Chapter Two: Literature Review

2.1 Background

Obesity is a complex disease that can be influenced by many factors including lifestyle, genetics, ethnicity, social status and medications. Weight management strategies available include lifestyle modification, pharmacotherapy and surgery. The aim of this study was to evaluate a lifestyle-modification weight management programme aimed at adults. Therefore, this literature review will exclude evidence for alternative management strategies for adults and weight management strategies aimed children or adolescents. For the purposes of this literature review, evidence for lifestyle modification strategies and published evaluations of weight management services in the UK will be appraised and the key findings from the research presented.

2.2 The main components of lifestyle modification weight management programmes

2.2.1 Diet

There is a large quantity of evidence on the effectiveness of dietary interventions for the treatment of obesity (Pirozzo et al., 2002; Astrup et al., 2000; NIH, 1998; Glenny et al., 1997). The most common dietary interventions are low calorie diets, very low calorie diets and low fat diets. The most recent evidence for dietary treatment supports the use of low-calorie diets, energy-deficit diets and low fat diets as being most effective for modest weight loss (Avanell et al., 2004; Mulvihill & Quigley, 2003). The choice of diet should be based on personal preference and promote a healthy, balanced diet as described in Table 2.1. In their systematic review, Avanell et al. (2004) demonstrated the changes in weight resulting from a 600kcal/day deficit or low fat diet compared with usual care from studies at 12 months. This type of intervention showed clear benefits on weight, risk factors and clinical outcomes, such as the prevention of diabetes and improvement in hypertension, and the effects appeared to continue for up to 3 years (Avanell et al., 2004).
Table 2.1: Key dietary messages for adults for managing weight and health risk reduction (Adapted from Costain & Croker, 2005)

- Include a variety of foods from the main food groups
- Consider portion size
- Reduce the proportion of fat, particularly saturated fat
- Partially substitute monounsaturated or $n$-3 polyunsaturated fats for saturated fat
- Increase fruit and vegetables to at least five portions daily
- Make low-glycaemic index, whole-grain and high-fibre carbohydrate-rich foods part of meals
- Reduce sugar intake
- Limit salt intake
- Follow a structured meal pattern, starting with breakfast

2.2.2 Physical activity

Reviews of the evidence on the role of physical activity in the treatment of overweight in adults concluded that while physical activity can lead to weight loss the results are often modest (Wing, 1999; NIH, 1998). Therefore, physical activity is generally recommended as an addition to dietary changes rather than a sole treatment for weight loss (Avanell et al., 2004; NIH, 1998). A typical programme of 30-45 minutes physical activity five to seven days a week can result in an additional expenditure of 300kcal per day or 1500-2100kcal per week in addition to energy deficits achieved through dietary restrictions. Physical activity also prevents the loss of lean body mass associated with dieting, which can lower metabolic rate and lead to a slowing of weight loss (Rippe & Hess, 1998). Physical activity can be in the form of structured exercise or lifestyle activity, when combined with a low-fat diet in a 16-week weight management programme, both structured physical activity and lifestyle activity
achieved similar weight loss and health benefits (Andersen et al., 1999). Other health benefits of physical activity include increased cardiorespiratory fitness, improved lipid profiles and blood glucose levels, thus reducing the risk of metabolic syndrome. Current guidelines for physical activity are described in Table 2.2.

**Table 2.2**: Key physical activity message for adults to promote health and weight management (Adapted from Department of Health, 2004)

- 30 min moderately-intense activity, e.g. brisk walking or taking 10 000 steps over the day, on at least 5 days per week can promote general health
- 45–60 min activity each day may be needed to prevent the development of obesity in the absence of a reduction in energy intake
- Individuals who have been obese and who have lost weight may need to do 60–90 min activity daily in order to maintain their weight loss

2.2.3 Behaviour change techniques

Behaviour change techniques aim to enable individuals to implement and maintain positive changes to their diet and activity levels in order to achieve weight loss. Recent NICE guidance has acknowledged the importance of these strategies in improving health at population, community and individual levels (NICE, 2007). At an individual level, interventions that encourage individuals to understand the consequences of their behaviours, feel positive about changing behaviour, plan changes over time, recognise barriers to change and plan how to overcome these, set and record personal goals and share goals with others are recommended. In obesity management, key features of behavioural techniques include self-monitoring, goal setting, diet, exercise, stimulus control, problem solving, cognitive restructuring, and relapse prevention (Berkel et al., 2005). It is now widely accepted that dietary interventions combined with physical activity and behavioural therapy techniques
more effective than each interventions alone (Avanell et al., 2004, Mulvihill & Quigley, 2003, Glenny et al. 1997).

2.2.4 Lifestyle modification

Although, physiological and genetic factors may contribute, the increased prevalence in obesity has been attributed to lifestyle factors, in particular increased energy intake and decreased physical activity (Prentice and Jebb, 1995). Lifestyle modification programmes include behaviour change strategies to increase physical activity, improve eating habits and reduce energy intake and are widely acknowledged as an important “first-line” approaches to the treatment of obesity (NICE, 2006, NHMRC, 2003, NIH, 1998, SIGN, 1996). These programmes focus on changing existing “unhealthy” behaviours to “healthier” ones, and typically include three main components: nutrition education, physical activity and behaviour therapy (Wadden et al., 2004).

Lifestyle weight management programmes are often community-based. Approximately 75% of the population see their general practitioner in one year, and about 90% in five years. The majority of overweight and obese individuals are either seeking help with weight management or treatment of associated medical conditions; therefore, primary care provides an ideal setting for weight management interventions (Maryon-Davis, 2005). Group-based interventions can manage more patients over time compared to one-on-one individual interventions, thus enabling more detailed education, support and encouragement to be provided. Social support and a sense of camaraderie created amongst individuals are other positive features of this setting. Programmes typically included 10-20 participants and may include some individual sessions. The length of programmes varies widely, recommended durations is three months weight loss followed by three months weight maintenance (SIGN, 1996).

2.3 The efficacy of lifestyle modification weight management programmes

Several randomised controlled trials have shown the health benefits of lifestyle intervention for weight control (Tuomilehto et al., 2001; Stevens et al., 2001; Diabetes Prevention Program Research Group, 2002). Although the trials focused on
prevention of conditions for which obesity is a risk factor, diabetes and hypertension, weight reduction was a primary goal.

The Diabetes Prevention Study (Tuomilehto et al., 2001; Lindstrom et al., 2003) randomised 522 middle-aged overweight subjects into a usual care and an intensive lifestyle intervention groups. At baseline the mean age of the subjects was 55, mean BMI was 31kg/m², all subjects had impaired glucose tolerance, and two thirds were women. At the start of the study, the control group were given general information by a nutritionist and a physician on how lifestyle factors affect glucose tolerance and diabetes risk. The intervention group had seven individual dietary counselling sessions with a nutritionist during the first year, and every three months thereafter, lasting 30 minutes to 1 hour (Lindstrom et al., 2005). All sessions had a pre-planned topic, were individualised and written information was provided. Additional voluntary cooking sessions and supermarket visits were provided and spouse involvement was encouraged. The goals of the intervention were weight reduction ≥5% from baseline weight, total fat intake <30% energy intake; saturated fat intake <10% energy intake; fibre intake ≥15 g/1000 kcal/day, and moderate-to-vigorous exercise of ≥30mins/day. Diet and exercise were recorded in diaries prior to each counselling session (Lindstrom et al., 2005).

Subjects in the intervention group lost significantly more weight than those in the control group after one (-4.5 ± 5.5kg versus -1.0 ± 5.0kg; P<0.0001) and three years (-3.5 ± 5.1kg versus 0.9 ± 5.4kg; P<0.0001) respectively (Lindstrom et al., 2005). The study supports the use of lifestyle-based interventions to achieve weight loss, but the generalisability was limited by the high intensity of the intervention and free use of a
gym, which is often not available within health care settings. The sample also represents a group of individuals likely to be more motivated to lose weight than a general obese population due to increased risk of developing diabetes.

The Diabetes Prevention Program (DPP) was a 4-year study that examined over 3200 overweight or obese men and women with elevated plasma glucose concentrations, which were randomised into control, Metformin or lifestyle-modification groups (DPP Research Group, 2002). The mean age of participants was 51 years, and the mean BMI was 34.0 kg/m². The goals of the programme were for participants to achieve at least a 7% reduction in initial weight through adoption of a healthy, low-energy, low-fat diet and at least 150 minutes of physical activity each week. Participants attended 16 individual sessions during the first 24 weeks of enrolment which involved diet, exercise, and behaviour modification advice. Subsequent monthly individual sessions and group sessions were designed to reinforce behavioural changes.

Although the primary outcome of the study was development of diabetes, the percentage of subjects who achieved the goals of the lifestyle intervention was also investigated. Within four months, half of the participants achieved ≥7% weight loss and three quarters achieved ≥150 minutes physical activity per week. The average weight loss throughout an average follow-up of 2.8 years was 0.1 kg, 2.1 kg, and 5.6 kg in the control, Metformin, and lifestyle-intervention groups respectively (P<0.001). Mean weight loss at each follow-up point was not reported. Although Figure 2.1 illustrates weight regain throughout the study, mean weight loss in the lifestyle groups
remained significantly greater than both placebo and Metformin groups over time (P<0.001).

The DPP weight maintenance phase included individual sessions every two months, phone contact in between visits and three group courses per year. Meal plans, meal replacements and other incentives were also offered. This study demonstrated greater weight loss than that achieved in the Diabetes Prevention Study (Lindstrom et al. 2005), possibly due to the increased overall intensity of the intervention (DPP Research Group, 2002). The fact that weight regain occurred despite the highly structured maintenance phase in this study highlights the challenges that face real-practice programmes in maintaining weight.

**Figure 2.1:** Changes in body weight according to study group in the Diabetes Prevention Program (DPP Research Group, 2002)*.

* Each data point represents the mean value for all participants examined at that time. The number of participants decreased over time because of the variable length of time that persons were in the study. Data on weight were available for 3085 persons at six months, 3064 at 1 year, 2887 at 2 years, and 1510 at 3 years.

Similar RCT’s have been performed to assess the efficacy of lifestyle interventions in reducing blood pressure. The Trials of Hypertension Prevention was multi-centre trial
running over three to four years. Participants were randomised into usual care (n=596) and weight loss (n=595) groups. At baseline, participants were aged 43.3±6.1 years with a BMI of 31.0±2.9kg/m² and 30.9±3.6kg/m² (in men and women respectively) (Stevens et al., 2001). The lifestyle intervention comprised of an initial individual counselling session, followed by 14 weekly group sessions led by dietitians or health educators. Participants then attended six biweekly group meetings followed by monthly group meetings. At 18 months, participants were offered individual and group sessions to keep them involved in the intervention (Stevens et al., 2001). The intervention focused on making and maintaining lifestyle changes through behaviour change, nutrition education, physical activity advice and social support. Energy intake was reduced by decreasing consumption of excess fat, sugar, and alcohol. Men and women were advised to consume at least 1500kcal/d and 1200kcal/d respectively and to limit weight loss to below 0.9 kg per week. Behavioural techniques included self-monitoring, goal setting, action plans and identifying triggers and problems. Individuals were advised to aim for 30 to 45 minutes of moderate physical activity per day, such as walking, four to five days per week (Stevens et al., 2001).

The intervention group lost significantly more weight than controls, as described in Table 2.3. Group differences in mean weight change were statistically significant at each follow-up point (P< 0.001), which was associated with a lower incidence of hypertension in the intervention group (Stevens et al., 2001).
Table 2.3: Mean change in body weight in intervention and control groups from baseline to each follow-up point in the Trials of Hypertension Prevention study (Adapted from Stevens et al., 2001).

<table>
<thead>
<tr>
<th>Time</th>
<th>Intervention Mean Weight Change (95% CI) (kg)</th>
<th>n</th>
<th>Control Mean Weight Change (95% CI) (kg)</th>
<th>n</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 months</td>
<td>-4.4 (-4.8 to -3.9)</td>
<td>565</td>
<td>0.1 (-0.1 to 0.4)</td>
<td>561</td>
</tr>
<tr>
<td>18 months</td>
<td>-2.0 (-2.5 to -1.5)</td>
<td>545</td>
<td>0.7 (0.4 to 1.6)</td>
<td>551</td>
</tr>
<tr>
<td>36 months</td>
<td>-0.2 (-0.7 to 0.3)</td>
<td>547</td>
<td>1.8 (1.3 to 2.2)</td>
<td>554</td>
</tr>
</tbody>
</table>

Weight loss was correlated with session attendance in the first six months but this relationship weakened as the trial continued (Stevens et al., 2001). This could be due to the direct effects of the sessions, different personal characteristics of attendees and non-attendees, or the fact that weight loss may have motivated participants to attend more sessions. Similar to previous studies, weight regain was observed over three years of study duration despite support being offered.

The long term weight loss shown in the Trials of Hypertension Prevention study is lower than that achieved in the DPS and DPP studies respectively. This suggests that higher intensity interventions delivered on an individual basis may achieve greater weight loss, although the practicality of delivering such programmes on a large-scale should be considered. Despite providing a high quality evidence base, these RCT’s are susceptible to error and bias. All participants that volunteered for the studies were overweight and most likely wanted to lose weight, therefore were ready to make positive changes. Weight loss may therefore have occurred simply due to participation in the study. Inclusion of a control group for comparison helps to minimise this bias,
but it is impossible to include a “placebo” lifestyle change or have blinded allocation. Control groups often received either no advice or routine treatment, but they could have inadvertently made changes that resulted in weight loss, which could have weakened the results.

In these trials, weight loss was used as a treatment rather than an outcome. It is difficult to ascertain whether the positive metabolic effects demonstrated are related to weight loss itself or the intervention used. Long-term trials are also susceptible to the adverse effects of time on metabolic variables such as lipids, blood pressure and insulin resistance, thus concealing the positive effects of weight loss. Although these trials do illustrate the benefits of lifestyle interventions to both weight and health, they focus on the adverse effects of excess weight such as diabetes and hypertension. Therefore, the results may not be generalisable to overweight or obese adults at lower risk of developing diabetes or hypertension. It has been shown that weight loss and maintenance may be more difficult for individuals with type II diabetes than for those with normal glucose tolerance, mainly due to differences in adherence to diet, despite the motivation from having diabetes and improving glycaemic control with weight loss (Guare et al., 1995). In addition, most of the trials were carried out in Scandinavia or North America, and their application to practice in the UK needs to be considered (Avanell et al., 2004).

Because of the difficulties in separating the positive effects of weight loss from the positive effects of the intervention, Lean (1998) recommended providing multi-component strategies with regular auditing to demonstrate the health benefits of
similar weight loss achieved by different interventions. This method of evaluation is more achievable and generalisable than the use of RCT’s in a real-practice setting.

2.4 Evaluation of current UK weight management practises

Glenny et al. (1997) have concluded that despite the importance of obesity in terms of health and cost to health services, there is a lack of high quality research in this area. The Department of Health accepted the fact that obesity deserved greater investment in terms of research and service provision, and allocated a budget to encourage good practice in the treatment of obesity in 1997 (Hughes & Martin, 1999; Appendix 1).

A survey of dietetic practice in obesity management was undertaken, which included 347 dietitians registered with the British Dietetic Association (Cowburn & Summerbell, 1998). A number of factors limited the applicability of the study, namely the fact that reported practices may differ to actual practice, and responses given may be subject to social desirability bias and a poor response rate of 40%. In addition, the survey was undertaken in 1997, and current dietetic practice may now be different. The survey indicated that dietitians’ treatment of obesity is often of short duration, mostly on an individual basis and not guided by standardised protocols. Thirty-five percent of dietetic service managers reported they routinely offered three-to four follow-up appointments to patients and only 16% offered five or more follow-up appointments. Most of the sample offered only individual treatment, and only a minority had devised and used a protocol to guide their weight management services. This study illustrated the differences between real-practice and that advocated by RCTs (Tuomilehto et al., 2001; Stevens et al., 2001; Diabetes Prevention Program Research Group, 2002) and showed that dietitians should utilise more evidence-based
treatments with longer-term programmes and more frequent auditing (Cowburn & Summerbell, 1998).

In 1999, 1,200 general practitioners and 1,200 practice nurses were surveyed by postal questionnaire as part of a National Audit Office study of obesity and weight management in the UK (Bourne, 2001). Twenty general practitioners and 16 practice nurses were also interviewed in person. The results indicated uncertainty about the effectiveness of different interventions for weight management amongst general practitioners, and more information on the most effective ways to help individuals lose weight was requested by health professionals. Sixty four per cent of those surveyed believed the range of treatments available were of little or no effectiveness. Factors identified that would assist general practitioners in referring patients more efficiently and effectively included better information about proven, effective interventions and improved access to community-based programmes or self-help groups. Dietetic Referral was the option most commonly used by general practitioners, although long waiting lists were highlighted as a difficulty (Bourne, 2001).

This was followed by a systematic review in 2001 to assess health professionals' management and the organisation of care for overweight and obese individuals (Harvey et al., 2001). Twelve studies were included, but heterogeneity between studies made it difficult to draw conclusions on how obesity management could be improved. Similar to Cowburn and Summerbell (1998), the authors suggested that weight management services provided by primary care are often inconsistent and lacked an evidence base, and reported an urgent need to assess whether there are
interventions that may be effective in improving weight management services through changes in health professionals' practice or the organisation of care (Harvey et al., 2001).

2.5 Evaluation of weight management programmes

There are many methods of evaluating the effects of weight management interventions. Due to the methodological limitations of weight loss studies, standard reporting criteria have been proposed by Douketis et al. (2005) to improve the applicability of results to everyday clinical practice, as shown in Table 2.4. Each measurement technique carries its own internal validity and reliability, and is affected by measurement bias due to the training and skills of the individual using the tool. Measurement of actual rather than reported parameters are not susceptible to reporting and recall biases, but may be more invasive and increase time and financial costs.
Table 2.4: Proposed framework for standardised reporting criteria in weight loss studies (Adapted from Douketis et al., 2005).

<table>
<thead>
<tr>
<th>Study Component</th>
<th>Study component characteristics</th>
</tr>
</thead>
</table>
| Study population characteristics | Consecutive overweight or obese adult men and women  
Demographic features of participants (e.g. age, race)  
Source of study participants |
| Baseline measures | Body weight (kg)  
Body mass index (kg/m²)  
Waist circumference (cm)  
Clinical CV risk factors (e.g. BP)  
Laboratory CV risk factors (e.g. blood lipids)  
Co-interventions that may influence outcomes (e.g. anti-hypertensive drugs) |
| Outcome measures | Body weight (kg)  
Body mass index (kg/m²)  
Waist circumference (cm)  
Clinical CV risk factors  
Laboratory CV risk factors  
Proportion of subjects with ≥5% weight loss  
Outcomes in high risk groups (e.g. with CV risk factors)  
Effects of weight loss on CV risk factors  
Clinical outcomes (e.g. myocardial infarction, stroke) |
| Study follow-up characteristics | ≥ 4 year follow-up duration  
Follow-up in ≥ 80% of initial study population  
Number and reasons for subjects leaving the study  
Contact all subjects at end of study for outcome documentation |

CV=Cardiovascular, BP=Blood Pressure

Another important outcome measure often omitted from weight loss interventions is participant satisfaction. Some studies have used semi-structured interviews (Jones et al., 2007) or open-ended telephone interviews (Garaulet et al., 1999; Hughes et al., 1999) to assess reported lifestyle changes and patient satisfaction. Others used self-developed questionnaires to evaluate programmes (Keppie & Lyon, 1999, Read et al., 2004). However, no previously validated published questionnaires aimed at assessing satisfaction with weight management programmes were identified in the literature.
2.5.1 Studies assessing group based interventions

Although there is some evidence to suggest that group therapy may achieve better weight loss outcomes than individual therapy, this is not conclusive (Jeffrey et al., 1983; Hakala et al., 1993; Ayyad & Andersen, 2000; Renjilian et al., 2001). SIGN (1996) guidelines state that most patients achieve improved weight loss in a group setting, while a Health Technology Appraisal found insufficient evidence to conclude that individual therapy was more beneficial than group therapy (Avanell et al., 2004).

It has also been suggested that dietary therapy combined with group therapy leads to better long term success rates than dietary therapy alone or dietary therapy and behaviour modification combined (Ayyad & Andersen, 2000). Group therapy does have important cost implications as it allows more individuals to be managed than would be possible on an individual basis. It has been estimated that the cost of providing dietetic service to individual patients was approximately twice that of group patients (Ash et al., 2006). This is an important consideration for NHS services, which are often run on tight budgets.

Read et al. (2004) undertook a prospective evaluation of a dietitian-led weight management programme set in Nottingham PCT (Appendix 2). Patients were recruited through referral from practice nurses and GP’s or self-referred. Measurements included weight, percentage body fat, blood pressure, waist circumference, blood lipids, HBA1c and psychological wellbeing; taken at baseline, 3 and 12 months. The intervention consisted of a three-month intensive education phase with group sessions every two weeks followed by a nine-month maintenance phase which included group sessions at four, six, nine and 12 months. The study reported a high attrition rate of 60%. Loss of motivation may have been a factor as participants
that dropped out between three and 12 months lost significantly less weight at three months than those who remained in the programme (-1.7±3kg versus -4.1±4.2kg; \(P<0.001\)) (Read et al., 2004).

Participants that attended the three-month intensive phase experienced significant reductions in weight, BMI, percentage body fat, waist circumference, total cholesterol, systolic and diastolic blood pressure, and triglycerides (Appendix 2). At 12 months, 4% achieved 10% weight loss and 13% of participants achieved 5-10% weight loss (Read et al., 2004). Participants who continued to attend the programme showed no significant changes in weight, BMI, waist circumference, percentage body fat or triglycerides (\(P\geq0.05\)), indicating that the positive effects of the intensive phase were maintained until 12 months (Read et al., 2004).

The study demonstrated that group programmes are a viable option for weight management and can achieve improvement in cardiovascular risk factors. The weight loss achieved was below recommendations, with only 13% of participants achieving 5-10% reductions in baseline weight. The positive effects of the intervention were maintained in those that continued to attend the programme, which supports the use of ongoing interventions with defined weight loss and weight maintenance phases in primary care. Practical recommendations arising from this evaluation included sharing clinical measurements with participants, involvement of local physical activity programmes and regular initial follow-up and long-term support (Read et al., 2004).

The Counterweight Programme is a primary care weight-management programme led by practice nurses that were trained by dietitians. The programme structure involved six
individual or group sessions in the first 12 weeks with follow-up appointments every three months thereafter. Preliminary evaluations of the programme show that both individual and group lifestyle change sessions can have positive effects on weight loss (The Counterweight Project Team, 2004 & 2005) (Appendix 2). Over 1500 patients were included in the evaluation. Data was only available for approximately 50% of patients, thus limiting applicability due to selection and attrition biases. Weight loss was achieved at three, six and 12 months and greater weight loss was associated with greater session attendance (The Counterweight Project Team, 2005).

Attrition in the study was initially low, possibly due to the GP practice setting or the intensity of sessions in the initial three months. Weight loss continued even when sessions were 3 months apart, although attrition increased. The characteristics of dropouts were not reported, therefore it was difficult to determine whether staying in the programme resulted in weight-loss, or weight-loss resulted in staying in the programme. The advantage of this study was the large sample size and primary care setting in locations across the UK, therefore the results could be generalised to a UK population. It also provides evidence for practise-nurse-led interventions with training and support from dietitians, rather than dietitian-led interventions. This is a more cost-effective measure that allows a greater number of patients access to weight management advice, while patients with more complex needs can attend a dietetic clinic.

Rapoport et al. (2000) undertook a randomised controlled trial to assess two different behavioural approaches to weight management. The non-diet modified cognitive behavioural approach (M-CBT) was designed to address psychosocial well-being, eating behaviour and cardiovascular risk factor reduction as well as weight, and
emphasised lifestyle change through recommending long term healthy eating and exercise habits. This was compared with the standard CBT (S-CBT) programme, which had greater emphasis on weight loss through energy restriction (Rapoport et al., 2000). Although the study included women only, and numbers were small, attrition was relatively low. Both groups lost weight after the ten week intervention stage and at 52 weeks follow-up (Appendix 2). Dietary quality, cardio-vascular risk factors and reported physical activity also improved (Rapoport et al., 2000). A limitation of the study was the reliance on reported data, as obese individuals tend to under-report dietary intake and over-report physical activity. However, the reported positive changes were supported by the fact that biochemical variables such as blood lipids also improved (Rapoport et al., 2000). Although the M-CBT showed no obvious benefit over S-CBT, the study adds to the evidence for behavioural lifestyle programmes in the management of obesity in women.

2.5.2 Studies assessing individual based interventions

A study by Frost et al. (2002) compared a dietitian-led Lifestyle Clinic aimed at overweight patients of high morbidity risk with usual care offered to overweight patients (Appendix 2). The clinic involved individual hospital outpatient appointments over six months with telephone support and the offer of pharmacotherapy to suitable patients. The aim of treatment was weight loss of 5-10% of initial body weight within 6 months (Frost et al., 2002). Participants were recruited onto the programme through referrals made to the dietetic departments. Patients that achieved ≥2.5kg weight loss in four weeks were offered Orlistat. An age, weight and sex matched control group was selected from departmental records for comparison (Frost et al., 2002).
One hundred and three patients were enrolled in the Lifestyle Clinics over 18 months. Only 26 completed the six-month programme, despite the contractual nature of enrolment. The other 77 patients were either discharged before completion, failed to achieve 2.5kg weight loss in four weeks or did not attend. The fact that these patients were high morbidity risk indicates that they may have had other medical or psychological problems that could impair weight loss. Based on this small number of highly selected completers, the results showed that the Lifestyle Clinic was more successful than standard practice (Appendix 2). Even those who did not use pharmacotherapy lost significantly more weight than control, demonstrating the benefits of lifestyle advice alone. Significant reductions were also observed for other health parameters, although they were not reported for the lifestyle group alone (Frost et al., 2002).

Limitations of this study include the high attrition rate and selected nature of the group (those that achieved 2.5kg in four weeks). This programme may not be suited as a first-line approach to weight management, but to higher-risk individuals that have failed to lose weight previously. The use of a retrospective control group in this study makes it difficult to draw definite conclusions between the Lifestyle Clinic and standard care.

Hughes et al. (1999) retrospectively evaluated the effectiveness of a weight loss programme within a diabetes clinic (Appendix 1). Entry onto the programme was open-ended; participants attended dietitian-led monthly individual sessions and optional additional group sessions. The aim of the programme was to help individuals achieve gradual weight loss through behaviour changes and maintain weight loss over
time (Hughes et al., 1999). Individual sessions focussed on the Stages of Change Model adapted for people with diabetes. The group sessions focussed on increasing knowledge of diabetes, developing skills and healthy eating for weight management.

Fifty patients were included in the study. At six, 12 and 18 months of participation in the programme, 33% (n=4), 25% (n=40) and 23% (n=5) had achieved >2.5kg weight loss respectively (Hughes et al., 1999). The study is difficult to compare with others as no data for mean weight loss was reported and the small sample size did not for tests of statistical significance. The sample consisted of a group of poorly controlled diabetic patients that appeared resistant to standard intervention, which could account for the low proportion of individuals achieving weight loss. This study highlights the difficulties of evaluating ongoing programmes in real practise, the low proportion of participants that achieve weight loss when they did not volunteer for a weight loss study, and the difficulties in maintaining weight loss over time.

Keppie & Lyon (1999) aimed to assess weight loss success, changes in dietary intake, patient satisfaction and the adequacy of documentation in a retrospective evaluation of a primary care weight management service (Appendix 1). Weight change was identified as successful (≥ 5kg weight loss or 5% body weight), maintained or improved (0-4.9kg weight loss) or unsuccessful (weight gain). Similarly, dietary change was identified as successful (patient achieved over 50% of their targets set at initial appointment), partially successful (patients achieved 30-50% of their set targets) or unsuccessful (patients achieved 0-30% of their targets). Patient satisfaction was also assessed (Keppie & Lyon, 1999).
The study did not include a specified intervention or episode of care. Subjects were divided into groups according to degree of weight change and the results from each group were presented. Of the 105 patients who had start and end weight recorded, 19% lost >5kg or 5% initial weight, 60% maintained or improved weight, and 21% gained weight. Mean weight change and mean episode of care for each group was -7.9kg in 50 weeks, -2.2kg in 22.5 weeks and +1.75kg in 36 weeks respectively (Keppie & Lyon, 1999). Those who attended the dietitian for the greatest amount of time were most successful at losing weight, but no association was observed between weight loss success and dietary targets met (Keppie & Lyon, 1999).

A limitation of this study was its retrospective design. Because data was recorded prior to analysis, missing data could not be replaced. As the dietitians did not have a standard method of documenting in record cards, this caused some errors and missing information. Only 65 out of 167 record cards documented information on patient targets, which may have led to the observed lack of relationship between achieved targets and weight loss.

Despite its limitations, the study does demonstrate the benefits of individual dietetic contact in helping patients to lose and/or maintain weight with 79% of patients achieving this goal. The fact that there is no defined intervention or episode of care makes it difficult to compare with other studies but does show the benefits of individualised dietitian-led intervention that provides personalised dietary goals and advice, which is not often available within a group setting. The ongoing nature of the programme allows patients to tailor the length and intensity of support according to their needs, but may reduce the accessibility of the service to new patients.
A similar evaluation was carried out of a GP practice based weight management clinic run by a health visitor in Chesterfield in the UK (Sleath, 1999; Appendix 1). The aims of the clinic were for patients to achieve sustained weight loss, make healthier choices, and to feel empowered to make a life-long commitment to sensible weight control (Sleath, 1999). Patients attended individual appointments with the health visitor at intervals of one to four weeks, where they were weighed and food diaries were discussed. Exercise was also encouraged as part of the programme. Several diets were used, but the specific types of diets were not reported. Patients with insulin dependent diabetes, mental health problems or using steroids that attended less than four appointments were excluded from the study, representing a highly selected group.

While 97% of patients achieved weight loss while attending the clinic, only 7.6% and 5.1% of patients maintained their ideal or target weights after leaving the clinic. Mean weight loss was not reported making comparison with other studies difficult. The most successful group were those who achieved a BMI of less than 30kg/m², with 17.6% maintaining this at follow-up (Sleath, 1999). Attrition was high, with only 105 out of 198 patients included in the follow-up evaluation. This study highlights the difficulty of weight maintenance after discharge and the importance of regular follow up, especially in patients with a BMI greater than 30kg/m².

The above studies demonstrate the variety of lifestyle-modification programmes currently utilised. Although many have demonstrated some weight loss, it is often below recommendations. Most studies did not include a control group to compare usual or absence of treatment and demonstrate the effectiveness of interventions in
terms of prevention of weight gain over time. Interventions varied widely in terms of intensity, setting, providers and length. Attrition rates were high and results were not analysed on an intention-to-treat basis, which can overestimate weight loss and improvements in risk factors because it does not account weight regain that may occur after participants leave the programme. Due to small sample sizes, many studies did not employ statistical analysis. From this review, the paucity of current evidence for effective interventions that are achievable in a NHS setting is obvious, this has been highlighted by several systematic reviews (Douketis et al., 2005; Avanell et al, 2004; Harvey et al., 2001 Ayyaad & Andersen, 2000; Glenny et al., 1997).

2.5.3 Studies assessing participant satisfaction

Although there is a great deal of research into the effectiveness of treatments of obesity, there is very little information on how individuals view interventions and how these interventions impact on their lives. A limitation of many evaluation studies is the omission of participant satisfaction with the programme. Participant opinions are an important means of monitoring and improving health care provision (Department of Health, 2000b), and patient involvement is a key focus of clinical governance within the NHS (Department of Health, 2006). Involving participants in the process of evaluating weight management programmes may identify issues to assist development and improvement of the service, and determine motivational factors and barriers to health behaviour change. A literature review of dietary research interventions undertaken to ascertain whether patient views were sought in determining outcomes identified very few such studies (Jackson et al., 2005), and only one assessed weight reduction advice aimed at overweight and obese patients (Roberts and Ashley, 1999).
Previous studies that utilised a patient satisfaction questionnaire include Keppie and Lyon’s (1999) evaluation of a weight management service. This was developed using a previously validated client satisfaction questionnaire (Nguyen et al., 1983), but not validated itself. The questionnaire obtained information about patient views on length of waiting time, length of appointment times, the dietetic consultation, support and monitoring and resources offered (Keppie & Lyon, 1999). It was administered via post to all patients with a return pre-paid envelope, and a reminder letter was sent if no questionnaire had been received within the allocated time.

The response rate of the questionnaire was relatively high (75%), which may have been positively influenced by inclusion of a pre-paid envelope and reminder letters. Non-response bias may account for the small proportion (10%) of patients that were dissatisfied with the programme, because participants who completed the questionnaire may have been successful in losing weight and were therefore more satisfied with the programme. The information provided by the questionnaire was also susceptible to confounding factors such as ethnicity, smoking, gender, education, socioeconomic status and physical activity.

Rapoport et al. (2000) also assessed participant satisfaction and acceptability of treatment in their study to compare modified and standard cognitive behavioural therapies for weight management. Participants’ satisfaction was assessed semi-quantitatively with a 13 item self-report questionnaire. This explored participants’ views on enjoyment, interest, relevance, helpfulness and satisfaction with the programme, perceived acquisition of new skills and their opinions of the group facilitators. It was followed with an individual, recorded semi-structured interview
(Rapoport et al., 2000). Although, there were no significant differences between the groups with respect to ratings of acceptability and satisfaction of the treatments, the questionnaires and semi-structured interviews allowed investigators to obtain more in-depth information regarding the two differed approaches.

Read et al. (2004) offered anonymous questionnaires to those that dropped out of the weight management programme, and postal evaluation forms at the end of the programme to obtain comments and views of participants. The reasons cited by participants for dropping out of the programme were then used to make recommendations for the future. The most common reasons were work commitments, childcare problems, family commitments, inconvenient timing of sessions, and participants preferring to lose weight on their own. Final evaluation forms were returned by 77% of patients that completed the programme, while only 30% of dropout questionnaires were returned. This highlights the difficulties faced when obtaining a true reflection of participant satisfaction from both completers and non-completers of weight management programmes. The questionnaire evaluated the design and usefulness of the programme, reported success in improving diet and exercise, patient views on the length of time between sessions, and other unique aspects of the programme, such as learning about health parameters (Read et al., 2004).

A recent study by Jones et al. (2007) focussed solely on obese adults’ views of the outcomes of dietary treatment. The aim was to collect patients’ views of the service, treatment outcomes in terms of lifestyle change and the impact the service had on their lives. Information was collected qualitatively from 24 obese patients attending
dietetic clinics using semi-structured questionnaires. Although the sample size was small and non-representative, the use of individual interviews allowed varied and in-depth information to be obtained. A number of themes were recognised based on analysis of interviews, including accessibility of services, facilitators and barriers to change and impact of weight loss.

Specific areas were identified in order to improve future services, for example decreased waiting times and training of other health professionals. Positive aspects of the programme included the supportive relationship between dietitian and client, individualised approaches, use of behavioural techniques and regular monitoring. The study also suggested that barriers to complying with advice were accentuated during periods of stress and emotional upset. Many patients reported feeling that no further changes to their lifestyles could be made and they were unable to help themselves, this suggests an avoidance of personal responsibility for health. Although these results cannot be generalised to the entire obese population, the study does provide valuable practical information that RCT’s often omit. It highlights the importance of assessing patient satisfaction in order to obtain a unique perspective of weight management programmes.

2.6 Conclusions

Evidence to date from well-designed RCT’s supports the effectiveness of lifestyle based weight management programmes for reducing weight and other risk factors in overweight and obese adults. However, these results should be interpreted with caution; most studies were undertaken outside the UK in highly controlled research or clinical settings, which is very different to a NHS primary care setting. Subjects in
these studies were often recruited by volunteering in response to advertisements in the media, and thus were likely to be more motivated to improve their health. In the NHS, patients do not always comply with interventions or attend appointments, most individuals are referred onto programmes by their GP or practice nurse. Therefore, although the lifestyle based weight management programmes are considered to be successful, more research is needed in primary care settings.

Evaluations of weight management programmes in primary care settings in the UK is scarce and often limited by methodological errors, due to time and financial limitations it is often difficult to achieve the same amount of control and methodological quality. High attrition rates make it difficult to separate the effects of the programme, personal attitudes and characteristics and weight loss from one another to identify exactly what leads to successful weight management. In addition, the characteristics of dropouts may be different to those who remain in the programme, thus positively skewing the results. The reasons why some people succeed at adopting and sustaining health behaviours while others undergoing similar treatment programs do not, remains largely unknown.

Obesity prevalence continues to increase despite the vast range of weight management options available. The evaluations of the weight management services reported in this literature review suggest that weight loss can be achieved by weight management programmes in primary care settings, although it is questionable whether this is clinically significant and sustainable. In order to improve these outcomes, the effectiveness of all weight management programmes needs to be evaluated and
successful strategies that are applicable to the management of overweight and obese patients in primary care need to be identified and shared.