cars, electric windows, remote controls, computer work stations and so on has meant that the vast majority of Australians can now choose to be largely sedentary and still live (or at least exist!) A few people still do have active occupations (eg, labourers, infantry soldiers, professional sportspeople); for such people there is still no choice but to be physically active. For the remainder (the vast majority of the population) physical activity is an 'optional extra' that requires a conscious choice to be made.

The motivations to be active can vary: some people choose to be active for general health; for others the motivation may be physical fitness, weight control, social contact or simply sheer enjoyment.

How much exercise is necessary for general good health?

Certainly, very high levels of exercise are associated with low levels of blood cholesterol, body weight, blood pressure and so on, even when the diet is extremely high in fat. The results of many studies in the West strongly support the belief that moderate physical activity is protective against a wide range of diseases - especially diabetes, stroke, colon cancer, and breast cancer. It is also likely that moderate physical activity has some positive benefit on the risks of stroke and osteoporosis (chalkiness of the bones) and it is believed to foster social and mental well-being. For example, exercise has been used successfully as an adjunct in the treatment of mild, chronic depression.

Discussion question:

What are participants' views on the role of physical exercise in their life?

1015am-1025am: Quick break

1025am-1115am:

The Active Australia Campaign recommends that for general health, 'You only have to and it doesn't have to be taken in 'one hit'. Rather, if you find it more convenient, you might prefer to take part in several short (eg, ~10 minute) periods of activity through the day, adding up to ~30 minutes of accumulated moderately-vigorous activity. If, however, you want to 'get it over and done with', it is suggested that you do one bout of ~30 minutes of moderately-vigorous activity on most days. This raises the question 'what constitutes "moderately-vigorous activity"?'. Perhaps the most appropriate answer is 'any activity that causes you to start breathing a little harder than normal and causes your heart to start beating noticeably faster than usual'. If your breathing rate is elevated to the extent that you can still talk normally (just), but you cannot sing, you are exercising at about the right level of intensity. The activity of choice will depend on the availability of facilities, personal preferences, age and capabilities. Examples of suitable activities that you can do on your own include:

Walking: Good for nearly everyone because it is 'weight bearing' and hence likely to be protective against osteoporosis in the legs, hips and (to some extent) in the spine.

Swimming: Good for people who are carrying a lot of extra body fat (and for everyone else who can swim), but water activities do require access to a pool or to the sea.

Bike riding: Something that can be conducted either outside in the fresh air, or in the privacy of your home (on a stationary bike).

Classes in aqua-aerobics for the unfit, the elderly or beginners; martial arts; jazzercise; aerobics; circuit training and so on are widely available. Similarly, dance classes are becoming very popular and cater for people of all ages. Organised activities such as these have social benefits, too.

Other suitable forms of exercise (depending on your age and skill level) include the traditional organised sports such as tennis, golf, netball, basketball, indoor cricket, softball and so on. There are now many organised social competitions in these and similar sports that cater for people over a wide range of ages and skill levels.

Discussion questions:

What types of activity do participants most enjoy?

What stops you from engaging regularly in this form of exercise?

How can you overcome this?

In addition to ~30 minutes of moderately-vigorous activity on most days, it would also be appropriate to include in your activity program some resistance activity and flexibility training (e.g., stretching) for promotion of general health. Resistance training assists with maintaining strength and muscular endurance. This is especially important for older people because our muscles lose strength with ageing. Resistance exercise is the only form of activity that will slow down the rate of loss of strength.

Discussion question:

Do participants have any ideas on how they can develop an adequate exercise schedule?

1115am-1130am: Wind down

What has each participant learnt from this session?

What are some strategies you will try to use in the future?

What will be the obstacles to following these strategies?

SESSION 5: PHYSICAL FITNESS AND ENERGY

1230-115pm:

If I want to maintain a fairly high level of 'all-round' physical fitness, what is an appropriate training program?

A training program that involves five or six days per week, with 20-30 minutes of vigorous activity on each training day, and with one or two days of rest and recovery, is ideal for the non-specialist sportsperson. It is also worth emphasising that to be of value, fitness training must be conducted on a regular basis. Fitness that took weeks or months to acquire will be largely lost after just three weeks of inactivity. Fortunately however, fitness can be re-gained just as quickly as it is lost, if the break from exercise is not prolonged. A big problem with today's busy lifestyles is finding the time to train. Many people find that they maintain a fitness program better if they make fitness training a part of their daily routine -- for example, setting aside an appropriate amount of time for training at much the same time each day. In this way, training becomes as much a 'habit' as putting on makeup or shaving. Some people also find that it helps with motivation if they keep a diary of their fitness training, noting such things as when they increase intensity or duration of activity and how many kilometres they are now running (or similar information).

Discussion questions:

What training programs have participants done in the past, and in the present?

What difficulties did you have sticking to this program?

How can you overcome these difficulties?

What training goals do participants have?

What may be some obstacles in meeting these goals?

How can these obstacles be overcome?

What are the types and intensities of training I should be doing for allround fitness?

For general fitness, the most important types of activity are aerobic training, strength training (also called 'resistance training') and flexibility exercises. A good exercise program will improve all these aspects of fitness and it will also help you to improve (or maintain) balance and good posture.

Aerobic Activity

This is probably the most important component for general fitness and health. 'Aerobic fitness' can be defined as the ability to continue to do fairly hard physical work (where the work may be any vigorous activity) over a prolonged period (e.g., for 30 minutes or more). Aerobic exercise includes walking, jogging, cycling, swimming, rowing and machine-based stair climbing (among many other activities). To improve aerobic fitness it is appropriate to exercise vigorously for 20-30 minutes continuously, three to five times per week. When commencing a program, 20 minutes of aerobic activity --

conducted three times a week -- will improve your fitness significantly. To obtain a training effect, you will need to exercise at a rate that requires you to breathe fairly heavily and that causes your heart to beat much faster than usual.

It is important to start at a low intensity and increase this over the following few weeks as the exercise feels easier. For example, 20 minutes of walking, jogging or a combination of walking/jogging may be sufficient to leave you rather breathless and fairly tired at the start of your program, but as the weeks go by, you may need to increase the pace or introduce jogging up some shallow hills to achieve a further increase in fitness. To continue to increase your fitness level, you will have to increase the time spent exercising aerobically to ~30 minutes per session for up to five sessions per week.

Using a variety of exercise types, intensities and durations is important; that is, do not get 'bogged down' into doing the same exercise each time you train. This would quickly become boring and would not lead to all-round fitness. Although a warm up is not necessary before gentle jogging, cycling or similar aerobic activity, the 'cool down' period following the activity is the most appropriate time for stretching to improve flexibility.

Discussion questions:

What types of aerobic activity are participants doing?

What stops you from doing aerobic activity?

How can you overcome this?

If they are not already exercising, what would they like to start doing?

How can they ensure that they will actually follow through on doing this?

What are some of barriers?

What are some of the solutions?

Strength Exercise

The aim of strength exercises is to improve muscular strength and muscular endurance. These two components are closely related. Many of the tasks that we carry out as part of daily living require a certain amount of muscular strength and endurance. Lifting the shopping bags into the car, walking up a set of stairs, pruning the hedge and so on all require some strength and muscular endurance. Even maintaining good posture while sitting requires muscular endurance. A strength program can also target muscles that are not used very often and so become weak, causing muscle imbalances that can lead to injury or pain. Increases in strength and muscular endurance can be achieved at any age, from childhood to well past retirement age. The 'overload principle' is used to develop muscular strength and endurance. This means gradually increasing the work the muscle has to do, leading to a slow but steady improvement. As in the case of aerobic fitness, it is important to start slowly and build up strength and muscular endurance over several months. Strength and muscular endurance can be improved through weight training, or by using your body weight as the source of resistance (exercises such as push ups, dips, squats and crunches are appropriate) or, better still, with a combination of these.

Discussion questions:**What types of strength activity are participants doing?****What stops you from doing strength activity?****How can you deal with this?****How can participants incorporate strength training into their schedule?****How can they ensure that they will actually follow through on doing this?****Barriers? Solutions?****115pm-125pm:** Quick break.**125pm-215pm:****Energy - Fuelling your body**

You need to provide your body with enough energy (kilojoules) to meet the demands of training and enable proper recovery between exercise sessions. The three main nutrients from food that supply the body with energy are carbohydrate, fat and protein. These can be obtained by eating foods from the five food groups. The main fuel used during exercise is carbohydrate (in the form of glucose) which is stored in muscle as glycogen. As you exercise, your muscles use the stored glycogen. Muscle can usually store enough glycogen for about 60-90 minutes of high intensity exercise, and these stores need to be replaced between exercise sessions by eating foods high in carbohydrate. Inadequate carbohydrate intake can lead to muscle fatigue which can affect performance. Meals should be based on nutrient-rich carbohydrate foods such as cereals, breads, pasta, rice, fruits, vegetables and legumes. Milk and yogurt also provide carbohydrate in the form of the milk sugar, lactose.

Foods high in refined sugar, such as lollies, soft drink, honey and jam, also contain carbohydrate. These foods can be a useful additional source of carbohydrate for athletes with very high energy requirements. However they are not a source of protein, vitamins or minerals and should not replace nutrient rich carbohydrate foods.

Discussion question:**What foods do participants generally eat before or after exercise?****Protein**

Protein helps repair and rebuild muscle after exercise and can also be used during exercise as an energy source, particularly when carbohydrate reserves are very low. Protein needs of most athletes can be met by a wellbalanced diet. You should consume a wide variety of high-quality protein foods such as chicken, turkey, beef, lamb, pork, fish, eggs, dairy foods, nuts and seeds. Some athletes, such as strength trained or endurance athletes often need more protein, with requirements of 1.2-1.6g per kilogram of body mass per day. Such intakes can generally be achieved by the overall increased food intake required to fuel training. Protein supplements and shakes can be very

expensive and are not usually necessary. You can make a high-protein milk drink at home at a fraction of the cost by adding skim milk powder to your normal milk drink. Skim milk powder can also be added to other meals such as soup or cereal to further boost protein intake.

Fat

Fat provides the main fuel source for long duration, low to moderate intensity exercise such as marathons. Even during high intensity exercise, where carbohydrate is the main fuel source, fat is needed to help access the stored carbohydrate (glycogen). You should include moderate amounts of 'healthy' fats into their daily diet, such as nuts, seeds, fish, reduced-fat dairy foods, lean meat and avocados. Foods high in 'unhealthy' fat and low in other nutrients such as biscuits, pastries, chips and deep fried foods should be limited. It is generally not advised to eat foods high in fat immediately before or during intense exercise as fat is slow to digest and can remain in the stomach for a long time.

Hydration

Good hydration is one of the most important nutrition priorities for athletes. During exercise your body produces sweat to help cool it down. Athletes who train for long intervals or in hot conditions can lose large amounts of fluid through sweat, which can lead to dehydration. Even small amounts of fluid loss can significantly impair performance. It is essential that you drink fluid before, during and after exercise to replace fluid lost from sweating. Keep in mind that thirst is not a good indication of fluid loss. By the time you feel thirsty your body is already dehydrated.

Discussion question:

What are some strategies that participants could ensure they eat enough protein and fat, and drink enough water to be adequately repairing muscle and rehydrating?

215pm-230pm: Wind-Down

What has each participant learnt from this session?

What are some strategies you will try to use in the future?

What will be the obstacles to following these strategies?

How may you be able to overcome these obstacles?

SESSION 6: DIABETES

300pm-345pm:

What is diabetes?

When a food containing carbohydrate is eaten, your body digests the carbohydrate into sugar (called glucose), which can then be used as energy by the cells in your body. Diabetes is a condition where your body can't properly control the amount of glucose in your blood. A hormone called insulin is needed for transferring glucose from the bloodstream to enter the body cells and be converted to energy. In people with diabetes, blood glucose levels are often higher than normal because either the body does not produce insulin (type 1 diabetes) or cannot use insulin properly (type 2 diabetes). High levels of glucose in the bloodstream can lead to short term complications such as:

- passing large amounts of urine
- being extremely thirsty and drinking lots of fluids
- being tired
- having blurred vision
- having frequent skin infections and being slow to heal

Blood glucose levels are normally between about 4.0 and 8.0 mmol/L. People with diabetes should aim for blood glucose levels as near to normal as possible, but individual targets should always be discussed with your diabetes health care professional. Controlling diabetes is important to prevent serious long term complications such as:

- heart and circulation problems
- infections
- kidney disease
- eye problems, which can lead to blindness
- nerve damage to the lower limbs and other parts of the body

Discussion question:

Do participants have any experiences to share with regard to diabetes? Are participants afraid that they may become diabetics?

Types of diabetes

There are three types of diabetes:

- Type 1 diabetes

Type 1 diabetes affects less than 1% of all Australians. It can appear at any age, but most commonly in childhood and early adult life. People with type 1 diabetes cannot produce enough insulin, and therefore they must inject themselves with insulin several times a day.

•Type 2 diabetes

Type 2 diabetes is the most common form of diabetes, affecting 7.1 % of all Australians over the age of 25 years. This type of diabetes most often occurs in people over 40 years of age who are overweight and/or have a family history of type 2 diabetes. In type 2 diabetes, the body is unable to use insulin properly (they are insulin resistant) and the pancreas may not make enough insulin. Type 2 diabetes may be treated by diet, exercise and/or tablets. Insulin injections may be required. Gestational diabetes Gestational diabetes occurs in around 5% of all pregnant women in Australia, usually occurring between 24 and 28 weeks of pregnancy. The hormonal changes of pregnancy combined with a predisposition for poor insulin production or utilisation, results in increased blood glucose levels in the mother and the baby. For most women with gestational diabetes, the diabetes will disappear after the baby is born. However, 30-50% of women who have gestational diabetes go on to develop type 2 diabetes later in life.

Managing diabetes

For people using insulin, regular physical activity and a healthy diet that is well matched to insulin medication is key to well-controlled blood glucose levels. They also need to consider the timing, amount and type of carbohydrate foods they eat, as well as the timing, amount and type of insulin they take. Regular blood glucose testing will help you manage your diabetes. All people with diabetes should avoid smoking.

Healthy eating tips for people with diabetes

A healthy diet used in the treatment of diabetes is similar to the diet recommended for all Australians. To help manage your diabetes, Diabetes Australia recommend that you:

1. Eat regular meals and healthy snacks spread over the day
2. Base meals on high fibre carbohydrate foods such as wholegrain breads and cereals, beans, lentils, vegetables and fruits
3. Watch the amount of fat you eat and limit the amount of saturated fat by choosing lean meats and low fat dairy foods. Try to avoid fried takeaway foods, pastries and biscuits
4. Keep your weight within the healthy weight range by matching the amount of food you eat with the amount you burn up each day

Discussion questions:

Are participants motivated to lose weight and develop a healthy lifestyle because of the fear of becoming a diabetic?

What steps will participants take to minimise the risk?

345pm-355pm: Quick break

355pm-430pm:

Carbohydrates and the glycaemic index

The amount of carbohydrate in a meal is the most important factor influencing blood glucose levels after a meal. Foods containing carbohydrate include breads, cereals, rice, pasta, grains such as barley and couscous, fruit and fruit juices, legumes and some

vegetables such as potato, sweet potato and corn. Milk and yogurt are also a source of carbohydrate in the form of the milk sugar, lactose.

The glycaemic index (GI) is a useful tool to choose foods to help control blood glucose levels in people with diabetes. Carbohydrates in food are digested and absorbed at different rates. The GI is a way of ranking carbohydrate-containing foods (from 0-100) based on whether they raise blood sugar levels a lot, moderately or a little. Carbohydrate containing foods that are digested quickly will result in a high blood glucose level and have a high glycaemic index (high GI foods).

Foods with a GI 70 and above are classified as high GI foods. Carbohydrate foods that are digested more slowly raise blood glucose levels more slowly, and so have a lower glycaemic index (low GI foods). Foods with a GI 55 and below are low GI foods. Eating foods with a low GI can help people with diabetes control their blood glucose levels. Eating moderate amounts of low GI carbohydrate foods regularly over the day will help you maintain consistent blood glucose levels. Low GI foods also stop you from feeling as hungry, which may help you to manage or lose weight. Healthy, low GI food choices

- Milk and dairy foods – reduced or low fat varieties of milk and dairy foods are the best choices for people with diabetes.
- Bread – wholegrain, fruit loaf and sourdough. Breakfast cereals – traditional porridge, natural muesli and some high fibre varieties.
- Pasta and noodles – all varieties. Some varieties of rice – ‘Basmati’ and ‘Doongara’ varieties are moderate to low GI.
- Grains – barley, bulgur and semolina.
- Legumes – beans (e.g. baked beans, kidney beans, soy beans), peas and lentils.
- Fruit – apple, orange, pear, peach, grapes, kiwi fruit, banana, plums.
- Vegetables – most vegetables have low amounts of carbohydrate and therefore have little effect on your blood glucose levels. Vegetables with a significant amount of carbohydrate include potato, sweet potato, yams and sweet corn. Orange sweet potato, yams and sweet corn are the lower GI choices.

Discussion question:

How useful have participants found the GI in determining what kinds of foods to eat?

430pm-500pm: Wind-Down.

What have participants learnt from the workshop as a whole?

What changes will participants be making in their daily lives?

References

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Appendix T: Qualitative Data for Study 3

Initial enquires to attend the workshop

“I’m really excited to be taking part in this”

“Would really love to participate in this study”

“Today I was at the doctor and I saw your advertisement. Yes, I need to lose 30kg and am very interested in what you have to say”

“I live up near the Gold Coast and I am prepared to fly down for the weekend”

“Definitely very interested”

“Please consider me for the weight-loss workshop”

“Count me in!”

“This sounds interesting and I am a willing participant”

“That sounds fantastic and I would love to be involved”

“I would love to join your group but I must warn you that I have been on a diet since potty training and am still overweight”

“I just saw your flyer about finding participants for your study. If you are still looking, let me know. I’m female, fat, and not in a program for weight loss”.

“That program sounds interesting...my posture is mainly sitting and using the computer. I tend to gain easily”

“Yes I do intend on continuing to lose weight this year, and I figure I can use every bit of help possible. I’d really be interested to see if your weight-loss group would be helpful in getting me back on track”

“I could come this weekend to participate in your study but only if there is going to be benefit to me. I desperately want to lose weight.”

“Many thanks for allowing me this opportunity – I really need to do something about my weight which has been an ongoing drama throughout my life.”

“I am interested in your two-day workshop. I am 54, obese, and have struggled with my weight for most of my life – i.e. yo yo dieting since the age of 11 and having bulimia from 1984-2001. I do not diet these days as I have found it, long term, a future exercise, as I only regain the weight. Plus, I hope that I fit the criteria.”

“I have been having problems with my weight all my life. I am willing to try and stick with a regime. Hope you can help me. I binge eat when I am stressed and this week alone I gained 1kg. I would appreciate a way I can redirect myself out of this loop”.

Participant feedback from the treatment group

“Thank you so much for this opportunity of a new start in life. It’s a wonderful program and I believe it works. Thank you for the tools to build a new future. The group facilitators are great and the ladies in the class were great to be with also. Many pennies dropped and to go into battle of the bulge will be victorious now. Thank you for putting your advertisement in the doctor’s clinic where I found it and am now equipped to go on and become victorious and stay on top. Thank you for caring for others”.

“I found the two days very interesting and informative but have doubts about the relevance to me. I rarely get depressed or angry and sleep extremely well. I am not aware of binge eating, although my daughter suggested I may be surprised, especially if I kept a food diary. Also, although the girls were very nice and helpful, I would have had more faith in somebody who had experienced weight problems. These lovely young ladies obviously had not!”.

“Let me start by saying it was I feel, a beneficial exercise for me. I enjoy learning and have come to see how much we can achieve by strengthening our minds. People are happy to help but they want to be treated as if they are important. We were asked to introduce ourselves and why we were there and the facilitators didn’t really explain themselves or ‘their’ right to be facilitating the session.”.

Participant feedback from the active control group

“I feel the content could have been presented in one day, with the small group we had. It didn’t seem like we were learning much from the booklets, most of the information I have to say that I knew already. The group discussion worked for me, it helped to hear that all the other participants had similar thoughts and feelings to what I did”.

On reflection, I *did* learn new things about nutrition, as the group facilitators and the other participants steered me in the right direction where I was following bad information! I’d previously thought that whole oats take several hours to cook, but it turns out you can cook them in half an hour (much handier for winter breakfasts!). And where I’d been obsessing over the lowest possible GI starches, I should be simply choosing a lower GI alternative to what I normally eat. They also presented new ways that I could incorporate healthy eating, exercise, and attitudes into my lifestyle. So that’s definitely new information I can work with.

But it was invaluable for finding out *why* I have trouble implementing what I know. I had quite a few breakthrough moments where the penny suddenly dropped as to why I eat too much, why I eat the wrong things at times, and why I’m not getting enough aerobic exercise.

I’ve already started incorporating Jessica* and Chanelle’s* suggestions into my lifestyle. I’m feeling really positive about these changes because I’m enjoying doing them, I’m not feeling like I’m suffering for an elusive long-term goal that may or may not eventuate like I did previously. As I can now identify why I resisted these changes before it’s making it easier to overcome these barriers. I’m eating better, starting to exercise and drinking a lot less alcohol. I hope to report some very positive results from these changes in my follow-up questionnaires!

Thanks for letting me take part in this. It’s really made a big difference in my outlook and lifestyle”.

What worked well was that the three of us were willing to actively participate. Day 2 in the morning was a little repetitive the difference between exercise and fitness was not really clear and it seemed a bit of a waste of time. I was expecting more examination of the motivation for eating, but perhaps that was another group. In any case, I actually found it quite helpful and have already applied a couple of new strategies”.

Facilitator feedback from the treatment group

“I found the groups to be enjoyable and participants positive. There was definitely a lot of information given, which could impact the degree of understanding and does not allow for practise at home and bring in difficulties - some of the participants commented on this. I do think however that all participants could and most likely will have taken something away from the groups. They spoke at the end the areas that they most benefited on and it was either mindfulness or distress tolerance that would help. The last 3 members were struggling a lot with the emotions component and I found they were most resistant to this than anything else - they all saw the benefits but only 1 openly said she would look into that further. One member actually said she was unable to explore the emotions part as she believed she could not control that yet. The other was blaming of others and unwilling to take personal responsibility. The structure of the groups could be changed around a little - such as more time on some content and less on others. Overall, the flow of the group was good though. Also, my group found discussion very helpful and found this to be very useful.

As for the participants, the three that remained were ready for change. This definitely assisted in the running of the group as we were not stuck on one participant who remained resistant. They were all very body image/self-identify/self esteem issues that were higher than the norm that were not fully able to be explored that could impact change. The one member who did not return had very high anxiety and very strong self esteem issues. It was, I could guess, her anxiety that inhibited her and unreadiness to change that stopped her.

Personally, I enjoyed running the group. I had thankfully covered similar content in the past and found that knowing what others had said/thought was helpful. At times I found that I had to verge off the specific content to explain or verify the content but overall the manual was enough. The groups were too long for one day as by 3-3.30 the participants were too exhausted to think more and most of the work was done in the morning.”

“Firstly, it was a great experience for myself and judging by the feedback, every member of our group feels that they got something beneficial out of the weekend. There was general consensus that they would have liked to have had some of the written material from Linehan to look over while Amy* and I were reading it out. I understand this might be difficult due to copyright etc. Otherwise, I really enjoyed it and think a DBT type treatment for obese/overweight people and overeaters is long overdue.”

Facilitator feedback from the active control group

“I think in the beginning they were receptive to the information, there was a fair amount of clinical issues mostly with a PD flavour. There was a lot of externalising of the blame and locus of control. They worked well together in that they encouraged each other a fair bit. .. and were fairly supportive and exchanged numbers. Two members travelled together to the Sunday session. There was some tension between Georgina* and Susan* but it was kept within the constraints of constructive criticism. I think in terms of real intervention around obesity, Mary* was the one who needed it the most ... other than that the others just needed to work on some other clinical issues. The most well adjusted was Kirsten*. I think deindividuation from family was the challenge there.

I think the end of the group on Sunday was a bit low because Susan* expressed dissatisfaction in that her needs of understanding psychological factors was not met and was quite vocal. Mary* played the pacifier role and attempted to bring calm... a role I suspect she adopts quite a bit. But I believe the group facilitator was very capable in diffusing the tension and letting Susan* express her concerns. At the end, she said she would take it up with the researcher. We had more discussion about the topic material

than actual going over the material as we seemed to have a very well informed group with regards to content overall over the two days.”

“Kara* and I really enjoyed working together and think we made a good team. The group felt much more cohesive on the Sunday. On the Sat, after Emily* left, we asked the group how they felt about her leaving and any responses they had. Group members weren't very vocal about their response to this, just that they felt she wasn't contributing much. We already gave you some feedback about Emily* leaving; basically it was her own issues; she didn't like that we didn't start exactly at 9 and didn't like that we read bits out of the manual. She also said that she didn't learn jack in the morning. When asked about her motivation for attending the group, she said that it was because it was really hard being a PhD student and she wanted to support the researcher. She didn't mention weight-loss. The group really responded to the progressive muscle relaxation- all participated fully and thought that it something that they could use to deal with stress.

The group members said that they did learn a few things over the weekend and gained some insights. Particularly just small changes that they could make to their lifestyles that may help them lose some weight.

Common barriers to change that the group expressed were difficulties putting themselves first and saying no to other people, not enjoying exercise and finding it difficult to prioritise exercise over other things. Also of interest was that despite all of them saying how much they enjoyed food and how pleasurable it was, all did a million other things while eating, such as TV, on the computer etc. Also some all or nothing thinking, and perfectionism, and looking for the "one" thing that would help them change. One participant had a multitude of books, DVDs etc. re: weight loss, and strongly identified as being 'overweight'. All had some form of fitness equipment in the garage, treadmills, elliptical trainers etc.

Kara* and I were mindful that we were the control group, and so held back in terms of challenging the group too much. Some just blatant contradictions we gently pointed out. We probably added a little more in terms of our knowledge re: weight loss but tried to keep the psychological content to a minimum. We found this hard because we really didn't want the weekend to be a waste of time for participants. They said that they knew most of the info already but found it helpful to spend the time discussing it in more detail. We finished about 3.30pm on the Sunday as we couldn't string it out any longer.”