Section 4: Management of obesity 1

14 Management of obesity in non-clinical settings

The following is based on an evidence review produced by the Centre for Reviews and Dissemination, University of York. Detailed evidence tables and supporting information are in Appendix 12.

14.1 Evidence statements (Table 14.1)

Table 14.1 Evidence statements and grading

No.	Statement	Grade	Evidence
Weight outcomes			
1	In both children and adults, there is a paucity of good-quality evidence on the effectiveness of interventions in non-clinical settings	N/A	N/A
Adults			
2	There is limited evidence on the effectiveness of interventions based in non-clinical settings to manage obesity in adults (particularly men)	N/A	N/A
3	There is moderate evidence that a multi-component commercial group programme may be more effective than a standard self-help programme. It remains unclear whether the branded commercial group programme for which there is evidence of effectiveness (WeightWatchers) is more or less effective than other branded commercial programmes	1++	Two RCTs (one good quality 1++ [Heshka et al. 2003[1]] and one poorer quality 1– [Rippe et al. 1998[2]])
4	There is no strong evidence to support the use of meal replacement products over a standard low-calorie diet	N/A	Two studies (one CBA 2– [Rothacker 2000[3]] and one RCT 1– [Ahrens et al. 2003[4]])
5	There is limited evidence that interventions to manage obesity based in workplace settings can be effective, though weight loss may be small in the long term	1–	Body of evidence: six RCTs of which one 1+ (Pritchard et al. 2002[5]), five 1– (Dennis 1999,[6] Peterson et al. 1985,[7] Follick et al. 1984,[8] Leslie et

No.	Statement	Grade	Evidence
			al. 2002,[9] Muto and Yamauchi 2001[10]) and one CBA 2– (Furuki et al. 1999[11])
6	There is some evidence that computer/email/internet-based programmes accompanied by greater ongoing support – in person, by post or email – may be more effective than those without	1+	Body of evidence: six RCTs of which four 1+ (Tate et al. 2001,[12] Tate et al. 2003,[13] Agras et al. 1990,[14] Womble et al. 2004[15]), two grade 1– (Taylor et al.1991,[16] Jones and Burkett 2002[17]) and one CBA 2– (Dennison et al. 1996[18])
7	The effectiveness of commercial and computer-based weight loss programmes in men remains unclear	N/A	N/A
8	There is limited evidence that a diverse range of novel, multi-component community-based interventions may be effective in the management of obesity, including a peer-led programme and a group-based and individual-based weight loss programme in a religious-based setting, a home-based exercise programme (accompanied by regular group sessions) and programme providing information through interactive television	1+	Five studies: four RCTs of which two 1+ (Perri et al. 1997[19] and McNabb et al. 1997[20]), two 2– (Jason et al. 1991[21] and Kennedy et al. 2005[22] and one CBA 2– (Harvey-Berino 1998[23])
Children			
9	There is a paucity of evidence on the effectiveness of interventions to manage obesity in children based in non-clinical settings; the evidence that was identified was generally for children aged 8–12 years of age and at the extreme end of obesity	N/A	N/A
10	There is no UK-based evidence available on the effectiveness of interventions to manage obesity in children and young people in non-clinical settings	N/A	N/A

No.	Statement	Grade	Evidence
11	There is limited evidence that interventions provided by school staff can aid the management of obesity in children and young people, at least in the short term, but this may be less effective than a more intensive intervention delivered in a clinical setting	2–	Two CBAs 2– (Donnelly et al. 1996[24] and Nuutinen 1991[25])
12	There is insufficient evidence to compare the effectiveness of interventions with or without family involvement in non-clinical settings	N/A	With family involvement: four studies – two RCTs 1+ (Figueroa-Colon et al. 1996[26], Grey et al. 2004[27]), one RCT 1– (Lansky and Vance 1983[28]) and one CBA 2+ (Graf 2005[29]) Versus without family involvement: one RCT 1– (Carrel et al. 2005[30]) and two CBAs 2– (Donnelly et al.1996[24] and Nuutinen 1991[25])
13	There is some evidence that home-based interventions may be more effective when accompanied by behaviour modification material and ongoing support. However, the replicability of this intervention on a wider scale remains unclear	1+	Three RCTs of which two 1+ (White et al. 2002[31] and Williamson et al. 2005[32] and one 1– (Jiang et al. 2005[33])
14	No evidence was identified which considered the effectiveness of exercise referral programmes to manage overweight or obesity in children and young people	N/A	N/A
Diet and activity outcomes			
15	Among both children and adults, interventions in non-clinical settings that are shown to be effective in terms of weight management, are likely to demonstrate significant improvements in participants' dietary intakes (most commonly fat and calorie intake) or physical activity	1+	Body of evidence: *In adults*: 12 studies of which six RCTs 1+ (Pritchard et al. 1997,[5] Tate et al. 2001,[12] Tate et al. 2003,[13] Womble et al. 2004,[15] McNabb et al. 1997,[20] Perri et al. 1997[19]), three RCTs 1– (Jason et al.

No.	Statement	Grade	Evidence
	levels		1991,[21] Taylor et al. 1991,[16] Rippe et al. 1998[2]) and three CBAs 2– (Harvey-Berino 1998,[23] Furuki et al. 1999,[11] Dennison et al. 1996[18]) *In children*: two studies – one RCT 1+ (Grey et al. 2004[27] and one CBA 2– (Nuutinen 1991[25])
Other outcomes			
16	No negative outcomes were reported in the identified studies for children or adults	N/A	N/ A
Generalisability			
17	The majority of studies identified were undertaken in the USA but many of the principles may be generalisable to the UK	N/A	1 RCT 1– (Leslie et al. 2002[9])
18	It remains unclear whether the effectiveness of programmes in children or adults varies by age, gender, ethnicity or social status	N/A	N/A
19	It remains unclear whether the effectiveness of programmes varies by whether participants have previously attempted to lose or maintain their weight	N/A	N/A
20	The impact of participant joining fees and participant costs on the long-term effectiveness in 'real life' commercial programmes remains unclear	N/A	N/A
Implementation			
21	There is insufficient evidence to identify strategies in non-clinical settings that are associated with the long-term maintenance of weight and continuation of improved behaviours among overweight and obese adults and children	N/A	N/A

No.	Statement	Grade	Evidence
22	It remains unclear whether the source of delivery (both the main intervention and ongoing support) had an influence on effectiveness	N/A	N/A
23	There is insufficient evidence to assess the importance of the source of delivery (for example, health professional versus volunteer worker) on the effectiveness of programmes for children or adults	N/A	N/A
24	None of the identified studies considered inter-agency or inter-professional partnerships	N/A	N/A

CBA, controlled before-and-after study; N/A, not applicable; RCT, randomised controlled trial.

Associated evidence tables for review are in Appendix 12.

14.2 Methodology

Database searches were carried out in July 2005 for papers published from 1990 onwards (1995 onwards for systematic review level evidence). A final update search was completed on 1 December 2005 on a reduced number of databases. Interventions of interest included:

- commercial and practice-based slimming groups
- exercise referral (for example, walking groups, access to sports facilities; to explicitly consider interventions among children as well as those for adults)
- community- and setting-based (for example schools, workplace) programmes for overweight and obese adults and children
- weight management/weight loss camps for children
- programmes for self-help/management for example, internet-based programmes.

Studies of children (age 2 years and over) and adults classified as overweight or obese (as measured by body mass index [BMI], waist, etc.) were included. Studies which included participants with any pre-existing medical condition such as diabetes, hypertension and eating disorders were excluded. Where studies included overweight and normal weight participants, the study was included only if outcome data were reported separately for overweight/obese participants. All other inclusion and exclusion criteria for public health reviews were applied.

From an initial 13,432 hits, 454 papers were assessed in detail of which 36 papers (35 individual studies) met the critical appraisal criteria for inclusion in evidence tables.

14.3 Weight outcomes

14.3.1 Adults

Although 23 primary studies were identified (19 randomised controlled trials [RCTs] and 4 controlled before-and-after studies [CBAs]), the studies tended to be small and with methodological limitations, providing little information on intervention setting and evaluating a fairly restricted range of interventions. In most RCTs, the methods of randomisation, allocation to treatment group and blinding of outcome assessors were inadequate or not possible to assess due to poor reporting. Most interventions were multi-component using the internet or a more traditional mode of delivery such as face-to-face group sessions, following participants from 3 months to 4 years. The participants in these studies were mainly middle-aged, white women from the USA (only one UK study was identified). Socioeconomic data were seldom reported. Several of the studies offered incentives to attend follow-up assessment, therefore if the intervention was implemented in a real-life setting without incentives, dropout may increase.

14.3.1.1 Commercial weight loss programmes

One systematic review of US-based commercial weight loss programmes was identified.[34] The review included two relevant studies of the WeightWatchers programme (both funded by WeightWatchers International).[1,2] The RCTs

included mainly female participants and the mean baseline BMI was greater than 30 kg/m^2.

The findings suggest that the WeightWatchers programme was more effective than a self-help programme. The larger, better quality RCT [1] reported that WeightWatchers participants lost a mean of 4.6% (4.3 kg) of their initial weight after 1 year with a mean loss of 3.1% (2.9 kg) of initial weight at 2 years. The mean weight loss in the self-help comparison group was 0% at 2 years. Non-completers were included in this analysis. After 2 years, 35% of the WeightWatchers participants and 21% of the self-help group participants had lost more than 5% of their baseline weight. However, this particular analysis included only participants who completed the programme and is likely therefore to be an overestimate. Participants attended the WeightWatchers programme free of charge; therefore the level of dropout (25% for self-help and 29% for WeightWatchers) may be lower than would be expected in a real-life situation. The second RCT, which had methodological limitations, reported a mean weight loss of 7.5% (6.1 kg) in the WeightWatchers group compared with 1.6% (1.3 kg) in the usual care group at 12 weeks.[2] Only participants who completed the programme were included in the analyses therefore the extent of weight loss is likely to be an overestimate. Loss to follow-up was considerably less in the WeightWatchers group than the usual care group though a quarter of participants did not complete the former programme.

Two US-based studies (funded by Slim-Fast Foods),[3,4] both with methodological limitations, including predominantly women, evaluated meal replacement shakes. (One study, an RCT, carried out in a pharmacy, reported similar weight loss and reduction in waist circumference at 12 and 22 weeks when a diet using liquid meal replacement shakes (Slim-Fast) was compared with a reduced-calorie diet.[4] The pharmacist was the point of contact for a fortnightly 15-minute review, with diet plans reviewed by a dietitian. The mean weight loss was just under 5 kg in both groups at 12 weeks with a further small loss of less than 1 kg at 22 weeks. The CBA compared a liquid meal replacement shake diet with a no intervention

control.[3] There was a weekly weigh-in at the local village centre during the first 12 weeks and then twice a year weigh-in for what appears to be 5 years. The BMI decreased in the meal replacement group (1.8 kg/m^2 for women and 1.6 kg/m^2 for men) whereas there was a weight gain in the control group. Participants were provided with free meal replacement shakes in both these studies therefore adherence may be more difficult outside the research context. Only participants who completed the programme were included in the analysis, therefore the extent of weight loss is likely to be an overestimate.

14.3.1.2 Computer-based interventions

Seven studies, based in the USA, used a computer in a non-clinical setting, as part of a weight loss programme. Although the setting was non-clinical, in some of these studies the setting was not the focus of the research question. On balance, the findings suggest there is some evidence that the internet was an effective mode of delivery for weight loss interventions. Weak evidence suggests that the intensity of support provided over the internet was important: an education-focused website was more effective when delivered with ongoing support by a therapist via email.

In two RCTs, the effect of varying levels of support or intensity of one-to-one contact over the internet was assessed.[12,13] Both studies investigated a primarily education-based website with and without weekly support via email from a therapist, including personalised feedback on progress. In one study the intervention was implemented in a large hospital group where website access was via the hospital intranet. In the other, participants were required to have their own computer access. Both studies included non-completers in the analysis and were of reasonable quality. Participants were predominantly women, white and well educated.

In both studies, weight loss was observed at 6 months[12] and 1 year[13] although this was statistically significantly greater in the group that received weekly support via email. The six-month mean weight loss in the group receiving

additional support was 2.9 kg compared with 1.3 kg in the education website only group.[12] In this study 35% of participants receiving additional support and 18% of participants in the education website only group achieved a weight loss of at least 5% of baseline weight (it was unclear whether this analysis included all participants). The 1-year weight loss in the group receiving additional support was 4.4 kg compared with 2 kg in the education website only group (per cent loss not available).[13]

One small RCT compared computer-assisted therapy (CAT) with or without an initial 3.6–4.5 kg (8–10 lb) weight loss through a 1200 calorie diet.[16] At 12 weeks, the authors reported less weight loss in the CAT only group compared with the diet and CAT group. By 38 weeks the weight loss was 0.9 kg and 3.8 kg, respectively, and the difference between the groups was statistically significant. However, this is likely to be an overestimate as only participants who completed the programme were included in the analysis.

The remaining four studies compared an internet- or computer-based intervention with an alternative mode of programme delivery.

Two small RCTs among female participants found similar levels of weight loss using different modes of delivery.[14,17] After 12 weeks there was no statistically significant difference in weight loss between a classroom-based, computer-based and self-help-manual-based programme. Although there was a statistically significant weight decrease over time for all the groups combined, the actual changes were very small.[17] A guided 1200 calorie weight loss programme provided through a hand-held computer (with regular exercise) led to a similar level of weight loss as a hand-held computer plus group sessions and behaviour therapy after 1 year. The mean weight loss was 0.3 kg, 1.9 kg and 1.0 kg, respectively.[14]

One internet-based intervention was found to be less effective than a self-help manual.[15] The small RCT compared a 1-year commercial internet-based programme with a self-help manual in women.[15] Participants in both groups also

had review meetings with a psychologist. After 1 year the internet group had lost less than 1 kg compared with a mean weight loss of 4 kg in the comparison group. Over a third of participants dropped out from both groups. Participants were given free 1-year membership of the commercial internet programme; therefore the level of dropout may be lower than would be expected in a real-life situation.

One small CBA among predominantly white male factory workers compared an 8-week computer-based and a group class (primarily education) programme.[18] However, three-quarters of the participants dropped out and so the weight loss data are not meaningful.

14.3.1.3 Work-based setting

Seven studies were identified that addressed weight control in a work-based setting. Only one was UK based and participants were predominantly male. The findings suggest that interventions in a work setting can be effective but the evidence was weak and the actual weight loss relatively small.

The UK-based RCT was conducted among men at a large petrochemical worksite in Scotland.[9] After 12 weeks an energy-deficit diet and a generalised low-calorie diet led to similar levels of weight loss (4.6 kg and 5.6 kg, respectively) whereas the control group gained 0.5 kg. At 24 weeks there was some weight re-gain in the two intervention groups, but weight was still lower than at baseline in both groups. Although all participants were included in the analysis at 12 weeks, only completers were included in the analysis of the later follow-up. In another men-only group in a small RCT there was greater weight loss with a diet and exercise intervention compared with no intervention at 12 months.[5] The mean BMI reduction was 8.2% in the group instructed to follow a personalised low-fat diet together with a weight loss manual and 4.5% in the group instructed to follow an aerobic exercise regimen in their leisure time compared to a 1% gain in the control group. Two further Japanese-based studies of mainly male participants reported a significantly greater reduction in BMI in the

intervention group. However, the mean change in BMI was fairly small: in the RCT, the mean BMI decreased by 0.6 kg/m^2 at 18 months in the intervention group,[10] and in CBA study, by 0.25 kg/m^2 at 4 years.[11] The intervention was directed at all staff or staff with cardiovascular heart disease risk factors, with outcome reported for an overweight subgroup. An intervention on a US navy ship, found similar weight loss in the intervention and no intervention groups.[6] None of these studies included non-completers in their statistical analysis, therefore any weight losses are likely to be overestimates.

One small RCT, carried out among mainly female participants in a US factory reported a similar level of weight loss at 8 months among participants of a 16-week professionally led weight loss programme and a volunteer-led programme.[7] In the former, participants lost a mean of 10.8 kg from a baseline of 82.9 kg; the latter lost 7.6 kg from a baseline of 81.6 kg. A structured weight loss programme was used with regular meetings and provision of workbooks. Volunteers were elected following the first two meetings which were led by health professionals. Dropout was greater in the professionally led group although all participants were included in the analysis. A further, very small RCT, including mainly women working in a US general hospital, found that using a financial incentive led to fewer participants dropping out of a programme involving 14, 30-minute behavioural weight loss sessions than no financial incentive.[8] However, even in the incentive group, 40% of participants did not complete the programme. In addition, although both groups lost weight following the intervention, there were no statistically significant differences between the groups in weight loss.

14.3.1.4 Other non-clinical settings

Five further studies, including predominantly women in a diverse range of non-clinical settings, were identified.

A small RCT of mainly white participants found that delivery of a 3-week weight loss intervention through a television programme and self-help book, with and without assistance in finding an appropriate self-help group, led to a self-reported

weight loss of 5.4 kg and 4.2 kg, respectively at 3 months.[21] Only completers were included in the analysis therefore the extent of weight loss is likely to be an overestimate.

One CBA reported similar weight loss with a 12-week behavioural therapy programme delivered through interactive television and face to face by a trained behavioural therapist.[23] The participants were predominantly white women and the mean baseline BMI was 34.5 kg/m^2 and 35.4 kg/m^2, respectively, for the two groups. The mean weight loss was almost 8 kg in both groups. However, this is likely to be an overestimate as only participants who completed the programme were included in the analysis.

One small RCT found that a home-based exercise programme led to significantly greater weight loss than a group clinic-based exercise programme after 15 months.[19] Both groups received similar exercise prescriptions of walking 30-minutes per day, 5 days a week with a target maximal heart rate of 60–70%. They also both received a behavioural intervention of 2 hours, weekly group sessions for 6 months followed by fortnightly sessions for 6 months. After the first 6 months both groups had similar weight loss but after 15 months the home-based group had lost more weight (11.7 kg) than the clinic-based group (7 kg). There were more dropouts from the group intervention, although non-completers were included in the analysis.

Two very small RCTs were based in African American churches. One was conducted in three urban churches with women who were educated beyond high school.[20] After 15 weeks, the BMI was reduced by 1.4 kg/m^2 in those who received the intervention of weekly 1.5-hour sessions led by trained lay facilitators compared with an increase in BMI in the no intervention control group. The other compared low-intensity group-based and individual-based weight loss programme over 6 months.[22] However, it was not possible to fully assess quality due to poor reporting of the methods of randomisation, allocation to treatment group and blinding of outcome assessors.

No controlled studies of exercise prescription were identified.

14.3.2 Children

Little evidence was available on interventions to manage overweight and obesity in children in a non-clinical setting. The majority of studies identified were conducted in schools. In particular, there was a paucity of evidence on management of overweight children as most of the studies were of very obese children and on management of young school-age children and children in their late teens. Ten studies (all non-UK based), including seven RCTs, involving pre-teen to early teen children were identified. The range of settings used was limited. The interventions were diverse, although generally multi-component, with methodological limitations, short duration (length of follow-up ranging from 6 months to 2 years) and small. No controlled studies were identified that addressed exercise referral in children.

14.3.2.1 School-based interventions with family involvement

Four studies considered school-based interventions with family involvement, of which two diverse interventions reported some evidence for effectiveness. In one, a protein-sparing modified fast diet followed by a hypocaloric diet, together with weekly multi-component sessions resulted in greater weight loss than in a no intervention control group.[26] After 6 months, BMI in the intervention group had decreased by 3.8 kg/m^2 from a baseline of 30.9 kg/m^2. Weight in the control group remained static. The intervention was intensive and involved a paediatrician, a psychologist, a nutritionist, a physical education (PE) instructor and a nurse. The intervention in the second study was delivered by a PE teacher and incorporated 12 weekly meetings of 45 minutes involving aerobic exercise, education and self-monitoring and four group meetings for parents.[28] Weight was recorded every 3 weeks and children received a lottery ticket (for prizes such as bowling) for each 0.23 kg lost. The mean percentage overweight (which took into account height and age) decreased by almost 6% in the intervention group compared with an increase of over 2% in the no intervention control group after 12 weeks.

Two of the interventions did not appear to be effective. One small RCT of 12-year-olds from mixed ethnic groups with a mean BMI above 35 kg/m^2 investigated a nutrition and physical activity programme with and without a culturally sensitive programme.[27] After 12 months the BMI in both groups remained fairly static and the culturally sensitive training did not lead to greater weight loss. None of the participants dropped out of the programme. Following a multi-component intervention involving 8-year-olds with a mean BMI above 21 kg/m^2, there was only marginally less gain in BMI compared with a usual care comparison at 9 months.[29]

14.3.2.2 School-based interventions without specified family involvement

Three diverse studies considered school-based interventions without family involvement.

One small CBA of children aged 8 and 11 years assessed a multi-component intervention incorporating nutrition education, modified school lunches and increased physical activity. The intervention was targeted at all the children in the specified age range, with outcomes reported for an overweight subgroup.[24] The control schools continued with usual lunches and PE programmes. After 2 years, the intervention was not found to be more effective than the control at reducing BMI.

In a small CBA of obese children, incorporating regular visits with the school nurse was less effective than a more intensive intervention in a clinical setting, although there was weight loss in both groups. The relative weight loss was 16% for the latter and 7% for the former after 2 years.[25]

A small RCT, with methodological limitations, compared 9 months of lifestyle-focused PE classes (of no more than 14 children) with standard PE classes (of 35–40 students), among 12-year-olds in a US school.[30] Both groups had five, 45-minute classes every 2 weeks. The intervention emphasised lifestyle activities such as walking and cycling but not competitive games. Children did not change their clothes for the class to maximise the amount of exercise time and the

emphasis was on keeping moving rather than watching. The typical amount of movement time in the intervention group was 42 minutes compared with 25 minutes in the standard class. The mean BMI at baseline was 32 kg/m^2 and 30 kg/m^2, respectively. BMI remained fairly static over the 9 months in both groups (33 kg/m^2 and 30 kg/m^2 for the intervention and control groups, respectively). Although there was no statistically significant difference between groups in change in BMI, there was a greater decrease in body fat in the intervention group compared with the control group (4.1% and 1.9%, respectively) which was statistically significant.

14.3.2.3 Home setting

In one small RCT of African American 13-year-old girls who had a baseline BMI of above 35 kg/m^2 and at least one obese parent, participants were provided with a personal computer for the home and free internet access.[31] An educational website specifically for teenagers was compared with and without support involving behaviour modification material, regular contact with a case manager via email and access to a chat room. At 6 months the group receiving the more intensive intervention lost 0.24 kg/m^2 whereas the comparison group gained 0.71 kg/m^2. Non-completers were included in the analysis. The obese parents of the children receiving the more intensive intervention also had a greater reduction in BMI than the comparison group parents although there was no difference on other weight measures.

One small RCT, with methodological limitations, of 12–14-year-old African American girls compared interactive behaviour therapy plus nutrition education via the internet to education only.[32] Both groups also received four sessions of face-to-face therapy over a 12-week period. The baseline BMI was 35.3 kg/m^2 and 37.3 kg/m^2, respectively, with one obese parent also participating in the study. There was a statistically significant difference in weight loss between the groups: the intervention group had a small decrease in BMI (0.19 kg/m^2) compared with an increase in the control group of 0.65 kg/m^2. There was a similar finding for per cent body fat. Among the parents, the intervention group

lost more weight than the control group and this was statistically significant, though the extent of weight loss was very small (1.03 kg/m^2 and 0.06 kg/m^2, respectively). Participants had to be willing to pay US$300 towards the purchase of a computer, although US$700 was contributed from the researchers.

One small RCT, with methodological limitations, compared an intensive 2-year family-based behavioural intervention to a usual family/school life control group in China.[33] The children were 13-year-olds with a baseline BMI of 26 kg/m^2. The intervention involved targeting specific dietary and activity patterns for each child based on individualised assessments. A detailed diet plan was developed for each family and daily food intake for each of the children was recorded. Paediatricians visited the families on a monthly basis over the 2 years. After two years there was a similar increase in height in both groups. Mean weight in the intervention group remained fairly static (decrease of 0.3 kg) whereas it increased in the control group (5.5 kg) and this difference was statistically significant. The mean change in BMI was 2.6 kg/m^2 and 0.1 kg/m^2, respectively.

14.4 Dietary and activity outcomes

Although studies that only reported diet and physical activity outcomes were eligible for inclusion in this review, no additional studies were identified. Ten studies reported diet or physical outcomes (using mainly self-reported measures) in addition to weight outcomes. Where diet and activity outcomes were reported they did not contradict the findings from the weight outcomes.

14.4.1 Adults

14.4.1.1 Commercial weight loss programmes

Along with weight loss, one of the WeightWatchers studies reported exercise and diet outcomes.[2] In addition to the WeightWatchers group achieving greater weight loss than a usual care group, they also reported a greater level of physical activity and greater reduction in calorie intake at 12-week follow-up.

14.4.1.2 Interventions using computers

Five studies reported diet and activity outcomes in addition to weight loss.[12,13, 15, 16, 18] Although the group that received e-counselling in addition to a website intervention lost more weight, there was a statistically significant reduction in calorie intake at 1 year in both groups with no statistically significant change in energy expenditure in either group.[13] A six-month follow-up of the same intervention reported a statistically significant improvement in both groups for diet and physical activity outcomes,[12;15] but no between-group differences were found in self-reported eating restraint, disinhibition and hunger, following an internet and self-help manual weight loss intervention. Following a comparison of computer-assisted therapy with or without a diet using pre-packaged meals first, Taylor and coworkers[16] reported that the latter group exercised more than the former following the intervention, as well as having greater weight loss. Baseline levels of exercise were not reported for the two groups therefore it is unclear how meaningful these data are. Three-quarters of the participants dropped out of the fifth study.[18] Therefore, the diet outcomes are not meaningful.

14.4.1.3 Work-based setting

Two studies reported diet and physical activity outcomes in addition to weight loss.[5,11] In one there were no between-group differences on these measures. Perhaps unsurprisingly Pritchard and coworkers[5] found that the diet intervention group consumed fewer calories than an exercise group and a no intervention control group; the exercise group took more exercise than the other two groups.

14.4.1.4 Other non-clinical settings

Four studies reported diet and physical activity outcomes in addition to weight loss. In the church-based intervention, besides weight loss in the intervention group, there was a reduction in consumption of high fat food and an increase in positive eating behaviours. But there was no change in the amount of exercise compared with a no intervention control group.[20] Perri and coworkers[19] reported a greater amount of exercise in a home-based exercise intervention compared with a clinic-based exercise group as well as a greater reduction in consumption

of high-fat foods. Jason and coworkers[21] reported more frequent exercise and lower calorie consumption in the group that had greater weight loss following the intervention. As well as reporting that there was no difference in weight loss following an interactive television and face-to-face intervention, Harvey-Berino[23] reported no between-group differences in calorie and fat intake or calories expended through activity, though there were improvements in both groups on these measures following the intervention.

14.4.2 Children

No controlled studies were identified that addressed exercise referral in children. Two studies reported diet and physical outcomes in addition to weight measures. For one study that reported no improvement in weight outcomes, there was also no improvement in diet or physical activity outcomes.[27] In a study that reported greater weight loss with a more intensive intervention in a clinical setting than a school-based intervention, there was also greater improvement on dietary measures in the former.[25]

14.5 Maintenance of weight loss

No studies were identified that addressed weight maintenance in children. Among adults, some of the identified interventions with weight outcomes included strategies to maintain weight loss as part of a multi-component programme. However, there was insufficient evidence from these studies to identify strategies associated with maintenance of weight loss or continuation of improved behaviours. Only two RCTs were identified that compared the effectiveness of a multi-component weight maintenance programme accessed over the internet, with frequent in-person and minimal in-person support following a 6-month behavioural weight control programme.[35,36] (Although these are reported as entirely separate studies the later study might have included the participants reported in the earlier data as the study was conducted from 2000 to 2002.) Participants were predominantly college-educated women, who had their own internet access. Although the earlier study found that internet support was less

effective than the other two forms of support, the more recent, larger study found that participants in the internet maintenance group achieved similar weight loss compared with the two levels of in-person support.

Weight loss from baseline to the end of the maintenance period (18 months in total) was 4.7 kg for the internet support group compared with 3.9 kg and 4.2 kg for frequent and minimal in-person support, respectively.[36] Non completers were included in this analysis. The proportion of participants achieving at least a 5% weight loss was 62%, 46% and 49% for each of the groups, respectively. However, this particular analysis included only those participants who completed the programme. Therefore is likely to be an overestimate. The earlier study also reported the acceptability of treatment group assignment following randomisation. At 6 months a similar proportion of participants in the internet and frequent in-person support groups agreed or strongly agreed that they would prefer to be in the other group (35% and 36%, respectively). After 1 year 70% of the internet support participants said they would prefer to be in the frequent in-person support group whereas 40% of the latter group said they would prefer to be in the internet support group. However, in the absence of any further data, it is difficult to reach a firm conclusion about the meaning of this information.

14.6 Sub questions

14.6.1 Variation by gender, age, ethnicity, religious practices or social group

Among children, no studies were identified that compared outcomes for participants with different socio-demographic characteristics. No studies were identified targeting young children or older teenagers. Apart from two studies involving different ethnic groups, little information was available on the social or ethnic backgrounds of the children who participated in the studies.

Among adults, no data were identified which allowed consideration of effectiveness by age, social status or ethnicity. The majority of participants in studies were white and the mean age of participants in most of the studies was

between 40 and 50 years. One study of liquid meal replacement shakes reported outcomes separately for men and women and the weight loss trends were similar in both groups.[3] The commercial weight loss programmes and interventions based on the use of a computer were mainly assessed in women therefore it is not possible assess the effectiveness of these interventions in men. One study comparing WeightWatchers and a self-help programme reported that weight loss was similar in men and women. However, this appeared to be for both intervention groups combined and only a fifth of participants were men.[1]

14.6.2 Influence of previous weight loss

No evidence was identified.

14.6.3 Source and mode of delivery

There was considerable variation between interventions in children in terms of the intervention and the comparator which means it is not possible to assess the role of the source of delivery or mode of delivery.

There was also insufficient evidence available for adults to assess the importance of source of delivery. A volunteer-led weight loss programme was as effective as a professional-led programme in one study.[7] In another study there was evidence that successful weight management can be achieved with the community pharmacist as the point of contact for participants.[4] However, comparison was not made with other possible sources of delivery.

The importance of mode of delivery for interventions aimed at adults remains unclear. There was some evidence that the delivery medium was not important. Weight loss was similar across groups in two studies comparing an internet-based intervention with a face-to-face intervention.[14,17] However, in one of the studies the intensity and nature of the intervention varied as well as the medium. A maintenance study reported similar levels of weight loss at 18 months with internet support, intensive in-person support and minimal in-person support,[36] as well as a study comparing interactive television with standard

therapy.[23] A further study found that a self-help manual was more effective than a programme delivered across the internet.[15] However, there appeared to be differences between the two interventions other than the mode of delivery.

The data identified did not allow an assessment of what strategies are effective in engaging a broad range of organisations and encouraging partnerships. The studies did not address inter-agency or inter-professional partnerships.

14.6.4 Potential negative impact

It is unknown whether the interventions identified had any negative effects. While no evidence was identified that reported a negative impact of interventions aimed at children or adults the studies did not explicitly attempt to address the question of negative impact. One study in adults comparing a diet-only to an exercise intervention reported a greater lean mass loss in the diet group compared with the exercise group. However, this is likely to be related to using a single component intervention rather than the non-clinical setting per se.

14.7 Review limitations

In applying the criteria for setting, it became apparent that there was some overlap with the other reviews. Some studies had a comparator in a clinical setting or had a treatment phase in a clinical setting and a maintenance phase in a non-clinical setting. Although all the studies had at least one intervention conducted in a non-clinical setting, the actual setting was not the focus of the research in some studies. Although every attempt has been made to resolve the overlap in a consistent and systematic manner, there may still be some overlap.

The details provided about the participants included in some of the studies were often limited, so it is possible that some participants may have had other medical conditions.

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