EVALUATING A COMPREHENSIVE WEIGHT CONTROL PROGRAMME FOR OBESITY MANAGEMENT: THE CONSIDERATION OF PSYCHOLOGICAL FACTORS IN TREATMENT OUTCOME.

A thesis submitted in partial fulfillment of the degree of Master of Arts (Psychology), in the Faculty of Social Science and Humanities.

by

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"If cure from obesity is defined as a reduction to ideal weight and maintenance of that weight for five years, a person is more likely to recover from most forms of cancer than from obesity."

(Brownell, 1982)
I would like to thank my supervisors, Johann Louw and Danie Le Grange, both of whom gave generously of their time and knowledge over the years. A special word of thanks must go to the Medical Research Council's Charl Badenhorst, for having the confidence in me to let me undertake this research project, and statistical consultant Ilse Stander, for her many hours of advice and input. I would also like to extend my appreciation to my bursar's: The Human Sciences Research Council, U.C.T. Research Scholarships Council, The Masonic Education Fund and the Clegg Foundation, without who's financial contributions this thesis would not have been possible. To my family and friends - 'thanks for your support guys!' Finally, I am particular indebted to Henriette Le Grange, without whose inspiration and encouragement, I would have had neither the motivation nor the perseverance to complete this task.
Abstract:

Obesity (BMI > 30 kg/m²) is a major health and psychosocial problem worldwide, for which no single consistently effective intervention has been found. In particular, obesity has a substantial impact on psychological well-being. Positive value is given to thinness in western society, thus stereotyping the obese as aesthetically displeasing, and subjecting them to prejudice and discrimination. Psychological distress often observed in obese individuals, can be seen as a direct consequence rather than a cause of their condition.

The high prevalence of obesity in all South African racial groups is striking, however, as yet no formal weight loss clinics exist in either outpatient or primary health care settings in this country. The aim of this study was to evaluate the effectiveness of a 24-week comprehensive behavioural weight management programme (CWCP) for outpatients, paying particular attention to psychological factors. The programme consisted of eating behaviour modification, nutrition education and increased activity levels. A randomised controlled trial was designed, and obese volunteers (n = 155), recruited through media advertisements, were assigned to either the experimental (CWCP) or control group (who received standard treatment). Four trained dieticians conducted the weekly, one-hour group sessions at Tygerberg Hospital. Subjects were required to undergo baseline, three, six and twelve month assessments, which included demographic, anthropometric and psychological measures. The psychological tests used consisted of the Beck Depression Inventory, The Robson Self-esteem Scale, The Eating Inventory, the Family Adaptability and Cohesion Evaluation Scales, and the Stress Vulnerability Scale.

The results showed that the experimental group receiving the CWCP showed significantly better psychological adjustment than did the control group, despite only marginal differences observed in the average weight loss obtained between the two groups. Findings suggest that in evaluating the effectiveness of treatment, success should be defined, not only in terms of weight loss, but also in terms of improved quality of life brought about by enhanced psychological functioning. In order to improve weight management for outpatients, it is imperative that health care professionals should incorporate psychological factors in their treatment modalities.
Table of Contents:

Acknowledgements II
Abstract III
Table of Contents IV
List of Figures and Tables VII
Preface IX

PART 1: THEORETICAL UNDERPINNINGS

CHAPTER 1: INTRODUCTION AND OVERVIEW 1
1.1 Definitions And Prevalence Of Obesity 1

1.2 Perspectives On The Development And Maintenance Of Obesity 4
   1.2.1 Genetics and human obesity 4
   1.2.2 The influence of environmental factors 6
   1.2.3 Psychodynamic vs. behavioural perspectives of obesity 7

1.3 Health Risks Associated With Obesity And The Consequences Of Weight Loss 10

CHAPTER 2: AN APPRAISAL OF CURRENT TREATMENT MODALITIES 15
2.1 The Basis Of Treatment 15

2.2 The Effectiveness Of Obesity Treatment 16
   2.2.1 The use of diets in obesity treatment programmes 16
   2.2.2 The behaviour modification approach 18
   2.2.3 The importance of exercise in weight control 21
   2.2.4 A comprehensive approach for treating obesity 22

2.3 Ethical Considerations In Obesity Treatment 26

CHAPTER 3: METHODOLOGICAL IMPERATIVES IN OBESITY RESEARCH 29
3.1 A Critical Assessment Of Issues Relating To Methods And Design 29

3.2 Measures Of Outcome 33

3.3 Factors Predicting Weight Loss 34

3.4 Confronting The Problem Of Attrition 35
CHAPTER 4: PSYCHOLOGICAL AND SOCIAL ASPECTS OF OBESITY AND WEIGHT LOSS

4.1 The Social Context Of Obesity 38

4.2 The Psychological Status Of Obese Persons 40

4.3 Psychological Symptoms Specific To The Obese 42
  4.3.1 Depressed mood 42
  4.3.2 Self-esteem 43
  4.3.3 The concept of restrained eating 45
  4.3.4 Binge eating 47

4.4 Detrimental Psycho-Social Influences 49
  4.4.1 Life stressors 49
  4.4.2 Family dynamics 50

4.5 Rationale 54

PART 2: THE EMPIRICAL STUDY

CHAPTER 5: METHODOLOGY 56

5.1 Motive For The Study 56

5.2 Aim 57

5.3 Specific Objectives 58

5.4 Method 58
  5.4.1 Study design 58
  5.4.2 Subjects 58
  5.4.3 Procedure 59
  5.4.4 Measurements 62

5.5 Ethical Approval 68

5.6 Statistical Analysis 68
CHAPTER 6: RESULTS

6.1 Demographic Information
6.2 Baseline Assessment
6.3 Three-month Assessment
6.4 Six-month Assessment
6.5 Follow-up Assessment
6.6 Modelling
6.7 Attrition Analysis

CHAPTER 7: DISCUSSION

7.1 Demographic And Baseline Comparisons
7.2 Anthropometric Comparisons
7.3 Psychological Change
7.4 Psychological Predictors Of Outcome
7.5 The Perils Of Attrition
7.6 General Conclusions

PART 3: FINAL CONSIDERATIONS

CHAPTER 8: THE CHALLENGE FOR OBESITY MANAGEMENT

8.1 Weight Loss Maintenance And Preventing Relapse
8.2 Psycho-Social Deliberations
8.3 Cultural Perspectives On The Treatment Of Obesity
8.4 Finale

REFERENCES

APPENDIX A & B
List of Figures and Tables:

Table 1: The Percentage of Overweight and Obese Persons in Several Westernised Countries 3
Table 2: The Percentage of Overweight and Obese Persons by Ethnic Group in South Africa 4
Figure 1: The Relation of Body Mass Index to Excess Mortality 11
Figure 2: Relapse Rates for Three Types of Obesity Treatment 24
Table 3: Means and Standard Deviations for Obese Samples on the Eating Inventory 47
Table 4: Total Subjects Per Group at the Start of the Trial 61
Table 5: Clinical Ranges for the Eating Inventory 64
Table 6: Norms and Cutting Points for Faces III 66
Table 7: The Demographic Breakdown of the Two Groups Prior to Treatment 69
Table 8: Pre-treatment Characteristics of Subjects According to Treatment Condition 71
Table 9: Mean Baseline Scores for The Eating Inventory 71
Table 10: The Percentage of Subjects Falling in Each of the 16 Family System Types (Groups Combined) 72
Table 11: Mean Changes in the Eating Inventory after 12 weeks of Treatment 74
Table 12: Correlational Coefficients for Weight Loss and Psychological Variables 74
Table 13: Changes in Mean Eating Inventory Scores at Completion of Treatment 76
Table 14: Correlational Coefficients Observed at the End of Treatment 77
Table 15: Mean Weight Loss Broken Down by Binge Severity Level 79
Table 16: Mean Weight Losses over a 12 Month Period 79
Figure 3: Mean Depression Levels Plotted Over Time 80
Figure 4: Mean Self-Esteem Levels Plotted Over Time 81
Table 17: Mean Item Analysis for the 5 Factors of Self-esteem

Figure 6: Mean Changes in the Eating Inventory Scores for the CWCP Group

Table 18: The Mean Slope and Standard Error of Estimates for the Psychological Variables

Figure 7: Weight Changes Over Time

Figure 8: Mean Change in Beck Depression Scores Over Time

Figure 9: Mean Change in Hunger Scores Over Time

Figure 10: Mean Change in Stress Vulnerability Scores Over Time

Table 19: Mean Binge Score Comparisons Between Completers and Drop-outs

Completers and Drop-outs

Figure 11: Diagramatical Representation of Mean Binge Score Comparisons
Preface:

Obesity is a refractory disorder that resists treatment. It is associated with major health and social problems worldwide, for which no single satisfactory treatment, with successful long-term weight loss maintenance, has yet been found. The condition has been associated with among other things increased risk for hypertension, cardiovascular disease, non-insulin dependent diabetes, cancer, gallbladder disease, and psychological distress. Associated health risks such as these have led to the belief that obesity be considered a distinct disease entity associated with a 6 to 12 fold increase in mortality rates (Kral, 1985). The beneficial effects of weight loss on reversing many of the disadvantages associated with obesity have long been known, and inform the central justification for the intent to treat the condition.

In South Africa, the prevalences of obesity is among the highest in the world, and there is a critical need to find safe and effective forms of treatment that can be applied on a primary health care basis. Recent research has shown that obesity is a very complex problem, and that the success of long-term weight loss depends on a comprehensive, multi-disciplinary programme. A holistic approach involving psychological, physiological, genetic and environmental factors, has to be taken in order to change eating patterns and lifestyle behaviours permanently. This state of the art comprehensive approach, usually revolves around the principles of behaviour modification, and addresses all aspects of the obese person's life-style, incorporating medical, dietetic and behavioural aspects in its treatment plan (Wadden, 1993). It is against this background that the objective of this thesis is to evaluate the effectiveness of a locally developed, innovative, comprehensive approach for managing obesity. A fundamental contention permeating throughout this dissertation however, is the belief that to be considered truly efficient, a weight control programme must result in more than just weight loss, it must also lead to improvements in psychological functioning. Consequently, a principal focus of this evaluation, is the consideration of psychological factors in treatment outcome.
In Part one of this thesis, the reader is provided with the basic context for understanding obesity and for appreciating why it is so difficult for the obese person to achieve long-term success. Chapter one serves to define the scope of the problem, and to give a brief description of the nature and prevalence of the condition. In reviewing the origins of the disorder, the standpoint is taken that obesity should be considered as a heterogeneous disorder with multiple aetiologies. The central argument in this chapter, is that obesity is of concern primarily because it has a substantial adverse impact on physical and psychological health.

Chapter two, considers the effectiveness of current treatment for obesity. This review is selective rather than exhaustive. In examining the relapse rates from a plethora of treatment research studies, the suggestion is made that effective and long-lasting treatment for obesity, has yet to be discovered, and the optimal treatment plan remains something of an enigma. Nevertheless, the conclusion of this chapter is that a comprehensive-behavioural approach to treating obesity holds the most promise for the majority of obese individuals seeking long-term weight maintenance. The fact that high rates of relapse have been consistently found in the literature, despite the multitudes of attempts to discover a reliable and effective treatment, has led some theorists to question the ethics of treating obesity at all. However, as outlined in Chapter three, this is a view that can not be endorsed, given the many methodological shortcomings on which past research findings have been based. This chapter thus delineates the ways in which future obesity research can and should make use of more methodologically sound research designs in evaluating their treatment outcomes.

One of the most glaring deficiencies in the obesity literature pertains less to what we do to obese people than to understanding, more completely, the problems faced by those seeking treatment (Brownell & Jeffery, 1987). Based on this view, a central premise underlying this thesis, is that obesity is as much a psychological as it is a physical disease. Consequently, Chapter four takes an in-depth look at the psychological and social aspects that impact on both the obese individual and the treatment process itself. The viewpoint taken in this chapter is that psychological distress associated with the obese state should be considered a consequence and not a cause of obesity! It is argued that many obese individuals experience social discrimination and psychological distress as a direct consequence of their weight. The overwhelming positive value given to thinness and the prejudice against obesity exacerbates the disdain that overweight people have for their own appearance. Concomitantly, the obese often experience serious negative psychological difficulties that are specific to their condition. This chapter then, concludes with a motivation for the pivotal role that a thorough psychological assessment can play, in gaining a more complete understanding of how treatment impacts on the life of the obese individual.
In Part two of this dissertation a report on the empirical study is undertaken. The content of which extends from Chapters five through seven. A random control trial is conducted to compare a comprehensive weight control programme for treating obesity, to an established conventional alternative. As will be discovered, the most consistent finding was the marked psychological improvement of patients receiving the former treatment, despite fairly equivalent rates of weight loss. The general anthropometrical conclusion derived from this study, is that although the prognosis of long-term weight loss maintenance is not good, it is not impossible.

In Part three of the thesis, an attempt is made to extricate from the particular findings of this study to the wider context of the future field of obesity treatment as a whole. The final chapter of this thesis, Chapter eight, endeavours to describe some essential challenges that the discipline of obesity management will have to confront, if it wishes its legitimization to be continued to be seen as authentic. In light of increasingly critical opinion about the nature and effectiveness of what obesity treatment has to offer, and against the realisation that many psychological concomitants of the disorder are socially constructed, this chapter and indeed this thesis, ends with the view that more emphasis should be put on teaching the obese to accept themselves for who they are - fat or not so fat!
PART ONE:
THEORETICAL UNDERPINNINGS
CHAPTER 1: INTRODUCTION AND OVERVIEW

This chapter provides an overview of the problem of obesity. The various definitions and classification schemes of obesity are described and the prevalence rates of obesity in a wide range of Westernised countries, in particular, South Africa, are examined. Various theoretical perspectives on the development and maintenance of obesity will then be considered. Finally, some of the most important health consequences of obesity will be documented, and the impact of reduction in weight on health will be determined.

1.1 Definition and Prevalence of Obesity:

Obesity is defined by an excessive accumulation of body fat. When body fat content equals or exceeds 30% in women, or 25% in men, an individual is considered obese (Perri, Nezu & Viegener, 1992). However, the measurement of body fat is a cumbersome and difficult procedure. As such there have been many attempts to derive more practical and convenient indicators for defining and classifying obesity, using either weight relative to norms, height to weight ratios, or indicators of regional fat distribution (Sjostrom, 1993).

'Relative weight' has become one of the most popular indicators of obesity, and is calculated by dividing a person's actual weight by the 'ideal' weight for his or her height and sex. A relative weight of 20% or more over ideal weight is used as an operational definition of obesity. Stunkard (1984), in attempting to classify obesity, proposed a simple scheme of defining obesity relative to norms. As stated by this classification, persons who are 20-39% overweight are described as mildly obese, those that are 40-99% overweight are described as moderately obese, and individuals 100% or more overweight are described as severely obese. According to Stunkard, about 35% of women in the United States would be considered obese, and of this group mild obesity would account for 90% of the prevalence, moderate obesity approximately 9%, and severe obesity only 0.5% of all the cases.

Although pervasively used, the above definition fails to explicate the fundamental distinction between the terms 'obesity' and 'overweight'. The term 'overweight' refers to weight in excess of some standard or norm and its diagnosis requires information about a patient's weight and height, and a suitable reference table that will allow one to judge if a patient's weight for height exceeds a given norm (VanItallie & Lew, 1992). Furthermore, being classified as overweight would include...
all elements of a person's body composition, such as the percentages of water and muscle distribution, and not just fat distribution. Obesity however, clearly refers to excess body fat, not simply overweight. Thus overweight and obesity can be considered to be two different bodily attributes. Although most overweight people are also obese, it is possible to be obese without being overweight (e.g. sedentary individuals with a small muscle mass) and overweight without being obese (e.g. body builders and certain athletes whose increased weight may reflect an increase in muscle mass only). A further criticism of the relative weight definition, is that the tables of ideal weights most commonly used are seldom representative of the populations for whom they are being compared (Bray, 1986).

An alternative classification scheme for defining obesity that offers several advantages over relative weight, and that will be used as one of the indicators of obesity in this thesis, is the Body Mass Index (BMI). BMI is derived by dividing weight (in Kilograms) by the square of height (in meters). The correlation between BMI and body fat (r's = .7 to .8) exceed the correlations for percentage overweight and other height to weight ratios, and as such represents a preferable indicator of obesity than relative weight or percentage overweight (Perri, Nezu & Viegener, 1992). Garrow (1981, cited in Perri et al., 1992) proposed a therapeutic classification of obesity based on severity. His system has become widely used and distinguishes three grades of obesity based on severity, but defines obesity in terms of BMI rather than percentage over ideal body weight. According to this classification, mild obesity corresponds to a BMI in the range of 25 to 29.9, moderate obesity falls in the range 30 to 40, and severe obesity is characterised by a BMI in excess of 40.

Using the BMI classification system, recent epidemiological surveys have shown that approximately 26% of American adults (about 34 million people) could be considered obese (National Centre for Heath Statistics, 1986), slightly more than that observed in England, Canada and Australia (Millar & Stephens, 1987). These findings support Rand & Kuldau's (1990) conclusion that in the U.S.A., 1 out of 5 adults is at least 20% overweight. The results of a survey of 10 000 persons from the age of 16 to 64 in the United Kingdom, showed that 34% of men and 24% of the women could be described as being overweight (Rosenbaum, 1985). Furthermore, 6% of men and 8% of women surveyed were obese. In general, the prevalence of obesity in westernised countries has been found to range between 4 and 12% (see Table 1), with an additional 20-40% of people being overweight (Bray, 1985).
Table 1: The percentage of overweight and obese persons in several westernised countries

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>Age</th>
<th>OVERWEIGHT</th>
<th>OBESE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>U.S.A.</td>
<td>20-74</td>
<td>31</td>
<td>24</td>
</tr>
<tr>
<td>CANADA</td>
<td>20-69</td>
<td>40</td>
<td>20</td>
</tr>
<tr>
<td>GREAT BRITAIN</td>
<td>16-65</td>
<td>34</td>
<td>24</td>
</tr>
<tr>
<td>NETHERLANDS</td>
<td>&gt;20</td>
<td>34</td>
<td>24</td>
</tr>
<tr>
<td>AUSTRALIA</td>
<td>25-64</td>
<td>34</td>
<td>24</td>
</tr>
</tbody>
</table>

Note: Figures compiled from Bray (1985).

The prevalence of obesity is increasing dramatically throughout the world in parallel with the industrialisation of countries. A comparison with earlier surveys shows this ominous trend: the incidence of obesity has more than doubled since 1900, and particularly large increases in obesity have been noted among children and adolescents (Brownell & Wadden, 1992). It has also been observed that the prevalence of overweight varies according to age, sex, race and social class. Rand & Kulda (1990), interviewed a random sample of 2,115 black and white American adults, aged 18-96, on weight and weight concerns. They found significant age, gender, race and social class differences. Data from the National Health and Nutrition Examination Survey II (1976-1980) (cited in Perri et al., 1992) indicated that 5.5% of black men compared to 12.7% of white men in their early twenties were overweight, with the highest prevalence of overweight (61.2%) occurring in 45-54 year-old black women. The prevalence of overweight among black women at all ages was greater than among white women, and overweight was more prevalent among poor than middle class women. A consistent inverse relationship between prevalence of obesity and social class has also been found among adult women, more upper-class women are thin and more lower class women are heavy (Sobal & Stunkard, 1989). The relationship between prevalence of obesity and social class for men is more equivocal.

Although, obesity has long been recognised in affluent societies, it has also become a major problem in developing countries, including South Africa. As illustrated in Table 2 below, alarmingly high prevalence rates of obesity have been noted among the white, coloured, indian and african populations in South Africa (Jooste, Steenkamp, Benade & Rossouw, 1988; Steyn, Fourie, Rossouw, et al., 1990; Steyn, Jooste, Fourie, et al., 1991; Seedat, Steyn, et al., 1990). In particularly, females older than 30 years of age showed an increased tendency for obesity, with the incidence rate (59%) being highest among black women older than 45 (Steyn, Jooste, Fourie, et al., 1991). Although the prevalence rates for South African men have been found to be much
lower than that of women, the incidence (21%) among white males over 45 years of age was also very high (Jooste et al., 1988).

Table 2: The percentage of overweight and obese persons by ethnic group in South Africa

<table>
<thead>
<tr>
<th>SOUTH AFRICA</th>
<th>Age</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHITE (n = 7188)</td>
<td>15-64</td>
<td>42</td>
<td>39</td>
<td>15</td>
<td>18</td>
</tr>
<tr>
<td>COLOURED (n = 976)</td>
<td>15-64</td>
<td>24</td>
<td>38</td>
<td>6</td>
<td>26</td>
</tr>
<tr>
<td>INDIA (n = 778)</td>
<td>15-64</td>
<td>22</td>
<td>58</td>
<td>3</td>
<td>22</td>
</tr>
<tr>
<td>BLACK (n = 986)</td>
<td>15-64</td>
<td>*</td>
<td>*</td>
<td>8</td>
<td>44</td>
</tr>
</tbody>
</table>

Note: Figures compiled from Jooste et al. (1988), Seedat et al. (1990), & Steyn et al. (1990, 1991)

The prevalence data reported above, clearly illustrates that obesity is a prevailing problem, both locally and abroad, that has begun to reach epidemic proportions. What then can be said about the origins of obesity? For we can not attempt to ameliorate the condition if we do not have a good understanding of the complex interactions that produce and sustain the disorder.

1.2 Perspectives on the Development and Maintenance of Obesity:

The 'cause' of obesity has not yet been conclusively demonstrated, although several factors have been strongly implicated in the development and maintenance of the condition. It has been argued that there are many ways of becoming and staying obese and that many disparate factors influence body weight (Meyer & Stunkard, 1993). Consequently, it is unlikely that any individual factor will come to be considered as a single cause of all cases of obesity and a multifactorial perspective is required. In this sub-section, some of the major contributors to obesity are examined, including genetic, environmental and psychological factors. However, the description of aetiological determinants of obesity does not aim to be exhaustive, and consideration of the physiological aspects of obesity is deemed to be beyond the scope of this overview.

1.2.1 Genetics and human obesity

It has been consistently observed that obesity is a familial disorder that seems to be inherited (Meyer & Stunkard, 1993). Since, familial members share not only genes but also cultural background and environmental conditions, it is often difficult to separate the genetic from the environmental influences (Ravussin & Swinburn, 1992). However, conclusive evidence now
indicates that weight does have a substantial genetic component. Recent studies of both twins (Bouchard, Tremblay, Despres, et al., 1990) and adoptees (Stunkard, Harris, Pedersen & McClearn, 1990) have given evidence for the importance of a genetic basis for obesity.

A study by Stunkard & Sorensen (1986, cited in Foreyt, 1987) examined the contribution of genetic factors in the aetiology of obesity in a sample of 540 adult Danish adoptees. The results showed strong correlations between the weight classes of the adoptees (thin, medium, overweight and obese) and the body mass index of their biological parents. Body weight of the adoptees most closely resembled the weight of their biological mothers, with the next strongest resemblance being the weights of their biological fathers. There was no relationship between the weight of the adoptees and the weights of their adoptive parents. Thus, lean adoptees were just as likely to have an obese adoptive parent as were obese adoptees. By contrast, obese adoptees tended to have obese biological mothers, and lean adoptees lean biological mothers.

The above study was the first to document a strong genetic component to obesity, however a study by Stunkard, Foch, and Hrubec (1986) also suggested that human obesity is under significant genetic control. The authors measured height, weight and body-mass index in a sample of 1,974 monozygotic and 2,097 dizygotic twin pairs. Concordance rates for overweight were twice as high for the monozygotic as for the dyzygotic twins. The results of this study showed a high heritability for height, weight and body-mass index, both at the age of 20 years (r's = .80, .78, & .77 respectively) and 45 years (r's = .80, .81 & .84). Stunkard concluded from this finding that body weight, including obesity, is under strong genetic control and that childhood family environment alone has little effect.

An even more precise way to understand the role of genetics is to compare identical twins who have been raised apart from those who have been raised together. Twins raised together share the same genes and environment, making the distinction between genes and environment difficult. Twins raised apart however, have only their genes in common. A recent study by Stunkard, Harris, Pedersen and McClearn (1990) examined 673 pairs of twins. The most interesting group was the 93 pairs of identical twins raised apart and the 154 identical twin pairs raised together. The findings from these latter groups indicated that the body weight of the twins was the same whether they had been raised together or apart, suggesting that the environment plays little part in determining body weight. The researchers concluded from this study that genetic factors accounted for 74% of the difference in weights of women and 69% of the difference in weights in men. These contentions were supported by Bouchard, Tremblay, Despres et al. (1990), who studied the genetic influence on the bodies ability to gain weight. They examined 12 pairs of lean
identical twins, and overfed them by 1000 calories a day for 100 days. The results showed a high degree of variability in weight gain between pairs of twins but great similarity within each pair. Each twin of each pair not only gained the same amount of weight but distributed excess weight in the same places.

The findings from the studies cited above suggest that the tendency to be obese is hereditary. However, this genetic susceptibility has to have an environment that will nurture its development before it becomes a reality.

1.2.2 The influence of environmental factors

It has long been held that obesity develops from particular kinds of lifestyles, including inactivity, and chronic over ingestion of food (Smith & Fremouw, 1987). Moreover, overeating may be attributed to highly palatable foods, especially those high in fat and sugar content, which are readily accessible to our society.

The composition of the 'Westernised diet' has changed dramatically in the last century. Since 1910, the percent of calories consumed from fat has risen from 32% to 43%, while that from carbohydrate has decreased from 57% to 46% (Brownell & Wadden, 1991). This is significant because the body uses 25% more energy to metabolise carbohydrate than fat. Thus a person will gain more weight eating fat, than from eating the same number of calories in the form of carbohydrates or protein. The increase in fat consumption can be explained in part by the increase in the amount of 'fast food' outlets and 'junk food' consumption (Selafani, 1993). This contention is supported by the findings of Miller, Linderman, Wallace and Niederpruem (1990) who found that dietary-fat intake was significantly and positively related to body fatness in both men and women.

Changes in nutrient intake and eating patterns have coincided with a substantial decline in physical activity (Perri et al., 1992). From 1965 to 1977 alone, caloric expenditure was thought to drop about 200 calories per day. With all the energy saving devices around us today, such as remote control, escalators, electric dishwashers and public transport, it is easy to see why exercise has become the exception rather than the rule. It has been argued that it is this fundamental change in lifestyle that has led to the increased prevalence of obesity, and that the cause of obesity can therefore be reduced to a simple tenant - lack of equilibrium. Body fat accumulates because energy intake exceeds energy expenditure. Indeed studies of physical activity have consistently
shown that obese adults are less active than their non-obese counterparts, and that as the percentage of overweight increases, physical activity decreases (Bray, 1990 cited in Fox, 1992).

The contention that obesity results from overindulgence in food, is largely the assertion that the obese eat more than the non-obese. However, the majority of available research has failed to conclusively demonstrate greater energy intake in obese individuals (Perri et al., 1992). Furthermore, if the above statement were true, one would anticipate that those with greater access to resources, would show higher incidence rates of obesity. Contrary to expectation, there has been consistent observation of an inverse relationship between weight and social class among women (not among men) in developed societies (Sobal & Stunkard, 1989). These findings have been attributed to the mediating influence of certain social attitudes towards obesity and thinness in westernised societies, that selectively influence members of different social classes. Accordingly, upper class women may be more committed to the view that slimness is desirable, and have greater resources to repress their weight through dietary restraint. They may also engage in more recreational activities because of greater leisure time, and social pressures to exercise.

The multiplicity of ways that the environment impacts on the prevalence of obesity should not be underestimated. In particular, given that food can promote overeating and obesity, the challenge is to develop diets that satisfy the palate without stimulating excess fat consumption. This implies that the predisposition to being obese can be controlled by adherence to sensible lifestyle behaviours.

1.2.3 Psychodynamic vs. behavioural perspectives of obesity

In addition to the use of food for nutritive purposes, many individuals eat in response to various emotional and arousal states such as depression, anger, anxiety, or boredom. This introduces the notion of psychological concomitants to obesity, and in particular, to the debate between psychodynamic and behavioural perspectives.

Psychodynamic psychology has tended to view obesity as a manifestation of underlying psychological problems. Consequently, psychoanalytical and psychodynamic interpretations of obesity see the disorder as a symptom of a complex syndrome of conscious and unconscious personality factors (Allon, 1980). As a result psychotherapeutic procedures for treating obesity have focused upon the uncovering of the conflict assumed to have caused the symptom of overeating.
Traditionally, psychoanalytic theory has related obesity to vicissitudes of the early oral period in the child's life when eating is the focus. The obesity is linked to various defensive actions and primitive attempts to fill inner voids, and to disturbances in body image (Bruch, 1973). The body image is considered important as the early forerunner of the ego, and so obesity can be linked to early and severe disturbances in the sense of self. Overeating represents a psychological process wherein the obese individual uses food to cope with feelings of personal inadequacy. This perspective views the obese person as an individual who has not learned appropriate ways of dealing with the problems of living. The overweight person overeats to ameliorate feelings of anxiety or depression resulting from personal ineffectiveness. Food serves as a substitute for maternal nurturance and thereby provides relief from distress. Therapy based upon such theoretical constructs stresses the difficulty of effecting and maintaining change without an alteration of the personality disturbance which is often considered severe (Bruch, 1973).

Bruch (1973) distinguishes developmental obesity which arises as a basic part of the child's personality-environment patterns as they grow up, from reactive obesity, where often a big and fast weight gain follows some emotional experience. From this perspective obesity is most often treated according to the compulsion neurosis model. Obesity is hypothesised as the end result of a comprehensive neurotic solution to internal conflicts, the hallmark of this neurosis is an eating compulsion. The obese eat in response to emotional distress, particularly anxiety and depression. The psychoanalytic approach thus aims to define these underlying conflicts. It is believed that the eating compulsion will not be checked until the patient has achieved insight into and has worked through the unconscious conflicts related to the eating compulsion. Thus actual weight loss is considered as secondary as it is not the cure of the problem (Reiser, 1985).

In general, the psychoanalytic approach to conceptualising obesity has not been very popular, nor have it made a substantial contribution to the explanation and modification of obesity (Rand & Stunkard, 1983). The long duration of treatment (up to 7 years) and the lack of effective outcome measures have been cited as possible reasons. An alternative and more current conceptualisation, that of behavioural modification, sees obesity as a consequence of observable habits, rather than as a symptom of some underlying psychological abnormality which is usually inaccessible to immediate observation (Allon, 1980). The basic characteristic of the behavioural modification approaches is the belief that obesity is a behavioural disorder that is a learned response.

Behavioural theorists propose different psychological mechanisms to explain the development and maintenance of obesity. They invoke the principles of operant and classical conditioning to explain how learned patterns of overeating and under-exercising produce a positive energy

Page 8
balance and result in an excessive accumulation of body fat. Thus the behavioural perspective suggests that obese individuals are distinguishable from normal-weight individuals based on four sets of behaviours: excessive caloric intake, a heightened responsiveness to stimuli associated with food, a characteristic eating style typified by rapid pace and large bites, and a diminished rate of physical activity (Perri et al., 1992).

The behavioural approach postulates that overeating is a behaviour largely controlled by immediate positive consequences. The taste of food serves as a powerful positive reinforcer, and the removal of the unpleasant sensation of hunger acts as a negative reinforcer (Walen, Hauserman & Lavin, 1977). The combination of reinforcing properties strengthen the eating habit. In terms of classical conditioning, an association develops between the environmental circumstances that precede eating (e.g. sight or smell of food), and internal stimuli that are perceived as hunger. The act of eating further strengthens the association between environmental stimuli and the sensation of hunger via operant conditioning, and a variety of non-eating stimuli (e.g. negative emotional states) might elicit the perception of hunger and in turn may prompt eating. Thus, for some individuals, "the combination of operant and conditioning can produce inappropriate stimulus control over eating, thereby resulting in faulty eating patterns, excessive food consumption, and eventually obesity" (Perri et al., 1992, p. 40).

The behavioural practitioner is therefore interested in a set of learned habits which contribute to excessive caloric intake and decreased energy expenditure, and tries to modify them. Behavioural modification approaches stress that people should redirect their inappropriate eating responses into more constructive and appropriate environmental and interpersonal responses (Smith & Fremouw, 1987). The emphasis is clearly on changing external behaviour, not on deeply understanding one's feelings and thoughts about food, eating and weight as grounded in one's childhood. Behaviour modification attempts to change the hows of ones eating not to deeply understand the whys of ones eating. The behaviour of weight-losing and changing one's eating patterns are considered the basic goals. Behaviour modification approaches attempt to construct a social and material environment that will help the obese person to gain control over their eating. Perhaps the strength of the behavioural approach lies in the fact that it focuses more on alleviating the problem than on understanding the complex causal networks that underlie the condition.

Although varying widely, the diverse explanations presented above are all valid, as applied to certain individuals. A common error is to assume that obesity is a single entity that can be explained by a single cause. Obesity is a heterogeneous disorder with multiple aetiologies, and hence multiple risk factors. Given their interdependence, it is difficult to identify the relative
influence of each component. Notwithstanding the fact that obesity is a multifaceted disorder with several causes, all obese persons share the same vulnerability for the health risks associated with this chronic disorder.

1.3 Health Risks Associated with Obesity and the Consequences of Weight Loss:

Obesity represents one of the most important public health threats of the latter half of this century. A plethora of epidemiological studies (prospective, cross-sectional and retrospective), have investigated the relationship between relative weight and health status. The findings of all such studies indicate that the risk of developing certain health problems and having a shortened life span is significantly higher among overweight individuals than it is among non overweight individuals of the same sex, race, age and socio-economic status (VanItallie & Lew, 1992). Furthermore, the degree of risk increases as overweight becomes more severe.

In South Africa chronic diseases, including obesity, are responsible for 25% of all deaths and 29% of those aged 35-64 years (Steyn et al., 1991). Morbidity data also indicates that 5.5 million South Africans have hypertension; 4.8 million have hypercholesterolaemia, and 3.1 million have ischaemic heart disease. The associations to obesity are well known. Similarly, in the United States the second National Health and Nutrition Survey, conducted during 1976 - 1980, revealed that (based on prevalence findings) overweight adults are subject to a significantly enhanced risk of developing hypertension, hypercholesterolemia, and non-insulin dependant diabetes mellitus (VanItallie, 1985). The prevalence of hypertension was 5.6 times higher for overweight individuals between the ages of 20-44, than for normal weight individuals of the same ages. The prevalence of type II diabetes was 2.9 times higher in overweight individuals than in normal weight individuals.

Almost all prospective studies concerned with the relationship between overweight and health have shown that overweight individuals have an increased risk of developing premature heart disease. Surveys have shown a strong association between the prevalence of obesity and cardio-vascular disease risk factors (Foreyt, 1987). A recent study by Manson et al. (1990, cited in Brownell & Wadden, 1991) followed 100 000 American women between the ages of 30 to 55 for a period of 8 years. Women as little as 5% overweight were 30% more likely than their lean peers to develop heart disease, and those 30% overweight were an alarming 300% more likely. In the latter group, 70% of the coronary events were attributable to excess weight (after controlling for other factors). In addition, it has been found that people with coronary artherosclerosis are more likely to have
angina if they are overweight. Furthermore, in people with underlying heart disease, obesity increases the risk of congestive heart failure.

It is now widely recognised that overweight is associated with an increased risk of premature death (see Figure 1). It has been found that there is a direct positive relationship between an increasing BMI and mortality rate. In the Framingham Heart Study, the risk of death within 26 years increased by 1% per extra pound for ages 30 to 49 and by 2% per extra pound for ages 50 - 62 (Garrison et al. 1983, cited in VanItallie & Lew, 1992). As regards disease-specific mortality, many epidemiological studies have demonstrated a nearly linear increase in mortality from cardiovascular disease with increments in BMI among both men and women. In the American Cancer Society study conducted on 750 000 men and women (Lew & Garfinkel, 1979), a 13 year follow-up disclosed that coronary heart disease was the major factor in the higher mortality of overweight individuals. Mortality was 55% higher among those whose relative weights were 30-40% heavier than average (with BMIs ranging from about 30-34) and 100% higher in those more than 40% overweight (BMI >34). Furthermore, cancer was increased in those who were 40% or more overweight. The principle sites of excess cancer mortality among men were cancer of the colon, rectum and prostate. Amongst seriously overweight women, the major causes of cancer mortality were cancer of the gallbladder, biliary passages, breasts, cervix and ovaries.

Figure 1: The relation of Body Mass Index to excess mortality

Approximately 90% of diabetic individuals have type II diabetes, non-insulin-dependent diabetes mellitus (NIDDM). Of these, 80 to 90% are obese (Baron, 1995). Individuals 20-30% overweight
overweight are then clearly at risk for NIDDM, and this risk rises linearly with body weight. The highest disease-specific mortality ratio's among overweight individuals, of both sexes, has been found to be caused by diabetes. For men who were 40% or more overweight (BMI > 35) the ratio was greater than 500%; for women 40% or more overweight (BMI > 33), the ratio was about 800% (National Institute of Health, 1987).

Obesity is also associated with a variety of other medical disorders. Obesity is associated with gallbladder disease, pulmonary function impairment, endocrine abnormalities, skin disorders, obstetric complications, trauma to weight bearing joints, gout, and increased haemoglobin concentrations (Sjostrom, 1993). Obese individuals are more likely to experience a variety of problems arising from venous stasis - notably varicose veins in the low extremities, hemorrhoids and thromboembolic disease (Baron, 1995). Women who are overweight are more prone to menstrual problems, moreover if they become pregnant, the pregnancy is more likely to terminate with a stillbirth (Vanltallie & Lew, 1992). The physical agility of severely obese individuals is often impaired and when they fall, and the resulting injury is often more severe. Furthermore, the presence of marked obesity may interfere with the physical examination given by a physician, thus important diagnoses might be missed or delayed (Sjostrom, 1993).

Recent investigations suggest that the location of the excess body fat (regional fat distribution) is a major determinant of the degree of excess morbidity and mortality due to obesity. Moreover, men and women typically have differences in fat distribution and these differences have specific health implications. The male (android) type of obesity is characterised by the predominance of excess fat in the upper half of the body: nape, neck, cheeks, shoulders and upper-half of the abdomen. This pattern correspond to what is usually called upper-half or abdominal obesity. In contrast, in the female (gynoid) form of obesity, excess fat predominates in the lower half of the body (buttocks, hips, thighs and lower half of the abdomen). The clinical importance of the distinction between these two forms of obesity lies in the fact that android obesity (in men or women) is associated with enhanced health risks, particularly those relating to metabolic and cardiovascular functions (Foreyt, 1987). In each of six prospective epidemiologic studies, increased abdominal obesity was associated with increased cardiovascular and total mortality (Baron, 1995). Abdominal obesity is thus more dangerous than gluteal-femoral obesity. The Waist to hip ratio (WHR) is a convenient objective method for estimating pattern of regional fat distribution. A WHR equal to or greater than 1.0 in men (and 0.8 in women) is considered to indicate a degree of upper body obesity sufficiently pronounced to warrant considerable concern about the associated health risks, especially ischemic heart disease, stroke and death (Bjorntorp, 1985).
In closing this description of the health risks associated with obesity, mention must also be made of the fact that it has been well documented that obesity has a substantial impact on psychological well-being (Kral, 1985), a subject that will be dealt with in detail in later chapters. Many obese individuals experience considerable psychological distress as a direct consequence of their weight (Wadden & Stunkard, 1993). The overwhelming positive value given to thinness and the prejudice against obesity exacerbates the disdain that overweight people have for their own appearance (Crocker, Cornwell & Major, 1993; Silverstein, Perdue, Peterson & Kelley, 1986). Concomitantly, the obese often experience serious negative psychological difficulties that are specific to their condition (Faubel, 1989; Allison & Stanley, 1993). However, treatment of obesity often results in beneficial psychological change, and the impact of weight loss has been shown to dramatically improve mood, self-esteem and social-functioning (Peri et al., 1992).

The detrimental health consequences of being obese underscore the importance of preventing the development of obesity, and when feasible, of encouraging weight loss among those who are obese. Indeed, the proposition that weight loss can reverse many of the disadvantages associated with obesity provides the main rationale for the treatment of the disorder.

Surprisingly few studies have examined the effects of weight loss on morbidity and mortality. Nevertheless, there is increasing evidence to support the notion that a 10 to 20% weight loss can ameliorate most obesity-related diseases and should serve as a goal of treatment (Kanders & Blackburn, 1992). Studies examining the effect of weight loss on cardiovascular risk factors generally show beneficial changes with weight loss as predicted. In the Framingham Heart Study for example (Garrison et al. 1983, cited in VanItallie & Lew, 1992), researchers showed that for a male between the ages 45-54 years, a reduction of 10% in relative weight corresponds to 20% reduction in the risk of coronary heart disease. A recent study by Baron (1995) estimated that if all Americans were to achieve normal body weight, there would be a 3 year increase in life expectancy, 25% less coronary heart disease, and 35% less congestive heart failure and strokes. Wing, Koeske, Epstein, et al. (1987) documented the health benefits of weight loss in diabetic patients. Their findings showed dramatic improvements on measures of blood-glucose control and blood lipid levels. Furthermore, it was shown that it was not necessary to achieve ideal weight in order to obtain these health benefits. Weight losses as modest as 7 kg produced clinically significant improvements.

The above studies clearly suggest that successful weight reduction can undo the health hazards associated with obesity. However, it must be mentioned that some research has warned of the
Lissner, Odell, D'Agostino et al. (1991) found that the variability in body weight was significantly associated with increased mortality and morbidity due to coronary heart disease in both men and women. Although available research on weight cycling is not consistent enough to allow for definite conclusions, the negative impact of body weight fluctuations on health remains an important question. Consequently, committed attempts at long-term weight loss should be strongly encouraged, although casual attempts at quick weight loss should be avoided.

**SUMMARY OF CHAPTER ONE**

*Obesity has been defined as an excess accumulation of body fat, and the BMI has been put forward as the preferable indicator of this condition. It has been shown that obesity is very prevalent in western society and that the prevalence appears to be increasing. Furthermore, it has been suggested that obesity represents a heterogeneous group of disorders and not just a single condition. Its origins can arise through a variety of different pathways. This provides the context for why obesity is such a difficult problem to treat. Most importantly, it has been shown that obesity has a substantial adverse impact on health and well-being. However, many of the disadvantages associated with obesity can be reduced or reversed by the maintenance of even modest weight losses. It is for this reason that it is argued that there is a need for more committed efforts towards the development of long-term weight loss programmes.*
CHAPTER 2: AN APPRAISAL OF CURRENT TREATMENT MODALITIES

In a report that has become the most widely cited and often stated quote about the treatment of obesity, Stunkard and McLaren-Hume (1959), stated that "Most obese persons will not stay in treatment. Of those who stay in treatment most will not lose weight, and of those who do lose weight, most will regain it" (pg. 79). Given this dismal summary of obesity treatment made over 37 years ago, has anything changed? The aim of this chapter is therefore to assess the nature and extent of obesity treatment today, and to ascertain how effective it is. Some ethical issues relating to the treatment of the obese will also be considered.

2.1 The Basis of Treatment:

Treating obesity involves reducing the amount of adipose tissue in the body. The basis for treatment rests on a simple premise, establishing a negative energy balance in which energy expenditure exceeds energy intake. Such an imbalance results in the utilization of energy stored in the body in the form of fat, and consequentially, in weight loss.

However, ameliorating the condition is slightly more complicated than this, as weight loss is also determined by the effect that the reduction in food intake has on reducing one's metabolic rate. Typically, the metabolic rate slows with reduced food intake, which results in a smaller energy imbalance. Furthermore, the energy value of weight loss varies according to what is being lost (Brodie & Slade, 1990). In the early stages of a diet, energy is taken from the less energy-dense glycogen store, producing greater losses. Once this store is depleted, energy is taken from the more energy-dense adipose tissue, with a lower rate of weight loss. Thus, if a person reduces energy intake by a constant amount, the rate of weight loss will diminish as a result of both increases in the energy value of what is lost, and also of decreases in the size of the energy imbalance. It is though possible to enhance energy imbalance and hence weight loss, by deliberately increasing physical activity, and therefore increasing energy expenditure by a significant amount (Pi-Sunyer, 1992).

Although the fundamental objective remains the same, the exact nature of the treatment for obesity varies widely. Nevertheless, the form and direction that treatment takes can be guided by
the classification of obesity presented in chapter one. Severe obesity (BMI > 40), affects less than 1% of the obese population, but is associated with unequivocal medical complications in almost every person who suffers from it (Stunkard, 1984). Surgery has become the treatment of choice for severe obesity, and as such this category will not be dealt with in any detail here. Mild obesity (BMI 26-30), is by far the most common of the three levels of severity, affecting 90% of all obese persons (Stunkard, 1984). There is a high degree of consensus regarding the treatment of choice for mildly obese persons. Mild obesity is best managed by what is called "conservative treatment". Conservative treatment has in the past placed primary emphasis on one treatment modality - either diet, behaviour modification, or medicalization. Most current treatment programmes for mild obesity consist of the three modalities of diet, physical activity and behaviour modification (Stunkard, 1987). In contrast to the clear choices for treatment of severe and mild obesity, there is uncertainty about the optimal treatment for moderate obesity (BMI 31-40). The use of a low-calorie diet in combination with behaviour modification, has shown promise and will be discussed in more depth in the next section of this chapter.

2.2 The Effectiveness of Obesity Treatment:

Most treatment for obesity is carried out by commercial organisations and there are few medically sponsored programmes. This leads to difficulties as there are few published results and little available data on the outcome of commercial weight loss programmes. Thus there is an unchallenged convention by which weight loss interventions are presumed effective until there is explicit evidence to the contrary (Garner & Wooley, 1991). This goes against the tradition in science which assumes that there are no treatment effects until they are demonstrated. In this section, the literature pertaining to the effectiveness of obesity treatment will be reviewed. The focus will be on clinical and research based contemporary treatments, and as has already been alluded to above, these have been modelled on the principles of diet, exercise and behaviour modification.

2.2.1 The use of diets in obesity treatment programmes

The use of diets, particularly a very low calorie diet (VLCD), is one of the most standard parts of the treatment of obesity. The large amount of excess weight that obese individuals carry sets the primary goal of dietary treatment - the establishment of the largest caloric deficit that the patient can tolerate with safety and comfort (Stunkard, 1984). Conventional reducing diets of 1200 to 1500 calories per day are safe and comfortable but have been shown to produce weight losses too slow to be of practical benefit, particularly for those with moderate and severe obesity. This has led to the development of the very low calorie diet.
Although there is no universally accepted definition of a very low calorie diet, it is usually defined in terms of the number of kilo calories it allows the patient (Wadden & Bartlett, 1992). By rule of thumb, these diets usually target at providing 50% or less of the patients' daily resting energy expenditure. These diets can therefore provide as little as 400 to 800 calories per day, consisting largely or exclusively of protein. When administered under supervision for periods of up to three months, the resulting weight losses can be striking, at least in the short-term. Losses of up to 5 kg per week have been recorded, with the extent of weight loss dependent on the patients initial body fat percentage (ibid.).

A typical course of treatment includes four distinct phases: introduction; very low calorie diet, refeeding; and weight stabilisation and maintenance (McNulty, 1992). Usually the use of a VLCD is initiated only after a period of approximately 4 weeks, which serves as an introductory period and gets the patient ready to start a period of severe calorie restriction. The introduction of the VLCD is associated with weight losses that average 2 to 5 kg for the first two weeks. Thereafter, losses average 1 to 2 kg weekly for women and 1,5 to 2,5 kg per week for men (Atkinson, 1992). The length of time that a given individual should diet is dependent on a number of factors, including the achievement of a satisfactory rate of weight loss, favourable medical findings and the individuals initial weight. Following the period of diet, conventional foods are gradually reintroduced for a period of 4 to 8 weeks. This period presents an excellent time to instruct the patient on the principles of sound nutrition. During the last phase, patient's are taught methods of maintaining their weight losses, which includes the modification of eating and dietary habits.

The popularity of VLCD's is attributable to the large rapid weight losses that they induce. The important question however, is how well these weight losses are maintained, and the examination of the literature suggests, 'not very well!' In their review of several studies conducted after 1983, Wadden and Bartlett (1992), conclude that person's treated by a VLCD for 12 to 16 weeks loose approximately 20 kg. Longer treatment was associated with larger weight loss, although the rate of loss slowed significantly after the 12th week. However, the majority of evidence from randomised trials indicates that patients treated by VLCD's are likely to regain substantial amounts of weight in the first two years following treatment (Wadden, Sternberg, Letizia, Stunkard & Foster, 1989; Wadden & Bartlett, 1992).

Besides the fact that the use of VLCD's provides very poor long-term weight maintenance of the initially impressive weight losses, there are two other reasons why its popularity as an individual
method of treatment has decreased. Firstly, research indicates that the use of VLCD's should be reserved for persons who are a minimum of 30% overweight (Wadden & Bartlett, 1992). This is not only because milder forms of obesity can be treated with safer and less expensive methods, but also because of the many health conditions that would disallow the use of strict dieting - such as cancer, type II diabetes, cardiac conduction, bulimia, pregnancy and depression (Atkinson, 1992). Secondly, the concept of going on a diet in the first place has been criticised from psychological grounds. Going on a diet implies coming off it again and thus the resumption of old eating habits (Perri et al., 1992). For this reason one could argue that the most effective form of diet is not a diet but rather a gradual change in eating patterns, and shifts in food that the patient can continue to eat indefinitely. This introduces the concepts of nutrition education and lifestyle change, and brings us to the behavioural modality.

2.2.2 The behaviour modification approach

The goal of behavioural treatment is to help obese individuals identify and modify inappropriate eating, exercise, and thinking habits that contribute to their weight problem. Behavioural treatment as such provides the patient with a set of skills with which to control their obesity, regardless of its aetiology (Wadden & Foster, 1992). Traditional, behavioural treatment of obesity is based on classic applied behavioural analysis which considers in detail the behaviour to be changed, its antecedents, and consequences (Stunkard & Mahoney, 1976). Eating and exercise habits are analysed to determine how they are related to emotions, events, times and places (Brownell & Wadden, 1986). Once the problem behaviours have been identified, efforts can be made to modify the cues leading to them or to find and reinforce alternative behavioural responses in their place (Kirschenbaum, Stalonas, Zastowny & Tomarken, 1985). The intent being to produce lifelong habit change and hence permanent weight loss.

The behavioural approach has several distinguishing features. It is goal directed and specifies clear objectives for treatment that can be easily measured. By being process oriented, the behavioural approach does more than identify the behaviours subjects should adopt - it also provides a method of learning (Krieshok & Karpowitz, 1988). Once a patient has identified the events that lead to inappropriate eating, they are taught problem-solving skills to develop alternative methods of coping with the difficulty. Typically, behaviour modification is delivered as a package, and usually includes all of the following key-elements. Self-monitoring (the cornerstone of this type of treatment) in the form of homework assignments that make patients aware of their own behaviour that triggers the eating (Levitz & Stunkard, 1974). This usually includes recording what is eaten, as well as antecedents such as mood, location, prior events and time of day. This detail makes it possible to accurately identify the aspects of behaviour to be
changed, to develop strategies to modify them, and to evaluate and monitor the effectiveness of these strategies. The second element is nutrition education, which teaches the patients about the nutritional value of different foods and which are the right ones for them to eat. It is not possible to make sensible choices among foods without a knowledge and understanding of their nutritional value (Smith & Fremouw, 1987; Brodie & Slade, 1990). The third element of a behavioural programme is cognitive restructuring, designed to overcome the self-defeating and maladaptive thoughts and attitudes that the obese hold towards weight loss, and indeed themselves, which undermine their efforts (Stunkard, 1984). Strong evidence points to the benefit of cognitive factors such as beliefs, expectations, evaluations, self-instructions and images (Bennett, 1988; Collins, Rothblum & Wilson, 1986). The fourth element is a programme to increase physical activity. This serves to increase caloric expenditure, and is thought to also counteract the fall in metabolic rate that is induced by dieting (Davis, Fox, Cowles, Hastings & Schwass, 1989). It is also believed that increasing physical activity might decreases appetite and food intake among sedentary obese persons (Thompson, Jarvie, Lahey & Cureton, 1982). Finally, the technique of stimulus control is used to limit the obese patients exposure to foods (Wadden, Stunkard, Brownell & Day, 1984; Sperduto, Thompson & O'Brien, 1986).

Behavioural treatments are most often provided in the context of group therapy because this is believed to be more cost-effective. Although individual treatment provides greater opportunity to tailor treatments to patients specific needs, there are several advantages of providing this type of treatment in the context of a group. It is a great source of support and patients share a common experience, a factor found to be very important in successful outcome (Wadden & Foster, 1992). Secondly, groups help patients to see that they are not alone with their difficulties. Members of the groups serve as a source of motivation for each other, and as such it is not surprising that it has been found that group treatment produces larger weight losses than individual treatment (ibid.).

Behavioural weight control programmes are often described as demonstrating promising treatment effects, that are well maintained over the first year of follow-up. Data from the recent literature suggests that patients in behavioural programs are treated for approximately 15-20 weeks, and lose on average about 10 kg (Bennett, 1986; Wadden, 1993). In a review of the results of 105 behavioural studies, Bennett (1986) reported a mean weight loss for the 6 121 participants of 5.38 kg after an average of 13.37 weeks of treatment. These treatment effects were maintained in the short-term, with a mean weight loss of 5.11 kg recorded for 5 453 participants followed for an average of 35.5 weeks. In a retrospective study of 6 controlled trials of behaviour therapy conducted since 1984, Brownell & Jeffery (1987) reported that the average weight loss after 17 weeks of treatment was 10 kg. However, the average weight loss at a follow
up of 44 weeks was 6.6 kg (66% of initial weight loss). Wing (1992) in her comprehensive review of behavioural treatments for obesity, reported that average weight losses had increased from 3.9 kg in 1974 to 10 kg in 1986. Furthermore, the average length of follow-up had increased from 1 month to a year, and reported weight loss at follow-up had increased from 4 kg to 7 kg. Wing postulates that plausible reasons for these larger weight losses are that current programmes place far greater emphasis on cognitive factors, reinforcement techniques have been refined, social support has been included and the importance of exercise has been recognised.

Although most behavioural treatments have involved only short-term evaluation of effectiveness, follow-up duration has increased in recent years, with increasing attention being paid to the long-term results (Griffiths & Holliday, 1987). Consequentially, several papers have reported follow up studies of two years or more (Bonato & Boland, 1987; Miura, Ari, Tsukahara, Ohono & Ikeda, 1989; Wadden, Stunkard & Liebschutz, 1988; Griffiths & Holliday, 1987). In contrast to the body of literature indicating that behavioural treatments for obesity produce weight loss that are reasonably well maintained after one year, it is evident that weight is gradually regained over time, with most individual's regaining most or all of their weight after four or five years (Garner & Wooley, 1991). In a review of 10 published and 3 unpublished behavioural studies (7 of which were controlled), that included follow-up data of two years or more, Brownell and Jeffery (1987), concluded that the pattern is one of gradual gain of weight. Thus for an average post-treatment loss of 7.3 kg, a person would regain 4.89 kg over four years. Some studies have shown that a majority will regain all of their weight loss within 5 years (Jordan, Canavan & Steere, 1985). The study by Kramer, Jeffery, Foster and Snell (1989) clearly illustrated the odds against long-term weight loss. They followed 152 obese person's that had successfully completed a 15 week behavioural weight loss programme, and reported that only 3% of patients maintained their post treatment weight throughout the four yearly follow-up assessments. Thus the discouraging finding from long-term follow-up studies has been the fact that patients regain greater amounts of weight with increasing time after therapy.

There is remarkable consistency in the findings of the respective studies reviewed above, demonstrating that most obese individuals who enter treatment programmes, although losing weight initially that is sustained relatively well in the short-term, will ultimately regain to levels that approximate their pre-treatment weight. These results leave little doubt that maintenance of weight loss, and not the induction of weight loss, is the critical problem in obesity treatment at present.
2.2.3 The importance of exercise in weight control

In the past, most weight loss programmes have placed little emphasis on the activity level of the obese person, despite the fact that there is a strong relationship between physical inactivity and obesity (Brownell, 1984). Nevertheless, exercise is increasingly becoming recognised as a critical component in the treatment of obesity, and as such exercise is commonly prescribed as a major constituent of treatment (Pi-Sunyer, 1992; Fox, 1992).

Exercise is thought to be beneficial for a number of reasons. It enhances energy expenditure, it is thought to decrease energy intake, it may counter the metabolic decline produced by dieting, and it helps to remedy the health risks associated with obesity (Stern & Lowney, 1986). Since body weight is determined by the balance between energy intake and energy expenditure, if energy expenditure were to be increased without changing food intake, weight will be lost. Research has shown that obese persons expend more energy in the non-resting than in the resting component of their 24-hour energy expenditure (Blair & Buskirk, 1987). This suggests that even when the obese are less overweight they expend more energy per unit of activity than do lean persons. Thus the expenditure side of the equation can help the treatment of obesity. There is also some evidence to indicate that increased activity stimulates metabolic activity above sedentary levels (Pi-Sunyer, 1992). One of the major contributions of exercise and improved physical fitness is the potential to improve the quality of life of the obese person. Besides the obvious medical benefits such as cardio-vascular fitness and reduced hypertension, epidemiological evidence shows that increased physical activity is associated with psychological well-being in overweight persons (Hayes & Ross, 1986). Exercise can initiate a broad range of mental health benefits including reductions in stress and depression, and may have a positive influence on self-concept (Brown, 1990, cited in Fox, 1992).

In general however, there has been some difficulty in evaluating the effectiveness of exercise in the treatment of obesity, in that its impact on energy intake is variable. Exercise has been reported to increase, decrease or have no effect on the amount of food consumed (Grilo, Brownell, & Stunkard, 1993). Furthermore, the efficacy of exercise is difficult to measure, as the effect of exercise on food intake and body weight depend on the type, intensity, duration and frequency of exercise, as well as the individual's age, sex, and degree of obesity. Moreover, the major promise of exercise is in the wake of weight loss, coming after diet induced weight loss (Phinney, 1992). Thus exercise by itself seems largely ineffective regarding weight loss and almost certainly has to be coupled with caloric restriction. This can be illustrated by the findings of a study by Brownell, Stunkard and Albaum (1980) that showed that walking up and down two flights of stairs a day would account for only 3kg of weight loss per year, for an average weight...
man. Nevertheless, it has been found that weight loss achieved by diet as well as exercise, results in greater loss of fat and better preservation of lean body tissue than does weight reduction by diet alone (Fox, 1992).

Although the magnitude of the effect of exercise is generally modest, its prediction of weight loss maintenance is impressive. There is ample evidence that exercise is associated with better weight loss maintenance, and is therefore a key factor in promoting sustained weight loss (Bray, 1990, cited in Fox, 1992). Colven and Olson (1983), in a survey of subjects who had lost at least 20% of their body weight and had maintained this loss for at least 2 years, reported that the overwhelming majority of men and women were exercising regularly. In a recent study by Van Dale, Saris and ten Hoor (1990) all subjects who started and maintained an exercise programme, were successful in maintaining weight loss at 26 months follow-up. In contrast, 70% of those who did not start exercising during treatment, gained at least 75% of their baseline weight. Despite this evidence that exercise promotes better weight loss maintenance, controlled trials indicate that exercise levels are rarely well maintained at follow-up (Perri, Nezu, Patti & McCann, 1988). This has led Stern and Lowney (1986) to argue that adherence is a major problem in evaluating the effectiveness of exercise in obesity treatment as "50% of individuals who begin an exercise programme drop out within the first six months" (pg. 145). Thus programmes for the obese should target low activity levels as an independent risk factor and should seek to promote gradual increase in lifestyle behaviour that are associated with modest improvements in aerobic fitness.

The above review of the relevant literature indicates that increasing physical activity plays an important role in weight loss, and in particular contributes to success in weight maintenance. However, the effect of exercise alone in inducing weight loss has been shown to be modest, and it is recommended that exercise be used in combination with diet or behavioural programmes.

2.2.4 A comprehensive approach for treating obesity

In his review of the problematic treatment of obesity, Stunkard (1984) concluded that the researcher had to either choose diets that produce good initial weight losses but high relapse rates, or behaviour modification which produces less dramatic weight losses but shows better maintenance rates. Not surprisingly, the combination of the two, preferably in conjunction with increased physical activity, has become the ideal in recent treatment approaches.
There has consequently been a move away from strictly behavioural programmes to greater emphasis on multi-component interventions that incorporate exercise, diet, social influence and longer treatment duration. These strategies have been shown to improve weight loss and maintenance during the first 18 months after treatment (Perri et al., 1988). Wadden, Stunkard, Brownell and Day (1984) treated 17 obese women over a period of 6 months by behaviour therapy and very low calorie diet. Subjects lost on average 20.5 kg and regained on average only 2.1 kg at 1 year follow-up. In an evaluation of the effectiveness of VLCD’s in combination with behaviour therapy, Wadden, Sternberg, Letizia, Stunkard and Foster (1989), showed that behaviour modification skills taught in combination with VLCD’s facilitated the maintenance of weight losses at follow up. Patients who received diet alone regained 8.4 kg (65%) of their 13.1 kg loss, whereas patients who received the VLCD combined with behaviour therapy regained only 6.2 kg (37%) of their 16.8 kg loss. In addition, these authors reported that at 1 year follow up, 32% of patients in the combined treatment group had maintained all of their initial weight loss, as compared to 5% of the VLCD group alone. In another study with a two year follow-up, patients on a VLCD alone regained all but 0.8 kg, and subjects on VLCD and exercise were still 9.1 kg below their starting weight (Sikland, Kondo, Foreyt, Jones & Gotto, 1988).

Although behaviour modification combined with a very low calorie diet leads to greater initial weight loss (Viegner, Perri, Nezu, Renjilian, Mckelvey & Schein, 1990) plentiful studies have shown that relapse rates are as high as with the plain behavioural treatment (Wadden & Stunkard, 1986; Wadden, Foster & Letizia, 1992; Garner & Woolley, 1991; Heller & Edelmann, 1991). In a review of studies using behaviour therapy and diet between 1974 - 1990, Wadden and Bartlett (1992) conclude that weight loss has remained constant at around 0.5 kg per week. However, on average patients regained approximately one-third of their weight lost one year later. Wadden and Stunkard (1986) conducted a controlled trial to assessed the effectiveness of a combined programme of a very low calorie diet and behaviour therapy in 59 obese subjects. Their results showed that combined treatment produced a significantly larger weight loss (5 kg) than treatment by a very low calorie diet or behaviour therapy alone. Wadden, Stunkard and Liebschutz (1988) conducted a three year follow-up of these same patients, the results of which are diagramatically represented in Figure 2 below. The findings showed that the diet alone group lost 14.09 kg at the end of treatment but had relapsed to 4.7 kg 1 year later, and 2.2 kg 3 years later. The behaviour group lost 14.26 kg but had regained to 9.48 kg 1 year later and 3.54 kg 3 years later. The combined group lost an impressive 19.25 kg, but regained to 12.89 kg at 1 year, and 5.11 kg by 3 years follow-up. Although the combined group appears to have maintained better rates of weight loss, when compared to their own initial rates of weight loss, the differences between the groups were not significant. Moreover, 40% of subjects had since sought additional treatment prior to the three year follow-up.
Figure 2: Relapse rates for three types of obesity treatment

It has been found that patients treated by behaviour therapy and conventional diet, typically lose only about half as much weight, as those treated by behaviour therapy and a VLCD. This belief is generally supported by the findings from two randomised trials in which patient's received behaviour therapy in combination with either conventional diet or a VLCD (Miura et al., 1989; Wadden et al., 1989). Thus VLCD clearly increases short-term weight losses. However, the possibility of more rapidly regaining weight following the latter type of treatment, might offset the short-term advantages of this approach. Wing et al., (1991, cited in Wadden & Bartlett, 1992) observed a 8.5 kg difference between the two forms of diet after treatment, but this difference had reduced to a mere 1.8 kg, 1 year later. Patients in both conditions had regained weight and the differences were no longer statistically significant.

Cognitive factors have begun to play an increasingly important role in behaviour therapy. Given the affective and cognitive aspects of obesity, cognitive techniques are being used to enhance the efficacy of behavioural interventions (Collins, Rothblum & Wilson, 1986). Few weight control programmes have included the explicit modification of the obese individual's ideas and feelings about themselves and their condition, though the inclusion of cognitive interventions into comprehensive treatment programmes has been widely recommended (Bennett, 1988). However, the efficacy of a combined cognitive and behavioural approach to weight loss has not been thoroughly tested. The few studies that have included cognitive behavioural interventions into their programmes, have found initial weight loss no worse than traditional behavioural
programmes. Collins, Rothblum, and Wilson (1986), in a comparison of cognitive, behavioural and cognitive-behavioural treatment, found that the combined group was the only one to show a continuing decrease in weight. Results from other studies have shown a combined approach to increase weight loss maintenance (Bennett, 1988).

Reviewers of the obesity treatment literature have frequently asserted that the most pressing challenge, is maintaining weight loss. The tendency for obese people to regain the weight that they have lost in treatment, represents an imperative clinical and research problem. After treatment, obese clients typically abandon weight loss techniques, experience relapse, and regain weight (Brownell & Jeffery, 1987). Booster sessions, monetary contracts, ongoing support groups, and mail and telephone follow-ups, have been evaluated as potential remedies to the maintenance problem. However, empirical support for the effectiveness of these procedures has been equivocal (Perri, Nezu & Viegener, 1992). More promising findings have been obtained with multi-faceted maintenance programmes that have included frequent therapist contacts coupled with training targeted to the specific problems of the post-treatment period. (Baum, Clark, Sandler, 1991; Westover & Lanyon, 1990) A study by Perri et al. (1988) evaluated the effectiveness of four post-treatment programmes designed to enhance the long term maintenance of weight loss. At an 18-month follow-up evaluation, all four conditions that combined behaviour therapy with a post-treatment maintenance programme, yielded significantly greater long-term weight losses than behaviour therapy alone. These results have been confirmed in other studies (Baum, Clark & Sandler, 1991).

It has been seen in Chapter one that recent research has shown obesity to be a heterogeneous disorder with multiple aetiologies, and therefore multiple risk factors. In the present chapter, it has been shown that no single approach dealing in a unitary dimension would seem to be adequate in providing effective weight loss. Rather, a combination of two or more treatment modalities seems to show more promise, at least in the short-term. It is therefore held that the focus of future treatment should be on a multidisciplinary approach that integrates the central psychological, physiological, genetic and environmental factors in the aetiology of the condition. Furthermore, the contemporary approach which emphasise the principles of behaviour modification and addresses all aspects of the obese person's life-style, incorporating medical, dietetic and behavioural aspects in its treatment plan, is strongly endorsed. Although providing some optimism for the future, this state of the art comprehensive, approach is still in need of sufficient empirical evaluation to see if it can avoid the pitfalls of the past. In particular more effective strategies for improving long-term weight maintenance need to be developed.
2.3 Ethical Considerations in Obesity Treatment:

No appraisal of obesity treatment would be complete without a regard for the ethics of treating in the first place. As has already been shown, obesity represents a serious condition that has a serious impact on the obese individual's quality of life. The need for safe and effective treatment of the condition can thus be endorsed by medical grounds alone. Yet the treatment of this chronic disorder has arguably come to be abused, with perhaps the most emphasis being placed on losing weight for cosmetic as opposed to health reasons alone. This has become evident by the fact that over the past decade, a variety of commercial ventures (ranging from diet products to health and exercise clubs) have opportunistically capitalised on the expanding market. In America for example, the estimated 65 million people served by the industry spend approximately 35 billion dollars annually on weight loss products and services (Begley, 1991). The imperative question that needs to be addressed is: do these commercial enterprises really have the best interests of the obese at heart, that is, do they really work?

This question also pertains to why so few treatments fulfil the basic ethical standard of being evaluated by means of rigorous empirical research, before going onto the market. Few weight loss programmes are evaluated empirically before they are used, and it is held that this no doubt exasperates the weight cycling patterns observed in so many of the obese. It is common practice for any therapeutic service to be validated to confirm that it is both safe and proficient before being offered for treatment; surely the treatment of the obese should be no different.

A relevant fact is that many of the people that join weight loss programmes have been through a long and unsuccessful history of joining other such programmes. This fact, and the results from treatment research studies reviewed above, suggests that efficient, effective and long lasting treatment for obesity has yet to be discovered (Goodrick & Foreyt, 1991). This fact embraces the implication of providing treatments that are ineffective in producing significant and lasting weight loss for the majority of obese patient's. Is it ethical, moral and right for weight loss programmes to continue to offer services that have only temporary effect for most of the clients that they treat? Numerous studies of weight loss programmes suggest that the long-term success rates of such treatment regimens are minimal (Perri et al., 1992). Why then are they offered for treatment in the first place? By offering treatment that has only temporary effects these unvalidated programmes put the obese person at an increased risk of the psychological and physical damages that might result from the repeated failure to lose weight. It is ethically proper for all treatment programmes to only offer services if the anticipated positive effects of the programme can clearly be seen to be greater than the negative repercussions of a person's
participation. It is argued however, that few, if any, treatment programs can currently meet this demand.

A central creed of all ethical codes concerning treatment is that there is a moral requirement to obtain the patient's informed and voluntary consent before they participate in therapy or research (Steere, 1984). It is held that many obesity treatment programmes fail to meet these requirements. Although treatment personnel are well familiar with the documentation of the lack of long term success, they do not disclose these facts to their naive clients. The practitioner must provide sufficient information about the proposed treatment to enable clients to make their own informed choice. Yet, few professionals discuss the realities of weight loss with their clients. Moreover, the potential risks posed by ineffective treatment are rarely mentioned (Lustig, 1991). If clients are unaware of these important revelations, how can they ever be perceived to have made an informed decision? It is equally important that consent be voluntary as well as informed.

It is noticeable that the qualifications of weight loss personnel vary widely and it is often evident that in commercial fields, no professional backing is required. Safe and effective weight loss management should, as a rule, exhibit the same general features as other medical procedures. Obesity treatment programmes should therefore always involve supervision by well trained personnel in settings conducive to patient success (Garner & Wooley, 1991). It is held that treatment personnel can play a pivotal role in the dissemination of new ideas in that they have the opportunity to address the ethical issues of obesity treatment and to promote weight management strategies that are beneficial and effective.

All professional bodies are guided by codes of ethics, and obesity professionals should adhere to such codes as well. For example, dieticians have the Code of Ethics for the Profession of Dietetics, adopted by The American Dietetic Association in 1989; whereas psychologists have the ethical principles for psychologists, adopted by the American Psychological Association in 1981. Irrespective of the discipline, the essential elements of these codes are all fairly similar. Several of these principles are relevant to this evaluation of the current treatment of obesity. A central tenet of most ethical codes is that clinicians have a responsibility to maintain high standards of competence. This also implies that they must recognise the boundaries of their competence. If obesity personnel continue to use weight loss strategies that have such low rates of success, are they being true to this code? To this end, treatment should always be based on current scientific principles and should always be open to new theoretical ideas and information (Pace, Bolton & Reeves, 1991).
By addressing obesity treatment from an ethical perspective it has been argued that our current approach to treating obesity should be carefully re-evaluated. Health care professionals must ask whether they are indeed providing objective services if they continue to offer treatments that do not produce substantial or lasting weight loss for most people. It is ethically imperative for treatment professionals to ensure that they remain objective in their pursuits and be honest with clients about the poor long-term outcome of obesity treatment. Obesity treatment faces a challenge, a challenge to "re-evaluate our standard arsenal of weight reduction tools, examine the need for additional skills and strategies, and develop treatments that meet the real needs of our clients" (Pace et al., 1991, p. 1260). The reality is that we do not have effective treatment to offer, and we should be candid about this until there is reliable evidence to the contrary. However, to suggest that we should stop treating the condition altogether is naive.

SUMMARY OF CHAPTER TWO

The appraisal of the obesity treatment literature indicates that there have been improvements in initial weight losses in comparison to those reported by Stunkard in 1959. Nevertheless, the evaluations of the long-term maintenance of these losses are still discouraging. The review of various treatment modalities reveals two indisputable facts regarding treatment of obesity. The first is that virtually all programmes appear to be able to demonstrate moderate success in promoting at least some short-term weight loss. The second, is that there is very little evidence that weight loss can be maintained in the long-term by the vast majority of people. Given the complexity of the disorder, it is held that to be successful, obesity management requires the co-ordination of a full range of resources to deal with the totality of the problem. Obesity treatment requires significant weight loss, lifestyle modification, psychological reinforcement, social readaption and considerable education. The advent of comprehensive-behavioural programmes, together with the recognition that exercise is an important component in weight loss maintenance, should continue to improve long-term success rates in the future. The dismal findings of significant weight regain have led some investigators to question the utility and ethics of current treatment, and to suggest that foregoing treatment may prove less damaging to physical and psychological health than repeated cycles of weight loss and regain. This however, would seem like an option that cannot be endorsed until we have some definite empirical findings that are based on well controlled studies that are free from the methodological shortcomings that have plagued the interpretation of results in the past.
Given the consequences of being excessively overweight, most health professionals would agree that there is a need for effective treatment. Yet, as described in Chapter two, a plethora of treatment research studies suggest that effective and long lasting treatment for obesity has still to be discovered, and the optimal treatment plan remains something of an enigma. It is in the light of these dismal long-term success rates, that this chapter aims to focus on methodological issues in research on obesity treatment. Could it be that methodological oversights of the past, have helped exacerbate our lack of knowledge about what constitutes an effective treatment plan? In attempting to answer this question, some of the more common methodological shortcomings of past treatment will be described, and some suggestions will be made for improving strategies for future evaluation studies.

3.1 A Critical Assessment of Issues Relating to Methods and Design:

The goal of all obesity management programmes should be to accumulate knowledge that will be highly relevant and effective for a wide range of obese patients. This can only be achieved if the principles of good research are met, including careful attention to research design, rigorous controls, and standardised collection of data (Lustig, 1991). However, despite the deluge of research that has been conducted and that continues to be done, we are still no closer to discovering the optimal treatment plan for obesity, than we were two decades ago (Stunkard, 1993). This has led to the presently pessimistic appraisal of obesity treatment, and has cast serious doubt on traditional treatment certainties.

The fact that obesity management has been the subject of so much empirical research, should not come as a surprise. For unlike many other clinical problems that have been the focus of treatment outcome research, obesity treatment offers a simple objective measure of success - weight reduction. A quantitative measure can be obtained simply by asking the obese client to step onto a scale. Furthermore, large samples of obese subjects for research investigations are readily available. These circumstances have no doubt encouraged research on obesity (Westover & Lanyon, 1990). However, as Garner and Wooley (1991) intimate, the ease with
which controlled research can be conducted, has probably also helped to generate countless studies that contribute 'neither to our knowledge about the treatment of obesity, nor to the development of the principles of behaviour change in general'. The practice of research for convenience sake has arguably contributed directly to two of the major deficiencies in the obesity field today, namely the paucity of long-term follow-up evaluations of treatment programmes, and the predominance of treatment findings that are frequently statistically but not clinically or substantively significant (Perri et al., 1992; Brownell & Jeffery, 1987).

A major shortcoming in research on obesity has been the relative lack of long-term follow-up evaluations of treatment efficacy (Westover & Lanyon, 1990; Kramer, Jefferey, Forster & Snell, 1989). The significance of this deficit is highlighted by the fact that obesity is a clinical disorder characterised by high relapse rates (Brownell, Marlatt, Lichtenstein & Wilson, 1986). Although the importance of weight maintenance and thus long-term follow-up studies is constantly stressed, the overwhelming majority of studies fail to include appropriate follow-ups. It is therefore imperative that researchers endeavour to include longer follow-ups in future treatment outcome studies.

There are however, two conceivable problems in conducting long-term follow-up studies. In some instances subjects might have sought alternative sources of treatment during the follow-up period, which confounds the research and makes interpretation very difficult (Bennett & Jones, 1986). This problem is unavoidable when it occurs. Secondly, dropout rates are likely to be much higher during the follow-up period than during initial treatment phases, and just as damaging to the interpretation of the results (Brownell & Jeffery, 1987). One suggestion to overcome this problem would be to make long-term follow-up an integral part of the research design. Thus in committing themselves to treatment subjects also commit themselves to follow-up. Furthermore, a useful strategy might be for weight loss personnel to keep in regular contact with subjects once the program has ended, consequently providing further social support and extending the initial treatment phase (Baum, Clark & Sandler, 1991; Westover & Lanyon, 1990).

A second area of concern that is apparent from the literature, is that past research has all too often focused on the evaluation of methods, rather than the treatment of obesity per se (Fitzgibbon & Kirschenbaum, 1990). This results in findings that are statistically but not necessarily clinically significant (Stunkard & Mahoney, 1976). Yet in clinical research, a major criterion for evaluating treatment is the overall importance of the treatment-produced improvement for the specific individual. The clinical significance of weight loss should
therefore be considered to be of comparable importance to the statistical comparison of group differences (Wing & Jeffrey, 1979). Consequentially, the magnitude of weight loss, and the clinical importance thereof, needs to be given much more attention in future treatment studies.

The overwhelming majority of empirical research on obesity has used designs that emphasise statistical comparisons of group differences, by averaging the amount of weight loss across all subjects, within each treatment group (Wadden & Letizia, 1992). In particular, treatment outcome research on obesity has consisted predominately of between-group designs (Bennett, 1986). The major advantage of this methodology, is that it provides information that is generalizable, and permits evaluations of the comparative efficacy of different treatment methods. Furthermore, it has been found that treatment delivered in small closed groups, that follows a structured and time limited protocol, is the best method to maximise retention rates (Yalom, 1985, cited in Wadden & Letizia, 1992). This is because the closed group format is believed to facilitate group interaction and cohesiveness. Nevertheless, there are several reasons why single-subject designs should be used more frequently. The emphasis on the individual subject seems particularly appropriate given the repeated finding of considerable inter-individual variability in treatment outcome studies on obesity (Krieshok & Karpowitz, 1988). This supports the notion of Brownell and Wadden (1991), that the obese are not a homogeneous group, and that group approaches can serve to obscure individual differences. This point can be underlined by the fact that contemporary emphasis has been placed on matching individuals to specific beneficial treatment modalities (Stunkard, 1993). Although a certain type of treatment may result in significant weight loss for most of the treatment group, it is also just as important to understand why a few subjects may not have improved. Moreover, an advantage of single-subject designs is that they allow for easy evaluation of the clinical importance of behaviour change (Wyshogrod, 1985). This characteristic assumes special importance given the above criticism, that treatment studies too often fail to demonstrate clinically meaningful reductions in weight, as opposed to statistically significant comparisons among different treatment groups. At the very least then, it would seem beneficial to report individual data even in the context of between-groups design.

Much of the empirical research conducted on obesity has followed the treatment package strategy, in which a comprehensive programme is compared to a control condition (Wing, 1992). Assuming the internal validity of the study, a significant difference between the treatment and control groups can be taken to indicate a causal relationship. If the treatment package proves effective in producing weight loss, then experimental analysis of its various components can be undertaken to elucidate the reasons for treatment success, and thereby to
subsequently refine and enhance the efficacy of that treatment approach. One methodological shortcoming that hinders the identification of the effective components of obesity treatment programmes, has been the failure of many studies to assess the subjects' adherence to treatment methods independently of outcome (Spiegel, Wadden & Foster, 1991). The intent of most behavioural programmes, for example, has been to alter eating habits as a means of producing weight loss. Typically however, the influence of the independent variables of such studies (manipulating eating habits) have been inferred, quite inappropriately, from treatment outcome results (Griffiths & Holliday, 1987). The use of self-report questionnaires or homework assignments would seem like an obvious strategy for assessing subjects adherence to the treatment programme outside of the treatment environment. Furthermore, once a causal relationship has been demonstrated, definite attention has to be given to what specific parts of the treatment package are the most important in causing the observed effects. This question can only be answered when greater attention is given to programme theory and design, before the implementation of the treatment.

The use of control groups in treatment evaluation studies is to ensure the internal validity of the study by precluding the effects of weight change over time that are independent of treatment. As a rule the nature of the control group will depend on the specific research strategy and the precise research question that is the focus of investigation. The type of control group that has been used most often in past obesity research, is the basic no-treatment condition (Lustig, 1991). However, there is now sufficient data to show that weight does not change significantly as a function of the mere passage of time (Perri et al., 1992). It is thus argued that this form of control is no longer necessary to control for in a between-subjects design. Simply comparing a treatment method with a no-treatment control group, is no longer sufficient or acceptable. Rather, control and treatment groups should differ on those specific variables that are held to be the unique influence of the treatment package itself.

Several other, 'so-called' miscellaneous methodological issues in need of attention can be identified in the literature. Firstly, very few researchers report appropriate demographic data on the subjects included in their studies (Brownell & Wadden, 1992). By knowing the demographic characteristics associated with successful weight loss, we might be able to predict what types of treatment will best suit a particular client. Secondly, in its emphasis on specific treatment techniques, outcome research on obesity has tended to overlook the potential contribution to weight loss of the therapists or personnel administering the treatment programme (Wadden & Letizia, 1992). A clear statement of their sex, qualifications, therapeutic experience and familiarity with the treatment of obesity is particularly important.
therapeutic experience and familiarity with the treatment of obesity is particularly important. The necessity of this information can be understood by the finding that professionally trained therapists were significantly more effective than non-professionals, in reducing client attrition and in effecting weight loss (Levitz & Stunkard, 1974). Another important consideration, is that if a single therapist administers all treatment conditions, it is impossible to disentangle the relative contributions of the therapist versus the treatment method. Moreover, if different therapists separately administer different treatment methods to different groups, then this is a potential source of confounding. Thus, in evaluating treatment packages, researchers should be aware of these often overlooked effects and control for them appropriately. The influence of therapist variables can be easily controlled and evaluated statistically, by using more than one therapist in a design in which each therapist administers comparable amounts of therapy to all groups.

3.2 Measures of Outcome:

As previously mentioned, reports of weight loss provide the optimal objective measure of successful treatment. Regardless of whatever other outcome measures are used, direct assessment of weight loss remains the methodological imperative of adequate evaluation of treatment of obesity (Bray, 1985; Foreyt, 1987).

However, simply reporting absolute weight loss severely impedes meaningful comparisons among different studies (Brownell & Wadden, 1991). For example, a 150 kg person loosing 40 kg, can obviously not be equated with a 100 kg individual who loses the same amount of weight. Comparative analysis of the outcome of different treatments requires the use of standardised measures of improvement. A popular approach has been to use relative weight as a measure of obesity (Bray, 1986). The problem with this approach (as was described in Chapter one), is that it is compounded by the fact that overall weight reflects the person's total body mass, which includes muscle mass and water, and it is therefore not a good measure of excessive body fat (Perri et al., 1992). Since it is body fat that is the target of obesity treatment, it is held that future outcome research should include a specific measures of body fat in addition to changes in body weight. The Body-Mass Index responds more closely to percentage body fat. As such, it represents the preferable indicator of obesity and should be considered to be the standard measure used in addition to an assessment of weight loss.

Many programmes evaluate successful outcome by means of their clients achieving predetermined ideal target weights. This fails to account for the results of genetic research
that has yielded evidence that the goal of thinness may be impossible for many people (Foreyt, 1987). For example, a client with a family history of obesity who has been overweight since childhood, is not likely to ever achieve ideal weight. Perhaps a better measure of success would be to set realistic target weights, individualised for every patient (Brownell & Wadden; 1991).

Much obesity research, particularly the earlier work done from a psychodynamic perspective, fails to report specific information on weight loss. Instead, these studies focus on subjective impressions of the subject's personal adjustment and emotional well-being (Leon, 1976). Neglecting to report precise data on weight in favour of a discussion of inferred psychological changes may obfuscate the evaluation of treatment efficacy. However, although it is necessary to report specific weight loss, this is also clearly not sufficient. To make a comprehensive evaluation of the efficacy of treatment, more than just a primary measure of weight loss is required (Wing & Jeffery, 1979). Treatment studies should ideally include concurrent evaluations of subject's emotional and social functioning, as these are the areas that have been found to be in need of most improvement in the obese person's lifestyle (Wadden, 1993; Fitzwater, Weinsier, Wooldridge, Birch, Liu & Bartolucci, 1991; Foreyt & Goodrick, 1990; Spiegel, Wadden & Foster, 1991). Furthermore, certain treatments have found weight loss to be associated with negative side effects such as depression (Wadden & Stunkard, 1993; Wadden, Stunkard & Smoller, 1986; Garner & Wooley, 1991), while others have found no such side effects and even improvement in psychological well being (Martin, Housley & McCoy, 1988; Allison & Stanley, 1993). Specific objective measures of the variables held to be associated with weight loss, will shed light on the potentially important relationships among different response systems, thus telling us why some people experience positive side effects and others negative.

It is strongly suggested that the psychosocial consequences of obesity treatment should be evaluated, and not just weight loss. Subject's who do not loose significant amounts of weight, might nevertheless show improvement in other areas of life functioning, leading to treatment outcome still being regarded as successful.

3.3 Factors Predicting Weight Loss:

A major shortcoming in obesity treatment research at the moment, is the absence of any reliable predictors of successful treatment outcome (Stunkard, 1993). An analysis of what
type of people do the best in various types of programmes, can lead to people being placed in
the type of treatments that will suit them best in the future.

A few attempts have been made to isolate predictors of treatment, and follow-up success, for
weight control programmes. Bonato and Boland (1987), in a study aimed at identifying
predictors of weight loss at the end of treatment and during one year follow-up, showed that
weight loss during the first week of treatment, greater number of past weight loss attempts,
and a larger monthly weight loss goal were predictive of outcome at the end of treatment. A
second study by Wadden and Letizia (1992) found that losing more weight during the first
month of treatment and attending a higher percentage of treatment sessions, is strongly
associated with greater weight loss at the end of treatment and at one-year follow-up. In
addition, patients's with the highest initial weight, lost the most weight.

Efforts to identify patient factors and process variables that predict weight loss, have also
often been neglected in the search for treatment interventions that are associated with
improved weight loss. Nevertheless, at least two variables have been shown in the literature
to improve end of treatment weight-losses. These include increasing the length of treatment
and increasing the patient's physical activity (Pavlou, Krey & Steffee, 1989). The contention
that longer treatment is associated with larger weight losses, was confirmed in a controlled
study by Perri, Nezu, Patti and McCann (1989), who found that patient's treated with a
conventional diet for 20 weeks lost 8.9 Kg, whereas those treated for 40 weeks lost 13.6 Kg.
However, this study also showed that weight losses slowed from 0.5 kg per week in the first
20 weeks to 0.2 kg during the last 20 weeks, indicating a point of diminishing returns. As we
have seen, exercise seems to be a strong correlate of weight loss maintenance. Patients's who
develop a programme of regular physical exercise during treatment will be more likely to
continue exercising, and thus maintain their weight loss (Wadden & Letizia, 1992).

Researchers should therefore strive to examine a wide number of variables, including
patient's pre-treatment characteristics, as well as process measures that assess behaviours
during treatment, to see their effect on the success of treatment. Identifying factors that
differentiate successful from unsuccessful dieters, could provide a good indication of what
strategies to incorporate into weight loss treatments and assist in the identification of factors
in successful maintenance.

3.4 Confronting the Problem of Attrition:
successfully completing them and losing weight. However, for several patients, these efforts are short lived, as they either do not comply with treatment or drop out of treatment (Wadden & Letizia, 1992). An individual who loses 5 kg will perhaps not experience as many health benefits as a person who loses 15 kg, but both will benefit far more than a person who drops out of treatment after just three weeks.

Attrition rates from behavioural programmes conducted in research settings are in general significantly lower than the up to 70% reported in commercial programmes that employ conventional methods of weight loss (Bernier & Avard, 1986). Nevertheless, some studies have reported rates of attrition to be as high as 83% (Pratt, 1989). Such high drop-out rates compound the problem of drawing reliable conclusions from treatment programmes. Furthermore, they can lead to feelings of guilt and failure on the part of the drop-outs themselves. This is not to mention the fact that high attrition rates can reduce the group morale of those left in treatment, consequently resulting in the failure of many members to achieve their weight loss goals.

Although a high correlation has been found between attrition from therapy and smaller weight losses, very few researchers include data from drop-outs in their search for predictors of weight loss (Wadden & Letizia, 1992). In most cases predictor variables have been examined only in those subjects who completed treatment. A possible reason for this is the fact that attrition often reflects negatively on the quality of treatment of a programme, and so is viewed as a negative. Of those studies that have focused on the problem of attrition, neither age, initial weight, body fat, percentage overweight or mood has consistently predicted attrition (Wing, Marcus, Epstein & Kupfer, 1983; Bennett & Jones, 1986). More favourable findings have however been found for patient variables such as binge eating (Marcus, Wing & Hopkins, 1988), hunger (LaPorte & Stunkard, 1990), dietary restraint (Polivy & Herman, 1985), and life stress (Wadden & Letizia, 1992). While subject characteristics are relevant factors that may affect attrition, possible mediating social-psychological factors, such as satisfaction with the programme, motivation, self-assurance, social support and attitudes, have not been extensively studied (Pratt, 1989).

It is evident that much of the obesity research is characterised by high drop-out rates (Bennett & Jones, 1986). Few, if any, studies specifically attempt to ascertain the reasons for attrition and to assess the progress of dropout subjects throughout the treatment period whenever possible (Pratt, 1989). There are two very good methodological reasons why every effort should be made to minimise attrition rates. Firstly, internal validity is compromised when
there is differential attrition across treatment groups, and secondly external validity can be jeopardised, since attrition reduces generalisability. Concomitantly, careful reporting of the precise number of subjects in each group that drop out of treatment is essential.

**SUMMARY OF CHAPTER THREE**

*It has been shown in this chapter that numerous methodological inadequacies have served to obstruct the further development of the field of obesity management. It is held that for treatment of obesity to become more successful in the future, these faults will need to be addressed first. Our knowledge can only be enhanced through more careful planning and consideration of methodological issues in our research plans. In particular, more careful consideration needs to be given to what constitutes effective outcome, and the role of psychosocial indicators in success or failure. It has also been stressed that there is a definite need for future studies to include information on the all-important problem of attrition.*
Obesity is a chronic disorder that is "at once personally undeniable, publicly visible, and socially scorned" (O'Neil & Jarrel, 1992, pg. 252). Regardless of the origins of the condition, the likely psychological ramifications of this plight are noteworthy. Further, as we have seen in Chapter two, patients in comprehensive weight loss programmes must undergo significant lifestyle readjustment, including curtailment of their eating behaviours. It is therefore plausible that the psychological consequences of obesity treatment, and indeed weight loss, also deserve examination. In this chapter the literature pertaining to the psychological and social concomitants of obesity and its treatment will be reviewed. This will include addressing the social context in which the obese find themselves, a critique of the psychological characteristics of the obese, as well as an in-depth examination of psychological disturbance specific to weight and eating. Moreover, the review will also include a description of possible psychological predictors of success and failure in treatment outcome. Finally, the chapter will conclude with a rationalisation for the use of psychological and social factors in future evaluations of obesity treatment.

4.1 The Social Context of Obesity:

For several decades the fashion, entertainment and publishing industries have bombarded women with role models for physical attractiveness so gaunt as to represent virtually no women in the actual population. These representations imply that not only beauty but also success, personal happiness, and self-worth can be achieved through slenderness (Garner & Wooley, 1991). The power of these influences is portentous, and can be evidenced in studies showing that the majority of adolescent and young adult women feel fat even when their weight falls within normal range (Garner, Rockert, Olmsted, Johnson & Cosicina, 1985). Other findings have even indicated that feeling fat and restricting food intake, are not uncommon in school children as young as eight years old (Rosen, Tacy & Howell, 1990).

The intensity of the prevailing cultural pressures for thinness, and the psychological risks that they impart, have particularly serious implications for those who suffer from obesity. The social stigma against obesity is extraordinary in both its magnitude and pervasiveness. This has led Crocker, Cornwell and Major (1993), to conclude that of all the conditions for which a person
may be stigmatised in our culture, including racial group membership, religious affiliation, physical handicaps, and sexual preference, the stigma of overweight may be the most debilitating. Furthermore, it has been suggested that "public derision and condemnation of fat people is one of the few remaining sanctioned social prejudices ... allowed against any group based solely on appearance" (Fitzgerald, 1981, cited in Garner et al., 1985, pg. 223). Although some conditions that are severely stigmatised, such as homosexuality, can be concealed from others, the fact that one is overweight is immediately visible and may thus affect most social interactions. Furthermore, although many stigmatised groups are not held responsible for their predicament, the obese are frequently blamed for their condition. Thus being overweight carries with it the burden of two types of stigmas: it elicits negative responses on the basis of its aesthetically displeasing qualities, and it carries with it the shame and guilt of self-blame for a moral failure (Robinson, Bacon & O'Reilly, 1993).

What then is the nature of the prejudice and discrimination to which the obese are subjected? It has been well documented that obese people are denied educational opportunities, employment, promotions, and housing because of their overweight (Garner et al., 1985; Jasper & Klassen, 1990). The aversion to obesity is evident in children as young as six years old, who have been shown to consistently associate the larger body shape of an obese child with adjectives such as stupid, dirty, cheats, lies, lazy, sloppy, mean, ugly and sad (Allon, 1980). As they grow older, the overweight are likely to face discrimination in gaining admission to college, and problems in finding satisfaction in personal relationships. Studies have shown that college students rated obese people as less active, less intelligent, less hardworking, less successful, and less popular than non-obese people (Stunkard & Wadden, 1992). Furthermore, when asked to rank order various categories of people as potential marital partners, students reported preferring to marry an embezzler, cocaine user, shoplifter and blind person before marrying an obese person (Tiggemann & Rothblum, 1988). Even more incredible is the finding that health professionals, including psychologists, psychiatrists, and social workers, also hold negative attitudes towards fat people (Robinson et al., 1993). In the face of overwhelming social rejection, obese individuals may seek professional support, only to find that health professionals share in the culture's stereotypical view of obesity and that this prejudice may influence their clinical judgement (Young & Powell, 1985, cited in Garner & Wooley, 1991). This sentiment can be clearly illustrated by the fact that some professionals have included social shaming procedures as a treatment principle, as documented by the following quote from a respected researcher in the field: "the ultimate social pressure treatment would be to increase the social sanctions against obesity, so that being overweight would be a tremendously shameful thing" (Foreyt, Goodrick & Gotto, 1981, p. 170).
Chapter Four: Psychological and Social Aspects of Obesity and Weight Loss

The findings from the research reported above suggest that the psychosocial perils of obesity may well exceed its medical complications, described in Chapter one. It is held that poor interpersonal relationships, low self-esteem, and depressed mood are not surprising in obese individuals, as a consequence of the intense prejudice to which they are subjected to (Stunkard & Wadden, 1992). Furthermore, the perception that being overweight is a person's own fault, may enhance the possibility of emotional and psychological disturbances. It has been shown that overweight individuals tend to interpret their social experiences in terms of their weight (Crocker, Cornwell & Major, 1993). Therefore, it is probable that obese individuals may tend to see their weight as a cause of their negative social outcomes. Thus the obese may be particularly likely to blame themselves for the negative reactions that their weight elicits from others, rather than blaming the prejudice of others against overweight.

The concept of psychological distress resulting from the condition of obesity is not a new one, just a neglected one, in a vastly medicalized field. In fact, at a recent conference on the health implications of obesity, it was emphasised that "obesity creates an enormous psychological burden ... in terms of suffering, this burden may be the greatest adverse effect of obesity" (Stunkard, Stinnett & Smoller, 1986, pg. 418). Other researchers have contended that the psychological traits found in the obese are most likely related to their dissatisfaction with appearance and to continuous and vain efforts to lose weight, rather than to an expression of a true eating disorder. This notion is supported by the findings of a study by Adami et al. (1994), of the psychological traits of obese patients. These authors showed that stable body weight normalisation confers considerable psychological benefit on obese individuals. This confirmed the findings of Stunkard and Wadden (1990), who showed remarkable improvements in psychosocial status and emotional reactivity following weight loss resulting from surgery.

The studies reviewed above demonstrate that most emotional and psychological disturbances experienced by the obese should be considered as secondary to the obesity itself. Having explored the social context which may induce such psychological impairment, it now remains to examine the exact nature of the likely psychological aspects of obesity and its treatment.

4.2. The Psychological Status of Obese Persons:

As shown in Chapter one, early conceptualisations of obesity saw the condition to be a result of psychological dysfunction, such as an underlying depression or anxiety condition, or inadequate adjustment to life stress (Leon & Roth, 1977). However, the overwhelming contemporary
opinion is of the view that psychological distress is a consequence of obesity, and not a cause of the condition (Wadden & Stunkard, 1993). It is this view that informs the present chapter.

In view of the stigmatisation of obesity, one would expect to find a higher incidence of psychopathology among obese persons than among normal-weight individuals. Yet, the relationship between obesity and psychopathology has remained elusive and controversial. Studies conducted on samples drawn from the general population have not consistently found a higher rate of occurrence of psychopathology among the obese, than among normal-weight individuals (O'Neil & Jarrell, 1992). In a review of more than 10 relevant studies, Wadden and Stunkard (1985) concluded that "there is little evidence of increased psychopathology in the obese population as a whole" (pg. 1063). This evidence suggests that the obese exhibit mental health functioning comparable to that of the general population. Other studies have found the obese to be a very heterogeneous population with respect to personality types and traits (Striegel-Moore, McAvay & Rodin, 1986). It therefore appears that the obese differ from each other as much as they differ from normal weight persons on psychological characteristics not explicitly concerned with weight and eating.

Nevertheless, higher levels of psychopathology have been noted among those obese individuals seeking treatment for their condition, than compared to non-clinical samples (O'Neil & Jarrell, 1992). In particular, the relationship between personality characteristics and weight loss, has been extensively studied (Wadden & Stunkard, 1993). Leon and Roth (1977), reviewed several studies that used the Minnesota Multiphasic Personality Inventory (MMPI) to assess obese individuals seeking treatment and found elevated scores on the depression scale. Wadden and Stunkard (1985), reported that an additional ten MMPI studies of the obese seeking treatment had found at least mild elevations of depression. A study by Fitzgibbon and Kirschenbaum (1990), showed that there is variability in psychological functioning among the obese seeking treatment. Twenty-three percent of the sample scored in a range indicative of significant personality disturbance, on the Borderline Syndrome Index. This group did not differ from those in normal ranges in weight, however they did report more extensive symptoms of psychopathology, more chaotic eating patterns, more binge eating, and evidence of less effective coping skills. The authors concluded that their findings indicated the need for a thorough assessment prior to treatment, as well as treatment tailored to meet the needs of specific issues. A study by Goldsmith et al. (1992) investigated the prevalence of DSM-III-R axis one psychiatric disorders, in a group of 54 obese patients at the time they presented for treatment. High rates of affective disorders, particularly those with depressive symptomatology were found. Moreover, at
Moreover, at least 26% of patients were in the midst of a current Axis 1 disorder, and 57% had a history of at least one lifetime Axis 1 disorder.

Taken as a whole though, these studies have produced inconsistent and contradictory findings, and have led Wadden and Letizia (1992) to conclude that they cannot recommend the use of personality and psychopathology inventories to predict weight loss. However, it has been stated that the lack of psychopathology observed in the obese, may be as a result of the fact that they suffer from weight-related psychological effects, that are not measured by our standard psychological inventories that have been used in most studies (Wadden & Stunkard, 1993). This contention is supported by evidence that obese person's suffer from emotional disturbance related to disparagement of body image (Stunkard, Stinnett & Smoller, 1986). Obese person's often feel that their bodies are loathsome and that others view them with hostility and contempt. Consequently, these feeling are closely associated with self-consciousness, depression, lowered self-esteem and impaired social functioning (ibid.).

4.3. Psychological Symptoms Specific to the Obese:

In contrast to the findings reported above, numerous studies have found consistent differences between the obese and the non-obese, on a number of psychological variables and behavioural patterns related specifically to weight and eating. In reviewing the areas of psychological health known to be related to weight, this section will focus specifically on the effect of treatment in ameliorating these symptoms. The review will include an examination of the effects of weight loss on depression and self-esteem, a description of the concept of restrained eating, as well as an examination of the binge-eating tendency of the obese.

4.3.1 Depressed mood

Obese person's have been said to suffer from underlying depression related to their weight (O'Neil & Jarrell, 1992). Although research has often been conflicting, due to methodological flaws, clinical observation supports the idea of an underlying depression (Faubel, 1989). However, studies have generally shown that improvement in mood can be expected as a consequence of treatment.

The literature on the psychological consequences of dieting are divided between those studies that report adverse effects on mood, and those that report beneficial effects. However, a closer scrutiny of the literature reveals that adverse effects were observed in seven studies published
prior to 1974 (Wadden, Stunkard & Smoller, 1986). In a review of ten studies investigating the relationship between mood changes and weight loss, published between 1969 and 1983, Wing et al. (1984), noted that six of the ten behavioural weight loss programmes showed a significant positive change in mood. None were reported to have increased the levels of depression. This finding was confirmed by Brodie and Slade (1990), who demonstrated that positive psychological changes in mood, followed involvement in treatment. Furthermore, the fact that untreated control subjects did not show positive mood changes, suggested that the elevated mood shown by treated groups was dependent on some degree of active participation in a treatment programme. Further illumination of the psychological consequences of dieting and weight loss comes from the three-year follow-up by Wadden, Stunkard and Liebschutz (1988). These authors reported that subjects who had received behaviour therapy reported significant reductions in depression at the end of treatment and at one year follow-up. Moreover, their findings indicated that when behaviour modification was used in combination with a VLCD, depression seemed to decrease; whereas levels stayed the same when a VLCD was used alone. Thus the improved psychological functioning was attributed to the effect of behaviour therapy.

Several other researchers have systematically measured changes in levels of depression during treatment (Wadden et al., 1984; Wadden & Stunkard, 1986). All of these studies reported either no change or an improvement in depression. A study of particular interest, conducted by Weighill and Buglass (1984), indicated that even minor changes in weight caused an immediate positive psychological response. These findings would suggest that a definite goal of weight loss programmes should be to improve the mood of their clients. Such positive improvements in psychological well-being might be expected to maintain or even enhance efforts towards further weight loss.

4.3.2 Self-Esteem

Self-esteem, defined as the totality of an individual's feelings and thoughts towards themselves (which includes elements of social identity, disposition, and physical characteristics), plays a critical role in psychological life (Robson, 1989). It has been thought to be an important factor in the integration of personality, in motivating behaviour, and in achieving mental health (ibid.). Furthermore, it has been shown that a person's evaluation or esteem of themselves plays an important role in determining their behaviour (Rosenberg, 1979).

Thus self-esteem can be viewed as an internal resource that enhances the ability to cope with the challenge of weight reduction. People with low self-esteem react to negative experiences in a
negative self-critical way, whereas people with high self-esteem attempt to offset negative events. As such a person with low self-esteem may express pessimism with respect to success in achieving goals in many areas in life, including those of weight-loss (Brown & Mankowiski, 1993). In addition, guilt feelings and negative thoughts about oneself may be compensated for via the enjoyment of the act of eating. In contrast, persons with high self-esteem have more positive views about themselves; they are more optimistic and possess the ability to adapt more readily to new situations. Hence when they experience guilt feelings they do not have to compensate for them by eating (Nir & Neumann, 1991). Furthermore, occasional setbacks do not lead to feelings of helplessness or worthlessness.

Given societies fascination for thinness, it is not surprising that the obese have been found to suffer from body-image disparagement (Wadden & Stunkard, 1993). Few obese people can or will reach the prevailing cultural ideal. Body-image and self-esteem are intertwined, thus people who are unhappy about their body tend to view themselves negatively (Brownell, 1991). This has obvious implications for obesity treatment to the extent that obese people with low self-esteem are more likely to have poor weight-loss maintenance and evaluate themselves negatively in their efforts at weight loss, especially if their goal weight is not achieved. This can be illustrated by the findings of a study by Stein (1987), who found that female students who suffered from overweight problems tended to have low self-esteem that expressed itself in 'worthlessness' and inferiority within their family circle. A study by Nir and Neuman (1991), found that subjects with low self-esteem, lost significantly less weight than subjects with medium and high scores. These author's concluded that high self-esteem scores related to higher ability to cope with the difficulties and crises induced during obesity treatment.

An encouraging finding has been the fact that obese patient's who lose weight, often display increased self-confidence and self-esteem (Brownell, 1988). This is because a person's positive self-concept increases with satisfaction of one's body characteristics. Even more promising has been the finding that self-esteem is enhanced regardless of the amount of weight lost (ibid.). This was illustrated by a New Orleans study measuring the effects of weight loss on the self-esteem of obese children. One group of children was given a low calorie diet and the other a normal diet. The two groups showed equivalent improvements in self-esteem at the end of the programme although the low calorie group lost twice as much weight (O'Neil & Jarrell, 1992). Thus losing even small amounts of weight can go a long way toward making obese people feel better about themselves.
Clearly then, a goal of obesity treatment should be to increase levels of self-esteem. This seems likely to happen merely by the act of losing weight. Conversely however, a study by Martin, Housley and McCoy (1988), of 550 adolescent girls, indicated that as weight increased self-esteem decreased. This should serve to cautioned about the adverse effects of weight regain on self-esteem, self-confidence, happiness and other areas of psychological health.

4.3.3 The concept of restrained eating

One relevant psychological characteristic that has received widespread attention in recent years, is that of restrained eating. This term 'restrained eating' is used to refer to the distinct eating behaviour of the obese, reflected not so much in their obesity, but rather in their chronic dieting in order to control their body weight (Stunkard, 1981). Thus the concept of restraint, refers to the process whereby the obese resist the physiological or psychological pressures to eat (Pirke & Laessle, 1993). The fact that restraint has been found to be a better predictor of overeating than weight, suggests that this is a psychological factor that may be useful in the classification of obesity (Ruderman, 1986). It may provide some index of how difficult it will be for an individual to lose weight, and more importantly, how well they will maintain a loss when challenged by the inevitable factors which promote overeating, such as the Christmas season.

A number of studies have shown that restrained eaters are more likely than unrestrained eaters to overeat in response to a challenge to their control over eating (Brownell, 1984). Moreover, research has shown that restrained eaters have distinctive responses to situations involving intake of high-calorie food (Stunkard, 1981). After consuming food such as a hamburger and chips, many person's, quite understandably, eat less of a subsequent test food. However, restrained eaters, defined by scores on the 'Restraint scale', eat more. This paradoxical behaviour is called 'counter regulation', and has been identified in a number of studies (Herman & Polivy, 1975). It is held that counter-regulation is significant because, when restrained eaters suspend their self-imposed restraint, they face a chronic caloric deprivation. Thus having given up the hope of staying within the caloric limits they had imposed on themselves, they suffer a motivational collapse and gave into the demands of the hunger that they had been depressing. The concept of counter regulation is therefore closely related to that of 'disinhibition' (abstinence violation effect) - the psychological process whereby the self-imposed rules for not eating are violated, resulting in untoward emotional reactions which are in turn associated with further overeating (Pirke & Laessle, 1993). Evidence for this contention comes from the finding that the ingestion of the classic disinhibitor, alcohol, increases food consumption in restrained, but not unrestrained eaters (Ruderman, 1986). It has also been shown that when depressed,
restrained eaters gained weight, whereas unrestrained eaters lost weight. Similarly, restrained eaters ate more when anxious, whereas unrestrained eaters ate less (Pirke & Laessle, 1993). These findings suggest that dieting behaviour and not obesity per se, is the cause of some of the psychological disturbances ordinarily attributed to obesity itself.

A major goal of restraint theory was to understand the eating behaviour of the obese person. However, serious problems with the predictive and construct validity of the Restraint Scale developed by Herman and Polivy in 1975, have since been discovered. Extensive refinements of the seminal concept of restraint led to the detection of three central dimensions within the global concept of restrained eating: - cognitive restraint, disinhibition, and hunger (Stunkard & Messick, 1985). Consequently, a new scale to measure restrained eating and the three dimensions of eating behaviour -the 'Eating Inventory', was developed (Stunkard & Messick, 1985; 1988).

The few applications of the Eating Inventory to date support it's usefulness and have clarified the psychological processes underlying restraint. Eating Inventory scores have predicted compliance, attrition, and outcome in obesity treatment (Stunkard & Wadden, 1990). Studies have found that obese person's (both those seeking and not seeking treatment), score higher than average-weight subjects on scales measuring disinhibition and perceived hunger (Stunkard and Wadden, 1990). High disinhibition scores have been shown to be related to weight gain and are predictive of poor outcome (Clark, Marcus, Pera, Niaura, 1994). Furthermore, the disinhibition scores of binge eaters have been shown to be higher than the disinhibition scores of non-bingers (Marcus, Wing & Lamparski, 1985). The extent to which dieters experience awareness of and susceptibility to hunger, has been shown to influence adherence and treatment completion (LaPorte & Stunkard, 1990). Moreover, hunger scores have also been positively related to binge severity (Clark et al., 1994), indicating that high susceptibility to hunger may predict poor treatment outcome.

Elevation of cognitive restraint has been shown to be particularly important in the successful treatment of obesity (see Table 3). A study by Bjorvell, Rossner, and Stunkard (1986), showed a significant correlation between weight loss and cognitive restraint scores, which increased during four years of follow-up. Of note, was the fact that obese person's who received behavioural treatment scored the highest cognitive restraint scores. This indicates that behavioural modification might increase cognitive restraint, thereby improving treatment outcome. In another study of 94 obese subjects participating in a very-low calorie diet and behaviour modification programme, elevated scores on cognitive restraint and low scores on
disinhibition and hunger prior to treatment, predicted positive outcome (LaPorte & Stunkard, 1990). These author's concluded that the higher the level of cognitive restraint, the better the outcome overall. In contrast, the greater the level of disinhibition, the poorer the outcome.

Table 3: Means and standard deviations for obese samples on the Eating Inventory

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Cognitive Restraint</th>
<th>Disinhibition</th>
<th>Hunger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Group</td>
<td>58</td>
<td>9.8 (4.2)</td>
<td>4.2 (2.8)</td>
<td>2.9 (2.3)</td>
</tr>
<tr>
<td>Obese in treatment</td>
<td>56</td>
<td>13.8 (4.7)</td>
<td>9.3 (3.0)</td>
<td>4.6 (2.9)</td>
</tr>
<tr>
<td>Obese not in treatment</td>
<td>16</td>
<td>7.6 (4.0)</td>
<td>9.7 (3.4)</td>
<td>6.0 (2.6)</td>
</tr>
</tbody>
</table>

Note: Figures compiled from Bjorvell et al. (1986)

It is evident from the studies reviewed above that the three core elements of restrained eating, as measured by the Eating Inventory, are useful predictors of positive treatment outcome. In particular, the elevations of cognitive restraint scores during successful treatment indicates that they may serve a useful monitors of treatment course. In considering all three factors simultaneously, high cognitive restraint scores, low disinhibition and low hunger scores, seem to be a profile suggestive of positive treatment outcome. Despite its apparent potential to predict successful outcome, research on the concept of restrained eating has not been well documented at this time, and it is still unclear how a comprehensive obesity treatment programme will effect Eating Inventory scores. There is thus a definite need for research documenting the use of the Eating Inventory as a monitor of clinical course.

4.3.4 Binge eating

It is now widely recognised that there is a subgroup of obese individuals with a distinctive eating style characterised by binge eating (Marcus, 1993). Binge eating refers to a form of eating characterised by both the consumption of a large amounts of food, and the loss of control over the eating at the time (Fairburn & Wilson, 1993). Obese binge eaters do not compensate for their overeating by purging or using laxatives, which differentiate them from person's with bulimia nervosa. The binge eating obese exhibit significantly more general and weight related psychopathology, compared with their non-binge eating counterparts (Wilson, Nonas & Rosenblum, 1992). In fact, so much so, that one of the new categories of the DSM-IV has been the inclusion of 'Binge Eating Disorder' (American Psychiatric Association, 1994). This has led some author's to suggest that binge eating may account for the relationship between obesity and psychopathology observed previously (Telch & Agras, 1994).
Chapter Four: Psychological and Social Aspects of Obesity and Weight Loss

Research focusing on the occurrence of binge eating among the obese has only commenced recently (Zwaan, Mitchell, Seim et al., 1994; Goldfein, Walsh, LaChaussee, Kissileff & Devlin, 1993). Nevertheless, estimates of the prevalence of binge eating among those seeking treatment, range from 23 to 82% (Marcus, Wing and Lamparski, 1985; Marcus, 1993; Brownell & Wadden, 1992). For example, a study by Spitzer, Devlin, Walsh et al. (1992), found that 30% of a group of patient's enrolled for treatment, met diagnostic criteria for binge eating disorder, compared to only 2% of subjects in the community. Obese binge eaters have also been found to have a higher lifetime prevalence of psychiatric illness, particularly affective and personality disorders (Zwaan et al., 1994; Marcus, 1993; Marcus, Smith, Santelli & Kaye, 1992; Brownell & Wadden, 1992). A comprehensive study by Marcus et al., (1990, cited in Marcus, 1993) compared the lifetime prevalence rates of DSM-III psychiatric disorders, in 25 obese binge eaters, and 25 obese non-bingers of similar age and weight. Their results showed that 60% of the binge eaters met criteria for one or more psychiatric disorders, compared to 28% of non-bingers. There was also significant differences between binge eaters and non-bingers in the lifetime prevalence rate of affective disorders (32% vs. 8%). In addition, it has been found that obese binge eaters: report more restrictive dieting standards and feel less able to maintain their diet (Marcus, Wing & Hopkins, 1988); experience more hunger and a higher tendency towards disinhibition of eating; show more emotional disturbance as measured by the MMPI, especially excessive compulsive thinking, anxiety, self-doubt and guilt (Kolotkin, Revis, Kirkley & Janick, 1987); and report more depression (Marcus et al., 1988).

Another important finding has been the discovery that episodes of major depression in binge eaters were all characterised by weight gain (Fairburn & Wilson, 1993). This has led clinical observers to suggest that binge eating is negatively associated with treatment outcome in weight control programmes. The results of a few empirical studies have confirmed this suspicion, showing binge eaters to experience poor weight losses and high attrition rates (Wadden, Foster, Letizia, 1992; Marcus et al., 1988). Nevertheless, a few recent studies have found that group-cognitive behavioural treatment is effective in reducing binge eating in the obese, in that it addresses the specific problems of these patient's (Agras, 1993; Smith, Marcus & Kaye, 1992). It is not yet known how these patient's will fare over long term follow-up.

Given the apparent prevalence of binge eating among the obese and the detrimental effects binge eating may have on weight loss, it is surprising how little is known about the impact of binge eating on the outcome of obesity treatment. This situation needs to be addressed by future research.
Chapter Four: Psychological and Social Aspects of Obesity and Weight Loss

4.4 Detrimental Psycho-Social Influences:

Many obese people experience untoward life events or circumstances during their efforts to lose weight, and these may well reflect why so many people fail to achieve successful weight-loss or drop out of treatment. Yet few, if any studies evaluating the effectiveness of treatment outcome, explicitly attempt to identify people's at risk of not achieving a therapeutic reduction of initial body weight. In this section then, the literature concerning two such potentially negative influences, life stressors and the obese person's family environment, will be reviewed.

4.4.1 Life stressors

It has been observed in several studies that patient's who relapse or do less well in treatment, report more negative life events during the same period of time (Kayman et al., 1990). It has been said that during the course of treatment it is not uncommon for at least one member in a group to experience a death in the family and another to face significant work-related or financial problems (Wadden & Stunkard, 1993). Such experiences may result in patient's losing control of their ability to manage their weight, and ultimately in weight regain or discontinued treatment. This introduces the notion of stress, and the role it plays in obesity management.

Some theorists have held that stress is inherent in dieting, and that as goal weight is approached a serious emotional crisis is experienced, due to the loss of the obese state as a defence. This introduces the antiquated concept of eating as a coping mechanism. Burbach and Schomer (1987) arguing from a purely psychodynamic perspective hypothesised that obese subjects with juvenile onset obesity, as opposed to adult onset obesity, would experience more stress during weight loss programmes as they had relied longer on eating as a coping mechanism. They argued that trying to lose weight would be more stressful for the former and that they would be more likely to drop out or lose significantly less amounts of weight. However, this hypothesis was unsupported by the results of the study. A far more popular contention has been the observation that the obese eat in order to cope with environmental threats to their psychosocial functioning.

Both clinical and laboratory studies suggest that obese individuals are more likely to overeat when stressed than are normal weight individuals (Wing, Blair, Epstein & McDermott, 1990). It has been found that obese patient's are more likely than normal weight people to eat when
Chapter Four: Psychological and Social Aspects of Obesity and Weight Loss

depressed, frustrated or angry, and more likely to gain weight during negative emotional periods (Lowe & Fisher, 1983). This is because food comes to be used as a readily available and reliable source of support and comfort. Whereas none of the obese subjects reported losing weight during periods of stress, 20% of normal-weight individual reported losing weight during such periods (Rand & Stunkard, 1978, cited in Wing et al., 1990). In light of the pervasive finding that the obese tend to eat when emotionally aroused, it is not surprising that some studies have indicated that up to 43% of relapse occurs under stress (Wadden & Stunkard, 1993).

The evidence of differences in stress induced eating between obese and normal weight people, has definite implications for treatment, in that an obvious goal would be to reduce stress levels. Obese subjects with lower stress levels are more likely to succeed. Furthermore, an analysis of the stress levels of patient's during treatment might give clues to why so many drop out or are not successful in losing significant weight. For example, some subjects may have a high degree of stress in their environment that could not tolerate the additional stress imposed by a programme aimed at behavioural change. In evaluating obesity programmes it is therefore important to know if there are any circumstantial life stressors that may induce weight regain or mediate against successful treatment outcome.

4.4.2 Family dynamics

In recent years obesity researchers have began to investigate the role of the family in the treatment process. It has long been known from other research fields, that active involvement of family members in treatment for a variety of illnesses, contributes significantly to patient compliance (Barbarin & Tirado, 1984). Furthermore, it has been postulated that one of the most influential factors in a person's continued progress with any form of treatment, may be the environment to which that person returns after termination of formal treatment (Tobias & Gordon, 1980). It is held that this should be no different in obesity treatment which involves major lifestyle modification and change.

The family is of particular import because it provides the natural environment in which maintenance of treatment effects must become a reality, and because family members are not disinterested parties to the change. The family is inevitably affected by drastic changes in eating and behaviour (Doherty & Harkaway, 1990). For example, weight reduction might requires the preparation of separate foods or the disruption of the family's established meal patterns and routines. As such, the family's co-operation in the subjects weight loss endeavours is likely to
have a major impact on the success or failure of treatment. If the subjects family and friends are critical or unconcerned about their efforts for weight loss, continuation of treatment is unlikely (Tobias & Gordon, 1980). It is therefore critically important for any effective evaluation of treatment, to also take into account the social interaction between the obese dieter and his or her family.

In this regard, it has been found that the degree to which obese person's receive social support from significant others in their social environment, is an important predictor of their susceptibility to treatment (Brownell, 1984). The perceived availability of support has been shown to protect individuals from the psychological impact of stressful life events, and appears to be an important factor in the successful treatment outcome (ibid.). This was clearly demonstrated in the classical study by Brownell, Heckerman, Westlake, Hayes and Monti (1978), evaluating the effect of spouse involvement in successful weight reduction. There results demonstrated that couples where the spouse was co-operative and participated actively in the programme lost significantly more weight than other treatment groups. The importance of the dynamics of the marital relationship and how it might influence the weight loss process was clearly demonstrated in a study by Stuart and Davis (1972, cited in Barbarin & Tirado, 1984) of 55 husbands of obese wives. Although 91% of the sample wanted their wives to lose weight, only 49% were willing to assist them in their efforts. Furthermore, 53% of the sample believed that the wife's weight loss might have a detrimental effect on the marriage. This belief stemmed from factors such as loss of power in marital conflicts and concerns about the spouse's marital commitment and sexual fidelity. This confirms other reports that large weight losses disrupt marriages and often result in divorce (Doherty & Harkaway, 1990). In contrast to the above findings, several studies suggest that the obese who lose less weight are dissatisfied with their support network and feel alienated from others (Grissett & Norvell, 1992). This validated Barbarin and Tirado's (1984) finding of significant differences between individuals who were able to maintain weight loss for over a year and those who could not, on marital quality, satisfaction with family life and perceived social support from the family. It has also been reported that major weight gains occurred during personal and family crises (Ganley, 1986). Thus differences in levels of social support may be an important factor why obese individuals drop out of treatment and why some lose more weight than others.

Clearly then, the family and the marital context should be taken into account even when the treatment plan does not call for active participation by family members. The family can facilitate weight loss by providing a stable, friction free environment which permits the obese member to channel energies into weight loss activities, rather than dissipate them in dealing with
Chapter Four: Psychological and Social Aspects of Obesity and Weight Loss

characterised by consensus, low levels of conflict, satisfaction, and expression of affection can assist the obese individual in their efforts to lose weight (Grissett & Norvell, 1992).

It has been seen that the family involvement can contribute to the success of weight loss programmes, and to the maintenance of weight loss. However, exactly how this effect is achieved is still not clear as studies have often failed to analyse what involvement entails and more specifically to identify the aspects of family process that contribute most directly to treatment enhancement. Family systems analyses of behaviour change provides a promising lead regarding the process underlying family members' influence in weight loss and weight maintenance. Many theorists have pointed to the belief that the families of anorexic and bulimic patients have specific qualities (Doherty & Harkaway, 1990). Extending this notion, it would seem conceivable that the families of the obese might also have its unique characteristics. Yet, few studies have undertaken to examine the family dynamics of obese families and the impact that these might have on efforts to lose weight.

The Family Systems Model postulates that certain types of family organisations are closely related to the development and maintenance of psychosomatic syndromes, of which obesity is thought to be one such syndrome. Four types of family transactions have been identified that encourage psychosomatic symptoms: Enmeshment, rigidity, overprotectiveness, and lack of conflict resolution (Wertheim, Paxton, Maude et al., 1992). Family processes are asserted to have a relationship to both psychological dysfunction and psychosocial competence. For example, the way in which families structure and manage their interdependence as reflected in family consensus, cohesion, conflict, and mutual responsiveness are key indicators of how well they function. The sources of pathology lie in communication deficits, disordered relationships (enmeshed or disengaged) and flawed structural features (lack of flexibility, rigid boundaries). Sources of family strength lie in processes which characterise qualities of family relations and by which family sub-systems promote psychological well-being of and contribute to the personal growth of members (Grissett & Norvell, 1992).

The understanding of the underlying dynamics of psychosomatic families can be extended by The Circumplex Model of family functioning (Olson, Sprekle & Russell, 1979; Olson, 1986). This model views two primary dimensions of family interaction and functioning to be cohesion and adaptability. Family cohesion assesses the degree to which family members are separated from or connected to their family. At the extreme of high family cohesion, Enmeshment, there is an over identification with the family that results in extreme bonding and limited individual autonomy. At the low extreme, disengagement, is characterised by low bonding and high autonomy from the
autonomy. At the low extreme, disengagement, is characterised by low bonding and high
autonomy from the family. Family adaptability has to do with the extent to which the family
system is flexible and able to change (Olson, 1986). As such family adaptability is defined as
the ability of a marital or family system to change its power structure, role relationships, and
relationship rules in response to situational and developmental stress (ibid.). For each dimension
the balanced levels are held to be most viable for healthy family functioning and the extreme
areas are generally seen as more problematic for families over time. Thus the central hypothesis
derived from the model, is that balanced families will function more adequately than extreme
families. This notion is built on the assumption that families extreme on both cohesion and
adaptability dimensions will tend to have more difficulties coping with stress.

The Family Systems Model presents obesity as being inextricably embedded in relationship
patterns that fundamentally influence its aetiology and maintenance (Ganley, 1986). Reviews of
studies of families with obese individuals have found evidence that these families were
characterised by Enmeshment, poor conflict resolution, emotional over involvement or
detachment, and a lack of affection and empathy (Wertheim et al, 1992). Less clear have been
findings of family rigidity, and parental overprotection (ibid.). A few studies have also assessed
how family characteristics relate to weight loss behaviours. A study by Doherty and Harkaway
(1990), examined the effects of family process on weight loss in different types of families.
They compared enmeshed and disengaged families in which a member attempted weight loss.
Disengaged families did not benefit from family support and members from these family types
were less effective in losing weight. Barbarin and Tirado (1985) conducted a study to examine
family processes and Enmeshment in relation to long-term maintenance of weight loss. They
found that at one year follow-up there were no differences in family processes between
successful and unsuccessful maintainers from disengaged families. However, successful
maintainers from enmeshed families reported higher levels of family support and satisfaction
with family life than unsuccessful maintainers. These results suggest that Enmeshment may
discriminate families whose home environment would contribute to the success of treatment of
obesity from families who's would not. Nevertheless, the enhancement of treatment effects
achieved by family involvement does not occur in all families but is more likely to occur in
highly cohesive, interdependent families (Brownell & Wadden, 1986).

It has been seen that balanced families characterised by cohesion, adaptability, satisfaction and
consensus can sustain and comfort the obese individual in their efforts to lose weight.
Furthermore, patient's who are supported by their families may experience fewer temptations to
overeat, be protected from emotional upset, and practice weight control behaviours more
regularly. The promise of increased effectiveness of a weight loss programme through family involvement also raises the possibility of decreased effectiveness due to sabotage and undermining of programme goals by the family. Pathological family processes make some families unable to contribute to the treatment of obesity. In some cases the family may actively obstruct treatment progress. Therefore, it is argued that an assessment of the family situation is critical in any evaluation of treatment programmes.

4.5 Rationale:

In most weight control programmes the goal of treatment is to achieve a predetermined 'goal' or 'ideal' weight. Thus the effectiveness of treatment is evaluated by means of the desired weight loss being obtained or not. The fact that weight loss can be easily measured enhances the misbelief that weight loss is the inevitable pre-requisite to symptomatic improvements. In many instances, however, the alleviation of the features of obesity may be arguably more important. Obesity is just a symptom, an it may not be essential for the obese subject to lose weight provided that they feel better. This contention is supported by the observation that a considerable number of the obese are motivated to lose weight for psychological reasons, relating to feelings of low self-esteem and depression, often aggravated by the social stigma of the condition (Munro & Cantley, 1992). Furthermore, the weight loss necessary to achieve ideal weight is always substantial, and may ignore the psychological and medical benefits of less than total weight loss (Munro & Cantley, 1992). The notion that small weight losses can produce significant improvement in health and happiness have existed for years (Brownell & Wadden, 1992).

Therefore, in evaluating the success of a weight control programme, a psychological assessment of change is also fundamental. With the exception of reduced depression, the psychological changes that accompany weight loss have not been well documented and characterised. The obesity literature is still far too abundant with statements such as "another important criteria for judging the success of treatment is the patient's quality of life...however, there has been little research on this topic" (Wing, 1992, pg. 546). Rather we should heed the petitions pleading that "approaches aimed at improving the psychological well-being of the obese individual (should) be given priority... as a subject of research (Garner & Wooley, 1991, pg. 767). Psychosocial factors such as self-esteem, mood, eating habits, vulnerability to stress and social relationships, can and should be included in evaluations of outcome. Such data can help to form a
Chapter Four: Psychological and Social Aspects of Obesity and Weight Loss

In this chapter the idea has been put forward that more attention needs to be given to addressing the psychological and social concomitants of obesity and its treatment. In particular, it has been shown that the utility of such an approach is twofold. Firstly, it will allow for successful treatment outcome to be defined not only in terms of weight loss, but also in terms of the improved quality of life brought about by decreased psychological distress. Secondly, it will allow for the identification of psychological and social factors, specific to treatment and in the environment in general, that may predict an individual's response to weight reduction programmes. Psycho-social factors are therefore critically important determinants of the extent of weight reduction in overweight individuals.
PART TWO:

THE EMPIRICAL STUDY
5.1 Motive For The Study:

It has been argued that given the nature and prevalence of obesity, and the medical and psychological ramifications shown to be associated with the condition, there is a definite need for safe and effective methods of treatment. Although many treatment options are available, comprehensive weight control programmes (CWCP) based on intensive lifestyle education, including eating behaviour modification, have been asserted to hold the most promise for treating obesity.

In general, no formal CWCP clinics exist in outpatient or primary health care settings in South Africa. However, a CWCP has been developed by a local group of experts in the field obesity management. The goal of which was to help a wide range of obese individuals to achieve a realistic goal weight, allowing for therapeutic effect, that they would be able to maintain. The CWCP was designed to be conducted over a period of 24-weeks, and included all elements of behaviour modification and reinforcement of learned behaviour. The programme was highly structured and dealt with every issue affecting weight management. The first seven weeks, called the awareness phase, educated individuals on: the health risks of being overweight; the causes of being obese; as well as the biological and physiological mechanisms underlying obesity (e.g. hunger, glucose, insulin and fat metabolism). The next eight weeks, called the changing phase, included: introducing a four-week low calorie diet to initiate weight loss; making the individual aware of their own eating habits; teaching nutrition education and healthy eating plans; emphasising the role physical exercise interventions by increased active and passive physical activities; introducing individuals to the technique of cognitive restructuring; and training individuals in attitudes awareness and skills. This was followed by a five week reinforcement phase, which included medical monitoring and intensive behavioural modification of eating habits and patterns. Finally, the last four weeks, called the maintenance phase, taught individuals eating habits for life and weight maintenance techniques. The intention of this latter phase was for obese individuals to acquire the life-style skills they needed for long-term weight maintenance.
The purpose of this study is thus to evaluate the efficacy of this CWCP in an outpatient setting. A successful study outcome could ultimately serve as a basis for modification of the CWCP for at risk populations in other outpatient venues and primary health care clinics, appropriate for all South African population groups.

Based on the psychological consequences that have been seen to be associated with obesity, a central premise of this study* is the assertion that those who feel that the basic strategy in weight management is only to produce weight loss, are treating the scales and not the patient. Rather, there should be three management objectives. These are the promotion of weight loss, the prevention of weight gain, and most importantly the alleviation of the complications of obesity. The latter point applies both to the physical and psychological consequences of obesity. If the obese patient comes out of treatment with reduced psychological distress and feeling better about themselves, it is illogical to consider this any less of a success whether weight loss occurs or not. Therefore, an accurate evaluation and assessment of psychological symptoms, both before, during and after the course of treatment, would be of considerable clinical interest to all health care providers working in the field of obesity.

5.2 Aim:

The aim of this study was to determine the efficacy of a comprehensive weight control programme (CWCP) for obese outpatients at Tygerberg Hospital, by comparing both weight loss and psychological outcome, with standard diet therapy (ST).

* It should be mentioned that this research formed part of a joint project between the Medical Research Councils' Division of Chronic Diseases of Lifestyle (whom the author represented), the Department of Human Nutrition (U.S.) and the Department of Physiology (U.S.). Thus only the content specific to the authors field of knowledge will be presented. Changes in eating behaviour, nutrition knowledge and improvements in levels of physical fitness were studied separately by researchers from the University of Stellenbosch, and will not be included here.
Chapter Five: Methodology

5.3 Specific Objectives:

To determine and compare between the CWCP (experimental) and ST (control) intervention groups:

1) Baseline data for all subject's prior to intervention.

2) Follow-up data after 3 and 6 months intervention.

3) Long-term follow-up data after 12 months intervention (six months after completion).

5.4 Method:

5.4.1 Study design

The study design was a randomised controlled trial (RCT) with follow-up, using a stratified randomisation procedure. The experimental group received comprehensive-behavioural treatment and the control group received 'standard' diet therapy.

5.4.2 Subject's

The sample consisted of 155 obese volunteers (BMI > 30), who were recruited through the local media and represented both the Northern and Southern suburbs of the Western Cape. Both male (n = 24) and female (n = 131) subject's participated in the study. The ages of the subject's ranged between 18 and 64 years old. The sample size was determined on the supposition that the attrition rate in the experimental and control groups would be approximately 40% and 80% respectively (based on previous studies). Assuming that the desirable minimum statistical power probability should not be less than 0.8 (Lipsey, 1990), a minimum sample size of 32 was calculated to be required in each group, to be sure that medium-small treatment effects of .65 would be detected (for a one-tailed test) at the 0.05 level of significance. The sample size was therefore deliberately increased at the start the programme, so as to allow for an acceptably high degree of statistical power for the comparisons made at the completion of treatment, despite high rates of attrition.
Chapter Five: Methodology

5.4.3 Procedure

A series of advertisements asking for obese volunteers to join a multi-disciplinary study of weight control were run in the local press. This included the Cape Times, The Argus, Die Burger, Gazette, Tyger-Burger, a news flash broadcast on Radio South Africa, as well as various advertisements placed on notice boards at the Tygerberg Hospital (see appendices). More than 6000 calls were received over a three day period and approximately 500 names and telephone numbers of interested parties were collected. The names of all interested persons were put on a waiting list and they were required to attend one of three scheduled evening information session meetings, held at the main conference hall of the Medical Research Council in Tygerberg. The purpose of these information sessions was to explain the study in more detail. Candidate participants were then informed that two research programmes were being evaluated concurrently and that they stood an equal chance of being selected for either one of them. This was to cover for the possibility of those allocated into the control group feeling that their treatment was inferior. Interested parties were also informed that a requirement for their participation was that data would be collected from them and that they would be willing to make themselves available for four routine assessments of their progress, which included a follow-up six months after treatment had been completed. It was stressed that all information gathered from them would be treated with the utmost confidentiality. Furthermore, the possible applicants were also informed that although participation was voluntary, and as such they would be allowed to withdraw from the programme at any time without prejudice, informed and written consent would be obtained from each subject prior to them joining the study. In addition, they would received a medical examination form that had to be completed by their doctor before inclusion into the study. Candidates were also reminded that a cost of R10 per week for the duration of the twenty-four week programme was to be charged so as to cover running costs. Prior to the study subject's were required to undergo a full physical examination with their own medical practitioners.

Those obese individuals that were still interested in participating after these information sessions, were required to fill out an application form (see Appendix A). This form required them, among other things, to give their height and weight, as well as for them to make a choice of one of four possible day / time combinations for their group meetings. The options that were available for subject's were Tuesday 13h00 -14h00, Wednesday 14h00-15h00 or 15h00 - 16h00, and Thursday 13h00 - 14h00, 17h00- 18h00 (X 2) or 18h00-19h00 (X 2). Subject's were informed that they were not guaranteed their first choice and had to provide a second and third choice as well. This
information was used to randomise the subjects by availability for group sessions, into control and experimental groups.

A total of 255 obese individuals (222 women & 33 men) applied to participate in the study after attending the information sessions. Of these, 71 applicants were excluded for one of the following reasons: BMI < 30, pregnancy, age < 18, on heavy drug regimens, could only make Friday's, or currently dieting or participation in other weight loss programmes. These subjects were sent a letter stating that they had not been chosen this time, but that they would be considered first in the event of a follow-up study. The 184 subjects (156 females & 28 males) that met the criteria for inclusion were pooled according to availability and randomised into treatment or control groups. The randomisation procedure was conducted as follows. The 88 participants for the Thursday groups were ranked using tables of random numbers. A quartile split was then used to form four groups of 22 and a coin toss decided the control from experimental groups. For both the Tuesday and Wednesday groups, there were 48 people available. Again tables of random numbers were used to allocate a rank order of 1 to 48. A median split was performed to divide the groups into two (24 people in each), and a coin toss decided the experimental from the control groups. Thus of the total of eight groups, four were randomised into control (n = 92) and four into the experimental group (n = 92). Once subjects had been selected in this way, they were not allowed to change their groups. Successful applicants were notified by telephone and post that they had been included in the study, and where told the date, time and venue that their groups would commence. Furthermore, appointments were made for their baseline assessments.

Four registered female dieticians from the Department of Human Nutrition at Tygerberg Hospital, with considerable experience in dealing with weight loss, were trained to conduct the treatment sessions. Training occurred over a three day period with all the stake-holders taking part. Each dietician was randomised to one control group and one experimental group so as to try and balance the effect of their individual influence on outcome. The dieticians were bilingual and conducted the programmes in both English and Afrikaans. A weekly meeting, attended by the study team, was held for the duration of the trial. This was to facilitate planning and administrative aspects.

A pilot study was conducted one month prior to the commencement of the study in order to evaluate practical and administrative difficulties that may arise from collecting data from questionnaires and measurement instruments. A small group (n = 12) of overweight volunteers recruited from the staff of the MRC and Tygerberg Hospital were assessed. This allowed minor practical problems to be
ironed out such as how long it took for the various stages of assessment - anthropology and questionnaire completion. The format of the questions was changed slightly as a result. It was also discovered that the assessments would run best when dealing with only a small group at any one time. The exercise also allowed dieters to standardise their anthropometric measurements. In addition, a further 23 subjects who were not initially included in the trial, were included in a 'dummy group' and received the same comprehensive treatment as the experimental groups. This group ran on Friday mornings a week prior to the experimental groups, and allowed for any problematic factor to be sorted out in advance.

The baseline assessment took place over a seven day period so as to allow for re-scheduling. Each person was booked for a two hour period of assessment. Approximately four sessions were run per day, with a maximum of eight subjects per session. In this period they were measured and assessed and had to complete a battery of questionnaires. The subjects received questionnaires in their home language (English or Afrikaans). Afrikaans questionnaires were translated back into English after being translated the first time so as to ensure for accuracy. At the assessment subjects were reminded the time, day and venue that their groups would be meeting. This procedure was followed for the three month, six month, and 12 month follow-ups. Those subject who dropped-out during the course of treatment and that therefore did not come to the assessments, were sent a questionnaire on their reasons for dropping out (this included the Binge Scale) by post.

Of those selected for the trial, 30 did not arrive for the baseline assessment, which meant that 155 subjects commenced the programme (see Table 4). Subjects met in small groups on a once weekly basis in an outpatient venue at the Tygerberg Hospital. A description of the differences between the control and experimental programmes is presented below.

<table>
<thead>
<tr>
<th>DIETICIAN 1</th>
<th>EXPERIMENTAL</th>
<th>CONTROL</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIETICIAN 2</td>
<td>20</td>
<td>21</td>
</tr>
<tr>
<td>DIETICIAN 3</td>
<td>16</td>
<td>19</td>
</tr>
<tr>
<td>DIETICIAN 4</td>
<td>18</td>
<td>20</td>
</tr>
</tbody>
</table>

Table 4: Total subjects per group at the start of the trial
Experimental group receiving the comprehensive treatment (CWCP):

The experimental group followed the 24-week comprehensive-behavioural treatment described above. These subjects received a workbook with daily exercise and behavioural checklists aimed at self-monitoring (observing and recording their behaviour). These were checked weekly by dieticians to ensure compliance. A low calorie diet was initiated at week eight, only once lifestyle patterns had been established.

Control group receiving the standard diet therapy (ST):

'Standard' therapy, for the purpose of this study, was defined as all the elements of the CWCP, but without an intensive behavioural modification (reinforcement) element. This implies that subjects receiving standard treatment did not receive a workbook nor did they participate in daily homework activities which were aimed at learning new eating behaviour. Thus the control group followed an unstructured 24-week programme to resemble conventional treatment of obesity. The subjects in the control groups followed a similar programme to the CWCP as far as content was concerned. Treatment involved a low calorie diet administered within the first two weeks of treatment, instruction to exercise, advice and encouragement.

5.4.4 Measurements

All the subjects completed assessments at baseline (onset), after 3 months, 6 months (completion), and again after 12 months (follow-up). [See Appendix B for copies of questionnaires]. The following assessment devices were used:

5.4.4.1 Demographic data:

This information was collected by questionnaire at baseline only and included: names, addresses, age, gender, socio-economic status details, personal information, health information and an assessment of weight history. In addition a few questions pertaining to motivational factors were included.
5.4.4.2 Anthropometry:

a) *Height* (m): baseline values to the nearest centimetre, were determined using a standard anthropometer with subjects standing in an upright position with their back against the wall, and their heels together (without shoes).

b) *Weight* (kg): baseline and weekly measurements of subjects in light clothing were determined to the nearest 0.1 kg, using an electronic scale which was standardised each week with a 10 kg reference weight. Weight loss was expressed as a mean change in weight.

c) *Body-Mass Index* \((\text{weight (Kg)} / \text{height (m}^2)\) ) was used as an indicator of obesity and thus to classify subjects into 'moderately' obese \((\text{BMI} = 30 \text{ to } 40)\), and 'severely' obese \((\text{BMI} = 40 \text{ and greater})\). Weight loss was also expressed as a mean change in BMI.

5.4.4.3 Psychological measurements:

All the participants were required to complete a battery of psychological measurements at each of the assessments. This was with the exception of the Binge Scale, which was only administered post hoc at the third assessment once treatment had been completed*. The psychological measurements included the following:

a) *The Eating Inventory* (EI) (Stunkard & Messick, 1988) is a 51-item scale designed to assess three dimension of eating behaviour: Cognitive Restraint; Disinhibition, and Hunger. Eating Inventory scores have predicted compliance and outcome in obesity treatment (Clark, Marcus, Pera & Niaura, 1994). In particular, elevation of cognitive restraint has been shown to be important to the successful treatment of obesity, with high levels of cognitive restraint predicting positive treatment outcome. In contrast elevated disinhibition scores predict a poor treatment outcome (see Table 5 for clinical ranges for interpreting raw scores). This scale was thus included as a monitor of treatment course.

* This was because the significance of binge eating for the obese was a relatively new one and was only discovered by the author at an International Obesity Management Congress, held in Belgium, after the study had already commenced.
Chapter Five: Methodology

Table 5: Clinical ranges for the Eating Inventory

<table>
<thead>
<tr>
<th>Clinical Range</th>
<th>Cognitive Restraint</th>
<th>Disinhibition</th>
<th>Hunger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low to Average Range</td>
<td>0-10</td>
<td>0-8</td>
<td>0-7</td>
</tr>
<tr>
<td>High Range</td>
<td>11-13</td>
<td>9-11</td>
<td>8-10</td>
</tr>
<tr>
<td>Clinical Range</td>
<td>14 &gt;</td>
<td>12 &gt;</td>
<td>11 &gt;</td>
</tr>
</tbody>
</table>

The fact that it is a fairly new scale not often used in past studies warrants a full investigation of the psychometric properties of this scale. Internal consistency estimates of reliability (alpha coefficients) for the three factors of the inventory were calculated at .93, .91, and .85. The test-retest reliability for the three factors, .93, .80, and .83, also indicates the scale stability (Stunkard & Messick, 1988). The content validity of the instrument is derived principally from the clinical basis upon which the items were developed. All three factors have clear uses in experimental literature and clinical treatment methods for eating disorders. In terms of construct validity, the analysis of internal consistency, insignificant scale intercorrelations, and factor structure clearly point to a coherent set of three constructs measured by the inventory. As reviewed earlier in Chapter three, studies both of obese patients seeking treatment and control groups, consistently demonstrate that scores on each of the three factors differentiate between groups predicted by theory and research on eating behaviour. The criterion validity of the questionnaire was supported by the finding that binge severity significantly correlated with factor II (r = .61) and with factor III (r = .54) (Marcus, Wing & Lamparski, 1985).

b) The Beck Depression Inventory (BDI) (Beck, Ward, Mendelson, Mock & Erbaugh, 1961) was included as a standard measure of assessing the severity of depressive symptomatology. This test is a widely used 21-item instrument of known reliability and validity (Bumberry, Oliver & McClure, 1978). The subject picks from each set of four statements the one that best represents their feelings; the higher the score the greater the degree of depression. There is no arbitrary score that can be used for all purposes to classify different degrees of depression, however, this study uses the guidelines for interpreting the scale suggested by Beck (1978): 0-9 = normal range, 10-15 = mild depression, 16-19 = mild-moderate depression, 20-29 = moderate-severe depression, 30-63 = severe depression.

c) The Self Concept Questionnaire (SCQ) (Robson, 1989), was included as a standard measure for evaluating level of self-esteem. The SCQ is a 30-item scale for measuring self-esteem that is easily
comprehensible to patients and quick to complete. It also demonstrates satisfactory psychometric properties. The reliability of the scale has been well documented, split-half correlation was 0.931 (p. < 0.0001) giving a reliability score of 0.96 using the Spearman-Brown formula (Robson, 1989). Cronbach's coefficient alpha was 0.89. The SCQ also has been shown to be a valid measure of self-esteem. The correlation with the widely used Rosenberg (1965) measure of self esteem was .804 (p<0.0001). In addition the correlation between the estimates by clinicians of the self-esteem of patients well known to them, and the SCQ scores was 0.7. Feelings of guilt and shame over their body size are likely to diminish the self-esteem of the obese person in some areas of functioning, even if not sufficient to affect global self-esteem. Self-esteem has been shown to be composite rather than a single entity (Robson, 1988). The advantage of using the newly developed SCQ as opposed to the more widely used Rosenberg Self-Esteem Scale, is that the former allows for the analysis of five separate components of self-esteem and is not just a global measure. These factors are: 1) attractiveness, approval by others, 2) contentment, worthiness, significance, 3) autonomous self-regard, 4) competence, self-efficacy & 5) the value of existence. The interpretation of global self-esteem is a simple one. The norm for healthy individuals has been found to be 140, thus any score less than this points to low self-esteem, and greater than this indicates high self-esteem.

d) The Family Adaptability and Cohesion Evaluation Scales (FACES III) was developed by Olson, Portner & Lavee (1985) for the study of family processes using family systems theory as its framework. Typically, this scale is used to assess family cohesion, family adaptability and levels of satisfaction with family functioning. The theoretical model underlying the FACES III is that of the circumplex model of family functioning and enables families to be classified into 16 specific types or three more general types - balances, mid-range and extreme (see Table 6). Disordered families are characterised as deviating from normal functioning. Normality is thought to lie in a balanced style - there being neither too much closeness nor too little, neither too much adherence to rules nor too little. The dimensions of cohesion and adaptability appear to be theoretically related to the first two features of Minuchin's psychosomatic family model - enmeshment and rigidity (Doherty & Harkaway, 1990). This information is of interest in the general systems understanding of the family in relation to adjustment, and allows for the identification of those families that adjust better than others. The scale consists of 20 items, 10 assessing cohesion and 10 assessing adaptability. There are two items for each of the following five concepts related to cohesion dimension: emotional bonding, supportiveness, family boundaries, time and friends, and interest in recreation. There are two items for each of the following concepts related to adaptability dimensions: leadership, control, and discipline; and four items for the combined concepts of roles and rules. The respondent is
required to indicate agreement on a five point Likert scale (1 = almost never to 5 = almost always). There is also a perceived and ideal measure of family functioning with the perceived-ideal discrepancy being used as an indirect measure of family satisfaction. The nature of the scale allows for information to be obtained about the family satisfaction for each of the adaptability and cohesion dimensions. The total family satisfaction score is obtained by the sum of the two discrepancy scores on cohesion and adaptability. The measure of family satisfaction is important as families that occupy extreme positions on adaptability and cohesion dimensions will still function well, provided the family members like it that way. It has been consistently found that more problem families were of the extreme types non-problem families were of the balanced type. The two dimensions of cohesion and adaptability are independent and orthogonal (\( r = 0.03 \)). The correlation between each of the adaptability items and total adaptability score ranges from 0.42 to 0.56 and the correlation between cohesion items and total cohesion score ranges from 0.51 to 0.74 (Olson, 1986). This is indicative of a sound construct validity of the FACES III. Internal consistency reliability using Cronbach Alpha for cohesion was 0.77, for adaptability 0.62 and for total scale 0.68. The test-retest reliability scores over a five week period were reported to be good (\( r = 0.8 \) for adaptability and 0.83 for cohesion). Apart from the impressive reliability and validity statistics this scale is one of the best tested and designed family assessment instruments available.

Table 6: Norms and cutting points for FACES III

<table>
<thead>
<tr>
<th>COHESION (( M = 39.8, SD = 5.4 ))</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disengaged</td>
<td>10-34</td>
</tr>
<tr>
<td>Separated</td>
<td>35-40</td>
</tr>
<tr>
<td>Connected</td>
<td>41-45</td>
</tr>
<tr>
<td>Enmeshed</td>
<td>46-50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ADAPTABILITY (( M = 24.1, SD = 4.7 ))</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rigid</td>
<td>10-19</td>
</tr>
<tr>
<td>Structured</td>
<td>20-24</td>
</tr>
<tr>
<td>Flexible</td>
<td>25-28</td>
</tr>
<tr>
<td>Chaotic</td>
<td>29-50</td>
</tr>
</tbody>
</table>
Chapter Five: Methodology

e) The Stress Vulnerability Scale (SVS) is a 20-item self-report questionnaire, of known validity and reliability, used to assess how vulnerable a person is to stress (Miller & Smith, 1983). The SVS scale was used in this study to assess untoward life events and environmental influences that might significantly affect subject's psychosocial functioning and thus their ability to control their weight. Such experiences may result in patients leaving treatment or gaining weight, as they lose control of their efforts to lose weight. The scale is easy to administer and assess. The scores are simply added up and subtracted by 20. A score greater than 30 indicates vulnerability to stress (50-75 seriously vulnerable, > 75 extremely vulnerable).

f) The 16-item Binge Eating Scale (BES) was used to assess binge eating severity (Gormally, Black, Daston & Rardin, 1982). The BES is a self-report questionnaire designed to measure both the behavioural features of binge eating and feelings and cognition's associated with this behaviour. The BES has a good test-retest reliability, and has been extensively used to select and characterise samples of obese binge eaters, and as such has become a fairly standard measure of binge eating symptomatology (Wilson, 1993). Gormally et al. (1982) validated the scale using as the external criterion clinical judgement of binge severity based on structured diagnostic interviews with obese persons seeking treatment. Individuals were classified as having no binge-eating problem, a moderate problem, or a severe bing-eating problem. Scores on the BES were found to be significantly different for each level of binge severity, suggesting that the scale may be used to assess severity of binge eating in obese persons. The internal consistency of the scale was moderately high (Cronbach's alpha = .85). Although there are no established cut-off points for the BES, the Gormally et al. (1982) analysis suggested the following categorisation, which was used in this study: 0-15 non-binge eating; 15-19 mild; 20-30 moderate; and > 30 severe.

5.4.4.4. Attrition Rate:

Total attrition was calculated as the number of subject's who for any reason discontinued treatment as a percentage of those who started treatment.
5.5 Ethical Approval:

The study was approved by the Department of Community Health and Ethical Committee of U.C.T.; as well as the ethical committees of the University of Stellenbosch and the Medical Research Council.

5.6 Statistical Analysis:

The primary purpose of this study was to compare the CWCP group to the ST group. Chi-square analysis was used to determine differences between the two groups on demographic variables. Analysis of Variance (ANOVA) was used to compare differences between the CWCP and ST groups at each assessment. Repeated measures t-tests were used to assess treatment-related changes in weight, BMI and psychological measures, within each group. Correlational analyses was also utilised to examine the relationship between weight loss and the psychological measurements used. To control for subject differences (heterogeneity) on all the dependent variables used, an unbalanced repeated measures analysis of covariance (ANCOVA) was conducted over time (modelling with the intent to treat), using baseline measures as the covariant. Statistical analyses at each comparative stage was conducted only on data from those subject's who had completed the programme at these time points.
CHAPTER 6: RESULTS

For the purposes of simplicity, the findings will be reported separately for each of the four assessments. The chapter will start by focusing on the baseline comparisons and demographic description of the groups; this will be followed by the various comparisons at 3 months, 6 months and follow-up. The more sophisticated analysis, modelling over time, will be presented at the end of this chapter, along with the results from the analysis of attrition.

6.1 Demographic Information:

The demographic data for the two groups is reported in Table 7 below.

Table 7: The demographic breakdown of the two groups prior to treatment

<table>
<thead>
<tr>
<th>DEMOGRAPHIC VARIABLES</th>
<th>EXPERIMENTAL</th>
<th>CONTROL</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>11% (n = 8)</td>
<td>20% (n = 16)</td>
</tr>
<tr>
<td>Female</td>
<td>89% (n = 66)</td>
<td>80% (n = 65)</td>
</tr>
<tr>
<td>LANGUAGE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Afrikaans</td>
<td>37% (n = 27)</td>
<td>54% (n = 43)</td>
</tr>
<tr>
<td>English</td>
<td>54% (n = 40)</td>
<td>35% (n = 28)</td>
</tr>
<tr>
<td>Bilingual</td>
<td>9% (n = 7)</td>
<td>11% (n = 10)</td>
</tr>
<tr>
<td>MARITAL STATUS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>28% (n = 21)</td>
<td>29% (n = 23)</td>
</tr>
<tr>
<td>Married</td>
<td>72% (n = 53)</td>
<td>71% (n = 57)</td>
</tr>
<tr>
<td>INCOME</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; R 3 000</td>
<td>42% (n = 31)</td>
<td>35% (n = 28)</td>
</tr>
<tr>
<td>R 3 000 - R 5 000</td>
<td>27% (n = 20)</td>
<td>33% (n = 26)</td>
</tr>
<tr>
<td>&gt; R 5 000</td>
<td>31% (n = 23)</td>
<td>32% (n = 26)</td>
</tr>
<tr>
<td>EDUCATION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; Std 8</td>
<td>22% (n = 16)</td>
<td>14% (n = 11)</td>
</tr>
<tr>
<td>Std 8 - 10</td>
<td>42% (n = 31)</td>
<td>35% (n = 28)</td>
</tr>
<tr>
<td>Degree / Diploma</td>
<td>36% (n = 27)</td>
<td>51% (n = 41)</td>
</tr>
</tbody>
</table>

As can be seen from Table 7, the majority of subjects from both groups were married, English and Afrikaans speaking women, who had above average education and earned more than R 3 000 per month. There were no significant differences in the demographic breakdown of the two groups at the
onset of treatment, other than a marginal difference for that of language ($\chi^2(2) = 5.8, p > 0.055$). Whereas more of the subjects in the CWCP group spoke English, more of the subjects in the ST group were Afrikaans speaking.

The following pre-treatment characteristics are reported for the sample as a whole, as no significant differences were found between the two groups. The sample was largely middle-aged, 40% being older than 41 years of age. With regard to associated health risks, the rates were as follows: high waist-hip ratios (66%); hypertension (28%); hypercholesterolaemia (18%); diabetes (9%); and cardiovascular disease (7%). Regarding the subjects motivation prior to the study, 86% indicated their intent to complete the course successfully, 77% felt that the information that they gained could be useful to ensure good health habits, 74% stated that there families and friends approved and strongly supported their weight loss efforts, and 97% stated that they felt the threat of obesity to their health would motivate them to lose weight. However, 27% believed from the start of the programme that they would be unable to control their eating and exercise habits. Furthermore, 92% did not currently engage in regular physical activity, 74% thought that they would be unable to say no to unwanted foods, and 97% were not currently in psychological or psychiatric treatment.

6.2 Baseline Assessment:

As indicated in Table 8, there were no significant differences between the CWCP and ST groups on any of the anthropometric measurements at the pre-treatment stage. One-way analysis of variance revealed that neither the average weight [$F(1,153) = 0.3, p>0.587$], nor the average height, were statistically significantly different between the two groups [$F(1,153) = 1.81, p>0.1809$]. With regard to the mean BMI of the groups, there was clearly no differences between the two treatment conditions [$F(1,153) = 0.02, p>0.877$].

The mean Beck Depression Inventory score for both groups fell in the mildly-depressed range at the onset of treatment. It was notable that 25% of subjects in both the experimental and control groups obtained a score indicative of being moderately depressed. One-way analysis of variance revealed that there was no significant difference between the two groups [$F(1,153) = 0.23, p>0.635$] at the onset of treatment.
Table 8: Pre-treatment characteristics of subjects according to treatment condition

<table>
<thead>
<tr>
<th>Measure</th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Std. Dev.</td>
</tr>
<tr>
<td>Weight</td>
<td>102.82 kg</td>
<td>20.5</td>
</tr>
<tr>
<td>Height</td>
<td>163.5 cm</td>
<td>7.93</td>
</tr>
<tr>
<td>BMI</td>
<td>38.38</td>
<td>6.9</td>
</tr>
<tr>
<td>Beck Depression</td>
<td>11.97</td>
<td>8.4</td>
</tr>
<tr>
<td>Self-Esteem</td>
<td>127.63</td>
<td>22.51</td>
</tr>
</tbody>
</table>

There were no statistically significant differences in the self-esteem of the two groups to start with, both groups having a mean score well below the clinical norm for healthy adults \[F(1,153) = .30, p>0.585\]. In both groups 50% of the subjects had scores at least 15 points lower than the norm for healthy controls, indicating that these subjects suffered from poor self-concept.

With regard to the scores on the Eating Inventory, Table 9 summarises the findings. As can be seen, there were no significant differences between the CWCP and the ST groups at the baseline stage, other than for a difference in hunger scores \[F(1,153) = 5.79, p<0.0173\]. However, this was not a clinical difference. For both groups, the mean cognitive restraint scores were in the low range, the mean disinhibition scores in the high range, and the mean hunger scores in the average range.

Table 9: Mean baseline scores for the Eating Inventory

<table>
<thead>
<tr>
<th>GROUPS</th>
<th>Cognitive Restraint</th>
<th>Disinhibition</th>
<th>Hunger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>7.97 (4.27)</td>
<td>12.08 (3.01)</td>
<td>8.48 (3.57)</td>
</tr>
<tr>
<td>Control</td>
<td>9.27 (6.47)</td>
<td>11.27 (5.53)</td>
<td>7.12 (3.47)</td>
</tr>
</tbody>
</table>

Note: standard Deviations in brackets.

Subjects in both groups showed a mean Stress Vulnerability score that fell in the clinically vulnerable range. The mean score for the CWCP group was 31.41 (sd = 9.6) and the mean score for the ST group was 30.86 (sd = 8.73). The difference was not significant \[F (1, 153) = 0.14, p<0.707\]. In both groups, approximately half of the subjects (49%) did not fall in the vulnerable to stress range.
The analysis of the Family Scale at baseline, revealed that both the CWCP and ST groups averaged baseline scores that characterised their family functioning as the 'balanced flexible-separated' type. In all, 36% of the families were typified as being of the balanced type, 26% of the mid-range type, and 17% of the extreme (problematic) type. Given that there were no significant differences in family type between the two groups (p>0.05), Table 10 represents the sample as a whole. There were no significant differences in the perceived level of cohesion, adaptability or family satisfaction, between the two groups.

Table 10: The percentage of subjects in each of the 16 family system types (groups combined)

<table>
<thead>
<tr>
<th>FAMILY ADAPTABILITY</th>
<th>DISENGAGED</th>
<th>SEPARATED</th>
<th>CONNECTED</th>
<th>ENMESHED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choatic</td>
<td>5.16%</td>
<td>9.03%</td>
<td>12.90%</td>
<td>5.16%</td>
</tr>
<tr>
<td>(n = 8)</td>
<td>(n = 14)</td>
<td>(n = 20)</td>
<td>(n = 8)</td>
<td></td>
</tr>
<tr>
<td>Flexible</td>
<td>4.51%</td>
<td>17.41%</td>
<td>7.77%</td>
<td>4.51%</td>
</tr>
<tr>
<td>(n = 7)</td>
<td>(n = 27)</td>
<td>(n = 12)</td>
<td>(n = 7)</td>
<td></td>
</tr>
<tr>
<td>Structured</td>
<td>6.45%</td>
<td>5.16%</td>
<td>6.45%</td>
<td>2.58%</td>
</tr>
<tr>
<td>(n = 10)</td>
<td>(n = 8)</td>
<td>(n = 10)</td>
<td>(n = 4)</td>
<td></td>
</tr>
<tr>
<td>Rigid</td>
<td>6.45%</td>
<td>3.22%</td>
<td>2.58%</td>
<td>0.64%</td>
</tr>
<tr>
<td>(n = 10)</td>
<td>(n = 5)</td>
<td>(n = 4)</td>
<td>(n = 1)</td>
<td></td>
</tr>
</tbody>
</table>

Note: Light shading represents healthy (balanced) family functioning, darker extremes problematic functioning.

6.3 Three-Month Assessment:

By the three-month stage, 24 people had dropped out of treatment. Of these, 11 were from the CWCP group, and 13 were from the ST group. Thus the attrition rate was 15% in the experimental group and 16% in the control group respectively. The following comparisons are made for the 131 subjects still in treatment only (CWCP: n = 65, ST: n = 66).

The CWCP group lost on average 4 kg (sd = 3.48) and the ST group 4.17 kg (sd = 3.49) after three months intervention. Thus the average weight of the experimental group was now 97.64 kg and the control group 97.47 kg. Although the average weight losses for both the experimental group [t(64) = 9.20, p<0.0001] and the control group [t(65) = 9.63, p<0.0001] were statistically significant decreases.
from their baseline weights, there were no difference in the mean weight lost between the two groups [F (1, 127) = 0.00, p>0.961] at this stage. This was also reflected by the change in BMI. The CWCP group had dropped to 36.68 and the ST group to 35.58 [F(1, 127) = 0.321, p>0.321]. A further indication of the equivalent extent of weight losses can be demonstrated by the finding that 34% of the subjects in the experimental group, and 32% of the subjects in the control group, had lost more than 5 Kg by this stage.

At three-months, both treatment conditions showed reductions on the Beck depression Inventory. Depression scores had dropped significantly [t(64) = -6.86, p<0.0001] by 5 points to within normal range for the CWCP group (M = 6.93, sd = 6.46). However, the ST group showed similar reductions (M = 6.95, sd = 4.88) from their baseline measures [t(66) = -7.07, p<0.0001]. Differences between conditions were thus not statistically significant as determined by a one-way analysis of variance [F (1, 130) = 0.01, p>0.9304]

The self-esteem scores after three months of treatment had increased significantly by 8 points in the CWCP group [t(64) = 4.02, p<0.0002]. The mean self-esteem score was now just under the normal range (M =135.67, sd = 22.56) for healthy adults. Although the mean self-esteem of the experimental group was not significantly different from that of the control group at this stage [F(1, 130) = 1.26, p>0.2637], there was an inclination for changes in self-esteem to be smaller in the latter group (M = 132, sd = 26.51). This was confirmed by the fact that the within group analyses for the control group, revealed that the average change in self-esteem was not significantly different from baseline levels [t(66) = 1.62, p>0.1080].

As illustrated in Table 11, there were significant changes in the scores on the Eating Inventory for both the CWCP and the ST groups, after only 3 months of treatment. The cognitive restraint scores for both the experimental [t(64) = 13.58, p<0.0001] and control group [t(66) = 9.92, p<0.0001] increased had significantly increased from their baseline measures. It was however evident, that subjects in the CWCP group showed significantly larger increases in cognitive restraint scores, than did the subjects in the ST group [F (1, 130) = 5.87, p<0.0168]. Similarly, although both treatment conditions showed a significant decreases in hunger and disinhibition when compared to their own baseline measures (p<0.0001), the decreases in disinhibition scores [F (1, 130) = 4.64, p<0.0331] and hunger scores [F(1, 130) = 5.30, p<0.0229] were significantly larger for subjects in the CWCP.
Table 11: Mean Changes in the Eating Inventory after 12 weeks of Treatment

<table>
<thead>
<tr>
<th>Groups</th>
<th>Cognitive Restraint Baseline</th>
<th>Cognitive Restraint 3 months</th>
<th>Disinhibition Baseline</th>
<th>Disinhibition 3 months</th>
<th>Hunger Baseline</th>
<th>Hunger 3 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>7.97</td>
<td>15.78</td>
<td>12.08</td>
<td>7.09</td>
<td>8.48</td>
<td>4.38</td>
</tr>
<tr>
<td>Control</td>
<td>9.27</td>
<td>14.66</td>
<td>11.27</td>
<td>7.15</td>
<td>7.12</td>
<td>4.44</td>
</tr>
</tbody>
</table>

Perceived vulnerability to stress decreased significantly \[ t(64) = -7.71, p<0.0001 \] in the experimental group by 7 points, to within normal levels (M = 24.75, sd = 10.22). However, this was not significantly different to the control group \[ F(1,129) = 0.74, p>0.3917 \], who also showed a significant drop \[ t(66) = -7.49, p<0.0001 \] of 6 points to within normal levels (M = 25.24, sd = 8.56).

As expected there were no changes in the perceived type of family functioning, both groups still being characterised as balanced. Moreover, there were no significant differences in the levels of satisfaction with family functioning between the control and the experimental groups.

To see how the changes in psychological measures were related to weight loss, a Pearson product-moment correlation analysis was conducted between the psychological variables and weight lost by 3 months. As represented in Table 12, there were clearly more psychological variables significantly correlated with weight loss in the experimental group than in the control group.

Table 12: Correlational coefficients for Weight Loss and Psychological Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Experimental (n = 65)</th>
<th>Control (n = 66)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beck Depression</td>
<td>-0.324* (p&lt;0.008)</td>
<td>-0.118 (p&gt;0.342)</td>
</tr>
<tr>
<td>Cognitive Restraint</td>
<td>0.1896 (p&gt;0.133)</td>
<td>0.268* (p&lt;0.029)</td>
</tr>
<tr>
<td>Disinhibition</td>
<td>-0.378* (p&lt;0.002)</td>
<td>-0.286* (p&lt;0.019)</td>
</tr>
<tr>
<td>Hunger</td>
<td>-0.345* (p&lt;0.005)</td>
<td>-0.277* (p&lt;0.024)</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>0.299* (p&lt;0.020)</td>
<td>0.082 (p&gt;0.512)</td>
</tr>
<tr>
<td>Stress-vulnerability</td>
<td>-0.295* (p&lt;0.019)</td>
<td>-0.050 (p&gt;0.688)</td>
</tr>
</tbody>
</table>

Note: * = significant
6.4 Six-Month Assessment:

By the completion of the 24-weeks of intervention, 70 people had discontinued the programme (this represents a 45% attrition rate). Of these, 33 were from the CWCP group, and 37 from the ST group. Thus the comparative attrition rates were 43% in the experimental group and 47% in the control group. The comparisons to baseline measurements made at this stage, are again only made for the 85 subjects that remained in treatment until the end (CWCP: n = 43, ST: n = 42).

At the completion of treatment the differences between the two group's, in terms of weight loss, were still not significant, although they did approached significance [F(1,75) = 1.47, p>0.075]. The CWCP had lost on average 2.5 kg more weight over a six month period. Both group's had however achieved significant weight loss as revealed by the results of the dependent t-test analysis. The experimental group had lost on average 8.05 kg (sd = 8.11), which was significantly different from baseline measures \[t(42) = 6.35, p<0.0001\]. Furthermore, 50% of the sample had lost more than 7 kg with the highest amount of individual weight lost being 40 kg. The control group had also lost significant weight \[t (41) = 5.372, p<0.0001\], on average 5.77 kg (sd = 6.08). However, in the control group, only 25% of the sample had lost more than 7kg, and the highest individual amount of weight lost was 23kg. Moreover, 16% of the subjects in the control group had regained their lost weight as opposed to only 2% in the experimental group. The mean change in BMI was also not significantly different between the group's [p>0.426].

The mean Beck Depression Inventory score had come down further to 5.76 (sd = 5.53) in the CWCP group after the completion of treatment. This represented a significant decrease of - 5.34 (sd = 7.83) from baseline measures \[t (42) = -4.47, p<0.0001\]. Although the depression levels for the ST group had remained more or less the same as they were at the three month stage 6.23 (sd = 6.14), when compared to their own baseline values, the differences were still significant \[t(41) = -4.42, p<0.0001\], having reduced by -4.54 (sd = 6.66) points on average. Thus the difference in Beck Depression scores were again not significantly different between the treatment conditions \[F (1,83) = 0.26, p>0.613\].

Self-esteem had continued to increase for both conditions, and the mean self esteem score for subjects in both the CWCP group (139.41) and the ST group (138.19) was now almost equivalent to the norms for healthy adults. Self-esteem had increased significantly from baseline by 11.51 (sd = 18.39) points, in the experimental group \[t(42) = 4.10, p<0.0002\]. For the control group, the comparison to baseline levels indicated a slightly less significant increase in self-esteem \[t(41) = 2.91, p<0.0068\].
The self-esteem of this group had increased on average 6.71 (sd = 14.95) points. The observed differences between the group's were however, not statistically significant (p>0.243).

The results of the Eating Inventory scores are summarised in Table 13. As illustrated, the levels had remained constant from the three month period, both group's still being significantly different from baseline measures. Cognitive restraint increased on average 6.86 (sd = 5.57) points [t(42) = 8.07, p<0.0001] in the experimental group, and 5.71 (sd = 4.19) points on average in the control group [t(41) = 8.83, p<0.0001]. There were no significant differences between the group's [F (1,83) = 1.14, p>0.2880]. Disinhibition scores decreased on average 4.88 (sd = 3.6) points in the experimental group [t(42) = -8.89, p<0.0001] and 3.4 (sd = 4.01) points in the control group [t(41) = -5.49, p<0.0001]. This difference approached significance [F (1,83) = 3.20, p>0.0774].

Similarly, the hunger scores in the experimental group dropped on average 3.86 (sd = 4.01) points [t(42) = -6.3, p<0.0001] and 2.52 (sd = 2.93) points in the control group [t(41) = -5.57, p<0.0001]. There was no significant difference between the two group's [F (1,83) = 3.08, p>0.08] on this factor. Although the one-way analysis of variance using the Welch technique for unequal variances, indicated that there were no statistical differences between the two group's on any of the three factors of the Eating Inventory by the completion of the trial, a perusal of Table 13 indicates that there was a clear tendency for differences in the desired direction to be larger in the experimental group.

<table>
<thead>
<tr>
<th>Table 13: Changes in mean Eating Inventory scores at completion of treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Group's</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Experimental</td>
</tr>
<tr>
<td>Control</td>
</tr>
</tbody>
</table>

There was no difference in the stress vulnerability scores observed at the end of treatment, to those obtained at the 3 month assessment stage. The mean scores for both the CWCP (24.30) and ST group's (25.56) had remained at the same level. Nevertheless, compared to baseline measures, the perceived vulnerability to stress had decreased significantly by 5.32 points [t(42) = -4.84, p<0.0001] in the experimental group, and by 4 points [t(41) = -2.77, p<0.0084] in the control group. There were no significant differences between the two group's [F (1,82) = 0.49, p>0.4842]. Contrary to expectation, when categorising Stress Vulnerability into its three clinical ranges (mild, moderate and severe) for both treatment conditions, those subjects in the moderate and severe stress vulnerability categories seemed to show greater improvements in mood and self-esteem, and a slight tendency to
lose more weight. Thus in the experimental group for example, those subjects in the mild vulnerability to stress category reduced their depression levels by 3.5 points on average, while those in the severe vulnerability category reduced their depression levels by 10.6 points. Furthermore, the self-esteem of subjects vulnerable to stress in the experimental group showed a mean improvement of 17.05 points as compared to only 6.19 points in those experimental subjects not vulnerable to stress. However, it must be mentioned that interpretation of these results is made difficult by the fact that there were no subjects in the severely vulnerable range in the ST group at baseline, and therefore the 2 (group) X 2 (severity) ANOVA could not be computed for the comparisons between the group's.

There were again no differences in perceived family functioning between the experimental and control group's at the end of intervention (p>0.752). However, there was a slight tendency for both group's to be a little more satisfied with family functioning. A 2 (group) X 2 (family type) ANOVA breaking the two group's down into the three clinical family types (balanced, mid-range and extreme family types), revealed no significant differences for any of the psychological measures, nor for differences in the amount of weight lost. However there was a slight tendency for more extreme family types to show less improvement in mood, greater disinhibition and less weight lost than those in balanced and mid-range types. Thus for example, those subjects in the CWCP coming from a balanced family environment lost on average 7.8 kg (sd = 5.8), while those coming from extreme type family environments lost on average only 4.17 kg (sd = 2.38).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Experimental (n = 43)</th>
<th>Control (n = 42)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beck Depression</td>
<td>-0.41* (p&lt;0.0067)</td>
<td>-0.091 (p&gt;0.564)</td>
</tr>
<tr>
<td>Cognitive Restraint</td>
<td>0.36* (p&lt;0.020)</td>
<td>0.468* (p&lt;0.0017)</td>
</tr>
<tr>
<td>Disinhibition</td>
<td>-0.59* (p&lt;0.0001)</td>
<td>-0.302* (p&lt;0.051)</td>
</tr>
<tr>
<td>Hunger</td>
<td>-0.61* (p&lt;0.0001)</td>
<td>-0.150 (p&gt;0.342)</td>
</tr>
<tr>
<td>Self-esteem</td>
<td>0.44* (p&lt;0.0035)</td>
<td>0.029 (p&gt;0.853)</td>
</tr>
<tr>
<td>Stress-vulnerability</td>
<td>-0.434* (p&lt;0.0041)</td>
<td>-0.218 (p&gt;0.170)</td>
</tr>
</tbody>
</table>

Note: * = significance

A Pearsons product moment correlation analysis was also conducted at the completion of treatment to see how the changes in psychological measures were related to weight loss during the course of treatment. As represented in Table 14, there were again clearly more psychological variables
significantly correlated with weight loss in the experimental group than in the control group. Furthermore, the predictive value of the Eating Inventory can be seen in the fact that the three factors of cognitive restraint (13%), disinhibition (37%), and hunger (35%), explained large proportions of the total variance in weight loss.

The Binge Scale was administered to all completers as a post-hoc measure of binge severity. The mean binge score for the CWCP group was 10.57 (sd = 7.3), and the mean for the ST group was 12.59 (sd = 9.18). Thus both group's had mean scores that fell in the non-binge eating range (0-15). Differences between these group's were not statistically significant (p>0.165). However, with regard to clinical differences, fewer subjects in the experimental group met the criteria for moderate or severe binge eating (12%), as opposed to subjects in the control group that met this criteria (26%).

A 2 (binge severity) X 2 (group) ANOVA revealed a significant main effect for binge severity on depression levels [F(2, 79) = 4.53, p<0.0367]. Severe binge eaters showed far less improvement in mood than did mild and moderate binge eaters. Whereas mild bingers in both group's lost on average 5.51 points in depression, those in the severe binge category lost only 1.66 points on the depression scale. The 2 X 2 analysis of variance for unequal variances revealed a marginally significant main effect for binge severity on the self-esteem scale [F(2, 79) = 6.13, p<0.0572]. Severe binge eaters showed less improvement in self-esteem during the course of treatment than non-bingers and mild binge eaters. Whereas those in the mild binge eating category gained an average of 10 points in self-esteem, those in the severe binge eating category showed a worsening in self-esteem of on average -6 points during the course of treatment. Similarly, on the Eating Inventory there was a marginally significant main effect for Cognitive Restraint [F(2, 79) = 2.44, p<0.0535] and a significant main effect for Disinhibition [F(2,79) = 8.62, p<0.0004]. While the cognitive restraint scores showed the most improvement in non-binge eating and mild-binge eating categories (M = 6.6), they were clearly worse in the severe binge eating category (M = - 4.00). For Disinhibition, again the most reduction took place in non-binging and mild binge eating subjects (M = -5.2) while those in the severe binge eating category showed increases in disinhibition (M = 1.667). In the Case of Cognitive Restraint there was also a significant interaction [F(2,79) = 4.63, p<0.0125] with moderate binge eaters in the experimental group showing higher cognitive restraint scores than those in the control group (t(79) = 2.62, p<0.005). There were no significant differences for hunger.

The 2 (binge severity) X 2 (group) ANOVA revealed a significant main effect for binge severity in the amount of weight lost during treatment [F (2,71) = 3.99, p<0.0227]. As can be seen in Table 15, there was a clear descending trend - the more severe the binge eating, the less weight the subjects lost.
Table 15: Mean weight loss broken down by binge severity level

<table>
<thead>
<tr>
<th>Binge Severity</th>
<th>Experimental</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>None / Mild</td>
<td>-8.94 kg</td>
<td>-6.96 kg</td>
</tr>
<tr>
<td>Moderate</td>
<td>-4.36 kg</td>
<td>-1.48 kg</td>
</tr>
<tr>
<td>Severe</td>
<td>-2.55 kg</td>
<td>+3.87 kg</td>
</tr>
</tbody>
</table>

6.5 Follow-up Assessment:

Of the 85 subjects that completed treatment, only 51 people were available to come to the follow-up assessments. Of these, 30 were from the experimental group and 21 from the control group. The following comparisons are made for this sample only.

As can be seen in Table 16, completers from the CWCP group lost slightly more weight than those from the ST group and maintained these losses more at follow-up. The mean weight at follow-up for the experimental group was 93.58 kg and for the control group 92.14 kg. However, although both groups were still significantly different from their baseline measures (p<0.0339), it was evident that both had started to relapse and regain lost weight. Furthermore, the differences in the mean weight lost between the two groups at follow-up was not significant [F (1,47) = 0.73, p>0.342], perhaps because of the large amount of variance evident in the experimental group. More than 30% of the subjects in both groups had still maintained a loss of more than 5 kg, six months after the completion of treatment. The mean BMI for the experimental group was 35.09 (sd = 6.2) and for the control group 33.76 (sd = 5.83). This difference was again not significant [F (1,46) = 0.57, p>0.45].

Table 16: Mean weight losses over a 12 month period:

<table>
<thead>
<tr>
<th></th>
<th>3 months</th>
<th>6 months</th>
<th>12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Experimental</strong></td>
<td>4 kg (3.49)</td>
<td>8.05 kg (8.11)</td>
<td>5.12 kg (15.27)</td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td>4.17 kg (3.48)</td>
<td>5.77 kg (6.08)</td>
<td>2.16 kg (4.81)</td>
</tr>
</tbody>
</table>

Note: Comparing the number of subjects in each assessment to their own baseline values.

By the follow-up stage, the differences among the treatment conditions were statistically significant for the Beck Depression Inventory scores [F(1,49) = 4.21, p<0.045]. The mean Beck depression score...
Chapter Six: Results

for the CWCP group was 4.26 (sd = 5.28) and for the ST group 7.42 (sd = 5.93). As represented in Figure 3, this represented a significant reduction in depression of 5.53 points for the experimental group that was maintained 6 months after treatment was completed \[t(29) = -4.5, p<0.0001\]. The control group on the other hand showed a greater rate of relapse, the mean depression score 6 months after treatment was only 1.9 points lower than baseline, a difference that was not significant \(t(20) = -1.62, p>0.12\).

**Figure 3: Mean depression levels plotted over time**

At follow-up, the mean self-esteem score for the experimental group was 143.53 (sd = 25.74) and for the control group it was 138.71 (sd = 31.54). Thus the CWCP group maintained a significant increase in self-esteem six months after the completion of the programme \[t(29) = 2.722, p<0.0108\]. The mean self-esteem score was 11.16 points higher than that observed pre-treatment. The ST group however, had relapsed to a larger extent. This groups Self-esteem scores were on average only 3.09 points higher than their pre-treatment measures, a difference that was not significant \(p>0.432\). The comparison between the two groups at 12 months follow-up produced a marginally significant result \(p<0.051\), but this small effect was predicted given the small sample sizes and the large standard deviations observed above. Figure 4, diagramatically illustrates the changes in self-esteem for both groups over the course of treatment and at follow-up.
Chapter Six: Results

Figure 4: Mean self-esteem levels plotted over time

Note: Figures compiled using the relevant sample sizes at each assessment

Table 17: Mean item analysis for the 5 factors of self-esteem

<table>
<thead>
<tr>
<th>FACTORS</th>
<th>Norms</th>
<th>Baseline</th>
<th>3 Months</th>
<th>6 Months</th>
<th>12 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Adults</td>
<td>EXP. n=74</td>
<td>CON. n=81</td>
<td>EXP. n=65</td>
<td>CON. n=66</td>
</tr>
<tr>
<td>&quot;Attractiveness, approval by others&quot;</td>
<td>23.85</td>
<td>20.62</td>
<td>21.11</td>
<td>17.81</td>
<td>17.73</td>
</tr>
<tr>
<td>&quot;Worthiness, contentment&quot;</td>
<td>24.84</td>
<td>20.82</td>
<td>19.85</td>
<td>21.84</td>
<td>21.41</td>
</tr>
<tr>
<td>&quot;autonomous Self-regard&quot;</td>
<td>23.60</td>
<td>23.66</td>
<td>23.53</td>
<td>24.33</td>
<td>23.56</td>
</tr>
<tr>
<td>&quot;Competence, self-efficacy&quot;</td>
<td>27.84</td>
<td>28.35</td>
<td>28.59</td>
<td>29.83</td>
<td>28.80</td>
</tr>
<tr>
<td>&quot;Value of existence&quot;</td>
<td>31.68</td>
<td>28.00</td>
<td>26.90</td>
<td>29.32</td>
<td>28.40</td>
</tr>
</tbody>
</table>

The five component items of self-esteem were monitored over the course of treatment and follow-up, and the results of the factor analysis are presented here for the assessments as a whole. As reflected in Table 17 above, there were no significant differences in mean scores between the experimental and
control groups, on any of the factor items at any of the four comparison points. Nevertheless, some interesting patterns are evident. The mean factor score for 'attractiveness, approval by others' decreased for both groups indicating that they came to see themselves as less attractive and approved as treatment progressed. There were good improvements in "worthiness, contentment and significance", as well as for "the value of existence", both groups being well below norms at baseline and increasing steadily towards the norms with treatment duration. It can also be noted that obese subjects in both groups were not significantly different to the norm on two of the five factors, "autonomous self-regard" and "competence, self-efficacy".

Figure 6: Mean changes in the Eating Inventory for the CWCP group

At follow-up, both the CWCP and ST groups had tended to relapse towards baseline measures on all three of the factors of the Eating Inventory. This pattern is clearly illustrated for the experimental group in Figure 5 below. Although there was a tendency towards reverting to baseline measures, both groups still showed significant differences to baseline on all three factors. In the experimental group cognitive restraint scores were still 4.66 points higher than baseline \[t(29) = 5.74, p<0.0001\] and in the control group they were still 2.23 \[t(20) = 2.359, p<0.028\] points higher. However, the subjects in the experimental group had maintained significantly higher cognitive restraint scores than those subjects in the control group, six months after intervention had been completed \[F(1, 49) = 3.75, p<0.0506\]. There were however, no significant differences between the two groups on either the disinhibition \[F(1, 49) = 0.03, p>0.8597\] or hunger \[F(1, 49) = 0.75, p>0.391\] factors by follow-up. The mean scores on these two factors for both treatment groups, differed to a similar extent to their own baseline values. Disinhibition scores were still 3.03 points lower than baseline measures \[t(29) = -
-4.46, p<0.0001] in the experimental group, and 2.85 points lower in the control group [t(20) = -4.19, p<0.0004]. Hunger scores were still 1.73 points lower than baseline in the experimental group [t(29) = -2.27, p<0.0303], and 2.66 points lower than baseline [t(20) = -3.857, p<0.0010] in the control group.

At 12 months follow-up, there was a significant difference in the stress levels of the subject in the control and experimental group's [F (1,49) = 3.90, p<0.0539], those subjects in the control group showing more vulnerability to stress (M = 28.14) than those in the experimental group (M = 23.2). Furthermore, the subjects in the experimental group were still a significant 6.13 (sd = 7.48) points below their baseline levels [t(29) = -4.48, p<0.0001]. The subjects in the control group on the other hand, were only 1.71 points lower than their baseline measures on average, a non-significant difference (p>0.359).

There were no differences in patterns of family functioning at follow-up, both group's still perceiving their family interactions to be fairly balanced on average. There were furthermore, no changes observed for either perceived cohesion, perceived adaptability or levels of family satisfaction between the two treatment group's.

6.6 Modelling:

To investigate changes over time, a SAS proc mixed method of analysis was used. Changes from baseline (baseline measurement - follow-up measurements) were computed at three different time points for the variables weight, BMI, as well as all the psychological variables. To adjust for baseline differences, the baseline value was included in the model as a covariate. This resulted in standardising the baseline to zero. The data was considered a growth curve and therefore the first-order auto-regressive covariance structure was used for modelling purposes. The slopes of the resulting regression lines were compared by using a unbalanced repeated-measures regression analysis over time.

Following the suggestion made by Lipsey (1990), about reporting of treatment effects in low powered research, the results of the statistical significance testing are presented as confidence intervals. This method encloses the range within which the differences between the condition means, can be expected to fall. The width of the confidence interval can be seen as a direct indicator of the power of the significance test. Low-powered research produces very wide intervals, high powered research
narrow ones. On the graphs presented below, the experimental group is indicated by a solid line and the control group by the dotted line. To locate the point where the groups start to differ significantly the two regression lines and the 95% confidence limits for the individual predictions have been drawn. The point where the confidence lines of the two regression lines part gives an indication of the time point where the actual difference occurs. The middle line will be the regression line and the other two will be confidence intervals. Estimates of the slopes of the regression lines and their standard errors are given in Table 18.

Table 18: The Mean Slope and Standard Error of Estimates for the Psychological Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Experimental Slope</th>
<th>Experimental Standard Error</th>
<th>Control Slope</th>
<th>Control Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>-0.0388</td>
<td>0.0217</td>
<td>0.0409</td>
<td>0.0250</td>
</tr>
<tr>
<td>Self-esteem Global Score</td>
<td>0.0909</td>
<td>0.0682</td>
<td>-0.0579</td>
<td>0.0790</td>
</tr>
<tr>
<td>Factor 1: &quot;Attractiveness&quot;</td>
<td>0.0147</td>
<td>0.0143</td>
<td>-0.0089</td>
<td>0.0163</td>
</tr>
<tr>
<td>Factor 2: &quot;Worthiness&quot;</td>
<td>0.0422</td>
<td>0.0197</td>
<td>0.0139</td>
<td>0.0221</td>
</tr>
<tr>
<td>Factor 3: &quot;Self-regard&quot;</td>
<td>0.0069</td>
<td>0.0205</td>
<td>-0.0142</td>
<td>0.0233</td>
</tr>
<tr>
<td>Factor 4: &quot;Competence&quot;</td>
<td>0.0030</td>
<td>0.0209</td>
<td>-0.0222</td>
<td>0.0234</td>
</tr>
<tr>
<td>Factor 5: &quot;Value of existence&quot;</td>
<td>0.0249</td>
<td>0.0248</td>
<td>-0.0210</td>
<td>0.0279</td>
</tr>
<tr>
<td>Cognitive Restraint</td>
<td>-0.0809</td>
<td>0.0153</td>
<td>-0.0543</td>
<td>0.0177</td>
</tr>
<tr>
<td>Disinhibition</td>
<td>0.0347</td>
<td>0.0126</td>
<td>0.0076</td>
<td>0.0146</td>
</tr>
<tr>
<td>Hunger</td>
<td>0.0414</td>
<td>0.0134</td>
<td>0.0056</td>
<td>0.0015</td>
</tr>
<tr>
<td>Family Satisfaction</td>
<td>0.0222</td>
<td>0.0448</td>
<td>0.0227</td>
<td>0.0512</td>
</tr>
<tr>
<td>Stress Vulnerability</td>
<td>0.0023</td>
<td>0.0331</td>
<td>0.0912</td>
<td>0.0378</td>
</tr>
</tbody>
</table>

As seen in Figure 7, weight change followed a quadratic curve over time. Even though the weight changes for both the CWCP [T(247) = 5.06, p<0.000] and control groups [T(247) = 2.26, p<0.0247] were significant over time, the groups did not differ significantly [F(1,247) = 3.14, p>0.077]. The difference did come close to being significant though. The experimental group, demonstrated more weight loss than the control group. The outcome for BMI was exactly the same as that for weight [F(1,247) = 3.42, p<0.0654].
The slopes of the two groups differed significantly for Beck Depression scores \( F(1, 263) = 5.80, p<0.0167 \). Thus the CWCP group demonstrated a bigger reduction in depression than the ST group over the course of the 52-week period (see Figure 8). However, the mean rate of change (the slopes of the regression lines) in depression for both the experimental and control groups were not significantly different from zero, although the experimental group did approach significance \( T(263) = -1.78, p>0.0758 \).
Chapter Six: Results

The mean rates of change for global self-esteem were not statistically significant from zero. Furthermore, the slopes of the experimental and control groups did not differ significantly either \[F(1, 262) = 0.64, \ p > 0.425\). When breaking self-esteem down into its five component factors (see Table 18), neither factors 1 (attractiveness), 3 (self-regard), 4 (competence) or 5 (value of existence) were statistically significantly different from zero in either of the two groups. However, the mean rate of change for Factor 2 (worthiness) was statistically significant from zero in the experimental group \[T(259) = 2.14, \ p < 0.0333\]. The mean rate of change in the control group was insignificant. The slopes of the two groups, however, did not differ significantly \[F(1, 262) = 0.91, \ p > 0.339\].

The mean rates of change for Cognitive Restraint in both the experimental \[T(262) = -5.26, \ p < 0.0000\] and control groups \[T(262) = -3.05, \ p < 0.0025\] were statistically significantly different from zero. The slopes of the two groups did not differ significantly \[F(1, 262) = 1.36, \ p > 0.243\]. The mean rate of change for Disinhibition was statistically significantly different from zero in the CWCP group only \[T(261) = 2.74, \ p < 0.0065\]. The slopes of the two groups however, did not differ significantly \[F(1, 262) = 1.36, \ p > 0.162\]. The mean rate of change for Hunger in the experimental group differed significantly from zero \[T(262) = 3.07, \ p < 0.0023\]. This was not the case in the control group. The slopes of the two groups came close to being significant \[F(1, 262) = 3.04, \ p > 0.0824\]. The results of the modelling analysis for Hunger is diagrammatically represented in Figures 9.

Figure 9: Mean change in hunger scores over time

![Diagram showing mean change in hunger scores over time](image-url)
The mean rates of change for vulnerability to stress in the control group was statistically significantly different from zero \( T(260) = 2.41, p<0.0167 \), but for the experimental group it was not. The slopes of the groups differed (see Figure 12) marginally \( F(1,260) = 3.13, p>0.0782 \).

Figure 10: Mean change in stress vulnerability scores over time

![Graph showing mean change in stress vulnerability scores over time.](image)

The mean rate of change for neither family type (process), nor level of family satisfaction, were statistically significantly different from zero. The slopes of the experimental and control groups for neither of the variables differed significantly.

### 6.7 Attrition Analysis:

Of the 155 subjects that started the programme, 24 dropped out before the second assessment (38% from experimental group & 62% from the control group). A further 46 subjects dropped out, or did not make themselves available for the 6 month assessment. This group included 17 subjects who were classified as 'academic dropouts' and ruled out of the final assessment, because they either missed 5 consecutive group meetings or had attended less than 60% of the total meetings. Thus 45% of the sample \( n = 70 \) either discontinued treatment, were classified as academic dropouts, or failed to make themselves available for the 6 month assessment. Of the total dropouts, 44% were from the experimental group \( n = 31 \) and 56% were from the control group \( n = 39 \). This means that 42% of
those subjects assigned to the experimental group, as opposed to 48% of those in the control group, dropped out before completion of the programme.

Based on the first 12 weeks of the programme, no significant differences were found on the psychological measures between drop-outs and continuers. Only BMI distinguished drop-outs (M = 42) from continuers (M = 37.7), with the former being 4 kg (p<0.01) heavier at the start of the programme. Drop-out characteristics were: married (66%); ≤ std 10 education (65%); ≤ 2 children (44%); income ≥ R 5 000 (78%); eat ≤ 3 meals per day (56%); smoked (54%); and had a previous history of dieting (65%). Expectations regarding programme performance and family support were high, but attitudes regarding group membership and the ability to control eating and exercise habits were less favourable.

A comparison of the 17 academic dropouts with those that completed treatment showed that they had higher rates of depression, poorer self-esteem, were more vulnerable to stress and were less satisfied with family functioning than were completers (p< 0.0001). Furthermore, the comparison of those that completed the treatment (n = 85) with those that dropped out (n = 70), revealed some significant findings. The 2 (completion type) X 2 (group) ANOVA revealed a main effect for completion type on Stress Vulnerability [F(1, 151) = 5.40, p<0.0214]. Thus dropouts (from both groups) had significantly higher Stress Vulnerability scores than did completers [M: 33.9 vs. 29.6]. Furthermore, a main effect was found for dropout on the perceived cohesion dimension of the FACES III scales [F(1,151) = 4.15, p<0.0433], dropouts once again showing lower perceived cohesion scores [36.95 vs. 40.23]. However, this difference was not clinically significant. There were no significant differences for adaptability or family satisfaction.

Table 19: Mean Binge Score comparisons between completers and dropouts.

<table>
<thead>
<tr>
<th></th>
<th>Completers</th>
<th>Dropouts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Experimental</strong></td>
<td>10.57 (n=42)</td>
<td>20.83 (n=12)</td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td>12.59 (n=42)</td>
<td>10.30 (n=10)</td>
</tr>
</tbody>
</table>

The results of two-way analysis of variance, also revealed a significant main effect for differences in the mean binge severity scores of the completers, as compared to those that dropped out of treatment [F(1,102) = 4.52, p<0.0359]. Those that dropped out of treatment in both groups were far more likely to suffer from binge eating tendencies (M = 15.63), than those that completed treatment (M = 11.58). As demonstrated in Table 19, when including treatment group into the analysis a more
complicated picture developed. The 2 (treatment group) x 2 (completion type) analysis of variance using the Brown-Forsythe analysis for unequal variance, showed a significant interaction [F(1,100) = 8.08, p<0.0054]. This pattern is illustrated in Figure 13. The multiple comparisons analysis of simple effects by means of Fisher's least significant difference test (protected t) revealed that there were significant differences between completers and dropouts in the experimental group [t(100) = -3.62, p<0.0005], but not in the control group. However, the interpretation of this analysis is made difficult by the fact that there were also significant differences in binge scores between dropouts in the experimental and control group's [t(100) =2.84, p<0.005].

Figure 11: Diagramatical representation of mean binge score comparisons

The results from the 'Reasons for Discontinuing Treatment Questionnaire' that was mailed to all dropouts, provided limited information, as only 22 completed questionnaires (31%) were received back by post. Nevertheless, the responses from this sample of the dropouts were content analysed for their reasons for discontinuing the programme. The most common responses included: 'lack of support at home', they could not 'get the momentum back', and that they 'got despondent at not losing large amounts of weight'. Furthermore, many subjects stated that they could not keep up with regular exercise routines and that the homework assignments were too time consuming. Finally, a few subjects dropped out because they either had: 'moved', 'got married', 'fell pregnant', had 'transport problems', or were just 'too busy at work'.

Page 89
The present study yields several findings consistent with previous research, and extends prior observations of the relationship between weight loss maintenance and comprehensive behavioural programmes. Furthermore, the results of this study have direct implications for the import of incorporating a thorough psychological assessment in the evaluation of obesity treatment.

In comparing the Comprehensive Weight Control Programme (CWCP) to 'Standard Treatment' (ST), it was evident that subjects in both groups significantly reduced their weight and BMI, although there was a marked tendency towards relapse by the follow-up stage. There were no statistically significant differences between the weight loss achieved by the two treatment conditions. Nevertheless, those subjects in the CWCP did lose marginally more weight and maintained a better rate of maintenance at six months follow-up. In addition to the anthropometric indicators of health improvement, it was apparent that those receiving the CWCP showed significantly better improvements in psychological functioning than those subjects receiving standard treatment. In general, despite the persistent problem of high relapse rates, the findings support the notion that comprehensive weight control programmes, which incorporate principles of lifestyle education and behavioural change, hold more promise than conventional treatments and are thus an effective option in managing obesity.

In evaluating the efficacy of the CWCP in more detail, this chapter will discuss the results of the controlled trial relevant to the indicators used. The chapter will commence by focusing on the demographic and baseline findings; this will be followed by a discussion of the results of the anthropometric assessments, and a consideration of the psychological measurements used, including indicators of change and predictors of outcome. Methodological issues relevant to this research and suggestions for future research directions, will be discussed in relation to the appropriate sections. The final sections of this chapter will address the impeding problem of attrition and summarise the findings as a whole.

7.1 Demographic and Baseline Comparisons:

The demographic description of the study suggests that those self-selected for weight loss programmes tend to be more than 130% overweight (BMI = 38), predominantly female, married,
Chapter 7: Discussion

The demographic description of the study suggests that those self-selected for weight loss programmes tend to be more than 130% overweight (BMI = 38), predominantly female, married, better educated and have at least a lower middle-class income. These characteristics have obvious implications for the external validity of the study in so much as the findings can only be seen to be representative of obese individual's with the same attributes [Rosenthal & Rosnow, 1991].

The fact that chronic diseases were prevalent in a substantial portion of those presenting for treatment, justifies the argument presented in chapter one, that the primary reason to treat obesity should be to reduce the health risks associated with the condition. Furthermore, this observation serves to emphasise the importance of finding safe and effective methods of weight loss for the obese. However, the fact that 85% of those that volunteered to participate in this study were female, contradicts the notion of treating solely to ameliorate health risks to some extent. Whereas most of the health risks associated with obesity have to do with abdominal obesity, most common in men, most people desiring treatment are women, primarily with gynoid obesity, wanting to lose weight for cosmetic reasons (Foreyt, 1987). Abdominal type obesity is also associated with the best success rates (Baron, 1995). These issues raise the question that perhaps the dismal treatment prognosis observed in the obesity literature, has more to do with the types of people we are treating and the reasons why, and does not reflect only on the treatment itself.

The low proportion of men participating in this study did not allow for gender comparisons to be made. This limitation is significant in light of the fact that recent theorists have postulated that men and women should ideally be treated separately (Rolls, Fedoroff, & Guthrie; 1991). This conjecture is based on the premise that women experience more food related conflict (in that they like fattening foods but perceive that they should not be eating them) than men, and also on the opinion that women experience more dissatisfaction with their body weight because of the fact that pressures to be thin are greater in women than in men. Researchers therefore need to re-evaluate their treatment participants. Further studies of gender differences would thus be important for designing gender-appropriate treatments.

Another salient observation apparent from the analysis of the demographic information, was the discrepancy between initial response rates and those who ultimately joined the controlled trial. This pattern suggests that once a long-term commitment to lifestyle modification is necessary, the level of motivation decreases. This would imply that those individual's still interested in participating would be more highly motivated to lose weight than the average obese person, and would again impact on the generalisability of the results. Indeed, a high level of motivation was
indicated by subject's in both treatment groups at the beginning of the programme. This intimates that screening prior to the start of weight control programmes, for those most motivated to stay in treatment, might be a useful method of selecting those most likely to succeed. The contention that unmotivated subject's are perhaps less suited to long-term obesity management strategies supports Pratt's (1989) claim that several environmental, social, personal and demographic factors may be related to the likelihood that an individual will continue with treatment. Obviously, researchers in the field of obesity management need to endeavour to find these predictors of success.

The lack of significant differences between the two treatment groups, on all anthropometric and psychological measures conducted at the baseline assessment, verifies that the randomisation procedure was effective. Furthermore, the fact that the CWCP group and the ST group were equivalent on all factors other than the type of treatment itself, at the start of the trial, attests to the initially high internal validity of this study (Cook & Campbell, 1979). Nevertheless, it is well known that an experimental design must be sensitive as well as valid (Lipsey, 1990). Despite the fact that most treatment effectiveness studies generally give little attention to the topic of design sensitivity, this study specifically attempted to increase the sensitivity of its design prior to the outset of the trial. One of the specific methods used (as described in the methods section) was to commence the study with sample sizes large enough to detect a small effect (.4) for the CWCP. Thus given that high attrition rates were expected (a typical threat to sensitivity), the likely subject's remaining in the study would still be large enough to detect the predicted medium effect* (.65) at a respectably high degree of statistical power (.80).

The only difference between the two groups at the onset of the trial was that the CWCP group had more English speaking participants than did the ST group, and the ST group had more Afrikaans speaking participants than did the CWCP group. However, it was thought that this language difference would not have a major impact on the outcome of the trial, given that the dieticians were bilingual and that the groups were conducted in dual medium. This notion was supported by Jeffery, Snell & Forster's (1985) assessment of group composition in obesity treatment. These authors found that there was no difference between groups comprising of similar and dissimilar individual's in terms of successful outcome. Neither gender, language or body size was found to be related to the of weight comparative groups lost. Nevertheless, it would be premature to totally reject the group homogeneity concept, as other studies have found that individual's with similar characteristics are more supportive of one another than those with disparate backgrounds (Jeffery, Snell & Forster, 1985).

* The predicted effect for the CWCP was a 'medium' one. To be explained in more detail later on in this discussion
7.2 Anthropometric Comparisons:

The most notable finding from the results of the anthropometric assessments, were that the differences in the of weight loss between the CWCP and ST groups was not significant, although they did approach significance. This means that one cannot conclude that the CWCP produced greater weight losses than those obtained by standard treatment. Nevertheless, although both groups lost significant s of weight on average, the subject's receiving the CWCP did maintain their weight loss better. However, both groups had relapsed to a large extent by the 52 week stage. The pattern of changes in BMI were the same as those observed for weight loss, which indicated that a high percentage of fat was being lost.

It is apparent that by the 12 week stage, both groups had lost an average of 4 kg. The lack of significant difference between the two groups at this stage however, needs to be seen within the context of the fact that the control group had started their diet at outset of treatment and the experimental group only at week eight. Seen in this context, it would have been expected that the ST group would have lost slightly more weight by this stage. Thus the fact that the CWCP showed an equivalent of weight loss, attests to the benefit of the treatment itself. By the end of the 24-week treatment programme, the CWCP group had lost on average 8 kg, just over 2 kg more than the average losses in the control group. This difference was significant at the 0.75 alpha level.

In considering the results of the anthropometric comparisons, one needs to bear in mind that group aggregates underrepresented good achievers. Thus for example, although the mean weight loss at 12-weeks was only 4 kg, 34% of subject's had lost more than this average. If one looks to the individual rates of weight loss between the two groups as an indicator of the extent of weight loss, some clear practical differences can be seen. Although these differences did not reach statistical significance in terms of the group aggregates, they nonetheless affirm the belief that the CWCP group did show more potential. Whereas 50% of the subject's in the CWCP lost more than 7 kg, with the highest individual weight loss being 40 kg, only 25 % of the subject's in the ST group had lost more than 7 Kg. Moreover, 14 % more people gained weight in the ST group as opposed to the CWCP group.

The rate of weight loss found in this study, although smaller than the findings from some studies (Wadden, Stunkard & Liebschutz, 1988), are highly comparable with the rates obtained by other
comprehensive-behavioural programmes (Wing, 1992; Brownell & Jeffery, 1987). Furthermore, the rate of weight loss concurred with the theorised standard reference point, of losing 0.5 kg per week (Wadden & Bartlett, 1992). More importantly, the rate of weight lost by the CWCP over the course of treatment falls in the therapeutic (clinical) range, found to be necessary to reduce many of the health risks associated with obesity (Kanders & Blackburn, 1992).

The fact that the CWCP was found to produce only marginal differences from the ST treatment, can be understood in terms of the relationship between the independent variable and the effect size. It has been well documented that the choice of control group impacts on the effect size observed (Lipsey, 1990). The contrast between the treatment and the control group can therefore be heightened or diminished by choosing a control group that is more or less different from the treatment condition in its expected effects on the dependent measures. The control group used in this study was an 'alternative treatment' control. This relates to the fact that the ST group is not so much a control as is a legitimate optional form of treatment. Consequently, this contrast will not generally be as extreme as it would be if a true no treatment control group was used, and the size of the likely effect of the CWCP is expected to be smaller. There were two fundamental reasons for the choice of a alternative treatment control group. Firstly, it is argued that the use of the no treatment control group in obesity research is a futile exercise, as it has been well documented that obese not treated do not lose weight and even gain weight (Wadden & Bartlett, 1992). Secondly, the interest in this study was to specifically compare a particular innovative component of treatment, with traditional treatment already know to be associated with at least some short-term success on its own. The salient differences between the two groups thus related less to the content and more to the structure of the programme itself. When seen in this light, the fact that the CWCP appears to be only modestly better than the ST, must be interpreted not as an indication that the former treatment is not effective, but rather as an indication that in certain respects the treatments are both equally effective.

A potential methodological shortcoming that may have had an impact on not finding bigger effects if they were there to be found, relates to the issue of compliance with treatment. Though weekly homework assignments, consisting of ratings of behaviour and diaries, were given to those in the CWCP (one of the fundamental differences between the groups), compliance with treatment instructions were not systematically assessed. One must agree with Collins, Rothblum & Wilson's (1986) statement, that a central issue for weight-loss maintenance involves whether or not the behaviour being taught during treatment actually becomes part of the subject's repertoire. There is therefore a need for future research to monitor compliance to treatment itself, so as to make sure that one is actually evaluating an effect in the first place.
Chapter 7: Discussion

The most marked finding at follow-up was that there was a definite pattern of relapse towards baseline weight and BMI, for both groups.* This finding seriously challenges the long-term clinical significance of the weight changes observed above. There is thus a need for concerted effort to find more effective methods of weight loss maintenance, so as to improve the long-term management of obesity (Peri et al., 1992). There was however, a noticeable tendency for maintenance rates to be larger in the CWCP group. This difference though, did not reach significance, probably due to the large amount of inter-individual variation observed in this group (as evidenced by the very high standard deviation). The technique of reducing this between subject variability by including subjects own baseline values as a covariant, demonstrated that the CWCP group did lose more weight over time than did the ST group.

Although behavioural weight-control programmes usually produce statistically-significant weight losses, there is considerable variability in the success of individual participants as evidenced above. This finding of high inter-individual variability within the groups, supports Fitzgibbon and Kirshenbaum's (1990) finding of heterogeneity in the obese population, and warns of the dangers of considering the obese as a homogeneous group simply by virtue of their common disorder. It is quite possible that there are subgroups among the obese individuals seeking treatment that may respond differently to different types of treatment. Of particular consequence for this study, is that many of the components of the CWCP were centred around the basic elements of cognitive-behavioural principles. The theory which underlies these principles recommends that they be used to meet the needs of individuals, not delivered on a group basis. Consequently, careful screening of patients individual requirements should be conducted prior to their inclusion in the CWCP. This should take into account the psychological, social and medical reasons why a person wants to lose weight.

One factor pertaining to the high relapse rates that is typically not taken into consideration when reviewing the obesity literature, is that obese subjects are self-selected, having often made numerous previous attempts at weight loss (Wadden & Stunkard, 1993). By virtue of this fact they have a poor prognosis to start with, which might account for the high rates of treatment failure manifest in the literature. The use of unrepresentative groups in treatment outcome studies, may well then create success rates that are much lower than would be found in the general population. This possibility needs to be taken into consideration when evaluating the outcome of this study.

* Both groups were however still significantly different to their own baseline measures
This study's findings, although consistent with the high relapse trends reported by numerous researchers, suggest that previous studies have overestimated the size of the long-term weight losses attributed to comprehensive treatments. This implies that unless the initial weight loss treatments are supplemented with interventions targeted at the problem of maintenance, the prospects for successful long-term management of obesity are meagre. The results of a series of studies conducted by Perri, Nezu and Viegner (1992), indicated that without a post-treatment programme, patients generally abandon the self-management strategies taught in treatment and gradually regain weight. These authors showed that when initial treatment was supplemented with post-treatment maintenance strategies, patients exhibited greater adherence to weight loss techniques and better weight loss maintenance was obtained. Moreover, the most consistent finding was that structured programmes of post-treatment therapist contact helped patients maintain their weight losses. These conclusions have direct relevance to the CWCP evaluated in this study, as patient contact generally ceased after the end of the treatment programme, despite the fact that subjects were given opportunities to remain in contact. This would suggest that a built-in post-treatment contact phase would considerably benefit the long-term efficacy of the CWCP.

The results of the follow-up assessment should however, be interpreted with caution for the following reasons. Firstly, these results are based only on only a six month follow-up. Ideally there would be a need for longer-term follow-up studies, but this was not possible given the time constraints of this thesis. Secondly, an inherent problem with interpreting the follow-up data relates to the fact that there is little information about what happens between completion of a programme and follow-up. Thus attributing long-term results to a specific intervention can be misleading as patients often use commercial programmes, self-help diets, exercise programmes and the like, after having been in a formal research programme. Wadden, Sternberg, Letizia, Stunkard and Foster (1989), in a comparative evaluation of the long-term effectiveness of behavioural modification and VLCD, reported that by 3 year follow-up, more than 40% of their subjects had received additional therapy for their weight reduction. This had increased to 55% by five years. The lack of control after treatment ends makes it very difficult to compare the relative effectiveness of the treatment conditions. Life events that occur in the months and years after brief weight loss programmes, may explain more of the variance in outcome than the programmes themselves (Brownell & Jeffery, 1987). A further problem experienced in the follow-up of this study, was that not all patients were available, or for that matter traceable, to be included in the follow-up comparisons. These biases can seriously jeopardises the validity of long-term obesity outcome studies and can complicate the evaluation of initial treatment effectiveness.
Chapter 7: Discussion

An added limitation in interpreting the anthropometric findings, relates to the fact that although weight loss was monitored on a weekly basis, analysis was only conducted at wide intervals (onset, 3, 6 and 12 months). This provides only 'snapeshot' weight trends and provides little information about what occurs between assessments. The use of this technique does not take into account weight gained and lost in the interim. A related problem, concerned with the use of group averages, is the possibility of making mistaken inferences about individual's. If 30% of subject's have lost at three months, and 30% at six months, it is quite possible that different subject's could comprise this group at each point.

A final methodological consideration relates to the choice of dieticians for conducting the group sessions. This decision was made on the basis that both of the treatment programmes concerned had large nutritional and healthy eating components. Yet given the considerable behavioural reinforcement elements incorporated into the CWCP, and the many ways that psychosocial variables can and do influence treatment outcome, there is arguably a need for personnel with experience in psychological techniques. It might therefore be suggested that this oversight may have contributed to the marginal results of the anthropometric findings. This could have been the case because a weak version of the treatment concept was administered by the dieticians that underrepresented the CWCP's potential. It has been suggested in the literature however, that teaching dieticians psychological techniques can considerably increase their chances of success with obese clients (Kennedy, 1987). These studies have shown that trained dieticians conducting interventions with obese clients, can obtain weight loss results comparable to results from interventions made directly by psychologists. The dieticians used in this study were given a three day workshop prior to treatment starting, that trained them in behavioural intervention and group dynamic skills. Moreover, as previously stated, the dieticians chosen to participate in the study all had considerable previous experience in dealing with obesity.

7.3 Psychological Change:

The results of the psychological measurements stand in sharp contrast to those of the anthropometric assessments. The subject's in the CWCP showed significantly better psychological adjustment than did those in ST group. Furthermore, these improvements were maintained over time. These findings suggest that stable body weight normalisation does confer considerable psychological benefit on obese individual's. The observed positive psychological change associated with weight loss, clearly provides strong corroboration for the belief that emotional and psychological disturbances have to be considered as largely secondary to the obesity itself. The observed improvements in psychological functioning are especially encouraging considering the of subject's who did not obtain significant weight loss over the
course of the programme. In particular, improvements in psychosocial functioning were still evident in the CWCP at 52-weeks follow-up, despite the fact that a high percentage of subject's from this group were still considered cosmetically overweight at post-treatment follow-up.

At the onset of the controlled trial it is evident that both groups showed clinical indications of psychological distress. The mean depression score for both the CWCP and the ST groups fell in the mildly-depressed range. Furthermore, at least 25% of the sample met the criteria for being categorised as being moderately depressed. In addition, both groups showed a mean baseline self-esteem score indicative of a poor self-concept. These findings support the observations of previous research that have shown that the obese presenting for treatment suffer from significant psychological distress, and have higher levels of psychopathology (related to their weight) than the non-obese (O'Neil & Jarrel, 1992; Wadden & Stunkard, 1993).

The influence of obesity treatment on psychological well-being, can be clearly demonstrated by the dramatic elevation in mood to within normal clinical range, for both groups, just 12 weeks into treatment. These patterns were continued to the completion of treatment. However, the effect of the CWCP can be seen by the fact that levels of depression had relapsed significantly less than those in the ST group, by follow-up. The results from the regression analysis incorporating baseline measures as a covariate so as to control for within-group variability, clearly showed that the CWCP group demonstrated a bigger reduction in depression over the 52 week period than did the ST group. The changes in depression observed in this study concur with the results of previous studies of the psychological consequences of dieting and weight loss, that have reported beneficial effects from treatment (Brodie & Slade, 1990). The positive changes in mood obtained by the CWCP, also suggest that the adverse emotional responses observed in some studies (Wadden, Stunkard & Smoller, 1986) may be more a result of the protracted effort to diet rather than to the proclaimed end of treatment weight losses. The fact that significant decreases in depression were generally maintained in the CWCP, suggests that the type of treatment itself has an implication for ameliorating depressed mood. This implies that the structure and content of the CWCP is well suited for inducing improvements in psychosocial functioning independently of whether weight loss occurs or not.

With regard to changes in the mean self-esteem of the two groups, it was again evident that the CWCP group performed better than did the ST group. By the three months comparison, the average increase in self-esteem was already slightly higher in the CWCP group than it was in the ST group. Although the self-esteem of both groups continued to increase significantly throughout the intervention stage, by the follow-up assessment it is apparent that those in the CWCP had maintained their elevated self-esteem to significantly greater degree than those in the
ST group. A possible reason for the differences in self-esteem observed between the groups, relates to the fact that the CWCP placed greater emphasis on cognitive restructuring and assertiveness training, in the form of structured lessons on these topics. Both assertiveness training and cognitive restructuring are considered to be effective methods of increasing an individual's self-concept (Robson, 1988).

The present findings serve to emphasise the importance of including an assessment of self-esteem levels, as part of an evaluation of the effectiveness of obesity treatment. It has been postulated that the lowered self-esteem observed in the obese arises from the fact that they internalise the negative attitudes of society about body size (Stunkard & Wadden, 1992). Regardless of the causes of low-self esteem observed in patients presenting for treatment, the results of this study indicated that self-esteem can be significantly improved during the course of treatment. This contention confirms the opinions of other researchers who have found that the self-esteem of overweight individual's is correlated with weight loss. In particular, a study by Martin, Housley, McCoy et al. (1988), provided convincing evidence that as weight increased so self-esteem decreased. It has also been found that subject's with high and medium levels of self-esteem lost more weight than those with low levels of self-esteem (Nir & Neumann, 1991).

The theoretical underpinnings of self-esteem and how people perceive themselves, can be extrapolated to the present findings of this study. Low self-esteem tends to be correlated with other negative views of oneself. Thus a person with low self-esteem might be expected to expresses pessimism with respect to success in achieving goals in many areas of ones life, including weight loss. In addition, low self-esteem seems to be correlated with guilt feelings and negative thoughts about oneself that are compensated for via the act of eating. As low self-esteem goes together with low ability to adapt to changes (Rosenberg, 1979), subject's with low self-esteem would be expected not to be consistent in their weight loss. Persons with high self-esteem on the other hand, have as a rule more positive views of themselves. They are more optimistic and possess the ability to adapt more readily to new situations (ibid.). Occasional setbacks or relapses do not lead to feelings of either worthlessness or helplessness. People with high levels of self-esteem are able to deal directly with stress when it occurs. In summary then, high self-esteem can be viewed as an internal resource that may enhance an individual's ability to cope with challenges such as weight reduction.

The results of the factor analysis of the five components theorised to constitute self-esteem, are of consequence to the obesity field as a whole. The analysis shows that it was not specifically global self-esteem that was being effected by treatment or weight loss, but rather specific composite elements of self-esteem. In particular, it is evident that treatment led to increases in
the two factors of 'worthiness, contentment and significance', and the 'value of existence'. The results of the modelling over time however (once within-group variability had been partialled out), indicated that only the mean rate of change for 'worthiness' was statistically significantly different from zero in the CWCP. This finding allies itself well with the work of Stein (1987), who found that female students who suffered from overweight problems tended to have low self-esteem that expressed itself in feelings of worthlessness and inferiority. Interestingly, it can be noted that the subject's came to perceive themselves as less attractive and approved by others as the treatment progressed. This observation could relate to the fact that treatment was placing an awareness on the negative ramifications of the obese state. A further benefit of breaking self-esteem down into its five sub-components, can be demonstrated by the identification of the fact that two factors, 'autonomous self-regard' and 'competence and self-efficacy', were shown to be unrelated to either treatment or weight loss, and thus arguably unrelated to the obese condition. The identification of certain composite elements of self-esteem that are unaffected by weight control programmes have direct implications for the content and form of treatment itself. Clearly, future interventions could more directly target those specific parts of self-esteem that are deemed to be adversely affected by the obese state.

In general the results of the psychological indicators of change, provide convincing evidence to support the contention that psychological distress is a consequence and not a cause of obesity. Significant psychological improvement was associated with weight loss. This verifies the recent research by Brodie and Slade (1990), which has argued that positive psychological changes follows involvement in treatment and do not proceed it. In contrast to the results of the present study however, Brodie and Slade's study did not find that changes were specific to the type of treatment given. Although psychological changes were observed during and after treatment, there were no significant differences between groups that received behaviour therapy and those that received conventional diet. The authors concluded that either being involved in a weight loss programme, and or losing weight is associated with positive psychological change. Such positive improvements in psychological well-being might be expected to maintain or even enhance efforts towards further weight loss.

The findings from the correlation analysis conducted at 12 and 24 weeks dramatically illustrate the fact that psychological improvements were associated with weight loss. Furthermore, it is clear that there were more significant associations for those receiving the CWCP. The fact that cognitive restraint was not significantly correlated with weight lost by week 12 in the CWCP, probably reflects the fact that this group commenced there dieting behaviour at a later stage than those in the ST group, and had thus not consciously been trying to restrain their eating for as long a period. Whereas all the psychological variables were significantly correlated with weight
loss in the CWCP at the completion of treatment, only cognitive restraint and disinhibition were significantly associated with weight loss in the ST group. In particular, the correlations between weight loss and the Eating Inventory were noteworthy, with all three factors explaining a high of the variance in the weight loss obtained by the CWCP group. This signifies the fact that the Eating Inventory might be a useful tool for predicting those subject's who will be more successful in losing weight using this particular treatment approach.

In summarising the findings from the correlational analysis then, it can be said that there is some evidence to suggest that as weight decreases psychological well-being increases. Due to the fact that the mean weight losses were very similar for both treatment groups by the completion of the programme, the significant differences observed between the two groups in the correlational matrixes have clear implications for the type of treatment offered. Psychological responses to weight management seem to be at least partially determined by the characteristics of the treatment employed. It is not merely the process of weight loss but the means by which it is achieved that is important for reducing psychological distress. This indicates that the content and structure of the CWCP is particularly suited for those subject's who experience high degrees of psychological distress prior to treatment.

Given the directional problem inherent in correlational analysis however (Rosenthal & Rosnow, 1991), the above conclusions can not be made with absolute certainty. Does weight loss result in psychological improvement or does psychological improvement lead to weight loss? The interpretation is complicated further by the fact that although depression and self-esteem would be theorised to result from weight loss, improvements on the three factors of the Eating Inventory would be expected to lead to better rates of weight loss. There is therefore two antagonistic processes at work here. Perhaps the most plausible explanation would be that a third variable, the CWCP itself, produces changes in both? This explanation is conceivable given that the treatment groups were associated with differential rates of psychological significance despite very similar weight losses. However this conjecture is not in itself absolute, in that even if we contend that the improved psychological adjustment has more to do with the type of treatment itself, has it to do with the exercise component, dietary change, or behavioural modification? All we know is that it has to do with the package as a whole. What exact component of the programme is responsible for the improvement is an issue for subsequent research.

7.4 Psychological Predictors of Outcome:
There has been a vigorous search for predictors of weight loss in recent years. Typically a predictor that appears promising in one study, is shown to have no value in another. This may occur because obesity has multiple origins, and a single treatment is likely to have much different effects on different people (Brownell & Wadden, 1991). The results of this study however, are in accord with the view that certain psychological scales, particularly the Eating Inventory, and Binge Scale, do show potential to identify people who are not likely to do well in treatment. It should be remembered however, that with the exception of the Eating Inventory (that clearly reflects the nature of treatment itself), the use of these measures were more to predict factors that may detract from the efficiency of controlled trial, in that factors other than the treatment itself may be related to the outcome. Thus the emphasis in this section is less on the comparisons between the two groups, than it is on the underlying psychological processes at work during the course of treatment.

With regard to the Eating Inventory, the baseline scores for both the CWCP and ST groups were as follows: cognitive restraint in the low range indicating a lack of restraint, disinhibition in the high and clinical ranges indicating problematic attitudes or behaviour towards eating habits, and hunger in the high range indicating susceptibility to hunger might compromise efforts at weight loss. These baseline findings were consistent with the findings from other studies of obese not in treatment (Bjorvell et al., 1986), and provided a direct monitor of the influence of treatment itself on the psychological attributes related to eating. The fact that cognitive restraint scores were low, indicated a definite need for these to be raised if treatment was going to be effective. Furthermore, high disinhibition and hunger scores warned of possible non-compliance or withdrawal from treatment. There was a need for these latter scores to be reduced if the effect of treatment was going to be maximised.

By the three month stage the influence of treatment was clearly evident, both groups having shown significant changes across all three factors of the Eating Inventory. However, it is also clearly apparent that significantly larger increases in cognitive restraint, coupled with larger decreases in disinhibition and hunger, took place in the CWCP group. The positive changes observed at the three month stage were maintained through to the end of treatment. Although the differences between the two groups at the six month stage were not significant (given that sample sizes had been reduced due to attrition), the changes were still larger in the desired direction for the CWCP group. These findings indicate that the specific structure and content of the programme can play an important role in more effective treatment outcome. The increases in cognitive restraint observed in the CWCP indicate that subject's were trying harder not to eat, and suggests that subject's were trying to incorporate behavioural controls into their lifestyle. Thus changes in the CWCP might be as a result of the subject's responding to information about
abilities of subjects. In addition, the group environment may have led to increases in perceived interpersonal support, especially in dealing with emotional disinhibitors such as anxiety, depression and loneliness. The significant improvements on the hunger dimensions may also relate to subjects benefiting from attributional techniques for coping with hunger induced by the CWCP. The lack of increase in the latter two factors gives reassurance that treatment had not provoked problematic attitudes or behaviours, and that the likely treatment outcome was going to be a good one. Nevertheless, the fact that the ST group were also significantly different from their own baselines, points to the fact that treatment per se has an important effect.

By the follow-up, although there was a marked pattern of relapse developing, both groups were still significantly below their baseline measures. Although both groups differed significantly from zero over time, the CWCP group had maintained significantly higher cognitive restraint scores than the control group at follow-up. Although there was no significant difference between the groups on either average disinhibition or hunger scores at follow-up, this was again attributable to a large amount of within-group variability. Consequentially, partialing out this variability in the regression analysis over time did indeed indicate that disinhibition and hunger scores differed significantly from zero in the CWCP group only.

Potential change on the Eating Inventory scores following treatment have not been well documented in the past. In this study however, patients in both groups demonstrated significant improvement on all three factors of the Eating Inventory, although the changes were larger for the CWCP group. Cognitive restraint increased, and both disinhibition and hunger were reduced. The fact that these rates were still higher at follow-up than before treatment began, is indicative of the success of treatment itself. The tendency towards relapse that was evident was probably due to the fact that treatment was over or that factor means were artificially higher during the course of treatment. The results of this study compare favourably to those found by Clark, Marcus, Pera & Niaura (1994) who provided initial guidelines for the magnitude of change anticipated on the Eating Inventory following treatment. Moreover, they match the expected changes reported by Stunkard and Messick (1988), who hypothesised that cognitive restraint scores may increase by approximately six points following treatment. The use of this scale moreover, serves to demonstrate that the degree to which patients exercise cognitive control over their eating may also predict weight loss. This is confirmed by the findings of at least two previous studies, that have reported greater weight losses in subjects with a high baseline dietary restraint (Bjorvell, Rossner & Stunkard, 1986). The current findings do suggest that the Eating Inventory may highlight areas of improvement and provide information on factors that require additional focus or treatment. They furthermore suggest that this instrument may be useful in terms of predicting those subjects that will benefit from comprehensive-behavioural forms of.
factors that require additional focus or treatment. They furthermore suggest that this instrument may be useful in terms of predicting those subject's that will benefit from comprehensive-behavioural forms of treatment, from those who won't. Screening obese subject's with high cognitive restraint scores and low disinhibition scores prior to treatment onset, may be a useful method of increasing success rates. Those subject's identified as being in danger of doing less well, can thus be provided with additional support. Further research is however needed to elucidate and determine the conditions under which dietary restraint predicts weight loss.

It was evident from the results of the baseline assessment that the Stress Vulnerability scores for both groups, fell in the clinically vulnerable range. This was a potential confound to the evaluation of treatment effectiveness, in so much as it warned that there might be many subject's with significant psychosocial stressors in their environments that could result in their poor compliance with treatment regimens. Both clinical and laboratory studies have indicated that obese individual's are more likely to overeat when stressed than normal weight individual's (Wing, Blair, Epstein & Medemott, 1990). However, by the three month stage Stress Vulnerability scores had decreased significantly in both groups, and these changes were maintained until the completion of treatment. This fact that levels of vulnerability were now in the normal range, eliminated the likelihood that stressors extraneous to treatment were biasing the results.

The finding that Stress Vulnerability Scores had been reduced during the course of treatment for both groups was an unexpected one, as it was not initially considered that obesity treatment would impact on psycho-social stressors in the environment. It is quite conceivable that these levels of stress had simply reduced naturally for both groups overtime. A far more likely explanation however, is that this findings may be due to the perceived ability to cope with their stressors that was encouraged during the process of treatment. Of course their is no knowing what exact process of treatment led to these changes. Coping ability may have increased due to cognitive restructuring techniques, assertiveness training, the increased exercise making them feel better about themselves, or merely by the general perception of being empowered by the programme as a whole. Moreover, theses changes in perceived vulnerability to stress may result from the increased psychological well-being associated with treatment. It has been shown for example, that high self-esteem is related to high ability to cope with difficulties and crisis during the lifecycle (Nir & Neuman,1991). Regardless of the causes of the observed reductions in stress vulnerability, this finding attests to the added resolve of those obese in treatment, in overcoming their difficulties.
Contrary to expectation, those subject's in the moderate and severe vulnerability to stress categories seemed to show greater improvements in mood and self-esteem than those in mild vulnerability ranges, as well as a slight tendency to lose more weight (although not significantly so). One conceivable explanation for this finding is that subject's were loosing weight during periods of stress. This conclusion opposes the findings of previous studies that have found that stress was associated with weight gain (Wing et al., 1990). However, it has been previously found that stress is correlated with dietary restraint in the obese (Rosen, Tacy & Howell, 1990). It must be mentioned however, that the interpretation of the above findings was made very difficult by the fact that there were no subject's in the severely vulnerable range in the ST group.

By follow-up, there was a significant difference between the two groups in the average vulnerability to stress, those subject's in the ST group showing more vulnerability to stress. Thus the subject's in the ST group had tended to relapse towards their baseline measures. This further suggest that the programme content may have something to do with the increased ability of those in the CWCP group to cope with stressful life events. It has indeed been found that those who relapse in weight loss efforts employ different coping style to weight loss maintainers (Kaymen et al., 1990). Maintainers confront their problems directly and use rational, problem-solving skills to find solutions. Not surprisingly, weight maintainers also have more positive thoughts about themselves and their weight control efforts. By contrast, relapers are more likely to seek ways of reducing the emotional distress that they experience (emotion-based coping), a search that may well lead to the temporary comforts of food. The conclusion that the treatment itself had an effect on Stress Vulnerability is complicated by the fact that although the mean rate of change over time was not different for the two groups, the rate of change was significant from zero in the control group but not in the experimental group. Furthermore, there is always the inherent danger that the two groups simply experienced differential levels of psychosocial stress after the completion of the programme. If this were the case the groups could no longer be considered equivalent and there would be a serious threat to the internal validity of the study. This finding may also undermine the findings reported above. Did the fact that the CWCP group maintained better rates of weight loss at follow-up, simply result from the fact that those in the ST group experienced greater psychosocial stressors causing them to regain lost weight? Consequently, the results need to be considered with the necessary degree of caution.

There were no significant differences found between the CWCP and the ST group on the Family Adaptability and Cohesion Evaluation Scales, across any of the four assessment periods. The analysis of family process indicated that as a whole, both groups were typified as having balanced type family's. Moreover, both groups were on average fairly satisfied with their
family's functioning. These patterns remained stable throughout the treatment programme. Thus on average there was no danger that the evaluation of the treatment effectiveness would be confounded by a high prevalence of problematic family's being included in the study.

Nevertheless, it was evident at the baseline assessment that 17% (n = 27) of the total number of subject's included in this trial were in danger of not giving themselves the best chance for effective outcome, based on their pathological family processes (Olson, 1986). The value of including an assessment of family process in evaluating obesity treatment was shown by the fact that by the six month stage it was apparent that there was a tendency for extreme type family's in both groups to lose less weight. In contrast, balanced family's were inclined to lose more weight. Specifically, this study seems to suggest that family's typified as being balanced, cohesive and satisfied with their family relationships, can provide the environment most suited to achieving significant weight loss and thus enhancing treatment effectiveness. In addition, general satisfaction with family life and the perception of the family as being supportive, are thought to contribute to successful maintenance (Ganley, 1986). Family life is believed to be most facilitative of the treatment of obesity when it is relatively free from emotional perturbations and conflict, effectively reducing the of stress individual's experience in the family. Family's high in conflict and low in family satisfaction on the other hand, are thought to undermine the subject's efforts at weight loss.

The finding of this study serves to reinforce the possible predictive value of an analysis of family type in obesity outcome studies. Previous research on family involvement suggests that the family is an important social context and that its process may play a critical role in facilitating and maintaining weight loss (Barbarin & Tirado, 1984). Future research needs to focus in more detail on the ways that family members might, through the environment they create and the process through which they interact, contribute to successful weight loss and long-term maintenance. These influences undoubtedly effect treatment outcome and need to be dealt with in more detail in future.

Of all the predictor variables, perhaps the most alarming results were obtained from the Binge Scale, administered at the completion of treatment. Clearly, the more severe the binge eating tendencies of subject's, the less weight they would lose. Furthermore, the level of binge severity had a direct impact on psychological functioning as well. The greater the severity of binge eating tendencies the less the likelihood for psychological improvement. This finding was true for both depression scores and self-esteem. With regard to the three factors of the Eating Inventory, the profile was for more severe binge eaters to show lower levels of cognitive restraint, and higher levels of disinhibition and hunger. An exciting finding was that there was a
significant interaction between binge severity and treatment group observed for cognitive restraint scores. The analysis of the comparative means showed that bingers in the CWCP tended to have higher cognitive restraint scores than those in the ST group. This finding suggests that the nature of the CWCP treatment itself was leading to their higher restraint scores despite binge eating tendencies, and thus suggests that the CWCP hold promise for the treatment of obese binge eaters. These conclusion must be made with caution however, because they are based on post-hoc comparisons only. Therefore there is no way of conclusively knowing whether the differences in the constraint scores of binge eaters, observed between the two groups at the completion of the controlled trial might not have been there right from the start of the programme.

In general, the above findings provide direct evidence for the consistently found clinical observation, that binge eating is negatively associated with treatment outcome in group-based comprehensive weight control programmes (Marcus, 1993). Furthermore, despite the striking lack of difference between obese bingers and nonbingers on anthropometric characteristics, the results of this study contribute to an increasing number of studies that have documented that obese binge eaters report greater psychopathology, than do obese non-bingers. A plethora of recent studies have shown that the obese binge-eaters are a distinct sub-group of the obese that suffer from significantly higher depressive symptomatology, lower-self esteem, more general psychiatric symptomatology, and greater interpersonal distress, than subject's who scored lower on binge severity (Kanders & Blackburn, 1992; Kuehnel & Wadden, 1994; Telch & Agras, 1994). It seems reasonable then, that treatment for obese binge eaters should be focused on the disordered eating, rather than on weight loss per se. Encouraging results have recently been obtained by treating obese binge eaters by means of a combination of cognitive-behavioural treatment and individual interpersonal therapy (Agras, Telch, Arnow, Eldredge, Henderson & Marnell, in press). The above findings might help explain the discrepant results obtained in previous studies attempting to determine the relationship between psychopathology and obesity. The implication that the findings of this study have for predicting treatment outcome seem obvious. Researchers need to be more aware that those who report binge eating are likely to be at increased risk at discontinuing treatment prematurely. Screening for binge eating disorders prior to treatment is thus likely to significantly improve treatment outcome, in that it would identify those obese individual's not suited to benefiting from this form of therapy.

7.5 The Perils Of Attrition:

Many obese individual's join weight loss programmes with the intention of successfully completing them and losing weight. However, one major problem evidenced in this study, and
indeed in others like it, is that significant numbers of subject's do not comply with treatment requirements and drop out. Some attrition rates have been reported to be as high as 83% (Pratt, 1989). High rates of attrition make it almost impossible to draw reliable conclusions from research on weight control, increase administration costs, lead to feelings of guilt and failure on the part of the drop-outs, reduce group morale, and consequently result in the failure of many people to achieve their weight loss goals (Prochasaka & Norcross, 1992; Israel, Silverman & Solotar, 1988). There is therefore a direct need for studies to investigate factors that promote completion in weight control programmes. This endeavour will allow for the identification of programme parameters that will be able to keep greater percentages of subject's from dropping out of treatment prematurely.

In this study 42% of those who started treatment in the CWCP group, and 48% of those who started treatment in the ST group, discontinued treatment prior to the completion of the 24-week programme or were classified as 'academic 'drop-outs due to lack of compliance with treatment protocol. These rates of attrition are substantially lower than that observed in programs that used open-ended therapy, and highly comparable to the 44% reported in similar closed-group, time limited programmes (Wadden & Letizia, 1992). Nevertheless, under normal circumstances this high rate of attrition would be classified as a major threat to the internal validity of this study and the conclusions derived from it (Lipsey, 1990). Fortunately however, as alluded to previously, a high rate of attrition had been predicted and the necessary strategies were incorporated into the design to increase statistical power. Thus by starting the study with larger subject numbers this allowed for the same degree of statistical power at the completion of the six month despite the fact that attrition took place. Furthermore, at the completion of the programme the subject numbers (n = 42) were still large enough to detect a medium-low treatment effect of .55. Thus despite the fairly large attrition rates, this study was still able to provide statistically valid results.

The definition of attrition used in this study, emphasised the percentage of drop-outs at the end of the programme. However, given that there is at least some support for the notion that drop-outs are not a homogeneous group, and that those who drop-out at the beginning of treatment might be very different from those who drop-out at the end of treatment (Bennett & Jones, 1986), the time of dropping out was considered in the analysis. Given that there were no significant differences found between the groups on drop-out characteristics, the findings discussed below relate to the comparisons made between drop-outs and completers for the sample as a whole. The only characteristic that distinguished completers from those who dropped out of treatment by the 12 week stage was BMI. Drop-outs were significantly more obese than completers. A possible reason for their dropping out thus relates to the fact that these
individual's were perhaps more despondent at the small weight losses achieved by this stage. Those who lose significant weight while on a programme will be positively reinforced by their losses and will continue with the programme until its completion. On the other hand, those who gain or lose only modest s of weight on a programme will find it difficult to lose and maintain weight loss when faced by the inevitable factors that promote overeating. Consequently, they will drop out. These postulations are sustained by the findings of contemporary research. A recent study by Wadden, Foster, Letizia and Stunkard (in press, cited in Wadden & Letizia, 1992) investigation of 517 obese individual's in treatment. These authors found that women patients who dropped out during the first three months of treatment had significantly smaller weight losses than those who remained in treatment. Other studies have found that 57% of dropouts indicated that slow rates of weight loss were responsible for their discontinuation (Bennett & Jones, 1986). The implications of these finding suggest that patients disappointed at the scale should be given additional counselling and support to make sure their expectations remain realistic and to further encourage them through their difficult times. It should be remembered however, that while it appears that there may be a causal relationship between these variables, small weight losses and attrition from therapy may simply be related to patient's lack of interest in the programme.

A total of 17 drop-outs were classified as 'academic dropouts' because of the fact that they had attended less than 60% of the weekly group meetings. In analysing the baseline data of this group, it was found that poor compliance was significantly related to depression, low self-esteem, a greater vulnerability to stress and less satisfaction with present family relationships. The analysis of attrition results for the dropouts as a whole, indicated that dropouts had significantly higher vulnerability to stress scores than completers. This result compares favourably to a study conducted by Wadden and Letizia (1992). These authors asked patients to indicate whether they were currently experiencing significant life changes in the following areas: work, health, relationships with significant others, events related to parents or children, financial or legal difficulties, and moving. Each of these variables were examined individually in relationship to attrition and the global measure of stress was also analysed. It was found that overall stress, plus three individual indicators, financial difficulties, events related to parents, and relationship difficulties, discriminated persons who discontinued treatment from those who remained. These results strongly impress that persons who are experiencing unsettling life events should wait for a more propitious time to lose weight.

It was also found that those who dropped out from this study had lower rates of perceived cohesion than did completers. This suggests that those subject's that dropped out of treatment perceived their family's to be of the separated type with little emotional bonding towards one
another (Olson, Portner & Lavee, 1985). These types of family's are typified by the fact that they have low levels of family support (Olson, Sprenkle & Russell, 1979) and are thus not the most conducive to facilitate weight loss efforts. The likelihood that the family's of dropouts were more disengaged than those of completers, again stresses the import of the predictive value of assessing family functioning. Nevertheless, the fact that only the obese subject's themselves completed the FACES scales, is a definite methodological shortcoming of this study and necessitates these findings being interpreted with caution. Ideally the scales should be completed by more than one family member as it is quite likely that family members could perceive their family functioning in different ways. A further finding from the analysis of attrition was that those who dropped out from treatment were far more likely to suffer from binge eating tendencies. This emphasises the arguments made above and confirms the results of other studies that have reported greater rates of attrition among obese binge eaters than among non-bingers (Marcus, 1993).

An oversight of this analysis of attrition was the fact that pre-treatment Eating Inventory scores were not included in the examination. LaPorte and Stunkard (1990) observed greater attrition among patients treated by very low calorie diet who reported susceptibility to hunger as measured by the Eating Inventory. Conversely, patients with high levels of dietary restraint coupled with low susceptibility to hunger were found to be more likely to complete treatment. Other studies have however, found no association between attrition and the three variables measured by the Eating Inventory (Wadden & Letizia, 1992). Consequently, this issue needs further illumination.

The above findings indicate that a profile of subject's most likely to drop-out before the completion of treatment would include heavier subject's, who are experiencing high s of stress in their environments, come from more disengaged family's and have a tendency to binge. Screening clients who should cautioned not to start treatment at these periods in time, may go a long way towards increasing compliance rates. However more research still needs to be conducted to identify high risk drop-outs. Some future possibilities for research endeavours would include an examination of whether the incidence of dropout varies with programme leaders, programme structure, and length of treatment. A useful alternative methodology that was attempted in this study, but proved of little value given the low mail response rate, would be to use a more qualitative approach to studying attrition. The abstinence of qualitative analysis in mainstream research on obesity represents a weakness in developing theory and clinical practice. Research on obesity has been dominated by a positivist scientific model (Hepworth, 1993). Consequently, qualitative research has been marginalised by mainstream research and its dissemination. By employing a qualitative approach, the researcher would be able to relate more
to the individual experience of the drop-outs themselves. This may provide some meaningful conclusions. Drop-outs could be asked for example, either by interview or open-ended questionnaire, to give more detailed reasons why they discontinued treatment.

7.6 General Conclusions:

The results of this controlled trial demonstrate that a comprehensive weight control programme, that include nutrition education, behaviour modification, increased activity, and psychosocial support, can be of benefit in the treatment of outpatient obesity. Successful maintenance of weight loss requires major changes in all aspects of the patient's lifestyle, including eating habits, activity levels, and psychological factors (Perri et al., 1992). Maintenance resulting from such changes have been seen to be possible only in a comprehensive behavioural weight reduction programme. In addition, the findings of this study have highlighted the fact that obesity is a psychological disease! Even though obesity appears to be a predominantly physiological disorder, our treatment modalities are psychological and motivational, and impressive evidence was found that comprehensive treatment can be of help the obese overcome their psychological distress related to being obese. These psychological improvements were maintained independently of weight loss and despite weight relapse.

Although the average rates of weight loss achieved by the CWCP were not as high as those seen in past studies, they were nevertheless marginally better than those achieved by the ST group of over the period of 52-weeks. It must be remembered that the results of this study were evaluated as the degree to which they compared to baseline measures. This assumes that individual's would have maintained stable weight and psychological status if left untreated. However it has been shown that people often gain weight with time, especially the obese, and psychological well-being often fluctuates with life events. This alludes to the fact that the findings may in fact be better than they seem. Although the relapse rate may cast doubt on the long-term outcome of obesity treatment, the reference point used has a direct implication for the evaluation of success. If the average weight loss resulting from the CWCP was initially 8 kg, but reduces to 5 kg at follow-up, this may be viewed as discouraging because about two-thirds of the weight is regained, and the subject's are only 5 kg better off. Yet, if it is true that the untreated obese gain weight over time, then even complete weight regain must be viewed in a more favourable light to the alternative of substantial weight gain associated with no treatment.

It is evident from the results of this study that the effects obtained by the CWCP fall in general in the small to medium range. Nevertheless, small treatment effects can be of definite practical significance (Lipsey, 1990). Translating the notion of a small treatment effect into a simple
success rate, the proportion of individual's that exceed the medium outcome, Rosenthal and Rubin (1982) demonstrated that a treatment effect of two-tenths of a standard deviation would correspond to a difference of approximately 10 percentage points between the treatment and control groups success rates respectively. Equating this to the treatment of obesity, if 65 of the 100 obese treated by standard treatment were to die prematurely due to cardiovascular problems relating to their excess fat, an innovative new treatment such as the CWCP that produced only a 0.2 better result, would reduce the death rate to 55 per 100, a saving of 10 lives! This means that a CWCP effect of this small order of magnitude would result in 15% (10/65) fewer obese individual's dying prematurely from weight related complications than would have without this form of treatment. Described in this way then, it is clearly difficult to argue that the small effects observed by the CWCP are trivial.

Two clear limitations relate negatively on the outcome of this study. Firstly, there was a large degree of inter-individual variation observed within the groups on many of the variables measured. Different subject's reacted differently to treatment regimens. This problem was particularly apparent in the CWCP group at the follow-up stage. This clearly suggests that subject variables, rather than treatment variables, have most influence on outcome. Given the considerable diversity in the origins of obesity however, it is hardly surprising that not all individual's would lose weight effectively by this approach. Thus despite the observed benefits of the CWCP as a whole, it might still be more appropriate to put greater emphasis on matching individual's needs to treatment methods (Brownell & Wadden, 1991; Brownell & Wadden, 1992). This contention was given direct support by the results of the predictor variables, including the analysis of attrition, that clearly showed that certain obese individual's were not going to benefit from these forms of treatment. If more attention was paid to excluding those subject's not suited to group based treatments of this nature, within-group variability could possibly be minimised or offset. This would result in obesity treatment effectiveness research being more powerful and more sensitive to true treatment effects if present. Secondly, this controlled trial began with the idea of evaluating a treatment concept (CWCP) which was believed to have a potential for producing certain beneficial effects. Although some positive effects were observed, the design of this study did not allow for an evaluation of what exact components of the CWCP produced the desired effects. There would thus be a need for a future study of this nature to include a thorough process evaluation (Posavac & Carey, 1992) to help to determine what about the CWCP actually caused the observed differences. This would include monitoring the integrity of the treatment provided to assess what exactly was delivered (e.g. procedural consistency) and to what extent the programme was complied with. These components of the CWCP package need to be studied in order to assess what is most efficacious
in producing weight loss. The results of such studies will indicate the strategies best suited for being incorporated into a modified comprehensive approach.

In conclusion then, faced with the relative lack of confidence in the prospects of weight loss maintenance, perhaps our focus needs to turn to the definition of successful treatment itself. As seen by the changes in the psychological measurements observed in the CWCP, we clearly need to define successful treatment not only in terms of weight loss but also in terms of the improved quality of life brought about by decreased psychological distress. It has been evident that psychological well being results from treatment. Furthermore, we have witnessed that this improvement seems to be associated with more than just weight loss, it was observed that psychological responses to weight management appear to be at least partially determined by the characteristics of the treatment employed. This is thus an important implication for health care professionals treating obesity - focus more on relieving psychological distress, a very important, but often neglected component of successful treatment. We also need to be more prudent in who we choose to participate in treatment. Closer attention to who will be suited to the CWCP and who will not, by means of more attention to predictor variables, might considerably improve success rates in future.
PART THREE:

FINAL CONSIDERATIONS
It has been argued in Chapter one of this thesis that obesity is a very prevalent problem which holds serious implications for both psychological and mental health. The potential benefits of safe and effective forms of treatment have been shown to be considerable. Yet as described in Chapter two, despite a plethora of available treatment regimens, the long-term success rates of obesity treatment have to be said to be bleak. In recent years though, the notion of comprehensive-behavioural weight control programmes have gained in popularity as one of the treatments of choice for the management of obesity. A glaring deficiency in the prevailing treatment effectiveness literature however, is the lack of consideration given to the psychosocial context in which the obese individuals find themselves. This assertion was reviewed in detail in Chapter three, and informed the fundamental motif underlying the empirical component of this thesis - the imperative need to incorporate psychological measures of outcome into obesity programme evaluations. In comparing a recently developed comprehensive weight control programme to a standard treatment approach, it was demonstrated that participants in the former programme showed superior psychological adjustment, despite only achieving marginally better rates of weight loss maintenance than the latter group. Perhaps one of the most exciting findings of this study was the fact that it was observed that improved psychological adjustment could be achieved independently of weight loss. This lead to the contention put forward in Chapter seven, that future evaluations of treatment effectiveness should not only consider successful outcome in terms of weight loss, but also in terms of the degree to which a programme can ameliorate psychological distress and induce lasting improvements in psychological well-being. This final chapter then, will conclude this dissertation by way of briefly reviewing some central challenges that lie ahead for the field of obesity. It is believed that these issues should and will become integral factors in the continuos strive to improve the long-term management of the obese.

8.1 Weight Loss Maintenance and Preventing Relapse:

The tendency for many patient's to regain the weight that they have lost in treatment, represents a direct challenge to the proclaimed effectiveness of obesity treatment modalities. The long-term ineffectiveness of obesity treatment, stems from a failure, by clinicians and patient's alike, to recognise that obesity is a chronic condition that requires continuos care. Most weight loss
treatments are in effect short-term interventions that leave the obese individual inadequately prepared to meet the challenges that lie ahead. When on their own, the majority of the obese cannot sustain the substantial degree of psychological control necessary to override the biological and psychosocial mechanisms compelling them to gain weight. The resulting relapse is considered a negative event in almost all quarters. When a person loses weight and then regains it, the expectation is that the person becomes depressed, embarrassed and ashamed, and that self-esteem is battered (Brownell, 1992). The experience is thought to be sufficiently negative to reduce the person's chances of success on the next attempt. It is therefore essential that future treatments for the obese be supplemented with programmes of ongoing care, specially designed to enhance the long-term maintenance of weight loss.

To date research on relapse is relatively new, so many unanswered questions remain. The most common-weight loss maintenance strategy has been the use of booster sessions. The rationale underlying this approach, has been the notion that additional weight-loss meetings scheduled during the follow-up period could increase adherence to treatment procedures. Although the use of such booster sessions has intuitive appeal, the results of its effectiveness have been mixed and research has failed to demonstrate the efficacy of booster sessions as a maintenance strategy (Perri, 1992). One alternative means of trying to prevent relapse, may be to provide advice and support during the follow-up period by means of post-treatment contact by telephone or mail (Peri & Nezu, 1993). Extensive research conducted recently by Perri et al (1992) investigated the effectiveness of various weight-loss maintenance strategies including ongoing professional contact, skills training, social support, physical activity and multi-component programs. There conclusions were quite startling - unless initial weight loss treatments are targeted at the problem of weight maintenance, successful long-term management of obesity was found to be unlikely. If patient's are not provided with a post-treatment maintenance programme, they are very likely to abandon the self-control strategies learned in treatment and regain weight. Participants in post-treatment maintenance programmes exhibit greater adherence to weight control strategies and demonstrate better maintenance of weight loss. These studies consistently showed that structured programmes of post-treatment contact successfully help patient's to sustain weight loss progress. They demonstrated that a post-treatment programme combining professional contact, social support and a high frequency of aerobic exercise, not only enhanced maintenance but also produced significant additional weight loss during the period following initial treatment.

The implications of Perri et al's findings are that far more focus needs to be put on ways to prevent relapse following treatment. The first step of which is for clinicians to acknowledge the long-term implications of obesity treatment. In addition to acknowledging that it is a chronic problem, clinicians must develop treatments that will provide patient's with lifelong assistance in managing
their obesity. Treatments of obesity often fail because they do not equip the patient to cope with
the relentless physiological processes that compensate for weigh loss and the negative
psychological reactions that result from the inability to sustain weight loss. Furthermore, clinician
needs to convey the awareness of the long-term implications regarding obesity to the patient's
themselves. Obese patient's need to know, that like to patient's who are diabetic, they may never be
cured of their disease. Instead they must focus their efforts on the controlling of their condition
through active self-management efforts for the rest of their lives. The bottom line is that obesity is
a chronic condition requiring continuous and possibly life long care.

8.2 Psycho-Social Deliberations:

The bad news that presently predominates the obesity literature is that having invariably been
through many previous weight-loss programmes, patient's are lured by the promise that 'this time it
is going to be different', only to once again be disappointed when they regain lost weight. The good
news highlighted by the present study however, is that whether weight is lost or not, outcome can
still be regarded as positive in terms of its having reduced psychosocial distress associated with the
condition. The implication of this finding for the field of obesity as a whole, is that far from being
regarded as just another statistic, those that fail in their quest to lose weight need to be helped to
manage the impact of their failure in a way that will relieve them from psychological despair. The
obese patient, like those in any other therapeutic relationship, should be treated with sensitivity and
in a way that makes them feel valued, respected and understood.

Notwithstanding the positive psychological changes observed in this evaluation, there are also
several psychological drawbacks of weight loss treatments that should not be overlooked. Firstly,
patient's often believe that all their problems are related to their obesity, and that once excess
weight is lost these problems will disappear. Such patient's scapegoat there obesity and are
disappointed when job and relationship problems still remain (O'Neil & Jarrell, 1992). This may
trigger weight regain, and therefore such unrealistic expectations need to be assessed and dealt with
prior to treatment if possible. Secondly, clinical findings have also documented that some patient's
do indeed experience negative psychological consequences associated with successful weight loss
(Wadden & Stunkard, 1993). Documented examples of such cases include obese women who have
experienced greater levels of anxiety associated with more opportunities for sexual contact.
Thirdly, and perhaps most importantly, there are some detrimental negative psychological
consequences associated with weight regain. Repeated failure to lose weight may exacerbate
feelings of worthlessness and despair, causing the obese person to look inwardly for an explanation,
thus blaming themselves (Brownell & Wadden, 1992). It is these negative consequences of failure
that too often go unnoticed by health care providers, who are still too willing to allow clients to
overestimate the effects of the treatment they offer. Rather than allowing clients to blame themselves for their failure, health professionals should be confronting the inadequacies of the treatment that they are providing. Finally, it must not be forgotten however that there are conceivably a sub-population of obese who are relatively satisfied with their bodies, and whose psychological adjustment is no different from that of people of normal weight (Faubel, 1989). Thus we must not assume inevitable psychological disturbance in the obese and that this will always need ameliorating. In conclusion then, researchers need to be sensitive to the often unquestioned assumption that weight reduction is ultimately psychologically beneficial for everyone and that indices of improved emotional and mental health include the behaviours of kg shed.

It has been argued that the most pervasive harmful consequence of obesity treatment stems from the fact that the obese are led to believe that their condition is a manifestation of some underlying emotional disturbance (Wooley & Garner, 1991). As a result many obese individual's are coerced to accept psychological interpretations for their condition and erroneously come to believe that they have some underlying character deficit. It is true that many obese individual's have been observed to experience psychological and behavioural symptoms such as binge eating and depression (Kolotkin et al., 1987; Faubel, 1989). What is still not clear however, is whether these symptoms are caused by being overweight, or are a consequence of losing weight. Indeed the findings of this study and other studies like it have gone a long way towards arguing for the latter belief (Black et al., 1992; Fichter et al., 1993). Psychological correlates of treatment should thus be persuaded by the interpretation that psychological disturbance results from the psychosocial context in which the obese person finds themselves.

A further important consideration for future obesity management, relates to the fact that health care professionals in their writing and in their treatment plans, have too often addressed the obese as an anonymous group, failing to realise that the experiences and knowledge of the obese themselves can be an all important component of successful treatment (Wooley & Garner, 1991). These experiences of the obese should not be ignored or discounted, as it is perhaps these personal experiences that can perhaps shed the most light on how to treat the issues relevant to the real problem, thus leading to more effective treatment. We should therefore not be so quick to discredit or discard the patient's account of the problem in the future, because we can learn a lot from listening to how the obese experience their own physical, mental, and social situations.

Finally, it must be remembered that many people have psychological problems connected with their weight because they have been indoctrinated with the belief that they cannot and should not relax and accept themselves as more or less overweight. The mania of slimness in contemporary western society has led to a plethora of commercial and research based weight-loss regimens that at best
have produced only short term weight-losses. As seen in the present study many people do not maintain weight losses on a long-term basis for more than six months. The stark reality as described in Chapter one in the review of the origins of obesity, is that many people are going to be overweight for much of their lives and have a genetic predisposition to be so. Consequently, more concerted efforts need to be directed to how people can lead more psychologically satisfying lives at elevated weights. Perhaps we as health professionals have far more to gain by employing strategies and tactics to increase the self-esteem of fat people, and by exposing the psychological damage which a thin culture inflicts on its 'not-so-thin' citizens (Allon, 1980). Medical doctors, psychologists, and researchers alike should be more open to tolerating and accepting the legitimacy of multiple body sizes and shapes and the fact that some people are predestined to be more or less overweight (Garner, 1993).

In summary, we know that despite the gains that have been made by comprehensive-behavioural programmes such as the one that has been evaluated in this thesis, obesity treatment is in general ineffective in terms of producing long-term weight losses. It may be argued however, that if health care professionals fail to take cognisance of the psychological deliberations described above, their treatment can become more than ineffective - it can become destructive!

8.3: Cultural Perspectives on the Treatment of Obesity:

One of the primary reasons for undertaking this evaluation was the belief that an effective outcome may lend itself to the modification of the CWCP for all at risk population groups in South Africa. It was held that comprehensive weight management interventions could be successfully implemented for use with different cultural groups in both outpatient and primary health care settings. This future intention, lends itself to the realisation that culturally patterned behaviours and beliefs play an important role in the aetiology of human obesity and therefore have practical implications for its prevention and treatment.

While cultural influences may be less important than genes in the statistical sense, they are more important in terms of the treatment and prevention of obesity (Brown, 1993). This is simply because cultural predisposition to obesity has been shown to be changeable (Brownell, 1991). Furthermore, the concept of culture is intimately related to the concepts of social class and ethnicity, which as described previously, is one of the key factors in the epidemiological distribution of obesity in this country. As such, culture is the key to prevention: the existing beliefs and practices of populations at greatest risk for obesity must be understood if appropriate and effective health intervention are to be designed. Culture plays a role not only in diet and exercise patterns, but also in the perception of health problems, and the pattern of health seeking behaviour by individuals (Wadden, Stunkard,
Chapter 8: The Challenge of Obesity Management

by individual's (Wadden, Stunkard, Rubin, Sweidel & McKinney, 1990). Thus the understanding of the cultural beliefs and practices of patient populations, particularly those from the majority ethnic groups in South Africa, and how they relate to obesity, are important for establishing effective cross-cultural communication between patient's and their health care providers. Nowhere was the importance of taking existing cultural beliefs into account, in the design- and implementation of health promotions projects, more clearly demonstrated than in an obesity prevention campaign conducted in a Zulu community outside of Durban (Gampel, 1962). In this campaign, one health education poster depicted an obese women and an overloaded truck with a flat tyre, with the caption "Both carry too much weight". The intended message of this poster was misinterpreted by the community because of the cultural connection between obesity and social status. The women in the poster was perceived to be rich and happy, since she was not only fat but had a truck overflowing with her possessions. This example serves to illustrate the importance of understanding the symbolic meaning of fatness among the poor or in ethnic groups with high prevalence of obesity.

It is also important to remember that culture defines normalcy. In other words definitions of ideal and normal body size reflect cultural and cosmetic standards, as well as medical issues. In contemporary westernised societies, the cosmetic ideal of body size for women is thinner than the medical ideal (Brown, 1993). Moreover, the behavioural aspects of culture that allow for obesity have corresponding ideological or symbolic components. Fatness is symbolically linked to psychological dimensions such as self-worth and sexuality in many societies of the world but the nature of that symbolic association is not constant. In mainstream western culture obesity is socially stigmatised, but for most cultures of the world, fatness is viewed as a welcome sign of health and prosperity (Brownell, 1991). In pre-industrial societies thinness is stigmatised as a symptom of starvation or as a sign of AIDS in central Africa (Brown, 1993). Among the middle and upper-class women in the united states, thinness represents the moral success of self-control over one's body (Hsu, 1987).

In summary any talk of extending the CWCP effectively to primary health care settings, must incorporate the cultural perspective into their management strategies. The most important practical suggestion that can be given to health professionals working in the local field of obesity management in South Africa, is that they need to try to understand the 'ethnic' point of view about health problems associated with being overweight. A direct recipe for failure is to assume that patient or community share a common set of interpretations about the meaning of symptoms. Health care workers attempting to prevent or treat obesity in an ethnic group, either in the clinic or community setting, can benefit from being aware of the range of health beliefs and practices of that group and how they may experience subtle cultural pressures to be overweight.
8.4 Finale:

I would like to end this thesis with the personal, but perhaps somewhat provocative view that health care professionals dealing in the field of obesity management need to fundamentally re-evaluate their treatment services. Many people are seeking the ideal that may be impossible to attain! The result is a nation of self-improvement enthusiasts willing to endure deprivation, pain and even surgery in the process. Like it or not, many people are going to be overweight for much of their lives and researchers need to direct their attention to why and how people can and do lead more or less psychologically satisfying lives at elevated weights.

We would have a far more effective and indeed more human form of treatment, if we treated obesity only for health reasons, and if we put greater emphasis on improving psychological well being and the promotion of fat acceptance. We need to reduce weight only to achieve therapeutic effect in terms of the associated health risks, not for cosmetic reasons, a taint too easily guiled by the lure of money. An interesting argument is made by Bjørntorp (1990) that based on associated health risks and the need for therapeutic effect, only abdominal obesity should be defined as 'true obesity', and that other peripheral accumulation of fat should receive less emphasis in the same way that muscle enlargement, large ears, or large feet are not distinguished by medical terminology.

Many people have psychological problems connected with their overweight because they have been indoctrinated with the belief that they can not and should not relax and accept themselves as more or less overweight. The experience of being stigmatised has considerable impact on the lives of those labelled obese. Stigma and the psychological ramifications thereof can be mitigated if the treatment offered is based on the assumption that fat people are capable human beings, whether or not they loose weight. It is time for a greater emphasis on acceptance of fatness and concentration on the civil rights of the obese with efforts at public education to counter the social stigmatisation associated with fatness (Garner, 1993). The obese individual seeking treatment should be assured that weight loss and maintenance of weight loss should not be considered the main goals for successful treatment. No one can magically transform a fat body into a thin one! Despite failed efforts to demonstrate lasting and clinically significant weight loss they can none the less be provided with blueprints that can be utilised to maximise their health throughout life and allowing them to be happy with who they are, whether they be fat or thin.

In taking a more responsible approach to the treating of obesity, a more responsible approach would include a consideration of the following issues: should the obese individual be treated at all, if so what treatment is best suited to their needs, what procedures will be utilised to increase the chances of long term success and diminish the possibility that initial weight loss will be followed by relapse.
and regaining of weight over the long run, and finally how the cultural perspective impacts on the individuals experience of the condition. It is believed that indeed the framework that best supports such an approach is a comprehensive weight control programme undertaken in the context of a multi-disciplinary management team. Furthermore it is held that is advisable if not essential for ongoing evaluation studies to include questions that focus not only on medical status, weight loss and nutritional content, but also very importantly on his/her emotional responses and encounters with others in his/her social world. It is only by the inclusion of all these elements that effective treatment plans can be developed and shaped.

Epilogue:

The message that permeates this Chapter, is that continuing efforts to eliminate obesity for any reason but to reduce health risks associated with being very overweight, may actually be perpetuating people's obsession with the need to be thin. Perhaps a more worthwhile effort, especially for those obese who repeatedly fail with weight loss attempts, would be to help these individuals develop a healthy lifestyle and a greater self-concept independent of weight loss. As more overweight people learn to be happy, attractive, and self-confident, less emphasis will be placed on the importance of being thin, and the prejudicial attitudes towards obesity in our society may diminish.
REFERENCES:


APPENDIX A:

Copies of Advertisements, Letters, Consent forms, application forms etc.
100 fatties wanted
for weight study

Health Reporter

ONE hundred seriously overweight people are urgently needed for a study of weight control.

The Medical Research Council (MRC), the departments of human nutrition and physiology at Stellenbosch University and the department of psychology at the University of Cape Town have pooled resources for the research project.

The MRC says South Africa has one the highest rates of obesity in the world — and up to 44 percent of people are overweight.

Obesity puts people at increased risk of hypertension, diabetes, cardiovascular diseases, certain cancers and gall bladder disease.

The study will focus on developing a holistic approach incorporating psychological, physiological, genetic and environmental factors.

The 24-week programme will be run from Tygerberg Hospital on an out-patient basis starting at the beginning of next month. Participants will meet once a week for an hour in group sessions and a fee of R10 per session will be charged to cover administration costs.

Information sessions will be held on July 27 and 29. To book, call Katja de Boer at the MRC, 938 0380 or Jason Tibbs, 650 3434.

The Argus
Thu. 22 July 1993

Beat obesity

RECENT research by the Medical Research Council has shown that South-Africa has among the highest prevalences of obesity in the world. In this country between 48% and 44% of people are obese, depending on their sex and population group. This causes a major health and social problem to those concerned.

Obese people are also at increased risk of hypertension, cardiovascular diseases, certain cancers, diabetes and gall bladder diseases. Research has shown that in order to beat obesity, a holistic approach involving psychological, physiological, genetic and environmental factors need to be taken into account.

In view of this, the MRC, the Departments of Human Nutrition and Human Physiology at Stellenbosch University and the Department of Psychology at the University of Cape Town have pooled resources to implement a comprehensive weight treatment programme at the Tygerberg hospital.

The 24-week programme which starts from the beginning of August, will be run by dietitians from the Department of Human Nutrition. Participants will meet once a week for an hour in group session of which only R10 per session will be charged.

For further information and, or booking, phone Katja de Boer at the MRC on 938-0380 or Jason Tibbs at UCT on 650-3434, during office hours.

Albertus Kotze

Vrywilligers kan vetrolletjies laat waai

KAAPSTAD. — Goeie nuus vir mense wat akkel om van ernstige vetrolletjies ontlae te raak, is dat vrywilligers dringend benodig word vir 'n gewigsbehandelings-program by die Tygerberg Hospitaal.

Die Mediese Navorsingsraad (MNR) en die Universiteit van Stellenbosch en Kaapstad is van die begin van Augustus betrokke by die program.

Onlangsige MNR-navorsing het getoon dat Suid-Afrika van die hoogste obesiteit-voorkomstes bysien ter wereld het. Tussen 8 en 44 percent van Suid-Afrikaners is oorweg.

Volgens 'n navorsing betrokke deur die program is obesiteit 'n baie ingewikkelde probleem om op te los.

Pasiënte wat erg oorwegig is, het 'n hoë risiko vir hipertensie, suikersiekte, hartsiekte, sekere kankers en galblassiesiekte.

Die program het daarop gemik om met die monitor van mediese en dieetkundige gewoontes mas- sieverlies op lang termyn te verseker. Behandeling sal toegespits word op voedingsvoeding, di- eet- en gedragsverandering, oefening en sosiale ondersteuning.

Die program duur 24 weke en word deur die departement van menslike opvoeding by die Tygerberg-Hospitaal op 'n out-patiëntbasis aangebied. Deelnemers sal wekeliks vir 'n uur in groepe vergader teen 'n koste van R10 per sessie.

Inligtingssesseie word op 27 Julie by Tygerberg-Hospitaal gehou. Bespreking is noodsaaklik. Vir nader inligting kan belangstellendes Katja de Boer by 938-0380 of Jason Tibbs by 650-3434 bel.

Die Burger Vi. 23 Julie 1993
APPLICATION TO JOIN THE WEIGHT CONTROL PROGRAMME

Name: __________________________ Date of Birth: ___/___/19
Age: _______ Sex: _____ Language: ____________
Address: _____________________________________________________________
Tel: __________________________ (Home) Code: __________________________
__________________________ (Work)
Weight: ________kg Height: _______m or _______ft _______inches

Income: <R500 R500-R1 000 R1 000-R2 000 R2 000 >R2 000

Which session will suit you best?

Office use only

Preliminary sessions:

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th>BMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuesday</td>
<td>13-15:00</td>
<td>1</td>
</tr>
<tr>
<td>Wednesday</td>
<td>14-16:00</td>
<td>2</td>
</tr>
<tr>
<td>Thursday</td>
<td>17:30-19:30</td>
<td>3</td>
</tr>
<tr>
<td>Friday</td>
<td>08-10:00</td>
<td></td>
</tr>
</tbody>
</table>

Other times that will suit you:

<table>
<thead>
<tr>
<th>Day</th>
<th>Time</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td>09-12:00 1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Tuesday</td>
<td>13-14:00 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wednesday</td>
<td>15-17:00 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thursday</td>
<td>17:30-18:30 4</td>
<td></td>
<td>Day</td>
</tr>
<tr>
<td>Friday</td>
<td>18-20:00</td>
<td></td>
<td>Time</td>
</tr>
</tbody>
</table>

Cost for 6-month treatment (24 weeks):
R10 a week = R240

Payments:

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Upfront</td>
<td>R240 1</td>
<td></td>
</tr>
<tr>
<td>2 Payments</td>
<td>2 x R120</td>
<td>2</td>
</tr>
<tr>
<td>3 Payments</td>
<td>3 x R80</td>
<td>3</td>
</tr>
</tbody>
</table>

I commit myself to join for a 6-month programme.

Date __________________________ Signature __________________________
INFORMED CONSENT

CONSENT FROM THE PATIENT MUST BE OBTAINED PRIOR TO TREATMENT

I (name) ............................................................ agree to the following:

1) I am joining the weight control program on a voluntary basis.

2) I am aware of the nature of the program and agree to participate in the research that is being conducted in conjunction with the program:

   The weight control program is aimed at establishing new healthy eating behaviour, improving passive and active physical exercise. I am aware of the fact that I will have an equal chance to be included in one of two programmes currently undergoing scientific evaluation. It is expected from me to answer several questions during the course.

3) I am willing and able to commit myself to weight control training for at least six months.

4) I agree that the cost of the six month course will be R240 and should be paid upfront at registration.

5) I understand that neither the Medical Research Council, nor any of the other institutions involved in this program, can be held responsible for any costs that may arise as a result of the effects of weight loss.

Signed: ............................................................ Date: .........................

Witness: ............................................................ Date: .........................
COMPREHENSIVE WEIGHT CONTROL RESEARCH PROGRAMME

CONFIRMATION SLIP

NAME: ...........................................................
ADDRESS: ...........................................................
TEL (home) .................... Tel (work) .................

This is to confirm that: (* delete if not applicable)

1. I will be able * / will NOT be able * to attend the REGISTRATION / BASELINE MEASUREMENT on ........................ at .....................

2. I will be able * / will NOT be able * to attend the CWCP weekly sessions at the times allocated to me.

3. I understand that the duration of the CWCP is 6 months (break over Dec/Jan holiday) and that commitment and regular attendance are crucial to the success of the programme.

4. I understand that the cost of the CWCP is R240-00, and that this is payable upon registration - unless alternative arrangements have been made.

5. I understand that acceptance on this programme is on condition that I have undergone a medical examination, and that my doctor has declared me medically fit to participate on this weight control programme. My completed and signed medical examination form is attached.

Signed by me on this ......day of ....... 1993 , at ............... 

Signature : ........................

Please return in the SAE.
COMPREHENSIVE WEIGHT CONTROL RESEARCH PROGRAMME

CERSA / MRC
P.O. Box 19079
TYGERBERG 7505

Dear .................,

Thank you for your interest in the Comprehensive Weight Control Programme (CWCP) and for attending the information session. We are pleased to advise you that you have been selected to participate in this programme. Your participation is, however, conditional on the approval of your doctor - please make the necessary arrangements for a medical examination. We remind you that this is a six month programme (with a break over Dec/Jan holiday period) and that your commitment to the programme is crucial to successful weight loss.

The CWCP will start the week of the 6th September 1993. Your group will meet on:

Starting date :........................................
#Time : .................. Day : ..................
Venue : ............................................
Your Dietitian : ..................................
Your project number : ............................

Further to our telephone discussion your appointment for registration and the baseline measurements is as follows:

# Time : .................. Date : ..................
(# Unfortunately, these times can not be changed)

To reserve your position on the CWCP we need to receive your confirmation slip (attached), your completed Tygerberg Hospital Registration form (attached) and your medical examination form (signed by your doctor) by return post. A stamped addressed envelope (SAE) is enclosed for your convenience.

We will be doing the following baseline measurements : height, weight, waist/hip measurements, determination of the percentage of body fat and a fitness assessment. You will also be asked to complete a series of questionnaires. These measurements will be
repeated midway through the programme, and on completion of the programme. Please allow 2 - 3 hours for this procedure.

The venue for the baseline assessments is the Exercise Laboratory, Department of Medical Physiology and Biochemistry, University of Stellenbosch, Tygerberg Campus. The Exercise laboratory is on the 5th floor (Room F562), "Fisiologie en Anatomie" building. (Directions attached).

For you own comfort, we suggest that you wear a tracksuit and tackies, or a loose-fitting skirt/pants and a top for the baseline measurement session. (If at all possible, NO stockings please, Ladies !) For some of the measurements you will need to remove your outer clothing - a gown will, however, be provided.

We wish to remind you that the cost of the six month CWCP is R240-00, payable upon registration. (If this is a problem please contact your dietitian urgently so that alternative arrangements can be made.) If the dietitian is not available please contact Katja de Boer at (021) 9380380.

Please do not hesitate to contact us should you have any further queries. Your dietitian 's telephone number, during office hours is : ......................

We look forward to seeing you, and remember LOSERS ARE WINNERS !!
30 March 1994

THE TYGERBERG WEIGHT CONTROL PROGRAMME

Dear Participant

It is with great regret that I hear that you have discontinued your involvement in the weight control programme. As you know, the programme was largely focused around research, which has been essential in terms of enabling us to learn what methods work best and for us to improve the long term success prospects for future participants. Unfortunately, being a new program there are still a lot of rough edges that need to be improved on. It is therefore most important that we come to understand why people are dropping out as well as the problems they are having controlling their eating behaviour, so as to be able to provide for these needs in the future. As such I would be most grateful if you could take a few minutes to complete the enclosed questionnaires and post them back to us as soon as possible. For your convenience we have enclosed a stamped return envelope.

Wishing you best of luck for the future and please don't hesitate to contact us if we can be of further assistance to you.

Thanking you kindly for your cooperativeness.

Yours sincerely

JASON TIBBS
Department of Psychology, U.C.T.
APPENDIX B:

Copies of the questionnaires used
DEMOGRAPHIC QUESTIONNAIRE

TYGERBERG HOSPITAL WEIGHT CONTROL PROGRAM
ALL INFORMATION IS CONFIDENTIAL AND WILL BE USED FOR RESEARCH PURPOSES ONLY

I. GENERAL INFORMATION

1. Name: ..................................................
   Office use only
   Code: 1

2. Date of birth  
   Day  Month  Year
   Code: 9

3. Sex: 
   Male = 1  Female = 2

4. Residential address: 
   Code: 

5. Postal address: 
   Code: 

6. Address of nearest relative: 
   Code: 

7. Work address: 
   Code: 

8. Telephone:  
   H:  B:  Friend:

9. Occupation: 

10. Employer: 

11. Spouse's occupation: 

12. Spouse's employer: 

13. Home language:  
   Afrikaans 1  English 2  
   Other (specify) ..................
   ......................... 15
14. Marital status: |                  |
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SINGLE</td>
</tr>
<tr>
<td>MARRIED</td>
</tr>
<tr>
<td>WIDOW/ WIDOWER</td>
</tr>
<tr>
<td>DIVORCED</td>
</tr>
<tr>
<td>LIVING WITH PARTNER</td>
</tr>
</tbody>
</table>

15. Number of children: | Number |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1-2</td>
<td>2</td>
</tr>
<tr>
<td>3-4</td>
<td>3</td>
</tr>
<tr>
<td>MORE THAN 4</td>
<td>4</td>
</tr>
</tbody>
</table>

16. Ages of children: | Age |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1 YRS</td>
<td>1</td>
</tr>
<tr>
<td>1-3 YRS</td>
<td>2</td>
</tr>
<tr>
<td>4-6 YRS</td>
<td>3</td>
</tr>
<tr>
<td>7-12 YRS</td>
<td>4</td>
</tr>
<tr>
<td>13-18 YRS</td>
<td>5</td>
</tr>
<tr>
<td>OVER 18</td>
<td>6</td>
</tr>
</tbody>
</table>

17. Educational level: | Level |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NO SCHOOLING</td>
<td>1</td>
</tr>
<tr>
<td>PRIMARY SCHOOL SUB A - STD 1</td>
<td>2</td>
</tr>
<tr>
<td>PRIMARY SCHOOL: STD 2 - STD 5</td>
<td>3</td>
</tr>
<tr>
<td>SECONDARY SCHOOL: STD 6-STD 8</td>
<td>4</td>
</tr>
<tr>
<td>SECONDARY SCHOOL: STD 9-STD 10</td>
<td>5</td>
</tr>
<tr>
<td>COLLEGE/TECHNICON DIPLOMA</td>
<td>6</td>
</tr>
<tr>
<td>UNIVERSITY DEGREE</td>
<td>7</td>
</tr>
</tbody>
</table>

18. What is your total monthly household income? | Income |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>NO INCOME</td>
<td>1</td>
</tr>
<tr>
<td>R 100 - R 999</td>
<td>2</td>
</tr>
<tr>
<td>R 1000 - R 299</td>
<td>3</td>
</tr>
<tr>
<td>R 3000 - R 4999</td>
<td>4</td>
</tr>
<tr>
<td>R 5000 - R 7999</td>
<td>5</td>
</tr>
<tr>
<td>R 8000 PLUS</td>
<td>6</td>
</tr>
</tbody>
</table>

25
II. **HEALTH INFORMATION**

1. Have you ever been told you suffer from any chronic medical problem?

<table>
<thead>
<tr>
<th>Condition</th>
<th>Y=1</th>
<th>N=2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heart Disease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes / High Blood Sugar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertension / High Blood Pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Blood Cholesterol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gout</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arthritis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any Other Diseases (Specify)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Are you currently taking any medication for (such as):

<table>
<thead>
<tr>
<th>Medication</th>
<th>Y=1</th>
<th>N=2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes / High Blood Sugar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypertension / High Blood Pressure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Blood Cholesterol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gout</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arthritis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;The Pill&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hormone Replacement Therapy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sleeping Tablets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tranquillisers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anti-Depressants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appetite Suppressants</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other (Specify) Vitamins</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Are you presently seeing a psychologist or psychiatrist?

<table>
<thead>
<tr>
<th></th>
<th>Y=1</th>
<th>N=2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.1 If yes, why?

<table>
<thead>
<tr>
<th>Reason</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Office use only
# TYGERBERG HOSPITAL
## COMPREHENSIVE WEIGHT CONTROL PROGRAMME

<table>
<thead>
<tr>
<th>Name:</th>
<th>Date: ddmmyy</th>
<th>Project code:</th>
<th>6</th>
</tr>
</thead>
</table>

Read the following statements carefully and mark (✓) the number of your response.

<table>
<thead>
<tr>
<th>Strongly agree</th>
<th>Agree</th>
<th>Un-decided</th>
<th>Dis-agree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

1. I expect to be enrolled in this program until its completion.
2. The lessons in this program will be useful for my health.
3. I am certain that this program is the right choice for me.
4. It is important for me to complete this weight loss program as opposed to some other program.
5. My family and/or my friends approve of me joining this program.
6. My family and friends support my effort to lose weight and to complete this program.
7. I feel accepted by members in my group.
8. I am very motivated to participate in this program.
9. I feel that the threat of obesity to my health will motivate me to lose weight.
10. I expect to reach my reasonable goal weight.
11. I feel that I can control my eating and exercise habits.
BECK INVENTORY:

On this questionnaire are groups of statements. Please read each group of statements carefully. Then pick out the one statement in each group which best describes the way you have been feeling the PAST WEEK, INCLUDING TODAY! Circle the number beside the statement you picked. If several statements in the group seem to apply equally well, circle each one. Be sure to read all the statements in each group before making your choice.

1) 0 I do not feel sad.
    1 I feel sad.
    2 I am sad all the time and I can't snap out of it.
    3 I am so sad or unhappy that I can't stand it.

2) 0 I am not particularly discouraged about the future.
    1 I feel discouraged about the future.
    2 I feel I have nothing to look forward to.
    3 I feel that the future is hopeless and that things cannot improve.

3) 0 I do not feel like a failure.
    1 I feel that I have failed more than the average person.
    2 As I look back on my life, all I can see is a lot of failures.
    3 I feel that I am a complete failure as a person.

4) 0 I get as much satisfaction out of things as I used to.
    1 I don't enjoy things the way I used to.
    2 I don't get real satisfaction out of anything anymore.
    3 I am dissatisfied or bored with everything.
<table>
<thead>
<tr>
<th></th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>5)</td>
<td>I don't feel particularly guilty.</td>
<td>I feel guilty a good part of the time.</td>
<td>I feel quite guilty most of the time.</td>
<td>I feel guilty all of the time.</td>
</tr>
<tr>
<td>6)</td>
<td>I don't feel I am being punished.</td>
<td>I feel I may be punished.</td>
<td>I expect to be punished.</td>
<td>I feel I am being punished.</td>
</tr>
<tr>
<td>7)</td>
<td>I don't feel disappointed in myself.</td>
<td>I am disappointed in myself.</td>
<td>I am disgusted with myself.</td>
<td>I hate myself.</td>
</tr>
<tr>
<td>8)</td>
<td>I don't feel I am any worse than anybody else.</td>
<td>I am critical of myself for my weaknesses or mistakes.</td>
<td>I blame myself all the time for my faults.</td>
<td>I blame myself for everything bad that happens.</td>
</tr>
<tr>
<td>9)</td>
<td>I don't have any thoughts of killing myself.</td>
<td>I have thoughts of killing myself, but I would not carry them out.</td>
<td>I would like to kill myself.</td>
<td>I would kill myself if I had a chance.</td>
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<td>10)</td>
<td>I don't cry any more than usual.</td>
<td>I cry more now than I used to.</td>
<td>I cry all the time now.</td>
<td>I used to be able to cry, but now I can't cry even though I want to.</td>
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<td>11)</td>
<td>I am no more irritated now than I ever am.</td>
<td>I get annoyed or irritated more easily than I used to.</td>
<td>I feel irritated all the time now.</td>
<td>I don't get irritated at all by the things that used to irritate me.</td>
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12) 0 I have not lost interest in other people.
     1 I am less interested in other people than I used to be.
     2 I have lost most of my interest in other people.
     3 I have lost all of my interest in other people.

13) 0 I make decisions about as well as I ever could.
     1 I put off making decisions more than I used to.
     2 I have greater difficulty in making decisions than before.
     3 I can't make decisions at all anymore.

14) 0 I don't feel I look any worse than I used to.
     1 I am worried that I am looking old and unattractive.
     2 I feel that there are permanent changes in my appearance that make me look unattractive.
     3 I believe that I look ugly.

15) 0 I can work about as well as before.
     1 It takes an extra effort to get started at doing something.
     2 I have to push myself very hard to do anything.
     3 I can't do any work at all.

16) 0 I can sleep as well as usual.
     1 I don't sleep as well as I used to.
     2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep.
     3 I wake up several hours earlier than I used to and cannot get back to sleep.

17) 0 I don't get more tired than usual.
     1 I get tired more easily than I used to.
     2 I get tired from doing almost anything.
     3 I am too tired to do anything.
18) 0 My appetite is no worse than usual.
     1 My appetite is not as good as it used to be.
     2 My appetite is much worse now.
     3 I have no appetite at all anymore.

19) 0 I haven't lost much weight, if any, lately.
     1 I have lost more than 5 pounds.
     2 I have lost more than 10 pounds.
     3 I have lost more than 15 pounds.

     I am purposely trying to lose weight by eating less.  Yes  No

20) 0 I am no more worried about my health than usual.
     1 I am worried about physical problems such as aches and pains; or upset stomach; or constipation.
     2 I am very worried about physical problems and it's hard to think of much else.
     3 I am so worried about my physical problems that I cannot think about anything else.

21) 0 I have not noticed any recent change in my interest in sex.
     1 I am less interested in sex than I used to be.
     2 I am much less interested in sex now.
     3 I have lost interest in sex completely.
This questionnaire deals with the attitudes and beliefs that some people have about themselves. Please indicate how much you agree or disagree with each statement by ringing a single number for each statement which represents how you typically feel most of the time. Since people vary so much in the opinions they hold, there are no right or wrong answers.

1) I have control over my own life.

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2) I am easy to like.

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3) I never feel down in the dumps for very long.

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4) I can never seem to achieve anything worthwhile.

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5) There are lots of things I'd change about myself if I could.

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6) I am not embarrassed to let people know my opinions.

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7) I don't care what happens to me.

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8) I seem to be very unlucky.

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9) Most people find me reasonably attractive.

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10) I'm glad I'm who I am.

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11) Most people would take advantage of me if they could.

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12) I am a reliable person.

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13) It would be boring if I talked about myself.

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14) When I'm successful, there's usually a lot of luck involved.

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15) I have a pleasant personality.

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16) If a task is difficult that just makes me all the more determined.

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17) I often feel humiliated.

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18) I can usually make my mind up and stick to it.

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19) Everyone else seems much more confident and contented than me.

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20) Even when I quite enjoy myself there doesn't seem much purpose to it all.

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21) I often worry about what other people are thinking about me.

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22) There's a lot of truth in the saying: "what will be, will be".

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23) I look awful these days.

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24) If I really try I can overcome most of my problems.

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25) It's pretty tough to be me.

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26) I feel emotionally mature.

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27) When people criticise me I often feel helpless and second rate.

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28) When progress is difficult, I often find myself thinking it's just not worth the effort.

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29) I can like myself even when others don't.

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30) Those who know me well are fond of me.

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PLEASE CHECK THAT YOU HAVE RESPONDED TO EVERY STATEMENT.
EATING INVENTORY

For ease of administration and scoring, this inventory is intended for use with the Eating Inventory Ready-Score Answer Sheet, available from the publisher. Examinees should be referred to the answer sheet for examples of the proper method for filling in response circles.
PART I

Read each of the following 36 statements carefully. If you agree with the statement, or feel that it is true as applied to you, answer true by filling in the appropriate circle on the separate answer sheet. If you disagree with the statement, or feel that it is false as applied to you, answer false by filling in the appropriate circle on the answer sheet. Be certain to fill in the circles completely, but do not make any stray marks on the answer sheet.

1. When I smell a sizzling steak or see a juicy piece of meat, I find it very difficult to keep from eating, even if I have just finished a meal.

2. I usually eat too much at social occasions, like parties and picnics.

3. I am usually so hungry that I eat more than three times a day.

4. When I have eaten my quota of calories, I am usually good about not eating any more.

5. Dieting is so hard for me because I just get too hungry.

6. I deliberately take small helpings as a means of controlling my weight.

7. Sometimes things just taste so good that I keep on eating even when I am no longer hungry.

8. Since I am often hungry, I sometimes wish that while I am eating, an expert would tell me that I have had enough or that I can have something more to eat.

9. When I feel anxious, I find myself eating.

10. Life is too short to worry about dieting.

11. Since my weight goes up and down, I have gone on reducing diets more than once.

12. I often feel so hungry that I just have to eat something.

13. When I am with someone who is overeating, I usually overeat too.

14. I have a pretty good idea of the number of calories in common foods.

15. Sometimes when I start eating, I just can't seem to stop.

16. It is not difficult for me to leave something on my plate.

17. At certain times of the day, I get hungry because I have gotten used to eating then.

18. While on a diet, if I eat a food that is not allowed, I consciously eat less for a period of time to make up for it.

19. Being with someone who is eating often makes me hungry enough to eat also.

20. When I feel blue, I often overeat.

21. I enjoy eating too much to spoil it by counting calories or watching my weight.

22. When I see a real delicacy, I often get so hungry that I have to eat right away.

23. I often stop eating when I am not really full as a conscious means of limiting the amount that I eat.

24. I get so hungry that my stomach often seems like a bottomless pit.

25. My weight has hardly changed at all in the last ten years.

26. I am always hungry so it is hard for me to stop eating before I finish the food on my plate.

27. When I feel lonely, I console myself by eating.

28. I consciously hold back at meals in order not to gain weight.

29. I sometimes get very hungry late in the evening or at night.

30. I eat anything I want, any time I want.

31. Without even thinking about it, I take a long time to eat.

32. I count calories as a conscious means of controlling my weight.

33. I do not eat some foods because they make me fat.

34. I am always hungry enough to eat at any time.

35. I pay a great deal of attention to changes in my figure.

36. While on a diet, if I eat a food that is not allowed, I often then splurge and eat other high calorie foods.
## PART II

Each question in this section is followed by a number of answer options. After reading each question carefully, choose the one option which most applies to you, and fill in the appropriate circle on the answer sheet. Be certain to fill in the circles completely, but do not make any stray marks on the answer sheet.

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
<th>Number Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>How often are you dieting in a conscious effort to control your weight?</td>
<td>rarely, sometimes, usually, always</td>
<td>1, 2, 3, 4</td>
</tr>
<tr>
<td>How often do you feel hungry?</td>
<td>only at meal times, sometimes, often,</td>
<td>1, 2, 3, 4</td>
</tr>
<tr>
<td>Do you feel hungry?</td>
<td>almost always</td>
<td>1, 2, 3, 4</td>
</tr>
<tr>
<td>Would a weight fluctuation of 5 lbs affect the way you live your life?</td>
<td>not at all, slightly, moderately, very</td>
<td>1, 2, 3, 4</td>
</tr>
<tr>
<td>How difficult would it be for you to stop eating halfway through dinner and not eat for the next four hours?</td>
<td>easy, slightly difficult, moderately difficult, very difficult</td>
<td>1, 2, 3, 4</td>
</tr>
<tr>
<td>How conscious are you of what you are eating?</td>
<td>not at all, slightly, moderately, extremely</td>
<td>1, 2, 3, 4</td>
</tr>
<tr>
<td>How frequently do you avoid “stocking up” on tempting foods?</td>
<td>almost, seldom, usually, almost always</td>
<td>1, 2, 3, 4</td>
</tr>
<tr>
<td>How likely are you to shop for low calorie foods?</td>
<td>unlikely, slightly likely, moderately likely, very likely</td>
<td>1, 2, 3, 4</td>
</tr>
<tr>
<td>Do you eat sensibly in front of others and splurge alone?</td>
<td>never, rarely, often, always</td>
<td>1, 2, 3, 4</td>
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<tr>
<td>How likely are you to consciously eat slowly in order to cut down on how much you eat?</td>
<td>unlikely, slightly likely, moderately likely, very likely</td>
<td>1, 2, 3, 4</td>
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<tr>
<td>How frequently do you skip dessert because you are no longer hungry?</td>
<td>almost, seldom, at least once a week, almost every day</td>
<td>1, 2, 3, 4</td>
</tr>
<tr>
<td>How likely are you to consciously eat less than you want?</td>
<td>unlikely, slightly likely, moderately likely, very likely</td>
<td>1, 2, 3, 4</td>
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<tr>
<td>Do you go on eating binges even though you are not hungry?</td>
<td>never, rarely, sometimes, at least once a week</td>
<td>1, 2, 3, 4</td>
</tr>
<tr>
<td>To what extent does this statement describe your eating behavior?</td>
<td>not like me, little like me, pretty good description, me perfectly describes me</td>
<td>1, 2, 3, 4</td>
</tr>
<tr>
<td>On a scale of 1 to 6, where 1 means no restraint in eating (eat whatever you want, whenever you want it) and 6 means total restraint (constantly limiting food intake and never “giving in”), what number would you give yourself?</td>
<td>1 eat whatever you want, whenever you want it, 2 usually eat whatever you want, whenever you want it, 3 often eat whatever you want, whenever you want it, 4 often limit food intake, but often “give in”, 5 usually limit food intake, rarely “give in”, 6 constantly limiting food intake, never “giving in”</td>
<td>1, 2, 3, 4</td>
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</table>
Directions for Marking the Answer Sheet

1. You may use a pencil or a ball point pen. Press firmly to make dark, heavy marks. Keep the marks inside the circles.

2. If you make a mistake or wish to change an answer, do not erase your mark. Make an X on the wrong mark like this: ☒ and then mark the space you want. If you later decide your first choice was correct, cross out the second answer with an X and then circle your first mark, like this: ☑
PLEASE READ THE FOLLOWING QUESTIONS CAREFULLY. SCORE EACH ITEM BY CIRCLING THE NUMBER CORRESPONDING TO HOW MUCH OF THE TIME EACH STATEMENT APPLIES TO YOU.

1. I eat at least one hot, balanced meal a day.

   1  2  3  4  5
   Always Frequently Occasionally Rarely Never

2. I get seven to eight hours sleep at least four nights a week.

   1  2  3  4  5
   Always Frequently Occasionally Rarely Never

3. I give and receive affection.

   1  2  3  4  5
   Always Frequently Occasionally Rarely Never

4. I feel that there is at least one relative living in my vicinity on whom I can rely.

   1  2  3  4  5
   Always Frequently Occasionally Rarely Never

5. I exercise to the point of perspiration at least twice a week.

   1  2  3  4  5
   Always Frequently Occasionally Rarely Never

6. I smoke less than half a pack of cigarettes a day.

   1  2  3  4  5
   Always Frequently Occasionally Rarely Never
7. I take fewer than five alcoholic drinks a week.

1  2  3  4  5
Always  Frequently  Occasionally  Rarely  Never

8. I feel that I am the appropriate weight for my height.

1  2  3  4  5
Always  Frequently  Occasionally  Rarely  Never

9. My income is adequate to meet basic expenses.

1  2  3  4  5
Always  Frequently  Occasionally  Rarely  Never

10. I get strength from my religious beliefs.

1  2  3  4  5
Always  Frequently  Occasionally  Rarely  Never

11. I attend club or social activities.

1  2  3  4  5
Always  Frequently  Occasionally  Rarely  Never

12. I have a network of friends and acquaintances.

1  2  3  4  5
Always  Frequently  Occasionally  Rarely  Never

13. I have one or more friends to confide in about personal matters.

1  2  3  4  5
Always  Frequently  Occasionally  Rarely  Never

14. I am in good health (including eyesight, hearing, teeth etc.).

1  2  3  4  5
Always  Frequently  Occasionally  Rarely  Never
15. I am able to speak openly about my feelings when angry or worried.

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16. I have conversations with the people I live with about domestic problems (e.g. chores, money and daily living issues).

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17. I do something for fun at least once a week.

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18. I am able to organize my time effectively.

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19. I drink fewer than three cups of coffee (or tea or cola drinks) a day.

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20. I take quiet time for myself during the day.

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Below are groups of numbered statements. Read all of the statements in each group and circle the number next to the statement that best describes the way you feel about the problems you have controlling your eating behaviour.

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

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

3) 1) I feel capable to control my eating urges when I want to.
    2) I feel like I have failed to control my eating more than the average person.
    3) I feel utterly helpless when it comes to feeling in control of my eating urges.
    4) Because I feel so helpless about controlling my eating I have become very desperate about trying to get in control.

4) 1) I don't have the habit of eating when I'm bored.
    2) I sometimes eat when I'm bored, but often I'm able to "get busy" and get my mind off food.
    3) I have a regular habit of eating when I'm bored, but occasionally, I can use some other activity to get my mind off eating.
    4) I have a strong habit of eating when I'm bored. Nothing seems to help me break the habit.
5) 1 I'm usually physically hungry when I eat something.
2 Occasionally, I eat something on impulse even though I really am not hungry.
3 I have the regular habit of eating foods, that I might not really enjoy, to satisfy a hungry feeling even though physically I don't need the food.
4 Even though I'm not physically hungry, I get a hungry feeling in my mouth that only seems to be satisfied when I eat a food, like a sandwich, that fills my mouth. Sometimes, when I eat the food to satisfy my mouth hunger, I then spit the food out so I won't gain weight.

6) 1 I don't feel any guilt or self-hate after I overeat.
2 After I overeat, occasionally I feel guilt or self-hate.
3 Almost all the time I experience strong guilt or self-hate after I overeat.

7) 1 I don't lose total control of my eating when dieting even after periods when I overeat.
2 Sometimes when I eat a "forbidden food" on a diet, I feel like I "blew it" and eat even more.
3 Frequently, I have the habit of saying to myself, "I've blown it now, why not go all the way" when I overeat on a diet. When that happens I eat even more.
4 I have regular habit of starting strict diets for myself, but I break the diets by going on an eating binge. My life seems to be either a "feast" or a "famine".

8) 1 I rarely eat so much food that I feel uncomfortably stuffed afterwards.
2 Usually about once a month, I eat such a quantity of food, I end up feeling very stuffed.
3 I have regular periods during the month when I eat large amounts of food, either at mealtime or at snacks.
4 I eat so much food that I regularly feel quite uncomfortable after eating and sometimes a bit nauseous.
9) 1 My level of calorie intake does not go up very high or go down very low on a 
regular basis.

2 Sometimes after I over eat, I will try to reduce my caloric intake to almost 
nothing to compensate for the excess calories I've eaten.

3 I have a regular habit of overeating during the night. It seems that my routine is 
not to be hungry in the morning but overeat in the evening.

4 In my adult years, I have had week-long periods where I practically starve myself. 
This follows periods when I overeat. It seems I live a life of either "feast or 
famine".

10) 1 I usually am able to stop eating when I want to. I know when "enough is enough".

2 Every so often, I experience a compulsion to eat which I can't seem to control.

3 Frequently, I experience strong urges to eat which I seem unable to control, but 
at other times I can control my eating urges.

4 I feel incapable of controlling urges to eat. I have a fear of not being able to stop 
eating voluntarily.

11) 1 I don't have any problem stopping eating when I feel full.

2 I usually can stop eating when I feel full but occasionally overeat leaving me 
feeling uncomfortably stuffed.

3 I have a problem stopping eating once I start and usually I feel uncomfortably 
stuffed after a meal.

4 Because I have a problem not being able to stop eating when I want, I 
sometimes have to induce vomiting to relieve my stuffed feeling.

12) 1 I seem to eat just as much when I'm with others (family, social gatherings) as 
when I'm by myself.

2 Sometimes, when I'm with other persons, I don't eat as much as I want to eat 
because I'm self-conscious about my eating.

3 Frequently, I eat only a small amount of food when others are present, because 
I'm very embarrassed about my eating.

4 I feel so ashamed about overeating that I pick times to overeat when I know no 
one will see me. I feel like a "closet eater".
I eat three meals a day with only an occasional between meal snack.
I eat 3 meals a day, but I also normally snack between meals.
When I am snacking heavily, I get in the habit of skipping regular meals.
There are regular periods when I seem to be continually eating, with no planned meals.

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

I don't think about food a great deal.
I have strong cravings for food but they last only for brief periods of time.
I have days when I can't seem to think about anything else but food.
Most of my days seem to be pre-occupied with thoughts about food. I feel like I live to eat.

I usually know whether or not I'm physically hungry. I take the right portion of food to satisfy me.
Occasionally, I feel uncertain about knowing whether or not I'm physically hungry. At these times it's hard to know how much food I should take to satisfy me.
Even though I might know how many calories I should eat, I don't have any idea what is a "normal" amount of food for me.

THANK YOU FOR YOUR CO-OPERATION.
PLEASE READ THE QUESTIONS CAREFULLY AND CIRCLE THE NUMBER OF YOUR RESPONSE.

DESCRIBE YOUR FAMILY NOW:

1. Family members ask each other for help.

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<tbody>
<tr>
<td>Almost never</td>
<td>once in a while</td>
<td>sometimes</td>
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2. In solving problems, the children's suggestions are followed.

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3. We approve of each other's friends.

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4. Children have a say in their discipline.

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5. We like to do things with just our immediate family.

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6. Different persons act as leaders in our family.

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7. Family members feel closer to other family members than to people outside the family.

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8. Our family changes in ways of handling tasks.

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9. Family members like to spend free time with each other.

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10. Parent(s) and children discuss punishment together.

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11. Family members feel very close to each other.

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12. The children make the decisions in our family.

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13. When our family gets together for activities, everbody is present.

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<td>Almost Always</td>
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</tbody>
</table>

14. Rules change in our family.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
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<th>5</th>
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<tbody>
<tr>
<td>Almost never</td>
<td>once in a while</td>
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<td>frequently</td>
<td>Almost Always</td>
</tr>
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</table>
15. We can easily think of things to do together as a family.

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16. We shift household responsibilities from person to person.

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17. Family members consult other family members on their decisions.

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18. It is hard to identify the leader(s) in our family.

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19. Family togetherness is very important.

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20. It is hard to tell who does which household chores.

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P.T.O.
IDEALLY, how would you like YOUR FAMILY TO BE:

21. Family members would ask each other for help.

1 2 3 4 5
Almost never once in a while sometimes frequently Almost Always

22. In solving problems, the children's suggestions would be followed.

1 2 3 4 5
Almost never once in a while sometimes frequently Almost Always

23. We would approve of each other's friends.

1 2 3 4 5
Almost never once in a while sometimes frequently Almost Always

24. The children would have a say in their discipline

1 2 3 4 5
Almost never once in a while sometimes frequently Almost Always

25. We would like to do things with just our immediate family.

1 2 3 4 5
Almost never once in a while sometimes frequently Almost Always

26. Different persons would act as leaders in our family.

1 2 3 4 5
Almost never once in a while sometimes frequently Almost Always

27. Family members would feel closer to each other than to people outside the family.

1 2 3 4 5
Almost never once in a while sometimes frequently Almost Always
36. We would shift household responsibilities from person to person.

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37. Family members would consult each other on their decisions.

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38. We would know who the leader(s) was in our family.

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39. Family togetherness would be very important.

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40. We could tell who does which household chores.

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WEEKLY WEIGHT RECORD

<table>
<thead>
<tr>
<th>Project No.</th>
<th>Client Names</th>
<th>Exercise*</th>
<th>Weight</th>
<th>Payment</th>
<th>Signed</th>
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<tbody>
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* Times spent 20 minutes brisk walking during the week