

Providing weight management via the workplace

Jenny Barber and Sarah E. Hillier

Nutrition and Research Department, Slimming World, Alfreton, UK

Geoff Middleton

School of Sport and Exercise Science, University of Lincoln, Lincoln, UK

Richard Keegan

*Research Institute for Sport and Exercise, Faculty of Health,
University of Canberra, Canberra, Australia*

Hannah Henderson

School of Sport and Exercise Science, University of Lincoln, Lincoln, UK, and

Jacquie Lavin

Nutrition and Research Department, Slimming World, Alfreton, UK

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Received 1 October 2014
Revised 11 March 2015
8 April 2015
Accepted 3 June 2015

Abstract

Purpose – The purpose of this paper is to assess the feasibility and benefits of providing weight management support via the workplace.

Design/methodology/approach – Quasi-experimental design using non-random assignment to a 12-week Slimming World (SW) weight management programme, either within the workplace or at a regular community group. Weight was recorded weekly and a 39-item questionnaire focused on mental and emotional health, self-esteem, dietary habits and physical activity habits administered at baseline, 12 weeks, six and 12 months.

Findings – In total, 243 participants enrolled (workplace $n=129$, community $n=114$) with 138 completers (defined as those weighing-in at baseline and attending at least once within the last four weeks; workplace $n=76$, community $n=62$). Completers reported a mean weight change of $-4.9 \text{ kg} \pm 3.4$ or $-5.7 \text{ per cent} \pm 3.8$. Mental and emotional health scores increased ($p < 0.05$) from baseline to 12 weeks. Self-worth scores increased ($p < 0.05$) from baseline to 12 weeks, six and 12 months. Healthy dietary habit scores increased and unhealthy dietary habit scores decreased ($p < 0.05$) from baseline to 12 weeks, six and 12 months. Healthy physical activity habit scores improved ($p < 0.05$) from baseline to 12 weeks and six months. There were no significant differences between groups.

Research limitations/implications – Participant demographic was predominantly female (94 per cent) aged 42.3 years, with only 13 men participating.

Practical implications – The results support the use of a 12-week SW weight management programme as a credible option for employers wanting to support staff to achieve weight loss and improve psycho-social health outcomes which could lead to improvements in quality of life and work performance.

Originality/value – Provides evidence for the delivery of weight management support via the workplace.

Keywords Obesity, Self-esteem, Workplace health, Nutrition, Weight management, Dietary habit

Paper type Research paper



Introduction

In England, 42 per cent of men and 36 per cent of women are overweight, while 26 per cent of men and women over 16 are classed as obese (Health and Social Care Information Centre, 2012). Overweight and obesity are associated with increased risks of a number of health conditions, including coronary heart disease, diabetes, joint problems and high-blood pressure (Wang *et al.*, 2011). There are also considerable psychological consequences to being overweight including feelings of low self-worth, low self-esteem and low self-confidence.

The current UK government aims to achieve a sustained downward trend in the number of people who are obese by 2020, through helping people to improve their diets, by eating more fruit and vegetables and increasing levels of physical activity (Department of Health (DoH), 2011). Being overweight and obese has an impact not only on an individual basis but also in the wider community and economy. The estimated total cost to the economy due to loss of earnings and cost of care related to obesity amounted to £16bn in 2007. This has the potential to rise to £50bn by 2050 if obesity continues to increase at its current rate (Foresight, 2007).

As a result of this financial cost, employers, whether private or public, have been recommended to serve their own economic interests by attempting to address obesity in the workplace (Heinen and Darling, 2009). Workplace environment has been highlighted as a potentially important setting for promoting health-related opportunities to employees (DoH, 2011; Gortmaker *et al.*, 2011; Academy of Medical Royal Colleges, 2013). Within the workplace overweight employees are more likely to have higher absenteeism and presenteeism; encounter difficulties with using equipment or seating; and be less able to cope with the physical demands of their employment (HSE, 2012, Health and Safety Executive, 2006). In the UK, employers have been proactive in signing-up for the national government's "Responsibility Deal – Health at Work Network" and have pledged to improve the work environment for their employees (Department of Health, 2012).

Workplace weight management programmes involving education and counselling including elements of dietary and physical activity behaviour have reported both short-term (Benedict and Arterburn, 2008; Verweij *et al.*, 2011), and long-term (Scroggins *et al.*, 2011) improvements in body weight. However, current literature reviewing specific dietary modifications in the workplace question the overall long-term effectiveness of research in this area (Geaney *et al.*, 2013, Anderson *et al.*, 2009, Mhurchu *et al.*, 2010; Maes *et al.*, 2012). As such, further exploration of workplace weight management programmes is necessary to determine the efficacy of such programmes and to identify and develop best practice (Quintiliani *et al.*, 2010).

The (East Midlands, UK) Platform for Health and Wellbeing is a network of private, public and voluntary sector organisations working to improve health and reduce obesity. Member organisations commit to undertaking actions to improve health and wellbeing of employees, individuals and/or communities in the East Midlands area. Slimming World (SW), as a member of East Midlands Platform for Health and Wellbeing, is the largest commercial weight management organisation in the UK, based on group attendances, serving over 800,000 members each week. SW has also been operating referral schemes (SW on referral) to the NHS since 2000, with its effectiveness appropriately reviewed in the scientific literature (Lavin *et al.*, 2006; Stubbs *et al.*, 2011, 2013). However, little is known on the effectiveness of referral to community groups via the workplace. As a result a pilot study was developed to assess the feasibility and benefits of providing weight management support via the workplace.

Methods

Design and intervention programme

The study utilised a quasi-experimental design using non-random assignment to the regular 12-week SW weight management programme from two workplaces, one private and one public which are part of the East Midlands Platform for Health and Wellbeing network. The study offered employees a choice of attendance at either an in-house workplace-based SW group or a traditional established community-based SW group for 12 weeks. Four workplace groups were established (three at lunchtime and one after work) for the purpose of this study (two sites in each of the public and private sector organisations). Both the community and workplace groups received the same SW programme run by trained SW consultants.

SW is a multicomponent behaviour change support programme meeting the UK's National Institute of Health and Clinical Excellence "best practice" criteria for weight management services (National Institute of Health and Clinical Excellence, 2014). This includes an eating plan based on energy density and satiety with group-based support to facilitate behaviour change in diet and activity. The programme helps adults develop the lifestyle changes needed to reduce weight, prevent weight gain and support long-term weight maintenance. Facilitator-led peer group support structure is used to share experiences and ideas, supporting participants in making healthy lifestyle changes around food and activity to promote weight loss. Formal and detailed characteristics have been published elsewhere (Lavin *et al.*, 2006).

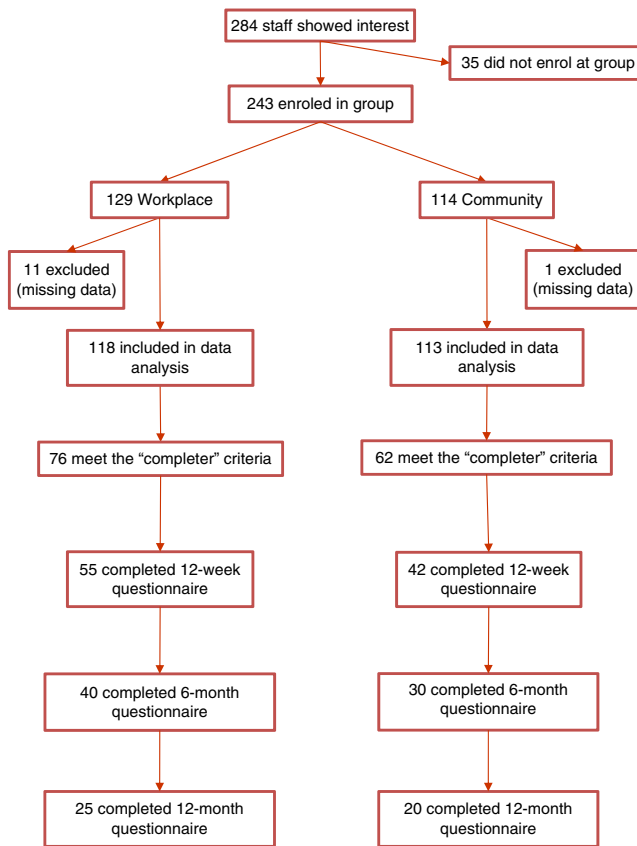
Participants and protocol

After receiving approval from the Faculty HLSS Research Committee at the University of Lincoln, participants were recruited from two organisations located in the East Midlands of England, UK, representing both the private sector and public sector. The study was advertised to employees via posters and internal electronic communications. Interested employees contacted their occupational health teams for further information, who determined suitability for inclusion ($\text{BMI} \geq 25 \text{ kg/m}^2$) in the study and gained informed consent. Eligible participants were offered attendance at either an "in-house" workplace-based or a traditional community-based SW group of their choice for 12 consecutive weeks. Intervention places were accommodated on a first-come first-served basis, with target numbers for both community and workplace groups set at 140.

Enrolment vouchers were supplied to participants covering the costs of normal group membership for the 12 weeks for both community and workplace groups. An overview of the process is shown in Figure 1. Initially, 284 employees showed interest in the programme. After screening and baseline questionnaires, 278 were allocated to their desired group.

Outcome measures

After the screening and referral process, baseline measurements (age (yrs), gender, height (m), weight (kg) and Body Mass Index (kg/m^2)) were collected from each participant by a trained SW consultant managing the designated group session at the first week of attendance. At each subsequent attendance the participant's weight was assessed on the same set of calibrated scales, recording weight and weight change to the nearest 200 g (Seca Ltd, Birmingham, England). Date of attendance, weight and weight change were recorded from the scales electronically and submitted to a central database. Participants who started the programme, weighing-in at baseline, and attended at least once within the last four weeks (weeks 8-12) were classified as "completers" of the programme.



Notes: Participants were categorised as “completers” if they started the programme, weighed-in at baseline, and attended at least once within the last four weeks (weeks 8-12)

Figure 1. Overview of the study protocol

Questionnaire

A self-reported online questionnaire was administered via e-mail link at four different time points: baseline (week 0) and immediately post-SW programme (12 weeks) with follow-up intervals of six and 12 months after the initial enrolment. All questionnaires administered required the same set of questions to be completed. The 39-item questionnaire focused on four main assessment sections: mental and emotional health (eight-items), self-esteem (11-items, adapted from Rosenberg’s Scale (Rosenberg, 1965)), dietary habits (14-items; healthy habits and unhealthy habits) and physical activity habits (seven-items). Participants selected an appropriate response on a five-point Likert scale ranging from “do not agree” to “agree very much”. Likert scale scores were summarised to calculate an overall section (and sub-section) score. The questionnaire sections had previously been administered (South Derbyshire Health Authority, 1999; Stubbs *et al.*, 2012) and were adapted in line with the aims of this study.

Data analysis

Data were analysed using SPSS for windows (SPSS Inc., Chicago, IL) and Microsoft Excel (Microsoft Corp., Redmond, WA, USA). Results are represented as means (standard deviation (SD)) and percentages where relevant. Weight, weight change, BMI and attendance data were subjected to parameter checks for outliers and anomalous data before statistical analysis. The data were independently analysed by the University of Lincoln. Initially, group characteristics were assessed using independent *t*-tests. Participant weight (kg), and BMI (kg/m^2) data were subjected to a factorial analysis-of-variance (ANOVA) having two levels for groups (workplace or community, between-subjects factor) and two levels of time (baseline and 12 weeks, within-subjects factor). The factorial ANOVA also determined whether any changes (with all participants) in these outcome variables were due to being enrolled on the SW programme (a general effect). Independent *t*-tests analysed differences with participant percentage weight change (per cent), total change (kg), BMI change (kg/m^2) and attendance between workplace and community-based groups at 12 weeks. The same procedures as stated were also adopted to analyse data from the “completers” of the programme. Due to an unanticipated decline in the response rates (at time points 12 weeks, six and 12 months), questionnaire data were only analysed with the completers of the programme. Subsection scores were analysed by a series of independent (between workplace and community groups) and dependent *t*-tests (within the entire participant sample). Suitable alternative nonparametric test were deployed when assumptions were not met for the parametric tests. Internal consistency of the questionnaire sections and sub scales was measured by using Cronbach's α after administration. Statistical significance was set at $p < 0.05$.

Findings*Participant demographics*

From the original 284 expressions of interest, 243 employees enrolled on to the programme (workplace $n = 129$, community $n = 114$). Following data cleansing, 11 workplace participants and one community participant were removed from the analysis due to incomplete data sets (Figure 1). In total 231 participants were recruited, 116 private sector ($n = 59$ workplace and $n = 57$ community) and 115 public sector ($n = 59$ workplace and $n = 56$ community).

Participant baseline characteristics (age, height, weight and BMI) did not differ between workplace and community groups (Table I). Of the initial sample ($n = 231$), 138 participants (59.7 per cent) completed the programme. Participants were categorised as “completers” if they started the programme, weighed-in at baseline and attended at least once within the last four weeks (weeks eight to 12); “non-completers” were categorised as those who started the programme, weighed-in at baseline and who did not attend in the last four weeks. Participant characteristics of completers were also not significantly different in baseline measures between workplace and community groups (Table II). Characteristics of the “non-completers” of the programme ($n = 93$) are also shown in Table II.

Weight data: all enrolled completers and non-completers

A mean weight change of -3.4 ± 3.4 kg, BMI change of -1.3 ± 1.3 kg/m^2 , percentage weight change of -3.9 ± 3.8 per cent with the average number of sessions attended at 7.2 ± 3.6 is reported when analysing the whole sample ($n = 231$, both workplace and

community groups). As a general effect, a significant decrease in weight (87.5 ± 17.8 vs 84.2 ± 17.9 kg) and BMI (32.4 ± 6.5 vs 31.2 ± 6.5 kg/m²) was reported ($p < 0.05$). There was no significant effect between workplace and community groups. Weight ($F(1, 229) = 2.0, p > 0.05$) and BMI ($F(1, 229) = 2.1, p > 0.05$) outcomes did not differ between workplace and community-based participants. Similarly, there were no significant differences detected between workplace and community groups with percentage weight change (per cent), total change (kg), BMI change (kg/m²) and attendance (all $p > 0.05$, Table II).

Weight data: completers of the programme

Completers (of both workplace and community groups, $n = 138$) reported a mean weight change of -4.9 ± 3.4 kg, BMI change of -1.8 ± 1.2 kg/m², percentage weight change of -5.7 per cent ± 3.8 with the average number of sessions attended at 9.8 ± 1.8 . As a general effect combined data from workplace and community groups), a significant difference between start (87.7 ± 18.1 kg) and end weight (84.2 ± 18.2 kg) was detected ($p < 0.05$), with reductions between starting BMI (32.6 ± 6.3 kg/m²) and end BMI (30.8 ± 6.2 kg/m²) also reported ($p < 0.05$). There was no significant effect between workplace and community groups. Workplace and community-based “completers” did not differ with weight ($F(1,136) = 0.47, p > 0.05$) and BMI ($F(1,136) = 0.49, p > 0.05$) outcomes. No significant differences were detected between workplace and community groups with percentage weight change (per cent), total change (kg), BMI change (kg/m²) and attendance (all $p > 0.05$, Table II).

Questionnaire data

The following sections and subscales reported Cronbach’s α for completer participants: mental and emotional, 0.64, self-worth, 0.78; dietary habits – healthy, 0.83; dietary habits – unhealthy, 0.89; physical activity habits – healthy, 0.72; physical activity habits – unhealthy, 0.70.

Questionnaire responses declined at each interval of administration: baseline ($n = 138$): workplace $n = 76$, community $n = 62$; 12 weeks ($n = 97$): workplace $n = 55$, community $n = 42$; six months ($n = 70$): workplace $n = 40$, community $n = 30$; 12 months ($n = 45$): workplace $n = 25$, community $n = 20$. Response rate on the sequence of questionnaires was similar between both workplace and community groups, with no significant differences detected between workplace and community groups on any of the subscale sections (Table III).

	Public sector organisation referral		Private sector organisation referral		All workplace ($n = 118$)	All community ($n = 113$)	<i>p</i> -Value
	Workplace ($n = 59$)	Community ($n = 56$)	Workplace ($n = 59$)	Community ($n = 57$)			
Males (<i>n</i>)	1	1	7	3	8	4	
Females (<i>n</i>)	58	55	52	54	110	109	
Age (yrs)	46.4 ± 9.6	45.6 ± 10.7	36.7 ± 9.4	41.0 ± 10.4	41.7 ± 10.6	42.6 ± 10.6	> 0.05
Height (m)	1.63 ± 0.08	1.64 ± 0.07	1.65 ± 0.08	1.65 ± 0.07	1.64 ± 8.2	1.64 ± 7.1	> 0.05
Start weight (kg)	87.5 ± 17.0	88.8 ± 18.2	87.4 ± 21.6	85.9 ± 13.4	87.2 ± 19.3	87.8 ± 16.2	> 0.05
Start BMI (kg/m ²)	33.0 ± 6.8	33.1 ± 6.1	32.1 ± 8.0	33.0 ± 5.0	32.5 ± 7.3	32.4 ± 5.6	> 0.05

Note: Data are expressed as mean \pm SD

Table I. Employee descriptive and demographic data, including specific designation into workplace and community sites

Table II.
Descriptive data and weight outcomes for all participants enrolled on the 12-week Slimming World programme

	Workplace (n = 118)	Community (n = 113)	Difference (+/-)	Combined data (n = 231)	Workplace "completers" (n = 76)	Community "completers" (n = 62)	Difference (+/-)	Combined "completers" (n = 138)	Combined "non- completers" (n = 93)
Age (yrs)	41.7 ± 10.6	42.6 ± 10.8	-0.9	42.2 ± 10.7	43.0 ± 10.5	45.0 ± 9.7	-2	43.9 ± 10.2	39.6 ± 11.0
Height (m)	1.64 ± 0.83	1.63 ± 0.71	0.01	1.64 ± 0.77	1.63 ± 0.81	1.65 ± 0.77	-2	1.64 ± 0.79	1.64 ± 7.3
Start weight (kg)	87.3 ± 19.3	87.8 ± 16.2	-0.5	87.5 ± 17.8	87.3 ± 19.2	88.2 ± 16.9	-0.9	87.7 ± 18.1	87.2 ± 17.5
End weight (kg)	83.6 ± 19.2	84.7 ± 16.5	-1.1	84.2 ± 17.9*	82.3 ± 19.0	83.6 ± 17.3	-1.3	82.8 ± 18.2*	86.1 ± 17.3
Total weight change (kg)	-3.7 ± 3.2	-3.0 ± 3.7	0.7	-3.4 ± 3.4	-5.1 ± 2.9	-4.7 ± 4.0	0.4	-4.9 ± 3.4	-1.1 ± 1.9
Weight change (per cent)	-4.2 ± 3.7	-3.5 ± 3.9	0.7	-3.9 ± 3.8	-5.8 ± 3.4	-5.4 ± 4.0	0.7	-5.7 ± 3.7	-1.3 ± 2.1
Start BMI (kg/m ²)	32.5 ± 7.3	32.4 ± 5.6	0.1	32.4 ± 6.5	32.7 ± 7.0	32.3 ± 5.3	0.4	32.6 ± 6.3	32.2 ± 6.8
End BMI (kg/m ²)	31.1 ± 7.2	31.3 ± 5.6	-0.2	31.2 ± 6.5**	30.9 ± 7.0	30.6 ± 5.3	0.3	30.8 ± 6.2**	31.8 ± 6.7
BMI change (kg/m ²)	-1.4 ± 1.2	-1.1 ± 1.3	0.3	-1.3 ± 1.3	-1.9 ± 1.1	-1.8 ± 1.4	0.1	-1.8 ± 1.2	-0.4 ± 0.7
Attendance (weeks)	7.3 ± 3.5	7.2 ± 3.9	0.1	7.2 ± 3.6	9.6 ± 1.6	10.0 ± 1.9	-0.4	9.8 ± 1.8	3.5 ± 1.9

Notes: Data are expressed as mean ± SD. *, **Significant difference between the start and end weight (kg) (*p* < 0.05) and between the start and end BMI (kg/m²) (*p* < 0.05), respectively

Table III. Group comparison: summarised questionnaire subscale data for “completers” during the study

Questionnaire subscales	Baseline (n = 76)	Workplace completers				Community completers			
		12 weeks (n = 55)	6 months (n = 40)	12 months (n = 25)	Baseline (n = 62)	12 weeks (n = 42)	6 months (n = 30)	12 months (n = 20)	
Mental and emotional	11.8±2.1	12.3±1.9	12.1±2.4	11.9±1.9	11.8±2.2	12.1±1.8	12.0±1.9	11.5±2.1	
Self-worth	29.0±5.4	31.6±5.8*	30.2±5.7**	30.4±6.4***	30.5±5.7	32.1±3.8	31.9±4.4**	31.4±5.1***	
Dietary habits									
Healthy	14.9±3.5	19.1±4.1*	18.3±4.4**	18.4±4.6***	15.5±4.3	17.9±5.2*	18.9±4.8**	18.4±4.6***	
Unhealthy	19.9±5.9	15.1±4.1*	15.2±4.8**	16.4±5.5***	19.3±5.2	14.7±4.5*	14.7±5.3**	15.5±5.8***	
Physical activity habits									
Healthy	5.2±2.0	6.7±2.0*	6.1±1.8**	5.6±2.2****, *****	4.9±1.9	5.9±2.2	5.5±2.2	4.9±1.7	
Unhealthy	12.5±5.0	9.1±3.8*	9.1±4.2**	10.2±4.2**	13.1±4.2	10.5±4.1*	10.7±4.1**	10.9±3.6***	

Notes: Data are expressed as mean±SD; Cronbach's α , mental and emotional, 0.64; self-worth, 0.78; dietary habits – healthy, 0.83; dietary habits – unhealthy, 0.89; physical activity habits – healthy, 0.72; physical activity habits – Unhealthy, 0.70. *,**,***,****,***** Significant difference between baseline to 12 weeks ($p < 0.05$); difference from baseline to six months ($p < 0.05$); difference from baseline to 12 months ($p < 0.05$); difference from 12 weeks to 12 months ($p < 0.05$); difference from six to 12 months ($p < 0.05$)

When analysing the data for all “completer” participants (Table IV), subscale section scores differed between times of questionnaire administration. Mental and emotional health section scores increased by 0.6 from baseline to 12 weeks and decreased 0.4 between six and 12 months. Self-worth section scores increased 2.9 from baseline to 12 weeks; baseline to six months and baseline to 12 months (both +2.0). Healthy dietary habit section scores increased from baseline to 12 weeks, baseline to six months and baseline to 12 months (all 3.5). Unhealthy dietary habit section scores decreased from baseline to 12 weeks (4.6), baseline to six months (4.5) and baseline to 12 months (3.5). Healthy physical activity habit section scores increased from baseline to 12 weeks (1.4) and baseline to six months (0.9). A decrease of 1.1 was reported between 12 weeks and 12 months and 0.6 between six and 12 months was also detected. Unhealthy physical activity habit section scores decreased 3.0 from baseline to 12 weeks and baseline to six months whilst baseline to 12 months decreased 2.2.

Of those participants who completed the baseline and all follow up questionnaires (12 weeks, six and 12 months), 20-30 per cent of participants reported that their health

Questionnaire subscales	Baseline (n = 138)	12 weeks (n = 97)	6 months (n = 70)	12 months (n = 45)
Mental and emotional	11.7 ± 2.0	12.3 ± 1.8*	12.1 ± 2.2	11.7 ± 2.0*****
Self-worth	28.9 ± 5.5	31.8 ± 5.8*	30.9 ± 5.2**	30.9 ± 5.8***
Dietary habits				
Healthy	15.1 ± 3.9	18.6 ± 4.6*	18.6 ± 4.5**	18.6 ± 4.6***
Unhealthy	19.5 ± 5.4	14.9 ± 4.7*	15.0 ± 5.0**	16.0 ± 5.7***
Physical activity habits				
Healthy	5.0 ± 1.8	6.4 ± 2.1*	5.9 ± 2.0**	5.3 ± 2.0****, *****
Unhealthy	12.7 ± 4.5	9.7 ± 4.0*	9.7 ± 4.2**	10.5 ± 3.9***

Notes: Data are expressed as mean ± SD; Cronbach's α , mental and emotional, 0.64; self-worth, 0.78; dietary habits – healthy, 0.83; dietary habits – unhealthy, 0.89; physical activity habits – healthy, 0.72; physical activity habits – unhealthy, 0.70. *,**,***,****,***** Significant difference between baseline to 12 weeks ($p < 0.05$); difference from baseline to six months ($p < 0.05$); difference from baseline to 12 months ($p < 0.05$); difference from 12 weeks to 12 months ($p < 0.05$); difference from six months to 12 months ($p < 0.05$)

Table IV. Combined data: summarised questionnaire and subscale data for “completers” (both workplace and community) during the study

was affecting their work (22 per cent), social life (28.6 per cent) and other daily activities (28.6 per cent) before the trial. However, after 12 weeks of weight management support this decreased across all three areas; at 12 weeks only 15.5 per cent reported that their health affected their work, 20.6 per cent social life and 14.4 per cent other daily activities. Further decreases were reported at six months (6.5 per cent work, 9.8 per cent social life and 9.8 per cent other activities) and 12 months (5.7 per cent work, 10 per cent social life and 11.4 per cent other activities), respectively.

Participants were also asked to indicate whether they would consider continuing the weight loss programme after their initial 12-week trial by attending a local community group. 46.4 per cent of participants ($n = 112$) expressed an intention to continue attending a SW community-based group, of which 60 became paying members after 12 weeks ($n = 36$ community and $n = 24$ workplace). When investigating why participants did not continue to attend after the intervention 27 participants felt that the weekly attendance fees were a barrier to continue, however, a number of the participants also felt that they had been equipped to continue to lose weight on their own ($n = 23$) with no difference between workplace or community groups. In total, 12 of the workplace participants felt that they did not want or have time to attend a group outside of work, with a further 11 expressing time pressures or being too busy to continue with the programme. In addition, participants evaluated how easy they found the SW programme to follow day-to-day whilst at work. In total, 52 per cent of the participants reported the plan very easy or easy to follow, with 15 per cent reporting it difficult or very difficult to follow.

Discussion

The aim of the current investigation was to assess the feasibility and benefits of offering weight management support via the workplace. The results demonstrate that there was enthusiasm for a weight management service and employees offered membership to SW via the workplace achieved significant weight loss during the 12-week trial period.

The average weight loss after 12 weeks of all participants (-3.9 per cent, $n = 231$) and of those “completing” the intervention (-5.7 , $n = 138$) was comparable to audits of referred-NHS members (-4.0 per cent, $n = 34,271$) and high attenders (-5.5 per cent, $n = 19,907$) (Stubbs *et al.*, 2011). A 5 per cent weight loss has been linked to a number of health benefits including, but not limited to: reduced blood pressure; improved cholesterol levels; reduced risk of developing type 2 diabetes; improved blood sugar levels; and reduced risk for certain cancers (DOH, 2011). This indicates that the weight loss intervention may have the potential to benefit wider health problems.

In addition, the average attendance over the 12-week pilot intervention was similar between the community (7.2 weeks) and the workplace (7.3 weeks) groups for all participants, with “completers” recording slightly greater attendance (community 10.0 weeks; workplace 9.6 weeks). There was however no significant difference between groups. It was anticipated that closed workplace groups may not perform as well as community groups because SW groups thrive with the regular addition of new members resulting in the provision of fresh support, ideas, expertise, enthusiasm and motivation from members at all stages of their weight loss journey. Without this, the closed group environment may have become stale and unsustainable for the longer term. We anticipate that the duration of the study was short enough that the workplace groups had not exhausted their ideas or become stale, and had benefited from psychological and social support from their fellow

members between meetings within the workplace. However, it is unclear whether closed workplace groups would have remained effective beyond the relatively short 12-week intervention.

Following the pilot intervention and as an addition to this study all participants were given the option of continuing to gain support from SW by attending an established SW community group, regardless of initial trial arm. From the 243 initial participants, 46.4 per cent ($n = 112$) of participants stated that they intended to continue attending at the end of the 12-week intervention, with 60 participants reporting they had attended post intervention at six months. Future research should aim to include weight loss data at six and 12 months post intervention and could extend the workplace group programme from 12 weeks or look at facilitation into an established community group for longer term support to determine longer-term benefits.

Questionnaire

Participants gave self-reported accounts of behaviour change related to diet and physical activity by answering questionnaires at baseline, 12 weeks (three), six and 12 months. Over the 12-week study period participants reported a decrease in unhealthy eating and inactivity habits (e.g. eating unhealthy snacks and watching a lot of TV) and an increase in healthy eating and activity habits (e.g. cooking from scratch and going out for walks). These behaviour changes were sustained over the follow-up period (six and 12 months). This suggests that the 12-week intervention encouraged sustainable healthy habit forming behaviours which are likely to be beneficial for sustained weight loss and or maintenance of weight loss.

In addition, measures of self-worth increased between baseline and 12 weeks, remaining elevated compared to baseline throughout the follow-up. Mental and emotional health improved significantly between baseline and 12 weeks and was sustained at six months. However, scores decreased between six and 12 months. This suggests that participation in this intervention improves mental wellbeing for participants at least in the medium term, extending to six months post participation, which could lead to improvements in work performance and overall quality of life.

Participant feedback was also gathered regarding the ability of the workplace environment to fully enable the SW programme to be followed whilst at work. Choices at meal times tended to be restricted to the regular menu at the cafeteria on site or what was available at convenience locations (e.g. vending machines, or local shops). Participants indicated that limited free time during an already busy working week was a barrier for those attending workplace groups that took place during the working day. Unfortunately, creating environmental changes within the workplace to support healthier choices on site was beyond the scope and purpose of this current investigation; however, the limited feedback we did receive highlighted the importance of gaining support from the workplace management in order to facilitate a weight management change. Consideration of these types of contextual factors has been suggested to enhance the design, delivery and evaluation of healthy eating strategies in this setting (Quintiliani *et al.*, 2010) and modifications to the food environment would support workplace employees to make healthier choices easier (Anderson *et al.*, 2009).

Limitations

Whilst the current investigation adds novel data to the debate of whether weight management via the workplace is a suitable opportunity to address employee weight,

there are limitations when interpreting the study findings. Participant response rate with the questionnaires dropped considerably from post-intervention (12 weeks) to six months (50 per cent) and 12 months (33 per cent). Despite prompts to complete the questionnaires, the majority of participants neglected this process at least once ($n = 93$) resulting in a reduced number of participants included within the analysis (participants were required to complete questionnaires at all intervals to be included). Inevitably, the declining response rate caused a further problem with data analysis with the use of multiple *t*-tests rather than the typical or expected approach for this type of data set (e.g. a two-way analysis of variance). Indeed, this issue has increased the chances of a type 1 error regarding the results of the questionnaire.

The current investigation collected weight data during the 12-week programme using the standard SW model of “weekly weigh-ins” with trained consultants. Unfortunately it is unclear if participants continued their weight loss progress beyond the 12-week intervention programme as weight was no longer recorded at weekly weigh-ins. Although unreliable, self-reported weight was requested from the participants in a follow-up correspondence, however, the data were not complete and may have been inaccurate and therefore has not been included in the study analysis. Although self-reported weight at follow-up may not lead to an overestimation in weight loss (Jolly *et al.*, 2011), future studies may wish to organise weigh-in sessions at fixed time points to allow accurate weight measures to be recorded post 12-week intervention to determine the effects of the intervention on weight change in the long term. Furthermore, future investigations may seek to produce long-term dietary, health and cost-effective indicators which link explicitly to the context of the workplace, in-terms of absenteeism and productivity (Geaney *et al.*, 2013).

In addition, participants were self-selecting to take part in this study, with the majority (94 per cent) female, aged 42.3 years with a joining BMI of 32.5 kg/m². Only 13 men took part in this investigation with an average age of 39.8 years and joining BMI of 32.1 kg/m². Whilst this intervention may have attracted a particular demographic that may not be representative of the workforce or general population as a whole, it is representative of commercial weight management organisations general membership (SW; 95 per cent female, 5 per cent male).

Conclusion

The current study attempted to integrate a commercially available weight management programme into the workplace for employees to attend by choice. This approach was as an innovation over other methods which have been primarily considered in previous systematic reviews in this area (Mhurchu *et al.*, 2010; Maes *et al.*, 2012; Geaney *et al.*, 2013) and to the author’s knowledge is the first such study in the UK to include a workplace SW weight management group.

The results illustrate that the SW programme works effectively for the short term (12 weeks) in both workplace and community groups (in terms of weight loss) when employees are recruited from local organisations and given the opportunity to choose a delivery option. The results indicate healthy behaviour changes occur, many of which are maintained beyond the intervention period. The data suggests completers of the programme report improvements in mental/emotional state, dietary habits, physical activity habits and self-esteem after taking part in the intervention compared to baseline. However, it must be acknowledged that questionnaire respondent rates reduced towards the end of the study affecting the power of this interpretation. Whilst there was no significant difference between groups in weight loss outcomes, the

sustainability of closed workplace-groups beyond 12 weeks remains uncertain particularly as community groups thrive with the addition of new members resulting in the provision of support and motivation from members at all stages of their weight loss journey. Without this, the closed group environment may become stale and unsustainable for the longer term. The study also highlights a number of potential barriers for employees when attending a weight management programme in the workplace and these may need to be considered when investigating the long-term success of this type of intervention.

The data from the current investigation supports the use of a 12-week SW weight management programme as a credible option for employers wanting to support employees achieve weight loss and improve psycho-social health outcomes which could lead to improvements in general wellbeing, overall quality of life and work performance.

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About the authors

Jenny Barber, an MSc, ANutr (Public Health) is a Nutritionist at the Nutrition and Research Department, Slimming World.

Dr Sarah E. Hillier, a PhD, RNutr (Nutrition Science), is a Research Associate at the Nutrition and Research Department, Slimming World. Dr Sarah E. Hillier is the corresponding author and can be contacted at: sarah.hillier@slimming-world.com

Dr Geoff Middleton is a Senior Lecturer at the School of Sport and Exercise Science, University of Lincoln.

Dr Richard Keegan is an Assistant Professor at the Faculty of Health and Research Institute for Sport and Exercise, University of Canberra, Australia.

Dr Hannah Henderson is a Senior Lecturer at the School of Sport and Exercise Science, University of Lincoln.

Dr Jacquie Lavin, a PhD, RNutr, is the Head of Nutrition and Research Department, Slimming World.

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