

What are the critical features of successful Tier 2 weight management programmes?

A systematic review to identify the programme characteristics, and combinations of characteristics, that are associated with successful weight loss



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Glossary

Commercial weight management programme - For-profit services.

Community weight management programme - Not-for-profit programmes delivering weight management in community rather than healthcare settings.

Condition - A characteristic or feature of a weight management programme.

Configuration - A specific combination of conditions or features of a weight management programme.

Domain - A group of weight management programme conditions or characteristics which cluster around a broader theme such as goal setting.

Health service weight management programme - Services provided directly by National Health Service staff in a health service setting.

Model - A theoretically driven set of configurations.

Service providers - Those with experience of delivering weight management programmes.

Service users - Adults with overweight or obesity who have experience of weight management programmes, including those who have been referred to, but declined to engage in, weight management programmes.

Stakeholders - Some service provider studies also include a range of 'stakeholders', typically healthcare professionals, who may or may not have direct experience of delivering weight management programmes. The views of stakeholders are considered alongside those of service providers.

Weight management programme (WMP) - Weight management services, provided in the public, private or voluntary sector, which are multi-component, i.e. they address both diet and exercise. In the UK, these usually fit within the provision type known as 'Tier 2 services'.

Executive summary: The systematic review and its findings

Aims

This systematic review was commissioned by the Policy Research Programme in the Department of Health England. It is a comprehensive review of the literature aiming to identify the critical features of successful Tier 2 weight management programmes (WMPs) for adults.

Methods

The review comprises three stages:

1. Analysis of service users' and providers' views: In the first stage, we sought to understand which weight management programme *features* are perceived as key to successful weight loss and the *mechanisms* through which these features are perceived to lead to successful weight loss according to those with direct experience of services; we examined studies reporting the views of people in the UK who had used or delivered weight management programmes.

2. Analysis of service evaluations: In the second stage, we sought to test whether features *perceived* to be important are actually *associated with greater weight loss*; we examined the presence or absence of identified features in weight management programmes evaluated in randomised controlled trials (RCTs). Selecting RCTs from a previous review of 40 studies,¹ we compared the ten most effective weight management programmes with the ten least effective ones.

3. Case studies with local authorities: The third stage aimed to ensure that the findings of the review could be put to best use by local authorities; thus we conducted case studies with two local authorities to explore the nature of current weight management provision and to consider the implications of the review findings for future provision.

Findings

What are the programme characteristics - and combinations of characteristics - that are associated with successful weight loss?

- The review revealed critical programme features which appear to be currently underemphasised or overlooked in the research and policy literature.
- According to service users and providers, the most critical feature of WMPs is supportive relationships with providers and peers in their WMP group.
- The ten most successful weight management programmes were characterised by the presence of support and direction from providers and opportunities to develop relationships with peers, whilst the ten least effective programmes were characterised by their absence.
- Programme characteristics perceived as encouraging self-regulation, such as provision of exercise, were also associated with the most successful programmes.

Which WMP characteristics do service users and providers perceive as important for successful weight loss?

Participants in 26 qualitative studies reported in 31 papers (see Section 7.1 for a list of the papers) identified seven important WMP components, although some appear to be valued more highly than others:

¹ We selected RCTs from a previous systematic review undertaken for NICE by Hartmann-Boyce et al. (2013b). We selected the ten most and the ten least effective trials in terms of the mean difference in weight loss between intervention and control at 12 months. Henceforth, these will be referred to as the 'most effective' and 'least effective' trials.

- Supportive relationships with WMP providers were widely perceived as the most critical feature for success; also widely and enthusiastically valued were services specifically targeted or tailored to meet user needs and preferences and weight monitoring.
- Delivery format was seen as an important moderator of WMP success, but opinion was divided as to the most appropriate delivery approaches.
- Evidence on the perceived value of exercise, dietary advice and goal setting components was relatively less extensive and less consistent.
- Users and providers also indicated that achieving successful weight loss was moderated by non-WMP factors such as experiences of being referred to services, as well as contextual, socio-cultural, psychological and resource factors.

How are these WMP components perceived to lead to successful weight loss?

Studies revealed ways in which supportive relationships were fundamental to three important moderators of weight loss: attendance at WMP sessions, initiation of healthy behaviours and self-regulation or maintenance of healthy behaviours:

- Supportive relationships with both providers and peers engendered social bonds, which were described as fostering attendance at WMP sessions.
- Social bonds with providers and peers fostered a sense of accountability, which was described as motivating initiation of healthy diet and exercise behaviours.
- Initiation of healthy behaviours led to development of self-efficacy and allowed users to experience various benefits of being healthy, which in turn fostered self-regulation and maintenance of healthy behaviours.

Are the features perceived to be important associated with greater weight loss?

Examination of 20 trials reported in 15 papers (see Section 7.2 for a list) revealed that WMP features identified as important by service users and providers were associated with higher effectiveness.

- The ten most effective WMPs were characterised by fostering supportive relationships with either providers or peers and encouraging self-regulation, whilst the least effective WMPs were characterised by an absence of these features.
- Three different models were developed to test different aspects of supportive relationships:
 - a) **Good quality provider-user relationships** appear to be necessary for higher effectiveness. However, WMPs that fostered good quality relationships also needed to include a mechanism for encouraging self-regulation. *Absence of either high-quality provider relationships or conditions which foster self-regulation was associated with reduced effectiveness.*
 - b) **A high level of support and direction from providers**, again in conjunction with self-regulation fostering, was also found to be necessary for higher effectiveness. WMPs that included provider-set goals addressing both energy intake and energy expenditure were all in the most effective group. *Absence of either a provider-set energy intake goal or a provider-set exercise goal was consistently associated with reduced effectiveness.*
 - c) **WMPs which incorporated both group work and which were targeted at a specific population group** (conditions perceived to engender peer relationships) were all in the most effective group. All WMPs characterised by the absence of both of these conditions were least effective. Since some WMPs with *either* group work *or* targeting were most effective, either one of these conditions may be sufficient. However, *the presence of both conditions appears to ensure greater effectiveness.*

How do the reviews findings resonate with local authority experiences?

- Discussions with providers and commissioners at local authorities indicated that they welcomed fine-grained guidance about the critical features of WMPs.

- Authorities' own experiences and research corroborated the findings regarding the critical nature of supportive relationships with providers.
- Flexible service provision in order to meet the needs and preferences of service users was also a strong theme in discussions.

Conclusions: What are the critical features of WMPs?

- Supportive relationships between service users and providers, and between services users and their weight management peers, are critical to the success of WMPs.
- Self-regulation and maintenance of a healthy weight depend upon individuals' experiencing their own ability to engage in activities such as exercise, and experiencing the various benefits afforded it.
- Thus relationships are an essential first step in a weight management journey, since they provide a much-needed external motivator or 'hook' for people to engage with a WMP and to initiate healthy behaviours.

Table 1: Summary of overall findings

Critical feature	Example view	Most effective interventions (n=10)	Least effective interventions (n=10)
Good quality provider relationships	'You feel that somebody's batting for you'	All 10 most effective interventions had: Provider-user relationships emphasised AND Characteristics perceived to foster self-regulation.	All 10 least effective interventions had: NO emphasis on provider relationships. OR An emphasis on provider relationships BUT NO self regulation characteristics.
Provider direction and support	'I need someone to take my hand and take me over'	All 10 most effective interventions had: Provider-set energy-intake goals AND Provider-set exercise goals AND EITHER direct provision of exercise OR provider-set weight goals.	All 10 least effective interventions had: NO provider-set energy-intake goals AND NO provider-set exercise goal AND NO direct provision of exercise. OR Direct provision of exercise AND provider-set exercise goals BUT NO provider-set energy-intake goals AND NO provider-set weight goals.
Opportunities for peer relationships	'You wanted to come back and hear how the guys were getting on'	All interventions with both of the following characteristics (n=5) were in the most effective group*: Group work AND Targeted at a specific population group.	All interventions with both of the following characteristics (n=5) were in the least effective group*: NO group work AND NO population targeting

* Some WMPs with *either* group work *or* targeting (n=5) were most effective, but the presence of both conditions appears to ensure greater effectiveness.

1. Introduction

1.1 Why is this systematic review being done?

Obesity poses one of the greatest public health challenges for the 21st century (Dyson, 2010). England, along with the rest of the UK, has one of the highest rates of obesity in the developed world (Ng et al., 2014). Between 1993 and 2011, the proportion of adults in England who were overweight (including obese) increased from 58% to 65% in men and from 49% to 58% in women. The proportion of people categorised as obese rose from 13% in 1993 to 24% in 2011 for men and from 16% to 25% for women (Health and Social Care Information Centre, 2014).

Obesity has a significantly detrimental impact on life expectancy; excess weight is a leading cause of type 2 diabetes, heart disease and cancer (Prospective Studies Collaboration et al., 2009). Other health impacts of obesity affect people's quality of life, for example back pain (Shiri et al., 2010), breathing problems (Bowden et al., 2011) and infertility (Sermondade et al., 2013). Poor mental health also affects many obese people (Garipey et al., 2010, Luppino et al., 2010) and many face multiple forms of prejudice and discrimination because of their weight (Puhl and Heuer, 2009).

The impact of obesity in economic terms is also significant. Health problems associated with overweight or obesity cost the English National Health Service (NHS) more than £5 billion a year (Department of Health, 2013). Overweight and obesity also impair the productivity of individuals and increase absenteeism (Trogdon et al., 2008).

In the UK, we have robust and comprehensive high-level 'broad brush' guidance on 'what works?' to promote weight management among adults (e.g. NICE guidance). Weight management services provided in the public, private or voluntary sector are known as 'Tier 2 services'; those that address both diet and exercise, have been shown in many systematic reviews to be broadly effective, for example by Hartmann-Boyce et al. (2013a). However, to aid commissioning decisions, more fine-grained evidence is needed. More information is also needed about the status of current provision within local authorities in the UK.

1.2 What research has been done before?

There has been extensive research effort in examining the impact of weight management programmes on people with obesity and those who are overweight. Large numbers of systematic reviews and even reviews of reviews (Dyson, 2010, Greaves et al., 2011) have been undertaken. A recent series of reviews for NICE (Hartmann-Boyce et al., 2013a, b, Johns et al., 2013) has assessed the effectiveness of behavioural weight management programmes (BWMPs) in overweight and obese adults. The review found that programmes which involved diet and exercise were more effective than those which involved diet only or exercise only. In addition, the evidence indicated that set energy-intake goals and some contact with a dietician were associated with greater weight loss. However, none of the large number of intervention components tested, including a standardised taxonomy of behaviour change techniques (Michie et al., 2011), could fully explain the large amount of variation in weight loss resulting from different programmes. The review also examined research on service-user and provider views about BWMPs, indicating some potential barriers to, and facilitators of, BWMP success. However, the views synthesis was conducted after the trials synthesis, so views were not used to inform the evaluation of the intervention components in trials; moreover the review did not systematically examine the relative perceived importance of different components or the mechanisms through which they were perceived to impact on weight loss. Therefore, further examination of the views of service users and the association between user and provider views and intervention success is warranted.

This review will use innovative methodological approaches to build on the existing evidence base, in particular the 2013 NICE reviews, drawing on the views of users and providers of weight management services.

1.3 What did this systematic review aim to find out?

The overall aim of the review was to identify what makes highly effective weight management programmes (WMPs) so successful. Given the evidence that WMPs that address both diet and exercise are broadly effective, this review focuses in detail on the various components of WMPs, to identify whether greater weight loss is associated with specific components. The review was guided by the following overarching question:

What are the characteristics of highly successful Tier 2 weight management programmes (WMPs) for adults?

1.4 How was the systematic review conducted?

This section provides a brief overview of the methods used to conduct the review. A comprehensive account of the methods, as required for any systematic review, is provided in Section 6. The review comprises three stages:

- 1. Analysis of service user and provider views:** we examined UK research reporting people's perspectives and experiences about receiving or delivering a WMP, to understand what people who have experience of WMPs feel are critical components for successful weight loss.
- 2. Analysis of service evaluations:** we used the findings from the views synthesis to see if the identified components helped to explain differences between WMPs found to be most effective for reducing weight and those that were least effective in a recent systematic review.²
- 3. Case studies with local authorities:** we conducted case studies with local authorities to explore the nature of current WMP provision and to consider the implications of the syntheses of views and service evaluations for future provision.

1.5 How is this review different from previous reviews?

The depth of analysis undertaken in the **views synthesis** aimed to achieve a more comprehensive, systematic and detailed understanding of how WMPs work, according to those with experience of receiving or delivering them, than previous syntheses have achieved. Since existing examinations of the substantial variation in effectiveness of different WMPs have been unable to identify the key features that differentiate more effective from less effective interventions (Hartmann-Boyce et al., 2013a), it was anticipated that detailed examination might reveal other features of WMPs that help to explain such variation.

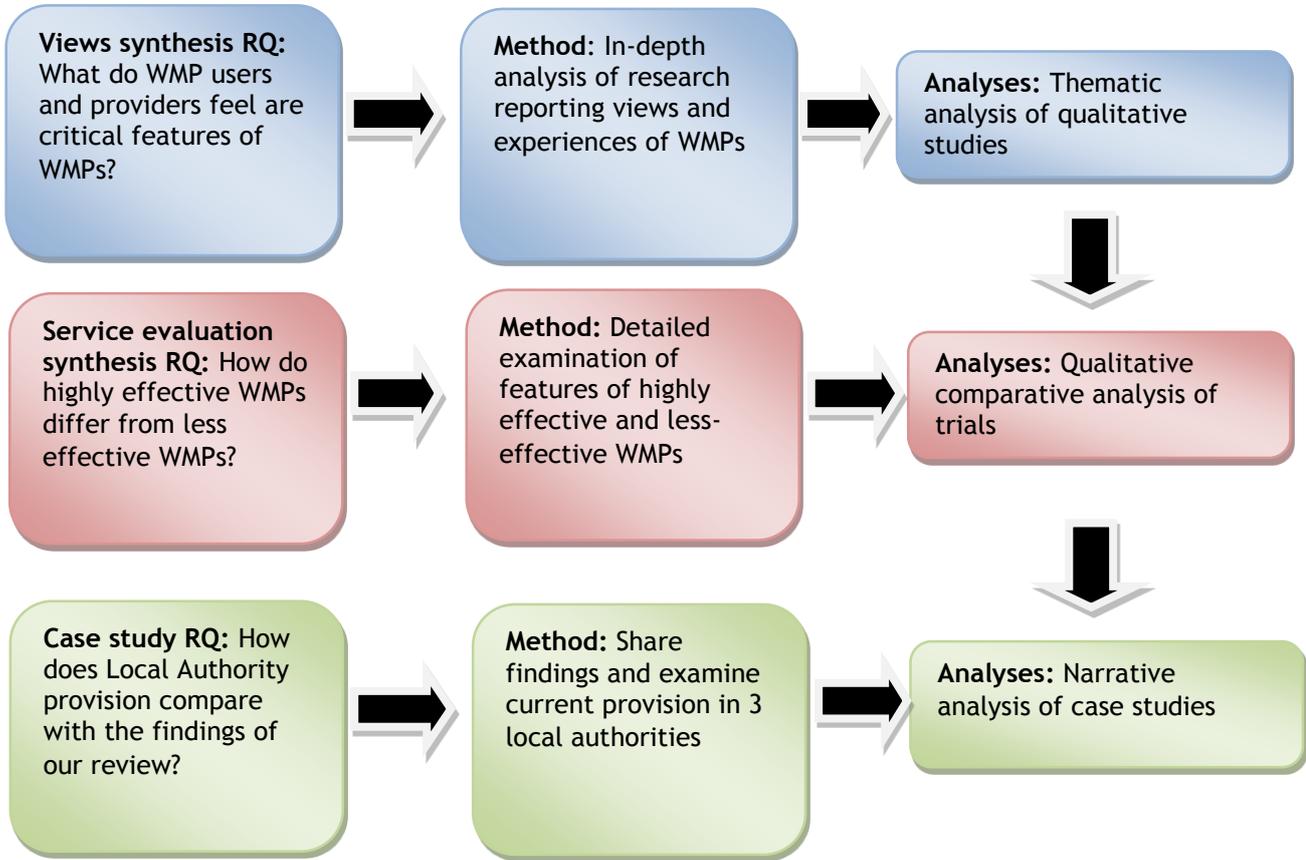
The synthesis of service evaluations differs from previous syntheses of WMP trials in three key ways. First, examination of associations between WMP components and effectiveness is informed by the views of WMP users and providers, as examined in the views synthesis. Second, the most effective interventions were compared with those only achieving minimal impact; by excluding those studies with moderate effects, we aimed to remove the 'noise', which may obscure identification of components critical for higher effectiveness. Third, qualitative comparative analysis (QCA), rather than traditional statistical meta-analysis, was employed to quantify observed associations between WMP components and effectiveness. QCA seeks to identify the necessary and sufficient conditions for an outcome to be obtained but, unlike the statistical methods often employed in meta-analyses, is appropriate for use in situations with small numbers of studies, a large number of possible factors that could explain variation in outcomes, and potentially multiple pathways to success (Candy, 2014, Candy et al., 2013, Thomas et al., 2014).

The case studies ensure the utility and relevance of the final report, first by providing much-needed insight into the nature of current provision in the UK, and second by exploring the

² We selected trials from a systematic review undertaken for NICE by Hartmann-Boyce et al (2013b). We selected the ten most effective and the ten least effective trials in terms of the mean difference in weight loss between intervention and control at 12 months; henceforth these are referred to as the 'most effective' and the 'least effective' trials.

implications of the findings from the syntheses of views and service evaluations for future commissioning.

Figure 1.5: Overview of review methods



2. Views synthesis: What do service users and providers feel are the critical features of WMPs?

2.1 What evidence was examined for the views synthesis?

2.1.1 Summary of evidence included in the views synthesis

- We examined 26 studies reported in 31 papers (see Table 2.1 for details):
- 21 of the 26 studies reported service-user views and 10 reported service provider views; 5 of the studies contain both user and provider views.
- 17 studies were conducted in England, 8 were conducted in Scotland, and 1 study was unclear about where in the UK it was conducted.
- The 21 service-user studies reported the views of 507 participants; there was a good range in terms of gender, age and socio-economic status but limited data from minority-ethnic service users.
- The 10 service provider studies reported the views of 234 providers; a range of health professionals and community-based providers were interviewed but only one study reports the views of commercial service providers.
- Most studies focused on face-to-face delivery rather than remote delivery via telephone or the internet; roughly equal proportions of the studies focused on group-based services and those delivered via one-to-one sessions.
- A range of different service models were discussed, including: commercial or 'for profit' services; community services i.e. not-for-profit services based in community rather than health-care settings; and health-service-based programmes, i.e. those services provided directly by National Health Service staff in a health service setting.

2.1.2 Overview of each of the 26 service user and provider views studies

Table 2.1 provides an overview of each of the 26 studies; a more comprehensive table with details of participant characteristics is provided in Appendix 1.

Table 2.1: Overview of included studies and linked papers

Study (linked papers)	Participants	Weight management programme(s)
Ahern et al. 2013	16 service users	Commercial Health service
Allan et al. 2011	22 service users, 11 providers	Commercial Health service Community
Atkinson et al. 2010 (Atkinson et al. 2012, 2013)	36 service users, 11 referrers, 10 providers	Health service
Bidgood and Buckroyd 2007	18 service users	A range discussed
Bingham et al. 2014	7 service users, 1 provider	Community
Brown et al. 2006	28 service users	Health service
De Souza and Ciclitira 2005	8 service users	Commercial

Study (linked papers)	Participants	Weight management programme(s)
Doyle and Shaw 2012	11 service users	Community
Furness et al. 2011 (Soltani et al. 2012)	6 service users, 7 providers	Health service
Gray et al. 2013a (Gray et al. 2009, 2013b)	39 service users, 6 providers	Community
Herriot et al. 2008	46 service users	Commercial
Hunt et al. 2013	29 service users	Community
Hunt et al. 2014	63 service users	Community
Jones et al. 2007	24 service users	Health service
MacLeod et al. 2013	78 providers	Health service
Mercer and Tessier 2001	20 providers	Health service
Monaghan 2007	37 service users	Commercial
Morrison et al. 2014	20 service users	Community
Oteng-Ntim et al. 2010	22 providers	Commercial Health service
Penn et al. 2008	15 service users	Unclear
Reed et al. 1999	30 service users	Health service
Smith et al. 2011	30 providers	Community Health service
Smith et al. 2012	30 providers	Health services
Webb et al. 2014	16 service users	Health service
Witty and White 2010	20 service users, 8 stakeholders	Community
Wormald et al. 2006	16 service users	Community

2.2 Views synthesis findings: What do service users and providers feel are the critical features of WMPs?

As illustrated in Figure 2.1, discussions largely focused on elements of the content and style of WMPs. However, evidence contained in the studies also indicated that the success of WMPs is perceived to be moderated by aspects of service provision both before and after joining a WMP, as well as by a wide range of external or non-WMP factors. Table 2.2 provides an overview of each of these themes. However, in order to maintain the thread between the views synthesis and the synthesis of service evaluations, the following sections only report findings on the two themes with direct relevance to WMP features: the content and style of WMPs (2.2.1) and ongoing support (2.2.2). The other two themes, 'Before the WMP' and 'External Moderating Factors', do not directly explore features of WMPs, making them less amenable to testing in the synthesis of service evaluations. Since they provide important contextual information about the full range of potential WMP moderators, they are reported in Appendix 2. Also described in this chapter are findings on the mechanisms through which the WMP features, identified and described in Sections 2.2.1 and 2.2.2, are perceived to lead to successful weight loss (2.2.3).

Figure 2.1: Factors perceived to moderate the success of WMPs

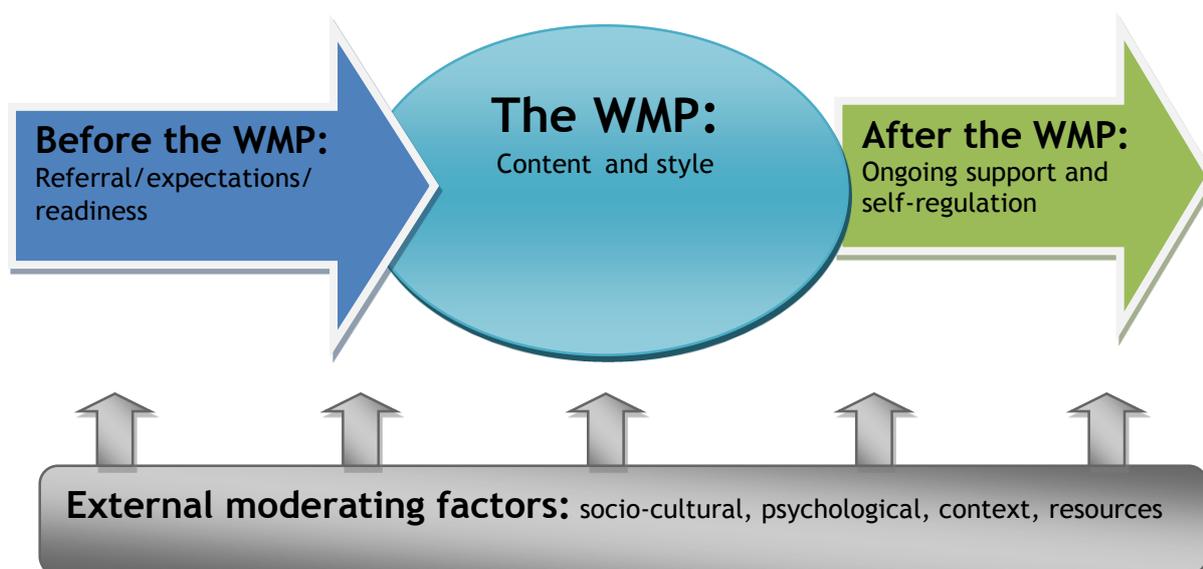


Table 2.2: Overview of findings on the factors perceived to moderate the success of WMPs

Overarching themes	Sub-themes	Section
Findings reported in main body of report		
The content and style of WMPs	<ul style="list-style-type: none"> Users and providers described seven key WMP features: <ul style="list-style-type: none"> Support from WMP providers was widely perceived as most critical feature. Services designed to meet user needs and preferences and weight monitoring were also widely valued. Opinions about diet and exercise education and goal setting were less prevalent and less consistent. 	2.2.1
After the WMP	<ul style="list-style-type: none"> Long-term or ongoing support was described as necessary for 'embedding' and maintaining healthy behaviours. Less-intensive ongoing support may be sufficient to maintain long-term motivation. 	2.2.2
Mechanisms through which WMPs are perceived to work	<ul style="list-style-type: none"> WMP attendance was motivated by social bonds and a safe space. Initiation of healthy behaviours was motivated by relationships with peers and providers. Maintenance of healthy behaviours was motivated by experience and self-efficacy. 	2.2.3
Findings reported in Appendix 2		
Before the WMP	<ul style="list-style-type: none"> Referrals were negatively experienced by many users - and were a potentially significant barrier to WMP uptake. Prior expectations of WMPs both deterred and attracted users. 	A2.1

	<ul style="list-style-type: none"> • Sensitive handling of referrals and encouraging readiness to change may improve experiences. 	
External moderating factors	<ul style="list-style-type: none"> • Four non-intervention factors were perceived to influence or moderate the success of a WMP: <ul style="list-style-type: none"> ○ Psychological factors ○ Socio-cultural factors ○ Contextual stressors ○ Available resources 	A2.2

2.2.1 Experiences of weight management programmes: Which WMP features do users and providers perceive to be critical for success?

This section explores views on the content and style of WMPs. We examine users' and providers' perspectives on different WMP features to consider:

- Which WMP features do service users and providers discuss?
- How critical are different features perceived to be and how are they best delivered?

Which WMP features do service users and providers discuss?

WMP features within seven domains were highlighted in discussions of experiences of WMPs. These include programme features which appear to be currently underemphasised or overlooked in the research and policy literature. Some features were widely and enthusiastically valued, while views about others were less consistent. Participants indicated that for many WMP features, the way in which that feature was delivered was at least as important as the presence of that feature. Table 2.3 provides an overview of the seven domains, including descriptions of the nature of each domain, along with example participant views and information on the extent of available evidence. The domains are ordered according to the number of studies discussing each.

Table 2.3: Overview of WMP features discussed by service users and providers

Domain	Domain description	Example data	Number of studies discussing domain		Relevant studies
			Users (N=21)	Providers (N=10)	
1. Provider support	A therapeutic relationship with service providers based on advice and encouragement.	'Just the general support, knowing that there was someone else there that was going to help me through it.' (Atkinson et al., 2010)	18	4	Ahern et al., 2013, Allan et al., 2011, Atkinson et al., 2010, Bidgood and Buckroyd, 2007, Bingham et al., 2014, Brown et al., 2006, De Souza and Ciclitira, 2005, Doyle and Shaw, 2012, Furness et al., 2011, Gray et al., 2013a, Herriot et al., 2008, Hunt et al., 2013, Jones et al., 2007, Morrison et al., 2014, Penn et al., 2008, Reed et al., 1999, Smith et al., 2012, Webb et al., 2014, Wormald et al., 2006
2. Meeting user needs and preferences	WMP adapted to meet user preferences and needs: Tailored = adapted to the individual; targeted = adapted for cultural/population groups.	'You personalised it so it was something that would work for you' (Gray et al., 2013a) 'Straight from the start, we all had something in common with each other.' (Hunt et al., 2014)	17	5	Ahern et al., 2013, Allan et al., 2011, Atkinson et al., 2010, Bingham et al., 2014, Brown et al., 2006, De Souza and Ciclitira, 2005, Doyle and Shaw, 2012, Furness et al., 2011, Gray et al., 2013a, Hunt et al., 2013, 2014, Jones et al., 2007, Monaghan, 2007, Morrison et al., 2014, Oteng-Ntim et al., 2010, Reed et al., 1999, Smith et al., 2011, Webb et al., 2014, Witty and White, 2010

Domain	Domain description	Example data	Number of studies discussing domain		Relevant studies
			Users (N=21)	Providers (N=10)	
3. Delivery format	Group/individual, face-to-face/remote, frequency/intensity and provider/setting	<p>'Class motivation I felt worked' (Ahern et al, 2013)</p> <p>'Emails have made all the difference. I really enjoyed that communication.' (Doyle and Shaw 2012)</p>	16	5	Ahern et al., 2013, Atkinson et al., 2010, Bidgood and Buckroyd, 2007, Bingham et al., 2014, De Souza and Ciclitira, 2005, Doyle and Shaw, 2012, Furness et al., 2011, Gray et al., 2013a, Herriot et al., 2008, Hunt et al., 2013, 2014, Jones et al., 2007, Mercer and Tessier, 2001, Oteng-Ntim et al., 2010, Reed et al., 1999, Smith et al., 2012, Webb et al., 2014, Witty and White, 2010, Wormald et al., 2006
4. Monitoring	Regular monitoring of weight, diet and exercise including self-monitoring or monitoring by providers.	'Being monitored or "checked" by someone "strict" [was described as] a significant motivator to attending and losing weight' (Allan et al., 2011)	16	3	Ahern et al., 2013, Allan et al., 2011, Atkinson et al., 2010, Bidgood and Buckroyd, 2007, Brown et al., 2006, Doyle and Shaw, 2012, Furness et al., 2011, Herriot et al., 2008, Hunt et al., 2013, 2014, Jones et al., 2007, Morrison et al., 2014, Penn et al., 2008, Reed et al., 1999, Webb et al., 2014, Wormald et al., 2006
5. Diet advice	Advice and information about 'healthy eating' and diet monitoring.	'It was when they showed us the portion sizes that you should be eating, that was the real shocker for me.' (Gray et al., 2013)	15	3	Ahern et al., 2013, Atkinson et al., 2010, Bidgood and Buckroyd, 2007, Bingham et al., 2014, De Souza and Ciclitira, 2005, Doyle and Shaw, 2012, Furness et al., 2011, Gray et al., 2013a, Herriot et al., 2008, Hunt et al., 2013, 2014, Jones et al., 2007, Reed et al., 1999, Webb et al., 2014, Wormald et al., 2006

Domain	Domain description	Example data	Number of studies discussing domain		Relevant studies
			Users (N=21)	Providers (N=10)	
6. Exercise	Exercise components including information, guidance and provision of supervised exercise.	'The RC [Rosemary Conley] group were strongly motivated by the exercise element of the classes.' (Herriot et al., 2008)	13	2	Atkinson et al., 2010, Bidgood and Buckroyd, 2007, Bingham et al., 2014, Doyle and Shaw, 2012, Furness et al., 2011, Gray et al., 2013a, Herriot et al., 2008, Hunt et al., 2013, Jones et al., 2007, Morrison et al., 2014, Penn et al., 2008, Reed et al., 1999, Wormald et al., 2006
7. Goal setting	Goals set by users or providers for diet, exercise or weight loss.	'The women ... found it useful to have goals they perceived as small and manageable.' (Atkinson et al, 2010)	8	2	Ahern et al., 2013, Atkinson et al., 2010, Bingham et al., 2014, Doyle and Shaw, 2012, Furness et al., 2011, Hunt et al., 2013, Penn et al., 2008, Wormald et al., 2006

How critical are different features perceived to be for WMP success?

Views of service users and providers indicated that some WMP features were valued more than others. In addition, views with regard to some features were largely homogeneous, whilst for other features, opinions varied.

The following sections provide detail on the perceived importance of each domain. However, as a crude indicator, we examined the number of studies commenting on each of the seven identified WMP domains. As presented in Table 2.3, features of provider support, services meeting user needs and preferences, monitoring and delivery format were the domains discussed most frequently. This indicates that perhaps service users experience WMPs differently than anticipated. WMPs are often described in health promotion guidance or trial reports in relation to specific advice and education around diet and exercise, yet these were some of the least frequently discussed features. Conversely, the notion of support is often secondary or implicit in intervention descriptions (Doyle and Shaw, 2012) despite being the most frequently highlighted feature by users and providers.

In addition to the frequency with which different WMP domains were discussed, as the following sections reveal, both users and providers were emphatic that non-educational features such as provider support and having services designed to meet their specific needs were vital WMP features. The educational aspects of WMPs were not only discussed less frequently, but views were more divergent with respect to perceived relevance and utility:

It isn't that I need educating, it's more that I need motivating (Ahern et al., 2013 p.255)

The following sections consider each of the seven WMP domains in turn to examine their perceived relevance and utility, and views about how they are best delivered.

Domain 1 - Provider support

Table 2.4: Overview of views on provider support

Overarching themes	Sub-themes
How critical is provider support perceived to be?	<ul style="list-style-type: none"> Provider support was the most frequently discussed WMP feature. Users were emphatic that provider support is fundamental to WMP success.
How are successful provider relationships achieved?	<ul style="list-style-type: none"> Provider personality and manner is considered more important than experience or professional expertise. Users valued providers who were approachable, compassionate, encouraging and non-judgemental.

How critical is provider support perceived to be for the success of WMPs?

Provider support was the most frequently discussed WMP feature across the studies. Moreover, users in 10 studies (Ahern et al., 2013, Bidgood and Buckroyd, 2007, Bingham et al., 2014, Brown et al., 2006, Doyle and Shaw, 2012, Gray et al., 2009, Herriot et al., 2008, Jones et al., 2007, Morrison et al., 2014, Wormald et al., 2006) and providers in two studies (Atkinson et al., 2010, Bingham et al., 2014) were emphatic that provider support was a key WMP feature. In six studies, provider relationships were indicated to be an essential feature of WMPs (Ahern et al., 2013, Bidgood and Buckroyd, 2007, Bingham et al., 2014, Doyle and Shaw, 2012, Jones et al., 2007, Wormald et al., 2006); for example:

A crucial finding from this study was that the most important element of the AL service appeared to be the AL advisor - the personality and approach of the advisor is likely to determine the success or failure of the service. (Wormald et al., 2006 p.208)

In one study, participants explicitly emphasised the importance of provider support over educational components (Ahern et al., 2013). Service users expressed how fervently they felt the need for such

support and implied that they were actively seeking it through attendance at WMPs; for example: ‘I just think I couldn’t do it on my own without seeing somebody’ (Ahern et al., 2013 p.255) and ‘I need someone to take my hand and take me over’ (Bidgood and Buckroyd, 2007 p. 226). The emphatic nature of these views, coupled with their extent and unanimity, indicate that provider support is perceived as fundamental to WMP success, but is perhaps an overlooked feature within current conceptions of WMPs.

How are successful provider relationships achieved?

In many studies, participants linked the value of provider support to the qualities and style of individual providers. For example, as noted above, one study concluded that the success of a lifestyle exercise service was entirely dependent on the qualities and approach of the service’s adviser (Wormald et al., 2006); another found that health care professionals varied considerably in their ability to support and motivate (Ahern et al., 2013).

Important provider characteristics: manner and personality vs background and expertise

Personality and people skills were consistently valued whereas the desirability of [a provider’s] personal experience of weight loss varied. (Allan et al., 2011 p.27)

No study focused in any depth on the importance of providers’ previous experience and expertise, but views on this appear to vary. Only one study reported views about providers’ personal experience of being overweight; several women spontaneously passed judgements about a provider’s degree of overweight, describing it as setting a poor example, although extremely thin leaders were also described as ‘off-putting’ (Allan et al., 2011 p.27). One participant in this study was quoted as saying ‘[a service provider’s] personal story really made you think. Oh, she can do it, oh I can do it’, but then added, ‘I am sure that somebody who has not lost weight would still be able to inspire’ (Allan et al., 2011 p.27) This same study noted that men seemed indifferent to a programme leader’s personal experience. It also reported that a lack of professional qualifications among group leaders was not raised by participants as a concern. However, in two other studies, nurses were seen as more appropriate providers than general practitioners (Brown et al., 2006, Wormald et al., 2006). Although not extensive, the most widespread and consistent views regarding professional qualifications were reported in relation to dieticians (Allan et al., 2011, Atkinson et al., 2010, Wormald et al., 2006, Webb et al., 2014), for example:

Dieticians are more qualified [...] You’ve got the person who is responsible. If you need an operation you would go to the surgeon wouldn’t you? (Webb et al., 2014 p.149)

The manner and character of providers

In contrast to the lack of commentary on providers’ expertise and experience, participants in many studies emphasised providers’ manner or character as important. Friendliness or approachability (Ahern et al., 2013, Allan et al., 2011, Atkinson et al., 2010, Bingham et al., 2014, Gray et al., 2013a, Webb et al., 2014, Wormald et al., 2006), empathy and compassion (Allan et al., 2011, Atkinson et al., 2010, Morrison et al., 2014, Wormald et al., 2006), being able to communicate verbally (Morrison et al., 2014, Wormald et al., 2006), or listen (Atkinson et al., 2013, Bingham et al., 2014, Wormald et al., 2006), being encouraging (Ahern et al., 2013, Bingham et al., 2014, Doyle and Shaw, 2012), and non-judgemental (Ahern et al., 2013, Atkinson et al., 2010, Brown et al., 2006, Furness et al., 2011, Penn et al., 2008, Wormald et al., 2006) were valued characteristics, for example:

She says yeah, do you want me to get the scales out or do you want me to leave them in the box. I’m like oh go on, get them out, let’s have a look. But I always get the choice and we always have a giggle about it. (Atkinson et al., 2012 p.14)

In another study, the dietician’s skill at building relationships was emphasised (Morrison et al., 2014). Seeing the same adviser over a period of time was described as helping to promote trust (Furness et al., 2011). Service users used phrases like ‘friendship’ and ‘personal touch’ to indicate the quality of these relationships, for example:

It is more like a friendship relationship with ‘Sarah’ rather than a health person, and you don’t feel as though she is instructing you. (Wormald et al., 2006 p.8)

Domain 2 - Meeting user needs and preferences

Table 2.5: Overview of views on meeting the needs and preferences of service users

Overarching themes	Sub-themes
How important is meeting user needs and preferences felt to be?	<ul style="list-style-type: none"> Services designed to meet user needs and preferences were consistently valued in a high proportion of the studies.
How can WMPs best meet user needs and preferences?	<ul style="list-style-type: none"> Tailored services: <ul style="list-style-type: none"> Services flexible enough to adapt to the needs of individuals led to high user satisfaction. Provider relationships were seen as fundamental to appropriately tailored services. Targeted services: <ul style="list-style-type: none"> Services developed for specific population groups were valued for being culturally appropriate. Being in group sessions with similar people was valued.

How important is meeting user needs and preferences felt to be?

As illustrated in Table 2.3, services designed to reflect user needs and preferences were the second most commonly discussed features of WMPs. Service users in eight studies (Atkinson et al., 2010, Bingham et al., 2014, Doyle and Shaw, 2012, Furness et al., 2011, Gray et al., 2013a, Jones et al., 2007, Morrison et al., 2014, Webb et al., 2014) and providers in three studies (Allan et al., 2011, Atkinson et al., 2010, Bingham et al., 2014) explicitly emphasised that they valued tailored services, those reflecting individual service users' choices or needs. In one study, authors reported this to be a theme which was closely linked to provider support, but which in its own right enjoyed 'strong' and 'unanimous' views which were 'unsolicited' (Doyle and Shaw, 2012).

That's the most important thing for me in the whole programme. It has been, it almost feels personalised for me (Doyle and Shaw, 2012 p.40).

Services users in 10 studies (Allan et al., 2011, Atkinson et al., 2010, De Souza and Ciclitira, 2005, Doyle and Shaw, 2012, Furness et al., 2011, Gray et al., 2013a, Hunt et al., 2013, 2014, Morrison et al., 2014, Witty and White, 2010) and providers in two studies (Bingham et al., 2014, Oteng-Ntim et al., 2010) discussed the issue of services targeted at particular population groups. In each study targeted services were positively valued, for example: 'It was good to see something that was just for male ...' (Hunt et al., 2014 p.9). Moreover, some service users were explicit that standardised or generic information or goals were unwelcome or unhelpful (Bingham et al., 2014, Furness et al., 2011, Jones et al., 2007). One study concluded that informational tools need to reflect the needs of their target audience, in this case men:

Shaping educational messages in ways that recognize the diversity and complexity of men's conceptualizations of their body image might offer a more sophisticated approach to health problems (De Souza and Ciclitira, 2005 p.801).

How can WMPs best meet user needs and preferences?

- Tailored services** were valued for their flexibility in addressing user needs, for example 'You personalised it so it was something that would work for you' (Gray et al., 2009 p.77). Participants in some studies valued tailored services which provided individualised information (Allan et al., 2011, Atkinson et al., 2010, Furness et al., 2011, Jones et al., 2007, Webb et al., 2014). A greater part of the data, however, reported users' appreciation for services where the structure and support mechanisms were individualised (Ahern et al., 2013, Allan et al., 2011, Atkinson et al., 2010, Doyle and Shaw, 2012, Gray et al., 2009, Morrison et al., 2014, Webb et al., 2014), for

example the degree to which providers were directive (Atkinson et al., 2010) or the flexibility of timing or location of meetings (Morrison et al., 2014). Indeed Ahern et al. (2013) concluded:

Being overweight is not conceived of as the same problem for all people but is a very personal issue; as a consequence, weight loss efforts call for a meaningful match between the kind of help given and how a person makes sense of trying to lose weight. (p.256)

Two studies recommended the development of tools to help providers identify the level of structure or type of support needed by individual users (Atkinson et al., 2010, Reed et al., 1999); indeed, in many studies, good provider relationships were seen as fundamental to providing appropriately tailored services.

- **Targeted services:** The characteristics of targeted services valued by participants were that they ensured that the providers were those most appropriate for meeting their needs, for example, through ensuring specialist help (Atkinson et al., 2010) and culturally appropriate assistance (Atkinson et al., 2010, Morrison et al., 2014, Oteng-Ntim et al., 2010). In one study, the benefit of having service providers with adequate language skills was emphasised. The following quote illustrates the benefits of both a targeted approach (appropriate language skills of provider) and tailored services (flexibility over the chosen language of communication):

It made me - like - relaxed when she was around because I didn't, sometimes I don't understand in English, then I could speak to her in Indian. But mostly I didn't want to speak to her in Indian. (Morrison et al., 2014 p.4)

Service users of Asian origin in two studies indicated that culturally inappropriate dietary advice left them struggling to adapt traditional recipes or practices to be healthier (Atkinson et al., 2010, Morrison et al., 2014). Unfortunately, limited data on minority ethnic populations mean that we have no indication of how extensive these issues are.

In addition to ensuring that providers and advice were appropriate, a valued characteristic of targeted services was their ability to bring together service users who had 'similar issues who care and understand' [Bingham et al, 2014 p. 889]. Targeted group meetings were thus perceived to encourage the development of, or provide a shortcut to, therapeutic peer relationships (Allan et al., 2011, Bingham et al., 2014, De Souza and Ciclitira, 2005, Furness et al., 2011, Gray et al., 2013a, Hunt et al., 2014, Witty and White, 2010).

The good thing was, straight from the start, we all had something in common with each other [...] we were cuddly and supported [Club03], and that was the big factor. So no matter... you didn't know each other's names, we immediately were able to converse with each other easily. (Hunt et al, 2014 p.7)

Domain 3 - Delivery format

Table 2.6: Overview of views on delivery format

Overarching themes	Sub-themes
To what extent is delivery format perceived to be an important aspect of WMPs?	<ul style="list-style-type: none"> • Delivery format was discussed in a large number of studies but opinion was divided with respect to a range of delivery formats. • The findings indicated the need for flexibility and the use of a combination of formats.
What are the benefits and dis-benefits of different WMP delivery formats?	<ul style="list-style-type: none"> • Group sessions were valued for social reasons, but individual sessions were perceived as offering greater provider support and enabling tailoring to user needs. • Face-to-face sessions were seen as essential for provider relationships but the convenience and anonymity of remote sessions were also valued.

Overarching themes	Sub-themes
	<ul style="list-style-type: none"> • There were benefits and dis-benefits to both appointment-based and fixed-schedule meetings. • There was no consensus about the frequency with which WMPs should be delivered.

To what extent is delivery format perceived to be an important aspect of WMPs?

Service users in 16 studies (Ahern et al., 2013, Atkinson et al., 2010, Bidgood and Buckroyd, 2007, Bingham et al., 2014, De Souza and Ciclitira, 2005, Doyle and Shaw, 2012, Furness et al., 2011, Gray et al., 2013a, Herriot et al., 2008, Hunt et al., 2013, 2014, Jones et al., 2007, Reed et al., 1999, Webb et al., 2014, Witty and White, 2010, Wormald et al., 2006) and service providers in five studies (Atkinson et al., 2010, Furness et al., 2011, Mercer and Tessier, 2001, Oteng-Ntim et al., 2010, Smith et al., 2012) suggested that delivery format was implicated in the success of WMPs. Discussions about delivery format included whether the sessions were: provided to individuals or groups; delivered face-to-face or remotely; scheduled in an accessible way; delivered with appropriate frequency; and provided in an appropriate setting. However, opinion was split with respect to each of these dimensions. To some extent, there was evidence that participants were satisfied with, and saw the benefits of whichever approach they had experienced (Ahern et al., 2013). Whilst this might be taken as evidence that participants has been successfully matched to the most appropriate service for them, others might conclude that delivery format has little impact on WMP success. Nevertheless, users and providers were clear about the particular benefits and dis-benefits of different delivery approaches, leading some authors to conclude that combinations of approaches or flexibility in the delivery format are essential (Atkinson et al., 2010, Oteng-Ntim et al., 2010, Webb et al., 2014).

What are perceived to be the benefits and dis-benefits of different WMP delivery formats?

- Group meetings vs individual sessions: Group delivery format was positively valued in 13 service-user studies (Ahern et al., 2013, Atkinson et al., 2010, Bidgood and Buckroyd, 2007, Bingham et al., 2014, Brown et al., 2006, De Souza and Ciclitira, 2005, Doyle and Shaw, 2012, Furness et al., 2011, Gray et al., 2013a, Herriot et al., 2008, Hunt et al., 2013, 2014, Webb et al., 2014) and two service-provider studies (Oteng-Ntim et al., 2010, Smith et al., 2012). Group services were described as attractive for reasons of sociability and fun (Atkinson et al., 2010, Bingham et al., 2014, Doyle and Shaw, 2012, Furness et al., 2011, Gray et al., 2013a, Hunt et al., 2014, Webb et al., 2014), for example ‘I look forward to meeting everyone. We have a laugh’ (Webb et al., 2014). The peer support gained through group WMPs was particularly valued (Ahern et al., 2013, Atkinson et al., 2010, Bidgood and Buckroyd, 2007, Bingham et al., 2014, Brown et al., 2006, De Souza and Ciclitira, 2005, Doyle and Shaw, 2012, Furness et al., 2011, Gray et al., 2013a, Herriot et al., 2008, Hunt et al., 2013, 2014, Oteng-Ntim et al., 2010, Webb et al., 2014):

That class motivation I felt worked ... building up that ... friendly atmosphere and team motivation I found worked quite well (Ahern et al., 2013 p.255)

However, service users in eight studies (Ahern et al., 2013, Allan et al., 2011, Atkinson et al., 2010, Bidgood and Buckroyd, 2007, De Souza and Ciclitira, 2005, Doyle and Shaw, 2012, Gray et al., 2013a, Webb et al., 2014) expressed strong views that group sessions had negative aspects, including difficulties in raising sensitive issues (Atkinson et al., 2010, Bidgood and Buckroyd, 2007, Gray et al., 2013a,) and the embarrassment of group ‘weigh-ins’ (Ahern et al., 2013, Atkinson et al., 2010, Doyle and Shaw, 2012). Indeed, service users in four studies (Ahern et al., 2013, Allan et al., 2011, Atkinson et al., 2010, Gray et al., 2013a) were emphatic that individual sessions offered greater benefits, including more attention from providers and greater scope for services to be tailored to individual needs. The apparent benefits of both approaches led Webb et al. (2014) to conclude that:

This therefore proposes an intricate balancing act of social, group aspects alongside enough individualised areas to ensure the programme is suitably patient-centred’ (p.151).

- **Face-to-face vs. remote delivery:** Just two of the studies focused specifically on remotely delivered WMPs (Doyle and Shaw, 2012, Soltani et al., 2012), and service users in these studies perceived such services to be beneficial. However, in these and other studies in which remotely delivered support was discussed (Atkinson et al., 2010, Doyle and Shaw, 2012, Furness et al., 2011, Wormald et al., 2006), it was felt to be most appropriate when delivered in conjunction with some face-to-face elements. Text messages, web support and telephone calls were all seen as convenient approaches for providing support and maintaining engagement when delivered between face-to-face contacts (Atkinson et al., 2010, Doyle and Shaw, 2012, Furness et al., 2011, Wormald et al., 2006). Face-to-face contact was seen as critical for developing supportive provider relationships, which were noted to underpin successful remote delivery, for example ‘It’s not just a name, it [the provider] is Emma. And I know what Emma looks like and I can hear your voice when I read your emails’ (Doyle and Shaw, 2012 p.40).
- **Fixed-time sessions vs appointment-based sessions:** Appointment-based sessions were valued by some for their convenience (Atkinson et al., 2010), particularly where these involved home visits (Atkinson et al., 2010, Morrison et al., 2014). Nevertheless, some service users found difficulties with making suitable appointments (Jones et al., 2007, Morrison et al., 2014) and some providers found it difficult to accommodate service users’ schedules (Morrison et al., 2014). Others found fixed-time, continuously available services (e.g. regular weekly meetings) preferable since they could ‘*dip in and out*’ of them (Allan et al., 2011, Ahern et al., 2013), but some commented on the inflexibility of this approach and the need for them to be conveniently timed (Allan et al., 2011, Atkinson et al., 2010, Brown et al., 2006, Jones et al., 2007, Morrison et al., 2014).
- **Frequency of sessions:** Frequency of contact was discussed in ten service-user studies (Ahern et al., 2013, Atkinson et al., 2010, Bingham et al., 2014, Brown et al., 2006, Doyle and Shaw, 2012, Furness et al., 2011, Herriot et al., 2008, Morrison et al., 2014, Reed et al., 1999, Wormald et al., 2006) and three provider studies (Atkinson et al., 2010, Furness et al., 2011, Oteng-Ntim et al., 2010), revealing variation in what was perceived as the ideal frequency. Service users in five studies suggested that weekly sessions were appropriate to maintain motivation (Atkinson et al., 2010, Bingham et al., 2014, Brown et al., 2006, Furness et al., 2011, Reed et al., 1999), but users in six studies suggested that less than weekly would be preferable (Ahern et al., 2013, Atkinson et al., 2010, Doyle and Shaw, 2012, Herriot et al., 2008, Morrison et al., 2014, Wormald et al., 2006). Greater frequency was valued for maintaining motivation, whereas less-frequent contacts were valued for enabling sufficient change between assessments (Wormald et al., 2006). Regardless of frequency, scheduled future appointments were noted for motivating behaviour change (Herriot et al., 2008, Morrison et al., 2014, Wormald et al., 2006).
- **Setting - community vs healthcare:** Whilst those who attended WMPs in healthcare settings indicated them to be acceptable (Morrison et al., 2014), participants in another study were noted to be averse to attending a hospital or clinic (Bidgood and Buckroyd, 2007). Indeed, users in four studies were clear that meetings in community settings were attractive (Bidgood and Buckroyd, 2007, Hunt et al., 2013, 2014, Witty and White, 2010). Some services for men were held in football stadia and this setting felt to be a particular draw, for example:

You’re doing it at a place where you go to support your team and you are actually involved in it (the team) you’re inside the stadium and you are actually getting shown about. It’s fantastic. (Hunt et al., 2013 p.60)

Thus flexibility in the delivery of WMPs can both ensure that the preferences of different users are met whilst also enabling users to access the benefits of different approaches.

Domain 4 - Monitoring of weight, diet and exercise

Table 2.7: Overview of views on monitoring

Overarching themes	Sub-themes
How do participants value monitoring of weight, diet and exercise?	<ul style="list-style-type: none"> Weight monitoring was discussed in 11 service user studies; views were predominantly positive and it was considered a powerful motivator. Monitoring of diet and exercise behaviours was discussed in fewer studies, and views were not consistently positive.
How is monitoring best delivered?	<ul style="list-style-type: none"> Private weight monitoring can help for some who are anxious or embarrassed. Tools for self-monitoring of diet and exercise should be well designed and easy to use.

How do participants value the monitoring of weight, diet and exercise?

Regular weight monitoring was described as beneficial or as a highly motivating element of WMPs by service users in 11 studies (Ahern et al., 2013, Allan et al., 2011, Atkinson et al., 2010, Brown et al., 2006, Doyle and Shaw, 2012, Furness et al., 2011, Herriot et al., 2008, Hunt et al., 2013, Jones et al., 2007, Penn et al., 2008, Reed et al., 1999). In five studies, participants described actively seeking weight monitoring through WMPs (Ahern et al., 2013, Allan et al., 2011, Atkinson et al., 2010, Brown et al., 2006, Furness et al., 2011). Although views about weight monitoring were largely positive, providers in one study (Atkinson et al., 2010) noted that some WMP participants resisted being weighed: ‘I’ve had mums who will do anything but let me weigh them’ (p.47). A small number of service users in other studies also shared negative experiences (Atkinson et al., 2010, Hunt et al., 2014, Webb et al., 2014), although they implied that appropriate approaches could overcome these problems (see below).

Fewer studies discussed diet monitoring (Atkinson et al., 2010, Doyle and Shaw, 2012, Jones et al., 2007, Wormald et al., 2006) and exercise monitoring (Hunt et al., 2013, Wormald et al., 2006). Behaviour diaries were variously received with some describing them as ‘*extremely useful*’ (Wormald et al., 2006) and others finding them difficult to use (Atkinson et al., 2010, Doyle and Shaw, 2012).

How is monitoring best delivered?

In eight studies, weight monitoring was explicitly described as an important weight loss motivator (Allan et al., 2011, Atkinson et al., 2010, Doyle and Shaw, 2012, Herriot et al., 2008, Morrison et al., 2014, Penn et al., 2008, Reed et al., 1999, Webb et al., 2014); attendees of both health service and commercial groups described being monitored or ‘checked’ by someone ‘strict’ as a significant motivator to losing weight. In one study, even control group participants noted weight monitoring conducted as part of trial assessments as motivating them to lose weight (Penn et al., 2008).

However, in many studies the motivational benefits of weight monitoring were linked to accountability to providers (see Section 2.2.3). The findings indicate that any form of regular weight monitoring by a third party may be beneficial, but that the experience may be better and the motivation to lose weight stronger when delivered by supportive providers.

- Addressing fear and embarrassment around weight monitoring:** Whilst the majority of service users’ viewed monitoring as a valued or desirable feature of services, for some there was a significant barrier to accessing its motivational benefits. Service users in three studies (Ahern et al., 2013, Atkinson et al., 2010, Hunt et al., 2014) and providers in one (Atkinson et al., 2010) described how participants feared or felt embarrassed by the prospect of being weighed:

I just didnae want to be here. I felt very nervous about the whole thing, and he [field staff member] was getting the weight. It was very embarrassing. It’s not now, but at the time, it was. At the time, I was like, ‘Oh, this is terrible’ (Hunt et al., 2014 p.7)

In two studies, participants described having overcome their fears with positive support and encouragement from providers (Atkinson et al., 2010, Hunt et al., 2013). In one study, service users described how the opportunity to be weighed in private at the physician's office was preferable to being weighed in a group setting (Ahern et al., 2013). Flexible approaches to weighing which enable participants to overcome fear and embarrassment may be necessary for all to access the benefits of regular weight monitoring by a third party.

- **Easy to use tools for self-monitoring of behaviour:** As noted above, some participants found behaviour monitoring diaries for diet or exercise difficult to use; some found them too time-consuming and others described them as 'cumbersome' (Atkinson et al., 2010, Doyle and Shaw, 2012). However, simple pieces of kit were found to be helpful motivators. In one study, men were described as being 'evangelical' about the benefits of pedometers for monitoring their activity levels (Hunt et al., 2013). In another, participants praised the simplicity of the tool they were using (Ahern et al., 2013) .

Domain 5 - Information and advice about diet

Table 2.8: Overview of views on diet advice

Overarching themes	Sub-themes
How much do participants value dietary advice as part of WMPs?	<ul style="list-style-type: none"> • Dietary advice was discussed in a large number of studies. • Some valued receiving diet advice but many others felt that they did not need it or that it was inappropriate for them.
What are the best approaches for delivering dietary components of WMPs?	<ul style="list-style-type: none"> • Amongst those who valued dietary advice, there were some clear preferences for: <ul style="list-style-type: none"> ○ clear and easy to understand advice ○ practical information such as on portion sizes ○ visual demonstrations. • Others recommended a de-emphasis on the notion of 'dieting'.

How much do participants value dietary advice as part of WMPs?

Comments on the perceived importance of dietary advice were available from service users in 12 studies (Ahern et al., 2013, Atkinson et al., 2010, Bidgood and Buckroyd, 2007, Bingham et al., 2014, Furness et al., 2011, Gray et al., 2013a, Herriot et al., 2008, Hunt et al., 2013, 2014, Jones et al., 2007, Reed et al., 1999, Webb et al., 2014) and providers in three studies (Atkinson et al., 2010, Bingham et al., 2014, Gray et al., 2013a). In contrast to the largely positive views about provider support, meeting user needs and preferences and weight monitoring, views were divergent about dietary advice. Nine studies included positive service-user statements about the focus of WMPs on diet (Atkinson et al., 2010, Bidgood and Buckroyd, 2007, Bingham et al., 2014, Furness et al., 2011, Gray et al., 2013a, Herriot et al., 2008, Jones et al., 2007, Reed et al., 1999, Webb et al., 2014) but seven studies indicated a perceived lack of need for dietary advice (Ahern et al., 2013, Atkinson et al., 2010, Furness et al., 2011, Gray et al., 2013a, Hunt et al., 2013, 2014, Jones et al., 2007), for example:

Perhaps counter to public health assumptions, none of the participants talked about needing an intervention to include education about food, eating, or diet as they believed they already had the necessary knowledge. (Ahern et al., 2013 p.254-255)

Male service users in three studies (Gray et al., 2013a, Hunt et al., 2013, 2014) indicated that dietary issues were considered an inappropriate focus for men; positive and negative views about dietary advice were, however, reported by both males and females.

How is dietary advice best delivered?

Amongst those who valued dietary advice, there were some clear preferences with regard to the delivery approach and the content of sessions.

- **Delivery approach:** Service users in four studies (Gray et al., 2013a, Herriot et al., 2008, Atkinson et al., 2010, Webb et al., 2014) and providers in two studies (Bingham et al., 2014, Gray et al., 2013a) were explicit that clear and easy-to-understand dietary advice enhanced both engagement with the programme and application of the information in people's lives.

The way she's put it across has been easy to understand. It hasn't been parrot fashion from a book that some PhD's wrote and she's just read it out and said 'do you understand that?' She puts it across really well. (Webb et al., 2014 p.148)

Visual demonstrations were particularly noted by service users as an engaging and effective approach for conveying dietary advice (Atkinson et al., 2010, Gray et al., 2013a, Webb et al., 2014):

You can look at a cream cake and then visualise the fat [...] when you look at the sugar content, it was horrendous. (Webb et al., 2014 p. 148)

In discussing the delivery of dietary advice, some participants were explicit that avoiding the term 'diet' made advice more acceptable. Many of the male-only studies indicated the value of a de-emphasis on the notion of 'dieting' (Gray et al., 2013a, Hunt et al., 2013, 2014) but this was not exclusive to men; service users in a mixed gender study (Jones et al., 2007) also raised the issue:

Many preferred the changes that they were making, to be referred to as 'healthy eating', rather than 'the diet'. One interviewee commented that, 'people say 'diet' too much and it makes you think about food and want it more.' (Jones et al, 2007, service-user, p.489)

- **Session content - practical information:** In addition to the delivery approach, participants were clear that sessions needed to deliver practical information. In particular, service users explicitly valued learning about nutrition labelling (Atkinson et al., 2010, Gray et al., 2013a, Herriot et al., 2008, Jones et al., 2007) and portion sizes (Atkinson et al., 2010, Jones et al., 2007, Gray et al., 2013a, Herriot et al., 2008). Cooking lessons and menu plans were identified as desirable by participants in one study, both by those who declined to take up WMP and people who had engaged with the service (Atkinson et al., 2010). However, experience of cooking lessons in another study appeared to be less than satisfactory because recipes were 'not to everyone's taste' (Webb et al., 2014); the authors recommended involving users in the planning of cooking sessions and the choice of food to cater for individual requirements.

Domain 6 - Advice about and provision of exercise

Table 2.9: Overview of views on exercise

Overarching themes	Sub-themes
How much do participants value exercise components of WMPs?	<ul style="list-style-type: none"> • Services users in 11 studies commented on exercise components. • Whilst many valued it positively, some participants were clear that for them it was not highly valued. • Some studies suggested that focusing on or providing exercise may increase its perceived value.
What are the best approaches for delivering exercise components of WMPs?	<ul style="list-style-type: none"> • Direct provision of exercise appeared to increase self-efficacy and enabled participants to experience health and other benefits. • Tailoring exercise to fitness levels and gradually increasing intensity over time were considered beneficial.

How much do participants value the exercise components of WMPs?

Twelve studies commented on the perceived importance of the exercise components of WMPs (Atkinson et al., 2010, Bidgood and Buckroyd, 2007, Bingham et al., 2014, Doyle and Shaw, 2012, Furness et al., 2011, Gray et al., 2013a, Herriot et al., 2008, Hunt et al., 2013, Jones et al., 2007, Morrison et al., 2014, Reed et al., 1999, Wormald et al., 2006). Service users in eleven studies valued exercise components positively (Atkinson et al., 2010, Bidgood and Buckroyd, 2007, Bingham et al., 2014, Doyle and Shaw, 2012, Furness et al., 2011, Gray et al., 2013a, Herriot et al., 2008, Hunt et al., 2013, Jones et al., 2007, Morrison et al., 2014, Wormald et al., 2006). However, two studies focusing on women indicated that exercise components are perceived by some as less important than dietary components of WMPs (Atkinson et al., 2010, Reed et al., 1999). Conversely, in studies focusing on male service users, exercise was cited as one of the things men found most useful (Gray et al., 2013a); some men reported desiring an increase in the focus on exercise (Hunt et al., 2013). Rather than gender differences, however, these findings may reflect the degree of emphasis on exercise in the interventions experienced by these service users; they appeared to have a significant focus on exercise, not least because they were affiliated to sports clubs (Gray et al., 2013a, Hunt et al., 2013). Moreover, one mixed-gender study also reported that 'Interviewees felt that exercise was the key to successful weight loss' (Jones et al., 2007) and in one female-only study, participants were noted as being 'delighted' with the provision of exercise programmes (Furness et al., 2011). These findings suggest that an increase in the focus on or provision of exercise within WMPs may increase the perceived value of and indeed appetite for exercise. A study which compared a range of commercial weight management groups found that participants receiving one of the programmes examined (Rosemary Conley) rated exercise as more important than those receiving other programmes; the authors concluded that 'RC appeared to have achieved an attitude change towards exercise not observed in the other groups' (Herriot et al., 2008).

What are the best approaches for delivering exercise components of WMPs?

- **Direct provision of exercise vs advice and information:** In two studies, advice and information about available classes was explicitly valued by service users seeking to engage in exercise (Atkinson et al., 2010, Wormald et al., 2006); service users in these studies also appreciated advice on ways to increase activity levels in their daily lives, such as through walking, gardening or doing the housework. However, service users in five studies expressed the opinion that actually partaking in exercise as part of the intervention, as opposed to just receiving advice, was desirable (Bidgood and Buckroyd, 2007, Doyle and Shaw, 2012, Gray et al., 2013a, Herriot et al., 2008, Hunt et al., 2013).

Direct provision of exercise appeared to benefit service users by challenging misconceptions or fears about engaging in exercise and by revealing that exercise was achievable for them (Atkinson et al., 2010, Doyle and Shaw, 2012, Gray et al., 2013a, Herriot et al., 2008, Hunt et al., 2013, Morrison et al., 2014, Wormald et al., 2006). Providing exercise directly also ensured that service users experienced the benefits of getting active; participants described how it revealed or 'proved' (Wormald et al., 2006) that exercise could be fun (Atkinson et al., 2010, Doyle and Shaw, 2012, Wormald et al., 2006), increase fitness (Bidgood and Buckroyd, 2007, Hunt et al., 2013), increase confidence (Atkinson et al., 2010, Bingham et al., 2014, Wormald et al., 2006) and improve mental well-being (Bingham et al., 2014, Hunt et al., 2013):

Quite quickly, men were able to conceive of progressing physically, psychologically, and in terms of taking up (again) activities which they valued, overcoming barriers which previously had seemed less surmountable (Hunt et al., 2013 p.61)

- **Tailoring to fitness levels and gradually increasing exercise levels:** Service users and providers indicated the need for exercise sessions to be adapted to participants' fitness levels (Bingham et al., 2014, Gray et al., 2013a, Hunt et al., 2013, Morrison et al., 2014, Wormald et al., 2006). Some indicated the need for beginning with low-level exercises (Bingham et al., 2014, Gray et al., 2013a, Morrison et al., 2014, Wormald et al., 2006). In one study, providers described needing to re-evaluate inappropriate exercise targets (Bingham et al., 2014):

The majority of the men looked at me in shock when I suggested that they jogged on the treadmill, or even asked them to aim for walking 30 min every day ‘... what walk 30 minutes! It ain’t happening lad, simple.’ (p.894).

Conversely, a small number of participants in a group-based study felt that the level of exercise provided was too low and stated that they would have like ‘*more challenging in-stadia exercise sessions earlier on*’ (Hunt et al., 2013). Many participants, however, described valuing a graduated approach, building up exercise levels over time (Bingham et al., 2014, Gray et al., 2013a, Herriot et al., 2008, Hunt et al., 2013, Wormald et al., 2006).

Domain 7 - Goal setting

Table 2.10: Overview of views on goal setting

Overarching themes	Sub-themes
How much do participants value the goal-setting components of WMPs?	<ul style="list-style-type: none"> The goal-setting components were mentioned in considerably fewer studies than components in other domains. Appraisals of goal setting were typically not very emphatic.
What are the best approaches for delivering the goal-setting components of WMPs?	<ul style="list-style-type: none"> There was some consensus that goals needed to be realistic and relevant. There was less consensus about how goals should be set and by whom, some preferred to set their own goals whilst others preferred strict goals set by providers.

How much do participants value goal-setting components of WMPs?

Goal setting was mentioned in considerably fewer studies than other components; positive statements about goal setting were identified in just six service-user studies (Ahern et al., 2013, Atkinson et al., 2010, Doyle and Shaw, 2012, Hunt et al., 2013, Penn et al., 2008, Wormald et al., 2006). Whilst this may simply reflect the types of programmes that people were involved with (i.e. programmes in which goal setting was not emphasised), positive appraisals of goal setting were also typically less emphatic than for other components. In addition, it is clear that not all participants perceived goal setting to be beneficial, for example: ‘Some were clearly orientated to goals and others expressed a more general desire to stay on track or avoid ill health’ (Penn et al., 2008 p7).

What are the best approaches for delivering goal-setting components of WMPs?

- Setting realistic and relevant targets:** Service users in two studies were explicit that unrealistic targets for exercise (Gray et al., 2013) or for weight loss (Jones et al., 2007) could be demotivating. In three studies, small achievable goals were described as helpful when initially engaging with WMPs (Atkinson et al., 2010, Bingham et al., 2014, Doyle and Shaw, 2012):

Bespoke, subtle, meaningful and achievable goal setting was required in order to ‘hook’ the participants into (small) positive exercise and health behaviours before introducing them to potential longer term achievements. (Bingham et al., 2014 p.889)

Four studies explicitly indicated a need for regular contact with providers in order to review progress or refocus on goals (Ahern et al., 2013, Atkinson et al., 2010, Doyle and Shaw, 2012, Furness et al., 2011).
- Provider identified or ‘self-negotiated’ goals?** Although there seemed to be consensus that goals should be personalised or bespoke (Atkinson et al., 2010, Bingham et al., 2014, Furness et al., 2011, Herriot et al., 2008, Penn et al., 2008), there was no clear pattern with regard to views about *how* goals should be set, or by *whom*. One study described personalised goals being identified and set by providers (Bingham et al., 2014), but in three studies, service users suggested that they enjoyed setting their own ‘self-negotiated’ goals (Doyle and Shaw, 2012, Hunt et al.,

2013, Penn et al., 2008). In a further study, whilst some participants valued an open or flexible approach, others felt that clear goals prescribed by practitioners would be more helpful: ‘Some women found the service to be too flexible, and needed more rigid instructions on what and how much to eat’ (Atkinson et al., 2010 p.56). A desire to be set strict dietary goals by providers was also voiced by service users in another study (Reed et al., 1999).

Summing up: Which WMP features do users and providers perceive to be critical for success?

In summary, provider support, meeting user needs and preferences and weight monitoring were widely and enthusiastically valued. Evidence on delivery formats and the perceived value of exercise, dietary advice and goal setting components is both less extensive and less consistent.

2.2.2 After the WMP

This section explores views on the need for ongoing support and the potential for a ‘graduated exit’ from WMPs.

Table 2.11: Overview of views on support after the WMP

Overarching themes	Sub-themes
The need for ongoing support	<ul style="list-style-type: none"> Many service users described long-term or ongoing support as necessary for ‘embedding’ and maintaining healthy behaviours.
Graduated exit	<ul style="list-style-type: none"> Service users suggested that less-intensive ongoing support from providers could be sufficient to maintain long-term motivation.

The need for ongoing support

Service users in seven studies expressed concern about the cessation of WMPs and their ability to maintain healthy behaviours without WMP support (Bidgood and Buckroyd, 2007, Doyle and Shaw, 2012, Herriot et al., 2008, Penn et al., 2008, Webb et al., 2014, Witty and White, 2010, Wormald et al., 2006):

The majority of participants, despite appearing confident in making dietary and lifestyle changes seem to lack the long-term empowerment to progress without guidance. (Webb et al., 2014 p.149)

Service users in nine studies (Gray et al., 2013a, Herriot et al., 2008, Bidgood and Buckroyd, 2007, Webb et al., 2014, Wormald et al., 2006, Witty and White, 2010, Doyle and Shaw, 2012, Ahern et al., 2013, Penn et al., 2008) and providers in one study (Gray et al., 2013a) suggested that longer-term support is necessary for sustaining successful weight management, as illustrated in the quote below:

You can lose two, three, four, five stone, but it’s the other five, it’s the long haul. I don’t think the people that are looking at obesity are thinking about the people beyond the two-stoners, beyond the five stone losses. It’s a huge thing, you’re talking about an eighteen month, two year project here just to get normal. We’re not looking at a quick diet here (Bidgood and Buckroyd, 2007 p.226)

As noted in Section 2.2.1, the social and psychological gains of engaging in WMPs, particularly in exercise, were quickly appreciated, which in turn fostered further positive changes. However, participants in some studies (Atkinson et al., 2010, Bidgood and Buckroyd, 2007, Gray et al., 2013a, Herriot et al., 2008, Penn et al., 2008, Webb et al., 2014, Wormald et al., 2006) suggested that for long-term change, ongoing support was necessary to move on from this ‘short term confidence’ (Webb et al., 2014 p.152) and ensure that changes were embedded or ‘absorbed’ (Penn et al., 2008):

The [Weight Watchers] group were concerned that they may put weight back on and that they had not ‘got quite that mind set yet (Herriot et al., 2008 p.77)

Graduated exit

It is unsurprising that ongoing support is seen as desirable or even essential for maintaining behaviour change given the emphatic views about the need for such support (see Section 2.2.2). In addition, the potential barriers to being healthy as described in Appendix 2, were seen as potentially impeding maintenance of embedded change: ‘Even when the beneficial change had become habitual, setbacks (such as physical injury or greater care demands) could disrupt this equilibrium’ (Penn et al., p.243). However, ongoing intensive support was recognised as being financially unsustainable (Wormald et al., 2006). Providers in one study considered charging for additional sessions after the end of the programme to enable users to continue to benefit from the support of the service and the group (Gray et al., 2013a). Service users suggested that less-intensive ongoing support from providers could be sufficient to maintain long-term motivation, for example:

But after the sessions I wouldn't like to think that it is finished full stop, and that you're in the filing cabinet. I would like to think that you could go at least twice a year ... as you would to a doctor for a check-up. To go back to 'Sarah' just to see whether you had lapsed in anything, if you have forgotten anything, or if there is anything new on the market (service user, Wormald et al., 2006 p.6)

The formation of informal peer-based group exercise sessions, or meetings outside of formal WMPs, was suggested as a cost-effective way of accessing social and psychological benefits of group WMPs and stimulating accountability to peers (Furness et al., 2011, Webb et al., 2014). Moreover, as noted above (Section 2.2.1, domain 3), remotely delivered support was seen as providing sufficient motivation between sessions and could perhaps be harnessed to provide follow-on support at a fraction of the cost of face-to-face services.

2.2.3 Mechanisms through which WMP features are perceived to impact on service users' engagement with WMPs and on weight loss

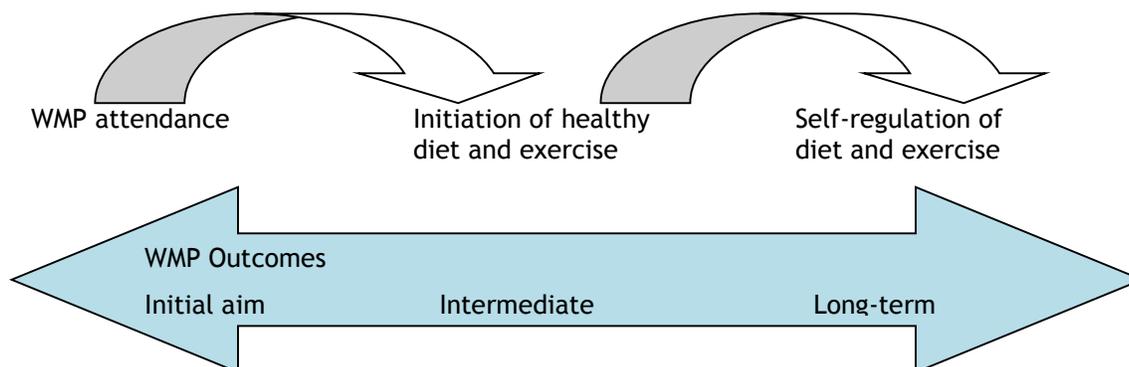
In this section we consider the mechanisms through which the identified and valued WMP characteristics are perceived to overcome potential barriers and impact on weight loss. Participants described impact on three relevant outcomes: 1) attendance at WMPs; 2) initiation of healthy behaviours; and 3) self-regulation of healthy behaviours.

Table 2.12: Overview of findings on mechanisms of impact

Overarching themes	Sub-themes
Attendance at WMPs	Two key mechanisms were identified as motivating WMP attendance: 1) the creation of a 'safe space'. 2) the creation of social bonds.
Initiation of healthy behaviours	A sense of accountability to providers and programme peers was described as a catalyst for behaviour change.
Self-regulation of healthy behaviours	Initiation of healthy behaviours led to development of self-efficacy and allowed users to experience various benefits of being healthy which fostered self-regulation.

Participants in the studies discussed a range of outcomes which map on to the logic model presented in Figure 2.2. As the logic model illustrates, for WMPs to have any impact on changing the behaviours of service users, they must first be successful at motivating and maintaining continued WMP attendance. Once participants are engaged, WMPs can then seek to motivate participants to initiate healthy diet and exercise behaviours to stimulate weight loss. If long-term weight loss is to be achieved, however, the ultimate aim of any WMP must be to enable people to self-regulate their own weight management. Figure 2.2, illustrates these outcomes for WMPs and the pathway to self-regulation. The following sections examine views about *how* different WMP features support each of these outcomes.

Figure 2.2: Pathway to self-regulation



What motivates attendance at WMPs?

Two key mechanisms were identified as motivating initial and continued attendance at WMPs: the creation of a 'safe space' and the creation of social bonds.

The creation of a safe space for people with obesity

Service users in seven studies (Bingham et al., 2014, Doyle and Shaw, 2012, Furness et al., 2011, Gray et al., 2013a, Hunt et al., 2013, 2014, Witty and White, 2010) described valuing a 'non-judgemental, non-threatening' environment (Furness et al., 2011 p.7). Group services were valued for creating a space with others 'in the same boat' [11]. All seven studies reported that services targeted at specific population groups were particularly valued for creating such spaces; as one participant said of a men's group 'The fact that there wasn't going to be any Greek gods in there, it was all going to be human beings, cherubs perhaps, so you're not going to feel out of place.' (Gray et al., 2013a p.6). Hunt et al. (2013) described how expectations of negative stereotypes (see Appendix 2, Section A2.2) meant that users 'could not have contemplated trying to become more active in a context which exposed their loss of fitness, youth and physicality, and their compromised bodies' (p.62). Thus WMPs which provided exercise sessions were valued for creation of a 'safe space' to exercise, for example 'A fitness class where there was people who were going to look like me and not lots of skinny girls [...] that made you feel a lot more comfortable, which encouraged me more to go' (Doyle and Shaw, 2012 p.37).

The creation of social bonds

The development of relationships with peers or providers in WMPs created the sense of a bond: in six studies, relationships with providers were explicitly linked to programme attendance and retention (Allan et al., 2011, Furness et al., 2011, Gray et al., 2009, Morrison et al., 2014, Penn et al., 2008, Webb et al., 2014), and in six studies, the social aspects of group-delivered WMPs were noted for motivating attendance (Bingham et al., 2014, Doyle and Shaw, 2012, Furness et al., 2011, Gray et al., 2009, Hunt et al., 2014, Webb et al., 2014). For example, one service user commented: 'There was quite a good crack going on all the time, so the following week you kinda felt you wanted to come back and hear how the guys were getting on' (Gray et al., 2009 p.77). Many service users described feeling isolated or depressed, or having low self-esteem or confidence (Atkinson et al., 2010, Bidgood and Buckroyd, 2007, Bingham et al., 2014, Brown et al., 2006, Furness et al., 2011, Wormald et al., 2006), so it is perhaps unsurprising that attendance was motivated by the social and psychological benefits of WMPs (Atkinson et al., 2010, Bidgood and Buckroyd, 2007, Doyle and Shaw, 2012, Furness et al., 2011, Hunt et al., 2014, Jones et al., 2007, Penn et al., 2008, Wormald et al., 2006). Providers were seen as someone to talk to and provide advice (Atkinson et al., 2010, Bingham et al., 2014, Brown et al., 2006, Doyle and Shaw, 2012, Furness et al., 2011, Jones et al., 2007, Morrison et al., 2014, Wormald et al., 2006), for example 'Just the support and knowing that they're there and someone's there to listen to you' (Atkinson et al., 2010 p.18). Also, they represented someone who cared (Ahern et al., 2013, Bidgood and Buckroyd, 2007, Bingham et al., 2014, Doyle and Shaw, 2012, Furness et al., 2011, Jones et al., 2007, Morrison et al., 2014, Penn et al., 2008, Wormald et al., 2006), for example 'You feel that

somebody's batting for you' (Doyle and Shaw, 2012 p.40) 'She used to advise me but so compassionately ... she cares so much.' (Morrison et al., 2014 p.4). As described in previous sections, the manner and character of providers and delivery via face-to-face sessions are fundamental to developing provider bonds, and targeted group services enhance the development of peer bonds.

How do WMPs foster initiation of healthy behaviours?

Accountability

In addition to enhancing WMP attendance, supportive and caring **relationships with providers and peers** were felt to foster a **sense of accountability**; this feeling of accountability was explicitly described as motivating users to engage in healthy behaviours. Accountability was seen as a much needed extrinsic motivator, and a catalyst for behaviour change.

Figure 2.3: Mechanism through which supportive relationships, via accountability lead to healthy behaviours



A sense of accountability to providers was described in 10 service-user studies (Ahern et al., 2013, Allan et al., 2011, Atkinson et al., 2010, Bidgood and Buckroyd, 2007, Doyle and Shaw, 2012, Furness et al., 2011, Gray et al., 2009, Morrison et al., 2014, Penn et al., 2008, Wormald et al., 2006). In each of these, service users described how the relationship with providers and the feeling of accountability towards them motivated them to lose weight, for example, 'For me ... what works is the fact that I know...I've got to go and see somebody ... and I've got to explain why I haven't lost any weight' (Ahern et al., 2013 p.255)

One study, however, acknowledged that accountability could be negative, such that service users felt 'pressure' to lose weight and employed extreme methods to achieve this (Webb et al., 2014). However, this specific example was found to occur in the context of a lack of supportive relationships. Another study recognised the potential for accountability to operate in a negative way (Ahern et al., 2013) but was explicit that in the context of supportive provider relationships, it was a much more positive experience.

Crucially, the sense of support and accountability was driven not by the fear of embarrassment that might be associated with peer pressure, but by the feelings of loyalty and obligation (Ahern et al., 2013 p.255)

A positive sense of accountability and its link to engagement in healthy behaviours was also reported in relation to peers in group WMPs (Ahern et al., 2013, Furness et al., 2011, Herriot et al., 2008, Hunt et al., 2014): 'There was a team spirit and you didn't want to let the team down' (Hunt et al., 2014 p.7).

How do WMPs foster self-regulation in relation to healthy behaviours?

Moving on from accountability, which acts as an extrinsic motivator, participants described how self-awareness fostered through WMPs could lead to intrinsic motivation and self-regulation. Self-regulation of diet was described as developing in relation to awareness of behaviours. However, self-regulation of exercise was described in relation to awareness of one's own abilities (self-efficacy), and awareness or experience of the health benefits. Awareness of progress towards goals, however, was described in relation to both diet and exercise.

Self-regulating diet: Awareness of behaviours

Although some service users felt that they had no need for dietary education, service users in six studies described visually presented dietary information to be revelatory. Where this was the case, service users described this knowledge helping them to regulate behaviours (Atkinson et al., 2010, Bingham et al., 2014, Herriot et al., 2008, Gray et al., 2013a, Jones et al., 2007, Webb et al., 2014).

It just made you realise how much fat you were taking in. Terrible isn't it [...] On one occasion I didn't feel like cooking and thought I'd go to the chippy, but then I seen that and I thought I would cook. (Webb et al., 2014 p.149)

Self-regulating exercise: Awareness of self-efficacy and of benefits

Service users in three studies expressed the opinion that actually participating in group exercise as part of the intervention, as opposed to just receiving advice, increased the chances of engaging in exercise (Bidgood and Buckroyd, 2007, Gray et al., 2013a, Herriot et al., 2008). Participants indicated that making small initial changes engendered confidence to progress to more active forms of exercise (Atkinson et al., 2010, Bingham et al., 2014, Herriot et al., 2008, Hunt et al., 2013):

These changes gave some men the ability and confidence to progress to forms of physical activity (such as squash or football) which are more traditionally seen as being valued by men, activities which just weeks before they would have felt unable to contemplate (Hunt et al., 2013 p.61)

In addition to increased self-efficacy, provision of exercise meant that service users were quite quickly able to appreciate the benefits of exercise. 'Because I can see the results you know I've seen my blood pressure go down and I've seen my fitness levels go up' (Herriot et al., 2008 p.77. In fact, focusing on the fitness **gains** made through exercise was described both as a psychological boost and as a motivator to further increase exercise in six studies (Bingham et al., 2014, Herriot et al., 2008, Hunt et al., 2013, Jones et al., 2007, Penn et al., 2008, Wormald et al., 2006), for example 'It's got me going back to the gym and stuff like that, on top of the walking' (Hunt et al., 2013 p.61).

Awareness of progress

Reviewing progress towards or achievement of goals was described in four studies as motivating further healthy behaviours (Atkinson et al., 2010, Doyle and Shaw, 2012, Hunt et al., 2013, Wormald et al., 2006). In relation to this, two studies noted how reviewing progress towards goals motivated healthy behaviours by encouraging competitiveness either with oneself (Hunt et al., 2013) or with others (Doyle and Shaw, 2012). An example of this was presented in a study of a WMP for men, in which pedometers were perceived as highly beneficial (Hunt et al., 2013):

That [pedometer] has been my Godsend. It becomes almost like, competitive with yourself. You know you're sitting at 10 o'clock at night, I've only done 8,000, I'll need to go and take the dog back out (p.61).

Moving from attendance to self-regulation

The above discussions reveal how at the outset of WMPs, users are seeking a high level of external support, i.e. a safe space and social bonds. These supportive mechanisms are also implicated in the initiation of healthy behaviours through accountability. However, it is only once behaviours have been initiated that users are able to perceive the self-efficacy and enjoy the benefits of behaviour change

that lead to self-regulation. Thus these findings suggest that WMPs will not foster self-regulation without initially providing a high level of support. As Ahern et al. (2013) concluded:

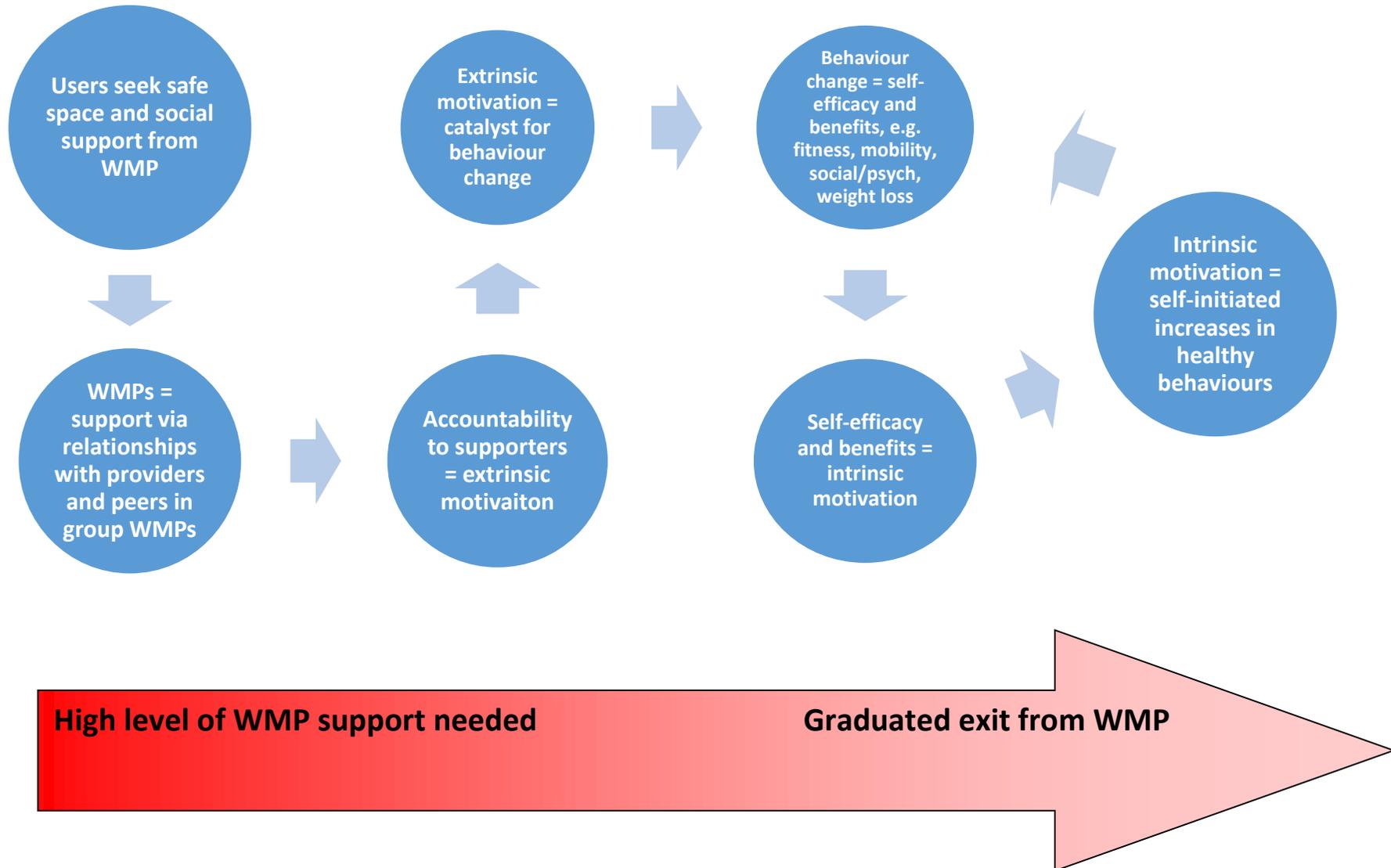
Participants' explanatory model appears to suggest weight loss interventions should balance the need to provide a sense of agency while not making the individual entirely responsible for their weight management (p.254)

It would appear that WMPs which intentionally provide a high level of support and build in a graduated exit, as described in Section 2.2.2, are likely to be the most appropriate model. In addition, as Table 2.13 illustrates, at the initiation stage of a WMP, the domains relating to support and motivation are predominantly important, with educational aspects of the programme (dietary advice, goal setting) only becoming significant at later stages. Figure 2.4 illustrates the various mechanisms that come into play along the pathway from attendance to self-regulation and the graduated decrease in the level of support needed. In the next chapter, we report on how we explored and tested these theories.

Table 2.13: Outcomes, change mechanisms and the WMP feature and domains which foster them

Initial aim: WMP attendance		Intermediate aim: Initiation of healthy behaviours		Long term aim: Self-regulation
Creation of a safe space	Social bonds	Accountability to providers	Accountability to peers	Awareness: behaviours, self-efficacy, benefits, progress
<p>Meeting user needs/preferences: targeted services mean 'you're not going to feel out of place'</p> <p>Delivery format: Group delivery = space with others 'in the same boat'</p> <p>Exercise: direct provision of exercise means a 'safe space' to exercise free from prejudice</p>	<p>Provider support: provider manner and character are fundamental to achieving 'bond'</p> <p>Meeting user needs/preferences: targeted services enhance the development of peer bonds</p> <p>Delivery format:</p> <ul style="list-style-type: none"> • Group delivery is prerequisite for peer bonds • face-to-face is key to provider bonds 	<p>Provider support: provider manner and character are fundamental to achieving 'bond', which is in turn fundamental to achieving a positive (rather than negative) sense of accountability</p>	<p>Meeting user needs/preferences: targeted services enhance the development of the peer bonds necessary for a positive sense of accountability</p> <p>Delivery format: Group delivery is prerequisite for peer bonds which are fundamental to achieving a positive (rather than negative) sense of accountability</p>	<p>Dietary advice: visual demonstrations are an engaging format to increase diet awareness</p> <p>Exercise:</p> <ul style="list-style-type: none"> • Direct provision engenders self-efficacy • Graduate intensity - confidence to progress to more active exercise • Focusing on fitness gains - psychological boost and motivates further exercise <p>Goal setting: awareness of progress motivates</p> <p>Follow on: initially a high level of support with graduated exit</p>

Figure 2.4: The WMP pathway from WMP attendance, through behaviour change initiation and self-regulation



3. Synthesis of service evaluations: Do the views of service users and providers help us to understand pathways to successful weight loss via WMPs?

This chapter reports on the synthesis of service evaluations, in which we used the findings from the views synthesis to examine the nature of WMPs evaluated in trials; we sought to test whether features *perceived* to be important are actually *associated with greater weight loss*. Section 3.1 describes the trials included and the context in which they evaluated WMP interventions; Section 3.2 reports our findings about pathways to higher effectiveness.

3.1 What evidence was examined in the synthesis of service evaluations?

3.1.1 Summary of evidence examined in the synthesis of service evaluations

- From a previous review, we identified potentially eligible trials of WMPs, and selected the 10 most effective and 10 least effective for achieving weight loss.
- All WMPs were delivered to people who were overweight or obese; some were delivered exclusively to women (n=5), men (n=1), older people (n=2), ethnic minorities (n=1) and those with other health conditions (n=2).
- 10 WMPs were evaluated in the USA and 10 were evaluated in European countries, of which 4 were evaluated in the UK.

3.1.2 The context of the 20 interventions and the trials from which they were drawn

From a previous review (Hartmann-Boyce et al., 2013b) we identified the ten interventions found to be the most effective for achieving weight loss and the ten least effective (see Section 6.5.1 for details). The interventions were evaluated in 15 trials (see Section 7.2 for a list). Several trials evaluated multiple interventions: two interventions were included from each of three trials (Hersey et al., 2012, Rock et al., 2010, Vissers et al., 2010); and three interventions were included from a fourth (Jolly et al., 2011). Mean weight loss, countries and participants of each intervention are described in Table 3.1. A more detailed summary of the trials and interventions is provided in Appendix 3.

Table 3.1: Overview of trial and intervention contexts and outcomes (n=20)

Reference (intervention arm)	Mean difference in weight loss (Kg) at 12 months between intervention and control group [CI]	Country of study	Participants
<i>Most effective interventions</i>			
Bertz et al. 2012	-6.00 [-2.49, -10.71]	Sweden	Breastfeeding women
Diabetes Prevention Program Research Group 2002a	-6.10 [-5.55, -6.65]	USA	Minority ethnic populations
Foster-Schubert et al. 2012	-8.20 [-6.81, -9.59]	USA	Post-menopausal women
Kuller et al. 2012	-5.10 [-4.02, -6.18]	USA	Post-menopausal women
Rejeski et al. 2011	-5.50 [-3.39, -7.61]	USA	Older/ cardiovascular risk
Rock et al. 2010 (centre-based)	-7.60 [-5.63, -9.57]	USA	Women

Reference (intervention arm)	Mean difference in weight loss (Kg) at 12 months between intervention and control group [CI]	Country of study	Participants
Rock et al. 2010 (telephone-based)	-6.00 [-3.95, -8.05]	USA	Women
Villareal et al. 2011	-7.80 [-5.76, -9.84]	USA	Older adults (>65 years)
Vissers et al. 2010 (fitness)	-7.40 [-3.95, -10.85]	Belgium	General overweight
Vissers et al. 2010 (vibration)	-8.30 [-4.61, -11.99]	Belgium	General overweight
<i>Least effective interventions</i>			
Eriksson et al. 2009	-0.60 [0.25, -1.45]	Sweden	Cardiovascular risk
Hersey et al. 2012 (web support only)	-0.70 [-0.03, -1.37]	USA	General overweight
Hersey et al. 2012 (web plus coaching)	-0.60 [0.08, -1.28]	USA	General overweight
Jolly et al. 2011 (GP)	0.30 [3.07, -2.47]	UK	General overweight
Jolly et al. 2011 (pharmacist)	0.40 [3.11, -2.31]	UK	General overweight
Jolly et al. 2011 (Slimming World)	-0.80 [1.82, -3.42]	UK	General overweight
Munsch et al. 2003 (clinic)	-0.70 [1.95, -3.35]	Switzerland	General overweight
Nanchahal et al. 2012	-0.30 [0.58, -1.18]	UK	General overweight
Patrick et al. 2011	-0.70 [0.56, -1.96]	USA	General overweight
Vermunt et al. 2011	-0.20 [0.42, -0.82]	Netherlands	At risk of type 2 diabetes

3.2 Findings: Synthesis of service evaluations

This section reports findings about whether particular features or ‘conditions’ and combinations of conditions are likely to lead to greater WMP effectiveness. In Section 3.2.1, we examine whether individual conditions identified as significant in the views synthesis were present in each of the 20 interventions and identify which were more common in the most effective interventions. In Section 3.2.2, we draw on the logic model described in Section 2.2.3 to explore whether particular combinations or ‘configurations’ of conditions related to change mechanisms can explain pathways to greater effectiveness.

3.2.1 Findings about individual conditions

We examined the individual conditions present in each of the 20 interventions according to a coding framework developed from the views synthesis (Appendix 4). The framework explored the absence or presence of conditions within the seven key domains identified in the views synthesis: provider support, addressing user needs and preferences, delivery format, monitoring, diet advice, exercise and goal setting. We also attempted to capture information relating to support after the WMP and attempts to address external moderators, as reported in Appendix 2. The results of this coding were reported in a ‘data table’, enabling us to explore differences between the most effective and the least effective interventions for each condition; the data table is presented in Appendix 5. Below, we describe the noteworthy findings from the data table, particularly where distinct differences between the most effective and least effective interventions were apparent; Table 3.2 provides an overview of these differences.

Which conditions appear to be necessary for higher effectiveness?

Conditions present in all of the most effective interventions and absent in all of the least effective interventions

The only condition found to discriminate perfectly between most effective and least effective interventions was having dietary goals, in the form of daily energy (calorie) intake goals, set by providers as opposed to being identified or set by service users. This finding, in line with the finding of previous reviews (Hartmann-Boyce et al., 2013a), suggests that a goal for daily energy intake may be necessary for WMP interventions to be most effective.

Conditions present in all of the most effective interventions and absent in some of the least effective interventions

Three conditions which were present in all of the most effective interventions and absent in some, but not all of the least effective interventions, may also be necessary for high effectiveness. Conditions in this category included another goal setting condition - exercise goals set by providers - and two provider support conditions: whether provider relationships were described as part of the intervention, and a more specific condition of whether interaction with providers was used to individualise support.

Which conditions appear more likely to be associated with high effectiveness?

Conditions present in the majority ($n \geq 7$) of the most effective interventions and absent in the majority of the least effective interventions

Six conditions within four domains were present in seven or more of the most effective interventions and absent in seven or more of the least effective interventions. Domains and conditions (in brackets) included: provider relationships (a high level of provider availability, dietician); meeting user needs and preferences (population targeting); delivery format (high intensity, graduated exit); exercise (direct provision of exercise); and goals (provider-set weight goals). Since these conditions are not present in all of the most effective interventions, they cannot be considered *necessary* for success; however, high effectiveness appears to be more likely when such conditions are present.

Which conditions appear to be associated with lower effectiveness?

Three goal-setting conditions that were present in some of the least effective interventions but absent in all of the most effective interventions indicate that having user-defined goals for diet, exercise and weight is less effective for weight loss than provider-defined goals. Conversely, provider-set weight goals, as noted above, were associated with high effectiveness.

Which conditions do not appear to distinguish between the most effective and least effective interventions?

Several conditions were reported fairly commonly but were present in similar numbers of the most effective and least effective interventions. These conditions (in brackets), grouped by domain, were: monitoring (weight monitoring, private weight monitoring, diet monitoring); delivery format (face-to-face sessions, remote sessions, individual sessions); diet (practical diet information); exercise (tailored to fitness levels, graduated intensity); external moderators (problem solving/relapse prevention; tailored problem solving/relapse prevention).

Which conditions do we need more information on?

Several conditions were present in few interventions across both the most effective and least effective ones ($n \leq 5/20$), and their relevance for weight management is difficult to establish; meeting user needs and preferences (flexible programmes, health risk group targeting); monitoring (diet monitoring made easy); delivery format (remote delivery only, combination of face-to-face and remote, group delivery only); diet (visual demonstrations, de-emphasising diet), exercise (focus on fitness gains, highlight services available) and other (competition emphasised, mental well-being emphasised, fun emphasised).

Table 3.2: Overview of conditions which distinguish between the most effective and least effective interventions

Domain	Condition	Most effective (n=10)	Least effective (n=10)
<i>Conditions present in all of the most effective interventions and absent in all of the least effective interventions</i>			
7. Goals	Energy (calorie intake) goal set by provider	10	0
<i>Conditions present in all of the most effective interventions but absent in some of the least effective interventions</i>			
1. Provider support	Provider relationships described as part of the intervention	10	6
1. Provider support	Provider role = interaction to ensure individualised support	10	5
7. Goals	Exercise goals set by provider	10	1
<i>Conditions present in the majority of the most effective interventions (n≥7) and a minority of the least effective interventions (n≤3)</i>			
1. Provider support	High level of provider availability	8	3
2. Meeting user needs and preferences	Intervention targeted at a specific population	8	1
3. Delivery format	Graduated exit	8	2
3. Delivery format	High intensity	9	2
6. Exercise	Direct provision of exercise	7	1
7. Goals	Weight goal set by provider	7	3
<i>Conditions present in some of the least effective interventions but absent in all of the most effective interventions</i>			
7. Goals	User-identified weight goals	0	4
7. Goals	User-identified diet goals	0	5
7. Goals	User-identified exercise goals	0	6

3.2.2 Findings about combinations of conditions: pathways to effectiveness

In this section we focus on particular combinations of conditions, referred to in qualitative comparative analysis (QCA) as ‘configurations’. Drawing on the views synthesis findings, we examined configurations of conditions implicated in mechanisms of behaviour change. In particular we focused our attention on configurations of conditions anticipated to foster provider relationships and peer relationships, since both were perceived to foster attendance at WMPs and initiation of behaviour change (See Section 2.2.3). Configurations also include WMP conditions that the views synthesis indicated were necessary for long-term weight loss as they were implicated in self-regulation (direct provision of exercise and graduated exit).

Provider relationships

We examined configurations of conditions relating to two models of provider relationships: provider directiveness and provider alliance. The provider directiveness model reflected the perceived need for a high level of guidance or direction from providers. Four conditions were included in this model: direct provision of exercise, provider-set energy-intake goals, provider-set weight goals and provider-set exercise goals. The provider alliance model reflected the quality of the relationship with providers. Four conditions were included in this model: one reflecting the quality of the relationship (provider relationships emphasised), and three reflecting the degree of opportunity for a relationship with providers to develop (direct provision of exercise, high intensity and graduated exit).

‘I need someone to take my hand and take me over’: Model 1 - provider directiveness

Each of the individual conditions included in the provider directiveness model discriminated between the most effective and least effective interventions, as illustrated in Table 3.3.

Table 3.3: Number of most effective and least effective interventions with conditions in the provider directiveness model

Condition	Most effective	Least effective
Direct provision of exercise (n = 8)	7	1
Provider-set energy-intake goals (n = 10)	10	0
Provider-set weight goals (n = 10)	8	2
Provider- set exercise goals (n = 11)	10	1

We identified interventions representing six of a total of 16 possible configurations in this model (4 x 4 conditions); each of the six configurations is presented in Table 3.4, together with the number of interventions.

Table 3.4: Configurations represented in the provider directiveness model

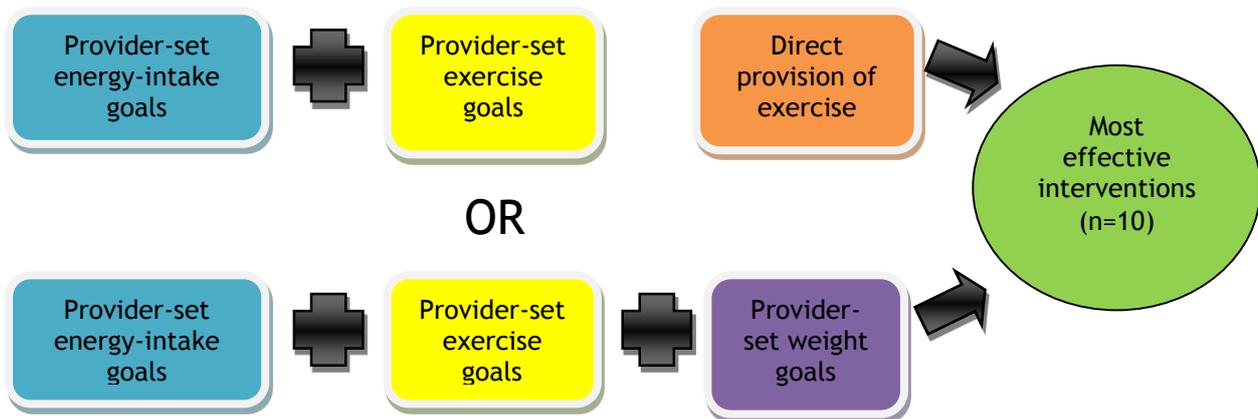
Direct provision of exercise	Provider-set weight goals	Provider-set energy-intake goals	Provider-set exercise goals	Number of the most effective interventions	Number of the least effective interventions
Present	Present	Present	Present	5	0
Absent	Present	Present	Present	3	0
Present	Absent	Present	Present	2	0
Present	Absent	Absent	Present	0	1
Absent	Present	Absent	Absent	0	2
Absent	Absent	Absent	Absent	0	7

None of the six configurations represented by the included interventions were contradictory i.e., all included either most effective interventions or least effective interventions but not both (see Table 3.4). We judged that the configurations in this model (or ‘truth table’) had good spread

across the included interventions. ‘Logical remainders’, or configurations of conditions for which we did not have any studies in our dataset (ten in this case) are discussed later.

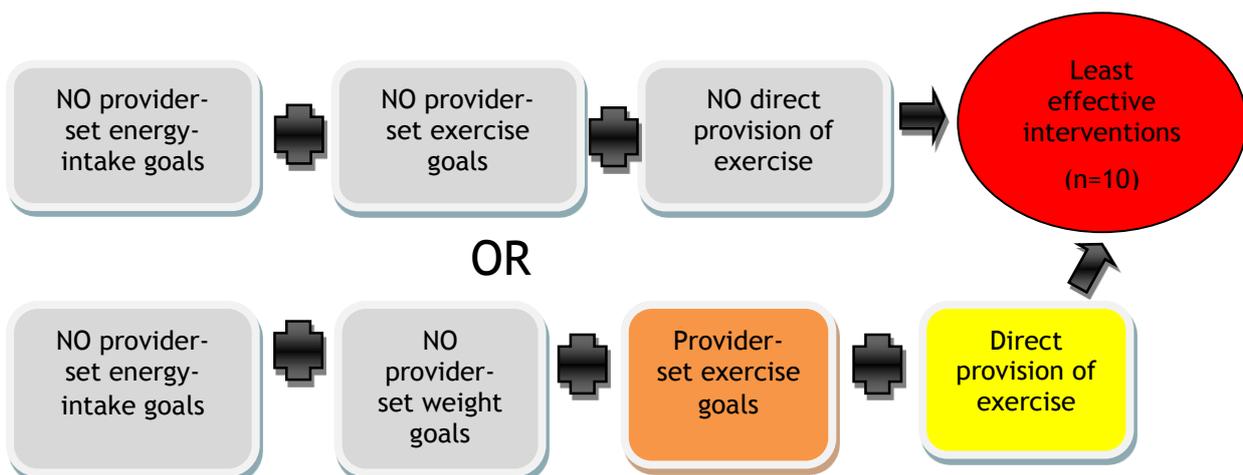
Based on Table 3.4 we identified the simplest possible expression of configurations (see Section 6.5.5 for details). This identified two possible pathways to high effectiveness (illustrated in Figure 3.1). Both were characterised by the presence of provider-set energy-intake goals and provider-set exercise goals with the presence of either direct provision of exercise or provider-set weight goals. These pathways were completely consistent (i.e., there were no least effective studies with these configurations) and had good coverage (i.e. they represented all ten most effective interventions).

Figure 3.1: Pathways to high effectiveness via provider in the provider directiveness model



Our analysis of the provider directiveness model revealed two pathways to *least* effectiveness, as represented in Figure 3.2. One pathway was the absence of provider-set energy-intake goals, provider-set exercise goals and direct provision of exercise, regardless of the presence or absence of provider-set weight goals. This pathway characterised nine of the ten least effective interventions. An additional pathway to least effectiveness that covered the remaining least effective intervention included, alongside a lack of provider-set energy-intake goals, an absence of provider-set weight goals even when direct provision of exercise and provider-set exercise goals were present in the intervention.

Figure 3.2: Pathways to least effectiveness in provider directiveness model



In summary, to be most effective, interventions should involve a high level of direction from providers, including provider-set behavioural directives addressing both energy intake and expenditure. The absence of either a provider-set energy intake goal or a provider-set energy expenditure goal will result in reduced effectiveness.

We now turn to a discussion of ‘logical remainders’, or configurations of conditions for which we did not have any studies in our dataset, to theorise what we would expect to happen in an intervention with these conditions.

Table 3.5: Logical remainders represented in the provider directiveness model

Direct provision of exercise	Provider-set weight goals	Provider-set energy-intake goals	Provider-set exercise goals	Number of most effective interventions	Number of least effective interventions
Present	Present	Present	Absent	0	0
Present	Present	Absent	Present	0	0
Present	Present	Absent	Absent	0	0
Present	Absent	Present	Absent	0	0
Present	Absent	Absent	Absent	0	0
Absent	Present	Present	Absent	0	0
Absent	Present	Absent	Present	0	0
Absent	Absent	Present	Present	0	0
Absent	Absent	Present	Absent	0	0
Absent	Absent	Absent	Present	0	0

Based on our analysis, we believe that most of the logical remainders in our provider directiveness model are more likely to lead to less effective rather than more effective interventions. As discussed in Section 2.2.3, interventions need initially to provide a high level of support and directiveness, but also incorporate some conditions which foster self-regulation. The only condition in this model perceived as fostering self-regulation is direct provision of exercise; thus we conclude that all five remaining configurations without this condition would probably be least effective. In addition, the above analyses indicate that the presence of provider-set energy-intake goals is also a necessary condition for high effectiveness; these were present in both causal pathways to effectiveness identified (Figure 3.1), and absent in both pathways to least effectiveness (Figure 3.2). Thus we conclude that the three configurations with direct provision of exercise but without provider set energy-intake goals would also probably lead to lower effectiveness.

However, it is possible that the remaining two logical remainders, combining direct provision of exercise with provider-set energy-intake goals, could be effective.

'You feel that somebody's batting for you': Model 2 - fostering a provider-user alliance

Each of the four conditions in this model discriminated between the most and least effective interventions. As shown in Table 3.6, all 10 of the most effective interventions emphasised provider relationships but not all of the least effective interventions. With regard to the other three conditions in this model, as shown below, their presence was much more likely in the most effective than in the least effective interventions.

Table 3.6: Number of the most effective and least effective interventions with conditions in the provider-user alliance model

Condition	Most effective	Least effective
Provider relationships emphasised (n = 16)	10	6
Graduated exit (n = 10)	8	2
High intensity (n = 11)	9	2
Direct provision of exercise (n = 8)	7	1

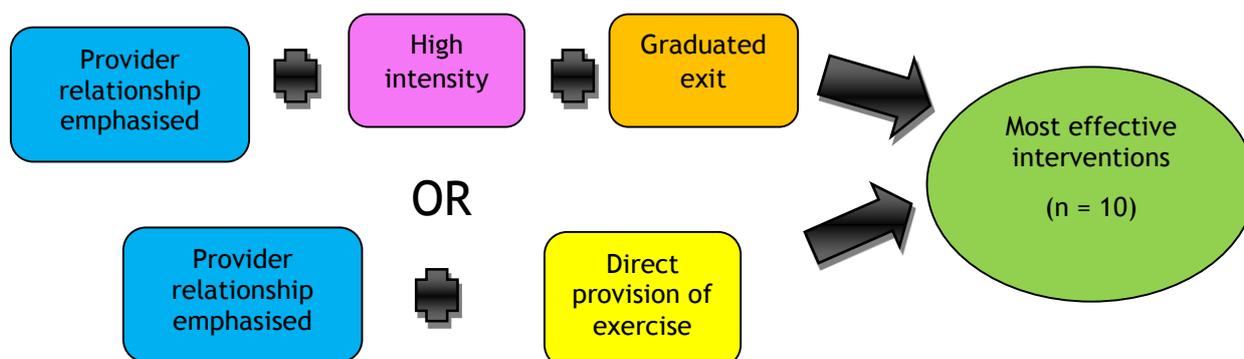
Our included interventions represented 9 of a total of 16 possible configurations (4 conditions x 4) in this model; each of the nine configurations is reported in Table 3.7, together with the number of interventions.

Table 3.7: Configurations represented in the provider alliance model

Direct provision of exercise	Provider relationships	Graduated exit	High intensity	Number of most effective interventions	Number of least effective interventions
Present	Present	Present	Present	5	0
Present	Present	Absent	Present	1	0
Present	Present	Absent	Absent	1	0
Absent	Present	Present	Present	3	0
Present	Absent	Present	Present	0	1
Absent	Present	Present	Absent	0	1
Absent	Present	Absent	Absent	0	5
Absent	Absent	Absent	Present	0	1
Absent	Absent	Absent	Absent	0	2

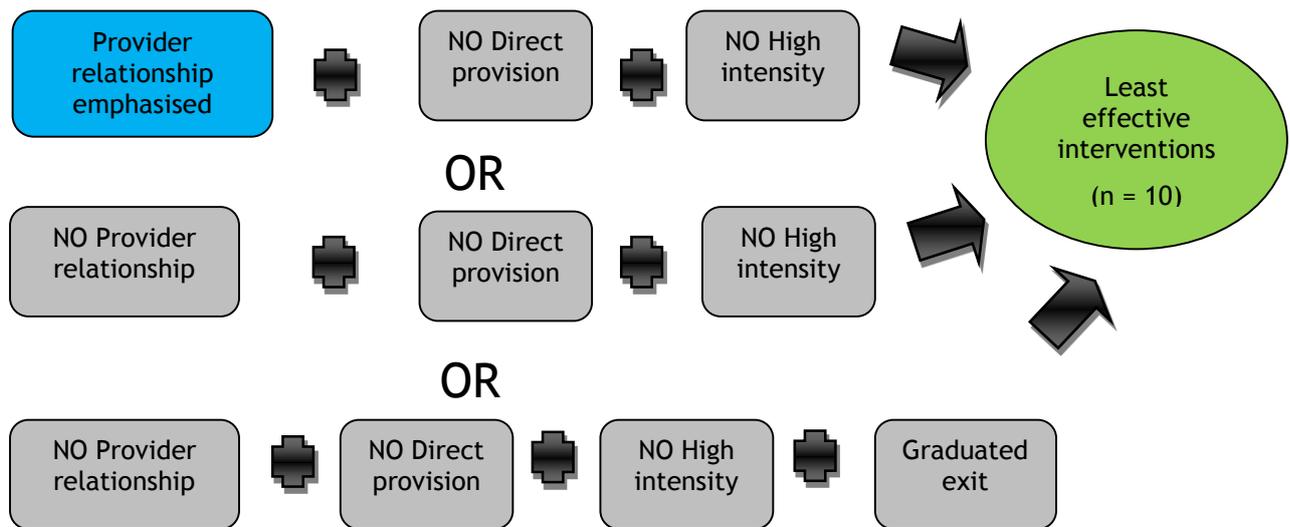
None of the nine configurations represented were contradictory, i.e., all included either the most effective interventions or the least effective interventions but not both. As with our analysis of provider directiveness, we judged that the configurations in this model had good spread across the included interventions. ‘Logical remainders’, or configurations of conditions for which we did not have any studies in our dataset (seven in this case) are discussed later.

Our analysis, which was both completely consistent and covered all the most effective interventions, revealed two pathways of provider support to effectiveness. Both pathways were characterised by the presence of provider relationships in the description of the intervention. Additionally, to be effective, interventions required either a combination of graduated exit and high intensity of provision or direct provision of exercise.

Figure 3.3: Provider alliance pathways to high effectiveness

Our analysis for least effectiveness was completely consistent and covered all of the least effective interventions. It revealed three pathways to intervention least effectiveness. One pathway, which characterised six of the least effective interventions, revealed that interventions with provider relationships present but without both direct provision of exercise and high intensity had reduced effectiveness. The other two pathways, which together accounted for the remaining four least effective interventions, were both characterised by lack of emphasis on provider relationships. One pathway included a lack of direct provision of exercise and of graduated exit. The other pathway was characterised by the absence of all the other conditions in the model.

Figure 3.4: Provider alliance pathways to least effectiveness



In summary, provider relationships appear to be a necessary condition for high effectiveness, but on its own this condition is not sufficient. To be most effective, interventions also need to include a mechanism for encouraging self-regulation, either direct provision of exercise or an intentionally graduated reduction in support after an initial more intensive period. The absence of either provider relationships or conditions which foster self-regulation will result in reduced effectiveness.

Table 3.8: Logical remainders in the provider alliance model

Provider relationship	Direct provision of exercise	High intensity	Graduated exit	Number of most effective interventions	Number of least effective interventions
Present	Present	Absent	Present	0	0
Absent	Present	Absent	Present	0	0
Absent	Present	Absent	Present	0	0
Absent	Present	Absent	Absent	0	0
Present	Absent	Present	Absent	0	0
Absent	Absent	Present	Present	0	0
Absent	Absent	Absent	Present	0	0

As Table 3.8 illustrates, we identified seven possible configurations in the provider alliance model that were not present in any of the included interventions. We concluded that five of these logical remainders would probably lead to lower effectiveness, since they were characterised by the absence of provider relationships. Throughout our qualitative synthesis, a theme that emerged was the centrality of relationship with the providers of the intervention as critical to successful weight management. This was borne out in our analysis, as all pathways to effectiveness included provider relationships.

This leaves two logical remainders to discuss. One logical remainder includes provider relationships and high intensity, but lacked direct provision of exercise and graduated exit. We believe that this intervention would be likely to be least effective, as it would not contain the conditions necessary to foster self-regulation in participants. However, the second logical remainder, which includes direct provision of exercise, provider relationships and graduated exit, but not high intensity, is likely to be effective because the combination of provider relationships and direct provision of

exercise would, based on our qualitative synthesis, create the conditions for continued exercise and weight management.

'You wanted to come back and hear how the guys were getting on': Model 3 - fostering peer relationships

The model we present for fostering peer relationships includes two conditions: delivery via group sessions (a prerequisite for peer relationships) and targeting a specific population group, which was perceived to enhance the likelihood of peer relationships developing in the views synthesis. As illustrated in Table 3.9, the majority of the most effective interventions included one or other of these conditions, whilst they were present in only a minority of the least effective interventions.

Table 3.9: Number of the most effective and least effective interventions with conditions in the fostering peer relationships model

Condition	Most effective	Least effective
Targeting a specific population group (n = 9)	8	1
Group work (n = 11)	7	4

We identified interventions representing all four possible configurations (two conditions x 2) in this model; each of these configurations is reported in Table 3.10, together with the number of interventions.

Table 3.10: Configurations represented in the fostering peer relationships model

Targeting a specific population group	Group work	Number of most effective interventions	Number of least effective interventions
Present	Present	5	0
Absent	Present	2	4
Present	Absent	3	1
Absent	Absent	0	5

As can be seen in Table 3.10, we had a good spread of cases across all possible configurations of conditions. There were no logical remainders in our analysis (i.e., all possible configurations were represented). Two configurations were completely consistent. All five interventions with population targeting and group work were most effective, and all five interventions without population targeting and without group work were least effective.

However, two configurations were contradictory. One contradictory configuration was characterised by the presence of group work with the absence of population targeting. Of the six interventions with this configuration, two were most effective and four were least effective. The second contradictory configuration was the opposite - that is, it included population targeting in the absence of any group work. Four interventions included this configuration, of which three were effective.

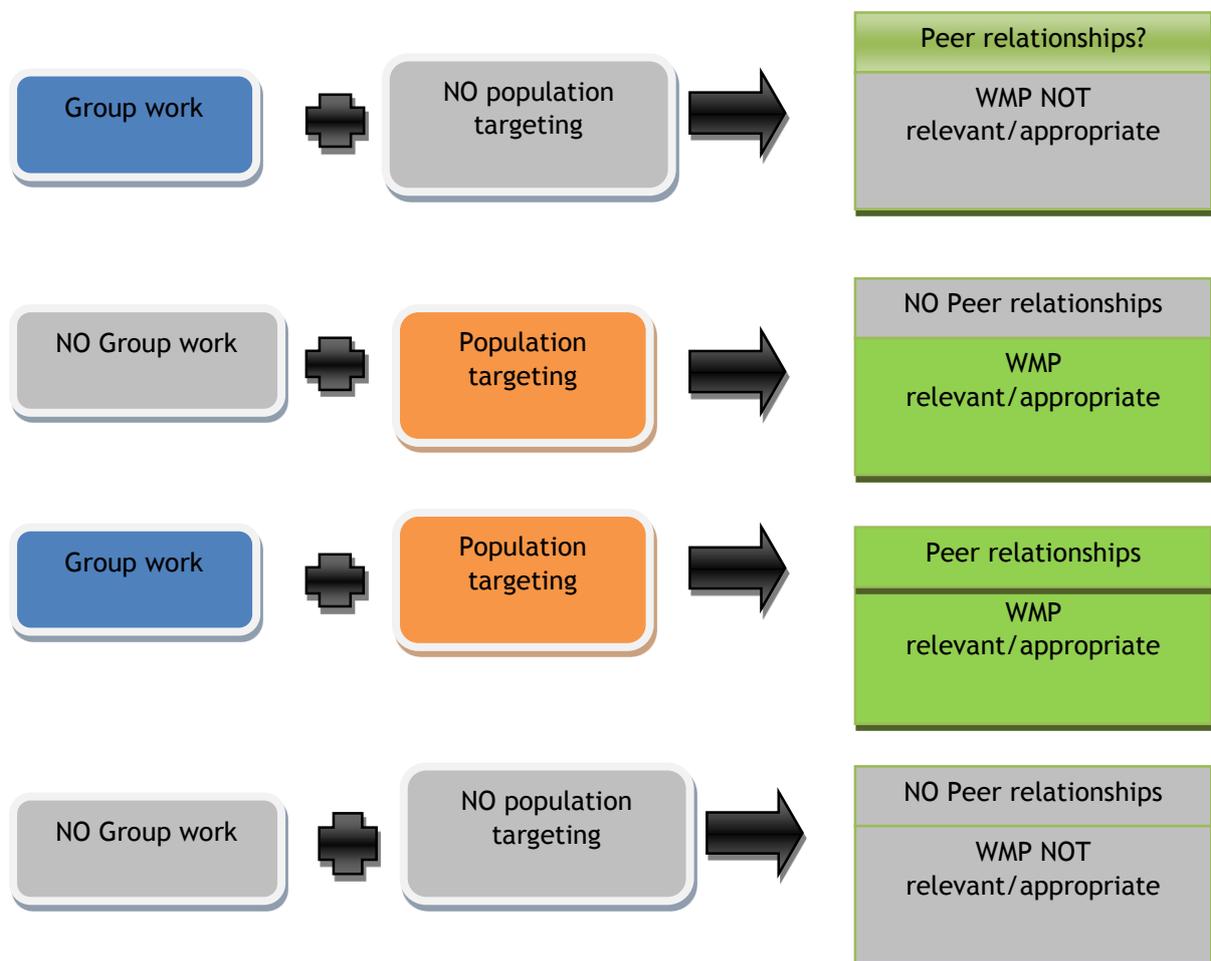
We pursued several lines of enquiry to resolve these contradictory configurations. We examined the possibility of health risk group targeting alongside population group targeting and group work, but this did not yield additional insights, nor did it help resolve any of the contradictory configurations. We also revisited those studies involving group work and noted that interventions with group work split between group discussions oriented didactically and group discussions oriented therapeutically (e.g. using behavioural therapy). We then revisited our models, using either presence of therapeutic groups or presence of didactic groups as a condition alongside population group targeting and risk group targeting. But this also identified several contradictory configurations and yielded minimised solutions that exhibited neither adequate consistency nor satisfactory coverage. We were unable to theorise additional reasons, and thus additional lines of enquiry to resolve these contradictions, without departing from the data that guided these analyses.

However, without amending the model, we were able to theorise a logical explanation. The model suggests that whilst *either* group work *or* targeting may be sufficient for achieving high effectiveness, the presence of both conditions appears to ensure higher effectiveness; drawing on

the views synthesis, we concluded that the presence of both conditions ensures that the full value of each is 'unlocked' as follows:

- a) The presence of group work *alone* may encourage peer relationships, which was perceived to increase the likelihood of WMP attendance (through social bonds) and initiation of healthy behaviours (through peer accountability).
- b) The presence of population targeting *alone* will help to ensure that relevant and appropriate services meeting user needs are delivered, which can apply whether the intervention is provided to groups or individuals.
- c) However, evidence from the views synthesis indicated that when population targeting is present *in conjunction* with delivery to groups it created a short-cut to, or enhanced the likelihood of, beneficial peer relationships because of the presence of similar others in the group. Thus, if population targeting is present on its own, only one of its two beneficial mechanisms are unlocked, and if group work is present on its own, the likelihood of peer relationships forming is diminished.

Figure 3.5: Pathways to effectiveness via peer relationships



Summing up: Which WMP characteristics, and combinations of characteristics, are associated with successful weight loss?

The above analyses illustrate that fostering supportive relationships with either providers or peers, as well as efforts to encouraging self-regulation, are fundamental to the success of WMPs. Whilst the most effective WMPs are characterised by these features, the least effective WMPs are characterised by their absence.

4. Case studies: How do the reviews findings resonate with local authority experiences?

In the final stage of the review we conducted case studies with two local authorities (LAs). The work involved open-ended interviews with key LA staff covering:

- a) the nature of the WMPs currently provided and how the provision corresponds with the findings of this review.
- b) the process of commissioning WMPs and implications of the review for future decisions.
- c) how current provision is monitored and evaluated.
- d) how to present the findings of the review in a report for use by LAs in the UK.

To draw out the implications of our review findings for LA commissioning and the provision of Tier 2 weight management services in the UK, we met with professionals from two LAs and looked for recent research and policy documents in this area. As described in Section 6.6.1, the two LAs, Birmingham and Rotherham, were selected to reflect differences in their characteristics, variation in levels of deprivation and ethnicity and variation in weight management strategy. In this section, we complement the results of our discussions with key staff from LAs with the findings from another recent study in which public health commissioners, service providers and service users contributed their perspectives on barriers and facilitators to weight loss maintenance within services (Poltawski and Greaves, 2014). Table 4.1 presents key aspects of LA work, focusing on the kinds of services that have recently been provided, the main challenges experienced and areas currently under review or development. The findings from the Poltawski and Greaves (2014) study are presented as the first column. Information is provided on our case study LAs in the next two columns to emphasise differences in approach.

Table 4.1: Overview of examples of local authority Tier 2 weight management service provision

	Poltawski and Greaves (2014) description of LA provision	Case study Las' details of current provision and plans	
		Birmingham	Rotherham
Participants in discussion	<ul style="list-style-type: none"> 12 commissioners responsible for/advising on Tier 2 weight management services in 10 English LAs (in W, SW and N England or London) and Public Health England 13 providers of Tier 2 services and health care practitioners attending a diabetes prevention workshop 22 people with experience of intentional weight loss 	<ul style="list-style-type: none"> Commissioning Lead for Lifestyles Regional Lead for Public Health England 	<ul style="list-style-type: none"> Public Health Specialist, Rotherham Council Head of Health Improvement, Rotherham Council Contractor for an organisation providing Tier 2 service Operations Manager for a Tier 2 service
Council type ¹	-	<ul style="list-style-type: none"> City Council Largest urban area outside London. Population of over one million people 	<ul style="list-style-type: none"> Metropolitan Borough Council Urban population of around 258,000
Population characteristics ¹	-	<ul style="list-style-type: none"> 56% living in the 20% most deprived areas in England Relatively low levels of White British (53.1%). Other large groups include Pakistani (13.5%), Indian (6.0%) and Black Caribbean (4.4%)³ Rate of adult obesity: 23% 	<ul style="list-style-type: none"> 33% living in the 20% most deprived areas in England 91.9% are White British² Rate of adult obesity: 28.5%
Commissioning cycle stage	-	<ul style="list-style-type: none"> Currently developing a strategy for tendering in 2016 	<ul style="list-style-type: none"> Commissioned new provision in April 2015. About to evaluate the first set of six-month follow-up data Originally commissioned service commenced 2009/2010

	Poltawski and Greaves (2014) description of LA provision	Case study LAs' details of current provision and plans	
		Birmingham	Rotherham
Service management model	<ul style="list-style-type: none"> Referral typically is to a 'lifestyle hub' for eligibility screening, advice on available programmes and onward referral 	<ul style="list-style-type: none"> Tier 2 referrals handled separately from other weight management referrals Planning a move to integrated services 	<ul style="list-style-type: none"> One contractor manages recruitment and triage through a single point of access for all weight management services, which include the adult Tier 2 programme 'Shape Up', Tier 2, 3 and 4 programmes for children and families, and adult Tier 3 programmes under the brand name Weigh Up⁴ The contractor is a provider of leisure centres in Rotherham and other LAs LA investment in a web-based data management system has simplified client identification and referral, case management and service monitoring and evaluation
Referral	<ul style="list-style-type: none"> Usually referral is by health professionals A small number were using/ planning self-referral 	<ul style="list-style-type: none"> GP referral 	<ul style="list-style-type: none"> Self and health professional referral
Targeting of specific populations	<ul style="list-style-type: none"> Targeting of deprived areas or people from lower socio-economic groups is common 	<ul style="list-style-type: none"> Is planning for the provision of adapted programme/s that address the demographics of people who are not engaging with current provision 	<ul style="list-style-type: none"> The reach includes all deprived LA areas Has recently increased outreach to engage people from Black and Minority ethnic groups
Range of Tier 2 services on offer	<ul style="list-style-type: none"> Ranged from 1-5 options Usually including at least one commercial slimming organisation Could also include services run by LA leisure or other in-house services, charities, community 	'Lighten Up' <ul style="list-style-type: none"> 12 weeks free Choice from three commercial organisations (Slimming World, 	'Shape Up' <ul style="list-style-type: none"> Model developed at UCL and delivered in partnership by the contractor 10 weeks free 1-1 consultations and group sessions

What are the critical features of successful Tier 2 weight management programmes?

	Poltawski and Greaves (2014) description of LA provision	Case study Las' details of current provision and plans	
		Birmingham	Rotherham
	<p>interest companies, and GP practices and other NHS-based groups led by clinicians</p> <ul style="list-style-type: none"> In-house and clinical providers tend to provide tailored services for particular client groups 	<p>Weight Watchers, or Rosemary Conley), or</p> <ul style="list-style-type: none"> My choice (pharmacy led one-to-one guidance) 	<ul style="list-style-type: none"> Held at leisure centres across the borough Includes free 12 week gym membership for Shape Up participants (funded by the provider)

1. Unless specified, figures are from 2015 PHE Health Profiles (www.healthprofiles.info)
2. http://www.rotherham.gov.uk/jsna/info/23/people/54/ethnicity_and_cultural_identity
3. www.birmingham.gov.uk/census
4. <http://www.placesforpeopleleisure.org/centres/rotherham-leisure-complex/sha>

The following sections discuss the findings of the review. In particular, these centre on WMP features as examined in the synthesis of service evaluations: Section 4.1 considers commissioners' views and experiences relating to provider support, Section 4.2 considers self-regulation and Section 4.3 focuses on the targeting and tailoring of services to meet user needs and preferences. Lastly, commissioners discussed many factors of their overarching service provision and coordination which they felt impacted on the delivery of successful WMP services; these are reported in Section 4.4.

4.1 Provider support: Fostering WMP engagement and initiation of healthy behaviours

Both of the LAs and the Poltawski and Greaves (2014) study corroborated the review findings about the critical nature of supportive relationships with providers. Although in their study, Poltawski and Greaves did not elaborate on which particular provider qualities are key, the pivotal role of providers in the success of WMPs is acknowledged. When we shared the review findings with local authorities, commissioners at both Birmingham and Rotherham noted the findings on the necessity of good-quality provider relationships as resonating with their own experiences and, in the case of Birmingham, their own research. Moreover, even before the sharing of findings at Rotherham, discussions with providers illustrated their view of relationship building with service users as key to engagement. See Table 4.2 for examples.

There was less resonance, however, with regard to aspects of provider relationships beyond the quality of relationship and engagement. With regard to provider directiveness, this was discussed only by the team at Rotherham, and providers there justified the fact that they did not set explicit weight or energy intake goals: 'We don't want to put a figure on somebody's success - behind the scenes we do.' The benefits of peer support were not discussed at either of the LAs and neither was the association between relationships and initiation of healthy behaviours.

Table 4.2: Example evidence on the importance of high-quality provider relationships

Source	Evidence on high-quality provider relationships
Poltawski and Greaves (2014)	'Trainer quality was seen as key to the success of weight management programmes' (p. 12)
Birmingham Local Authority	In response to the findings: 'I'd support that from some of the findings that we've had from our research. It's more about that local understanding and communication ... rather than that expertise around that medical approach to what we offer' (LA Commissioning Lead for Lifestyles)
Rotherham Local Authority	Prior to sharing the findings: 'We have focused on making sure they've got that initial quality contact, built that relationship - they want to come for week one because they've got that strong relationship' (Provider view) In response to the findings: 'Non-judgemental attitude of providers is absolutely key' (LA Public Health Specialist)

4.2 Self-regulation: Physical activity and graduated exit

As illustrated in Section 2.2.3, the evidence indicates that both supervised physical activity and an intentional stepped reduction in support foster self-regulation and maintenance of healthy behaviours. When sharing the findings on physical activity and self-regulation, both local authorities recognised the need to increase the focus of WMPs on physical activity. The commissioner at Birmingham described physical activity as promoting 'linked-in engagement'. The team at Rotherham described the location of their service within leisure centres across the borough as helping service users to overcome several barriers to participating in physical activity. First, in terms of encouraging them to become familiar with physical activity settings 'with it being based in leisure centres themselves we've already broken down that barrier of being in there - "the only thing I need to do is go downstairs and put my costume on!"'. Second, they were explicit that they could also capitalise on the user-provider relationships they had established 'when we tendered for

this we said we wanted to create a hub - so providers say “If you’re going to come to workshops - I also do some classes downstairs - so it’s going to be me downstairs!” - so you know build on that link’. Third, the provider at Rotherham offered and funded free gym membership as an incentive to those who attended at least seven of the ten WMP sessions offered; 35% of those who had taken up the free gym offer had gone on to pay for a gym subscription, underscoring the finding that introduction to physical activity leads to self-regulation and maintenance of healthy behaviours.

However, whilst the findings of the Poltawski and Greaves (2014) study directly addressed the issue of a graduated exit to foster self-regulation, neither of the LAs elaborated on this issue following the presentation of the review findings. In fact, with respect to the length of programme, whilst Poltawski and Greaves found that a three-month programme was perceived as insufficient to support maintenance, commissioners at Rotherham noted that the long-term nature of the trials included in the QCA meant that they did not resemble the typical 12-week programme offered in Tier 2 services. Nevertheless, providers at Rotherham did describe an event which they recently staged to attract both new recruits to the service and those who had completed the programme. The event was designed so that those from their initial programme cohort (April 2015) could attend a ‘relaxed drop-in session’ at the leisure centre enabling former service users to: a) catch up with peers and providers; b) share success stories with new recruits to the service (September 2015); and c) undergo a six-month outcome assessment. The team described needing to think creatively about how to encourage former service users to return for assessments; the innovative approach combining assessment with ongoing engagement attracted around 40% of the original cohort.

Table 4.3: Example evidence on activities which foster self-regulation: direct provision of physical activity and graduated exit

Source	Evidence
Poltawski and Greaves (2014)	Graduated exit - ‘Support levels should be graded so that they are intensive initially and gradually tapered as appropriate for the individual’ (p.13) Ongoing support - ‘most agreed that more than three months was needed if both weight loss and maintenance were to be adequately addressed’ (p.3)
Birmingham Local Authority	Physical activity - ‘This is something we’ve found in a lot of our research and evaluations, that linked-in engagement around physical activity ... not just in sustainability model, but emphasising that in importance rather than specifically working around calorie restriction ... which is what has been traditionally offered’
Rotherham Local Authority	Physical activity - ‘We don’t do any direct provision of physical activity in group sessions, but ... we’re quite lucky as many on our team are physical activity specialists as much as they are nutrition specialists, so if there are barriers they can advise on the right kinds of exercise to get them over hurdle.’ (Provider) ‘Which is clearly what we didn’t have in our previous intervention which was purely dietetic-based’ (Commissioner)

4.3 Meeting service-user needs and preferences: Flexibility in the WMPs and in the service delivery model

Further corroborating the findings of this review, meeting the needs of specific groups and individual service users was a strong theme in the research by Poltawski and Greaves (2014) and in discussions with each of the LAs. Meeting the needs of different population groups was discussed, as well as the need for flexibility in programmes and in the overarching service model. The commissioner from Birmingham discussed the notion of flexibility in relation to the model of service provision, describing the authority’s plans to move from a ‘universal offer’, i.e. a single type of programme offered to all participants, to the offer of a range of different programmes. In the new model, commercial services (which appear to attract white British women of higher socio-economic status) will be offered alongside programmes targeted at other priority populations, such as men, minority ethnic groups and those with learning disabilities or mental health problems. As such, evidence on what to provide for different groups was considered vital, highlighting significant gaps in the research evidence examined for this review. We found little evidence on the views of people from minority ethnic groups and none on those with learning disabilities or mental health problems. In discussions at Rotherham, flexibility in the weight management programme provided was

emphasised rather than in the service model. Rotherham's new service involves a single programme but aims to ensure that it is sufficiently flexible to adapt to the needs of different individuals and population groups. The team also described efforts to reach out to different communities, such as minority ethnic communities and men. Flexibility in Rotherham comes not from providing multiple services, but through engagement between service providers and commissioners. The community-based leisure providers work intensively and continuously with commissioners to adapt the service so it can respond to identified local needs.

Table 4.4: Example evidence on meeting service-user needs and preferences

Source	Flexibility of service and tailored programmes	Population targeting
Poltawski and Greaves (2014)	<p>Service and programme 'Assuming adequate resources were available, there was broad agreement on several features of an ideal weight loss maintenance service. It would include a range of programmes that address the needs and preferences of different segments of the overweight population, and the different stages individuals are at in the "weight management journey". Programmes would be flexible and deliverable in a variety of formats.'</p>	<p>'Commissioners and providers should promote, co-opt and support local community engagement in the provision and leadership ... [to] help tailor programmes to local circumstances and demographics.'</p>
Birmingham Local Authority	<p>Service 'We'll still in part have a universal programme - but ... it's that realisation that the model needs be more flexible, in past we had a one size fits all approach that was very much focused around Slimming World or Weight Watchers ... but it's not necessarily representative of the issues and barriers that some of our demographic has in Birmingham.'</p>	<p>Minority ethnic groups 'What we need to do is create a third tier which has more of a local adapted programme addressing the specific demographic of Birmingham.'</p> <p>Gender 'There's a real lack of male engagement in terms of accessing - it's down to the offers in place - in terms of focus on slimming.'</p> <p>Learning disabilities and mental health - 'A greater level of support may be required.'</p>
Rotherham Local Authority	<p>Service and programme 'In our Tier 2 programme we try to make it as bespoke as possible and spend enough time with a person to get the desired outcome ... We up skill our team members through training - so we can respond to an individual; if you've got a person who is ready to change and suddenly starts talking about physical activity the best practice is given to that person at that essential point in time. About 70-80% of us are physical activity specialists and nutritionists ... so we're confident to adapt ... being a leisure provider there's a lot of training that goes on to get that broad knowledge and skill set ... [and we have a] diversified team ... mix of people of different ages, backgrounds' (Provider)</p> <p>Service flexibility - adapting to needs 'We're launching a service at a local</p>	<p>Minority ethnic groups 'We will go out into community venues; we will go out into Mosques build up that relationship. We've got team members from BME communities - from the local area - so we can make links with elders.' (Provider)</p> <p>Gender 'We disproportionately represent women over men - I don't think we're different to many other services there ... I'd challenge anybody to say they're doing it really, really well.' (Commissioner)</p> <p>Learning disabilities 'One area we're struggling with is learning disabilities. A standard approach doesn't meet their needs. Trying to find ways that our services can better engage with those groups ... it's often about getting a family member engaged.' (Service commissioner)</p>

Source	Flexibility of service and tailored programmes	Population targeting
	football ground to try to attract some men' (Service provider)	

4.4 Which other issues are key to service commissioning?

Whilst the aim of the review was to identify the critical features of WMPs themselves, discussions at each of the LAs revealed factors at the service delivery and commissioning level that impact on the effectiveness and development of services. In addition to having a flexible service model (as described above), issues around service organisation and monitoring were felt to be key to success.

4.4.1 Service infrastructure

Rotherham's new service, launched in April 2015, was felt to be supported by a highly developed and coordinated infrastructure for the service, involving a single point of access for referrals, sophisticated marketing under a single brand and a comprehensive but agile data-management system. This high level of infrastructure coordination was felt to be key to the overall success of the weight management service, although the significant investment required to develop it was recognised. Although much earlier in the cycle of service development, the commissioner at Birmingham also implied recognition of the benefits of a coordinated service infrastructure when noting the challenges of streamlining the work of the three primary care trusts that is now covered by a single LA.

Features of service infrastructure highlighted as beneficial by commissioners and providers at Rotherham include:

- a single point-of-access referral management system.
- coordinated branding and marketing of weight management services.
- easy to use data-management systems.
- data collection systems that support evaluation but do not overburden staff or impede service-user engagement.
- commissioner access to live service data enables data quality review and indicators of service activity and performance.

Evidence from the Poltawski and Greaves (2014) study corroborates the findings regarding the benefits of appropriate data-management systems.

4.4.2 The challenges of data collection

Another key issue that arose in both the Rotherham interview and in the Poltawski and Greaves study was the issue of balancing the challenges of data collection and the need to review and evaluate services comprehensively, with the need to engage participants and deliver an effective service. The public health specialist at Rotherham noted that:

Practically it can be quite challenging to collect that data. If the task is to deliver a service ... collecting how many fruit and vegetables a day and food diaries - it's quite time consuming when you know that potentially that person is not going to complete the course.

In particular, interview participants at Rotherham noted that the detailed data required from service users in their first session was likely to hinder their level of engagement. As well as taking time away from developing personal relationships in WMP sessions, participants at Rotherham noted the potential frustration for service providers:

That's taking time away from attracting new people - so it's a real juggling act. But as commissioners we ask for it - because that's what we need to decide whether a service is working.

Likewise, the Poltawski and Greaves study contained evidence relating to the challenges of data collection:

Data collection was increasingly difficult at successive time points because of lost contact and non-response, and data were very rarely sought from those dropping out of programmes. Hence, measuring effectiveness reliably was problematic, particularly for long term outcomes.’ (p.10).

4.4.3 *Generating useful research evidence for local authorities*

A related theme in both the case studies and the Poltawski and Greaves study was the lack of highly relevant research evidence for Local Authorities. As the Public Health England (PHE) representative from Birmingham noted, the challenges of gathering data coupled with a lack of authority-relevant research evidence leaves LA’s vulnerable to a lack of return on WMP investment. Two sub-themes emerged. The first related to the need for engagement between academics and LAs to evaluate the schemes that are currently being provided in LA setting. Commissioners in the Rotherham case study noted that the research community are ‘not evaluating the right activity’ and that:

We’ve struggled to engage academic colleagues to evaluate. I mean as an example colleagues at Sheffield wanted to do a trial of incentivised weight loss - I’d much rather find out if what we’re doing is effective or not in comparison to what others are doing ... As an academic you want to show innovation, it’s not very sexy to evaluate what Rotherham has been doing for last 5 years!

Similarly, Poltawski and Greaves concluded that academics needed encouragement to ‘collaborate with commissioners and providers to ensure robust evaluation of existing programmes, not just new ones of their own creation’ (p.16).

The second theme relating to LA relevant research was the need to collect evidence on the costs and benefits for LAs of providing services. As the commissioner from Birmingham noted:

the recommendations and the rationale for why we do this needs to be geared a bit more towards what the local authorities priorities are - linking back to the demand for social care, fitness and employment, the broader issues - rather than going in heavy in the first instance around the health benefits and savings for NHS.

Similarly, Poltawski and Greaves concluded that

Programmes should be evaluated not only in terms of weight loss and attendance levels, but also broader indicators that are of concern to both policy-makers in Local Authorities, and the target groups. (p.5)

This may be especially pertinent in the current context of reduced public health grants to LAs and reconfiguration of services as an effect of this.

Thus there are some clear directives for future research that could contribute to LA commissioning and delivery of effective weight management services.

4.4.4 *Presenting and disseminating the findings of the review for an LA audience*

Presentation: Clear advice and directives

In relation to the presentation of evidence both the commissioner in Birmingham and the participants at Rotherham requested clear advice and directives from the review. The Public Health Specialist at Rotherham requested ‘strong recommendations’ that were ‘not woolly’ and which they could cite as justification for actions they take and continued investment. Similarly the commissioner at Birmingham noted that directives in the form of ‘must do’s’ and ‘don’t do’s’ would be helpful. In giving feedback to the draft report, the PHE representative from Birmingham noted the need for ‘one page summaries’ and also recommended acknowledging where these review findings rest in the Nesta Standards of Evidence.

Dissemination

Participants at Rotherham also gave advice on how to disseminate the review findings for an LA audience. They suggested employing multiple dissemination strategies. First, they suggested disseminating via local obesity networks, such as the Yorkshire and Humber obesity network, which meets three of four times per year. Using local networks was described as having the benefit of

addressing the very different approaches and models across the country. Second, they recommended that the review should be mentioned in joint NICE and Local Government Association (LGA) briefings. Third, they suggested getting a clear endorsement from PHE and the National Obesity Observatory. The PHE representative from Birmingham recommended that his suggestion of single page summaries would be especially suitable as briefings for use by Health and Wellbeing Boards.

5. Discussion

5.1 Summary of findings

The approach taken for this review has enabled us to identify features that are critical to programme success but which are currently underemphasised or overlooked in the research and policy literature. Examining the views of service users and providers revealed that supportive relationships with providers and peers in their WMP group are potentially a critical feature of WMPs. Using QCA to test the association between supportive relationships and outcomes, the review identified that the most successful WMPs *were* characterised by the presence of supportive relationships with providers and peers and that the least effective programmes were characterised by their absence.

Evidence from the views synthesis indicated the importance of having providers who were approachable, compassionate and non-judgemental, and service users indicated that they were actively seeking support and direction from others through a WMP. Correspondingly, increased effectiveness of WMPs was found to be associated with both the quality of provider-user relationships and the level of direction and support offered by providers, in particular through giving specific guidance about energy intake and expenditure. Increased effectiveness was also associated with WMP features that foster peer support, i.e. group-based services that are targeted at specific population groups.

Efforts to foster self-regulation and maintenance of a healthy weight were also found to be critical features of WMPs; the evidence suggests that self-regulation is engendered by individuals experiencing their own ability to engage in activities such as exercise, and experiencing the various benefits afforded it. Correspondingly, increased effectiveness was found to be associated with WMPs offering direct provision of exercise or those initially offering a high level of support but which built in a graduated exit from services.

5.2 Strengths and limitations

5.2.1 Strengths

A key strength of this research was its ability to provide fine-grained evidence on the features of successful weight management programmes. LA commissioners called for clear and strong recommendations, and the approach to this review has enabled us to provide clear guidance about the nature of successful WMPs.

A second strength was the grounding of the approach in users' and providers' experience of WMPs. WMPs are social interventions characterised by complexity; that is, they have multiple interacting components and multiple potential moderators such as delivery and context (Noyes et al., 2013). Unanticipated interactions between components, delivery and context are extremely likely in complex interventions, and experience is necessary to identify how such interactions play out in practice (Petticrew, 2015). In this review, the experiences of service users and providers revealed supportive relationships to be a potentially critical factor in WMPs despite the lack of focus on this aspect in trial descriptions or policy documents. Thus, a WMP feature that might previously have been seen as a 'nicety' or peripheral to delivering specific approaches to diet and exercise is revealed in this research as fundamental to success and worthy of significant attention and investment. The significance of provider support may also help to explain the findings of other systematic reviews examining differences between WMPs. For example, a review and meta-analysis of WMPs conducted in 'everyday contexts' found that in contrast to commercial programmes, pooled results from five interventions delivered by primary care teams showed no evidence of an effect on weight (Hartmann-Boyce et al., 2014). Examining the views of primary care-based providers for the views synthesis revealed their perception of time constraints and staffing levels, which would of course preclude the development of supportive relationships with patients. Health-service and community providers also commonly reported a desire for training specifically to ensure appropriate and sensitive support, further indicating deficiencies in the area of relationship building (See Appendix 2, Section A2.2).

An holistic contextual understanding of the range of factors implicated in weight management is further enhanced in this review through our synthesis of qualitative evidence on factors unrelated to programme characteristics. As reported in Appendix 2, services users and providers indicate that approaches to recruitment and referral to WMPs can be a significant barrier to WMP uptake (Section A2.1) and other external factors may moderate WMP success (Section A2.2).

Another key strength of the approach to this research was its ability to identify key ('necessary') programme characteristics within individual contexts, whilst taking account of the complexity of interacting intervention components, and its ability to explore combinations of factors that were associated with WMP effectiveness. For example, by using QCA, it was possible to identify different service provision models that were associated with productive relationships which were critical for success.

5.2.2 Limitations

One of the most significant limitations to the work was the lack of detail in the description of intervention components in many of the trials. For many intervention features, we had to use scant information to infer the presence or absence of a feature, for example when using any mention of 'counselling', 'coaching' or 'advice giving' as indicative of interventions in which user-provider relationships were fostered. Of course, this also means that there may be a whole host of potentially significant intervention features that we have not considered or tested, since they are not apparent or salient to either service users or trialists and therefore emerged in neither the views synthesis nor the trial descriptions. Another significant weakness was the lack of process evaluations associated with the interventions; just four of the included trials had an associated process evaluation. One of these measured satisfaction with the service (Nanchahal et al., 2012), one measured the intervention dose received (Patrick et al., 2011) and a third measured both of these outcomes (Vermunt et al., 2011). The fourth process evaluation comprised qualitative interviews with trial participants to provide an explanatory account of how weight loss was achieved in this highly successful trial (Bertz et al., 2012). Interestingly, in this study, despite the fact that there was scant detail on provider relationships reported in the intervention description (it was mentioned only in the very last sentence of the intervention description) the trial participants identified provider relationships as *the* most critical feature for success. The authors of the study concluded that an 'emotional bond' with the service provider provided a 'catalytic interaction' that was the key to sustainable weight loss (Bertz et al., 2015).

Another limitation resulting from the scant intervention descriptions is that it remains unclear if features that were not reported as part of some interventions were not present or if they were simply overlooked in the intervention description. The poor intervention descriptions and lack of process evaluations also mean that we have no evidence on the degree to which interventions fostered key features, such as provider-user relationships. Likewise, it remains unclear as to whether, when effective provider-user relationships occurred, they were an intended component of the intervention or they simply occurred by chance; the providers employed to deliver interventions that turned out to be successful may just have happened to have appropriate interpersonal skills and be naturally inclined to invest time in developing relationships. Thus it is unclear how consistently WMPs may be able to foster these vital relationships.

Of course, limitations are also imposed by the qualitative research included in the views synthesis, which is subject to all the biases and confounders that such research is unavoidably prey to. As the table of studies in Appendix 1 makes clear, there was a range in terms of many characteristics of the participants such as gender and SES; thus the views considered may be those of a selective or unrepresentative set of individuals, limiting the generalisability of the findings. In particular, whilst we did include studies reporting the views of those who had declined to engage in a programme or who had disengaged from the programme, there were very few of these and so the findings predominantly reflect those who successfully engaged with programmes.

In addition to the weaknesses inherent in the available research, gaps in the research literature were a further limitation to the review. We can be reasonably confident that these findings are relevant to some key groups who do not traditionally engage with WMPs, such as men and those from deprived backgrounds, since the views studies reflected a good range of perspectives in terms of the gender, age and socio-economic status of participants. However, we found little views or trials research on other key service user groups identified by LAs as important targets, such as people from minority ethnic groups and those with learning disabilities.

Another weakness relating to gaps in the research literature relates to the lack of evidence regarding weight maintenance and longer-term outcomes. We used evidence from trials reporting weight loss at 12 months following recruitment to a WMP; just seven of these studies provided outcomes at 18-24 months, and just one at 36 months. Whilst participants in views studies were clear about moving from supported weight management in the early stages of a WMP to self-regulation, evidence regarding a desire for follow-on support (Section 2.2.2) and the potential of external moderating factors to hinder maintenance (Appendix 2, Section A2.2), indicate the need to understand the kinds of support needed to prevent relapse and maintain weight loss in the longer term. In addition, it may be that successful programmes with greater initial weight loss may suffer from poor sustainability, while weight loss in programmes with smaller loss may be sustained or improved over time. However, available data on longer term outcomes of the included trials indicate that weight loss continues to be greater among the studies that were most effective at 12 months in comparison to those that were least effective at 12 months (See Appendix 3 for details).

Whilst the selection of the most effective and least effective interventions should be considered a strength since it enabled us to remove the ‘noise’ of interventions with intermediate effects, our *approach to selection* of those most effective and least effective interventions may be considered a potential weakness of the review. Selection was based on the assumption that those interventions achieving the greatest weight loss in the intervention group when compared to the control group are those that are most effective, and those with the least difference between intervention and control groups are the least effective. This logic holds if what is delivered to those in control groups is essentially the same for all studies; it may be that smaller differences between intervention and control groups may be due to higher quality or greater intensity of services delivered to control groups. However, it appears that the controls in the most effective studies were more likely to receive better-quality services. Seven of the most effective studies involved high-intensity comparator conditions involving seeing someone more than once for weight management and three involved receipt of leaflets only or no intervention; amongst the least effective interventions, five of the control groups received leaflets only or no intervention and five involved seeing someone for weight management advice, but this comprised only a single session, rather than multiple sessions, in four of the five cases. Thus, while we acknowledge this as a ‘known unknown’ limitation, we do not consider it a significant threat to the findings presented here.

Another concern about the selection of evidence for this review reflects the concerns of LAs that the interventions evaluated were not reflective of the approaches they currently deliver or are able to deliver on a large scale. For example, many of the included interventions lasted for considerably longer than the 12-week courses typically offered by LAs. In addition, as illustrated in Table 3.1 it is clear that the vast majority of the most effective interventions were evaluated in the USA and none were evaluated in the UK; indeed, all of the interventions evaluated in the UK were among the least effective. Thus the applicability of the review findings for LA commissioning in the UK may be unclear. However, given that the findings about the critical nature of relationship building with WMPs are grounded in the perspectives of UK service users and providers, it seems likely that we could build on the lessons learned in other countries. Moreover, as the key findings do not indicate the need for highly sophisticated and intensive programmes but for programmes with the low-tech, relatively low-cost and universally accessible feature of relationship building, it seems likely that the findings will have relevance and utility in the LA setting.

5.3 Implications

5.3.1 Implications for policy and practice

The review findings suggest the following implications for policy and practice:

- WMPs should offer support to service users and develop vital provider-user and user-peer relationships.
- WMPs need to invest time and resources to achieve high-quality relationships.
- Commissioning briefs and job specifications should specify the need for providers with excellent interpersonal skills.

- Providers should give specific direction and guidance about energy intake and expenditure in the context of a supportive relationship.
- WMPs should comprise group-based services targeted at specific population groups to harness the beneficial effects of peer support.
- WMPs should involve a graduated exit offering light-touch support after the typical 12-week programme.
- WMPs should enhance their focus on physical activity and include physical activity sessions in order to unlock self-efficacy and encourage self-regulation.

5.3.2 Implications for further research

Recommendations for further primary research and synthesis arise from this review are:

Primary research of the following types is needed:

- Collaborative research between academic institutions and LAs to ensure the relevance and utility of evidence;
- Rigorous evaluations of the kinds of services currently being provided by LAs in the UK.
- Process evaluations associated with trials of weight management interventions to further identify how these complex interventions work in practice and to reveal potentially overlooked yet significant components.
- Better descriptions of intervention content.
- Evaluations of interventions for key target groups, e.g. different minority ethnic groups, those with learning disabilities or people with mental health problems.

Synthesis research of the following types is warranted:

- Comparison of the effectiveness of approaches developed for and delivered to specific target audiences with the effectiveness of flexible approaches designed to adapt to the needs of individuals.
- Application of this research synthesis model to evidence on WMPs for children and young people.
- Synthesis of evidence on the effectiveness of interventions targeting multiple lifestyle risk behaviours in addition to obesity, such as smoking and drinking.

6. Detailed methods

This section provides a detailed account of the methods used to conduct this review. Systematic reviews derive strength from being explicit and transparent about how they are conducted, since readers can then judge the reliability of their findings.

6.1 Design

The systematic review comprised three interconnecting pieces of research:

1. **Views synthesis:** we examined UK research reporting people's views about their experience of receiving or delivering a WMP to understand what people who have experience of WMPs (either as providers or participants) feel are critical features for successful weight loss.
2. **Synthesis of service evaluations:** we used the findings from the views synthesis to see if they were able to explain differences between WMPs shown in trials to be most effective for reducing participants' weight and those with lower effects.
3. **Case studies:** we conducted case studies with LAs to explore the nature of current WMP provision and to consider the implications of the review findings for future provision.

Below we provide an explicit account of the methods used to identify, describe, appraise and synthesise the evidence for the views and the trials syntheses. Also described are the methods used for the case studies.

6.2 User involvement

We worked closely with the review commissioners to ensure that the review is relevant and accessible. Their input was sought during the review: a) to guide the scope of the research and to identify priority research areas; and b) with regard to dissemination of the study findings, including input into their presentation, so that the reports can meet user needs as well as possible. Other input on the scope and direction of the review was sought through an Advisory Group comprising academic experts: Susan Jebb, Professor of Diet and Population Health at Oxford University and Professor Harry Rutter founder of the National Obesity Observatory, and a LA Director of Public Health, Jim McManus. As part of the case studies with LAs we shared the findings of the review and sought to understand how the findings could be used and how to present them most appropriately for those involved in commissioning services.

6.3 Review questions

This review aimed to answer the following overarching question:

What are the characteristics of highly successful Tier 2 weight management programmes (WMPs) for adults?

The following questions were used to guide each of the three stages of the review:

- **Views synthesis** 'What do service users and providers feel are the critical features of WMPs and how are they perceived to impact on weight loss?'
- **Synthesis of service evaluations:** 'Do the WMP features identified as critical by service users and providers explain differences between WMPs shown in trials to be most effective and those shown to be least effective?'
- **Case studies** 'How does current local authority provision in the UK compare and contrast with the findings about effective WMP configurations, and what are the implications of the review findings for future provision?'

6.4 Methods for the views synthesis: Thematic analysis

6.4.1 Identifying qualitative studies for the views synthesis

Since a recent NICE review had undertaken searches for views studies (Johns et al., 2013), we focused resource on analysis rather than study identification. However, we employed several strategies in order to ensure that the set of included studies encompasses the most recent research in this area. Views studies were identified in the following ways:

- a) Studies identified and included in the NICE Review 2 (Johns et al., 2013).
- b) Re-running a 'streamlined' update of the searches employed by Johns et al. (2013) (i.e. the same search strategy applied to the highest yielding databases from the original search - MEDLINE, EMBASE, Web of Science, Medline in process) for the period from 2012 to 2014 to identify qualitative studies reported on since 2012. This search was conducted by our information specialist on 2 October 2014; an example search strategy used for the EMBASE database is shown in Appendix 7.
- c) Studies included in recent reviews of qualitative views research by Johnson et al. (2013), Robertson et al. (2014) and Brown and Gould (2011).
- d) Backward citation chasing (i.e. identifying potential studies from the reference lists of included views studies).
- e) Forward citation chasing (i.e. using Google Scholar to identify studies citing included views studies).
- f) Contacting key authors in the field.
- g) Targeted 'non-systematic' searches using Google, combining terms for 'qualitative' (e.g. qualitative, views) with terms for weight management interventions (e.g. weight management, weight watchers, slimming world).

Titles and abstracts returned by the search strategy were exported into EPPI-Reviewer 4 (Thomas et al., 2010) reviewing software and independently screened by pairs of reviewers (KS, RR, MR) using the predefined criteria specified in Table 6.1. All disagreements were resolved by discussion between the reviewers. Where it was not possible to decide on the exclusion of a paper based on the information in the title and abstract, the full text was retrieved. The same three researchers examined these independently for inclusion or exclusion using modified predefined criteria (specified in parentheses in Table 6.1). Again, all disagreements were resolved through discussion. Where full-text papers were not easily retrievable (locally or from the British Library), the authors were contacted.

6.4.2 Inclusion and exclusion criteria for the view synthesis

Table 6.1: Inclusion and exclusion criteria for the views synthesis

Criteria	Specification
<i>Inclusion</i>	
Population	<ul style="list-style-type: none"> • Adult (≥ 18 years) service users who had experience of attending a WMP • Adult (≥ 18 years) Service providers who had delivered a WMP
Study type	<ul style="list-style-type: none"> • Qualitative synthesis of views, perceptions or beliefs about WMPs.
Country	<ul style="list-style-type: none"> • UK
Language	<ul style="list-style-type: none"> • English only

Criteria	Specification
<i>Exclusion</i>	
Document type	<ul style="list-style-type: none"> • Conference abstracts • Reviews of reviews, though the reference lists were searched for primary studies
Quality and data	<ul style="list-style-type: none"> • Study with a poor description of the methods (Stage 2, full text screening only) • Studies with little data on experience with WMP (Stage 2, full text screening only)

6.4.3 Quality assessment of views studies

There is a lack of consensus among qualitative researchers about how to measure quality in qualitative research (Garside, 2014); therefore, we were cautious about excluding papers on the basis of quality. Nonetheless, to ensure a basic level of quality, papers were excluded if they:

- a) did not provide a clear account of the methods used for data collection and analysis; or
- b) contained only minimal or ‘thin’ data pertinent to the review question.

6.4.4 Data extraction

Data were extracted from studies meeting the eligibility criteria for inclusion in the syntheses. User and provider views were extracted independently, leading to the development of two classification systems. Thematic analysis (Thomas and Harden, 2008) was used inductively to code and describe the papers. The process involved reading and re-reading the papers and applying line-by-line coding to capture descriptive themes about WMP features (Strauss and Corbin, 1990). Ten papers were initially coded, and the themes scrutinised by the study team for conceptual coherence. Themes were collapsed where redundant or overlapping and split when necessary to improve the conceptual clarity of the themes. Definitions of each of the themes were written and were applied to all the studies to extract data on user and provider views. New descriptive themes were added where they were not covered by the existing framework, which was modified on an iterative basis. We also extracted study, demographic and methodological information including type of WMP(s) evaluated, setting of WMP(s) (e.g. community, commercial, health service, online), method of synthesis, method of analyses and number of study participants.

6.4.5 Synthesis methods

After data extraction, the descriptive themes were organised into higher-order analytical themes that ‘went beyond’ the original findings of the studies (Thomas and Harden, 2008). The initial stage of this process sought to identify and group descriptions of WMP features. This stage of analysis identified the four factors impacting on the success of WMPs: 1) the process of referral to a WMP; 2) the WMP itself - specifically, the seven identified WMP domains; 3) non-WMP moderators; and 4) experiences following the WMP. Since the identification of WMP features was the chief aim of the synthesis, and since most of the data related to WMP features, further scrutiny of these data and development of additional higher-order themes was undertaken. Themes identified at this stage included perceptions of: a) the relative importance and utility of different features; b) the best approaches for delivering each of the features; and c) the mechanisms through which the different features influence behaviour change. Where relevant and possible, themes were examined to see if they were influenced by different contextual factors, such as age, ethnicity or gender.

6.5 Methods for the synthesis of service evaluations: Qualitative comparative analysis

6.5.1 Identifying trials for the qualitative comparative analysis

As with the views synthesis, we aimed to focus resource on analysis rather than study identification since the weight management/obesity literature has been extensively reviewed.

We purposively identified trials of WMPs shown to be most effective for achieving weight loss among people with obesity and those shown to have the least effect in the NICE review (Hartmann-Boyce et al., 2013b). This approach, similar to maximum variation sampling typically employed in qualitative research, and MSDO/MDSO (most similar, different outcome/most different, similar outcome) designs (De Meur and Gottcheiner, 2009) was used to enhance our ability to detect the critical features of successful WMPs. By excluding interventions shown to be moderately effective, we filtered out 'noise' which might obscure differences between the most effective and least effective WMPs. We identified the ten most effective and the ten least effective interventions evaluated in the NICE review, in terms of the mean difference in weight loss between intervention and control at 12 months (from baseline). In one of the least effective interventions (Dale et al., 2009) the control group unexpectedly lost a lot of weight, which called into question the reliability of the study findings. We therefore excluded this study and selected the next least effective to ensure that we had ten in each group.

6.5.2 Inclusion criteria: Synthesis of service evaluations

Trials evaluating the selected interventions all met the inclusion criteria set out in the NICE review (Hartmann-Boyce et al., 2013b). The studies were all randomised controlled trials (RCTs) of WMPs for adults (≥ 18 years) classified as overweight or obese, i.e. people with a BMI of ≥ 25 kg/m² and ≥ 30 kg/m², respectively, or a BMI of ≥ 23 kg/m² in Asian populations. The intervention had to contain a combination of diet and exercise with a behaviour change strategy to influence lifestyles, and be delivered in the health sector, in the community or commercially. Included WMPs assessed weight loss at follow-up of 12 months or more. Included comparators were: no intervention at all or leaflet/s only; discussion/advice/counselling in a one-off session +/- leaflet; seeing someone more than once for discussion of something other than weight loss; and seeing someone more than once for weight management, person untrained +/- leaflets. WMPs that included surgery, medication or other lifestyle changes, such as efforts at smoking cessation, were excluded. For full details see the NICE review (Hartmann-Boyce et al., 2013b).

6.5.3 Quality assessment: Synthesis of service evaluations

We used the study quality scores as appraised in the NICE review (Hartmann-Boyce et al., 2013b) which was based on the York Centre for Reviews and Dissemination approach as described in the CPHE Methods Manual (National Institute for Health and Clinical Excellence, 2012), but did not evaluate on the basis of blinding. Overall scores of internal and external validity were generated and graded as ++ (most of the checklist criteria were fulfilled and the conclusions were judged very unlikely to alter), + (some criteria were fulfilled and the conclusions were unlikely to alter) or - (few or no criteria were fulfilled and the conclusions were likely or very likely to alter) for each study. Internal validity was based on assessment of the randomisation and allocation procedures, evidence of selective reporting and attrition. External validity was based on how representative the study sample was of the general population and how applicable the findings were to implementation in the UK.

6.5.4 Data extraction: Synthesis of service evaluations

To extract information about the features of the selected WMP interventions, we developed a coding framework based on the findings of the views synthesis. Data were extracted by two researchers who first worked independently and then compared their work to reach a consensus.

We developed the coding framework with the intention of reflecting the key features and domains of WMPs as identified in the views synthesis. Thus the framework, presented in Appendix 4, reflects each of the seven programme domains identified, as well as reflecting views about external moderators and programme follow-on.

Capturing information about intervention characteristics was not always straightforward; often, there was little detail. For example, provider support, arguably the most significant intervention feature according to users and providers in the views syntheses, was rarely described in any detail;

thus we inferred a level of provider relationship, for example that interventions involving counselling would incorporate some level of provider-user relationships. Despite these challenges, we applied the coding framework to each of the interventions, capturing evidence for each of the characteristics and assigning interventions to the relevant ‘conditions’.

We also utilised additional data including the methods of recruitment used and variables for other intervention characteristics reported in the NICE review (Hartmann-Boyce et al., 2013b) which are summarised in Table 6.2. Changes to some of the codes applied in that study were modified where extraction errors were identified.

Table 6.2: Methodological information extracted from the NICE review

Program feature	Information included
Bibliographic and study details	<ul style="list-style-type: none"> • Study aim • Country • Sample size • Study recruitment method
Control	<ul style="list-style-type: none"> • Control group
Participant characteristics	<ul style="list-style-type: none"> • Population group targeted • Mean age (years) • Percentage of female participants • % ethnic minority • % some college education
Effective intervention components found by NICE	<ul style="list-style-type: none"> • Dietician • Energy intake prescription (set energy prescription)
Weight outcomes	<ul style="list-style-type: none"> • Outcomes at 12, 18 and 36 months
Risk of bias	<ul style="list-style-type: none"> • Assessed using the York CRD approach (National Institute for Health and Clinical Excellence, 2012)

6.5.5 Synthesis methods: Qualitative comparative analysis (QCA)

We used QCA to understand pathways to intervention effectiveness; that is to say we sought to identify whether particular combinations of WMP features were associated with greater effectiveness.

QCA enables the identification of configurations of various intervention and other contextual features that are (or are not) present when the intervention has been successful (or not) in obtaining a desired outcome; it aims to identify the necessary and sufficient conditions for achieving a desired outcome (Thomas et al., 2014). QCA has several advantages over meta-regression and other related meta-analytic methods. It allows for multiple overlapping pathways to causality, and it identifies combinations of conditions as opposed to isolating the effect of one characteristic on intervention effectiveness. This may better represent the complex causal pathways that often characterise psychosocial interventions such as WMPs. In using QCA to understand pathways to intervention effectiveness, we followed the guidance offered by Thomas et al. (2014). Our discussion below is structured by the six steps they describe.

Stage 1: Building the data table. We used the findings of the views synthesis and other key intervention features to create a coding framework (See Appendix 4) to capture whether particular features (or using standard QCA terminology, ‘conditions’) were present or not present in the ten most effective interventions and the ten least effective interventions. Before creation of the preliminary data table, we decided to use QCA with ‘crisp sets’, which designates an intervention as either having a characteristic or not, over ‘fuzzy sets’, which allows coders to designate a study as ‘partially’ having a characteristic. Team consensus was that interventions generally either

manifested characteristics or did not, and thus calibration would not be of value in our analysis. After compiling data on the presence or absence of conditions for each of the interventions in a matrix, with rows representing the interventions and columns for each of the characteristics or conditions, we examined the table for apparent differences between the most effective and the least effective interventions using descriptive statistics. We also reviewed the data table to check for ‘deviant cases’ - i.e. circumstances where individual conditions did not appear to discriminate clearly between the most effective and least effective interventions.

Stage 2: Constructing and checking the quality of the truth tables. At this stage, the focus moved from exploring individual studies and individual conditions, as in the data table above, to exploring particular combinations or ‘configurations’ of conditions and their association with either the most effective or the least effective interventions. Because we identified a large number of possible features for inclusion in our QCA models, we returned to our views synthesis to help in constructing more ‘specific’ truth tables. The views synthesis identified two especially salient mechanisms that were perceived to enhance the success of interventions: social bonds were perceived to motivate attendance, and accountability to others was perceived to motivate healthy behaviours. Since both provider relationships and peer relationships were implicated in each these mechanisms, two sets of configurations were explored, one with conditions anticipated to foster provider relationships and one with conditions anticipated to foster peer relationships. We examined these issues in three key truth tables: two tables for provider support - ‘directiveness’ and ‘alliance’ - and one for peer relationships.

Provider relationships. The qualitative studies indicated that participants had identified a need for high levels of provider support for initiating behaviour change. For example, as one participant noted ‘I need someone to take my hand and take me over’ (Bidgood and Buckroyd, 2007 p. 226). Thus, we developed an initial provider support model that included conditions which indicated a high level of provider support. The configuration obviously included provider support itself, but it also included conditions indicating a high level of contact with providers, including ‘high intensity’ and ‘graduated exit’, which was presumed to indicate that there had at some point been a high level of support. In addition, conditions indicating a high level of guidance from providers were included; these included direct provision of exercise and targets set by providers for energy intake, weight loss and exercise. However, initial inspection of the model suggested that the results were difficult to interpret and theorise in the light of the qualitative synthesis. This led us to a new line of enquiry. Though group discussion, we developed two separate models that we believed pertained to two possible types of pathways to intervention effectiveness: one addressing provider directiveness (that is, the degree to which interventions were characterised by strong provider action) and one addressing provider-user alliance (that is, the degree to which the intervention fostered partnership between the provider and the user).

Peer relationships. The conditions included in this configuration were group interventions and population targeting. Although group-based interventions were not valued by all participants, a key value of them, as identified by those who had experienced them, was that they encouraged peer relationships. The views synthesis also indicated that interventions targeted towards specific population groups enabled a ‘short cut’ to, or increased the likelihood of, peer relationships in group WMPs. Conditions in each configuration are noted in Table 6.3. For each configuration, we explored pathways to high effectiveness and pathways to low effectiveness.

Table 6.3: Conditions in each QCA model

Condition	Provider support models			Peer support model
	Provider support	Provider directiveness	Provider alliance	
Direct provision of exercise	✓	✓	✓	
Provider relationships discussed	✓		✓	
Graduated exit	✓		✓	
High intensity	✓		✓	
Provider sets energy-intake goals	✓	✓		

Condition	Provider support models			Peer support model
	Provider support	Provider direct-iveness	Provider alliance	
Provider sets weight goals	✓	✓		
Provider sets exercise goals	✓	✓		
Group work				✓
Population group targeted				✓

Stage 3: Resolving contradictory configurations and checking for satisfactory spread. As suggested by Thomas et al. (2014), we then examined the quality of the truth tables. We checked for any contradictory configurations, i.e. identical configurations that were present in both the most effective and least effective interventions. We also checked that there was a good spread of studies across the different configurations available within each model.

In relation to provider support we found that neither of the two truth tables had contradictory configurations. Both also had satisfactory spread across different conditions.

However, we were unable to theorise explanations for contradictory configurations in our early models of peer support. This led to us pursuing several lines of enquiry before arriving at our final model incorporating just population targeting and group work. An initial model incorporated interventions with targeting of any kind, either population targeting or risk group targeting (i.e. WMPs provided to those with particular health conditions). However, this model identified several contradictory configurations, and since the views synthesis highlighted population group characteristics as those most likely to ensure a feeling of being with similar people, we dropped the risk-group condition. We also revisited the condition that represented group work and noted that interventions incorporating group work split between group discussions oriented didactically (e.g. for teaching purposes) and group discussions oriented therapeutically (e.g. using behavioural therapy). However, models incorporating either presence of therapeutic groups or the presence of didactic groups as a condition alongside population group targeting and risk group targeting also identified several contradictory configurations.

We thus selected the simplest model, with just two conditions: group work and population group targeting. In this model, two of the four configurations were completely consistent. All five interventions with both population targeting and group work were most effective, and all five interventions without population targeting and without group work were least effective. However, the remaining two configurations were contradictory. One contradictory configuration was characterised by the presence of group work with the absence of population targeting. Of the six interventions with this configuration, two were most effective and four were least effective. The second contradictory configuration was the opposite - that is, it included population targeting in the absence of any group work. Four interventions included this configuration, of which three were most effective. Although contradictory configurations were present in this model, we felt able to theorise a logical explanation for them and as such we retained this model.

Stage 4: Boolean minimisation. After checking for contradictory configurations, we used Boolean minimisation to arrive at final solutions. We aimed for minimised solution sets, i.e., the most simplified configurations, that had both complete coverage and high consistency. By 'complete coverage', we mean that when examining causal pathways to high effectiveness, we sought minimised solutions that covered as many of the most effective studies as possible - that is, that 'explained' as much of the causal pathway to effectiveness as possible. By 'high consistency', we mean that we sought minimised solutions that did not also include interventions that were not among the most effective. Conversely, when we examined causal pathways to low effectiveness, we sought minimised solutions that covered as many of the least effective studies as possible (coverage) and that did not also include any of the most effective interventions (consistency).

Stage 5: Consideration of the 'logical remainders' cases. This stage of the QCA involved consideration of the potential outcome of configurations that were not present in any of the

interventions. There were no logical remainders for the peer support model, but several for each of the more complex provider support models.

Stage 6: Interpretation. This final stage of the QCA involved interpreting the different solutions in the light of the findings of the views synthesis. In an effort to ensure that the analysis accounted for our shared perspectives of the data, all conditions, configurations, models and interpretations were discussed in a group meeting. We did this to ensure that construction of the QCA models and interpretation of them were based on coherent understandings of the qualitative synthesis that guided their construction.

6.6 Methods for case studies

The final stage of the review was to conduct case studies with LAs. These involved open-ended interviews in which we asked key authority staff to comment on the findings contained in this report and on the following issues:

- a) The nature of the WMPs currently provided and how provision corresponds with the findings of this review.
- b) The process of commissioning WMPs and the implication of the review for future decisions.
- c) How current provision is monitored and evaluated.
- d) How best to present the findings of the review in a report for wider use by LAs in the UK.

6.6.1 Selection of authorities

Authorities were selected to maximise variation. The two selected, Rotherham and Birmingham, varied in the following ways:

- LA characteristics (authority type/population size, and urban/rural).
- factors strongly associated with levels of obesity (deprivation and ethnicity).
- weight management strategy (as indicated by how long weight management service provision had been in place, the ways in which the strategy appears to be framed around different population groups, emphasis on evaluation).

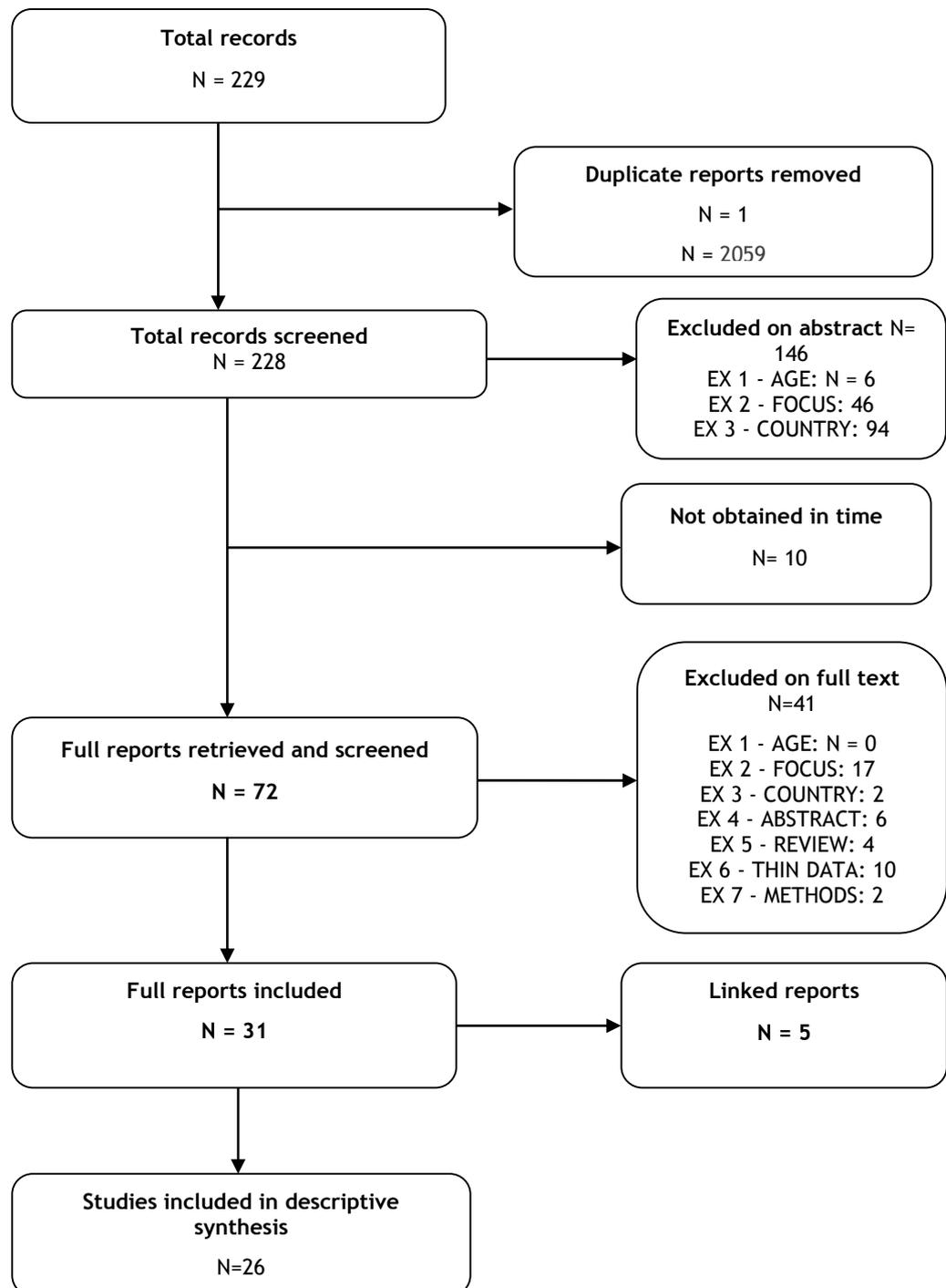
Specific details on each of the authorities can be found in Chapter 4.

6.6.2 Data collection methods

The first interview was conducted by phone with the Commissioning Lead for Lifestyles and the Regional Lead for Public Health England at Birmingham LA. The second interview was conducted face-to-face at the Council Offices in Rotherham and involved two members of authority staff - a public health specialist and the Head of Health Improvement - as well as two service providers, including a contractor for the organisation providing Tier 2 service and the Operations Manager of the Tier 2 service. Ethical approval for this part of the review was obtained from the UCL Institute of Education Research Ethics Committee. All participants were asked whether they consented to the discussions being tape-recorded. Each of the two interviews lasted between one and two hours.

6.6.3 Data analysis methods

A transcript was produced from each of the interview recordings. The transcripts were analysed thematically in relation to each of the case study questions. In order to complement the evidence base on the experiences of LAs in delivering WMPs, we compared our case study findings with the findings of a recent study in which public health commissioners, service providers and service users contributed their perspectives on the barriers to and facilitators of weight loss maintenance within services (Poltawski and Greaves, 2014). Reports of our draft findings were shared with each of the LAs to check that they were happy that what was reported was representative and accurate.

Figure 6.1 Flow of literature through the review: identification of views studies*

Criteria on which reports excluded (abstract and full text)

EX 1 - AGE - not adults (≥ 18 years)

EX 2 - FOCUS - No views, perceptions or beliefs of adults towards weight management programmes for overweight adults

EX 3 - COUNTRY - Study not conducted in the UK

EX 4 - ABSTRACT - conference abstract only

EX 5 - REVIEW - review of studies

EX 6 - THIN DATA - views on weight management programmes limited

EX 7 - METHODS - Study methods poorly reported

* Since trials were selected from a previous review, rather than through searching and screening, they are not represented in this flow diagram. Details of selection of trials is provided in section 6.5.1.

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Appendices

Appendix 1: Characteristics of studies included in the views synthesis (n=26 studies reported in 31 papers)

Study (linked studies)	Focus	Weight management programme(s)	Participants	Service-user characteristics	Data collection	Data analysis
Ahern et al. 2013	Participants' accounts of attending a commercial program compared with those receiving standard care	Commercial (Weight Watchers); Health service	16 service users	Gender: 100% female Age: mean 47 years Ethnicity: 94% white BMI: Mean 31 Location: Not stated Other: Both WMP completers and withdrawers	Semi-structured telephone interviews	Thematic analysis
Allan et al. 2011	Providers' and service users' experiences of health service and commercial weight loss groups	Commercial (unspecified); Health service; Community	22 service users; 11 providers	Gender: 75% female Age: Predominantly 'middle aged' Ethnicity: Ethnic minorities 'under-represented' BMI: Range (70% >30) Location: Scotland Other: Groups with diverse characteristics, serving inner city, town and rural populations with range of socio-economic profiles	Semi-structured group observations and face-to-face or telephone interviews	Framework method for qualitative analysis
Atkinson et al. 2010* (Atkinson et al., 2011, 2012)	Service users' experiences of specialist healthy weight advisers for obese women during pregnancy and up to two years after delivery	Specialist health service	36 service users; 11 referrers; 10 providers	Gender: 100% female Age: 25-39 years Ethnicity: 3 Pakistani/British Pakistani, 33 white British BMI: >30 Location: West Midlands (Dudley, Shropshire, Telford and Wrekin,	Semi-structured face-to-face or telephone interviews	Thematic analysis

What are the critical features of successful Tier 2 weight management programmes?

Study (linked studies)	Focus	Weight management programme(s)	Participants	Service-user characteristics	Data collection	Data analysis
				Walsall, Wolverhampton and Worcestershire) Other: Parity ranged from first to third pregnancy; users include some who declined or disengaged from the service		
Bidgood and Buckroyd 2007	Accounts of experiences and feelings during attempts to lose weight and to maintain a reduced weight	A range discussed	18 service users	Gender: 89% female Age: Not stated Ethnicity: Not stated BMI: ≥ 30 Location: Hertfordshire Other: Includes 5 women with severe obesity ≥ 30 but < 40	Semi-structured interviews and focus groups	Thematic analysis
Bingham et al. 2014	The perspectives of a practitioner and understanding participants' health needs within Fit Fans, a health promotion programme for older men delivered within an English Premier League football club	Community (Fit Fans)	1 provider; 7 service users	Gender: 100% male Age: 47-63 years Ethnicity: White British BMI: ≥ 25 Location: Liverpool Other: All low socio-economic status	Practitioner's observations and account of discussions with service users were recorded through informal field notes and a reflective diary	Content analysis
Brown et al. 2006	Obese patients' experiences and perceptions of support in primary care	Health service	28 service users	Gender: 64% female Age: 18->75 years Ethnicity: Not stated BMI: 30- ≥ 40 Location: Not stated Other: 64% non-manual occupations, 86% co-morbidities	Semi-structured interviews	Thematic analysis

Study (linked studies)	Focus	Weight management programme(s)	Participants	Service-user characteristics	Data collection	Data analysis
De Souza and Ciclitira 2005	Men's experiences of dieting and views on related issues such as health and body image	Commercial	6 service users	Gender: 100% male Age: 33-57 years Ethnicity: White British BMI: Not stated Location: London Other: n/a	Face-to-face interviews	Discourse analytic approach
Doyle and Shaw 2012	Users experiences of Totally YouPLUS, a web-based weight reduction intervention study for obese individuals	Web-Based	11 service users (mixture of intervention and control group members)	Gender: Mixed (% female not stated) Age: Not stated Ethnicity: Predominately White British (% not stated) BMI: ≥ 30 Location: West Oxfordshire, UK Other: n/a	Focus groups	Thematic analysis
Furness et al. 2011* (Soltani et al. 2012)	Experiences and perceptions of pregnant women and midwives regarding existing support for weight management in pregnancy and their ideas for service development	Health service	6 service users; 7 midwives	Gender: 100% female Age: 18-40 years Ethnicity: 100% white British BMI: ≥ 30 Location: Doncaster, UK Other: Parity ranged from first to fourth pregnancy	Focus groups	Thematic analysis
Gray et al. 2013a (Gray et al. 2009, 2013b)	The utility/ acceptability of gender sensitised programme delivered to men in a professional sports club setting (Football	Community	39 service users; 6 providers	Gender: 100% male Age: Not stated Ethnicity: Not stated BMI: ≥ 27 Location: Newcastle area Other: n/a	Participant and coach feedback, focus group discussions and interviews	NR

Study (linked studies)	Focus	Weight management programme(s)	Participants	Service-user characteristics	Data collection	Data analysis
	Fans in Training (FFIT))					
Herriot et al. 2008	Experiences and expectations of individuals enrolled in a randomised trial of four commercial weight loss programmes	Commercial (Weight Watchers, Rosemary Conley, Slimfast, Atkins)	46 service users	Gender: 80% female Age: mean 42.3 years (SD 10.1) Ethnicity: Not stated BMI: Mean 32 Location: Surrey area	Focus groups	Thematic analysis
Hunt et al. 2013	Men's views of a pedometer-based walking program, part of a weight-management intervention delivered through Scottish Premier League football clubs	Community	29 service users	Gender: 100% male Age: 35-65 years Ethnicity: Not stated BMI: Mean 34.5 Location: Scotland Other: Over 90% of participants were at very high or extremely high risk of future ill-health	Semi-structured telephone interviews	Thematic analysis
Hunt et al. 2014	To explore who is attracted to FFIT and why overweight/ obese men choose to take part	Community	63 service users	Gender: 100% male Age: 35-65 years Ethnicity: Not stated BMI: Mean 35.3 Location: Scotland Other: Roughly equal proportions from the five quintiles of socio-economic deprivation (Note: characteristics for the wider intervention group; views taken from a random selection of those agreeing to participate in focus groups)	Focus groups	Thematic analysis

Study (linked studies)	Focus	Weight management programme(s)	Participants	Service-user characteristics	Data collection	Data analysis
Jones et al. 2007	Patients' views on the service and the impact that attending the dietetic service had on their lives	Health service	24 service users	Gender: 75% female Age: 20-50 years Ethnicity: Not stated BMI: ≥ 30 Location: Ayrshire (West of Scotland) Other: n/a	Semi-structured interviews	Content analysis
MacLeod et al. 2013	Midwives' current practice and views on weight management of obese women during pregnancy and the puerperium	Health service	78 providers	Gender: n/a Age: n/a Ethnicity: n/a BMI: n/a Location: NHS Tayside, Scotland. Other: n/a	Interviews	NR
Mercer and Tessier 2001	General practitioners' and practice nurses' perceptions of obesity, their strategies and attitudes towards weight management and major obstacles to (and need for) better weight management in primary care	Health service	20 providers	Gender: n/a Age: n/a Ethnicity: n/a BMI: n/a Location: Greater Glasgow Health Board area Other: n/a	Semi-structured interviews	Thematic analysis
Monaghan 2007	Men's critical understandings of 'appropriate' weight-for-height in relation	Commercial	37 service users	Gender: 100% male Age: 16-79 years Ethnicity: All were White, with the exception of two men of African-Caribbean origin	Interviews	NR

Study (linked studies)	Focus	Weight management programme(s)	Participants	Service-user characteristics	Data collection	Data analysis
	to masculinities and moral worth			BMI: Not stated Location: Not stated Other: n/a		
Morrison et al. 2014	Reasons for enrolling, experiences of participating and reasons for remaining in a family-based trial of a dietician-delivered lifestyle modification intervention aiming to reduce obesity in South Asians	Community	20 service users	Gender: 35% female Age: Not stated Ethnicity: South Asians: 55% Pakistani; 45% Indian BMI: Not stated Location: Scotland Other: Faith, Muslim 55%; Sikh 45%	Face-to-face Interviews	Thematic data analysis
Oteng-Ntim et al. 2010	Healthcare professionals' views on the development of multi-component interventions for obese pregnant women	Commercial (range); Health service	22 providers	Gender: n/a Age: n/a Ethnicity: n/a BMI: n/a Location: London (Lambeth) Other: 12 NHS providers and 10 other providers including commercial service providers such as Slimming World and Weight Watchers, but also including some local provision	Semi-structured telephone Interviews	Framework analysis
Penn et al. 2008	The experience of participants who maintained behaviour change in an RCT of diet and exercise interventions in	Unclear - European Diabetes Prevention Study (EDIPS)	15 service users	Gender: 47% female Age: 47-72 Ethnicity: Not stated BMI: >25 Location: Newcastle area	Interviews	Framework method

What are the critical features of successful Tier 2 weight management programmes?

Study (linked studies)	Focus	Weight management programme(s)	Participants	Service-user characteristics	Data collection	Data analysis
	people with impaired glucose tolerance			Other: Impaired glucose tolerance diagnoses		
Reed et al. 1999	Perceived barriers to successful weight loss among people attending an aqua-fitness programme with dietician support, compared with the perceptions of those receiving dietician support only	Health service	30 service users	Gender: 100% female Age: Mean 52 Ethnicity: 80% White British, 20% 'other' BMI: >35 Location: Coventry area Other: n/a	Interviews	NR
Smith et al. 2011	Health service providers' views on maternal obesity services and their perceived role in the management and prevention of maternal obesity.	Community and health services (a range were discussed)	30 providers	Gender: n/a Age: n/a Ethnicity: n/a BMI: n/a Location: North East of England Other: n/a	Semi-structured interviews	Thematic analysis
Smith et al. 2012	Health professionals' experiences of caring for women with a BMI ≥ 30 kg/m ² and their views of the proposed lifestyle programme.	Health service	30 providers	Gender: n/a Age: n/a Ethnicity: n/a BMI: n/a Location: North West of England Other: n/a	Semi-structured interviews	Thematic analysis
Webb et al. 2014*	Patients' experiences of the Liverpool Weight Management Programme.	Health service	16 Service users	Gender: 70% women Age: Not stated Ethnicity: Not stated BMI: 'Obese'	Focus groups	Thematic analysis

Study (linked studies)	Focus	Weight management programme(s)	Participants	Service-user characteristics	Data collection	Data analysis
				Location: Liverpool area		
Witty and White 2010	To assess the barriers and facilitators associated with implementing a health promotion intervention targeting men attending rugby league games	Community (Tackling Men's Health)	20 Service users; 8 stakeholders	Gender: 100% male Age: Not stated Ethnicity: Predominately White BMI: Not stated Location: Leeds Carnegie Stadium Other: n/a	Semi-structured interviews	Thematic analysis
Wormald et al. 2006	Participants' perceptions of the operation and effectiveness of the Active Life service	Community	16 service users	Gender: 69% female Age: 15-73 years Ethnicity: White BMI: Not stated Location: Kingston-upon-Hull Other: n/a	Focus groups	Content analysis

* Studies not included in NICE review (Hartmann-Boyce et al., 2013b).

Appendix 2: Views synthesis findings: Non-weight management programme factors that are perceived to moderate programme success

The following sections report on key contextual issues, rather than WMP features, that impact on service users' success with weight loss and engagement with weight management services. Section A2.1 considers experiences in the period before engaging (or not) with a weight management programme. Section A2.2 considers service users' and providers views' about factors external to services that moderate or prevent successful engagement with WMPs.

A2.1 Before joining a weight management programme: being referred, expectations of the programme and readiness to change

Although we were seeking studies which examined experience of WMPs, 14 service-user studies (Atkinson et al., 2010, Brown et al., 2006, De Souza and Ciclitira, 2005, Doyle and Shaw, 2012, Furness et al., 2011, Gray et al., 2013a, Herriot et al., 2008, Hunt et al., 2013, 2014, Jones et al., 2007, Monaghan, 2007, Penn et al., 2008, Witty and White, 2010, Wormald et al., 2006) and six service-provider studies (Furness et al., 2011, Macleod et al., 2013, Mercer and Tessier, 2001, Oteng-Ntim et al., 2010, Smith et al., 2011, 2012) included views relating to the period prior to joining a WMP. These data relate to referring or being referred to a WMP and also to service users' expectations of WMPs prior to joining. The findings make clear how referrals and prior expectations of WMPs are pivotal to users' decisions about whether to engage with them.

Table A2.1: Overview of findings on referrals and prior expectations of WMPs

Overarching themes	Sub-themes
Referring and being referred to a WMP	<p>Referrals were a potentially significant barrier to WMP uptake:</p> <ul style="list-style-type: none"> • Referrals were negatively experienced by many users • Obesity stigma meant that people often felt judged or offended • Providers lacked confidence to discuss patients' weight
What might improve the experience of referral?	<p>Sensitive handling of referrals:</p> <ul style="list-style-type: none"> • Initiating the process via face-to-face discussions • A respectful and non-judgemental provider manner • Appropriate timing and encouragement of self-referral • Referrals training for providers
What else affects people's decision to join a WMP?	<p>Prior expectations of WMPs both deter and attract users:</p> <ul style="list-style-type: none"> • Deterrents - negative or judgemental WMP providers • Incentives - health benefits, the prestige of partner organisations such as football clubs

What do users and providers say about referring or being referred to a weight management programme?

Reflections on the referrals process were found in ten service-user studies (Atkinson et al., 2010, Brown et al., 2006, Doyle and Shaw, 2012, Furness et al., 2011, Gray et al., 2013a, Hunt et al., 2014, Jones et al., 2007, Penn et al., 2008, Witty and White, 2010, Wormald et al., 2006) and seven provider studies (Atkinson et al., 2010, Furness et al., 2011, Macleod et al., 2013, Mercer and Tessier, 2001, Oteng-Ntim et al., 2010, Smith et al., 2011, Witty and White, 2010). Service users in four studies (Atkinson et al., 2010, Brown et al., 2006, Doyle and Shaw, 2012, Furness et al., 2011) vividly illustrated the potential for patients to feel distressed and offended by being referred to WMPs; for example, one service-user described being referred as 'like a personal insult to you' (Atkinson et al., 2010); another as 'Really upsetting and a blow to my confidence' (Doyle and Shaw, 2012). Common to six service-user studies were comments indicating a pervasive stigma around being overweight (Brown et al., 2006, Doyle and Shaw, 2012, Furness et al., 2011, Gray et al.,

2013a, Hunt et al., 2014, Witty and White, 2010). Service users in four studies described feeling judged (Atkinson et al., 2010, Brown et al., 2006, Doyle and Shaw, 2012, Furness et al., 2011).

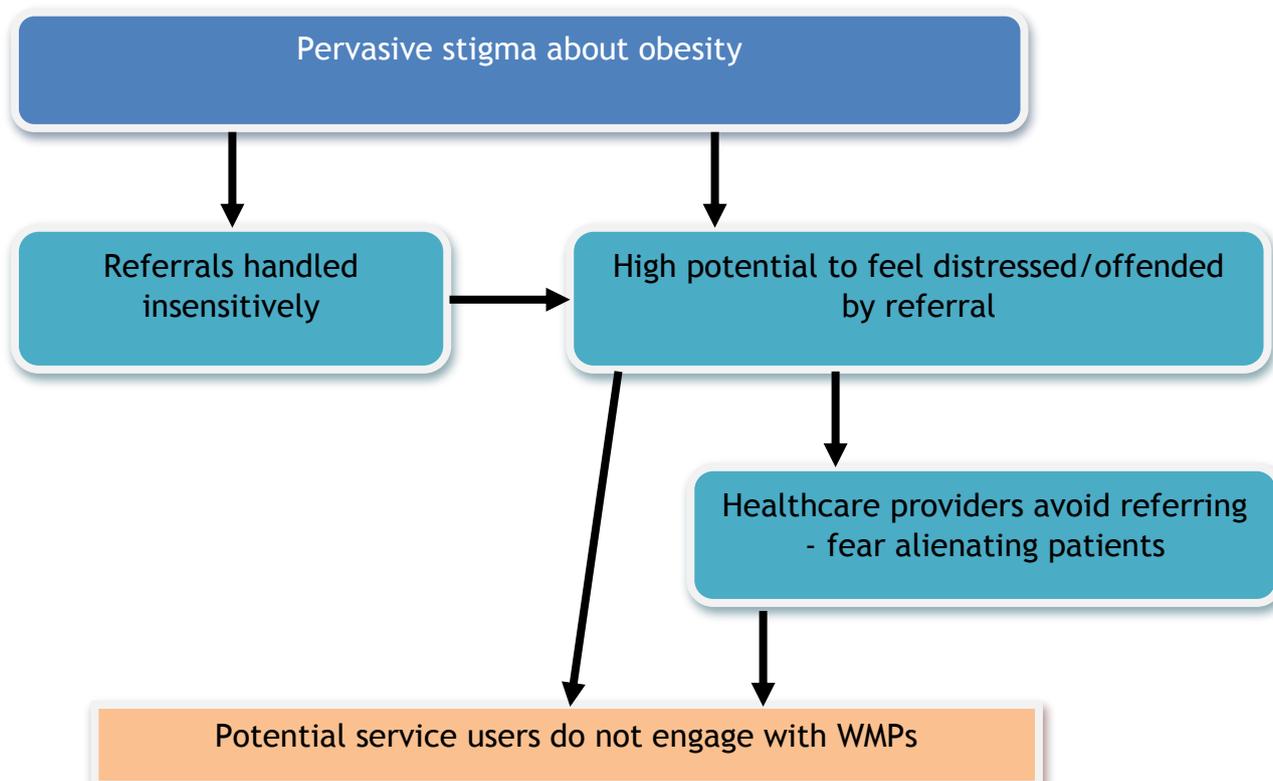
Providers were also acutely aware of the potentially negative psychological impact of discussing weight management with patients (Macleod et al., 2013) and expressed anxiety and a lack of confidence to broach the issue (Atkinson et al., 2010, Furness et al., 2011, Macleod et al., 2013, Oteng-Ntim et al., 2010, Witty and White, 2010). Providers in five studies reported avoiding raising the issue with people for fear of alienating them (Atkinson et al., 2010, Furness et al., 2011, Macleod et al., 2013, Oteng-Ntim et al., 2010, Witty and White, 2010).

The sensitive nature of the issue thus has the potential to be a significant barrier to uptake of WMPs in two ways. First, service users may be put off from considering WMPs if the issue of their weight is addressed insensitively, for example:

The initial contact deterred some women, even if they were motivated to make some lifestyle changes. (Atkinson et al., 2010 p.11)

Second, service users may never be informed about or offered access to WMPs if providers avoid discussing patients' weight. Other factors that discouraged people from engaging with WMPs were poorly organised referral follow-up (Atkinson et al., 2010), excessive waiting times following referral (Jones et al., 2007) and a lack of consultation prior to being referred (Atkinson et al., 2010, Doyle and Shaw, 2012).

Figure A2.1: Barriers to initial engagement with WMPs



What do service users and providers feel might improve the experience of referral?

Some studies indicated that the referrals process worked best when initiated via sensitive face-to-face discussions with healthcare practitioners. One study, focusing on a service for pregnant women, described that whilst many women had negative experiences of referral, those who were referred to the service following discussions with a health professional reported being happy to be referred (Atkinson et al., 2010). A respectful and non-judgemental approach in discussions was viewed as having the potential to overcome initial sensitivities (Atkinson et al., 2010, Furness et al., 2011). Humour was suggested as a technique for reducing tensions in one study focusing on men:

Identifying fat people and then saying do you want to join a group it's tricky, you can sort of get away with it, with a bit of banter but it's hard (Witty and White, 2010 p.18)

Sensitivity with regard to the timing of referral was also commonly raised; service users (Atkinson et al., 2010, Doyle and Shaw, 2012, Hunt et al., 2014, Penn et al., 2008) and providers (Atkinson et al., 2010, Macleod et al., 2013, Oteng-Ntim et al., 2010, Smith et al., 2012) indicated that being sensitive to events in people's lives would help to get the timing right:

A lot of people felt that it wasn't a good time to be saying to someone who might not be coping particularly well with a new baby well aren't you a big fat pig and you've been referred to a project to sort out weight. (Atkinson et al., 2010 p.34)

Service users and providers indicated that timing a referral appropriately would enhance the likelihood of engagement with a WMP (Atkinson et al., 2010, Macleod et al., 2013, Oteng-Ntim et al., 2010, Smith et al., 2012). Providers in studies focusing on services for pregnant women indicated that whilst pregnancy was a particularly sensitive time to raise the issue, pregnancy was a potential hook for engaging with women about weight management since they were concerned to do the best for their children (Atkinson et al., 2010, Furness et al., 2011, Oteng-Ntim et al., 2010). Service users who had experienced a pregnancy-related programme suggested that the referral should be timed early in the pregnancy (Atkinson et al., 2010).

However, some service users found that getting the timing right was a matter of serendipity, the timing of the intervention opportunity coinciding with the readiness of the participant (Atkinson et al., 2010, Doyle and Shaw, 2012, Hunt et al., 2014, Penn et al., 2008). Service providers also recognised the difficulty of attracting those who were not ready to engage (Atkinson et al., 2010).

Self-referral was indicated as an avenue for avoiding the potential harm and distress caused by insensitively handled professional referral, whilst simultaneously encouraging readiness to change. Several studies indicated the success or potential value of posters and leaflets for encouraging self-referral; evidence from four studies suggests that service users would welcome this approach (Atkinson et al., 2010, Brown et al., 2006, Doyle and Shaw, 2012, Wormald et al., 2006). Authors of a study which had initially struggled to recruit men to a weight-loss programme hypothesised that encouraging readiness to change in this way could probably have increased recruitment (Witty and White, 2010).

Provider training on conducting referrals was suggested by several providers (Atkinson et al., 2010, Furness et al., 2011, Mercer and Tessier, 2001, Oteng-Ntim et al., 2010). One study suggested working with potential service users to establish what terminology and language should be used (Oteng-Ntim et al., 2010); a further suggestion in this study was procedures to standardise the approach to referrals.

Is there anything else that affects people's decision to join a WMP?

Some service users indicated that rather than the referral, it was prior expectations of the programme itself that put them off. In one study, stigma was indicated as a barrier again; several service users anticipated that they would be judged or treated insensitively by the WMP providers (Atkinson et al., 2010).

Service users in a small number of studies reflected on aspects of WMPs that initially attracted them; factors included anticipated health benefits for the whole family (Atkinson et al., 2010, Hunt et al., 2014), information on healthy eating, exercise and weight management (Atkinson et al., 2010), and improved fitness and energy levels (Atkinson et al., 2010, Herriot et al., 2008). One study which asked about expectations of the service found that, among those who had ultimately joined and remained in the service, the opportunity for someone to monitor their weight was a draw (Atkinson et al., 2010). Service users in studies exploring views about WMPs involving high-profile organisations indicated that the prestige of these organisations was a powerful draw (Herriot et al., 2008, Hunt et al., 2014, Witty and White, 2010).

The evidence from service users and providers indicates that the process of referral is potentially a significant impediment to addressing levels of obesity in the UK via WMPs. Likewise, prior expectations of WMPs, and the associated push and pull factors for joining one, appear to be significant moderators. We have highlighted these issues since they emerged from the data within the studies; however, since these issues were not the primary focus of the review the search strategy was not specifically designed to identify studies examining them, so more evidence than

that which is examined here may currently be available. The limited data examined here suggest that further investigation of these issues is warranted.

A2.2 External influences on WMP engagement and successful weight loss: Social, cultural, environmental and organisational moderators

This section reports on views about non-intervention factors perceived to influence or moderate the success of a WMP: 1) psychological factors; 2) socio-cultural factors 3) contextual stressors; and 4) available resources.

Table A2.2: Overview of findings on non-intervention factors which moderate WMP success

Overarching themes	Sub-themes
Psychological factors	Beliefs, will power, emotional regulation.
Socio-cultural factors	Cultural beliefs, social relationships and stigma.
Contextual stressors	Fitting into schedule, environmental stressors, physical health stressors.
Resource issues	The cost of WMPs and the time and training needed to deliver them.

Psychological factors

Nine service-user studies (Atkinson et al., 2010, Bidgood and Buckroyd, 2007, Gray et al., 2009, Jones et al., 2007, Herriot et al., 2008, Monaghan, 2007, Penn et al., 2008, Reed et al., 1999, Soltani et al., 2012) and three service-provider studies (Bingham et al., 2014, Mercer and Tessier, 2001, Soltani et al., 2012) suggested that psychological factors such as beliefs, will power and emotions moderate WMPs' engagement and health behaviours.

Beliefs

Service users in eight studies (De Souza and Ciclitira, 2005, Gray et al., 2009, Herriot et al., 2008, Hunt et al., 2014, Jones et al., 2007, Monaghan, 2007, Morrison et al., 2014, Penn et al., 2008) and providers in three studies (Bingham et al., 2014, Mercer and Tessier, 2001, Soltani et al., 2012) described how negative beliefs may hinder people's ability to lose weight. Service users in four studies described a lack of belief in their capacity to lose weight (Ahern et al., 2013, Herriot et al., 2008, Jones et al., 2007, Penn et al., 2008), for example 'I'd like to be a size 14 or 12 that would be ideal, but is it ever going to happen?' (Herriot et al., 2008 p.78). Thus developing self-efficacy may be an important aim for WMPs. Beliefs about weight management inculcated by negative experiences also acted as a barrier, for example 'I went to the gym once and kinda thought it was terrible. I didn't want to go back' (Penn et al., 2008 p.4). WMPs which emphasise benefits may be able to overturn such beliefs. Beliefs about the desirability of particular physiques were also identified as a potential barrier to weight loss. In two studies (Gray et al., 2009, Monaghan, 2007) male service users indicated that being thin was not seen as positive for males, for example 'I'm at 15 [stones] the now, so if I can stay at 15 I'd be happy ... If I get too low down, I'll probably just look ill' (Gray et al., 2009 p.78).

Providers also described a lack of self-efficacy to enable behaviour change amongst service users (Bingham et al., 2014, Furness et al., 2011), perhaps suggesting the need for additional training. Furthermore, GPs in one study reported a belief that weight management was an inappropriate use of their time (Mercer and Tessier, 2001); other providers reported feeling de-motivated by colleagues such as GPs who were perceived to be uninterested in weight management (Mercer and Tessier, 2001, Soltani et al., 2012).

Will power

The inability to resist temptation was identified as a barrier to weight loss in nine service-user studies (Atkinson et al., 2010, Bidgood and Buckroyd, 2007, Furness et al., 2011, Herriot et al., 2008, Jones et al., 2007, Monaghan, 2007, Morrison et al., 2014, Penn et al., 2008, Reed et al., 1999). Will power was discussed generally, for example 'When she was here it was like yes I can do that, but as soon as she drove off the drive I'll have a cup of tea and a biscuit' (Atkinson et al., 2010 p.19), but also in terms of contexts when it was likely to be challenged such as during holidays and social functions, for example 'Life gets in the way and you put a bit on when there's things going on like holidays' (Monaghan, 2007 p.592).

Emotional regulation

Service users in three studies (Gray et al., 2009, Jones et al., 2007, Soltani et al., 2012) indicated how negative emotions can impede successful health behaviour change, including feeling overwhelmed by the amount of change required, sadness and apathy or boredom with the WMP. One service user described how her mood affected their receptiveness to motivational text messages: 'On a fat day, that motivational message might make you feel like oh I can't be bothered today' (Soltani et al., 2012 p.4).

Socio-cultural factors

Ten service-user studies (Ahern et al., 2013, Atkinson et al., 2010, Bidgood and Buckroyd, 2007, De Souza and Ciclitira, 2005, Doyle and Shaw, 2012, Furness et al., 2011, Monaghan, 2007, Morrison et al., 2014, Penn et al., 2008, Witty and White, 2010) suggested that socio-cultural factors were implicated in engagement with WMPs. Three factors were identified: culture, social relationships and stigma.

Culture

Two service-user studies suggested that cultural factors acted as barriers to successful weight management (Morrison et al., 2014, Atkinson et al., 2010). In one study, the important role of food in community and faith-based traditions, was highlighted as a barrier to sustaining healthy eating: 'I know that if I lose more weight I'm going to put it back on at Ramadan' (Morrison et al., 2014 p.6).

Cultural mores were also described as inhibiting successful weight management; female participants in two studies suggested that culturally entrenched gender roles acted as a barrier in their respective communities (one South Asian, Morrison et al., 2014, the other unspecified, Atkinson et al., 2010), for example, 'Not all the people, especially in our culture, our husbands, they don't support us' (Atkinson et al., 2010 p.31).

Personal relationships

Personal relationships were discussed in five service-user studies; they were identified as both a potential barrier and facilitator of weight management.

Four studies (Penn et al., 2008, Doyle and Shaw, 2012, Atkinson et al., 2010, De Souza and Ciclitira, 2005) described personal relationships as a hindrance to losing weight. In two studies (Doyle and Shaw, 2012, De Souza and Ciclitira, 2005) women were de-motivated to lose weight because their partners were in favour of maintaining the status quo rather than being supportive of change, for example 'I've also got a husband who has always liked the larger lady really, and that doesn't help' (Doyle and Shaw, 2012 p.9). In another study (De Souza and Ciclitira, 2005) a male participant appeared nonchalant with regard to a lack of support from his partner, although his statement implied that he clearly recognised the potential for support from significant others to help: 'It doesn't bother me uhm because I'm doing it for myself so I don't necessarily need their support' (p.800).

Conversely, service users in five studies reported the benefits of personal relationships within the context of weight management (Atkinson et al., 2010, De Souza and Ciclitira, 2005, Doyle and Shaw, 2012, Jones et al., 2007, Penn et al., 2008):

I do engage with my colleagues. I do say to them, 'Right come on there's another Lent coming up, I've just come back from America'. My trip to America with all the fast food, my God I put four pounds on in twelve nights ... my team is quite small and they are very supportive (Doyle and Shaw, 2012 p.38).

These findings further emphasise the centrality of the need for support from others when engaging in weight management; they also suggest that WMPs could further bolster the availability of support from providers and peers by encouraging or facilitating support from users' own social networks. The studies provided no clear suggestions for how to achieve this. Whilst participants in one study suggested including partners in WMPs (Atkinson et al., 2010) service users in another study were 'vigorously against the proposition' (Webb et al., 2014 p.149). In addition, the evidence suggests that some people are resistant to their partners changing their weight, which presumably has deep psychological roots. Thus providers of WMPs will need to be creative in harnessing the support of and mitigating the barriers imposed by the social networks of service users.

Stigma

Ten service-user studies discussed the stigmatised nature of obesity (Ahern et al., 2013, Atkinson et al., 2010, Bidgood and Buckroyd, 2007, Bingham et al., 2014, Brown et al., 2006, Furness et al., 2011, Gray et al., 2013a, Hunt et al., 2013, Monaghan, 2007, Witty and White, 2010). In five studies, participants described an expectation of negative stereotypes in social interactions (Atkinson et al., 2010, Bidgood and Buckroyd, 2007, Brown et al., 2006, Furness et al., 2011, Gray et al., 2013a), for example:

I think the stigma is that if you're over a certain BMI that you don't exercise isn't it? (General agreement) That's what people think. I mean if you're slim and you've got a low BMI then they automatically think that you exercise, if you're not then they think you don't (Furness et al., 2011 p.5).

The expectation of negative responses was described as fostering an inclination to withdraw from social interactions; participants in three studies described a reluctance to leave the house (Bidgood and Buckroyd, 2007, Bingham et al., 2014, Furness et al., 2011) which impacted negatively on their activity levels. In six studies participants indicated that stigma was a barrier to taking up available weight management resources (Ahern et al., 2013, Atkinson et al., 2010, Bidgood and Buckroyd, 2007, Gray et al., 2013a, Hunt et al., 2013, Witty and White, 2010); for example, swimmers in one study (Bidgood and Buckroyd, 2007) (gender unspecified) felt uncomfortable accessing local exercise facilities and wanted to see times allocated at public pools exclusively for large people. Evidence in four studies suggested that men might be particularly affected by weight related stigma (De Souza and Ciclitira, 2005, Hunt et al., 2013, 2014, Witty and White, 2010):

[M]en particularly are reluctant to up take the many health care provisions that there are in our society, this kind of self image thing and the sense of mortality is a huge barrier to some people (Witty and White, 2010 p.28)

Men described WMPs and weight-loss as feminised activities (De Souza and Ciclitira, 2005, Hunt et al., 2013, 2014, Witty and White, 2010) that were 'inaccessible, inappropriate, or threatening to their identities as men' (Hunt et al., 2013). Even engagement in masculine activities such as sport risked exposing a lack of masculinity as their 'compromised bodies' revealed 'loss of fitness, youth and physicality' (Hunt et al., 2013).

Contextual stressors

Service users in 11 studies (Ahern et al., 2013, Atkinson et al., 2010, De Souza and Ciclitira, 2005, Doyle and Shaw, 2012, Gray et al., 2013a, Hunt et al., 2013, Jones et al., 2007, Morrison et al., 2014, Penn et al., 2008, Reed et al., 1999, Witty and White, 2010) described contextual factors as inhibiting their ability to lose weight; participants described responsibilities and time constraints, environmental stressors and physical health stressors as barriers to attending WMPs and engaging in healthy behaviours.

Responsibilities and time constraints

Service users in five studies identified responsibilities in their life as preventing attendance at or resulting in withdrawal from a WMP (Atkinson et al., 2010, Doyle and Shaw, 2012, Gray et al., 2013a, Morrison et al., 2014, Penn et al., 2008), including family commitments such as child and partner care (Atkinson et al., 2010, Morrison et al., 2014, Penn et al., 2008), work (Doyle and Shaw, 2012, Penn et al., 2008), bereavements (Atkinson et al., 2010, Doyle and Shaw, 2012) and moving house or location (Atkinson et al., 2010, Gray et al., 2013a):

Then I hit a big problem, a big crisis in my work life and that has made everything very difficult... The programme is perfect when you are in the right frame of mind to commit to it (Service-user - Doyle and Shaw, 2012 p.39).

Environmental stressors

Four service-user studies identified environmental stressors as barriers to engaging in healthy behaviours, including bad weather (Hunt et al., 2013, Penn et al., 2008), lack of healthy eating facilities (Witty and White, 2010) and supermarket promotions of unhealthy foods (Jones et al., 2007).

Physical health stressors

Five service-user studies identified physical health stressors as barriers to weight management. In two studies, service users talked about how physical joint problems or arthritis inhibited capacity to engage in exercise (Penn et al., 2008, Reed et al., 1999), for example ‘The occurrence of setbacks, such as deteriorating physical condition or injury, was mentioned by many participants’ (Penn et al., 2008 p.4). However, it should be noted that in three studies, service users highlighted that deteriorating physical health was a key driver for initially engaging in WMPs (Ahern et al., 2013, De Souza and Ciclitira, 2005, Gray et al., 2009).

Available resources

Three service-user studies (Ahern et al., 2013, Jones et al., 2007, Penn et al., 2008) and six provider studies (Allan et al., 2011, Atkinson et al., 2010, Furness et al., 2011, Mercer and Tessier, 2001, Smith et al., 2011, Witty and White, 2010) suggested that resource issues, for users in terms of financial cost and for providers in terms of time and training, inhibited WMP attendance and engagement in healthy behaviours.

Service-user concerns

Service users in six studies indicated that the expense of attending WMPs was a potential barrier. Two studies (Jones et al., 2007, Penn et al., 2008) identified cost as a barrier to engaging in exercise, for example ‘I get a pension ... not very much mind - can't buy a new pair of shoes with it, that's for sure’ (Penn et al., 2008 p.6). All six were clear that subsidised WMPs, including those provided through the NHS, were a likely facilitator of service use (Ahern et al., 2013, Atkinson et al., 2010, Brown et al., 2006, Doyle and Shaw, 2012, Jones et al., 2007, Penn et al., 2008). In one study some service users indicated that subsidised programmes led to a perceived obligation to attend, whereas others in the same study described feeling less pressure to attend because they were not paying and they therefore felt more comfortable (Ahern et al., 2013).

Service-provider concerns

Time constraints and staffing levels were reported as barriers to providing adequate weight management support in five studies on health service or community-based interventions (Allan et al., 2011, Brown et al., 2006, Furness et al., 2011, Mercer and Tessier, 2001, Witty and White, 2010). Service providers in two studies talked about needing better facilities (Atkinson et al., 2010, Mercer and Tessier, 2001), for example interpreting services to reach non-English speakers (Atkinson et al., 2010), and providers in nine studies discussed the need for more staff training (Allan et al., 2011, Atkinson et al., 2010, Bingham et al., 2014, Gray et al., 2013a, Macleod et al., 2013, Mercer and Tessier, 2001, Oteng-Ntim et al., 2010, Smith et al., 2011, 2012). Some identified a need for additional knowledge, for example in relation to nutrition (Mercer and Tessier, 2001), but the most commonly cited training needs were for developing people skills to ensure appropriate and sensitive support for those with obesity (Allan et al., 2011, Atkinson et al., 2010, Bingham et al., 2014, Macleod et al., 2013, Mercer and Tessier, 2001, Oteng-Ntim et al., 2010, Smith et al., 2012).

Appendix 3: Characteristics of interventions included in the synthesis of service evaluations (n= 20 interventions in 15 trials)

First study author, Year (arm)	Study aim	Country	Number of participants in focal intervention and control	Study recruitment	Comparator	Study population	Mean age (years) of participants	female	Ethnic minority	Some college education	Outcomes at 12 months	Outcomes at 18 to 24 months	Outcomes at 36 months
Most effective interventions (n=10)													
Bertz et al. 2012	Weight loss	Sweden	33*	Personalised contact via clinic/GP	No intervention or leaflets only	Breastfeeding women	34	100	3	69	-6.00 [-8.05, -3.95]		
Diabetes Prevention Program Research Group 2002a	Diabetes prevention	USA	2,161	Mass recruitment (direct mail/ advertisement)	Seeing someone more than once for weight mgmt, provider untrained +/- leaflets	US ethnic minority populations	51	68	54	74	-6.10 [-6.65, -5.55]		
Foster-Schubert et al. 2012	Weight loss	USA	204*	Mass recruitment (direct mail/ advertisement)	No intervention or leaflet/s only	Post-menopausal women	58	100	15	70	-8.20 [-9.59, -6.81]		

What are the critical features of successful Tier 2 weight management programmes?

First study author, Year (arm)	Study aim	Country	Number of participants in focal intervention and control	Study recruitment	Comparator	Study population	Mean age (years) of participants	female	Ethnic minority	Some college education	Outcomes at 12 months	Outcomes at 18 to 24 months	Outcomes at 36 months
Kuller et al. 2012	Slow sub-clinical atherosclerosis in women on HRT	USA	508	Mass recruitment (direct mail/ advertisement)	Seeing someone more than once for discussion other than weight loss	Post-menopausal women	57	100	12	80	-5.10 [-6.18, -4.02]		-2.70 [-3.75, -1.65]
Rejeski et al. 2011	Increased mobility	USA	191*	Mass recruitment (direct mail/ advertisement)	Seeing someone more than once for discussion of something other than weight loss	Older adults with poor cardiovascular health	67	67	15	47	-5.50 [-7.61, -3.39]		
Rock et al. 2010 (centre-based)	Weight loss	USA	278*	Mass recruitment (direct mail/ advertisement)	Seeing someone more than once for weight mgmt, provider untrained +/- leaflets	Women only	44	100	32	74	-7.60 [-9.57, -5.63]	-5.50 [-7.78, -3.22]	

First study author, Year (arm)	Study aim	Country	Number of participants in focal intervention and control	Study recruitment	Comparator	Study population	Mean age (years) of participants	female	Ethnic minority	Some college education	Outcomes at 12 months	Outcomes at 18 to 24 months	Outcomes at 36 months
Rock 2010 (telephone-based)	Weight loss	USA	275*	Mass recruitment (direct mail/ advertisement)	Seeing someone more than once for weight mgmt, provider untrained +/- leaflets	Women only	44	100	21	73	-6.00 [-8.05, -3.95]	-4.40 [-6.78, -2.02]	
Villareal et al. 2011	Weight loss and improved physical function	USA	55*	Mass recruitment (direct mail/ advertisement)	Seeing someone more than once for weight mgmt, provider untrained +/- leaflets	Aged 65 years or older	70	63	NR	68	-7.80 [-9.84, -5.76]		
Vissers 2010 (fitness)	Weight loss	Belgium	41*	Personalised contact via clinic/GP	No intervention or leaflet/s only	Non-targeted	45	74.7	NR	NR	-7.40 [-10.85, -3.95]		
Vissers 2010 (vibration)	Weight loss	Belgium	36*	Personalised contact via clinic/GP	No intervention or leaflet/s only	Non-targeted	43	74.7	NR	NR	-8.30 [-11.99, -4.61]		
Least effective interventions (n=10)													

What are the critical features of successful Tier 2 weight management programmes?

First study author, Year (arm)	Study aim	Country	Number of participants in focal intervention and control	Study recruitment	Comparator	Study population	Mean age (years) of participants	female	Ethnic minority	Some college education	Outcomes at 12 months	Outcomes at 18 to 24 months	Outcomes at 36 months
Eriksson et al. 2009	CVD prevention	Sweden	151	Personalised contact via clinic/GP	Discussion/ advice/ counselling in one-off session +/-leaflet	Cardiovascular risk	54	57	NR	NR	-0.60 [-1.45, 0.25]		
Hersey et al. 2012 (2)	Weight loss	USA	1,177*	Mass recruitment (direct mailing/ advertisement)	Discussion/ advice/ counselling in one-off session +/-leaflet	Non-targeted	47	71.8	5.5	NR	-0.70 [-1.37, -0.03]	0.00 [-0.60, 0.60]	
Hersey et al. 2012 (3)	Weight loss	USA	1,176*	Mass recruitment (direct mailing/ advertisement)	Discussion/ advice/ counselling in one-off session +/-leaflet	Non-targeted	47	77	5.9	NR	-0.60 [-1.28, 0.08]	-0.50 [-1.14, 0.14]	
Jolly et al. 2011 (GP)	Weight loss	UK	170*	Personalised contact via clinic/GP	No intervention or leaflet/s only	Non-targeted	50	67	10	NR	0.30 [-2.47, 3.07]		
Jolly et al. 2011 (pharmacist)	Weight loss	UK	170*	Personalised contact via clinic/GP	No intervention or leaflet/s only	Non-targeted	49	73	13	NR	0.40 [-2.31, 3.11]		

What are the critical features of successful Tier 2 weight management programmes?

First study author, Year (arm)	Study aim	Country	Number of participants in focal intervention and control	Study recruitment	Comparator	Study population	Mean age (years) of participants	female	Ethnic minority	Some college education	Outcomes at 12 months	Outcomes at 18 to 24 months	Outcomes at 36 months
Jolly 2011 (social worker)	Weight loss	UK	200*	Personalised contact via clinic/GP	No intervention or leaflet/s only	Non-targeted	49	65	12	NR	-0.80 [-3.42, 1.82]		
Munsch et al. 2003 (clinic)	Weight loss	Switzerland	69*	Personalised contact via clinic/GP	Seeing someone more than once for weight mgmt, provider untrained +/- leaflets	Non-targeted	46	75	NR	NR	-0.70 [-3.35, 1.95]		
Nanchahal et al. 2011	Weight loss	UK	381	Personalised contact via clinic/GP	No intervention or leaflet/s only	Non-targeted	49	72	29	NR	-0.30 [-1.18, 0.58]		
Patrick et al. 2011	Weight loss	USA	441	Mass recruitment (direct mailing/ advertisement)	No intervention or leaflet/s only	Men only	44	0	29	69	-0.70 [-1.96, 0.56]		
Vermunt 2011	Diabetes prevention	Netherlands	764*	Personalised contact via clinic/GP	Discussion/ advice/ counselling in one-off session +/- leaflet	Risk of developing type 2 diabetes	58	60	NR	NR	-0.20 [-0.82, 0.42]	-0.20 [-0.82, 0.42]	

*Study reports additional trial arms that were not included in the analysis

What are the critical features of successful Tier 2 weight management programmes?

Appendix 4: Framework developed from views synthesis and used to code intervention characteristics

Domain	Condition	Definition	Example descriptions in trial reports used as evidence of condition presence	Views evidence supporting condition
1. Provider support	Provider-user relationship emphasised	Therapeutic, provider-user relationship to support weight management, e.g. counselling or coaching	At randomisation, each lifestyle participant was assigned a case manager, called a 'lifestyle coach', who had primary responsibility for delivering the core curriculum, conducting postcore maintenance sessions, eliciting motivation from the participant to achieve the lifestyle goals, and assuring completion of required data collection (Diabetes Prevention Program Research Group, 2002b p2168)	See Table 2.4
	Provider role - interaction for individualised support	The role of providers to ensure intervention is personalised	Women met individually with a study dietitian for personalized goal-setting on at least two occasions (Foster-Schubert et al., 2012 p1629)	See Table 2.5
	Provider manner - encouraging/ supportive	Providers described as approachable, empathetic, compassionate, encouraging or non-judgemental	Progress was highlighted with strong positive feedback (Rejeski et al., 2011 p.882)	See Table 2.4
	Dietician	Some or all sessions were provided by a dietician	A trained dietician was responsible for the diet counselling. [p.4] (Eriksson et al., 2009)	See Table 2.4
2. Meeting user needs and preferences	Flexible programme	Intervention described as flexible to enable specific user needs to be met	A 'toolbox' of strategies that could be used with individual participants was developed. The toolbox was arranged in a hierarchy from less to more expensive approaches (in terms of staff time as well as money) and contained problem-solving strategies and reinforcements for use with individual participants (Diabetes Prevention Program Research Group, 2002b p2171)	See Table 2.5
	Population group targeted	Interventions targeted at a specific population group (e.g. men)	Healthy lactating women with self-reported pre-pregnant body mass index (calculated as kg/m ²) 25 to 35 and a singleton term delivery	See Table 2.5

Domain	Condition	Definition	Example descriptions in trial reports used as evidence of condition presence	Views evidence supporting condition
	Health risk group targeted	Interventions targeted at people with a specific health condition (e.g. diabetes)	Individuals at high risk for type 2 diabetes (Vermunt et al., 2011 p.1919)	See Table 2.5
3. Delivery format	Face-to-face sessions	Intervention delivered via face-to-face sessions	Dieticians had contact with participants twice a month, including one face-to-face contact (individual or group session) and one additional contact via phone or email (Foster-Schubert et al., 2012 p1629)	See Table 2.6
	Remote sessions	Intervention delivered remotely (e.g. online, telephone)	As well as manual-based information RCT2 added an interactive version of eHEALTH that provided tailored computerised feedback whenever participants submitted weekly assessments (Hersey et al., 2012 p.42)	See Table 2.6
	Group sessions	Intervention delivered via group sessions.	Three group exercise-training sessions per week. Participants met weekly as a group with a dietician for adjustments of their caloric intake and for behavioural therapy (Villareal et al., 2011 p 1220)	See Table 2.6
	Individual sessions	Intervention delivered via one-to-one sessions	12 one to one sessions in the general practice or pharmacy (Jolly et al., 2011 p2)	See Table 2.6
	High intensity	Interventions with a high number of sessions (≥ 48) delivered at high frequency (fortnightly or more often) and over a long duration (≥ 12 months)	During the first 3 months, participants had dietary counselling every fortnight. During the next 3 months they had dietary counselling once a month. During the last 6 months (follow-up) there were 3 more visits to the dietician (bi-monthly) (Vissers et al., 2010 p.95)	See Section 2.2.2
4. Monitoring	Weight monitoring	Weight monitoring, either self-monitored or provider monitored	During the 12-week programmes the service providers record weights on each visit (Jolly et al., 2011 p5)	See Table 2.7
	Private weight monitoring	Weight monitoring occurred within a private context, i.e., one-to-one with provider or in home setting	After a private weigh-in, participants provided a confidential progress update and identified problems encountered (Rejeski et al., 2011 p.882)	See Table 2.7

Domain	Condition	Definition	Example descriptions in trial reports used as evidence of condition presence	Views evidence supporting condition
	Diet monitoring	Self-monitoring of food consumed	Women were asked to record all food eaten daily for at least 6 months, or until they reached their individual weight loss goal (10%) (Foster-Schubert et al., 2012 p.1629)	See Table 2.7
	Diet monitoring made 'easy'	Tools for self-monitoring diet described as accessible and easy to use	They used a pocket sized 'Keeping Track' booklet. Self-monitoring skills were taught gradually over the first few weeks (Diabetes Prevention Program Research Group, 2002b p.2169)	See Table 2.7
	Exercise monitoring	Self-monitoring of exercise (either through diaries or technology, e.g. pedometer, heart-rate monitor)	The women were provided with an exercise-plan booklet, a heart-rate monitor (Polar FS2C; Polar Electro Oy), and an activity diary for self-monitoring (Bertz et al., 2012 p.699)	See Table 2.7
5. Diet	Practical diet information	Practical dietary advice (e.g. information on portion sizes, food preparation and reading food labels)	Sample meal plans based on food groups, recommendations to increase physical activity, and written materials and resources for strategies and skills (e.g., reading food labels, estimating serving sizes, eating outside the home) were provided (Rock et al., 2010 p.1805)	See Table 2.8
	Visual demonstration of diet information	Dietary advice provided using visual demonstrations (e.g. to illustrate fat content, portion size, weight loss)	'Cover one-half of the plate with vegetables at lunch and dinner, and reduce portion sizes' (Bertz et al., 2012 p.699)	See Table 2.8
	De-emphasise diet	Intentional avoidance of the term 'diet' in preference for terms such as 'healthy lifestyle' or intentionally minimal focus on diet	No examples located	See Table 2.8
6. Exercise	Supervised provision of exercise	Supervised exercise provided within the context of the intervention	The protocol required that each clinical centre offer supervised physical activity sessions at least twice per week throughout the trial (Diabetes Prevention Program Research Group, 2002b p.2170)	See Table 2.9

Domain	Condition	Definition	Example descriptions in trial reports used as evidence of condition presence	Views evidence supporting condition
	Focus on fitness gains of exercise	Feed back information about fitness gains when they are obtained	The intensive phase lasted 90 minutes. The first segment reviewed participants' progress from the previous session (Rejeski et al., 2011 p.882)	See Table 2.9
	Tailor exercise to fitness levels	Tailor exercise to fitness levels	In addition, the dieticians and exercise physiologists met regularly with a clinical health psychologist experienced in lifestyle behaviour change to discuss participant progress and refine behaviour modification goals according to each participant's needs (Foster-Schubert et al., 2012 p.1630)	See Table 2.9
	Graduated exercise	Increase the duration and/or the intensity of exercise gradually over time	The duration of walks was gradually increased in the first 4 weeks. During week 1, three 30-min and one 45-min walks were performed; during week 2, there were two 30-min and two 45-min walks, and during week 3, one 30-min and three 45-min walks (Bertz et al., 2012 p.699)	See Table 2.9
	Highlight local services available	Notify participants about relevant local services for exercise	Participants also received information about community-based physical activity and a study visit at a local gym was provided for each training group. (Eriksson et al., 2009 p.4)	See section 2.9
7. Goals	Provider-set energy-intake goal	Energy intake goal prescribed by the provider	Total daily energy intake of 1,200-2,000 kcal/day based on baseline weight, <30% daily energy intake from fat, and a 10% reduction in body weight by 6 months (Foster-Schubert et al., 2012 p.1629)	See Table 2.10
	User-identified diet goals	Goals for dietary intake set by users	Members leave the group each week prepared with a plan to address potential problems, having set individual weight loss and behaviour change targets (Jolly et al., 2011)	See Table 2.10
	Provider-set weight	Weight outcome goal was prescribed by the provider	The goal of the intervention was outcome-specific: to reduce weight by 0.5 kg week (but not exceed 1 kg week) to a total of 6 kg weight loss (Bertz et al., 2012 p.699)	See Table 2.10
	User-identified weight goal	Weight loss goals identified by users	Participants were encouraged to establish individual goals for weight reduction and to develop a personal physical activity plan (Eriksson et al., 2009 p. e5195)	See Table 2.10

Domain	Condition	Definition	Example descriptions in trial reports used as evidence of condition presence	Views evidence supporting condition
	Provider-set exercise goal	Exercise goal prescribed by the provider	They were encouraged to maintain at least 30 min/day of physical activity (Eriksson et al., 2009 p. e5195)	See Table 2.10
	User-identified exercise goal	Exercise goals identified by users	Participants were encouraged to establish individual goals for weight reduction and to develop a personal physical activity plan (Eriksson et al., 2009 p. e5195)	See Table 2.10
8. External moderators	Problem solving/relapse prevents	Discuss common/generic barriers to successful weight management and solutions to overcome them	Examples of specific key behavioural strategies included: self-monitoring, goal setting, stimulus control, problem solving, cognitive restructuring, relapse prevention, social support, and motivational techniques (Kuller et al., 2007 p.373)	See Table 2.12
	Tailored problem solving/relapse prevention	Discuss individuals' specific barriers to weight management and solutions to overcome them (includes socio-cultural, organisation and psychological barriers)	Lifestyle coaches were encouraged to work with each participant individually to identify the specific barriers and possible solutions to these barriers (Diabetes Prevention Program Research Group, 2002b p.2170)	See Table 2.12
9. Follow-on	Graduated exit from intervention	Stepped reduction in intervention intensity	During the first 3 months participants had a dietary counselling every fortnight. During the next 3 months there was a dietary counselling once a month. During the last 6 months (follow-up) there were 3 more visits to the dietician (bi-monthly). (Vissers et al., 2010 p.95)	See Table 2.11
10. Other benefits	Element of competition emphasised	Facilitate or emphasis competition to support weight management	In several campaigns, local participant teams or DPP centres competed for the best attendance, self-monitoring, weight loss, minutes of physical activity, or steps as measured by pedometer (Diabetes Prevention Program Research Group, 2002b p.2170)	
	Social benefits emphasised	Provide or emphasise the importance of social support for achieving weight management (other than provider support)	Reported difficulties were dealt with through group support and advice (Rejeski et al., 2011 p.882)	

Domain	Condition	Definition	Example descriptions in trial reports used as evidence of condition presence	Views evidence supporting condition
	Mental well-being benefits emphasised	Emphasise mental well-being benefits of weight management	Discussions focused on the concept of participants perceiving themselves as physically active, independent older adults (Rejeski et al., 2011 p.882)	
	Fun emphasised	Use fun to make the intervention more enjoyable and appealing	Food game to recall information (Vermunt et al., 2012 p.81)	

Appendix 5: QCA data table: How the interventions matched the WMP features identified in the views synthesis

Domain	Intervention features	Bertz 2013	DPP 2002	Foster-Schubert 2012	Kuller 2012	Rejeski 2011	Rock 2010 (CB)	Rock 2010 (TB)	Villareal 2011	Visser 2010 (fitness)	Visser 2010 (vibration)	Eriksson 2009	Hersey 2012 (2)	Hersey 2012 (3)	Jolly 2011 (GP)	Jolly 2011 (pharmacist)	Jolly 2011 (SW)	Munsch 2003 (clinic)	Nanchahal 2012	Patrick 2011	Vermunt 2011	Total most effective (n=10)	Total least effective (n=10)
		Most effective interventions										Least effective interventions											
1. Provider support	Provider-user relationship emphasised	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	0	1	0	1	10	6
	Provider role - interaction for individualised support	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	0	0	0	1	10	5
	Provider manner - encouraging/supportive	1	1	0	1	1	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	4	3
	Dietician	1	1	1	1	0	0	0	1	1	1	1	0	0	0	0	0	0	0	1	1	7	3
2. Addressing user needs/preferences	Risk group targeting	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	2
	Population group targeting	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	1	0	8	1
	Flexible programme	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
3. Monitoring	Weight monitoring	1	1	1	0	1	0	0	1	0	0	0	1	1	1	1	1	0	0	0	0	5	5
	Private weight monitoring	1	1	0	0	1	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	3	5
	Diet monitoring	1	0	1	1	1	0	0	1	0	0	0	1	1	1	1	1	1	1	0	1	5	8
	Diet monitoring made 'easy'	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1

What are the critical features of successful Tier 2 weight management programmes?

Domain	Intervention features	Bertz 2013	DPP 2002	Foster-Schubert 2012	Kuller 2012	Rejeski 2011	Rock 2010 (CB)	Rock 2010 (TB)	Villareal 2011	Visser 2010 (fitness)	Visser 2010 (vibration)	Eriksson 2009	Hersey 2012 (2)	Hersey 2012 (3)	Jolly 2011 (GP)	Jolly 2011 (pharmacist)	Jolly 2011 (SW)	Munsch 2003 (clinic)	Nanchahal 2012	Patrick 2011	Vermunt 2011	Total most effective (n=10)	Total least effective (n=10)
	Exercise monitoring	1	1	1	1	1	0	0	0	1	0	1	1	1	0	0	0	1	1	1	0	6	6
4. Delivery	Face-to-face	1	1	1	1	1	1	0	1	1	1	1	0	0	1	1	1	1	1	0	1	9	7
	Remote	1	0	1	0	0	1	1	0	0	0	0	1	1	0	0	1	0	0	1	0	4	4
	Group sessions	0	1	1	1	1	0	0	1	1	1	1	0	0	0	0	1	1	0	0	1	7	4
	Individual sessions	1	1	1	0	1	1	1	0	1	1	0	1	1	1	1	1	0	1	1	1	8	8
	High intensity	0	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	1	0	0	9	2
5. Diet	Practical diet information	1	1	0	1	1	1	1	0	0	0	1	0	0	1	1	1	0	1	1	1	6	7
	Visual demonstrations	1	0	0	0	1	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	2	3
	De-emphasise diet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6. Exercise	Supervised exercise provision	1	1	1	0	1	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	7	1
	Focus on fitness gains	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
	Tailored to fitness levels	1	1	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	1	0	4	3
	Graduated intensity	1	0	1	1	1	0	0	1	1	1	1	0	0	1	1	1	1	0	1	0	7	6
	Highlight services available	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	1	0	0	0	3
7. Goals	Provider-set energy-intake goal	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	10	0
	User-identified diet goal	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	1	0	0	5

What are the critical features of successful Tier 2 weight management programmes?

Domain	Intervention features	Bertz 2013	DPP 2002	Foster-Schubert 2012	Kuller 2012	Rejeski 2011	Rock 2010 (CB)	Rock 2010 (TB)	Villareal 2011	Visser 2010 (fitness)	Visser 2010 (vibration)	Eriksson 2009	Hersey 2012 (2)	Hersey 2012 (3)	Jolly 2011 (GP)	Jolly 2011 (pharmacist)	Jolly 2011 (SW)	Munsch 2003 (clinic)	Nanchahal 2012	Patrick 2011	Vermunt 2011	Total most effective (n=10)	Total least effective (n=10)
	Provider-set weight goal	1	1	1	1	1	1	1	1	0	0	0	0	0	1	1	0	0	0	0	0	8	2
	User-identified weight goal	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	1	0	0	4
	Provider-set exercise goal	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	10	1
	User-identified exercise goal	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1	1	0	1	0	0	6
8. External moderators	Problem solving /relapse prevention	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1	0	1	7	9
	Individualised problem solving / relapse prevention	1	1	1	0	1	0	0	0	0	0	1	0	1	1	1	0	0	1	0	1	4	6
9. Follow-on	Graduated exit	0	1	1	1	1	1	1	0	1	1	1	0	0	0	0	0	0	1	0	0	8	2
10. Other	Competition emphasised	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	Social benefits emphasised	0	0	1	1	1	0	0	0	0	0	1	1	1	0	0	1	0	0	1	1	3	6
	Mental well-being emphasised	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	Fun emphasised	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1

Appendix 6: QCA models

Table A6.1: Provider directiveness (* and, ~ not, + union set)

Set	Consistency (Coverage)	Number of cases
~direct provision * ~provider-set weight goals * ~provider-set energy-intake goals * ~provider-set exercise goals	0.00	7
~direct provision * provider-set weight goals * ~provider-set energy-intake goals * ~provider-set exercise goals	0.00	2
~direct provision * provider-set weight goals * provider-set energy-intake goals * provider-set exercise goals	1.00	3
direct provision * ~provider-set weight goals * ~provider-set energy-intake goals * provider-set exercise goals	0.00	1
direct provision * ~provider-set weight goals * provider-set energy-intake goals * provider-set exercise goals	1.00	2
direct provision * provider-set weight goals * provider-set energy-intake goals * provider-set exercise goals	1.00	5
~direct provision * ~provider-set weight goals * ~provider-set energy-intake goals * provider-set exercise goals		0
~direct provision * ~provider-set weight goals * provider-set energy-intake goals * ~provider-set exercise goals		0
~direct provision * ~provider-set weight goals * provider-set energy-intake goals * provider-set exercise goals		0
~direct provision * provider-set weight goals * ~provider-set energy-intake goals * provider-set exercise goals		0
~direct provision * provider-set weight goals * provider-set energy-intake goals * ~provider-set exercise goals		0
direct provision * ~provider-set weight goals * ~provider-set energy-intake goals * ~provider-set exercise goals		0
direct provision * ~provider-set weight goals * provider-set energy-intake goals * ~provider-set exercise goals		0
direct provision * provider-set weight goals * ~provider-set energy-intake goals * ~provider-set exercise goals		0
direct provision * provider-set weight goals * ~provider-set energy-intake goals * provider-set exercise goals		0
direct provision * provider-set weight goals * provider-set energy-intake goals * ~provider-set exercise goals		0
provider-set energy-intake goals * provider-set exercise goals * (direct provision + provider-set weight goals)	1.00 (1.00)	

What are the critical features of successful Tier 2 weight management programmes?

Table A6.2: Provider-user alliance (* and, ~ not, + union set)

Set	Consistency (Coverage)	Number of cases
~direct provision * ~provider relationships * ~graduated exit * ~high intensity	0.00	2
~direct provision * ~provider relationships * ~graduated exit * high intensity	0.00	1
~direct provision * provider relationships * ~graduated exit * ~high intensity	0.00	5
~direct provision * provider relationships * graduated exit * ~high intensity	0.00	1
~direct provision * provider relationships * graduated exit * high intensity	1.00	3
direct provision * ~provider relationships * graduated exit * high intensity	0.00	1
direct provision * provider relationships * ~graduated exit * ~high intensity	1.00	1
direct provision * provider relationships * ~graduated exit * high intensity	1.00	1
direct provision * provider relationships * graduated exit * high intensity	1.00	5
~direct provision * ~provider relationships * graduated exit * ~high intensity		0
~direct provision * ~provider relationships * graduated exit * high intensity		0
~direct provision * provider relationships * ~graduated exit * high intensity		0
direct provision * ~provider relationships * ~graduated exit * ~high intensity		0
direct provision * ~provider relationships * ~graduated exit * high intensity		0
direct provision * ~provider relationships * graduated exit * ~high intensity		0
direct provision * provider relationships * graduated exit * ~high intensity		0
provider relationships * (graduated exit * high intensity + direct provision * ~graduated exit)	1.00 (1.00)	

What are the critical features of successful Tier 2 weight management programmes?

Table A6.3: Intervention targeting–group work (* and, ~ not, + union set)

Set	Effectiveness consistency (Coverage)	Least effectiveness consistency (Coverage)	Number of cases
~population targeting * ~group work	0.00	1.00	5
population targeting * ~group work	0.75	0.25	4
~population targeting * group work	0.33	0.67	6
population targeting * group work	1.00	0.00	5

What are the critical features of successful Tier 2 weight management programmes?

Appendix 7: Example search strategy for identification of studies for the views synthesis

Database: Embase <1988 to 2014 Week 39>

Search strategy:

-
- 1 morbid obesity/ or abdominal obesity/ or diabetic obesity/ or metabolic syndrome X/ (66546)
 - 2 weight gain/ (65711)
 - 3 (overweight or over weight or overeat* or over eat* or overfeed* or over feed*).ti,ab. (56462)
 - 4 (weight adj1 gain*).ti,ab. (51684)
 - 5 obes*.ti,ab. (228578)
 - 6 or/1-5 (342214)
 - 7 (modific* or therap* or intervention* or strateg* or program* or management or scheme* or group* or pathway*).ti,ab. (6806625)
 - 8 morbid obesity/ or abdominal obesity/ or diabetic obesity/ or metabolic syndrome X/ (66546)
 - 9 weight gain/ (65711)
 - 10 (overweight or over weight or overeat* or over eat* or overfeed* or over feed*).ti,ab. (56462)
 - 11 (weight adj1 gain*).ti,ab. (51684)
 - 12 obes*.ti,ab. (228578)
 - 13 or/8-12 (342214)
 - 14 (modific* or therap* or intervention* or strateg* or program* or management or scheme* or group* or pathway*).ti,ab. (6806625)
 - 15 (weight adj1 los*).ti,ab. (76990)
 - 16 (weight adj1 reduc*).ti,ab. (11599)
 - 17 weight reduction/ (101906)
 - 18 14 and (15 or 16 or 17) (68529)
 - 19 obesity/dm, pc, th (21553)
 - 20 Obesity, Morbid/dm, pc, th (805)
 - 21 14 and (19 or 20) (13433)
 - 22 Diet Therapy/ (34163)
 - 23 low calory diet/ (5341)
 - 24 low fat diet/ (6837)
 - 25 diet restriction/ (61083)
 - 26 caloric restriction/ (9059)
 - 27 Dietetics/ or Dietetics Education/ (3585)
 - 28 (diet or diets or dieting).ti,ab. (250890)
 - 29 (low calorie or hypocaloric or calorie control*).ti,ab. (4069)
 - 30 (health* adj1 eating).ti,ab. (4648)

What are the critical features of successful Tier 2 weight management programmes?

- 31 (diet* adj2 (modific* or therapy or intervention* or strateg* or program* or management or scheme*)).ti,ab. (20560)
- 32 (nutrition adj2 (modific* or therapy or intervention* or strateg* or program* or management or scheme*)).ti,ab. (7398)
- 33 (Weight Watchers or weightwatchers).ti,ab. (136)
- 34 (slimming world or slimmingworld).ti,ab. (41)
- 35 (lighterlife or "lighter life").ti,ab. (49)
- 36 or/22-35 (344404)
- 37 14 and 36 (192782)
- 38 exp exercise/ (178855)
- 39 exp kinesiotherapy/ (40730)
- 40 (exercise and (therapy or therapies or activity or activities or class* or program* or group* or session* or scheme*)).ti,ab. (115449)
- 41 (Gym and (trainer* or therap* or activit* or class* or program* or group* or session* or scheme* or club*)).ti,ab. (618)
- 42 (walk* or step* or jog* or run*).ti,ab. (692481)
- 43 (aerobic* or physical therap* or physical activit*).ti,ab. (145844)
- 44 (fitness adj (class or regime* or program* or group* or session* or scheme*)).ti,ab. (712)
- 45 (reduc* adj2 sedentary behavio?r).ti,ab. (176)
- 46 (dance and (therap* or activit* or class* or program* or group* or session* or scheme*)).ti,ab. (1745)
- 47 personal trainer*.ti,ab. (106)
- 48 (gym or gyms or gymnasium).ti,ab. (1730)
- 49 or/38-48 (996449)
- 50 14 and (38 or 39 or 42 or 43) (452649)
- 51 40 or 41 or 44 or 45 or 46 or 47 or 48 or 50 (498804)
- 52 cognitive therapy/ (34018)
- 53 Counseling/ or nutritional counseling/ or patient counseling/ or patient guidance/ (67655)
- 54 behavior therapy/ (30557)
- 55 cognitive behavio?r* therapy.ti,ab. (11293)
- 56 behavio?ral interventio*.ti,ab. (6572)
- 57 (change* adj2 lifestyle*).ti,ab. (8494)
- 58 (changing adj2 lifestyle*).ti,ab. (417)
- 59 (lifestyle adj2 modif*).ti,ab. (6225)
- 60 Hypnosis/ (8369)
- 61 hypnosis.ti,ab. (4649)
- 62 (counseling or counselling).ti,ab. (70938)
- 63 or/52-62 (178585)
- 64 18 or 21 (75501)
- 65 Antiobesity Agent/ (3161)
- What are the critical features of successful Tier 2 weight management programmes?

- 66 (sibutramine or orlistat or rimonabant).mp. (10358)
- 67 exp bariatric surgery/ (19439)
- 68 exp obesity/su (12200)
- 69 or/65-68 (35588)
- 70 13 and 36 (73662)
- 71 13 and 37 (46907)
- 72 13 and 49 (47564)
- 73 13 and 51 (33734)
- 74 13 and 63 (13239)
- 75 70 and 72 and 74 (3148)
- 76 70 and 72 (16827)
- 77 70 and 74 (5062)
- 78 72 and 74 (5474)
- 79 76 or 77 or 78 (21067)
- 80 71 and 73 (12853)
- 81 71 and 74 (4391)
- 82 73 and 74 (4877)
- 83 80 or 81 or 82 (16457)
- 84 75 or 79 or 83 (21067)
- 85 84 not 69 (18820)
- 86 limit 85 to (human and english language) (14835)
- 87 limit 86 to embase (12321)
- 88 limit 87 to (infant <to one year> or child <unspecified age> or preschool child <1 to 6 years> or school child <7 to 12 years> or adolescent <13 to 17 years>) (2242)
- 89 87 not 88 (10079)
- 90 limit 89 to dd=19950101-20132803 (8314)
- 91 (weight adj3 intervention*).ab,ti. (3777)
- 92 (weight adj3 program*).ab,ti. (4923)
- 93 (weight adj3 service*).ab,ti. (261)
- 94 ("weight watchers" or weightwatchers or "slimming world" or slimmingworld or "lighter life" or lighterlife or "rosemary conley" or rosemaryconley or "jenny craig" or jennycraig).ti,ab. (219)
- 95 (Weight adj3 (group* or organi?ation or initiative* or scheme* or project*)).ti,ab. (13491)
- 96 (slim* adj1 (world or organisation or organization or group or club)).ti,ab. (63)
- 97 or/91-96 (21008)
- 98 97 and 90 (1120)
- 99 limit 98 to em=199501-201312 (933)
- 100 limit 89 to em=199501-201312 (6993)
- 101 97 and 100 (936)
- 102 99 or 101 (936)
- What are the critical features of successful Tier 2 weight management programmes?

103 limit 89 to em=201313-201439 (2572)

104 97 and 103 (393)

What are the critical features of successful Tier 2 weight management programmes?

The Department of Health Reviews Facility aims to put the evidence into development and implementation of health policy through:

- Undertaking policy-relevant systematic reviews of health and social care research
- Developing capacity for undertaking and using reviews
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