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Weight change of participants in the WeightWatchers GP Referral Scheme

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1. Summary

There are limitations to this dataset due to uncertainty over the validity of the baseline body weight data. This limits wider publication or dissemination of the data. However, this report summarises the findings on the assumption that the data is valid and correct.

Based on data from 1058 courses, patients who completed a 12-week course of WeightWatchers (n=583), following referral from a GP, lost 5.2 kg on average. More than half of these (54%) achieved weight loss $\geq 5\%$ of initial body weight, a level associated with appreciable decreases in disease risk as well as improvements in quality of life.

2. Methods

2.1 The dataset

This report analyses data collected from participants in the WeightWatchers referral scheme between 28/06/2005 and 20/06/2007. Data was collected as part of routine commercial practice.

The dataset contained data from 1492 referral courses. Courses with a start date later than 28/03/2007 (n=318/1492) were excluded from the analysis to ensure that all patients included had the opportunity to complete a full 12-week referral course by the end cut-off date. Patients were excluded from the analysis if they were missing start (n=28/1492) or final weight (n=406/1492) data, or data on number of meetings attended (n=417/1492). Data from 1058 referral courses was included in the final analysis.

Data was obtained from the WeightWatchers referral scheme participant database. Upon registering with WeightWatchers by telephone, participants self-reported their body weight. This was recorded as baseline weight. Once participants had attended their first WeightWatchers meeting, the leader should have reported measured weight, to replace self-reported weight as the baseline weight. There is no way of distinguishing self-reported from measured values. Final weight data was obtained from final measured weight at a WeightWatchers meeting, as reported by WeightWatchers group leaders. This is recorded upon the participant completing the 12-week referral course, or as the last measurement prior to first non-attendance.

2.2 Statistical analysis

As there were a number of outliers in the dataset, for which it was not possible to check validity, medians rather than means were used to represent the data. Plots shown in this report are 'box and whisker plots'. Boxes show medians and inter-quartile (IQ) ranges, whilst the whiskers span approximately 1.5 times the IQ range. Outliers falling outside this range are shown separately on the plots.

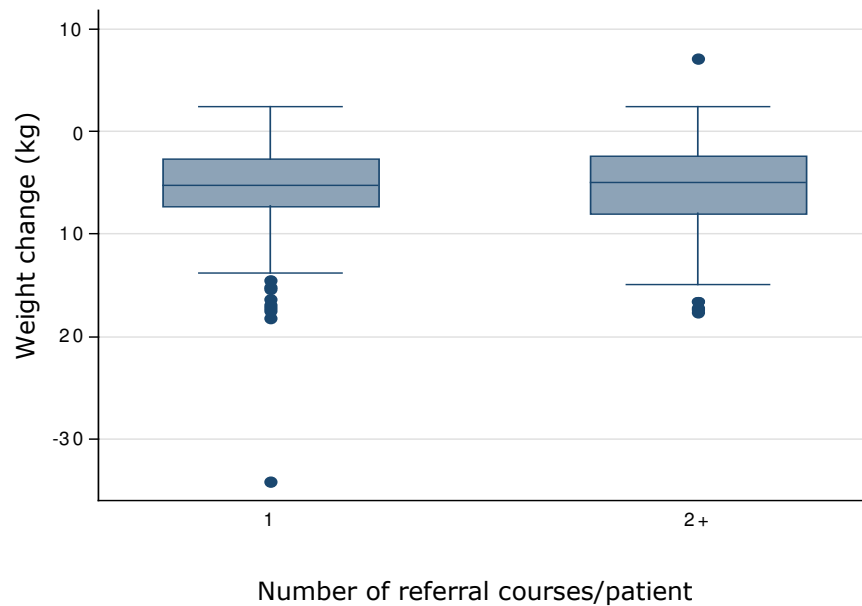
In the analysis of weight change by baseline weight, a Deming regression was used rather than simple linear regression, in order to avoid regression to the mean, a statistical effect which could indicate a false relationship between baseline weight and weight change (Deming, 1943; Bland & Altman, 1994).

2.3 Data for analysis

1058 referral courses were included in the analysis. This consisted of 884 people who did 1 course, 75 people who did 2 courses and 8 people who did 3 courses.

Of the 174 courses attended by the patients who did more than one course, 138 (79%) were completed. Weight change was similar on repeated courses to single courses (see figure 1). All courses were therefore included in the analysis presented in this report.

Figure 1 Box and whisker plot showing weight change per referral course in patients taking 1 or more courses



Box represents median and IQ range. Whiskers span approximately 1.5 times the IQ range. Points represent outliers falling outside this range.

3. Results

3.1 Baseline characteristics of participants

Of the 1058 referrals, 928 (87.7%) were women. Median age was 49.4 years (IQ range 39.4-59.0 years). Median weight was 95.0 kg (IQ range 82.8-110.0 kg), and median BMI was 35.2 kg/m² (IQ range 31.7-40.3 kg/m²).

On average, men were slightly older than women (~5 years). BMI was similar between genders (~0.5 kg/m² greater in men than women).

3.2 Attendance and influencing factors

583 of the 1058 courses (55.1%) were completed. Numbers and percentages of participants lapsing at each week of the course are given in table 1. Lapse rates (2.7-4.5%) were similar at all weeks throughout the 12-week course, with the exception of week 1, when drop-out rates were higher (7.0%).

Table 1 Numbers and percentages of participants completing the 12-week course and lapsing at each week

Number of meetings	N	%
12	583	55.1
11	33	3.1
10	49	4.6
9	31	2.9
8	29	2.7
7	41	3.9
6	48	4.5
5	45	4.3
4	31	2.9
3	42	4.0
2	43	4.1
1	74	7.0
0	9	0.9
Total	1058	100

Course completion by primary care trust (PCT) is shown in table 2. The proportion of participants completing the courses ranged from 36-61% for individual PCTs.

Table 2 Course completion rates by PCT

PCT	% with 12 meetings (n)*
Knowsley	61 (61)
NHS Ayrshire	59 (125)
Anglesey	57 (173)
Rolls Royce	55 (67)
North Ayrshire	54 (96)
Middlesborough	53 (236)
Plymouth	42 (118)
Trafford	36 (59)
Other 13 PCTs (combined)	77 (116)

*excludes number of meetings=0

For examination of the characteristics of completers and drop-outs, the sample was broken down into immediate drop-outs (1 meeting only), early dropouts (2-6 meetings), late dropouts (7-11 weeks) and completers (12 meetings).

Longer duration of attendance was associated with older age (figure 2). Those attending 1 meeting only were slightly lighter than those attending for 2-12 meetings, although there was no association between duration of attendance and start weight or BMI after week 2 (table 3). There was no evidence of differential drop-out by gender.

Figure 2 Box and whisker plot showing baseline age by duration of attendance (median and IQ range)

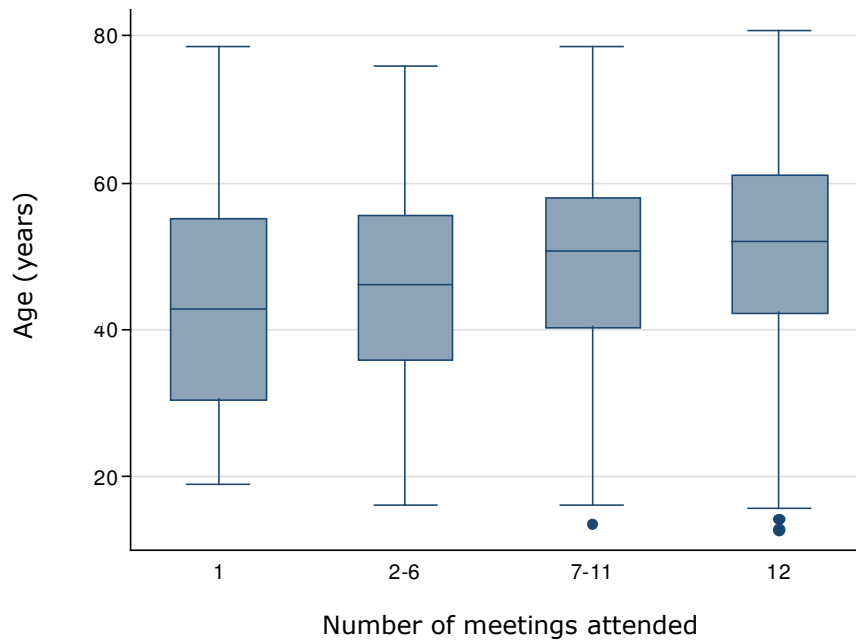


Table 3 Baseline weight and BMI by duration of course attended

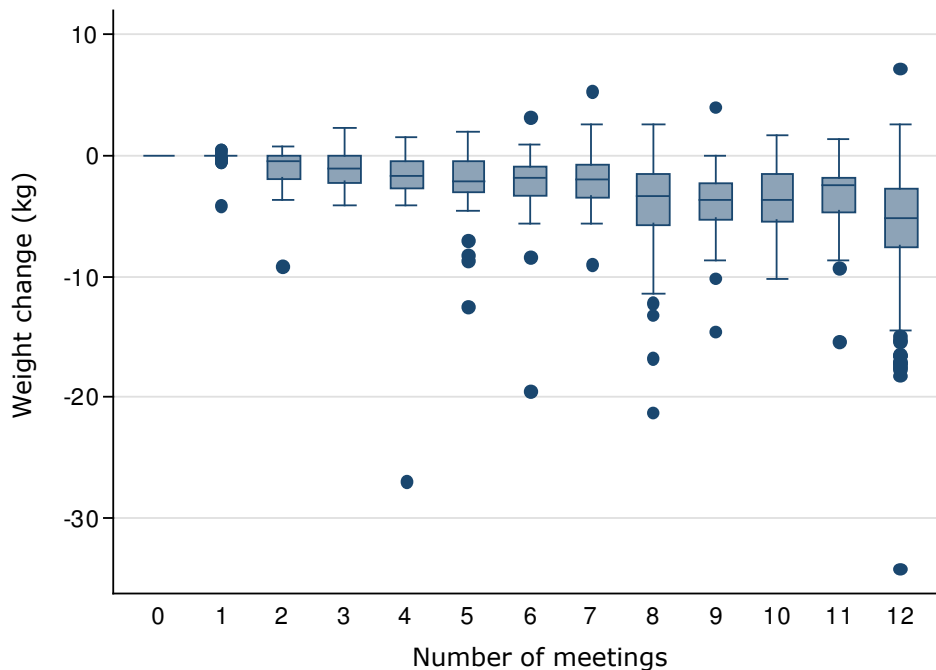
Number of meetings	Median weight (kg)	Median BMI (kg/m ²)
1	92.1	33.8
2-6	96.2	35.3
7-11	94.3	35.5
12	95.0	35.2

3.3 Weight loss

Median weight loss in patients completing the 12-week course was 5.2 kg (IQ range 2.7-7.5 kg). Expressed as a percentage of baseline weight, this represents 5.3% weight loss (IQ range 2.8-7.7%).

Weight loss by number of weeks attended is shown in figure 3. Perhaps surprisingly, weight loss increased with weeks attended in a linear manner, tentatively suggesting that those lapsing may have been losing weight at a similar rate to completers. However, this cannot be confirmed in the absence of weekly weight data as it may be expected that weight loss would occur at a faster rate in the initial weeks and then slow later in the course.

Figure 3 Box and whisker plot showing weight change by week of final weight data (median and IQ range)



Of all 1058 courses initiated, 381 (36%) resulted in weight loss $\geq 5\%$ baseline body weight. Of these, 75 (7% of 1058) resulted in weight loss $\geq 10\%$ baseline body weight.

Of the 583 completed courses, 314 (54%) resulted in weight loss $\geq 5\%$ baseline body weight. This includes 65 courses (11% of 583) which resulted in weight loss $\geq 10\%$ baseline body weight. 34 patients (6%) completing the course gained weight.

The percentage of completing patients in different weight change categories is shown in figure 5, and final weights are plotted against baseline weight in figure 6.

Figure 5 Weight change in completers

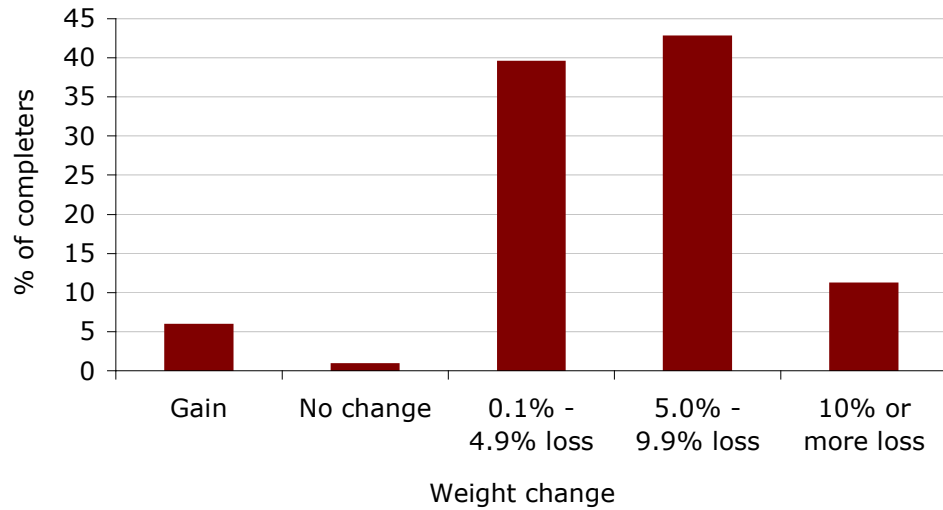
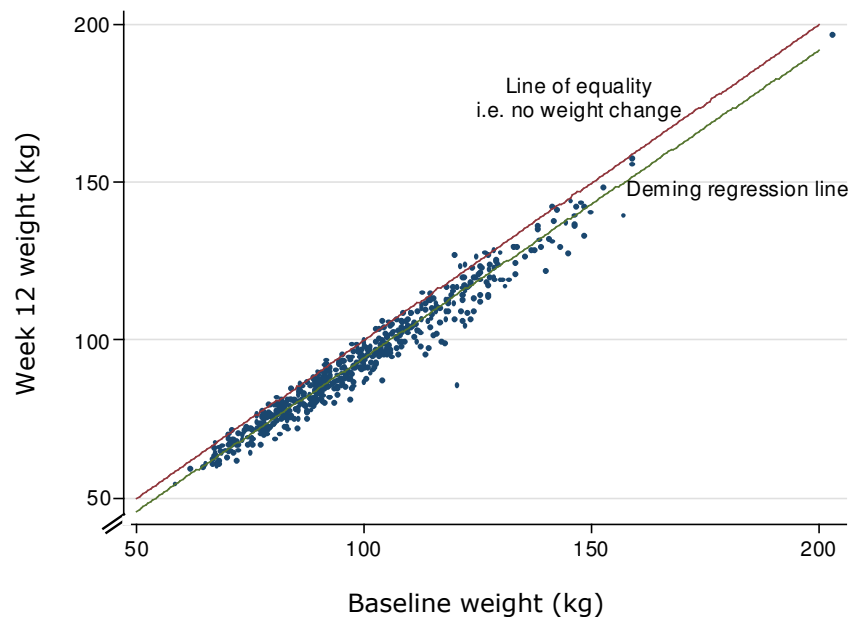


Figure 6 Final (week 12) weight in completers against baseline weight



3.4 Covariates

The influence of various potential covariates on weight loss was investigated in completers.

There was very little influence of baseline weight on weight change (figure 6 and table 4). This was assessed using Deming regression in order to minimise the effect of regression to the mean. This phenomenon would have the effect of exaggerating the weight loss in those with the highest starting weight and underestimating it in those with the lowest baseline weight, so giving a spurious impression of an effect of baseline weight on weight change.

Table 4 Weight change by baseline weight

Baseline weight (kg)		Weight change	
		(kg)	(%)
75.3	(10 th percentile)	-4.75	-6.3
95.0	(Median)	-5.28	-5.6
125.4	(90 th percentile)	-6.10	-4.9

There was no influence of gender (figure 5), age (figure 6) or PCT (figure 7) on weight change.

Figure 5 Box and whisker plot showing weight change in females (F) versus males (M) (median and IQ range)

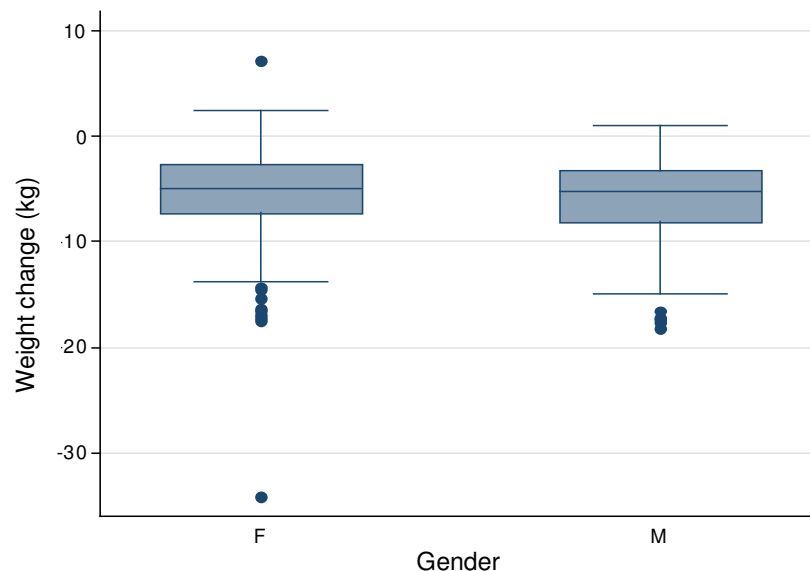


Figure 6 Box and whisker plot showing weight change by age (median and IQ range)

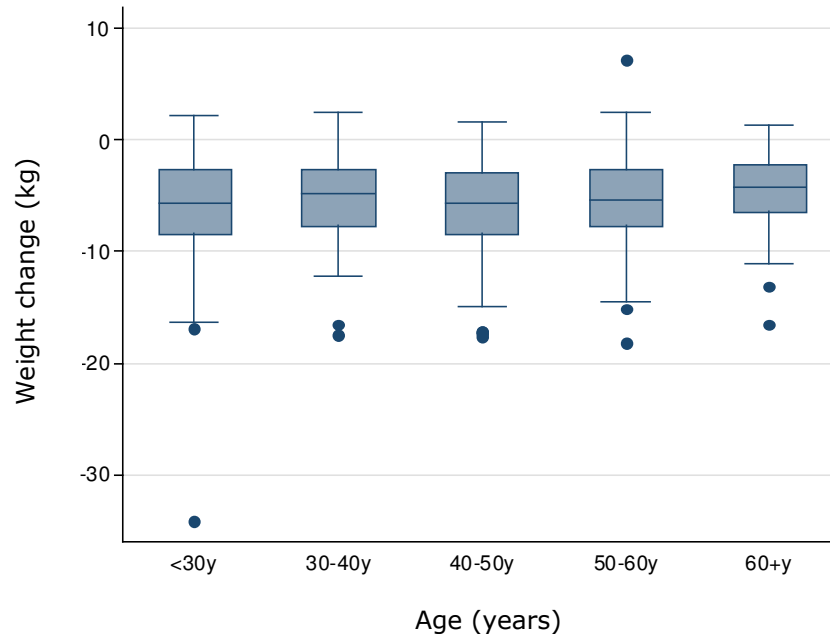
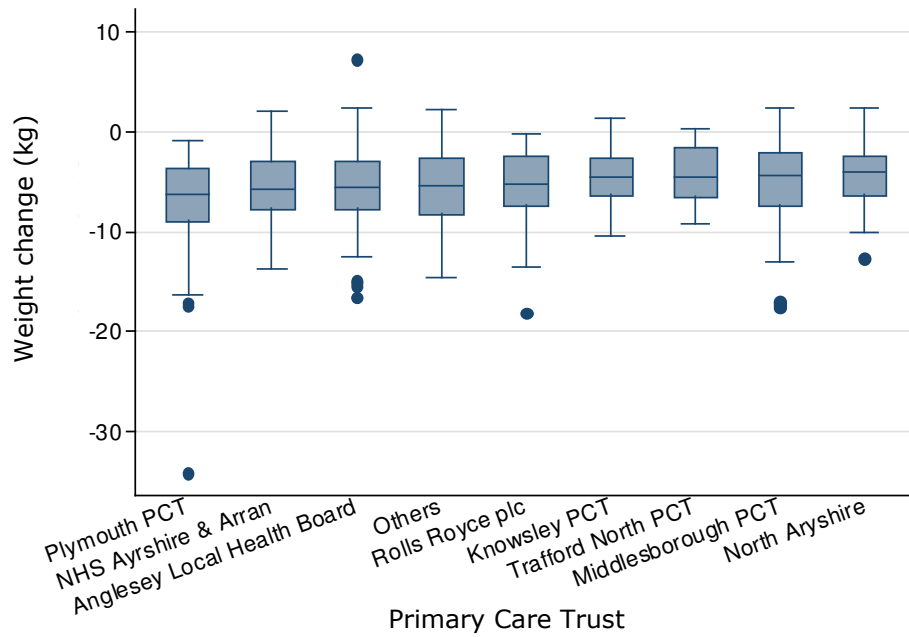


Figure 7 Box and whisker plot showing weight change by PCT (median and IQ range)



4. Discussion

4.1 Conclusions

This analysis provides data for WeightWatchers on the impact of the GP referral scheme on weight loss, confirming its clinical value. Limitations in the dataset preclude its wider dissemination. However, it does provide a platform from which to plan future analysis.

The findings of this analysis show that 55% of patients referred to a 12-week course of WeightWatchers by their GP completed the course. The 45% drop-out rate is consistent with previous high drop-out rates in interventions targeting overweight and obesity, with rates of 10-80% reported in controlled trials, in which retention rates are likely to be higher than in routine practice (Inelmen *et al.*, 2005).

Median weight loss in those completing the 12-week course was 5.2 kg. This represents 5.5% of the median initial weight of the completers. This weight loss is comparable to that over the initial 12-weeks of a previous 2-year trial of the WeightWatchers programme in the USA, in subjects with high self-reported attendance at meetings (Heshka *et al.*, 2003). In a previous 12-week trial of 80 women randomised to WeightWatchers or to a usual care intervention, those in the WeightWatchers programme lost 6.1 kg compared to 1.3 kg in controls (Rippe *et al.*, 1998). This consistency suggests that this is a robust programme delivering consistent outcomes across diverse settings.

Other commercially-available weight loss programmes in the USA have been evaluated (Tsai & Wadden, 2005). Of the programmes maintained for a similar duration, very low calorie diets resulted in weight loss of around 14-15% in 12-weeks, an online diet programme led to weight loss of 0.9% in 16 weeks compared with 3.6% with a behavioural weight loss manual (LEARN Program for Weight Management). Behaviour therapy was associated with weight losses of 1-2.3% over 12-weeks and nutrition therapy with only 0.1% over the same period. Aside from the extreme VLCD intervention, WW provides a programme with greater weight loss than the others reported which are based on behavioural change.

Median weight loss of completers in this analysis was 5.2 kg, meaning that half of all completers lost more weight than this. In a previous study, 5 kg weight loss was associated with a 55% reduction in risk of developing type 2 diabetes risk over a mean 3.2 years follow-up in a high risk population (Hamman *et al.*, 2006). In

addition, this level of weight loss over this relatively short period of time has been associated with improvements in blood pressure, lipid profiles and physical performance in a study of older women (Jensen *et al.*, 2004), and with improvement in quality of life indices including mental health, vitality and physical function (Rippe *et al.*, 1998).

Drop-out rates were similar at all weeks throughout the 12-week course, except for the first week, when rates were higher. Course completion ranged from 36% to 61% between the 8 PCTs with the highest numbers of patients referred. The completion rate was 77% for the other 13 PCTs with fewer patients combined. There was a trend for older patients to remain on the course the longest, which is in agreement with previous reports (Dalle Grave *et al.*, 2005), but there was no difference between men and women. Median BMI was slightly lower in those dropping out at the very beginning of the course, but there was no difference in BMI between those lapsing at later points or completers.

Investigation of factors influencing weight loss revealed no effect of gender, age or PCT. As might be expected, amount of weight lost increased very slightly with baseline weight. When expressed as a percentage of baseline weight, weight change decreased slightly with increasing baseline weight.

4.2 Limitations of the data

This data was collected as part of routine commercial practice, rather than for the purpose of research. It has not been possible to check the validity of outliers or a number of dubious figures in the dataset.

A major limitation of this dataset is the validity of the baseline weight data. Baseline weight was originally obtained from self-reported weight when patients registered by telephone for the programme. When patients attended their first meeting they would be weighed by the group leader. This data should have then been reported back by the group leader to over-write self-reported weight in the database as baseline weight. However, from the time this data was collected, verification rates were only around 50%, meaning that whilst baseline weight is measured in around 50% of cases, the other 50% of the baseline weight data is self-reported. There is no way of knowing which data has been verified and which is self-reported and therefore potentially inaccurate due to misreporting or the wide variability in the accuracy of home scales.

Previous literature reports a tendency for self-reported weight to underestimate measured weight, particularly in heavier subjects, with one paper reporting a mean difference of 1.2 (SD 3.1) kg (Stunkard & Albaum, 1981; Bland & Altman, 1994). An inaccuracy of this magnitude would represent a large proportion of the median weight change in the completers. Even though this would lead to an under- rather than an over-estimation of weight loss, it is our opinion that this makes the data unsuitable for publication or wider dissemination.

4.3 Recommendations for future data collection

This type of data provides an excellent source of practice-based evidence which would be of significant interest to health practitioners and policy makers. To be suitable for wider dissemination, we recommend the following changes be made to future data collection:

1. To ensure that the source of all baseline weight data for analysis of weight change is measured and reported by a WeightWatchers leader, rather than self-reported by the patient. Also that measured data does not over-write self-reported to allow investigation of the accuracy of self-reported weight.
2. To obtain weekly weight data in order to investigate rates of weight loss in completers versus those who lapse from the programme.
3. To record postcodes of patients to allow demographic profiling.
4. To seek to obtain follow-up data from patients at 6 and 12 months after commencing the referral course, in both those who have continued at WeightWatchers and those who only attended the referral course, to investigate maintenance of weight loss.

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