

Is a local tier 3 weight management service effective in supporting people with type 2 diabetes to lose weight?

Iona Taylor

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Article points

1. In the absence of specialist diabetes services, community tier 3 weight loss services can provide effective support for those with type 2 diabetes and obesity.
2. Sustained weight loss can improve physical, emotional and mental health, as well as reducing costs to the NHS in medication and managing complications.
3. The tier 3 weight management service was equally as effective at encouraging weight loss in people with and without a type 2 diabetes diagnosis.

Key words

- Community services
- Dietetics
- Multidisciplinary teams
- Weight loss

Author

Iona Taylor is a Specialist Dietitian at Warrington and Halton Hospitals NHS Trust, Warrington, Cheshire.

As obesity levels have risen nationally, the prevalence of type 2 diabetes has also increased. Weight loss has long been recognised as an effective strategy for improving management of type 2 diabetes, although it is acknowledged that weight loss in type 2 diabetes may be slower. It is recommended that obese people with type 2 diabetes are provided with appropriate weight management support. Despite the recent development of specialist diabetes services, in many cases this may be via the multidisciplinary weight management team in a community-based service. Are these community services able to provide effective support for people with type 2 diabetes? To answer this question, the outcomes of individuals referred to a “tier 3” weight management service with and without a diagnosis of type 2 diabetes were compared.

It has long been understood that those with type 2 diabetes can find weight loss harder than those without (Norris et al, 2005), and that some interventions to tighten glycaemic control may be to the detriment of weight (Lau and Teoh, 2013). To meet the rising duality of type 2 diabetes with obesity (Gonzalez et al, 2009), in the past few years, diabetes-specific services have become demonstrably effective (Rajeswaran et al, 2012). However, these multi-disciplinary services are not yet available across the UK, and many localities continue to run community-based weight management services as an accessible form of support for people with diabetes.

The comorbidity of diabetes with obesity would classify someone as having “complex” obesity, commonly seen as appropriate for treatment at tier 3 level within a weight management service (NHS England, 2014). Tier 3 weight management is defined as a clinician-led, multi-disciplinary team-approach service aimed at the obese for whom tier 2 services have not been effective (NHS England, 2014). In the absence of specialist

diabetes services, is a local tier 3 service able to provide effective support for people with obesity and type 2 diabetes?

Case study

As part of an MSc project, a retrospective review of a tier 3 weight management service was conducted to compare outcomes of those with and without a diagnosis of type 2 diabetes.

Locality

Warrington and Halton Hospitals NHS Trust offers a community-based, specialist weight management tier 3 service for the Halton locality. Halton is in Cheshire in the north-west of England and the overall health of people in Halton is generally worse than the England average, with an adult and child obesity rate 12–15% higher than the national average (Public Health England, 2014). In 2012/2013 there were 7367 people recorded with a diagnosis of diabetes in the Halton locality (including type 1 or type 2 diabetes). This equates to a prevalence of 7.2% (Public Health England,

2014), which is higher than the national average of 6%. Nationally, 90% of diabetes diagnoses are for type 2 diabetes (NHS Choices, 2012), which would approximate to a local type 2 diabetes population in Halton of around 6600 people. Therefore, weight management services play an important role in this area.

Service details

The service provided in Halton is available to people with obesity and diabetes and is dietetic-led. Entry to the tier 3 service is through referral from a healthcare professional, although individuals can also self-refer into the tier 2 service and be appropriately triaged for complex support. Patients enrolled are able to receive support for up to 2 years during weight loss and then during the maintenance phases. In addition, those seeking bariatric surgery are able to prepare via this service.

After referral, individuals are formally assessed at their initial appointment (45 minutes), and then again at 6, 12, 18 and 24 months (30-minute appointments). Individuals referred to the tier 3 service primarily receive dietitian support. However, they may also choose to receive additional sessions with a dedicated cognitive behavioural therapist providing psychological input, and they have the option of accessing tier 2 activities, such as healthy eating education and physical activity. Users of the service are also able to access email and telephone support between appointments to suit their individual needs. Dietary strategies may include tailored portion plans, meal replacement plans, pharmacotherapy or SMART-goal stepwise changes towards a healthier lifestyle.

Aim and analysis

The aim of the analysis was to determine whether community-based, tier 3 weight management services are able to provide as effective support for people with a diagnosis of type 2 diabetes as they do for people without.

A 6-month study period was selected because it represents a typical time-frame for weight loss before plateauing is likely to occur (NICE, 2006). The effect of glucose-lowering therapy was also investigated in the type 2 diabetes group. BMI and weight at baseline and at 6 months for the

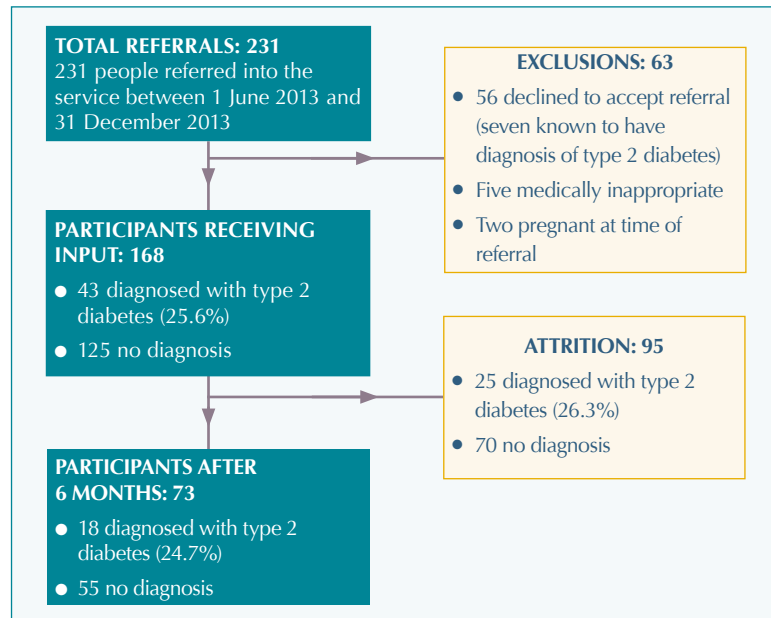


Figure 1. Participant inclusion process of the weight management service.

type 2 diabetes group and the non-type 2 diabetes group were analysed in a two-way related sample design. Paired *t*-tests were used to analyse data sets and statistical significance was delimited at $P < 0.05$ and exact *P* values are cited.

Results

Participant outcomes

In total, 231 adults over the age of 18 years were referred to receive tier 3 support between 1 June 2013 and 31 December 2013 (Figure 1). Of the 168 people who went on to receive input, 78.5% were female and 21.5% male. The age of participants was not recorded or evaluated within the scope of this review.

After 6 months, 73 people were continuing to receive input; 18 people were diagnosed with type 2 diabetes and 55 people were not (see Table 1 for analysis). The baseline BMI was not significantly different between the type 2 diabetes group and the non-type 2 diabetes group (42.97 kg/m² and 41.31 kg/m² respectively [$P = 0.888$]). Baseline weight was also not significantly different. After 6 months, both the diabetes and the non-diabetes group achieved a significant weight loss ($P = 0.007$ and $P = 0.0001$ respectively). The diabetes group lost a median of 4.26 kg, and in the non-type 2 diabetes group lost a median of 3.76 kg. The difference between the two groups was again not significantly

Page points

1. The aim of the analysis was to determine whether community-based, tier 3 weight management services are able to provide as effective support for people with type 2 diabetes as they do for people without type 2 diabetes.
2. In total, 231 people were referred to a weight management service in Halton, Cheshire; 168 went on to receive input and 73 were still receiving input 6 months later.
3. The type 2 diabetes and the non-type 2 diabetes group both achieved a significant weight loss, but there was no significant difference in the weight loss and BMI change between groups.

Table 1. Comparison of physiological outcomes between the type 2 diabetes group and the non-type 2 diabetes group over 6 months.

	Type 2 diabetes group (n=18)	Non-type 2 diabetes group (n=55)	P value*
Starting weight (kg)	120.11 (8.38) [†]	112.73 (3.48)	0.586
Weight change (kg)	-4.26 (1.27)	-3.76 (0.92)	0.582
Starting BMI (kg/m ²)	42.97 (2.57)	41.31 (1.10)	0.888
BMI change (kg/m ²)	-1.51 (0.49)	-1.41 (0.33)	0.683

*Statistical significance is accepting at $P < 0.05$. [†]Mean (Standard Error).

Table 2. Distribution of the type 2 diabetes group by pharmacotherapy treatment over 6 months.

	Number of participants	Mean start weight (kg)	Mean weight change (kg)	Mean start BMI (kg/m ²)	Mean BMI change (kg/m ²)
Diet only	3	129.1	-5.8	42.3	-2.1
Monotherapy	8	121.0	-4.8	46.1	-1.7
Multiple therapies (not including insulin)	5	116.9	-4.8	39.2	-1.6
Multiple therapies including insulins	2	111.3	1.6	40.7	0.6

Page points

1. The weight loss observed in the analysis was comparable to similar tier 3 services available in the UK.
2. The rates of attrition and the high female:male ratio has also been observed in similar weight management services.

different ($P=0.582$). The BMI change was also not significantly different between the two groups ($P=0.683$).

Attrition

Attrition was observed in this study: 24.2% of participants did not accept the referral into the service, and a further 41.1% ($n=95$) dropped out of the intervention before 6 months. The rate of attrition was similar between those with and without a diagnosis of type 2 diabetes. Approximately 55% of both groups did not complete the 6-month study period.

Effect of pharmacological treatment

After 6 months, the type 2 diabetes group consisted of 18 people. As a result, this limited the statistical analysis that could be conducted on the effect of the pharmacological treatment in the type 2 diabetes group. However, mean weight loss was calculated for the broad pharmacological sub-groups for observational discussion (see *Table 2*).

Discussion

Weight loss

The results of the study show that this tier 3 service supports weight loss equally effectively in those with and without a diagnosis of type 2 diabetes. Overall, the weight losses observed here compare with similar services in the UK. An NHS-funded programme in Shropshire evaluated weight loss in 1129 participants, and found that men and women lost a mean of 5.7 kg and 4.2 kg respectively over 12 weeks (Bhogal and Langford, 2014), and the specialist diabetology clinic at the Mid Yorkshire NHS Trust found that 143 people enrolled in a 12-week programme had a mean weight loss of 3.6% 3 months after completion (Srinivasan, 2014).

Gender imbalance

In this study, over three-quarters of the enrolled participants were women. The gender imbalance of enrolled participants observed in this case study has been observed elsewhere. The Shropshire study also reported that 78.5% of the participants were female (Bhogal and Langford, 2014), and a NHS-based tier 3 programme in Glasgow found 73.7% of starting participants were female (Morrison et al, 2011). This trend has also been observed in weight management services for US-military veterans; Spring et al (2014) reported that although only 5.5% of veterans are female, 14% of the 18 865 weight management participants were female.

Men tend to be under-represented in weight loss trials, as well as in interventions. This could be due to the perception that they are under less cultural pressure to lose weight, or that they perceive themselves as less overweight than female counterparts, resulting in lower motivation to lose weight. Men may also be less likely to seek external help (Pagato et al, 2012).

Attrition

More than half of the originally enrolled individuals did not complete the 6-month service, either declining the offer of referral or ending their attendance of the service. Attrition is commonly seen in weight management services and is reported in the Glasgow, Shropshire and US veterans programmes discussed above (Morrison et al, 2011; Bhogal and Langford, 2014; Spring et al, 2014 respectively).

Although what constitutes as “attrition” is not well defined, lower starting BMI and younger age (Gill et al, 2011), depressive symptoms, and seeing low weight loss during the first few weeks of treatment (Fabricatore et al, 2009) have been associated with increased attrition. In terms of service provision, the US veterans weight loss programme, which was held over multiple sites and, therefore, offered slightly different strategies, found that retention rates were increased in localities offering programmed physical activity, structured low-calorie plans and a rewards system (Spring et al, 2014).

People with chronic conditions are also more likely to fail to attend therapeutic services. Especially with diabetes, a lack of perception of the severity of the condition and not having developed complications can be a factor in non-attending services. High HbA_{1c}, high BMI and high blood pressure were also linked with lower attendance (Paterson et al, 2010). Paterson et al (2010) also note that where symptoms do not cause pain or discomfort, patients may be less motivated to attend appointments. Making multiple health behaviour changes simultaneously has also been observed to be less effective in causing change than implementing stand-alone changes (Wing et al, 2001), although some combinations may act synergistically to improve outcome.

This may be where the value of specialised diabetes services have the edge: the capacity for professionals to work closely together with the patient to establish priorities, rather than each discipline making demands of the patient to achieve goals. Priorities such as encouraging regular blood glucose testing, or even taking medication on a regular basis, could be more imminently important than diet and lifestyle changes when examined holistically.

Representing the local diabetes population

Given the prevalence of type 2 diabetes in the Halton area, it seems likely that the small number of referrals to the service of people with type 2 diabetes represents only a tiny proportion of those in the locality who are diabetese and looking for support. Other forms of support are of course available for those who wish to prioritise dietary change and weight loss: for example, weekly weight checks at local GP practices, commercial slimming groups and structured education groups. It is not known whether patients are given the options of support by the relevant clinician, or whether all

relevant clinicians are aware of the different services available locally.

Impact of anti-diabetes pharmacotherapy

Although a larger cohort is needed to add statistical weight to the observations, *Table 2* suggests that weight loss may be more successful in those not using insulin. Insulin is well known to induce considerable weight gain (Lau and Teoh, 2013). According to NICE treatment guidelines (2009), insulin is usually initiated after a combination of other glucose-lowering agents have failed to provide adequate control; therefore, it tends to be instigated in people whose type 2 diabetes has progressed significantly. If individuals with diabetes have not received weight loss support during the early stages of disease progression, further weight gain is likely to occur once the commencement of insulin, or indeed other anti-diabetes medication, is required (Lau and Teoh, 2013).

Previous studies have demonstrated the positive impact of dietary intervention within the first year of diabetes diagnosis – stimulating weight loss, improved HbA_{1c} and fewer increases in anti-diabetes medication agents compared with standard care (Andrews et al, 2011). It is already currently recommended that people with type 2 diabetes receive structured education, preferably within a group setting around the time of diagnosis, and followed up annually (National Collaborating Centre for Chronic Conditions, 2008). As discussed above, individuals who are receiving structured education may not feel able to take on the additional commitment of regular appointment attendance and lifestyle changes – be that with a weight management service or a specialist diabetes clinic. This leaves the referring clinician to decide with the individual patient what their priorities are and their ability to focus on achieving them: are they more likely to respond to a structured approach, to diabetes education, or would tailored dietary intervention in the first instance be more appropriate?

Preventing type 2 diabetes and impaired glucose regulation

It has been outside the scope of this case study to consider the role of this service for those at risk of developing type 2 diabetes. Given that nationally one in 70 adults is estimated to have undiagnosed

Page points

1. Although there was not enough data to perform statistical analysis, the results suggest that those on insulin may find it harder to lose weight.
2. People with chronic conditions, depressive symptoms, lower starting BMI and younger age are at increased risk of dropping out of a weight management service.
3. If individuals with diabetes have not received weight loss support during the early stages of disease progression, further weight gain is likely to occur once the commencement of insulin is required.

“A tier 3 weight management service can be as effective at assisting people with a type 2 diabetes diagnosis to lose weight as it is for people without a diabetes diagnosis.”

type 2 diabetes (Diabetes UK, 2012), it is also likely that a significant number have impaired glucose regulation without a diabetes diagnosis, possibly including those seeking support from this service.

Improvements to the service

Measuring, and identifying changes in, HbA_{1c} is not routinely conducted within the service in Halton. It is well-evidenced that weight loss generally improves diabetes control (Lau and Teoh, 2013), underpinning guidance encouraging individuals with type 2 diabetes to engage with lifestyle changes (NICE, 2009; 2014). Incorporating HbA_{1c} testing (alongside other markers such as lipid profile and blood pressure) as part of the service would enable evaluation of the service on secondary outcomes such as glycaemic control and cardiovascular risk.

Conclusion

A tier 3 weight management service can be as effective at assisting people with a type 2 diabetes diagnosis to lose weight as it is for people without a diabetes diagnosis. Where this type of provision exists, it contributes positively to the range of services available for individuals to improve their diet and lifestyle. However, responsibilities lie with the clinician in encouraging self-management and guiding them into appropriate treatment options. ■

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Practice points

- Referring a patient who needs (and will accept) weight management advice in the early days of their diabetes may be beneficial in long-term management. Support for weight loss may be more effective soon after diagnosis rather than once disease progression has occurred.
- Attrition is common in weight management programmes. There is a role for all members of the multi-disciplinary team to encourage and motivate individuals in their weight management efforts and reinforce its importance in their overall diabetes care, to enhance patients' self-responsibility and reduce risk of dropout.
- Sustained weight loss can improve physical, emotional and mental health, as well as reducing costs to the NHS in medication and managing complications.
- Not all people with type 2 diabetes want, or need, specialist support for weight loss or dietary change. Clinicians play a role in being aware of what the various support options are to offer patients, and guiding them in making an informed decision.

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