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Appendix 10

THE EFFECTIVENESS OF BROADER COMMUNITY-BASED INTERVENTIONS TO PREVENT OBESITY

EVIDENCE SUMMARY TABLES

EVIDENCE TABLE 1: SUPERMARKETS AND SHOPS

- **Point of choice (point-of-purchase) prompts**
- **Educational videos**
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SUMMARY

Evidence of efficacy for weight management/reduction

No studies were found that reported weight outcomes.

Evidence of efficacy for diet/physical activity outcomes

Dietary outcomes

Point-of-purchase: Two good quality reviews with limited overlap (Roe 1997; Seymour 2004) concluded that informational point-of-purchase strategies in supermarkets can increase the purchase of targeted items. Both reviews looked at all types of research study. Seymour (2004) noted that the longer (2-year) multi-component studies showed the greater intervention effects but no data were provided. Roe (1997) noted that point-of-choice programmes supported by informational brochures and local promotion had a positive effect on sales of at least some items in two of the three good quality studies while the intervention was in place. The magnitude of the effect ranged from 1–2% of total market share of healthier food items. The third study showed no effect on sales.

Two randomised controlled trials (RCTs) of point-of-purchase interventions in supermarkets have been found to date (Kristal 1997; Steenhuis 2004). One found no decrease in total fat intake (Steenhuis 2004) and the other found no increase in fruit and vegetable consumption (Kristal 1997), although Kristal noted a borderline statistically significant 8.4% increase ($p < 0.07$) in the percentage of intervention store shoppers in the action or maintenance stage of dietary change. Unpicking to extract data from any other RCTs included in the systematic reviews was carried out. No RCTs were included and none of the studies appeared to meet the rapid review criteria of control group and 3-months follow-up.

Educational videos: Two studies of educational videos included in the systematic review by Roe (1997) resulted in a reduction in fat intake of purchases of 4–5% while the intervention and feedback were provided.

Computer-based intervention: An RCT to assess the direct and mediated impact of a self-administered, computer-based intervention on supermarket shoppers (Anderson 2001) found that the treatment group was more likely than the control group to attain goals for fat at the end of the intervention ($p < 0.001$) and follow-up ($p < 0.05$), although the low initial response and compliance rate suggest that these results could be from a motivated subgroup. There was a trend towards goal attainment for fibre and fruits and vegetables post-intervention ($p < 0.1$), but this was not significant.

All the interventions were in supermarkets and none of the studies was carried out in the UK. Most of the subjects in the three RCTs were women, as might be expected in this setting.

Physical activity

No studies were found that reported physical activity (PA) outcomes.

Evidence of corroboration in the UK

In terms of corroboration, nine UK-based corroborative studies were found, only two of which had a direct bearing on the point-of-purchase interventions summarised above.

Point-of-purchase

The study by Knox (2001) combined a cross-sectional survey and interviews to determine those factors most important for successful reduced-fat product development and to seek consumers' views on perceived barriers to reduced fat intake. 69.3% of consumers felt that nutritional information on food products was helpful. Those in lower socio-economic groups appeared more likely to find information on products more difficult to understand (p = 0.021), whilst those in higher socio-economic groupings appeared more likely to attribute confusion to conflicting dietary advice (p = 0.002). Confusing nutritional labelling information and conflicting dietary advice were barriers to making informed decisions. 59% of consumers were of the view that reduced fat foods were inferior in taste compared with full fat products, and over 90% considered taste to be the most important criteria in the selection of both meat and dairy products.

A qualitative study of 14 low-income middle-aged women (Dibsdall 2002) reported that while the women found media messages (from television [TV] and radio programmes, magazines or newspapers) surrounding healthier eating confusing they were aware of and agreed with the basic recommendations for a healthier diet. Participants reported good control of food availability and budgets but buying 'more' foods such as more fruits and vegetables was beyond their budgetary control. Irrespective of the healthiness of their diet, the participants displayed a basic lack of motivation to change eating behaviours.

Food deserts

Six publications addressed the specific issue of 'food deserts'. A before and after study (Wrigley 2003) and companion qualitative studies (Whelan 2002; Wrigley 2004) looking at the effect of the opening of a supermarket in a deprived, previously poor-retail-access community in Leeds, and a cross-sectional comparison of dietary intake vs. retail access in Newcastle upon Tyne (White 2004). Neither study provides evidence of a 'food desert' effect on dietary intake. In Newcastle the data did not demonstrate a relationship between most indicators of healthier eating and factors relating to the local retail environment. Knowledge and relative affluence were the key indicators. Individuals in the lowest socio-economic quintile were less aware of current healthy eating messages than those in the top quintile. Poor knowledge was consistently associated with less healthy eating, as well as with other measures of a less healthy lifestyle (e.g. low levels of PA and smoking) (White 2004). In Leeds, the affect of improved retail provision did not improve population intakes of fruit and vegetables although the group that switched to the new store increased their consumption by 0.23 portions per day (Wrigley 2003).

A potentially biased study in Northern Ireland (Furey 2001) found that 11% of consumers self-reported a concern regarding food poverty issues and the authors concluded that some non-car owners and lower income family units cannot achieve a healthy affordable diet. Another study carried out in England (Caraher 1998) found that one-third of women, compared with 7.7% of men, cited transport as a major factor limiting their choice of food. Cost rather than quality is the major issue for those in lower income brackets when deciding where to shop (Furey 2001; Whelan 2002). One study found, however, that this constraint applied to younger women only while older women tended to be less worried about the cost of food and more enthusiastic regarding buying foods that would be perceived as healthier (Whelan 2002). For the elderly, the main issues related to physical access constraints (Whelan 2002).

A very weak cross-sectional evaluation of a fruit and vegetable home delivery scheme found that 74% of participants reported eating more fruit and vegetables while on the scheme and 42% reported that they were eating more fruit and vegetables after than before the scheme (Ali 2001).

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EVIDENCE TABLE 1: SUPERMARKETS AND SHOPS

First author	Study design	Research type	Research quality	Study population	Research question and design (include power calculation if available)	Length of follow-up	Main results (include effect size(s)/confidence intervals for each outcome if available)	Confounders (potential sources of bias)/comments
Evidence of efficacy (internal validity) for weight maintenance/reduction								
Overall strength of evidence of efficacy for weight outcomes = no evidence found								
Evidence of efficacy (internal validity) for diet outcomes								
Point of choice/purchase prompts								
Seymour 2004	Systematic review	2	++	Literature search from 1970 to June 2003. Thirty-eight studies reviewed including ten grocery store interventions of which the authors regarded six as strong or very strong research designs, including one RCT; i.e. most studies graded research type 2.	**Aim:** All articles that included a nutrition intervention with an environmental or policy component conducted in an English-speaking industrialised country.	The studies varied in length from 1 week to 2 years.	The general conclusions of this wide-ranging review of point-of-purchase behaviour were that interventions in 'limited access' sites (i.e. where few other choices were available) had the greatest effect on sales of targeted (healthier) food choices. Eight interventions used only information strategies and, of these, five reported increased sales of targeted items. There was little evidence to suggest that any particular combination of information strategies was more successful than any other. The longer (2-year) multi-component informational studies showed the greatest intervention effects. The remaining two interventions used strategies of availability, access or incentives as well as information (Kristal 1997, see below and Curhan 1974). Curhan	None of the studies appeared to be in a UK setting. Although a good review the evidence tables lacked detail in terms of significance values and the quality assessment methods used.

							compared four interventions of which the most successful was increasing produce display space to 200% of original allocation; this significantly increased sales (from 28–59% depending on the type of produce).	
Roe 1997	Systematic review	1	++	Literature search to 1996. Seventy-six studies (37 RCTs, 29 cohort studies, nine uncontrolled before and after studies, one crossover study of three parallel interventions). **Supermarket settings:** One RCT, three controlled cohort studies judged to be of good quality, one RCT and one uncontrolled study judged to be moderate quality and two poor quality cohort studies, i.e. most studies graded research type 2. Seven studies were based in the USA and one in Canada.	To review health promotion interventions to promote healthy eating in the general population. Little information on who provided interventions. Information is provided for only two studies – one study delivered by the authors and the other by a dietitian.	Follow-up periods were minimal or non-existent. Six of eight studies assessed the impact immediately after the intervention while two studies followed-up outcomes 4 weeks post-intervention. No summary information for supermarket settings. Where assessed, effects generally only lasted as long as the intervention was in place.	Point-of-choice programmes supported by informational brochures and local promotion had a positive effect on sales of at least some low fat or 'healthier' items (items that aid reduction in fat intake and/or increased fibre, fruit and vegetable intake) in two of the three good quality studies while the intervention was in place. The magnitude of the effect ranged from 1–2% of total market share. The third study showed no effect on total sales of low fat or 'healthier' items (i.e. aid reduction in energy, fat and dietary cholesterol intake). (Good quality studies: Ernst 1986; Rodgers 1994; Levy 1995.) Two studies of educational videos (Winett 1988, 1991) resulted in a decrease in the fat content of purchases of 4–5% energy while the intervention and feedback were provided. The educational videos used various forms of modelling, goal-setting and feedback addressing nutrition education, personal control of diet, options for new purchases.	Good quality but relatively dated systematic review. No UK trials in supermarket settings.
Steenhuis 2004	RCT Cluster	1	+	2203 clients of 13 Dutch supermarkets.	**Aim:** To assess the effect of nutrition education with or without shelf	Six-month intervention with questionnaires	48% response to pre-questionnaire, 80% (of this 48%) responded to the 2-month and 83% to the 6-month post-	No allocation concealment. Self-reported fat intake by questionnaire. Intention

				Clients were 80% female, medium education, mean age 46 years, mean BMI 24.3 kg/m^2.	labelling on reduced fat intake. Supermarkets were randomised to: 1) no intervention (control); 2) education alone (posters, brochure, recipe cards, self-help manual etc.); 3) education with shelf-labelling of low-fat products. **Delivered by:** University researchers. No power calculation.	at 1 month pre- and 2 and 6 months post-intervention.	intervention questionnaires. No significant effects were found for the educational intervention, alone or with the labelling, compared with control, on total fat intake and the psychosocial determinants of eating less fat.	to treat (ITT) poorly addressed. All supermarkets followed up but variable questionnaire responses. Meets criteria for a **social marketing** intervention (see methodology).
Kristal 1997	RCT Cluster	1	+	Eight supermarkets in Iowa, USA. No demographic differences between stores. 84% of respondents were women, even age distribution, 18 to ≥65 years old, 28% considered themselves 'farm families'.	**Aim:** To evaluate whether a supermarket point-of-purchase intervention could increase shoppers' consumption of fruit and vegetables. Four stores were randomised to an educational intervention (flyers, signs, recipes, coupons, food demos, store staff dressed as vegetables) and four to control. **Delivered by:** Probably a	Eight-month intervention and 1-year follow-up (i.e. 4 months post-intervention).	**Overall response rates to exit interviews:** 59.8% in intervention (I) and 67.2% in control (C) stores, and similar at baseline and follow-up. Response rates to take home survey 74.5% (I), 72.3% (C) at baseline and 77.5% (I & C) at follow-up. Compared with change in control shoppers, the percentage of intervention store shoppers in the action or maintenance stage of dietary change increased by 8.4% but this was non significant ($p < 0.07$), and there was no corresponding increase in fruit and vegetable consumption.	No allocation concealment. No ITT analysis. Not included in the review by Matson–Koffman (reason unknown – may have been excluded by the authors or missed by the search strategy).

					combination of higher education research and supermarket employees. No power calculation.			
Computerised intervention								
Anderson 2001	RCT individual	1	+	USA supermarkets, probably Virginia but not stated. Participants were 96% female, 92% White, mean income of US$35,000 and mean education of 14.8 ± 2.1 years. Participants (self-selected) were recruited in five supermarkets during face-to-face contact followed by a mail-back of enrolment materials. An expression of interest was acknowledged when a shopper returned at least some part of the enrolment packet.	**Aim:** To explore the extent to which treatment effects were mediated by social cognitive variables using measures of self-efficacy (for buying, preparing, eating and serving lower fat and higher fibre foods and more fruits and vegetables) and outcome expectations shown to explain nutrition behaviour among food shoppers).* Based on a self-administered, computer-based intervention on nutrition behaviour in supermarket food shoppers. Individuals randomised to tailored information and regulation strategies delivered in 15 brief weekly segments, or control.	15-week intervention plus 6-months follow-up.	795 expressed interest and 363 recruited. At end of intervention all controls and 87% intervention group completed questionnaires. At follow-up 62% control and 49% intervention provided full questionnaire and receipt data. The treatment group was more likely than the control group to attain goals (i.e. personalised nutritional goals set during the intervention) for reducing fat intake at the end of the intervention ($p < 0.001$) and at 6-month follow-up ($p < 0.05$). There was a trend towards goal attainment for increasing fibre and fruit and vegetables intake post-intervention ($p < 0.1$) but this was not significant.	Nutrition for Life (NFL) computerised intervention. No allocation concealment. No ITT. Subjects were highly motivated. Participants received US$10 for completing enrolment forms, US$10 for baseline, US$15 for post-test food frequency questionnaires (FFQs) and Food Beliefs Surveys and US$20 for follow-up FFQs. Participants also received US$5 per week for returning annotated food shopping receipts during baseline, US$7 per week during the intervention and US$10 per week during follow-up. *Social cognitive theory suggests nutrition goal-setting and self-regulation may directly improve participants'

					Delivered by: Higher education researchers and supermarket employees delivered intervention. Computerised element self-delivered. No power calculation.			nutrition-related behaviour.

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Evidence of corroboration (external validity)								
Evidence of salience – Is it appropriate for the UK?								
First author	**Study design**	**Research type**	**Research quality**	**Study population**	**Research question and design**	**Length of follow-up**	**Main results**	**Confounders /comments**
Evidence for implementation – Will it work in the UK?								
First author	**Study design**	**Research type**	**Research quality**	**Study population**	**Research question and design**	**Length of follow-up**	**Main results**	**Confounders /comments**
Point of choice/purchase								
Knox 2001	Cross-sectional survey and qualitative interviews	3	+	**Product development personnel:** Qualitative interviews (*n* = 47) with key food product development personnel from 27 food companies throughout Northern Ireland and England. **Consumers:** Qualitative interviews (*n* = 90) followed by survey (*n* = 1004) of customers in retail	**Aim:** 1) To determine those factors most important for successful reduced fat product development; and 2) to gain insight into the consumer view of reduced fat foods and to determine barriers to the uptake of reduced fat foods from the consumer	N/a Cross-sectional plus interviews.	**Consumer qualitative:** Ninety-six approached, 90 interviewed (60 in Northern Ireland and 30 in England) in store and 68 (75.5%) returned for a debriefing interview on exiting the store. **Consumer survey:** More than 3000 people approached, 2148 refused to participate (32.8% response rate). **Qualitative:** Uptake or rejection of reduced fat	Sample characteristics for the key food product development personnel and details of interviews not provided Low response rate to questionnaire. Largely female

				outlets in Northern Ireland and England. **Qualitative sample:** 90% female, age distribution slightly skewed towards the 40s. **Survey sample:** 77.5% female, age was normally distributed. **Qualitative:** 34.4% housewives or retired. **Survey:** Sample slightly biased towards the lower middle class and upper working class. 64.8% held GCEs or about with a large proportion holding no formal qualification (20.6%).	perspective Product development personnel described their experiences to provide insight into problems encountered re development, launch and marketing of reduced fat products.* **Consumer qualitative:** 10–15 min interview re food choices. **Survey tool:** Dietary views and attitudes. Participants were interviewed prior to commencing shopping and were asked upon leaving the store if they thought the interview had influenced their purchases and were requested to provide the researcher with a copy of their till receipt (i.e. interviewed before		foods influenced by health concerns, 'goodness of fit' with dietary health strategies, particularly weight reduction, perceived inferior sensory attributes of the products and scepticism towards reduced fat foods and fat claims. Although none of those who said they were influenced by the interview had bought reduced fat products, 5% of respondents said they had thought more about their purchases as a result of the interview. 66% of those re-interviewed on leaving the store believed that the interview would not influence subsequent purchases. **Survey:** 69.3% of respondents felt that nutritional information on food products was helpful. Lower socio-economic groups appeared more likely to find information difficult to understand (p = 0.021), whilst those in higher economic groupings were significantly more likely to attribute confusion to conflicting dietary advice (p = 0.002). Reported barriers to uptake of reduced-fat food products – confusing nutritional labelling information and conflicting dietary advice makes it difficult to make informed decisions. Authors commented that participants were sceptical of advice offered and	sample and likely to be motivated. Compliance for consumer qualitative interviews was high (94%) although the sample consisted of 81 females and nine males. Compliance for the consumer survey was very low at 33%. *Qualitative interviews with product development available but not considered of relevance to this review.

					bought groceries). **Delivered by:** Higher education researchers probably. No power calculation.		claims made for reduced fat foods. 59% indicated that reduced-fat foods were inferior in taste and over 90% felt that taste was the most important criteria in selecting meat and dairy products. Those reporting barriers more likely to be male, young, sceptical to products and claims, report lack of will power and concerns on expense. Uptake associated with being female, older, belief that reduced fat products are healthier, concern about health and body weight, and adopting a dietary health strategy).	
Dibsdal l 2002	Qualitative	3	+	Fourteen middle-aged women from a low-income Housing Association in Norwich. Women had a mean age of 51.3 years, all had some profession other than housewife although only seven were in full-time, low-paid employment.	To provide an in-depth account of the beliefs and experiences pertaining to food and health from a specific group of low-income women. Letters were sent to residents inviting them to take part in a health study. Individual semi-structured 50 min interviews were conducted by one researcher. Long-term health (particularly cancer) and healthy eating, (particularly fruit	Interviews between July and September 2000 No follow-up.	Women reported being confused by messages surrounding healthy eating. However, participants were aware of and agreed with the basic recommendations for a healthier diet, high in fruits and vegetables and low in fats, sugars, and salts. 'Fresh', 'natural' and 'organic foods' were seen as healthier, whereas processed food and foods containing chemical additives were perceived as less healthy, even possible causes of cancer. Participants reported good control of food availability and budgets, but that purchasing organic foods and buying 'more' foods such as more fruits and vegetables was beyond their budgetary control. Irrespective of the healthiness of their diet, the participants displayed a basic lack of motivation to change eating	Small sample size and low response rate to invitations to participate (9%) may have led to the possibility of selection biases. NB. Authors state that they expected the low response rate from the letters inviting study participation 'given the commitment required from respondents,

					and vegetable consumption), were explored. Audiotaped interviews were transcribed verbatim, coded and analysed by two people and themes were identified for each interview. **Delivered by:** Higher education researchers. No power calculation.		behaviours.	the lack of incentive and the knowledge that individuals from low income groups in the UK generally refuse such invitations'.
Food deserts								
Wrigley 2003	Before and after study	2	+	Local authority housing estate area of Leeds (Seacroft) – within the top 5% most deprived wards in England. Essentially a low-income, compoundly deprived, White area. **Respondents at baseline:** 82% female. 9% 17–24 years and 22% ≥65 years. 20% in full time work, 24.7% employed at home, 5.5% unemployed. 72.5% GCSE or below. 16.5% income of <£5000 per annum, 13% >£20,000 and 17.5% refused information. Household	**Aim:** To assess the impact of a retail provision intervention (the opening of a retail centre including a Tesco store in the locality) on food consumption patterns, and by extension diet-related health, in a deprived, previously poor-retail-access community. Two waves of study in June/July 2000 (before, approximately	Before and after study.	Of 3000 households contacted, 1009 respondents completed the 'before' wave of the survey (34%) and 615 completed the 'after' wave (21%, or 61% of the baseline respondents). Of respondents completing both waves, 45% switched to the new store, claiming ease of access and convenience. Those who didn't switch were concerned about the expense of the store (28%) and its large size and layout (21%). Across the 615 respondents who completed both waves, mean consumption of fruit and vegetables increased insignificantly by 0.4 portions per day (from 2.88 to 2.92). The group that switched to the new store (*n* = 276) increased their	Survey was pre-tested. Power calculation used although detail unclear. Attempts to get representative sample were made. Links with Whelan 2002 . Authors confirmed (3 June 2005) that 'the bias introduced as a result of the attrition (between

				deprivation score: 0, (least deprived) 25.5%; 1, 29.4%; 2, 30.2%; 3, 11.9%; 4 (most deprived), 1.5%.	5 months before the opening of the new store) and in June/July 2001 (after, 7–8 months beyond the opening of the new store). Seven-day food-consumption diary, plus interviewer-administered household questionnaire. **Delivered by:** Fieldwork by market research team and survey designed by university researchers, market research team and J. Sainsbury. Power calculation used but statistical power not stated.		consumption by 0.23 (2.66 to 2.89; p = 0.034) portions per day compared with those who did not switch (n = 339) (–0.13; 3.07 to 2.94, p = 0.178).	waves 1 and 2 which they checked very carefully) was fairly minimal'.
Whelan 2002	Qualitative	3	++	Residents in the Seacroft area of Leeds, a 'food desert' prior to a major improvement in food retail accessibility. Thirty-three women and two men aged 18–40 years. Area mainly deprived housing estates with a 'smattering' of private housing.	**Aim:** To explore individual food shopping behaviour, consumption patterns and attitudes towards a healthy diet. Five focus groups (between five and ten members)	N/a. Focus groups.	Recruitment rate unknown. Younger women, especially those with low incomes, were more concerned about cost rather than the quality of the food bought. This often led to foods being bought exclusively in budget stores, which may have imposed important constraints on what was available to purchase. When asked 'What influenced the foods they bought', older women tended	Recruitment and complete details of sampling frame not reported. Links with Wrigley 2003 . The focus groups were not composed

					sampled opportunistically. **Delivered by:** Higher education researchers. No power calculation.		to be less worried about the cost of food and more enthusiastic regarding buying foods that would be perceived as healthier. For the elderly, the main issues related to physical access constraints.	of members of the main Seacroft sample. Author confirmed 5 July 2005.
Wrigley 2004	Qualitative	3	++	Residents in the highly deprived Seacroft area of Leeds. Recruitment was conducted by experienced fieldworkers and five of eight groups consisted of residents who had switched their main food shopping source in the post-intervention period to the new store. Forty-nine participants comprised eight focus groups in age gradients 17–34 years (*n* = 4), 35–54 years (*n* = 2), >45 years (*n* = 1) and >55 years (*n* = 1). Focus groups were predominantly composed of socio-economic group D/E. Focus groups were conducted in September 2002 (a little over 1 year on from the main post-intervention household-questionnaire surveys and 1 year 10 months	**Aim:** To explore the impact of increased physical access to full-range retailing in the area, assess the views of the residents who had switched their main food sources as a result of the intervention compared with those who had not and to investigate the perceptions of the impact of the intervention on food consumption habits and their potential to eat a more healthy diet. **Delivered by:** Higher education researchers. No power calculation.	N/a. Focus groups.	77% of those recruited attended with the exception of groups 1 and 2. Walking to the 'main' food source, with its associated flexibility and cost-savings, had become a viable option for the majority of focus group participants and physical access coping strategies had significantly altered. However, economic access constraints (with the exception of certain direct reductions in the transport costs of food shopping) had for many remained fundamentally unaltered. Overall, there was little evidence (if any) from the focus groups concerning the impact of the new store on the potential of participants to eat a more healthy diet. What evidence there was suggested that a minority of participants were using the transport cost savings associated with improved access to full-range food retail provision to buy fresh food.	Focus groups 1 and 2 (younger switchers) where nine individuals had been recruited for each group only four and three respectively attended. Total number recruited unclear. Participants give small monetary incentive to attend the focus groups. Focus group residents not drawn from the main Seacroft sample (author confirmed 6 July 2005).

				from the opening of the new store) at a variety of venues in the vicinity of the intervention store and lasted approximately 75–90 min. Groups were moderated by a qualitative researcher. Each session was audio taped, transcribed and analysed by the moderator using standard content analysis.				
White 2004	Cross-sectional survey	3	++	Representative sample of households and individuals in Newcastle upon Tyne and all retail outlets selling food, as well as data on access to retail outlets and socio-economic data. Retail outlets were surveyed to get details on type, size and opening hours plus the range, cost and quality of 33 commonly eaten food items. Surveyed sample were >16 years old, 59% women, 95% White European and 37% in full-time employment. The sample of households was slightly biased towards higher socio-economic status,	**Aim:** To determine the relationship between dietary intake and socio-economic factors at individual, household and neighbourhood levels and retail access to a 'healthy' and affordable diet, to determine if food 'deserts' exist and, if so, to describe their characteristics. Food Standards Agency report. **Delivered by:** Higher education researchers. No power calculation.	N/a. Cross-sectional survey with multi-level modelling.	5044 individuals (of 6162, 83% response rate) in 3153 households (of 17801 contacted – 18% response rate) completed the main surveys. 560 retail outlets (of 658 approached, 85% response) were surveyed. Individuals in the lowest socio-economic quintile were less aware of current healthy eating messages than those in the top quintile. Poor knowledge was consistently associated with less healthy eating, as well as with other measures of a less healthy lifestyle (e.g. low levels of PA and smoking). The availability of the full range of foods, the 'healthy' and the 'unhealthy' baskets was not socio-economically patterned by area and there were no significant cost variations. The data did not demonstrate a relationship between most indicators of healthier eating and	Unknown if questionnaire validated but otherwise a good study. Low household response rate indicates selection bias toward those of higher socio-economic status.

				and of individuals to older age groups and women, compared with the Newcastle population as a whole. An initial random sample of 11,266 private households was selected using the Post Office's Postcode Address File (PAF). Each selected household was sent a questionnaire pack, addressed to the householder and a pre-paid envelope. The main food shopper was asked to complete the questionnaire. As a result of a poorer than anticipated response rate a further sample of 6535 households was selected using the same procedure 3 months later. Respondents were asked if they and other household members were willing to take part in the individual survey. Those who agreed were added to the Phase 2 study sample list and sent an individual questionnaire.			factors relating to the local retail environment. The authors concluded that key predictors of healthy eating are primarily dietary knowledge, relative affluence and a 'healthy' lifestyle, so it seems unlikely that those people whose diet is 'less healthy' than desirable would eat more healthily if supplied with improved retail provision.	
Furey 2001	Range of qualitative/ quantitative methods	3	+	A range of research methodologies were employed in locations throughout Northern	**Aim:** To identify possible locations of food deserts in Northern	N/a	The authors concluded that certain user groups in Northern Ireland (non-car owners and lower-income family units) cannot	A good range of research methods were used and

				Ireland. Of the (stratified random sample of) food shoppers interviewed half were from rural and half from urban locations. 77% were female and the majority were aged ≥65 years. The social class status was skewed towards the lower socio-economic classes because the fieldwork was largely conducted in housing estates and 51% fell into the unemployed, casual worker, housewife or retired groups with only 12% professing themselves as social class A or B.	Ireland, quantify their characteristics, establish which consumer groups are affected and make recommendations to negate the effects of food deserts. Quantitative methods included a consumer questionnaire, comparative shopping exercises, and shopping diaries. Qualitative methods included consumer focus groups and interviews with retail managers. **Delivered by:** Higher education researchers. No power calculation.		achieve an affordable, healthy diet – possibly to the detriment of their health status. 11% of Northern Ireland consumers self-reported a real concern regarding food poverty issues, suggesting simultaneous financial constraints on food choice as well as the market-inflicted physical access difficulties. 82% noticed how their seemed to be fewer food stores than previously, while two thirds argued the town centre food store was more convenient than the edge of town.	combined. Little detail of study questions was provided, nor was there a discussion of the researchers' viewpoint or potential limitations of the study. Potential for bias cannot be ruled out.
Carahe r 1998	Cross-sectional survey	3	+	The Health Education Authority's (HEA) 1993 Health and Lifestyles survey. 5553 interviews with 16–74-year-olds at a random sample of addresses in England, stratified by NHS region.	Corroborative evidence to look at the issues of access to food and the influences people face when shopping for a healthy food	N/a	9% of social group I and II respondents report no concern with what they eat compared with 24.9% in class III manual and 21.2% in classes IV and V. A higher proportion of individuals in the lower income brackets (11% lowest vs. 7% highest income	Results were weighted as far as possible to allow for potential bias due to the policy of interviewing

				The Registrar General's six-group social class classification was used.	basket. No power calculation. **Delivered by:** Data from the HEA survey carried out by Market & Opinion Research International (MORI).		bracket) and people aged ≥55 years use local shops (10.5 vs. 7.9% 35–54-year-olds). The major issue for those in the lowest income bracket in deciding where to shop is cost (47.3%) whereas speed and convenience is the key issue for the highest income groups (69.4% of the highest income group). The quality of food and the range of healthy foods were cited by less than 10% of respondents as factors in deciding where to shop. 12.7% of men compared with 5.4% women cited not knowing how to cook as a restriction on their choice of food. When asked about factors they felt limited their choice of food, a third of women compared with 7.7% of men cited transport as a factor.	only one person per household and to compensate for the under-representation of certain age groups. Self-reported data.
Fruit and vegetable delivery scheme								
Ali 2001	Cross-sectional survey	3	+	Two London estates. Fifty-one households ('51 individual members'), recruitment details not reported. 66% respondents were aged between 25 and 59 years, 16% male, 39% in work (full or part time). 24% White, White British, or English. 18% Black African, 10% Caribbean/Black, Afro-Caribbean/Caribbean 47% on state benefits.	**Aim:** To explore whether fruit and vegetable delivery schemes met a need on the estates and to see what lessons could be learned to help future projects. Survey with qualitative and quantitative sections to evaluate two 6-week pilot fruit and vegetable delivery schemes. Survey	N/a. Cross-sectional	Fifty-one households completed information about circumstances survey, 75% (*n* = 38) completed the views and experiences survey. 74% of people who filled in survey questionnaires said they ate more fruit and vegetables while on the scheme. 42% of people of filled in survey questionnaires said that they were eating more fruit and vegetables after than before the scheme. 45% of people who filled in the	Data analysis may not be rigorous. Some conclusions drawn through use of additional unreported data. Self-reported fruit and vegetable intake.

					conducted after the pilot scheme (time difference not reported). **Delivered by:** Evaluation group led by the project worker and a Health First researcher. No power calculation.		questionnaire listed convenience/ease of access to fruit and vegetables as a benefit. 97% said they would use a new scheme if it was set up.	

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EVIDENCE TABLE 2: RESTAURANTS AND CAFÉS

- **Point-of-purchase prompts**
- **Non promotional information**
- **Price changes**
- **Manipulation of nutrient content/increased availability of nutritious foods**

Note: Overlap with workplace and school interventions in systematic reviews.

SUMMARY

Evidence of efficacy for weight management/reduction
No studies were found that reported weight outcomes.

Evidence of efficacy for diet/physical activity outcomes
Dietary outcomes

Point-of-purchase: Four systematic reviews were found. They looked at all types of research study, 28 primary studies in all, and had limited overlap. Two were good quality (Roe 1997; Seymour 2004) and two much lower quality (Holdsworth 1998; Matson-Koffman 2005). All the reviews concluded that informational point-of-purchase or choice strategies increased the consumption of targeted items. Seymour (2004) reported that most of the restaurant studies reported some significant increased sales of targeted menu items but no data were provided. Roe (1997) concluded that point of choice promotions led to an increase in sales of promoted items by 2–12% total market share but the effect generally only lasted as long as the intervention was in place. Since the reviews lacked detailed information, unpicking was carried out. Of the 28 primary studies, none met the rapid review inclusion criteria (a control group and at least 3-months follow-up).

A single RCT was found that was not included in any of the reviews and was carried out in the UK (Stubenitsky 2000). This found that provision of an acceptable lower fat, lower energy main course dish in a restaurant setting had a direct effect on fat and energy intake, was not compensated for in other components of the meal and was not affected by consumer knowledge of the 'lower fat' nature of the dish (through menu text). For the group choosing the target dish who were served the full fat version, their total energy and fat intakes during the meal was increased compared with those served the lower fat option [$F(3,80) = 5.27$, $p = 0.0002$ and $F(3,80+13.82$, $p \leq 0.0001$].

Physical activity
No studies were found that reported PA outcomes.

Evidence of corroboration in the UK:
Five UK corroborative studies were found of relevance to eating out.

In a cross-sectional survey of 14-year-olds in London (Watt 1996) the most frequently cited factor perceived as being helpful to promote future changes in general eating habits was strong will power (83.3%). Other important factors included wider availability of healthy foods (67.3%), support from family (66.7%), advice from doctors (58.2%), cheaper healthy foods (53.3%) and better food labelling (50.0%). Between the social classes, a difference emerged for friends' support, information

booklets, wider availability of healthy foods, costs of healthy foods and own will power, with these being considered more helpful by individuals from non-manual households ($p < 0.05$). A companion qualitative study (Watt 1997) found that 'healthy foods' were considered to be largely irrelevant, unappealing and expensive by most young people interviewed, and not readily available outside their own homes. In contrast 'fast foods' were considered part of their independent lives, commonly eaten with friends, associated with enjoyment and relaxation, ready available, appealing and inexpensive. Parental disapproval appeared to be part of their appeal.

From a questionnaire study of public eating places (Warm 1997) reported that Heartbeat Awards (HBA) premises compared with controls were more likely to report that they offered what they perceived as a healthy dish ($p < 0.001$) and they also recorded an increase in purchases of brown rice ($p < 0.001$) and more low-fat spreads ($p < 0.05$,for public eating places). The data were self-reported and there is potential for bias. Another study of HBA public eating premises (Holdsworth 1997) found that the main influences were quality of food (72.2%), affordable prices (60%), good service (53.3%), variety of choice (48.5%) and location (42%). The availability of healthy food choices (30%) was least often selected, but nearly twice as many women (34%) as men (17.2%) said that this influenced their choice of eating-place ($p = 0.014$). Availability of healthy food choices was more important to those aged ≥45 years (40.5 vs. 25.5% of ≤45-year-olds; $p = 0.016$).

A qualitative study of community cafés in Glasgow (Simons 2004) made the following recommendations for increasing healthy choice sales: the need for a strong lead to provide coordination and support; café staff should be actively involved, trained and supported; promotion to be encouraged and best practice shared between cafes; healthy options to be competitively priced and to include 'special offer' incentives.

EVIDENCE TABLE 2: RESTAURANTS AND CAFÉS

First author	Study design	Research type	Research quality	Study population	Research question and design (include power calculation if available)	Length of follow-up	Main results (include effect size(s)/confidence intervals for each outcome if available)	Confounders (potential sources of bias)/comments
Evidence of efficacy (internal validity) for weight maintenance/reduction								
No evidence found.								
Evidence of efficacy (internal validity) for diet outcomes								
Seymour 2004	Systematic review	2	++	Literature search from 1970 to June 2003. Thirty-eight studies reviewed including five restaurant interventions, only one with a strong research design but no RCTs.	**Aim:** All articles that included a nutrition intervention with an environmental or policy component conducted in an English-speaking industrialised country.	The studies varied in length from 4 weeks to 1 year	The general conclusions of this wide-ranging review of point-of-purchase behaviour were that interventions in 'limited access' sites (i.e. where few other choices were available) had the greatest effect on food choices. The authors reported that most of the restaurant studies reported some significant increased sales of targeted menu items. Not enough information was provided to assess the exact number with significant positive results. All used some form of information strategy (such as symbols or labels to promote low fat items) and, overall, providing information in the restaurant setting appeared to be associated with increased purchase of targeted items, suggesting that the specific strategies were not as important as the act of intervening.	None of the studies appeared to be in a UK setting. Although a good review the evidence tables lacked detail in terms of significance values and the quality assessment methods used.
Roe 1997	Systematic review	2	++	Literature search to 1996. **Catering settings:** Fifteen studies (one RCT, eight	To review health promotion interventions to promote healthy eating in the general population.	Range of timescales. Two weeks to 6 months in catering settings.	Point of choice promotions used in five of fifteen studies and all four of the restaurant studies, used signs to encourage selection, backed up with written educational and promotional	Good quality but relatively dated systematic review. No UK trials in restaurant settings. The

				uncontrolled before and after studies, five cohort studies, one crossover study of three parallel interventions) in all including community, school and work outlets (three judged to be of good quality) but only four in public restaurants (none judged to be good quality) – i.e. most studies graded type 2.	Information on who delivered the interventions not provided.		materials such as posters, information boards, fliers and table tents (nb: assumed that table tents are three-dimensional table displays). These led to an increase in sales of promoted items by 2–12% but the effect generally only lasted as long as the intervention was in place.	restaurant studies were all assessed as moderate quality (three uncontrolled studies and one crossover study) – i.e. no restaurant RCTs. **Restaurant studies:** Mayer 1986 Colby 1987 Wagner 1988 Albright 1990 **University studies:** David-Chervin 1985 Meiselman 1994 (study 1) Meiselman 1994 (study 2)
Matson-Koffman 2005]	Systematic review	2	+	1970 – October 2003 (more comprehensive search from 1990). Sixty-five pre-1990 and 64 in 1990 or later intervention studies of all research types (authors report as 26 experimental studies, 51 quasi-experimental studies and 50 non-experimental studies). Of the nutrition studies, 33 looked at the availability of nutritious foods and	To review the literature to determine whether policy and environmental interventions can increase people's PA or improve their nutrition. Studies published pre-1990 are only briefly summarised. Study designs for individual studies are not reported and are referred to as 'large scale trials'.	Not stated for pre-1990 studies. Follow-up periods for studies published between 1990 and 2003 ranged from 4 weeks to 10 years to three years for post-1990 studies.	From this narrative review (with some data on post-1990 but no data provided on pre-1990 studies) the authors made the following recommendations: • Use point-of-purchase strategies, including menu and shelf labelling, to increase purchases and consumption of healthier foods. • Promote policies and environmental supports that increase supply and access to healthier foods and beverages in vending machines, restaurants and cafeterias, including more fruits and	Supermarket and restaurant studies were combined (see also Evidence Table 1). Recent but confusing review of varied study types and outcomes. No unpublished studies included. Study quality assessed but doesn't appear to have been taken into account in the summary. The analysis of results was different for pre and post-1990 studies. Follow-up periods have not been reported for all of the studies

				29 at point-of-purchase strategies in supermarkets and restaurants. Studies pre-1990 only briefly summarised. Study designs of individual studies not reported and referred to as 'large scale trials'. None of the restaurant studies were RCTs. For post-1990 studies, 48 were conducted in the USA, three UK, three Australia, two Canada, one Sweden, one Finland, one Switzerland, and two not reported.			vegetables and reasonably priced, good tasting, heart healthy items with lower fat and sugar content.	No post-1990 UK studies. Pre-1990 unknown. PA data not extracted as better review.
Holds worth, 1998	Systematic review	2	+	Literature search date unknown. Twenty-one nutrition labelling schemes at the point-of-purchase published between 1978 and 1993 (13 pre-1990 and eight 1990 or later). Of the 21 studies six (three prescriptive, two descriptive and one prescriptive replaced by a	To review point-of-choice nutrition labelling schemes in catering establishments to describe the variety of schemes and determine the characteristics of effective interventions, including both descriptive and prescriptive labelling.	Range of timescales. Eight weeks to 12 months in public eating places and 4 weeks to 16 months in universities.	Most of the studies reviewed demonstrated some positive short-terms benefits from schemes although it is unclear which is the most effective labelling format, i.e. labelling of healthier food choices or providing nutrient information.	Literature search dates have not been reported. Varied study types and outcomes. No details of the methods used for quality appraisal. Number of papers identified and methods of the selection process not reported. Many of the interventions were of short duration, had short-term follow-up

				consumer driven scheme) were conducted in public eating places and four (descriptive labelling) in university settings. None of the restaurant studies were RCTs.				periods and few had a control group. The majority of the schemes were from the USA. **Public eating places:** Scott 1979 Dubbert 1984 Wagner 1988 Albright 1990 Heartbeat Award Scheme 1990 Green 1993
Stubenitsky 2000	RCT	1	+	279 members of the public booking a meal at a restaurant during the week in which the study was being held. Mixed age group but majority 'somewhat older than average age' – 11.6% ≤34 years old, 22.8% 35–49 years old, 25% 50–64 years old, 40.6% ≥65 years old. Silver service training restaurant at a City College Hotel School in Norwich. Actually refers to	To examine the influences of nutritional information and consumer characteristics on meal quality expectations, food selection and subsequent macronutrient intakes of consumers offered a reduced-fat option in a restaurant. Subjects seated in different parts of the restaurant were presented with menus differing only in printed information accompanying one target dish – smoked haddock with Welsh rarebit. Four groups:	Questionnaires handed out after ordering and before meal was served; repeated after meal was finished with modified wording relating to actual perception of meal just eaten; and final questionnaire re attitudes and beliefs towards eating 'healthy eating' options in a catering environment, 'completed following the entire meal'.	Subjects in the older age group differed in absolute terms from those in younger groups but this did not significantly influence the direction of any of the outcome measures. Menu information had no effect on total energy and fat intake among the three groups receiving the RF (reduced fat) target dish The proportion of subjects choosing alternative options was not influenced by the presence of information on the menu ($p \geq 0.05$). For the FFB group choosing the target dish, their total energy and grams of fat intake was increased compared with those served the lower fat option [$F(3,80) = 5.27$, $p = 0.0002$ and $F(3,80) = 13.82$, $p \leq 0.0001$]. No consistent pattern in	No allocation concealment. ITT analysis used. Subjects in this study tended to be older than average, which might have some influence on results although direction of outcome measures was the same in all age groups. Most of the subjects were regular visitors to this restaurant, hence uniformly high pre-meal expectations based on prior experience. Nutritional calculations were based on amount and type of food served, as practical considerations meant leftovers could not be

				two separate weeks in June and October 1996 but results appear to have been aggregated between the two as no distinction is made.	1) Full-fat blind (FFB) – no additional information, full-fat food served. 2) Reduced-fat blind (RFB) – no additional information, reduced-fat food served. 3) Reduced-fat informed (RFI) – 'this is a lower fat option' – reduced-fat food served. 4) Reduced-fat informed with details (RFID) – 'This lower fat option is prepared with reduced-fat cheese and skimmed milk' – reduced-fat version served. **Delivered by:** Training school. No power calculation.		differences between pre-meal (expectation) ratings and post-meal (actual) ratings between the four groups. FFB group had significantly lower expected liking, taste and texture rating than the other three groups [$F(3,80) = 3.98$, $F(3,80) = 6.52$ and $F(3,80) = 3.9$; all $p < 0.05$]. Did not find differences in overall meal fat and energy intake of subjects informed versus not informed of their main course dish (RFI vs. RFB). Provision of menu information did not have a significant effect on pre-meal expectation ratings. Provision of an acceptable lower fat, lower energy main course dish in a restaurant setting had a direct effect on fat and energy intake, which was not compensated for in other components of the meal, and was not affected by consumer knowledge of the 'lower fat' nature of the dish (through menu text). Measures of meal expectations, actual acceptance and perceived matching of expectations were also not affected by this information.	measured. Accuracy of actual intake data would have been enhanced by this but effect would be expected to be small compared with that observed for meal composition. Unclear whether questionnaires were validated. Self-reported behaviour.

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Evidence of corroboration (external validity)								
Evidence of salience – Is it appropriate for the UK?								
First author	**Study design**	**Research type**	**Research quality**	**Study population**	**Research question and design**	**Length of follow-up**	**Main results**	**Confounders/ Comments**

Evidence for implementation – Will it work in the UK?								
First author	**Study design**	**Research type**	**Research quality**	**Study population**	**Research question and design**	**Length of follow-up**	**Main results**	**Confounders/ comments**
Simons 2004	Qualitative	3	+	Customers and staff at 13 community cafés in greater Glasgow, plus stakeholders in the project. No socio-demographic details provided.	**Aim:** To assess the effectiveness of the five components of the Scottish Healthy Choices Award intervention in the 13 cafés that took part in the pilot. Each café was visited for a full day by a researcher and as many customers, staff and volunteers interviewed as possible. Interviews were also undertaken with 12 stakeholders (Greater Glasgow NHS Board, mobile chefs, NHS Health Scotland, Project management team etc.) face-to-face or by telephone. **Delivered by:** Collaboration of NHS, city and local organisations in Glasgow. Evaluation carried	N/a	A large number of recommendations for the scheme were made including: the need for a strong lead to provide coordination and support; café staff should be actively involved, trained and supported; promotion to be encouraged and best practice shared between cafes, healthy options to be competitively priced and to include 'special offer' incentives.	Uncontrolled evaluation study – effectively a series of case studies with stakeholder interviews.

					out by independent consultants. No power calculation.			
Holdsworth 1997	Cross-sectional survey	3	+	Eleven eating places in Leicestershire with the HBA (one hotel, two leisure centres, two public houses, two restaurants, four cafés), all in rural locations. Customers completing the questionnaire were adults aged 16–80 years, two-thirds <45 years, 78.5% were female and 97.4% were White. One-third was from social class group 1, and one-third from group 4, and only 13.2% in the HBA target group 3.	**Aim:** To evaluate customers' perspectives of the HBA Scheme in 11 public eating places. A self-completed structured questionnaire was administered to all customers at the establishments on the day the researcher visited. **Delivered by:** Evaluation was carried out by University researchers. No power calculation.	N/a	Of 377 customers approached, 271 completed questionnaires (72%). The response rate varied between establishments from 47.5% to 100%. The main influences on choice of eating place were quality of food (72.2%), affordable prices (60%), good service (53.3%), variety of choice (48.5%) and location (42%). The availability of healthy food choices (30%) was least often selected but nearly twice as many women (34%) as men (17.2%) said that this influenced their choice of eating place (p = 0.014). Availability of healthy food choices was more important to those aged ≥45 years (40.5 vs. 25.5% of the <45-year olds; p = 0.016).	Most outcomes related to awareness – possible relevance to awareness review.
Watt 1997	Qualitative	3	++	Eighty-one adolescents aged 13 or 14 years (Year 9) from four schools in inner London. Purposive sample from respondents to a cross-sectional survey to provide a range of experiences of dietary	A cross-sectional survey of school children in Camden. A set of interviews to explore young people's perceptions of food.	N/a	No-one selected refused to be interviewed. The most prominent food-classification system used by this sample of inner city Year 9 children involved the dichotomisation of foods into either 'fast food'	Companion paper to Watt 1996. A well described piece of qualitative research with a robust

				change. 41 female, 40 male. No further data other than provided by Watt 1996.	**Delivered by:** Higher education researchers. No power calculation.		or 'healthy food'. 'Fast foods' were generally considered to be high in fat and/or cholesterol and some considered them to be high in fat and sugar while others stressed the additives and preservatives contained in the foods. 'Healthy food' was generally considered to be low in fat with a good balance of vitamins and other nutritional items. 'Healthy foods' were considered to be largely irrelevant, unappealing and expensive by most young people interviewed, and not considered readily available outside their own homes. In contrast 'fast foods' were considered part of their independent lives, commonly eaten with friends, associated with enjoyment and relaxation, ready available, appealing and inexpensive. Parental disapproval appeared to be part of their appeal.	methodology.
Watt 1996	Cross-sectional	3	+	485 Year 9 students at four schools in Inner London. Subjects were 60.3% male, mean age 14.3 years, 52% lived in manual households, 62%	**Aim:** To assess the patterns of dietary behaviour and experiences of change. Knowledge, skills and beliefs about	Survey between May and July. No follow-up.	The most frequently cited factor perceived as being helpful to promote future changes in general eating habits was strong will power (83.3%). Other important factors included wider availability of	Self-reported survey data collected in 1994. School students – potential

				White and 37% lived with a single parent.	food and health were also investigated. Students self-completed questionnaires comprised of six sections covering socio-demographic information, food frequencies, eating patterns, food skills, dietary behaviour changes and knowledge and attitudes towards food and health at school during May–July 1994. **Delivered by:** UCL Medical School researchers. No power calculation.		healthier foods (67.3%), support from family (66.7%), advice from doctors (58.2%), cheaper healthier foods (53.3%) and better food labelling (50.0%). Between the social classes, a difference emerged for friends' support, information booklets, wider availability of healthy foods, costs of healthy foods and own will power, with these being considered more helpful by individuals from non-manual households ($p < 0.05$) than manual.	relevance to schools review.
Warm 1997	Evaluation	3	++	Public eating places (including hotels, guest houses, public houses and leisure centres), workplace canteens/restaurants and education establishments 'within the former Wessex region' – more specific details are not reported.	To compare the differences between premises with and without the HBA (current catering practices including their purchasing, promotion and availability of healthy food options and cooking procedures).	N/a	497 HBA premises and 495 control premises without the award were sent postal questionnaires. Response rates were 76% (n = 380) and 62% (n = 306) respectively. 39% of those surveyed were public eating places. 76% of premises believed they offered healthier meals, although most premises did not have to	Greater response rate from establishments holding award. Bias may have been introduced by award-holders in over reporting the provision of healthy foods and by

					Delivered by: Regional group in Wessex Regional Health Authority. Unclear precisely who sent out or analysed the questionnaires.		change either their purchasing or cooking practices in order to achieve the levels required to receive the award. HBA premises compared with controls more likely to offer what they perceived as a healthy dish ($p < 0.001$) and recorded an increase in purchases of brown rice ($p < 0.001$) and more low-fat spreads ($p < 0.05$ for public eating places). Although 81% of HBA premises compared with 55% of controls indicated that they actively promoted healthy eating ($p < 0.001$ for comparison), public eating places were the least likely to do so. Both HBA and control premises indicated that there had been an increased demand for more healthy food over the last 5 years with active premises seeing a larger increase in demand than control sites (76 vs. 61%, $p < 0.001$). This change in demand for healthy food had led to more than 90% of premises altering the food served. Increased customer demand was proposed as a motivation to possibly selling more healthy food in	providing more healthy choices than non-respondents. Unannounced site visits could have assessed the extent of potential biases but were not conducted. Self-reported behaviour. Unclear if questionnaire validated.

							the future (58 and 66% for HBA and controls, respectively).	

EVIDENCE TABLE 3: RELIGIOUS ORGANISATION-BASED

SUMMARY

Evidence of efficacy for weight management/reduction
No studies were found that reported weight outcomes.

Evidence of efficacy for diet/physical activity outcomes
Dietary outcomes
Only one study was found that included White as well as Black and ethnic minority groups (BMEGs). Solely BMEG studies will be considered in a future review.

Physical activity
No studies were found that reported PA outcomes.

Evidence of corroboration in the UK
No UK corroborative studies were found.

EVIDENCE TABLE 3: RELIGIOUS ORGANISATION-BASED

First author	Study design	Research type	Research quality	Study population	Research question and design (include power calculation if available)	Length of follow-up	Main results (include effect size(s)/confidence intervals for each outcome if available)	Confounders (potential sources of bias)/comments
Evidence of efficacy (internal validity) for weight maintenance/reduction								
Weight outcomes = no evidence with weight outcomes								
Evidence of efficacy (internal validity) for diet outcomes								

First author	Study design	Research type	Research quality	Study population	Research question and design	Length of follow-up	Main results	Confounders/comments
Evidence of corroboration (external validity)								
Evidence of salience – Is it appropriate for the UK?								
Evidence for Implementation – Will it work in the UK?								

EVIDENCE TABLE 4: ENVIRONMENTAL CHANGES AND FACILITIES TO PROMOTE PHYSICAL ACTIVITY

- **Active travel vs. car travel**
- **Stair-climbing**
- **Access to space and facilities for physical activity**
- **Safer routes to school**

Note: According to the rapid review parameters, only intervention studies with a control group are included in evidence tables. In two topic areas of this review, stair climbing and walking/cycling trails, the only available evidence comes largely from uncontrolled before-and-after studies with a high potential for bias and, in the case of stair climbing studies, largely short term. Since this is the best available evidence on topics of relevance to the obesity prevention guidelines, they have been included in this review for information and comment by the Guidance Development Group (GDG).

SUMMARY

Evidence of efficacy for weight management/reduction

No studies were identified with weight outcomes.

Evidence of efficacy for diet/physical activity outcomes

Physical activity

Active travel vs. car travel: One good quality systematic review (Ogilvie 2004, including nine UK studies) concluded that targeted behavioural change programmes with tailored advice can change the travel behaviour of motivated subgroups, resulting, in the largest study, in a shift to walking and cycling from car use by about 5% of all trips at a population level compared with a shift towards car use by 2% in the control groups. The review indicated that single studies of commuter subsidies and a new railway station also showed positive effects. The balance of best available evidence about publicity campaigns, engineering measures and other interventions suggested that they have not been effective.

Point-of-decision prompts to stimulate stair-climbing: Two systematic reviews, one good quality (Kahn 2002, including two UK studies) and one more recent but lower quality (Foster 2004b, including eight UK studies) concluded that educational materials such as posters and stair riser banners have a weak positive effect on stimulating stair climbing. Foster 2004b found that most studies saw a short-term effect for up to 3 months though one study saw an effect (+29%) 6 months after baseline. Kahn (2002) noted a range of effect sizes (observed a net increase in stair use compared with baseline levels) from a 5.5 to 128.6%. Three before and after studies were published since these reviews, two in the UK (Adams 2002; Webb 2005) and one in Australia (Marshall 2002). Studies found either no increase in stair use (Adams 2002) or a short-term increase (Marshall 2002; Webb 2005). Marshall (2002) found that stair use dropped to baseline levels 10 weeks into the 12-week intervention. A very weak study (Webb, 2005) compared a 2-week phase of stair riser banners with an identical message followed by 2- weeks with different messages. Stair use increased significantly during both phases compared with baseline but there was no significant different between the two phases. A further study with a very weak study design comparing stair- to escalator-use in a Stockholm rail station (Faskunger 2003) found that, with only one ascending escalator, 35.2% of the population decided to climb the stairs. With two ascending escalators, stair use dropped to 18.2% (p = 0.000).

Creation of space for physical activity: One good quality systematic review (Kahn 2002 , all US studies of varying designs) found strong evidence that creation of or enhanced access to places for PA combined with informational outreach activities is effective in increasing levels of PA. Examples of interventions were access to

fitness equipment in fitness or community centres and creation of walking trails. One more recent controlled before and after (CBA) trial carried out in the USA (Brownson 2004) and two more recent before and after studies of multi-purpose trails, one in the USA (Evenson 2005) and one in Australia (Merom 2003) have been published. A study of six communities with walking trails compared with comparison communities (Brownson 2004) reported no statistically significant intervention effects although two subgroups showed trends to a positive net change in rates of 7-day total walking in the intervention communities; people with high school degrees or less and people living in households of lower annual incomes (≤US$20,000). Evenson (2005) found that 2 months following the building of a multi-use trail, there was no demonstration in increase of PA amongst adults living within 2 miles (1.6 km) of the trail. Conversely Merom (2003) found that a promotional campaign for a local trail reached and influenced cyclists living within 1.5 km of the trail.

Safer routes to school: One RCT (Rowland 2003) found that assistance from a school travel coordinator did not change children's travel patterns or substantially affect parental fears about the safety of the journey to school. At 1-year follow-up the adjusted odds ratio (OR) for walking, cycling or using public transport in intervention schools was almost identical to that in control schools (0.98, 95% confidence interval [CI] 0.61,1.59).

Evidence of corroboration in the UK

Active vs. car travel

A cross-sectional survey (Foster 2004a) found that, for UK women, the perceived safety of walking during the day and lack of shops within walking distance were significant barriers to walking. Environmental perceptions were not related to the number of women walking for more than 150 min per week whereas having a park within walking distance was significantly associated with this measure in men. Data from two sets of case studies (Sustrans 2004, Department of Transport 2003) provide evidence for improvements in active travel as a result of: (1) improving the walking and cycling environment (e.g. traffic calming, good crossings, lighting); (2) providing better facilities (e.g. cycle stores, traffic free routes); and (3) influencing behaviour (e.g. involving the community, educational schemes, guides, maps and leaflets). Experience from a mass media campaign in Scotland (Wimbush 1998) suggested that a TV advertisement and helpline encouraged motivated individuals (callers to the helpline) to walk more but there was no effect on the population as a whole.

Two years after implementation of the City of London's congestion charging scheme (Transport for London 2005) it was estimated that 5000–10,000 former car journeys (10–20%) had transferred to cycling, walking, motorcycle, taxi or car share since implementation. Before and after street surveys found that walking and public transport were perceived to have improved in comfort and overall quality. Cycle and powered two-wheeler safety were perceived to have improved.

Point-of-decision prompts to stimulate stair-climbing: A large number of stair-climbing studies have been carried out in the UK that provide weak evidence of effectiveness and these are summarised above. Evidence from a worldwide systematic review (Kahn 2002, including two UK studies) suggested that tailoring the prompts either by specifying the benefits of stair use or by customising the sign to appeal to specific populations (e.g. ethnic groups, obese people) may increase intervention effectiveness and that signs were effective for both men and women (three studies). One UK study (Adams 2002) found evidence that prompts could be guilt-inducing (see also workplace review).

Creation of space for physical activity

One systematic review of consultation studies (Cole-Hamilton 2002) and four individual studies (Coakley 1992; Hillman 1993, 1996; Davis Mulvihill 2000) were found.

The systematic review of 93 consultation studies in England (Cole-Hamilton 2002) found that barriers to play for school-age children are fears for their own safety, in particular: bullies; dirty unkempt play areas and parks; the lack of things to do; traffic; lack of facilities for disabled children. Children using staffed provision like: staff who listen; staff who are funny, friendly and fair; having a say in what they do; staff who can deal with conflicts between children.

A qualitative study of English children (Mulvihill 2000) concluded that barriers to PA for 5–11-year-olds were lack of their and parents' time and, for some, expense. Parental barriers were lack of time, lack of safety and the poor condition of local parks. Children aged 11–15 years old stressed the importance of the social aspects of PA and cited cost and lack of transport in rural areas as barriers. A reduction in PA in young women was notable and cited barriers included feeling intimidated by young men, lack of time and lack of self-confidence. Safety was the main parental concern and parents believed that PA declined in females of this age.

A weak report of cross-sectional surveys of English 7–11-year-olds (Hillman 1993) noted that in 1971, three-quarters of 7–11-year-olds were allowed to cross roads on their own. By 1990 this had fallen to one-half. 50% were allowed to use buses in 1971 compared with one in seven by 1990. Bicycle ownership increased from two-thirds in 1971 to 90% in 1990 but only one-quarter was allowed to use them on the roads compared with two-thirds in 1971. Nearly four times as many children were driven to school in 1990 compared with 1971. Boys were allowed far more independence than girls; three in five of the boys could cross roads alone, compared with two in five girls **in 1990.** The primary concerns of parents were danger from traffic, children's reliability and fear of molestation.

A qualitative study of young people in London (Coakley 1992) concluded that young women were less likely than young men to see sport as compatible with adulthood. Financial constraints had a significant impact on sport participation in both sexes. Young women mentioned parental constraints and the influence of boyfriends as affecting their leisure choices whereas young men tended to 'do what they wanted'. For 13–16-year-olds encouragement from parents was particularly important; for people >16 years old adult advocates and role models were more likely to be important. Decisions about sport participation reflected past experiences and were often associated with feelings of discomfort and embarrassment in young women.

A cross-sectional and focus group study of 9–11- and 13–14-year-olds (Davis 1996) found that children were aware of the health promotion messages but felt considerable environmental constraints. Many were not allowed to play outdoors, use local parks or cycle to school – or they did not feel comfortable doing so. Girls especially were restricted in how late they were allowed out. In the children's views, traffic danger, 'stranger danger' and social and cultural factors interact to create barriers to keeping healthy and active. Neither study looked at attitudes to dance, yoga or other 'non-sport' forms of PA.

Safer routes to school: There is good corroborative evidence from the UK that Safer Routes to School (SRTS) schemes can be effective (i.e. at odds with one identified RCT). A series of before and after studies in Worcestershire (Parker 2003) found that, when both a school travel plan (STP) and SRTS programmes were in place, there was a 3% increase in walking, a 4% reduction in single-occupancy car use and a 1.5% increase in car sharing. Bus and cycle use remained largely static. A selected series of 30 case studies of school travel initiatives in the UK (Department for the Environment, Transport and the Regions 1999) found, in the ten schools that reported data, an overall increase in cycle use and decrease in car travel. Effects on walking and bus travel were variable. Another scheme (Jones 2001) found a considerable increase in walking and cycling to school 3 years after the intervention. From baseline, bus use increased considerably (from 44 to 53% to school and from 50 to 56% home) while walking (23–26%, 27–29%) and cycling (3–7%, 3–7%) also increased.

Cross-sectional and focus group surveys (DiGuiseppi 1998; Derek Halden Consultancy 1999; Dixey 1999, 1998; Jones 2001) provide powerful evidence that children would like to walk, cycle or take the bus to school but perceived and actual dangers have led to increased vigilance by parents and reduced activity in children.

One ongoing longitudinal study (EarlyBird, Metcalf 2004) found that being driven to school did not affect the overall PA of 5-year-olds.

A Scotland-wide study of SRTS schemes (Derek Halden Consultancy 1999) included the following recommendations: encourage publicity that identifies for local communities that their involvement can make a real difference; note that many of the measures that can be taken forward within schemes are effective, simple and cheap to implement; reinforce the need to achieve wide ownership at the outset and a good understanding among partners of their complementary aims; ensure that there are clearly defined roles for the project champion; emphasise that projects should be designed for sustainability and publicise success stories.

1

EVIDENCE TABLE 4: ENVIRONMENTAL CHANGES AND FACILITIES TO PROMOTE PHYSICAL ACTIVITY

Definitions

Physical activity

Any force exerted by skeletal muscle that results in energy expenditure above resting level. The term PA therefore includes the full range of human movement, from competitive sport and exercise to active hobbies, walking, cycling, or activities of daily living. PA per se is a complex, multi-dimensional behaviour.

Exercise

Planned bouts of PA usually pursued for personal health and fitness goals. Exercise is a subset of PA, which is volitional, planned, structured, repetitive and aimed at improvement or maintenance of any aspect of fitness or health.

Sport

A subset of PA, which involves structured competitive situations governed by rules. In Europe, sport is often used in a wider context to include all exercise and leisure PA. The Council of Europe European Sports Charter 1993 defines sport as '… all forms of PA which, through casual or organised participation, aim at expressing or improving physical fitness and mental well-being, forming social relationships or obtaining results in competition at all levels'.

MET

MET stands for 'metabolic equivalent task'. 1 MET = a person's metabolic rate (rate of energy expenditure) when at rest. MET values are assigned to activities to denote their intensity and are given in multiples of resting metabolic rate. For example, walking elicits an intensity of 3–6 METs, depending on how brisk the walk is.

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First author	Study design	Research type	Research quality	Study population	Research question and design (include power calculation if available)	Length of follow-up	Main results (include effect size(s)/confidence intervals for each outcome if available)	Confounders (potential sources of bias)/comments
Evidence of efficacy (internal validity) for weight maintenance/reduction								
No intervention studies with weight outcomes.								

2
3

Evidence of efficacy (internal validity) for diet outcomes								
Evidence of efficacy (internal validity) for physical activity outcomes								
Active travel vs. car travel								
Ogilvie 2004	Systematic review	1	++	Literature search from earliest date to December 2002. Twenty-two controlled or uncontrolled prospective and controlled retrospective studies included (three RCTs, seven controlled non-randomised trial [CCTs], 11 uncontrolled and one controlled prospective study).	To assess what interventions are effective in promoting a population shift from using cars towards walking and cycling and to assess the health effects of such interventions.	Study lengths varied from 1 to 60 months.	Targeted behavioural change programmes can change the behaviour of motivated subgroups, resulting (in the largest study) in an increase of around 5% of all trips undertaken by walking and cycling. Single studies of commuter subsidies and a new railway station also showed positive effects. The balance of best available evidence about publicity campaigns, engineering measures (such as 20 mph zones or bypasses [England], extending existing cycle route networks [The Netherlands, Germany], new cycle routes [England], downtown auto-restricted zone [Boston, MA, USA]) and other interventions suggests that they have not been effective. The targeted behavioural change programmes (six studies of four interventions) offered an intervention	**UK trials:** Barrell 1995 Hodgson 1998 Social Research Associates 1999 Mutrie 2000, 2002, Babtie Group 2001 Sustrans 2002a, 2000b Rowland 2003 Only three RCTs included but still treated as type 1 research.

							to a motivated subgroup only or information and advice tailored to peoples' particular requirements, or both (e.g. leaflets, time tables, maps, trial free bus or bike passes, personal travel diaries).	
Point-of-decision prompts								
Centres for Disease Control and Prevention 2001 - Summary Report Kahn 2002	Systematic review	2 Before and after stud-ies only.	++	Literature search 1980–2000, English language publications only. Ninety-four studies included of which five were on point-of-decision prompts to encourage stair use (all before and after studies).	A systematic review of community interventions to increase PA.	No information on intervention lengths provided.	There is sufficient evidence that point-of-decision prompts are effective in increasing levels of PA, as measured by an increase in the percentage of people choosing to take the stairs rather than an elevator or escalator. Range of effect sizes (observed increase in stair use compared with baseline levels) from a 5.5% net increase to 128.6%. Findings from several of the studies suggest that tailoring the prompts either by specifying the benefits of stair use or by customising the sign to appeal to specific populations (e.g. ethnic groups, obese people) may increase intervention effectiveness. Signs were effective for both men and women (three studies). None of the studies measured outcomes other than the percentage of people using the stairs, and none attempted to ascertain possible permanence of their reported effects.	Good review and quality assessment undertaken. Point-of-decision prompts for stair use: Two UK studies (Blamey 1995; Kerr 2000), both of which were included in the review by Foster (2004b). Summary also available as Centres for Disease Control publication 2001. Studies conducted in shopping centres, train/bus stations and university Library.
Foster 2004b	Systematic review	2 Before and after stud-ies only.	+	Literature search from earliest date – December 2001. Sixteen uncontrolled before and after studies of educational	A systematic review of studies that used environmental interventions to increase health-enhancing PA.	Length of intervention and follow-up mostly not stated but text suggests that the majority	A number of before and after studies suggest a weak effect of educational materials (e.g. posters and stair riser banners) on stimulating stair climbing. Most studies have seen a short-term effect for up to three months and one study saw an	No unpublished studies sought. No critical appraisal undertaken of included studies. **UK studies:**

				materials on stair use (eight based in the UK).		were more than 3 months.	effect (+29%) 6 months after baseline (Kerr 2001c).	Blamey 1995 Mutrie 1996 Kerr 2000, 2001a, 2001b, 2001c, 2001d, 2001e
Webb 2005	Before and after (interrupted)	2	–	A shopping mall in England with a 24-step staircase and adjacent escalators. 32,597 ascending pedestrians observed. 54% were women, 80% appeared younger than 60 years and 21% were classified as non-White.	**Aim:** To systematically compare the effects of stair riser banners featuring eight different messages with the effects of banners that repeated a single message. No power calculation. Higher education researchers. Same message: Eight banners saying 'Keep fit' interspersed with three saying 'Take the stairs' were fitted to alternate stair risers. Different messages: 'Stay healthy', 'Free exercise', 'Work your legs', 'Daily exercise', 'Keep fit', 'Easy exercise', 'Be active', 'Exercise your heart'.	Two-weeks of baseline observation followed by 2 weeks when banners with the same message were displayed and a further 2 weeks when banners with different messages.	Stair climbing increased significantly between baseline and the intervention period (OR 2.45, 95% CI 2.14, 2.40) from 7.0% using the stairs at baseline, compared with 14.2 and 13.6% respectively, in the single- and multiple-message phases. There was no significant difference between the single message and multiple message condition. Throughout the study, males, White persons, those <60 years and those without baggage climbed the stairs more than their counterparts (all $p < 0.001$). However, no significant interactions occurred between demographic characteristics and either intervention phase.	Very short-term before and after study only. No post-intervention follow-up, although analysis suggested no significant changes in stair or escalator use over successive weeks of the intervention. Activity was measured by observation with 95% interobserver agreement. Number of observations for each period not reported so not possible to confirm the % increases claimed by the authors. Poor study and not included in evidence statements.
Adams 2002	Before and after (time series)	2	+	All users of the stairs and lifts in the medical school of the University of Newcastle upon Tyne.	**Aim:** To use a theoretically based, systematic approach to design and evaluate a stair promotion	The posters were in place for 4 weeks with data collected at baseline and	No increase in stair use was measured in response to the intervention. Stair use comprised 20.1% of all upward journeys pre-intervention, 20.6% at week 1 and 19.5% at week 4 ($p>0.05$).	Time series studies inherently low quality, although a fair and unobtrusive method of observation was

					intervention in conjunction with the target group. **Intervention:** A time-series study building on lessons learnt from users' views on attitudes to stair climbing (from 73 semi-structured interviews; methodology not provided) and to the most acceptable and potentially effective messages and slogan. **Delivered by:** Researchers at the University. **Power:** Eight hours of observation to detect a 50% increase in stair use = 90% power.	at weeks 1 and 4.	Interviews post-intervention suggested that the posters were considered good but probably not effective, they were informative and guilt-inducing, and encouraging people to climb five flights of stairs was overambitious. Although the authors aimed to leave the posters in place for at least 12 weeks and to collect data at baseline and at weeks 1, 4 and 12 the intervention was terminated after the fourth intervention week. As no significant difference was detected between stair use at baseline and at one or four weeks, authors hypothesised that a delayed effect at 12 weeks would be unlikely.	employed (observation from fifth floor, with simultaneous observation from inside stairwell and from one of the lifts, of distance and direction of all journeys made over a 45-min period). There was unauthorised removal of 29/39 posters during the intervention.
Marshall 2002	Before and after (interrupted)	2	+	Australian hospital. No population data provided.	**Aim:** To evaluate whether a stair-promoting intervention could increase the use of the stairs over the elevator in a healthcare facility. The intervention included motivational signs and footprints. Numbers using the	Time series design over 12 weeks. Data were collected before, during and after displaying a signed intervention during weeks 4–5 and 8–9.	Stair use significantly increased from baseline after the first intervention phase (weeks 4–5) (1%, p = 0.02; OR 1.05, 95% CI 1.01, 1.10), but stair use decreased back towards baseline levels after the intervention was removed (between weeks 6 and 7). Stair use did not significantly change from baseline after re-introduction of the intervention (weeks 8–9). Lastly, stair use decreased below the initial baseline	Uncontrolled time series study is an inherently weak design. Data collection included unobtrusive monitoring and looks reliable. Power calculation carried out but no sign of application.

					stairs were recorded by an objective, unobtrusive motion-sensing device and research assistant observation; self-report data from hospital staff working on floors four and five were also collected. **Delivered by:** University researchers. No power calculation.		level during the final weeks of evaluation (weeks 10–12). There was no significant change in self-reported stair use by hospital staff.	Total number of observations not provided.
Faskunger 2003	Observational field study	2	+/–	Observation of 1614 people using the stairwell (51 steps) and escalator during rush hour in a Stockholm suburb train station. No details of Study population.	To investigate stairwell and escalator use in a train station where the setting was modified during the intervention (one or two ascending escalators) to increase understanding of how PA could be promoted in such an environment. **Delivered by:** University researchers. No power calculation.	One-hour observation of commuters (n = 1614) in a situation with one (n = 854) or two (n = 760) ascending escalators.	With only one ascending escalator, 35.2% of the population decided to climb the stairwell. With two ascending escalators, stairwell use dropped to 18.2% (p = 0.000). Some people taking the escalator decided to walk up it, however (data not provided).	Uncontrolled study design and brief data collection (1-hour observation only). No baseline data. May be highly confounded.
Space for physical activity								
Kahn 2002	Systematic review	2	++	Literature search 1980–2000, English language publications only.	A systematic review of community interventions to increase PA.	No information on length of follow-up.	There is strong evidence that creation of or enhanced access to places for PA combined with informational outreach activities is	Good review and quality assessment undertaken.

				Ninety-four studies included (type not specified so assumed no RCTs) of which ten looked at creation of or enhanced access to places for PA combined with informational outreach – community-wide campaigns or mass-media campaigns.			effective in increasing levels of PA. Examples of interventions were access to fitness equipment in fitness or community centres and creation of walking trails. Informational outreach interventions included point-of-decision prompts, see above, and mass media campaigns. Outcome measures varied but from five studies reporting the effect on frequency of PA the median increase was 48.4 (interquartile range 21.0–83.8)%. The intervention was effective for diverse populations including Black ethnic groups (two studies).	**Enhanced access to space:** No UK studies (all USA) and eight were carried out in the workplace.
Brownson 2004	CBA	2	+	Six rural intervention communities in Missouri and six comparison communities in Arkansas/Tenness ee with similar socio-demographic characteristics. Female 77% in intervention, 74% in control sites. Age group ≥18 years old. White race 70% intervention, 64% control; Black 29%, 34%; other 1%, 2%. Education < high school 29%, 21%; college graduate 14%,	**Aim:** To determine whether a multi-level ecologic intervention is effective in increasing PA at the community level and to examine intervention effectiveness for various high-risk groups (e.g. persons of lower income). The intervention was developed with community input and included tailored newsletters based on information provided by participants, walking clubs, fun and awareness days, walk-a-thons, etc.	Baseline and follow-up survey at approximately 2-year intervals with intervention between times.	No information given on participation rate for completion of form leading to tailored newsletter or refusal rates to random phone questionnaire. A community-wide change in walking rates in rural communities was not documented. Although two subgroups showed trends to a positive net change in rates of 7-day total walking in the intervention communities; people with high school degrees or less and people living in households of lower annual incomes (≤US$20,000) no studied group showed a statistically significant net intervention effect.	The Bootheel Heart Health Project. Controlled before and after study only. Intervention was less intense than planned. No participation/attrition information. Self-reported outcomes. Data appear to be from separate cross-sectional surveys rather than cohorts.

				17%.	Telephone survey using random-digit dialling to households with working phones. **Delivered by:** Intervention by an academic team working with community coalitions and local governments. Questionnaire administered by trained interviewers. No power calculation.			
Evenson 2005	Before and after	2	+	366 randomly selected adults (≥18 years) living within 2 miles (3.2 km) of a segment of a multi-use trail in Durham, central North Carolina. Most participants were in good health, had ≥16 years of education; approximately two-thirds were women, one-third were non-Hispanic Black and two-thirds lived within 1 mile (1.6 km) of the trail.	A prospective evaluation of the impact of building a multi-use trail (i.e. cycle path), in terms of change in PA levels among nearby residents. **Delivered by:** University researchers. No power calculation.	Data collected 2 years before and 2 months after opening of trail.	Baseline (2 years pre-trail construction) response rate 47.2% (*n* = 685 out of 2125). At follow-up 63.7% of those who responded at baseline completed the interview (*n* = 436 but 48 had moved away and 22 lived >2 miles (3.7 km) from the trail, leaving *n* = 366). Two months following the building of a multiuse trail, there was no demonstration in increase of PA amongst adults living within 2 miles (3.2 km) of the trail.	Good before and after study but inherently weak design and poor response rate. Some differences between those who completed the baseline and the follow-up survey (more likely to be non-Hispanic White and male). Did not appear to include promotion of trail.

Merom 2003	Before and after	2	+	Adults aged 18–55 years of age who lived around a newly constructed Rail Trail (part of the NSW state-wide 'BikePlan' but designed for walking as well as cycling) in Sydney, Australia. Adults were randomly sampled from an 'inner' area within 1.5 km of the trail and an 'outer' area, bike owners only, 1.5–5 km from the trail. Two-thirds of the sample were inner-city residents, 57% male. 54% had a more than high school education, 34% from a non-English speaking background. In the outer area there were more males (64%), reflecting bike ownership.	**Aim:** To assess the impact of a local promotional campaign (including press advertisements with maps, radio promotion, brochure and map distribution, around a newly constructed Rail Trail in Western Sydney. Pre- and post-campaign telephone surveys were used. Objective concurrent monitoring of daily bike counts was carried out. Promotional campaign delivered by the NSW Road and Traffic Authority. **Delivered by:** Evaluation carried out by Health Service Epidemiology Unit/NSW University. No power calculation.	3 months. No follow-up.	At baseline, 65% sampled households agreed to participate and 568 (73%) completed the baseline interview. 450 (79%) of the cohort completed both interviews. The campaign reached and influenced cyclists in the inner area. Inner cyclists increased mean cycling time by 0.19 (SD 1.5) hours while outer cyclists decreased cycling time (–0.24 [SD 1.6] hours). Mean daily bike counts in the monitored areas increased significantly after the trail launch ($p < 0.001$).	Good before and after study although inherently weak study design.
Safer routes to school								
Rowland 2003	RCT cluster	1	++	Children aged 6–7 or 9–10 years in 21 primary schools in London (Camden and Islington). Sex ratio unknown.	**Aim:** To evaluate the effect of site specific advice from a school travel coordinator on school travel patterns.	One-year intervention plus 1-year follow-up.	21/41 schools (51.2%) agreed to participate and were randomised. The survey questionnaires were administered to parents of children aged 6–7 or 9–10 years and had an 85% response rate.	The study size and duration were constrained by time and resources. it is not clear whether any practical road

				54% White, 18% Black, 15% Asian, 15% other.	Intervention schools (*n* = 11) received 16 hours of expert assistance over one school year. Road safety issues were identified by meetings with teachers and governors, organising focus groups of parents and pupils and encouraging the establishment of a school travel working group. It is unclear where the intervention was conducted. **Delivered by:** School travel coordinators (funded by Camden and Islington Health Action Zone). No power calculation.		Assistance from a school travel coordinator did not change children's travel patterns or substantially affect parental fears about the safety of the journey to school. At 1-year follow-up the adjusted OR for walking, cycling or using public transport in intervention schools was not significantly different to that in control schools (0.98, 95% CI 0.61, 1.59).	safety/engineering solutions were implemented (e.g. speed reduction, crossing patrols – see corroborative evidence).

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Evidence of corroboration (external validity)								
Evidence of salience – Is it appropriate for the UK?								
First author	**Study design**	**Research type**	**Research quality**	**Study population**	**Research question and design**	**Length of follow-up**	**Main results**	**Confounders/comments**
Active vs. car travel								
Ogilvie 2004	Systematic review	1	++	Literature search from earliest date to December 2002. Twenty-two controlled or uncontrolled prospective and controlled retrospective	See above.	See above.	See above.	**UK trials:** Barrell 1995 Hodgson 1998 Social Research Associates 1999 Mutrie 2000, 2002 Babtie Group 2001 Sustrans 2002a, 2002b

				studies included, nine from the UK.				Rowland 2003
Point of decision prompts								
Webb 2005	Before and after (interrupted)	2	+	A shopping mall in England with a 24-step staircase and adjacent escalators. 32,597 ascending pedestrians observed.	See above.	See above.	See above.	See above.
Foster 2004b	Systematic review	2 Before and after studies only	+	Literature search from earliest date – December 2001. Sixteen uncontrolled before and after studies of educational materials on stair use.	See above.	See above.	See above.	Eight included studies carried out in the UK: Blamey 1995 Mutrie 1996 Kerr 2000, 2001a, 2001b, 2001c, 2001d, 2001e
Adams 2002 [	Before and after (time series)	2	+	All users of the stairs and lifts in the medical school of the University of Newcastle upon Tyne.	See above.	See above.	See above.	See above.
Safer routes to school								
Rowland 2003	RCT cluster	1	++	Investigation of site-specific advice on school travel patterns; 21 primary schools in London (Camden and Islington). 54% White, 18% Black, 15% Asian, 15% other.	See above.	See above.	See above.	See above.

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Evidence for Implementation – Will it work in the UK?								
First author	**Study design**	**Research type**	**Research quality**	**Study population**	**Research question and design**	**Length of follow-up**	**Main results**	**Confounders/comments**
Active vs. car travel								
Transport	Audit/ev	3	+	General London	**Aim of**	Scheme	Comparing 2003 with 2002, there was an	The effects

for London 2005	aluation			population and commuters	**congestion charging:** To reduce congestion, to make radical improvements in bus services, to improve journey time reliability to car users, to make distribution of goods and services more efficient. Net revenues of £90 million were generated in 2004/5 and have been largely spent on improved bus services. **Delivered by:** Government. No power calculation.	introduced in February 2003. Annual evaluations.	increase of 37% in the number of people entering the charging zone by bus. In 2004 a further 12% increase compared with 2003 was registered. A decrease of 7% of underground journeys to the congestion zone was noted in 2003 but this recovered to 2002 levels in 2004. An increase in two-wheeled travel (pedal cycle and powered two-wheeler) was reported but no figures are provided. Of an estimated 40,000–45,000 car journeys transferred to other methods (60–70% of former terminating car movements), it was estimated that 5,000–10,000 journeys (10–20%) transferred to cycle, walk, motorcycle, taxi or car share since the introduction of the scheme. Before and after street surveys found that walking and public transport were perceived to have improved in comfort and overall quality. Cycle and powered two-wheeler safety were perceived to have improved. Negative and positive responses to the scheme were voiced and it was difficult to isolate the perceived impacts on the local neighbourhood and quality of life. In general the scheme was perceived to have been more successful than expected.	on PA are incidental to the aims of the scheme and limited information has been gathered.
Foster 2004a	Cross-sectional survey	3	+	Survey of 4265 nationally representative English adults aged 16–74 years.	To examine the relation between adults' perceptions of the social and physical environment and their self-reported walking behaviour. **Delivered by:** Department of	N/a Cross-sectional survey by 30-min interview.	In women, perceived safety of walking during the day (OR 0.53, 95% CI 0.31, 0.88) and no shop within walking distance (OR 0.72, 95% CI 0.52, 0.99) were associated with any reported walking occasions. Perceptions of the environment were not related to women walking ≥150 min/week. In men, having a park within walking distance was associated with walking ≥150 min/week (OR 2.22, 95% CI 1.18, 4.35). No other significant associations were found.	Unclear if questionnaire was validated, self-reported data, although reliable statistics and the sample was probably

					Health 3-year health promotion campaign. Trained interviewers from a social marketing company interviewed participants at home. No power calculation.			representative.
Sustrans 2004	Selective case studies	3	+	Various locations in England. No socio-demographic details.	A Sustrans action plan for increasing walking and cycling based on good practice guidance in three areas from 50 case studies in England. **Delivered by:** Case studies selected by Sustrans.	Varies for each case study.	The action plan provides evidence through the descriptions of 50 case studies for successful outcomes as a result of: 1) Improving the walking and cycling environment (e.g. introducing safety and security measures such as traffic calming, charging for cars, pedestrian crossings, CCTV, cycle lanes, lighting, cleaner streets). 2) Providing better facilities for walking and cycling (e.g. cycle stores, seats, drinking fountains, traffic free routes). 3) Influencing travel behaviour (e.g. educational/promotional schemes, led walks/cycle rides, guides, walking/cycling incentive schemes, cycle proficiency training).	Selected case studies with limited description of methodology although some studies include PA outcome measures.
Department of Transport 2003	Series of case studies	3	+/–	UK-wide case series. No population data given.	A collection of case studies of community projects that illustrate (in the authors' words) that 'for virtually every aspect of walking policy and promotion of walking there is … a good idea	Data not provided.	Using illustrations from case studies where the amount of walking was increased, the authors summarised good practice in developing pedestrian schemes as including: • an evaluation and audit of pedestrian needs; • community involvement; • good road crossings; • signs (e.g. high quality maps) and lighting; • home zones – making the road a shared area for both cars and pedestrians; • car user charging;	Very brief selected descriptions of case studies with no methodological information and very little in the way of data.

					that works'. **Delivered by:** Case studies selected by Department of Transport.		• walking schemes (rural areas, to work, to school).	
Wimbush 1998	Evaluation incorporating before and after	2	+	Scotland-wide mass media campaign. **Nationwide pre- and post-survey:** Representative of Scottish population. 'Fitline' callers (a free, direct-response telephone helpline service): 59% female. All ages included, 8% <16 years; 20% >55 years. 40% manual and 60% non-manual. Only 15% inactive at baseline.	**Aim:** To evaluate a national campaign involving a 40-second TV advertisement, a telephone helpline (with information pack for callers) and encouragement to local radio stations to run programmes. Target population people aged 30–55 years, who were not regular exercisers. Evaluation involved pre- and post-campaign population surveys and baseline and follow-up surveys (at 10 weeks and 1 year) of a random sample (*n* = 700) of helpline callers	Mass media campaign for 4 weeks in autumn 1995 with second four week burst in spring 1996. National evaluation pre- (June 1995) and post- (June 1996) campaign. Fitline callers at baseline (time of first call) and 10 weeks and 1 year after initial call.	Response rate to baseline survey individual questions varied from 62–86%. Of 700 randomly selected and consenting callers, 490 (70%) interviewed at 10 weeks and 283 (58%) at 1 year. In the population surveys, although knowledge and awareness increased, there was no change in the number of days in the last week on which respondents had spent at least 30 min walking, the mean number of days being 4.26 in June 1995 and 4.13 in June 1996. Among Fitline callers, 48% of the respondents claimed to be more physically active than they had been at last contact, 46% were exercising at the same level and 7% were less active.	Uncontrolled before and after a weak study design. Fitline callers are likely to be highly motivated, so will not be representative of the general population. All outcomes self-reported.

					who consented to be followed up. **Delivered by:** Campaign by the Health Education Board for Scotland and Government national survey. Fitline caller surveys by University researchers. No power calculation.			
Space and motivation for physical activity								
Mulvihill 2000 [	Qualitative	3	++	Paired interviews and focus groups with 163 children (aged 5–15 years) and 52 parents in six geographical areas of England – at schools, youth clubs and a shopping mall. Combination of urban/suburban and rural sites in Manchester, Durham, Leicester, Birmingham, London and Devon. A purposive sample was selected (guided by teachers) to reflect the diversity of socio-economic background, ethnicity and PA levels. The authors claimed a bias towards lower socio-economic groups (as	**Aim:** To provide, using qualitative methods, information concerning the reported perceptions of, motivations for, and barriers to PA among young people aged 5–15 years. **Delivered by:** Fieldwork carried out by higher education researchers. No power calculation.	N/a	**Children aged 5–11 years:** PA was considered pleasurable and good for you. Parents determined whether or not children walked to school and how far they were allowed to cycle. They also facilitated attendance at out of school activities. Barriers to activity were seen by the children as the lack of their own, and parents, time. Expense was a barrier for a small number. **Parents of children aged 5–11 years:** Parents perceived their children as energetic and PA as highly beneficial but requiring more work by the parents. Time was considered a barrier, including whether children walked to school or not. Parents also agreed that organised PA was expensive but lack of funds were not a barrier. Lack of safety and the poor condition of local parks were barriers. **Children aged 11–15 years:** The transition from primary to secondary	High quality study but lack of detail on sampling methods and no summary of Study population (though information provided for each site in appendices).

				measured by receipt of free school meals), lower levels of PA and young women aged 13–15 and data were provided, spread across four appendices with no summary analysis.			school led to a reduction in PA in young women, some of whom felt that teachers did not always treat them seriously in sports. Social aspects of PA (hanging out, shopping, dancing) were important. Young women felt intimidated and embarrassed by young men when playing sport and felt the latter generally played too vigorously. Young men preferred to play with their own sex as girls were seen as having a poorer ability and lower interest. Barriers included cost and lack of late transport in rural areas. Barriers for girls included feeling self-conscious and lack of time. Choices at this age were not influenced by parents. **Parents of children aged 11–15 years:** A number of parents felt they had to encourage their children to be physically active though others regarded their children as very active. Safety was a parental concern particularly at night. General belief that interest in PA declines with age, especially in girls.	
Cole-Hamilton 2002	Systematic review of observational studies	3	++	In May–July 2001 the Children's Play Council contacted organisations in England known to have undertaken Best Value Reviews of children's play and asked for copies of any consultations with school-age children and young people about children's free time. 108 reports were received (93 consultations and >13,000 subjects) and analysed for common themes and interests of	**Aim:** To review the attitudes and activities of children and young people to look at their free time activities in general and at their views of provision. The research was carried out by the Children's Play	N/a	Children play in the streets, local parks and recreation fields, open spaces and play areas. They like physically active outdoor and indoor pursuits, meeting friends, quiet activities, a choice of activities. Barriers to play for children are: fears for their own safety, in particular bullies; dirty unkempt play areas and parks; the lack of things to do; traffic; lack of facilities for disabled children. Children using staffed provision like: staff who listen; staff who are funny, friendly and fair; having a say in what they do; staff who	Excellent summary of themes from 93 separate studies. However, no analysis of results in terms of gender, age, ethnicity.

				children, young people and parents. (An additional systematic review was also carried out for publications from 1995 onwards looking for evidence to substantiate the arguments for play and is reported in this publication.)	Council, an alliance of national and regional organisations and local authorities.		can deal with conflicts between children.	
Hillman 1993	Cross-sectional survey	3	+/–	English school children aged 7–11 years in five areas. No further detail provided.	Two cross-sectional surveys in 1971 and 1990. **Delivered by:** Unknown. No power calculation.	N/a	In 1971, three-quarters of 7–11-year-olds were allowed to cross roads on their own. By 1990 this had fallen to one-half. One in two were allowed to use buses in 1971 compared with one in seven by 1990. Bicycle ownership increased from two-thirds in 1971 to 90% in 1990 but only one-quarter were allowed to use them on the roads compared with two-thirds in 1971. Nearly four times as many children were chauffeured to school in 1990 compared with 1971. Boys were allowed far more independence than girls, three in five of the boys could cross roads alone, compared with two in five girls (in 1990?). The primary concerns of parents were danger from traffic, children's reliability and fear of molestation.	A very weak paper with no methodological detail and no citations to follow-up. **Consider exclusion?**

Coakley 1992	Qualitative	3	++	Thirty-four men and 26 women aged 13–23 years (only three older than 18 years) from an industrial area south-east of London. 85% were White, native [sic] Britons, 15% were Black, Indian or Asian. About 75% from working class families, remainder from middle class families. Half of the interviewees were chosen because of their active involvement in sport and half identified by teachers or program organisers as dropouts or non-participants.	Qualitative study by semi structured interview (45 min) in conjunction with a media-marketing campaign by the British Sports Council in 1985 to 'sell' sport participation to young people, especially 14–18-year-olds working-class youth who had quit or never participated in sport. **Delivered by:** Study commissioned by the regional Sports Council and higher education researchers carried out the interviews. No power calculation.	N/a	Most young people chose leisure activities they thought would prepare them for adult roles or to do adult things (i.e. be independent and autonomous). Young women were more likely to conclude that sport had nothing to do with adulthood while young men were more likely to see sport as compatible with adulthood. Participation was more likely if it was seen as an avenue for extending or displaying competence. Financial constraints had a significant impact on sport participation in both sexes. Young women mentioned parental constraints and the influence of boyfriends as affecting their leisure choices whereas young men tended to 'do what they wanted'. For 13–16-year-olds encouragement from parents was particularly important; for people over 16 years adult advocates and role models were more likely to be important. Decisions about sport participation reflected past experiences and were often associated with feelings of discomfort and embarrassment in young women.	Generally a good study. Attitudes to non-'sport' forms of PA (e.g. dance/yoga) were not considered.
Davis 1996	Questionnaire and focus group – qualitative	3	+	9–11- and 13–14-year-old pupils from four schools in areas of Birmingham with an 'above-average concentration of heads of households in lower occupational classes'. One primary and one	**Aim:** To build an understanding of children's and young people's perceptions of risk and patterns of decision making on transport.	N/a	Children were aware of the health promotion messages that walking and cycling were 'healthy' and that being active was important but felt considerable environmental constraints on their activities. Many were not allowed to play outdoors, use local parks or cycle to school – or they did not feel comfortable doing so. Girls especially were restricted in how late they	Little clarity on data analysis provided and focus group members were not randomly selected. Attitudes to PA

				secondary in the inner suburbs and one primary and one secondary in the outer suburbs.	Semi-structured questionnaire completed by 492 pupils and focus-group discussions with one group from each class taking part in the questionnaire. **Delivered by:** University researchers (health and transport research group). No power calculation.		were allowed out. In the children's views, traffic danger, 'stranger danger' and social and cultural factors interact to create barriers to keeping healthy and active.	from sport and non-sport (e.g. dance/yoga) were not considered.
Safer routes to school								
Parker 2003	Series of before and after studies	2	+	Schools in Worcestershire. No population details provided. Example safer route to school (SRTS) measures were engineering improvements – lighting, crossings, junction changes, traffic calming, footway enhancements, improved school entrances, bus waiting areas. Example STP measures were secure cycle parking, lockers and storage, dry waiting areas, educational	An evaluation using uncontrolled before-and-after methods of 87 SRTS schemes and eight STPs implemented across the county. **Delivered by:** County Council. In all cases, the development and implementation was undertaken with all members of the school community, including questionnaire surveys of pupils at	Ongoing.	From before and after travel surveys at a 1-year interval (using a 'hands up' design) at schools with SRTS measures alone, there was an increase in walking but at the expense of other sustainable travel methods and single occupancy car use also increased. Where STP and SRTS programmes were in place there was a 3% increase in walking, a 4% reduction in single-occupancy car use and a 1.5% increase in car sharing. Bus and cycle use remained largely static.	Series of before and after case studies and no controls (other than SRTS only schools). It is not possible to tell if the changes recorded are a direct result of the STP/SRTS programmes. Annual surveys will be undertaking at schools and longitudinal data will be available at a later date.

				materials (project work, assignments), cycle proficiency training, car sharing, promotional materials (newsletters, posters), rescheduled bus time-tables, maps.	each school. No power calculation.			
Jones 2001	Before and after study and surveys	2	+	Secondary school in East Grinstead, West Sussex. No socio-demographic details.	**Aim:** To develop a SRTS scheme by asking the pupils themselves what problems were deterring them from walking, cycling or using public transport to get to school. The scheme included sheltered cycle parking for upper school, new pedestrian and cycle access, enhanced signing, speed reduction, footway and carriageway maintenance and was implemented and informed by baseline, and 1- and 3-year post-intervention pupil surveys. **Delivered by:** West Sussex County Council.	Ongoing scheme with 1- and 3-year follow-up.	Response rate unknown. At baseline 28% of pupils travelled to school, and 18% travelled home from school by car. Three years after the intervention, these values had dropped to 13 and 7%. Bus use increased considerably (from 44 to 53% to school and from 50 to 56% home), while walking (23–26%, 27–29%) and cycling (3–7%, 3–7%) also increased. At the 3 year survey, cycling was cited as the preferred mode of transport for boys, while girls expressed a preference for the bus. 'Too dangerous' was the reason 12% of pupils give for not walking and 14% for not cycling – yet fewer than 7% of the walkers and cyclists themselves said it was dangerous.	Uncontrolled before and after study. Sampling methods for the surveys and response rates unknown. Intervention seems to be a comprehensive, multi-component scheme.

					No power calculation.			
Derek Halden Consultancy 1999	Case studies and surveys	3	++	Scotland-wide. SRTS is a UK-wide campaign. SRTS plans tend to include the following measures: • improved safety and accessibility for walkers and cyclists (e.g. pedestrian crossings, speed cameras, maps); • measures to enhance personal skills of children (e.g. pedestrian and cycle skills training, cycle maintenance training, road safety in curricula); • measures to enhance participation (e.g. publicity, community involvement in promotion/implementation, project evaluation).	**Aim:** To prepare an inventory of SRTS in Scotland and to prepare draft guidance for best practice on such schemes. **Delivered by:** Evaluation by private consultancy commissioned by the Scottish Office Central Research Unit. No power calculation.	Ongoing schemes.	Council and cycle charity (Sustrans, Spoke) questionnaires delivered to all 32 Scottish Unitary Councils, Sustrans the national sustainable transport charity and Spokes the cycle campaign group. 32/34 replied = 94%. Questionnaires were also sent to practitioners taking forward 89 active projects, *n* = 152. 127/152 replied = 84%, but only 51 fully completed since many projects not sufficiently advanced to answer all questions (covering 36 of 89 active projects = 40%). Overall practitioners considered that the presence of vehicles in the vicinity of the school, particularly those of parents of school children, is the major concern, and that improving safety and accessibility for walkers was the main aim, particularly for children crossing busy roads. The authors recommendations for SRTS guidance included: • encourage publicity that identifies for local communities that their involvement in SRTS can make a real difference; • note that many of the measures that can be taken forward within schemes are effective, simple and cheap to implement; • reinforce the need to achieve wide ownership at the outset and a good understanding among partners of their complementary aims; • ensure that there are clearly defined roles for the project champion; • emphasise that projects should be designed for sustainability; • publicise success stories.	Good corroborative evaluation with case studies supported by survey data.

Department of Employment, Training and Rehabilitation 1999	Case series	3	+	Thirty case studies (15 urban, seven inner city, eight rural) of existing school travel initiatives in the UK selected from 92 schools identified through work by Sustrans and the University of Westminster. The 50 schools were selected to give a range of catchment areas, school types, travel patterns, travel plan initiatives and 30 of these were chosen for detailed study.	**Aim:** Case studies of selected school travel initiatives. Questionnaire and interviews with local authorities, school teachers (and sometimes governors), travel mode split survey. The school travel plans varied but common initiatives were engineering changes including traffic calming, car banning and safe routes, improved facilities (e.g. cycle parks), education/promotion **Delivered by:** Schools. No power calculations.	Ongoing.	Only ten of the case studies reported before and after travel arrangements and a common result was an increase in the number of students cycling to school. Of the ten schools, walking increased in four, decreased in six; cycling increased in eight and stayed the same in two; bus travel increased in three, decreased in two and stayed the same in four. Car travel increased in one, decreased in six and stayed the same in three.	Selected case studies. 30 selected from 92. Different sets of data collected within each case study. No overall summary and very difficult to compare results and draw conclusions
Dixey 1999 Dixey 1998	Two surveys plus interview	3	++	Seven primary schools in housing estates on the fringes of Leeds. Sex and age range unknown. Described as predominantly White and working class areas with a mix of council and private housing; relatively disadvantaged with a range of social problems (including high	**Aim:** To present findings of a study regarding supervised journeys, actual and preferred modes of travel, and parent's perceptions of danger. Data were collected from children and parents in 1995 and	1 year.	Response rate unknown (though 75% quoted for the children's' questionnaire). 1043 children's and 758 parents' questionnaires returned in 1995, 933 children's and 544 parents' in 1996. From the questionnaire results, the parents and children differed significantly from each other in how they would prefer to get to and from school. Almost 40% would prefer to cycle. A quarter would prefer to travel by car, which is similar to the proportion that does. More	Unclear how many people were surveyed; unclear if survey tool validated. However, combination of quantitative and

				traffic areas) drug users, strangers and litter in the estate used for the qualitative research). Intervention provided by Leeds Road Safety Unit.	1996 to inform an educational road safety education programme (no description). A questionnaire was used (teacher supervised for the children) – questions/details of survey not reported. Interviews were also carried out with 32 mothers of primary school children in one of the estates, (1-hour semi-structured interview). **Delivered by:** University research evaluation. Interviews by professional interviewer.		parents would prefer to use a car than do so. From the qualitative research it appeared that a high profile given to the vulnerability of children in public places has resulted in parents becoming ever vigilant and subjecting children to increased surveillance. Parents had practical ideas about making their environment safer. There was considerable consensus that there were inadequate facilities for young people. Increased school security was also seen to have improved general feelings of safety.	qualitative research and overall good quality study. Nearly one-half of the questionnaire respondents had no paid employment and one-third did not own a car. Of 52 mothers surveyed, 11 had no partner, 19 had no paid employment.
Metcalf 2004	Longitudinal survey	3	++	154 boys and 121 girls in their first year (aged 5 years) at 53 urban primary schools in the UK. Socio-economic details collected but not reported. Recruitment details not provided.	**Aim:** To measure the activity cost of the school run in young children in the EarlyBird study. The children wore uniaxial accelerometers during waking hours for five consecutive schooldays and the weekend. Mode of transport and school	N/a	No attrition reported. Being driven to school does not affect the overall PA of 5-year-olds. Twice as many children walked to school as were driven by car with no significant gender bias – median time 7 min; median distance 0.7 km. Total weekly activity of children walking to school compared with those travelling by car was identical (p = 0.97) and the additional activity reported by walkers during the school journey was only 2% of the total weekly activity.	Recruitment details were not provided. Objective measure of PA – uniaxial accelerometers worn during waking hours. The EarlyBird study is

					journey time were assessed by questionnaire and with the RAC's online route planner. Power calculation – 80% to detect a significant difference of 12% school journey activity and 8% total weekly activity.		The authors stated that although the proportion of walkers was highest in the lowest socio-economic group (C 78%, B 63%, A 62%) the pattern was unchanged across groupings. The two groups did not differ in either BMI or sum of skinfold thicknesses.	longitudinal and data for older children will be available in due course.
DiGuisepi 1998	Cross-sectional	3	++	Survey of primary school children in two inner London boroughs (Camden and Islington). Excluding independent schools (data unavailable), respondents were 54% White, 18% Black, 14% Asian, 15% other, and similar to the school populations.	**Aim:** To survey the travel patterns of urban primary school children to inform the development of strategies to reduce school-related car travel. **Delivered by:** Survey carried out by university researchers, funded by the two London boroughs and the local Health Authority. No power calculation.	N/a	Thirty schools (97%) agreed to participate. Of 2476 enrolled children, 2086 (84%) returned usable questionnaires. Adults accompanied 84% of children to and from school. Most children (61%) were rarely or never allowed out without an adult for school or leisure. Only 3% of bicycle owners were allowed to cycle on main roads. 90% of parents were very or quite worried about abduction or molestation and 89% were very or quite worried about traffic. The strongest predictors of car travel to school were car ownership, greater distance to school, attendance at an independent school, and parental worry about abduction. The authors concluded that parents who currently drive their children might forgo the car for safe, convenient alternatives that address their fears.	Good quality cross-sectional survey.
Thomas 2004	Qualitative	3	–	Series of interviews around the UK with children aged 10–11 years.	**Aim:** To establish children's' attitudes to their environment and how this affects them.	N/a	In order of frequency and emphasis, children cited traffic, strangers/criminals, being lost, bullying, trains and terrorism as dangers. The overall level of deprivation impacted on children's access to quality space. The authors concluded that new ways should be	Potentially highly flawed study. No methodology description

					Four locations (with large Pakistani, African-Caribbean/Black African, White and disadvantaged populations). **Delivered by:** Unclear (see confounders). No power calculation		found to facilitate environmental education through out of school learning and green school design and children from disadvantaged backgrounds should be given more opportunities to access quality public space.	. Roles of researchers unclear (Demos, 'green alliance'). Results appear consistent across the minority/disadvantaged groups included in study.

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EVIDENCE TABLE 5: MULTI-COMPONENT CITY-/COUNTY-/STATE-WIDE INTERVENTIONS WITH POTENTIAL FOR LOCAL IMPLEMENTATION

SUMMARY

Overall, five CBA studies were identified (Osler 1993; Shelley 1995; Baxter 1997; O'Loughlin 1999; Huot 2004) of which one (Baxter) was based in the UK. All five were multi-component interventions aimed at reducing cardiovascular risk factors (including smoking) in adults and employing a range of educational and behavioural strategies such as workshops, seminars, point of choice, educational materials and local multi-media components. Three were broadly city-wide (O'Louglin, Baxter, Osler) and two were county-/state-wide (Huot, Shelley), one with suburban and rural components (Huot). Two looked at lower income populations (O'Loughlin, Baxter).

There was very little evidence of benefit from these interventions in terms of weight, diet and/or PA outcomes.

Evidence of efficacy for weight management/reduction

Three CBA studies measured weight outcomes (O'Loughlin, Baxter, Shelley). O'Loughlin and Baxter looked at lower income populations. None of the studies noted a significant reduction in weight or BMI in the intervention compared with the control communities although Shelley recorded a trend towards weight reduction in the intervention group.

Evidence of efficacy for diet/physical activity outcomes

Four CBAs measured dietary outcomes (Huot, O'Loughlin, Baxter, Osler). Three measured no difference in dietary outcomes between the intervention and control areas (Huot, O'Loughlin, Osler). The UK study (Baxter) observed a single significant change, in that 8.7% more people drank low-fat milk in the intervention population ($p < 0.001$). The authors believed that this change in was largely attributable to a 'wake up to semi-skimmed milk' promotion – leaflets were delivered to 11,000 households over a 2-year period.

Three CBAs measured PA outcomes (O'Loughlin, Baxter, Osler). None of the studies detected a difference between control, although two (O'Loughlin, Osler) noted an increase in PA in both intervention and control populations.

Evidence of corroboration in the UK

One of the studies (Baxter) was carried out in Rotherham, UK.

Cost-effectiveness data

Baxter estimated the cost per life-year gained as £31 in 1997 (but this was based on a reduction in smoking of 6.9% as well as an increase in semi-skimmed milk consumption of 8.7%).

EVIDENCE TABLE 5: MULTI-COMPONENT CITY-/COUNTY-/STATE-WIDE INTERVENTIONS WITH POTENTIAL FOR LOCAL IMPLEMENTATION

First author	Study design	Research type	Research quality	Study population	Research question and design (include power calculation if available)	Length of follow-up	Main results (include effect size(s)/confidence intervals for each outcome if available)	Confounders (potential sources of bias)/comments
Evidence of efficacy (internal validity) for weight maintenance/reduction								
O'Loughlin 1999	CBA	2	+	St Henri, Montreal, Canada – adults in a low-income, inner city neighbourhood with a population of 25,000. Independent sample survey and longitudinal survey of 52% of independent sample. At baseline in independent sample: *n* = 849 in intervention and *n* = 825 in control. Mean age (years) 38.8 (12.8) in intervention and 36.9 (11.7) in control. 47.3% male in intervention and 52.8% male in control. 72.9% completed high school in intervention and 77.4% in control. 28.4% with insufficient household income	**Aim:** To evaluate the impact of a 4-year community based cardiovascular disease prevention program among adults aged 18–65 years in a low-income inner city neighbourhood. 'Coeur en santé St-Henri' included smoking cessation workshops, nutrition education, menu-labelling and point of choice education, mailed print education materials and screening. No power calculation provided. **Delivered by:** Coeur en santé St-Henri 'run from an ordinary public health department'. Unclear who delivered	Four-year intervention. Three-year follow-up from baseline for repeat independent sample survey and 5-year follow-up from baseline for longitudinal survey (18 months post-intervention).	**Independent sample survey:** Baseline: 79.3% response rate in intervention: 77.8% response rate in control. Follow-up: 70.6% response rate in intervention and 67.2% response rate in control. **Longitudinal survey:** Intervention: 423/849 = 50% follow-up. Control: 396/825 = 48% follow-up. The participation rate in activities was only 2–3%. There were few community-wide programme benefits. In the independent sample there were no statistically significant differences between intervention and control in the OR of BMI ≥27 kg/m^2 (p = 0.466) at follow-up. In the longitudinal cohort survey the percentage of subjects with mean BMI ≥27 kg/m^2 increased in intervention by 9.5% and in control by 9.3 (OR 1, 95% CI 0.7,	Reliance on self-report, use of telephone surveys, loss to follow-up in the longitudinal cohort study, and contamination of control site. Also relevant to awareness-raising review.

				in intervention and 33.8% in control Subjects from random samples selected from residential telephone directories.	interventions.		1.6)%.	
Baxter 1997	CBA	2	+	Adults aged 18–64 years in Rotherham, UK. Two intervention areas with a high incidence of coronary heart disease (Swinton and Wath) were compared with a control area (Maltby) with a similar record for coronary heart disease and socio-economic composition. Jarman deprivation scores (and values)/unemployment rates (and values) for intervention areas of Swinton = 12 (1.5)/10 (11.3) and Wath = 9 (–1.2)/7 (10.4) compared with control area Maltby = 14 (3.5)/12(11.8).	**Aim:** To determine whether a community-based coronary heart disease health promotion project was associated with changes in lifestyle risk factors and to estimate whether such an approach was cost-effective. Subjects for the separate cross-sectional surveys at baseline and post-intervention (4 years) randomly selected from the Rotherham Family Health Services Authority register. Power calculation assumed 2% smoking reduction over 3 years. No power calculation for weight control. **Delivered by:**	Four years with surveys at baseline and 4 years.	Response rates to questionnaire 82–86%. There were no weight benefits. Overweight increased in all areas between baseline and follow-up and there were no significant differences in weight change between the intervention and control areas.	The Action Heart health promotion intervention: Incorporating elements of behavioural change (e.g. weight control clinic, stop smoking groups), education (course, leaflets, library resources), empowerment (action heart clubs), medical (screening checks), social change (institutional action heart charter). Questionnaire validated in previous research (references provided). Socio-economic differences between study and control sites so study essentially before and after. Self-reported outcomes. Excellent response rate.

					Health Authority/higher education researchers.			
Shelley 1995	CBA	2	+	Adults in the county of Kilkenny, south-east Ireland (*n* = approximately 70,000) and reference county with shared demographics. **Intervention sample:** Baseline: *n* = 792 (53.3% male, 42.9% aged 35–44 years, 29.4% aged 49–54 years, 27.7% aged 55–64 years). Follow-up: *n* = 802 (50.2% male, 44.4% aged 35–44 years, 31.9% aged 45–54 years, 23.7% aged 55–64 years). **Reference sample:** Baseline: *n* = 604 (51.7% male, 40.2% aged 35–44 years, 32.1% aged 45–54 years, 27.7% aged 55–64 years). Follow-up: *n* = 631	**Aim:** To assess the results of the Kilkenny Health Project in terms of the effect on the major cardiovascular risk factors. Outcomes evaluated by means of population surveys of independent samples in Kilkenny and in equivalent control community. Programme included leaflets, training seminars for health, education and catering personnel, nutrition counselling service and coverage in local media. **Power calculation:** The sample size (900 in intervention and 600 in reference communities) gives a power of 80%, at a two-sided significance level of 5%, to detect differences between the two communities	Five-year health promotion project, with measurements at baseline and 5 years later.	'The final response rates for the surveys were in the range of 70–75% of the self-selected sample' (no data provided). Mean BMI increased by 0.4 kg/m² in men in the intervention area compared with by 1.0 kg/m² in the controls ($p < 0.01$). For women increases were 0.4 and 1.3 kg/m² respectively ($p < 0.01$) in women. The end result was a net but non-significant reduction in BMI gain in both males and females in the intervention compared with the control communities.	Baseline survey in reference group may have taken place after intervention started (1986). Possible contamination of reference group by national media (see above). Self-selected sample. Different cross-sectional samples. No intervention control (although may have seen some national media: 'national media used as little as possible in the early years of the project'.

				(49% male, 43.3% aged 35–44 years, 32.5% aged 45–54 years, 24.2% aged 55–64 years) No socio-economic details provided. Self-selected recruitment – sample of 2000–3000 subjects selected from the register of electors and subjects asked if they wanted to participate. Chosen to ensure spread of age and sex.	of at least 20% in the prevalence of any risk factor. **Delivered by:** Survey nurses.			
Evidence of efficacy (internal validity) for diet outcomes								
Huot 2004	CBA	2	+	Suburban and rural communities in Montreal, Canada. Adults were all parents targeted through their grade 4–6 children at school. Control communities were selected with similar socio-economic data. Pre- and post-analysis was through independent samples and there	**Aim:** To evaluate the dietary impact of multiple community-based cardiovascular disease prevention programmes by means of a validated, self-administered FFQ. **Suburban programme:** Local media articles, taste-testing sessions, meetings/conferences, games in local stores, walking clubs.	Five-year intervention with baseline and 4-year assessment.	Response rates varied among sites from 65% to >80%. Only 4% of the suburban intervention community participated in activities. 19% of the rural group said they had participated in a heart health activity while 15% of the control group also reported involvement, indicating contamination. The interventions did not have any measurable effect on dietary behaviours either within or between groups.	The urban programme was school-based and is not summarised here. Clear differences between the pre and post-test groups could have seriously confounded the results. The Ammerman FFQ was validated with 70 adults and a test/pre-test reliability of 0.78 recorded. Self-reported weight and PA reported in companion paper? – no reference given.

				were variations in socio-economic data at post- compared with pre-test (see confounders). Pooled data (very similar for intervention and control groups): circa 55% female. Mean age circa 40 (SD circa 5.7) years. Primary school education or less at baseline circa 13% and follow-up circa 6%. College or above education at baseline circa 36% and at follow-up circa 46%. Separate data were not provided for rural and suburban communities.	**Rural programme:** Local newspaper articles, screening sessions for hypertension/cholesterolaemia, supermarket tours, healthy recipe booklets, food tasting and cookery sessions, conferences, walking clubs. No power calculation. **Delivered by**: Suburban – unknown. Rural – local volunteers. Evaluation by higher education researchers.		The suburban sites showed improvements in diet in both experimental and control groups while the rural sites showed deterioration in both groups (all non significant). The authors proposed several possible explanations for lack of effect including the difficulty of involving the community in events, cross contamination, problems with the dietary measure and bias from the study design.	
O'Loughlin 1999	CBA	2	+	Adults in St Henri, Montreal, Canada – low-income, inner-city neighbourhood with a population of 25,000. Independent sample survey and longitudinal survey. At baseline in independent survey – *n* = 849 in intervention and	**Aim:** To evaluate the impact of a 4-year community-based cardiovascular disease prevention programme among adults aged 18–65 years in a low-income inner city neighbourhood. 'Coeur en santé St-	Four-year intervention. Three-year follow-up from baseline for repeat independent sample survey and 5-year follow-up from baseline for longitudinal survey (18-	**Independent sample survey:** Baseline: 79.3% response rate in intervention, 77.8% response rate in control. Follow-up: 70.6% response rate in intervention and 67.2% response rate in control. **Longitudinal survey:** Intervention: 423/849 = 50% follow-up	Reliance on self-report, use of telephone surveys, loss to follow-up in the longitudinal cohort study, and contamination of control site. Also relevant to awareness raising review.

				n = 825 in control. Mean age: 38.8 (SD 12.8) in intervention and 36.9 (SD 11.7) years in control. 47.3% male in intervention and 52.8% male in control. 72.9% completed high school in intervention and 77.4% in control. 28.4% with insufficient household income in intervention and 33.8% in control. Subjects from random samples selected from residential telephone directories.	Henri' included smoking cessation workshops, nutrition education, menu-labelling and point-of-choice education, mailed print education materials and screening. No power calculation provided. **Delivered by:** Coeur en santé St-Henri 'run from an ordinary public health department'. Unclear who delivered interventions.	months post-intervention).	Control: 396/825 = 48% follow-up The participation rate in activities was only 2–3% and there were few community wide programme effects. In the independent sample there were no statistically significant differences between intervention and control in the ORs of high-fat/junk food consumption at follow-up (p = 0.442). In the longitudinal cohort survey there were no significant declines in the prevalence of high fat/junk food consumption in either community.	
Baxter 1997	CBA	2	+	Adults aged 18–64 years in Rotherham, UK. Two intervention areas with a high incidence of coronary heart disease (Swinton and Wath) were compared with a control area (Maltby) with a similar record for coronary heart disease and socio-	**Aim:** To determine whether a community-based coronary heart disease health promotion project was associated with changes in lifestyle risk factors and to estimate whether such an approach was cost-effective. Subjects for the	Four years with surveys at baseline and 4 years.	Response rates to questionnaire 82–86%. Low-fat milk consumption increased in both intervention and control areas from baseline to follow but 8.7% more people drank low-fat milk (p < 0.001) in the intervention area compared with the control area. No other statistically significant changes between the areas were detected. The authors believed that the change in low-fat milk consumption was largely	The Action Heart health promotion intervention: Incorporating elements of behavioural change (e.g. weight control clinic, stop smoking groups), education (course, leaflets, library resources), empowerment (action heart clubs), medical (screening checks), social change (institutional action heart charter).

				economic composition. Jarman deprivation scores (and values)/unemployment rates (and values) for intervention areas of Swinton = 12 (1.5)/10 (11.3) and Wath = 9 (–1.2)/7 (10.4) compared with control area Maltby = 14 (3.5)/12 (11.8).	separate cross-sectional surveys at baseline and post-intervention (4 years) were randomly selected from the Rotherham Family Health Services Authority register. Power calculation assumed 2% smoking reduction over 3 years. No calculation re diet outcomes. **Delivered by:** Health Authority/higher education researchers.		attributable to a 'wake up to semi-skimmed milk' promotion as part of the intervention – leaflets were delivered to 11,000 households in the intervention area over a 2-year period.	Questionnaire validated in previous research (references provided). Socio-economic differences between study and control sites so study essentially before and after. Self-reported outcomes. Excellent response rate.
Osler 1993	CBA	2	+	Adults in two municipalities in rural Denmark. Control municipality had comparable population parameters. **Intervention:** *n* = 1010 (1989) and *n* = 1003 (1990). 52% female, 84% married or cohabiting, 56% with more than 3 years education and 20% with none. Age range 20–	**Aim:** To assess the effect of a community-based cardiovascular disease prevention project on awareness and health behaviours. Activities (fitness tests, exercise, smoking cessation programmes, safety education and demonstration of how to buy healthy food). Heart Week organised after 6 months with	Intervention throughout 12 months? One-year follow-up from baseline (6 months from 'Heart week').	51% of total sample (intervention and control) responded to cross-sectional surveys in 1989, and 59% of total sample responded in 1990. Response rate lowest amongst men aged 20–24 years and highest amongst women aged 44–65 years. Unmarried and divorced people under-represented in sample. 39% of respondents ate less fat with no difference between intervention and control area. Sex (Female?) ($p < 0.001$) and health beliefs (own effort is	Low response rate. Evaluation of study possibly not sufficiently sensitive to detect an acceleration of an already observed upturn in health behaviour in Denmark. Integration of programme into community social organisations didn't appear to work. Difficult to recruit volunteers and elements of group activities and face-to-face interaction were of limited proportions and based on self-selection,

				65 years, 78% between 25 and 54 years old. **Control:** *n* = 1092 (1989) and *n* = 1109 (1990) 50% female, 83% married or cohabiting, 54% with more than 3 years education and 19% with none. Age range 20–65 years, 75% between 25 and 54 years old.	activities and mass media (cinema, newspaper and radio) campaign. **Delivered by:** Volunteers organised by a paid project coordinator, led by a steering committee with members of the Health Council under the local Health Administration. No power calculation provided.		important) ($p < 0.001$) predicted attained changes in fat consumption.	and the project ended up as a pure mass media campaign.
Evidence of efficacy (internal validity) for physical activity outcomes								
O'Loughlin 1999	CBA	2	+	Adults in St Henri, Montreal, Canada – low-income, inner city neighbourhood with a population of 25,000. Independent sample survey and longitudinal survey. At baseline in independent sample *n* = 849 in intervention and *n* = 825 in control. Mean age 38.8 (12.8) years in intervention and 36.9 (11.7) years in control. 47.3% male in intervention and 52.8% male in	**Aim:** To evaluate the impact of a 4-year community-based cardiovascular disease prevention program among adults aged 18–65 years in a low-income inner city neighbourhood. 'Coeur en santé St-Henri' included smoking cessation workshops, nutrition education, menu-labelling and point of choice education, mailed print education materials	Four-year intervention. Three-year follow-up from baseline for repeat independent sample survey and 5-year follow-up from baseline for longitudinal survey (18 months post-intervention).	**Independent sample survey:** Baseline: 79.3% response rate in intervention, 77.8% response rate in control. Follow-up: 70.6% response rate in intervention, 67.2% response rate in control. **Longitudinal survey:** Intervention: 423/849 = 50% follow-up. Control 396/825 = 48% follow-up. Participation rate in activities was only 2–3% and there were few community-wide programme effects. In the independent sample survey models for physical inactivity, the adjusted OR for infrequent leisure time PA	Reliance on self-report, use of telephone surveys, loss to follow-up in the longitudinal cohort study, and contamination of control site.

				control. 72.9% completed high school in intervention and 77.4% in control. 28.4% with insufficient household income in intervention and 33.8% in control Subjects from random samples selected from residential telephone directories.	and screening. No power calculation provided. **Delivered by:** Coeur en santé St-Henri 'run from an ordinary public health department'. Unclear who delivered interventions.		in intervention was 1.9 compared with 2.8 in control, indicating that PA increased more in control group, but this did not reach statistical significance (p = 0.063). In the longitudinal cohort survey there were no significant declines in the prevalence of physical inactivity between communities, both of which reported an increase in PA (+16.3% in the intervention and +13.5% in the control communities).	
Baxter 1997	CBA	2	+	Adults aged 18–64 years in Rotherham, UK. Two intervention areas with a high incidence of coronary heart disease (Swinton and Wath) were compared with a control area (Maltby) with a similar record for coronary heart disease and socio-economic composition. Jarman deprivation scores (and values)/unemployment rates (and values) for intervention areas	**Aim:** To determine whether a community based coronary heart disease health promotion project was associated with changes in lifestyle risk factors and to estimate whether such an approach was cost-effective. Subjects for the separate cross-sectional surveys at baseline and post-intervention (4 years) were randomly selected from the Rotherham Family Health Services Authority register. Power calculation	Four years with surveys at baseline and 4 years.	Response rates to questionnaire 82–86%. No PA changes were detected between baseline and follow-up in either the intervention or the control group.	The Action Heart health promotion intervention: incorporating elements of behavioural change (e.g. weight control clinic, stop smoking groups), education (course, leaflets, library resources), empowerment (action heart clubs), medical (screening checks), social change (institutional action heart charter). Questionnaire validated in previous research (references provided). Socio-economic differences between study and control sites so study essentially before and after. Self-

				of Swinton = 12 (1.5)/10 (11.3) and Wath = 9 (–1.2)/7 (10.4) compared with control area Maltby = 14 (3.5)/12(11.8).	assumed 2% smoking reduction over 3 years. No power calculation for PA outcomes. **Delivered by:** Health Authority/higher education researchers.			reported outcomes. Excellent response rate.
Osler 1993	CBA	2	+	Adults in two municipalities in rural Denmark. Control municipality had comparable population parameters. **Intervention:** *n* = 1010 (1989) and *n* = 1003 (1990). 52% female, 84% married or cohabiting, 56% with more than 3 years education and 20% with none. Age range 20–65 years, 78% between 25 and 54 years old. **Control:** *n* = 1092 (1989) and *n* = 1109 (1990). 50% female, 83% married or	**Aim:** To assess the effect of a community-based cardiovascular disease prevention project on awareness and health behaviours. Activities (fitness tests, exercise, smoking cessation programmes, safety education and demonstration of how to buy healthy food). Heart Week organised after 6 months with activities and mass media (cinema, newspaper and radio) campaign. **Delivered by:** Volunteers organised by a paid project coordinator, led by a steering committee	Intervention throughout 12 months? One-year follow-up from baseline (6 months from 'Heart week').	51% of total sample (intervention and control) responded to cross-sectional surveys in 1989, and 59% of total sample responded in 1990. Response rate lowest amongst men aged 20–24 years and highest amongst women aged 44–65 years. Unmarried and divorced people under-represented in sample. 28% did more exercise with no difference between intervention and control area. 13% and 15% reported being physically inactive in intervention and control areas at baseline. At follow-up 20% reported being physically inactive in both areas. Age ($p = 0.01$) and health beliefs (own effort is important) ($p < 0.001$) predicted attained changes in PA.	Low response rate. Evaluation of study possibly not sufficiently sensitive to detect an acceleration of an already observed upturn in health behaviour in Denmark. Integration of programme into community social organisations didn't appear to work. Difficult to recruit volunteers and elements of group activities and face-to-face interaction were of limited proportions and based on self-selection, and the project ended up as a pure mass media campaign.

				cohabiting, 54% with more than 3 years education and 19% with none. Age range = 20–65 years, 75% between 25 and 54 years.	with members of the Health Council under the local Health Administration. No power calculation provided.			

1

Evidence of corroboration (external validity)								
Evidence of salience – Is it appropriate for the UK?								
First author	**Study design**	**Research type**	**Research quality**	**Study population**	**Research question and design** (include power calculation if available)	**Length of follow-up**	**Main results** (include effect size(s)/confidence intervals for each outcome if available)	**Confounders** (potential sources of bias)**/Comments**
Baxter 1997	CBA	2	+	Adults aged 18–64 years in Rotherham, UK.	See above.	See above.	See above.	See above.

2

Evidence for implementation – Will it work in the UK?								
Overall strength of evidence of corroboration =								
First author	**Study design**	**Research type**	**Research quality**	**Study population**	**Research question and design** (include power calculation if available)	**Length of follow-up**	**Main results** (include effect size(s)/confidence intervals for each outcome if available)	**Confounders** (potential sources of bias)**/comments**

SEARCH STRATEGIES

1. exp OBESITY/
2. exp Weight Gain/
3. exp Weight Loss/
4. obes$.ti,ab.
5. (weight gain or weight loss).ti,ab.
6. (overweight or over weight or overeat$ or over eat$).ti,ab.
7. weight change$.ti,ab.
8. ((bmi or body mass index) adj2 (gain or loss or change)).ti,ab.
9. body mass.ti,ab.
10. or/1-9
11. exp Behavior Therapy/
12. exp Social Support/
13. exp Family Therapy/
14. exp Psychotherapy, Group/
15. ((psychological or behavio?r$) adj (therapy or modif$ or strateg$ or intervention$)).ti,ab.
16. (group therapy or family therapy or cognitive therapy).ti,ab.
17. ((lifestyle or life style) adj (chang$ or intervention$)).ti,ab.
18. counsel?ing.ti,ab.
19. social support.ti,ab.
20. (peer adj2 support).ti,ab.
21. (children adj3 parent$ adj therapy).ti,ab.
22. or/11-21
23. exp OBESITY/dh [Diet Therapy]
24. exp Diet, Fat-Restricted/
25. exp Diet, Reducing/
26. exp Diet Therapy/
27. exp FASTING/
28. diet$.ti,ab.
29. (diet$ adj (modif$ or therapy or intervention$ or strateg$)).ti,ab.
30. (low calorie or calorie control$ or healthy eating).ti,ab.
31. (fasting or modified fast$).ti,ab.
32. exp Dietary Fats/
33. (fruit or vegetable$).ti,ab.
34. (high fat$ or low fat$ or fatty food$).ti,ab.
35. formula diet$.ti,ab.
36. or/23-35
37. exp EXERCISE/
38. exp Exercise Therapy/
39. exercis$.ti,ab.
40. (aerobics or physical therapy or physical activity or physical inactivity).ti,ab.
41. (fitness adj (class$ or regime$ or program$)).ti,ab.
42. (aerobics or physical therapy or physical training or physical education).ti,ab.
43. dance therapy.ti,ab.
44. sedentary behavio?r.ti,ab.
45. or/37-44
46. exp Complementary Therapies/
47. (alternative medicine or complementary therap$ or complementary medicine).ti,ab.
48. (hypnotism or hypnosis or hypnotherapy).ti,ab.
49. (acupuncture or homeopathy or homoeopathy).ti,ab.
50. (chinese medicine or indian medicine or herbal medicine or ayurvedic).ti,ab.
51. or/46–50
52. ((diet or dieting or slim$) adj (club$ or organi?ation)).ti,ab.
53. (weightwatcher$ or weight watcher$).ti,ab.
54. (correspondence adj (course$ or program$)).ti,ab.
55. (fat camp$ or diet$ camp$).ti,ab.
56. or/52-55
57. exp Health Promotion/
58. exp Health Education/
59. mass media/
60. (health promotion or health education).ti,ab.

61. (media intervention$ or community intervention$).ti,ab.
62. (community adj2 program$).ti,ab.
63. (family intervention$ or parent$ intervention$).ti,ab.
64. or/57-63
65. exp Health Policy/
66. exp Nutrition Policy/
67. (health polic$ or food polic$ or nutrition polic$).ti,ab.
68. or/65-67
69. exp OBESITY/pc [Prevention & Control]
70. exp Primary Prevention/
71. (primary prevention or secondary prevention).ti,ab.
72. (preventive measure$ or preventative measure$).ti,ab.
73. (preventive care or preventative care).ti,ab.
74. (obesity adj2 (prevent$ or treat$)).ti,ab.
75. or/69-74
76. exp Controlled Clinical Trials/
77. exp Random Allocation/
78. exp Double-Blind Method/
79. exp Single-Blind Method/
80. exp PLACEBOS/
81. exp Research Design/
82. exp Intervention Studies/
83. exp Evaluation Studies/
84. exp Cost Benefit Analysis/
85. (time adj series).tw.
86. ((singl$ or doubl$ or trebl$ or tripl$) adj5 (blind$ or mask)).ti,ab.
87. exact{CONTROLLED-CLINICAL-TRIAL}.pt.
88. placebo$.ti,ab.
89. (matched communities or matched populations).ti,ab.
90. (control$ adj (trial$ or stud$ or evaluation$ or experiment$)).ti,ab.
91. (comparison group$ or control group$).ti,ab.
92. matched pairs.ti,ab.
93. (outcome study or outcome studies).ti,ab.
94. (quasiexperimental or quasi experimental or pseudo experimental).ti,ab.
95. (nonrandomi?ed or non randomi?ed or pseudo randomi?ed).ti,ab.
96. randomi?ed.hw.
97. (cohort or survey: or qualitative).ti,ab.
98. or/76-97
99. exp Meta-Analysis/
100. meta-analys$.ti,ab.
101. metaanalys$.ab,ti.
102. meta analys$.ab,ti.
103. Cochrane.ab,sh,ti.
104. (review$ or overview$).ti.
105. review$.pt.
106. (synthes$ adj3 (literature$ or research or studies or data)).ab,ti.
107. pooled analys$.ab,ti.
108. ((data adj2 pool$) and studies).mp.
109. ((hand or manual or database$ or computer$) adj2 search$).ab,ti.
110. ((electronic or bibliographic$) adj2 (database$ or data base$)).ab,ti.
111. ((review$ or overview$) adj10 (systematic$ or methodologic$ or quantitativ$ or research$ or literature$ or studies or trial$ or effective$)).ab.
112. or/99-111
113. (retrospective$ adj2 review$).ab,sh,ti.
114. (case$ adj2 review$).ab,sh,ti.
115. (record$ adj2 review$).ab,sh,ti.
116. (patient$ adj2 review$).ab,sh,ti.
117. (patient$ adj2 chart$).ab,sh,ti.
118. (peer adj2 review$).ab,sh,ti.
119. (chart$ adj2 review$).ab,sh,ti.
120. (case$ adj2 report$).ab,sh,ti.
121. (rat or rats or mouse or mice or hamster or hamsters or animal or animals or dog or dogs or cat or cats or bovine or sheep).ab,sh,ti.

122. or/113-121
123. 122 not (122 and 112)
124. 112 not 123
125. 22 or 36 or 45 or 51 or 56 or 64 or 68 or 75
126. 10 and 98 and 125
127. 10 and 124 and 125
128. 126 or 127
129. Residence characteristics/
130. Community Health Planning/
131. Community Health Services/
132. Community-Institutional Relations/
133. Public Health/
134. Environment Design/
135. City planning/
136. Social Environment/
137. Housing/
138. Restaurants/
139. restaurant$.ti,ab.
140. neighbo?rhood$.ti,ab.
141. community wide.af.
142. built environment$.ti,ab.
143. shop$.ti,ab.
144. supermarket$.ti,ab.
145. vending machine$.ti,ab.
146. food desert$.ti,ab.
147. church$.ti,ab.
148. urban environment$.ti,ab.
149. (barriers adj10 food).ti,ab.
150. guide to community preventive services.ti,ab.
151. (youth club$ or gym$ or leisure cent$ or leisure service$).ti,ab.
152. or/129-151
153. 128 and 152
154. animal.sh.
155. human.sh.
156. 154 not (154 and 155)
157. 153 not 156
158. limit 157 to yr=1990-2005

DATA SOURCES

The following information sources were searched during April 2005:

AMED (Allied and Complementary Medicine)
ASSIA (Applied Social Sciences Index and Abstracts)
British Nursing Index
CAB Abstracts - Human health and nutrition, agriculture
CENTRAL (Cochrane Controlled Trials Register)
CINAHL (Cumulative Index to Nursing & Allied Health Literature
Clinical Evidence - http://www.clinicalevidence.org
Cochrane Database of Systematic Reviews
NHS EED (NHS Economic Evaluation Database) - http://www.york.ac.uk/inst/crd
DARE (Database of Abstracts of Reviews of Effects)
Embase
EPPI-Centre - http://eppi.ioe.ac.uk/
ERIC (Educational Resources Information Centre)
Food Standards Agency - http://www.food.gov.uk/science/research/
HDA Evidence Base - http://www.hda-online.org.uk/html/research/effectiveness.html
Health Evidence Bulletins – Wales - http://hebw.cf.ac.uk
HealthPromis
IUHPE (International Union for Health Promotion and Education) - http://www.iuhpe.org
Medline
NCCHTA (National Coordinating Centre for Health Technology Assessment) - http://www.ncchta.org
NICE (National Institute for Clinical Excellence) – www.nice.org.uk
Public Health Effectiveness (Hamilton, Ontario) - http://www.health.hamilton-went.on.ca/CSCARB/EPHPP/ephpp.htm
PsycINFO
SIGN (Scottish Intercollegiate Guidelines Network) – http://www.sign.ac.uk
Social Science Citation Index (equiv. to Current Contents)
Sociological Abstracts
Sport Discus
Urbadisc

Update searches

An update search of the same databases was carried out in September 2005 for worldwide intervention and UK corroborative studies. A final search was completed on 1 December 2005 for systematic reviews and controlled trials only in a reduced number of databases: CINAHL, Cochrane, Embase, Medline and PsycINFO.

The electronic search strategies (see part c, supporting information) were developed in Medline and adapted for use with the other information sources. Additional papers were identified from reference lists and (*n* = 7) by members of the GDG.

EXCLUDED REFERENCES

Papers excluded: non UK-corroborative

Paper	Reason for exclusion
Addy CL, Ainsworth BE, Kimsey D, Kirtland KA, Sharpe P, Wilson DK. Associations of perceived social and physical environmental supports with physical and walking behaviour. *American Journal of Public Health* 2004;94(3):440–3.	Non-UK corroborative – excluded due to lack of time.
Anonymous. The national bicycling and walking study. Case study number 1: Reasons why bicycling and walking are not used more extensively as travel modes. US Department of Transportation. Washington DC; 1994.	Non-UK corroborative – excluded due to lack of time.
Appleyard BS. Planning safe routes to school. *Planning* 2003;69(5):34–7.	Non-UK corroborative – excluded due to lack of time.
Ashton B, Hehir A. Working with private partner organizations to address public health nutrition issues: a case study. *Nutrition and Dietetics* 2002;59:43–7.	Non-UK corroborative – excluded due to lack of time.
Ball K, Crawford D, Warren N. How feasible are healthy eating and physical activity for young women? *Public Health Nutrition* 2004;7(3):433–41.	Non-UK corroborative – excluded due to lack of time.
Bauman AE, Humpel N, Leslie E, Marshall AL, Owen N, Sallis JF. Association of location and perceived environmental attributes with walking in neighbourhoods. *American Journal of Health Promotion* 2004;18(3):239–42.	Non-UK corroborative – excluded due to lack of time.
Benson W. Strategies and willingness of rural restaurateurs to promote healthy foods. *Canadian Journal of Public Health* 1995;86(3):181–4.	Non-UK corroborative – excluded due to lack of time.
Blanchard CM, McGannon KR, Spence JC et al. Social ecological correlates of physical activity in normal weight, overweight, and obese individuals. *International Journal of Obesity* 2005;29(6):720–6.	Non-UK corroborative – excluded due to lack of time.
Boarnet MG, Anderson CL, Day K, McMillan T, Alfonzo M. Evaluation of the California Safe Routes to School legislation: urban form changes and children's active transportation to school. *American Journal of Preventive Medicine* 2005;28(2)(Suppl 2):134–40.	Non-UK corroborative – excluded due to lack of time.
Braza M, Seeley A, Shoemaker W. Neighborhood design and rates of walking and biking to elementary school in 34 California communities. *American Journal of Health Promotion* 2004;19(2):128–36.	Non-UK corroborative – excluded due to lack of time.
Brownson RC, Housemann RA, Brown DR et al. Promoting physical activity in rural communities: walking trail access, use and effects. *American Journal of Preventive Medicine* 2000;18(3):235–41.	Non-UK corroborative – excluded due to lack of time.
Centers for Disease Control and Prevention. *Kids walk to school: a guide to promote walking to school.* Washington DC: Department of Health and Human Services; 1999.	Non-UK corroborative – excluded due to lack of time.
Cho MH. The strength of motivation and physical activity level during leisure time among youth in South Korea. *Youth and Society* 2004;35(4):480–94.	Non-UK corroborative – excluded due to lack of time.
Clark DO, Nothwehr F. Exercise self-efficacy and its correlates among	Non-UK corroborative –

socio-economically disadvantaged older adults. *Health Education and Behaviour* 1999;26(4):535–46.	excluded due to lack of time.
Clarke A, Dornfeld M. *National bicycling and walking study. FHWA case study no. 19: Traffic calming, auto-restricted zones and other traffic management techniques – Their effects on bicycling and pedestrians.* Report no. FHWA-PD-93-028. Washington DC: Federal Highway Administration; 1994.	Non-UK corroborative – excluded due to lack of time.
Corti B, Donovan RJ, Holman CDJ. Factors influencing the use of physical activity facilities: results from qualitative research. *Health Promotion Journal of Australia* 1996;6(1):16–21.	Non-UK corroborative – excluded due to lack of time.
Cotugna N, Vickery CE. Development and supermarket field testing of videotaped nutrition messages for cancer risk reduction. *Public Health Reports*. 1992;107(6):691–4.	Non-UK corroborative – excluded due to lack of time.
Cox R, Parker G, Watson A et al. Dietary cancer risk of low-income women and change with intervention. *Journal of the American Dietetic Association*. 1995;95:1031–4.	Non-UK corroborative – excluded due to lack of time.
Darbyshire P, McDougall C, Schinder W. We have to live in the future. *Early Child Development and Care* 2004;174(3):369–87.	
Duncan HH, Travis SS, McAuley WJ. An emergent theoretical model for interventions encouraging physical activity (mall walking) among older adults. *Journal of Applied Gerontology* 1995;14(1):64–77.	Non-UK corroborative – excluded due to lack of time.
Duncan M, Mummery K. Psychosocial and environmental factors associated with physical activity among city dwellers in regional Queensland. *Preventive Medicine* 2005;40(4):363–72.	Non-UK corroborative – excluded due to lack of time.
Dwivedi G, Harvey J. Evaluation of the heart smart heart beat restaurant program. *Canadian Journal of Dietetic Practice and Research* 1999;60(156):159.	Non-UK corroborative – excluded due to lack of time.
Elkins WL, Cohen DA, Koralewicz LM, Taylor SN. After school activities, overweight and obesity among inner city youth. *Journal of Adolescence* 2004;27(2):181–9.	Non-UK corroborative – excluded due to lack of time.
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Frank LD, Engelke PO, Schmid TL. *Health and community design: the impact of the built environment on physical activity.* Washington DC: Island Press; 2003.	Non-UK corroborative – excluded due to lack of time.
Frazao E. *America's eating habits: changes and consequences.* Washington, DC: USDA/Economic Research Services 1999.	Non-UK corroborative – excluded due to lack of time.
French SA, Harnack L, Jeffery RW. Fast food restaurant use among women in the Pound of Prevention study: dietary, behavioural and demographic correlates. *International Journal of Obesity and Related Metabolic Disorders*. 2000;24(10):1353–9.	Non-UK corroborative – excluded due to lack of time.

Gehl J, Gemzoe L. *Public spaces, public life*. Copenhagen: Danish Architectural Press; 1999.	Non-UK corroborative – excluded due to lack of time . NB: Reference from paper suggested by GDG.
Giles-Corti B, Donovan RJ. The relative influence of individual, social and physical environment determinants of physical activity. *Social Science and Medicine* 2002;54:1793–1812.	Non-UK corroborative – excluded due to lack of time
Go for Green/Environics. *National survey on active transportation: summary report*. Ottawa, Canada: Go for Green/Environics; 1998.	Non-UK corroborative – excluded due to lack of time
Godbey G, Graefe A, James, SW. The benefits of local recreation and park services: a nationwide study of the perceptions of the American public. Pennsylvania: Pennsylvania State University;1992.	Non-UK corroborative – excluded due to lack of time
Granner ML, Sargent RG, Calderon KS et al. Factors of fruit and vegetable intake by race, gender, and age among young adolescents. *Journal of Nutrition Education and Behaviour* 2004;36(4):173–80.	Non-UK corroborative- excluded due to lack of time
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neighborhood environments, and their association with objectively measured physical activity: a qualitative and quantitative study. *Health Education Research* 2005;20(1):1–13.	excluded due to lack of time.
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Lian WM, Gan GL, Pin CH, Wee S, Ye HC. Correlates of leisure-time physical activity in an elderly population in Singapore. *American Journal of Public Health* 1999;89(10):1578–80.	Non-UK corroborative – excluded due to lack of time.
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Lobstein T, Dibb S. Evidence of a possible link between obesogenic food	Ecological study. Includes UK

advertising and child overweight. *Obesity Reviews* 2005;6(3):203–8.	corroborative data but excluded from December 2005 update that covered RCTs and systematic reviews only.
MacDougall C, Cooke R, Owen N, Willson K, Bauman A. Relating physical activity to health status, social connections and community facilities. *Australian and New Zealand Journal of Public Health* 1997;21:631–7.	Non-UK corroborative – excluded due to lack of time.
McCabe MP, Ricciardeli LA. A prospective study of pressures from parents, peers, and the media on extreme weight change behaviours among adolescent boys and girls. *Behaviour Research and Therapy* 2005;43:663–8.	Non-UK corroborative – excluded due to lack of time.
Merrill RM, Shields EC, White GL, Druce D. Climate conditions and physical activity in the United States. *American Journal of Health Behaviour* 2005;29(4):371–81.	Non-UK corroborative – excluded due to lack of time.
Mitchell SA, Olds RS. Psychological and perceived situational predictors of physical activity: a cross-sectional analysis. *Health Education Research* 1999;14:305–13.	Non-UK corroborative – excluded due to lack of time.
Moudon A, Hess *P*, Snyder M, Stanliov K. Effects of site design on pedestrian travel in mixed use medium-density environments. *Transportation Research Record* 1997;1578:48–55.	Non-UK corroborative – excluded due to lack of time.
Neumark-Sztainer D, Story M, Perry C, Casey MA. Factors influencing food choices of adolescents: findings from focus-group discussions with adolescents. *Journal of the American Dietetic Association* 1999;99(8):929–34.	Non-UK corroborative excluded due to lack of time.
Nielson K-D, Dyhr l, Lauritzen T, Malterud K. You can't prevent everything anyway: A qualitative study of beliefs and attitudes about refusing health screening in general practice. *Family Practice* 2004;21(1):	Non-UK corroborative excluded due to lack of time.
North Carolina Prevention Partners. Winner's circle healthy dining program. *Health Education Behavior* 2002;29:406–8.	Non-UK corroborative – excluded due to lack of time.
O'Loughlin J, Ledoux J, Barnett T. La Commande du Coeur (‘Shop for your Heart’): a point-of-choice nutrition education campaign in a low-income urban neighbourhood. *American Journal of Health Promotion* 1996;10(3):175–8.	Non-UK corroborative – excluded due to lack of time.
Pikora T, Giles-Corti B, Bull F, Jamrozik K, Donovan R. Developing a framework for assessment of the environmental determinants of walking and cycling. *Social Science and Medicine* 2003;56(8):1693–1703.	Non-UK corroborative – excluded due to lack of time.
Pucher J. Urban transport in Germany: providing feasible alternatives to the car. *Transport Reviews* 1998;18(4):285–310.	Non-UK corroborative – excluded due to lack of time.
Pucher J, Dijkstra L. Promoting safe walking and cycling to improve public health: lessons from the Netherlands and Germany. *American Journal of Public Health* 2003;93(9):1509–16.	Non-UK corroborative – excluded due to lack of time.
Reed JA, Ainsworth BE, Wilson DK, Mixon G, Cook A. Awareness and use of community walking trails. *Preventive Medicine* 2004;39(5):903–8.	Non-UK corroborative – excluded due to lack of time.
Reicks M, Mills J, Henry H. Qualitative study of spirituality in a weight loss program: Contribution to self-efficacy and locus of control. *Journal of Nutrition Education and Behaviour* 2004;36(1):13–19.	Non-UK corroborative – excluded due to lack of time.

Rouffignat J, Vallee A. Changes in eating habits and urban-environment – development of the restaurant industry in metropolitan-area of Quebec City. *Canadian Geographer – Geographe Canadien* 1990;34(3):194–208.	Non-UK corroborative – excluded due to lack of time.
Rutt CD. Individual, social, and environmental correlates of physical activity and body mass index in El Paso, Texas. *Dissertation Abstracts International: Section B: The Sciences and Engineering* 2004; 65; 6-B)	Non-UK corroborative – excluded due to lack of time.
Sallis JF, Hovell MF, Hofstetter CR. Predictors of adoption and maintenance of vigorous physical activity in men and women. *Preventive Medicine* 1992;21:237–51.	Non-UK corroborative – excluded due to lack of time.
Sallis JF, Johnson KJ, Calfas S, Caparosa S, Nichols JF. Assessing perceived physical environment variables that may influence physical activity. *Research Quarterly for Exercise and Sport* 1997;68:345–51.	Non-UK corroborative – excluded due to lack of time.
Sanderson B, Littleton MA, Pulley LV. Environmental, policy, and cultural factors related to physical activity among rural, African American women. *Women and Health* 2002;36(2):75–90.	Non-UK corroborative – excluded due to lack of time.
Scott D, Munson W. Perceived constraints to park usage among individuals with low incomes. *Journal of Park and Recreation Administration* 1994;12:52–69.	Non-UK corroborative – excluded due to lack of time.
Scott J, Wadley D, Ziviani J. Walking to school: incidental physical activity in the daily occupations of Australian children. *Occupational Therapy International* 2004;11(1):1–11.	
Sharpe PA, Granner ML, Hutto B, Ainsworth BE. Association of environmental factors to meeting physical activity recommendations in two South Carolina counties. *American Journal of Health Promotion* 2004;18(3):251–7.	Non-UK corroborative – excluded due to lack of time.
Shepherd SK, Sims LS. Employing cognitive response analysis to examine message acceptance in nutrition education. *Journal of Nutrition Education* 1990;22(5):215–9.	Non-UK corroborative – excluded due to lack of time.
Shriver K. Influence of environmental design on pedestrian travel in four Austin neighborhoods. *Transportation Research Record* 1997;1578:64–75.	Non-UK corroborative – excluded due to lack of time.
Simmons D, McKenzie A, Eaton S et al. Choice and availability of takeaway and restaurant food is not related to the prevalence of adult obesity in rural communities in Australia. *International Journal of Obesity* 2005;29(6):703–10.	Non-UK corroborative – excluded due to lack of time.
Sirard JR, Ainsworth BE, McIver KL, Pate RR. Prevalence of active commuting at urban and suburban elementary schools in Columbia, SC. *American Journal of Public Health* 2005;95(2):236–7.	Non-UK corroborative – excluded due to lack of time.
Steenhuis IHM, Van Assema P, Glanz K. Strengthening environmental and educational nutrition programmes in worksite cafeterias and supermarkets in the Netherlands. *Health Promotion International* 2001;16(1):21–33.	Non-UK corroborative – excluded due to lack of time.
Stone G. 'Walk it, bike it, bus it': perceptions of active modes of transport. *World Transport Policy and Practice* 2003;9(3):15–25.	Non-UK corroborative – excluded due to lack of time.
Story M, Neumark-Sztainer D, French S. Individual and environmental influences on adolescent eating behaviors. *Journal of the American Dietetic Association* 2002;102:S40–51.	Non-UK corroborative – excluded due to lack of time.
Sutherland M, Hale CD, Harris GJ. Community health promotion: the	Non-UK corroborative –

church as partner. *Journal of Primary Prevention* 1995;16(2):201–16.	excluded due to lack of time.
Timperio A, Crawford D, Telford A, Salmon J. Perceptions about the local neighborhood and walking and cycling among children. *Preventive Medicine* 2004;38(1):39–47.	Non-UK corroborative – excluded due to lack of time.
Timperio A, Salmon J, Telford A, Crawford D. Perceptions of local neighbourhood environments and their relationship to childhood overweight and obesity. *International Journal of Obesity* 2005;29(2):170–5.	Non-UK corroborative – excluded due to lack of time.
Titze S, Stronegger W, Owen N. Prospective study of individual, social, and environmental predictors of physical activity: women's leisure running. *Psychology of Sport and Exercise* 2005;6:363–76.	Non-UK corroborative – excluded due to lack of time.
Tully AM. Ireland's national dairy council's '3-a-day' campaign: the Irish perspective*. British Nutrition Foundation* 2005;30:182–5.	Non-UK corroborative – excluded due to lack of time.
Vereecken CA, Van Damme W, Maes L. Measuring attitudes, self-efficacy, and social and environmental influences on fruit and vegetable consumption of 11- and 12-year-old children: reliability and validity. *Journal of the American Dietetic Association* 2005;105:257–61.	Non-UK corroborative – excluded due to lack of time.
Wells BL, Brown CC, Horm JW, Carleton RA, Lasater TM. Who participates in cardiovascular-disease risk factor screenings - experience with a religious organization based program. *American Journal of Public Health* 1994;84(1):113–5.	Non-UK corroborative – excluded due to lack of time.
Wiggers J, Considine R, Hazell T, Haile M, Rees M, Daly J. Increasing the practice of health promotion initiatives by licensed premises. *Health Education Behaviour* 2001;28:331–40.	Non-UK corroborative – excluded due to lack of time.
Yancey A, Miles O, Jordan A. Organizational characteristics facilitating initiation and institutionalization of physical activity programs in a multiethnic urban community. *Journal of Health Education* 1999;30(2):44–51.	Non-UK corroborative – excluded due to lack of time.

Other excluded papers

Paper	**Reason for exclusion**
Aaron JI, Evans RE, Mela DJ. Paradoxical effect of a nutrition labelling scheme in a student cafeteria. *Nutrition Research* 1995;15(9):1251–61.	Less than 3 months follow-up.
Achabal DD, McIntyre SH, Bell CH, Tucker N. The effect of nutrition P-O-P signs on consumer attitudes and behaviour. *Journal of Retail* 1987;63:9–24.	Country-wide intervention and not suitable for local implementation.
Albright CL, Flora JA, Fortmann SP. Restaurant menu labeling: Impact of nutrition information on entree sales and patron attitudes. *Health Education Quarterly* 1990;17(2):157–67.	Less than 3-months follow-up.
Allison DB, Weber MT. Treatment and prevention of obesity: what works, what doesn't work, and what might work*. Lipids* 2003;38(2):147–55.	Broad conceptual overview.
Ammerman AS, Lindquist CH, Lohr KN, Hersey J. The efficacy of behavioural interventions to modify dietary fat and fruit and vegetable intake: a review of the evidence. *Preventive Medicine* 2002;35:25–41.	No relevant papers.
Ammerman AS, Lindquist CH, Hersey J et al. *The efficacy of interventions*	Not possible to separate

to modify dietary behaviour related to cancer risk. AHRQ Evidence Report 25. Rockville: Agency for Healthcare Research and Quality, June 2001.	community from other interventions. Information in appendices does not match info in results chapters.
Andersen RE, Franckowiak SC, Snyder J, Bartlett SJ, Fontaine KR. Can inexpensive signs encourage the use of stairs? Results from a community intervention. *Annals of Internal Medicine* 1998;29(5):363–69.	Covered by systematic review 2000.
Anderson ES, Winett RA, Wojcik JR. Social-cognitive determinants of nutrition behavior among supermarket food shoppers: A structural equation analysis. *Health Psychology* 2000;19(5):479–86.	Behavioural/psychological analysis of healthy food-purchasing and methods of changing choices.
Anderson J, Haas MH. Impact of a nutrition education program on food sales in restaurants. *Journal of Nutrition Education* 1990;22:232–8.	No control group.
Anderson A, Cox D. Five a day – challenges and achievement. *Nutrition and Food Science* 2000;30(1):30–34.	– Quality corroboration study.
Anlinker JA, Winne M, Drake LT. An evaluation of the Connecticut farmers' market coupon program. *Journal of Nutrition Education* 1992;24(4):185–91.	Less than 3-months follow-up.
Anonymous. NHS can save billions by encouraging active travel. *SportEX Health* 2003;15:6.	Small news item about Sustrans leaflet launch.
Anonymous. Food issues: a partnership approach. *Community Health UK Action* 2004;63:14–5.	Discussion paper.
Aoun P, Brecht III CR, Gambert SR. Diabetes mellitus: Present and future preventive strategies – Part II. *Clinical Geriatrics* 2005;13(7):30–32.	All subjects with impaired glucose tolerance.
Balding J, Gimber P, Regis D, Wise A. A quarter of year 7 young men want to cycle to school. *Education and Health* 1997;15(4):49–52.	Survey of method of transport to school – no relevant information given.
Baranowski T, Anderson C, Carmack C. Mediating variable frame work in physical activity intervention. *American Journal of Preventive Medicine* 1998;15:266–97.	Behavioural science.
Baranowski T, Mendlein J, Resnicow K, Frank E, Cullen KW, Baranowski J. Physical activity and nutrition in children and youth: an overview of obesity prevention. *Preventive Medicine* 2000;31(2):S1–10.	Narrative overview – reference list checked.
Barnhart JM, Mossavar-Rahmani Y, Nelson M, Raiford Y, Wylie-Rosett J. Innovations in practice: an innovative, culturally sensitive dietary intervention to increase fruit and vegetable intake among African American women: a pilot study. *Topics in Clinical Nutrition* 1998;13:63–71.	Passed to Teesside.
Barton H, Baker J. Sustainability appraisal of plans. One day short course; 2004, Nov 5; Bristol, UK	Not relevant to review.
Batch JA, Baur LA. Management and prevention of obesity and its complications in children and adolescents. *Medical Journal of Australia* 2005;182(3):130–5.	Narrative overview.
Bedimo-Rung AL, Mowen AJ, Cohen DA. The significance of parks to physical activity and public health – A conceptual model. *American Journal of Preventive Medicine* 2005;28(2):159–68.	Discussion paper – relevant papers obtained.

Biddle SJH, Gorely T, Stensel DJ. Health-enhancing physical activity and sedentary behaviour in children and adolescents. *Journal of Sports Sciences* 2004;22(8):679–701.	Non-systematic review.
Blamey A, Mutrie N, Aitchison T. Health promotion by encouraged use of stairs. *British Medical Journal* 1995;311(7000):289–290.	Covered by systematic review evidence up to 2000.
Bonica JL. The effects of proximity and prompts on stair use. Microform Publications, University of Oregon Eugene, OR, 2002, 2. microfiche (142. fr 1911;): negative.	Not held at British Library – Unable to locate.
Booth KM, Pinkston MM, Poston WS. Obesity and the built environment. *Journal of the American Dietetic Association* 2005;105(5)(Suppl 1):S110–7.	Non-systematic literature review; non-UK corroborative.
Booth M, Bauman A, Oldenburg B, Marcus BH, Bauman A. Population prevalence and correlates of stages of change in physical activity. *Health Education Quarterly* 1993;20:431–40.	Population survey to determine who is most receptive to changing PA.
Booth M, Bauman A, Owen N, Gore C. Physical activity preferences, preferred sources of assistance, and perceived barriers to increased physical activity among physically inactive Australians. *Preventive Medicine* 1997;26:131–7.	Survey of PA barriers – none of stated barriers relevant to review. Non-UK corroborative.
Booth ML, Owen N, Bauman A, Clavisi O, Leslie E. Social-cognitive and perceived environment influences associated with physical activity in older Australians. *Preventive Medicine* 2000;31(1):15–22.	Causation – social–cognitive and environmental influences on PA.
Boutelle KN, Jeffery RW, Murray DM, Schmitz MK. Using signs, artwork, and music to promote stair use in a public building. *American Journal of Public Health* 2001;91(12):2004–6.	Included in Foster 2004 systematic review.
Boutelle KN, Jeffery RW, Murray DM, Schmitz MK. Using signs, artwork, and music to promote stair use in a public building. *American Journal of Public Health* 2001;91(12):2004–6.	Duplicate of above (Boutelle 2001).
Bowen DJ. Baseline data and design for a randomized intervention study of dietary change in religious organizations. *Preventive Medicine* 2004;39(3):602–11.	Trial protocol only.
Bozionelos G, Bennett P. The theory of planned behaviour as predictor of exercise: the moderating influence of beliefs and personality variables. *Journal of Health Psychology* 1999;4:517–29.	Theory of planned behaviour as predictor of exercise – no relevant evidence.
Brannstrom I, Weinehall L, Persson LA, Wester PO, Wall S. Changing social patterns of risk factors for cardiovascular disease in a Swedish community intervention programme. *International Journal of Epidemiology* 1993;22(5):1026–37.	Countrywide and not suitable for local implementation.
Brownell K, Stunkard AJ, Albaum JM. Evaluation and modification of exercise patterns in the natural environment. *American Journal of Psychiatry* 1980;137:1540–5.	Pre-1990 non-RCT.
Buller D, Morrill C, Taren D et al. Randomized trial testing the effect of peer education at increasing fruit and vegetable intake. *Journal of the National Cancer Institute* 1999;91:1491–1500.	Workplace-based.
Buttriss J, Stanner S, McKevith B et al. *A critical review of the psychosocial basis of food choice and identification of tools to effect positive food choice: a summary.* Report No. N09017. London: British Nutrition Foundation; 2004.	Non-systematic review – reference list checked.

Cairns S. Redirecting the school run. *Town and Country Planning*. 1999;68:300–1.	Insufficient detail.
CABE Space. *The value of public space: how high quality parks and public spaces create economic, social and environmental value*. London: CABE Space; 2004.	Little relevant evidence on interventions to do with obesity. Reference list checked.
CABE Space. *What would you do with this space? A good practice guide to involving children and young people in the design and care of urban spaces*. London: CABE Space; 2004.	Series of case studies – no relevant outcomes. NB: Suggested by GDG.
Campbell MK. Fruit and vegetable consumption and prevention of cancer: The Black Churches Unified for Better Health Project. *American Journal of Public Health* 1999;89(9):1390–6.	Government funded project.
Canning U, Bull J, Killoran A et al. *The evidence for 'what works' in community development and health improvement: talking health inequalities*. Health Development Agency; 2002.	Case series – reference list checked.
Caraher M, Dixon P, Felton M, South L, Tull A. *Making fruit and vegetables the easy choice: report of a Five-a-day pilot project in Hastings and St Leonards*. Brighton: Department of Health; 2002.	Countrywide government funded. Overall summary included as corroborative evidence in Department of Health 2003 .
Cavill N. Walking and health: making the links. *World Transport Policy and Practice* 2001;7(4):33–8.	Discussion paper – reference list checked.
Cervero R, Gorham R. Commuting in transit versus automobile neighbourhoods. *Journal of the American Planning Association* 1995;61:210–25.	Study of commuting in transit versus automobile neighbourhoods in California. No relevant evidence.
Cervero R, Duncan M. Walking, bicycling and urban landscapes: evidence from the San Francisco Bay area. *American Journal of Public Health* 2003;93(9):1478–83.	No intervention.
Chant S, Grant T, Andrews F. *Five-a-day keeps the doctor away: report of a Five-a-day pilot project in Somerset*. London: Department of Health; 2002.	Community-wide government funded. Overall summary included as corroborative evidence in Department of Health 2003.
Cheadle A. Evaluating community-based nutrition programs: comparing grocery store and individual-level survey measures of program impact. *Preventive Medicine* 1995;24(1):71–9.	Community-wide and not suitable for local implementation.
Cheadle A, Psaty BM, Curry S et al. Community-level comparisons between the grocery store environment and individual dietary practices. *Preventive Medicine* 1991;20:250–61.	Causation – link between reported healthy diet and availability of healthful food in local supermarkets.
Ciliska D. Interventions to improve nutritional intake in children and youth. In: Thomas H, Ciliska D, Micucci S, Wilson-Abra J, Dobbins M, Dwyer J, (eds), *Effectiveness of physical activity enhancement and obesity prevention programs in children and youth*. Hamilton, Ontario: Effective Public Health Practice Project; 2004.	All studies related to schoolchildren.
Ciliska D, Miles E, O'Brien MA et al. Effectiveness of community-based interventions to increase fruit and vegetable consumption. *Journal of*	No relevant studies.

Nutrition Education 2000;32(6):341–52.	
Cinciripini PM. Changing food selections in a public cafeteria. *Behaviour Modification* 1984;3:171–77.	Pre-1990 non-RCT.
Clarke G, Eyre H, Guy C. Deriving indicators of access to food retail provision in British cities: studies of Cardiff, Leeds and Bradford. *Urban Studies* 2002;39(11):2041–60.	Maps accessibility of food outlets but no corroborative evidence of people's eating habits and preferences.
Clemmens D, Hayman LL. Increasing activity to reduce obesity in adolescent girls: A research review. *Journal of Obstetric, Gynecologic, and Neonatal Nursing: Clinical Issues* 2004;33:801–8.	Relevant to schools review
Coady J, O'Hara E. *Five-a-day community project, County Durham and Darlington: Report of a Five-a-day pilot project*. London: Department of Health; 2002.	Community-wide government funded. Overall summary included as corroborative evidence in Department of Health 2003.
Cobb KF, Solera MK. 5-A-Day: a strategy for environmental change. *Topics in Clinical Nutrition* 2003;18(4):245–53.	Narrative overview – reference list checked.
Coday M, Klesages LM, Garrison RJ, Johnson KC, O'Toole M, Morris GS. Health opportunities with physical exercise (HOPE): social contextual interventions to reduce sedentary behaviour in urban settings. *Health Education Research* 2002;17(5):637–47.	Description of theoretical basis for trial only.
Colby JJ, Elder JP, Peterson G, Knisley PM, Carleton RA. Promoting the selection of healthy food through menu item description in a family-style restaurant. *American Journal of Preventive Medicine* 1987;3:171–7.	Pre-1990 non-RCT.
Coleman A. Utopia on trial: Vision and reality in planned housing. London: Hilary Shipman; 1985.	Pre-1990 non RCT.
Coleman A, Coleman D, Beresford P et al. Altered estates. London: Adam Smith Institute;1988.	Pre-1990 non-RCT.
Coleman KJ, Gonzalez EC. Promoting stair use in a US–Mexico border community. *American Journal of Public Health* 2001;91(12):2007–9.	Culturally relevant intervention to non-UK BMEG.
Connell D, Goldberg JP, Folta SC. An intervention to increase fruit and vegetable consumption using audio communications: in-store public service announcements and audiotapes. *Journal of Health Communication* 2001;6:31–43.	Less than 3-months follow-up.
Cordell HK, McDonald BL, Teasley RJ et al. Outdoor recreation participation trends. In: Cordell HK, ed. *Outdoor recreation in American life: a national assessment of demand and supply trends*. Champaign, IL: Sagamore Publishing; 1999:219–322.	Survey of participation trends – no relevant information.
Cox R, Gonzales-Vigilar C, Novascone M et al. Impact of a cancer intervention on diet-related cardiovascular disease risks of white and African-American EFNEP clients. *Journal of Nutrition Education* 1996;28:209–18.	US government-funded intervention.
Craig CL, Brownson RC, Cragg SE, Dunn AI. Exploring the effect of the environment on physical activity – A study examining walking to work. *American Journal of Preventive Medicine* 2002;23(2):36–43.	Causation – neighbourhood characteristics influencing physical activity.

Crane R, Crepeau R. *Does neighbourhood design influence travel? A behavioural analysis of travel diary and GIS data.* Working paper no. 374. Transportation Center, University of California, Berkeley; 1998.	No useful findings, USA.
Crane R. *The impacts of urban form on travel: a critical review.* Working paper no. WP99RC1. Lincoln Institute of Land Policy, Cambridge, MA: 1999.	Causation.
Cullen KW, Bartholomew LK, Parcel GS. Girl scouting: an effective channel for nutrition education. *Journal of Nutrition Education* 1997;29:86–91.	<3-months follow-up.
Cummins S, Macintyre S. The location of food stores in urban areas: a case study in Glasgow. *British Food Journal* 1999;101(7):545–53.	Analysis of location of food outlets to determine the existence of 'food deserts'.
Cummins S, Macintyre S. A systematic study of an urban foodscape: the price and availability of food in greater Glasgow. *Urban Studies* 2002;39(11):2115–30.	Looks at food availability – no evidence of corroboration for potential interventions.
Cummins SK, Jackson RJ. The built environment and children's health. *Paediatric Clinics of North America* 2001;48(5):1241.	Narrative overview, only obesity section relevant – reference list checked. NB: Suggested by GDG.
Cummins S, Petticrew M, Higgins C, Sparks L, Findlay A. Large scale food retailing as an intervention for diet and health: quasi-experimental evaluation of a natural experiment. Journal of Epidemiology and Community Health 2005; 59: 1035-1050	No control group. NB: Suggested by GDG.
Cummins S, Petticrew M, Sparks L, Findlay A. Large scale food retail interventions and diet. *British Medical Journal* 2005;330(7493):683–84.	Brief non-systematic review of large-scale food retail interventions – reference list checked.
Cunningham GO, Michael YL. Concepts guiding the study of the impact of the built environment on physical activity for older adults: a review of the literature. *American Journal of Health Promotion* 2004;18(6):435–43.	Causation – built environments/neighbourhoods and PA.
Curhan RC. The effects of merchandising and temporary promotional activities on the sales of fresh fruit and vegetables in supermarkets. *Journal of Market Research* 1997;11:286–94.	Pre-1990 non-RCT level evidence.
Curtin KA. *A needs assessment of the residents of Perry (Oklahoma) and evaluation of the city parks system*. Kinesiology Publications, University of Oregon Eugene, OR, 2003, 2. microfiche (178. fr 2001): negative.	Not held at British Library – Abstract only
Davis D, Bustamante A, Brown C et al. The urban church and cancer control: a source of social influence in minority communities. *Public Health Reports* 1994;109:500–6.	Cervical cancer only.
Davis DZ, Rogers T. Point-of-choice nutrition information for the modification of milk selection. *Journal of American College Health* 1982;30:275–8.	Pre-1990 non-RCT.
Davis-Chervin D, Rogers T, Clark M. Influencing food selections with point-of-choice nutrition information. *Journal of Nutrition Education* 1985;17:18–22.	Pre-1990 Non RCT

De Bourdeaudhuij I, Saelens BE, Sallis JF. Environmental correlates of physical activity in a sample of Belgian adults. *American Journal of Health Promotion* 2003;18(1):83–92.	Survey on causation.
Dearry A. Impacts of our built environment on public health. *Environmental Health Perspectives* 2004;112(11):A600–1.	Editorial.
DeHaven MJ, Hunter IB, Wilder L, Walton JW, Berry J. Health programs in faith-based organizations: Are they effective? *American Journal of Public Health* 2004;94(6):1030–6.	Little detail provided.
Demark-Wahnefried**,** W. McClelland, J W. Jackson, B. Campbell, M K. Cowan, A. Hoben, K. Rimer, B K. Partnering with African-American churches to achieve better health: lessons learned during the Black Churches United for Better Health 5. A Day project. *Journal of Cancer Education* 2000;15(3):164–7.	Discussion paper.
Demers A, Renaud L. Formative evaluation of a nutritional marketing project in city-center restaurants. *Evaluation Review* 1992;16(6):634–49.	No control group – better evidence available.
Department for Education and Skills, Department for Transport. *Travelling to school: an action plan*. Nottingham; Department for Education and Skills Publications, 2003.	Action plan, not a corroborative research study.
Department of Health. Choosing activity: a physical activity action plan. London: Department of Health; 2005.	Policy document without the supporting evidence – passed to NICE for background information.
Department of Health. *Five-a-day pilot initiatives: executive summary of the pilot initiatives evaluation study*. London: Department of Health; 2003.	Relevant to and included in community 1.
DePue JD, Wells BL, Lasater TM, Carleton RA. Volunteers as providers of heart health Programs in churches: a report on implementation. *American Journal of Health Promotion* 1990;4:361–86.	No relevant outcome data given.
Department for Environment, Transport and the Regions, CABE. *By design: urban design in the planning system: towards better practice.* London: DETR, CABE; 2000.	Guide with no evidence-based conclusions.
Keith Diaz Moore. Book review: Design for Assisted Living: Guidelines for Housing the Physically and Mentally Frail (Victor Regnier) *Journal of Architectural and Planning Research* 2005;22(1):86–88.	No indication of systematic approach to looking at intervention studies.
Dibb S. *Rating retailers for health: how supermarkets can affect your chances of a healthy diet.* London: National Consumer Council; 2004.	No corroborative information.
Dibsdall LA, Lambert N, Bobbin RF, Frewer LJ. Low-income consumers' attitudes and behaviour towards access, availability and motivation to eat fruit and vegetables. *Public Health Nutrition* 2003;6(2):159–68.	No relevant outcomes/qualitative results requested.
Dielman FM, Dijst M, Burghouwt G. Urban form and travel behaviour: micro-level household attributes and residential context. *Urban Studies* 2002;39(3):507–27.	Health aspects not mentioned.
Doherty M. Health promotion in places of worship. *Community Health Action* 1994;32:10–2.	No evaluations to provide corroborative evidence re outcomes.
Dolesh RJ. Follow the trail to improved health. *Parks and Recreation*	Un-referenced review article

(Ashburn) 2004;39(5):40–6.	discussing walking trails.
Dougherty MF, Wittsten AB, Guarino M. Promoting low-fat foods in the supermarket using various methods, including videocassettes. *Journal of the American Dietetic Association* 1990;90:1106–8.	Before and after study. No control group – better evidence available.
Dubbert PM, Johnson WG, Schlundt DG et al. The influence of calorific information on cafeteria food choices. *Journal of Applied Behavioural Analysis* 1984;17:85–92.	Pre-1990 non-RCT.
Dunn AL, Andersen RE, Jakicic JM. Lifestyle physical activity interventions. History, short- and long-term effects, and recommendations. *American Journal of Preventive Medicine* 1998;15(4):398–412.	– Quality systematic review – reference list checked.
Dunn AL, Marcus BH, Kampert JB, Garcia ME, Kohl HWI, Blair SN. Reduction in cardiovascular disease risk factors: six-month results from Project Active. *Preventive Medicine* 1997;26:883–92.	Relevant to Community 1 and 18-month results (Dunn 1999) already included.
Dunn AL, Garcia ME, Marcus BH, Kampert JB, Kohl III HW, Blair SN. Six-month physical activity and fitness changes in Project Active, a randomized trial. *Medicine and Science in Sports and Exercise* 1998;30(7):1076–83.	Relevant to Community 1 and 18-month results (Dunn 1999) already included.
Dunt D, Day N, Pirkis J. Evaluation of a community-based health promotion program supporting public policy initiatives for a healthy diet. *Health Promotion International* 1999;14(4):317–27.	Excluded on NICE advice at Community 1 Review.
Duquin M. A faith-based intergenerational health and wellness program. *Journal of Intergenerational Relationships* 2004;2(3/4):105–18.	No relevant outcomes given.
Durkin M, Hobbiss A, Robinson J. *Five-a-day in Airedale and Craven: Report of a Five-a-day pilot project*. London: Department of Health; 2002.	Community-wide government funded. Overall summary included as corroborative evidence in Department of Heath 2003
Eaton C, Reynes J, Assaf A, Feldman H, Lasater T, Carleton R. Predicting physical activity change in men and women in two New England communities. American Journal of Preventive Medicine 1993;9(4):209–19.	Survey of predictors of PA. No relevant evidence.
Ebbeling CB, Pawlak DB, Ludwig DS. Childhood obesity: public health crisis, common sense cure. *Lancet* 2002;360:473–852.	Systematic review of prevalence and determinants.
Eldridge A, Snyder M, Faus N et al. Development and evaluation of a labeling program for low-fat foods in a discount department store foodservice area. *Journal of Nutrition Education* 1997;29:159–161.	No control group.
Ellery S. Landlord's food and fitness ideas help tenants fight the flab. *Inside Housing* 2004. No other details available	General discussion paper.
Elkins WL, Cohen DA, Koralewicz LM, Taylor SN. After school activities, overweight, and obesity among inner city youth. *Journal of Adolescence* 2004;27:181–89.	Discussion of risk.
Elvik R. Which are the relevant costs and benefits of road safety measures designed for pedestrians and cyclists? *Accident Analysis and Prevention* 2000;32(1):37–45.	Review of what is currently looked at in cost-benefit analyses of transport.
Eng E, Hatch JW. Networking between agencies and black churches: the lay health advisor model. *Prevention in Human Services* 1991;10(123):146.	Black churches – passed to Teesside.

Ernst ND, Wu M, Frommer P et al. Nutrition education at the point of purchase: the foods for health project evaluated. *Preventive Medicine* 1986;15:60–73.	Pre-1990 non-RCT.
Eves F. Impact of a new message format in getting people to use the stairs. *Active Living* 2002;11(4):2.	Not held by British Library. Unable to locate.
Ewing R. Can the physical environment determine physical activity levels. *Exercise and Sport Sciences Reviews* 2004;3302:69–75.	Non-systematic review.
Ewing R, Schmid T, Killingsworth R, Zlot A, Raudenbush S. Relationship between urban sprawl and physical activity, obesity and morbidity. *American Journal of Health Promotion* 2003;18(1):47–57.	Causation – built environment/environmental effects and obesity and physical activity. NB: Suggested by GDG.
Fitzgibbon ML, Stolley MR. Environmental changes may be needed for prevention of overweight in minority children. *Pediatric Annals* 2004;33(1):45–9.	Discussion paper.
Fitzpatrick MP, Chapman GE, Barr SI. Lower-fat menu items in restaurants satisfy customers. *Journal of the American Dietetic Association*. 1997;97:510–14.	No data point prior to intervention.
Foerster SB, Kizer KW, DiSogra LK, Bal DG, Krieg BF, Bunch KL. California's '5 a day – for better health!' campaign: an innovative population-based effort to effect large-scale dietary change. *American Journal of Preventive Medicine* 1995;11(2):124–31.	No control group.
Food Standards Agency, LACORS, Local Government Association. *Food: the local vision*. London: LACORS; 2002.	No relevant outcomes/no usable corroborative information.
Food Standards Agency. *Barriers to the development and uptake of reduced fat foods.* N09002. London: Food Standards Agency; 2005.	Duplicate of included paper: Know 2001
Fox KR. Childhood obesity and the role of physical activity. *Journal of the Royal Society of Health* 2004;124(1):34–9.	Non-systematic review.
Frank LD. Land use and transportation interaction – implications on public health and quality of life. *Journal of Planning Education and Research*. 2000;20(1):6–22.	Review article giving the author's personal viewpoint on land use and the effects on transportation/PA.
Frank LD, Engelke P, Hourigan D. *How land use and transportation systems impact public health: An annotated bibliography*. Working paper 2:1–63. City and Regional Planning Program College of Architecture (updated 26/12/2000)	No methodology to treat as non-systematic review. Mostly Non-UK corroborative.
Frank LD, Engelke P. How land use and transportation systems impact public health: A literature review of the relationship between physical activity and built form. *City and Regional Planning Program College of Architecture* 2005;8–12.	Non-systematic review.
Frank LD, Engelke PO. The built environment and human activity patterns: exploring the impacts of urban form on public health. *Journal of Planning Literature* 2001;16(2):202–28.	Narrative overview – reference list checked.
Frank LD, Andresen MA, Schmid TL. Obesity relationships with community design, physical activity and time spent in cars. *American Journal of*	Causation– reference list

Preventive Medicine 2004;27(2):87–96.	checked.
Frank LD. Economic determinants of urban form – resulting trade-offs between active and sedentary forms of travel. *American Journal of Preventive Medicine* 2004;27(3):146–53.	Discussion of economic forces and impacts on transportation and land use decisions.
French SA, Story M, Jeffery RW. Environmental influences on eating and physical activity. *Annual Review of Public Health* 2001;22:309–35.]	Literature review – reference list checked.
French SA, Story M, Neumark-Sztainer D, Fulkerson JA, Hannan P. Fast food restaurant use among adolescents: associations with nutrient intake, food choices and behavioural and psychosocial variables. *International Journal of Obesity and Related Metabolic Disorders* 2001;25(12):1823–33.	School-based/observational.
French SA, Jeffery RW, Story M, Hannan P, Snyder MP. A pricing strategy to promote low-fat snack choices through vending machines. *American Journal of Public Health* 1997;18(5):849–51.	No control group.
Frumkin H. Urban sprawl and public health. *Public Health Reports* 2002;117:201–17.	General discussion of air pollution and pedestrian accidents. NB: Suggested by GDG.
Gielen AC, Defrancesco S, Bishai D, Mahoney P, Ho S, Guyer B. Child pedestrians: the role of parental beliefs and practices in promoting safe walking in urban neighbourhoods. *Journal of Urban Health* 2004;81(4):545–55.	Injury risk/non-UK corroborative.
Gilbert K. Pedal cycling: positively healthy transport. *Health and Hygiene*. 1994;15(4):146–9.	Discussion paper.
Giles-Corti B, Macintyre S, Clarkson JP, Pikora T, Donovan RJ. Environmental and lifestyle factors associated with overweight and obesity in Perth, Australia. *American Journal of Health Promotion* 2003;18(1):93–102.	Causation – lifestyle/social and physical environmental factors and obesity/overweight.
Glanz K, Fallis JF, Saelens BE, Frank LD. Healthy nutrition environments: concepts and measures. *American Journal of Health Promotion* 2005;19(5):330–3.	Non-systematic literature review.
Glanz K, Hewitt A, Rudd J. Consumer behaviour and nutrition education: an integrative review. *Journal of Nutrition Education* 1992;24:267–77.	Pre-1995 systematic review.
Glanz K, Lankenau B, Foerster S, Temple S, Mullis R, Schmid T. Environmental and policy approaches to cardiovascular disease prevention through nutrition: opportunities for state and local action. *Health Education Quarterly* 1995;22:512–27.	Literature review – reference list checked.
Glanz K, Yaroch AL. Strategies for increasing fruit and vegetable intake in grocery stores and communities: policy, pricing and environmental change. *Preventive Medicine* 2004;39:S75–80.	– Quality systematic review.
Glanz K, Hoelscher D. Increasing fruit and vegetable intake by changing environments, policy and pricing: restaurant-based research, strategies and recommendations. *Preventive Medicine* 2004;39:S88–S93.	Narrative overview – reference list checked.
Goran MI, Treuth MS. Energy expenditure, physical activity, and obesity in children. *Paediatric Clinics of North America* 2001;48(4):931–53.	Narrative overview – reference list checked.
Gorbach S, Morrill-LaBrode A, Woods M et al. Changes in food patterns	Relevant to Community 1 and

during a low-fat dietary intervention in women. *Journal of the American Dietetic Association* 1990;90:802–9.	excluded from Community 1 – all subjects at elevated risk for breast cancer.
Greater London Authority. *Making London a walkable city*. London: Greater London Authority; 2004.	Discussion paper.
Green LW, Richard L, Potvin L. Ecological foundations of health promotion. *American Journal of Health Promotion* 1996;10:270–81.	General discussion paper.
Greiser E. Risk factor trends and cardiovascular mortality risk after 3.5 years of community-based intervention in the German Cardiovascular Prevention Study*. Annals of Epidemiology* 1993;3:S13–27.	Country-wide study and not suitable for local implementation.
Grilo CM, Pogue-Geile MF. The nature of environmental influences on weight and obesity: a behavior genetic analysis*. Psychological Bulletin* 1991;110(3):520–37.	Review of genetic vs. environmental influences on weight and obesity.
Guy CM. Corporate strategies in food retailing and their local impacts: a case study of Cardiff. *Environment and Planning A*1996;28:1575–602.	Not relevant to review topic.
Handy S. Urban form and pedestrian choices. Study of Austin neighborhoods. *Transportation Research Record* 1996;1552:135–44.	Causation.
Handy S. Health and community design: the impact of the built environment on physical activity. *Journal of the American Planning Association* 2004;70(3):375–6.	Book review only.
Hatch J, Jackson C. North Carolina Baptist church program. *Urban Health* 1981;10:70–1.	Pre-1990 non-RCT.
Hatch JW, Cunningham AC, Woods WW, Snipes FC. The fitness through churches project: description of a community-based cardiovascular health promotion intervention. *Hygiene* 1986;5:9–12.	Pre-1990 non-RCT.
Hayne CL, Moran PA, Ford MM. Regulating environments to reduce obesity. *Journal of Public Health Policy* 2004;25(3/4):391–407.	General discussion paper – reference list checked.
Health Development Agency. *Coronary heart disease: guidance for implementing the preventive aspects of the National Service Framework.* London: Department of Health; 2000.	Coronary heart disease guidance – reference list checked.
Health Education Authority. *The National Catering Initiative: promoting healthier choices.* London: Health Education Authority; 1998.	Workplace-based intervention.
Heath GW, Fuchs R, Croft JB, Temple S, Wheeler FC. Changes in blood cholesterol awareness: final results from the South Carolina cardiovascular disease prevention project. *American Journal of Preventive Medicine* 1995;11(3):190–6.	Blood cholesterol awareness outcome.
Heesch K, Brown D, Blanton C. Perceived barriers to exercise and stage of exercise adoption in older women of difference racial/ethnic groups. *Women and Health*2000;30(4):61–76.	US barriers to exercise adoption. Barriers not relevant to this review.
Hider PN. Environmental interventions to reduce energy intake or density: a critical appraisal of the literature. *NZHTA Report* 2001;4(2)	Duplicates information in other included reviews – reference list checked.
Hill JO. Environmental contributions to the obesity epidemic. *Science* 1998;280(5368):1374.	Discussion paper – reference list checked.

Hillsdon M, Thorogood M, Anstiss T, Morris J. Randomised controlled trials of physical activity promotion in free living populations: a review. *Journal of Epidemiology and Community Health* 1995;49:448–53.	No relevant papers identified from included studies.
Hoerr SM, Loudes VA. Can nutrition information increase sales of healthful vended snacks? *Journal of School Health* 1993;63:386–90.	No control group – better evidence available.
Holt NL, Bewick BM, Gateley PJ. Children's perceptions of attending a residential weight-loss camp in the UK. *Child: Care, Health and Development* 2005;31(2):223–31.	All subjects overweight/obese.
Horgen KB, Brownell KD. Comparison of price change and health message interventions in promoting healthy food choices. *Health Psychology* 2002;21(5):505–12.	No subject comparison group and less than 3-month follow-up. Before and after study.
Horgen KB. Promoting healthy food choices: A health message and economic incentive intervention. *Dissertation Abstracts International: Section B: The Sciences and Engineering* 2001; 62: 3-B	Not held at British Library – Abstract only
Humpel N, Owen N, Leslie E. Environmental factors associated with adults' participation in physical activity – a review. *American Journal of Preventive Medicine* 2002;22(3):188–99.	Causation – reference list checked.
Hunt MK, Lefebvre RC, Hixson ML, Banspach SW, Assaf AR, Carleton R. Pawtucket Heart Health Program: point-of-choice nutrition education program in supermarkets. *American Journal of Public Health* 1990;80:730–2.	No control group.
Israel BA, Schulz AJ, Parker EA, Becker AB. Review of community-based research: assessing partnership approaches to improve pubic health. *Annual Review of Public Health* 1998;19:173–202.	Non-SR review of principles of community based research.
Jackson LE. The relationship of urban design to human health and condition. *Landscape and Urban Planning* 2003;64(4):191–200.	Narrative overview. Causation – impact of urban design on health and well being.
Jackson NW, Howes FS, Gupta S, Doyle JL, Waters E. Policy interventions implemented through sporting organisations for promoting healthy behaviour change Cochrane Database of Systematic Reviews 2005; 4(1)	No studies included in review.
Jackson RJ, Kochtitzky C. *Creating a healthy environment: the impact of the built environment on public health*. Washington DC: Sprawl Watch Clearing House; 2001.	Literature review – reference list checked. NB: Suggested by GDG.
Jago R, Baranowski T. Non-curricular approaches for increasing physical activity in youth: a review. *Preventive Medicine* 2004;39(1):157–63. [529]	Only one relevant study.
Jakicic JM, Wing RR, Butler BA, Robertson RJ. Prescribing exercise in multiple short bouts versus one continuous bout: effects on adherence, cardiorespiratory fitness, and weight loss in overweight women. *International Journal of Obesity* 1995;19:893–901.	All obese.
Jebb SA, Lambert J. Overweight and obesity in European children and adolescents. *European Journal of Pediatrics* 2000;159(Suppl 1):S2–4.	Summary of a panel discussion.
Jebb SA, Lang R, Penrose A. Improving communication to tackle obesity	Discussion/position paper.

in the UK. *Proceedings of the Nutrition Society* 2003;62:577–81.	
Jeffery RW, French SA, Raether C, Baxter JE. An environmental intervention to increase fruit and salad purchases in a cafeteria. *Preventive Medicine* 1994;23(6):788–92.	Before and after study. No control group – better evidence available.
Jeffery RW, Pirie PL, Rosenthal BS, Gerber WM, Murray DM. Nutrition education in supermarkets: an unsuccessful attempt to influence knowledge and product sales. *Journal of Behavioural Medicine*. 1982;5:189–200.	Pre-1990/no weight outcomes.
Jeffery RW, Utter J. The changing environment and population obesity in the United States. *Obesity Research* 2003;11:12S–22S	General discussion on the obesity epidemic in the USA.
Jones JL, Krummel DA, Wheeler K, Forbes B, Fitch C. The prevalence of heart-healthy menu items in west Virginia restaurants. *American Journal of Health Behaviour* 2004;28(4):328–34.	Survey to assess prevalence of low-fat menu items.
Jordan A. The role of media in children's development: an ecological perspective. *Development and Behavioural Pediatrics* 2004;25(3):196–206.	Not relevant to review question.
Kaduskar S, Boaz A, Dowler E, Meyrick J, Rayner M. Evaluating the work of a community cafe in a town in the south east of England: reflections of methods, process and results. *Health Education Journal* 1999;58:341–54.	Community café – objectives not relevant to obesity prevention.
Kane RL, Johnson PE, Town RJ, Butler M. A structured review of the effect of economic incentives on consumers' preventive behaviour. *American Journal of Preventive Medicine* 2004;27:327–52.	Relevant studies included in Community 1.
Kennedy L, Ubido J, Elhassan S et al. Dietetic helpers in the community: the Bolton community nutrition assistant's project. *Journal of Human Nutrition and Dietetics* 1999;12:501–12.	Relevant to Community 1 and included in update.
Kerr J, Eves F, Carroll D. Six-month observational study of prompted stair climbing. *Preventive Medicine* 2001;33(5):422–7.	Included in Foster 2004 systematic review.
Kerr J, Eves FF, Carroll D. The influence of poster prompts on stair use: The effects of setting, poster size and content. *British Journal of Health Psychology* 2001;6(4):397–405.	Included in Foster 2000 systematic review.
Kerr J, Eves FF, Carroll D. Getting more people on the stairs: the impact of a new message format. *Journal of Health Psychology* 2001;6(5):495–500.	Included in Foster 2000 systematic review.
Kerr J, Eves F, Carroll D. Encouraging stair use: stair-riser banners are better than posters. *American Journal of Public Health* 2001;91(8):1192–3.	Included in Foster 2004 systematic review.
Kerr J, Eves F, Carroll D. Can posters prompt stair use in a worksite environment? *Journal of Occupational Health*. 2001;43(4):205–7.	Workplace intervention.
Killingsworth R, Earp J, Moore R. Supporting health through design: challenges and opportunities. *American Journal of Health Promotion*. 2003;18(1):1–4.	Introduction to special issue of journal. Reference list checked.
Killingsworth RE, Schmid TL. Community design and transportation policies: new ways to promote physical activity. *Physician and Sports Medicine* 2001;29(2):31–2, 34.	General discussion paper.
King WC, Belle SH, Brach JS, Simkin-Silverman LR, Soska T, Kriska AM. Objective measures of neighbourhood environment and physical activity in	Causation.

older women. *American Journal of Preventive Medicine* 2005;28(5):461–9.	
King WC, Brach JS, Belle S, Killingsworth R, Fenton M, Kriska AM. The relationship between convenience of destinations and walking levels in older women. *American Journal of Health Promotion* 2003;18(1):74–82.	Causation – convenience walking to destination and PA levels.
King A. Co-ops in the food desert. Community Health 1999;49:10–2.	Not held in British Library – unobtainable.
Kohl HW, Hobbs KE. Development of physical activity behaviours among children and adolescents. *Pediatrics* 1998;101(3):549–54.	Narrative overview – reference list checked.
Korve MJ, Niemeier DA. Benefit–cost analysis of added bicycle phase at existing signalized intersection. *Journal of Transportation Engineering* 2002;128(1):40–8.	Not relevant to review topic.
Kumanyika SK, Charleston JB. Lose weight and win – a church-based weight-loss program for blood-pressure control among black-women. *Patient Education and Counselling* 1992;19(1):19–32.	Relevant to BMEG review.
Lang JE, Mercer N, Tran D, Mosca L. Use of a supermarket shelf-labeling program to educate a predominantly minority community about foods that promote heart health. *Journal of the American Dietetic Association*. 2000;100:804–9.	No relevant outcomes.
Lang T, Caraher M. Access to healthy foods: part II. Food poverty and shopping deserts: what are the implications for health promotion policy and practice? *Health Education Journal*. 1998;57(3):202–11.	Systematic review of prevalence and determinants – reference list checked.
Larkin M. Can cities be designed to fight obesity? Urban planners and health experts work to get people up and about. *Lancet* 2003;362(9389):1046–7.	Discussion paper.
Lasater T, Carleton R, Wells B. Religious organizations and large-scale health related lifestyle change programs. *Journal of Health Education* 1991;22(4):233–9.	Discussion paper.
Lasater TM, Wells BL, Carleton RA, Elder JP. The role of churches in disease prevention research studies. *Public Health Reports* 1986;101:125–31.	Pre-1990 non-RCT.
Lasater TM, Becker DM, Hill MN, Gans KM. Synthesis of findings and issues from religious-based cardiovascular disease prevention trials. *Annals of Epidemiology* 1997;7(7)(Suppl):S46–53.	Literature review – reference list checked.
Lasater TM, Dupue JD, Wells RP, Gans KM, Bellis J, Carleton RA. The effectiveness and feasibility of delivering nutrition education programs through religious organizations. *Health Promotion International* 1990;5(4):253–8.	Before-and-after study. No control group – better evidence available.
Laurendeau H, Battista RN, Potvin L. Impact of a nutrition information program on the content of grocery carts. *Canadian Journal of Public Health – Revue Canadienne de Sante Publique* 1993;84(6):376–81.	French only.
Lawlor DA, Ness AR, Cope AM, Davis A, Insall P, Riddoch C. The challenges of evaluating environmental interventions to increase population levels of physical activity: the case of the UK National Cycle Network. *Journal of Epidemiology and Community Health* 2003;57(2):96–101.	General discussion of how to evaluate the Sustrans network but no evaluation information included.
Lawrence RJ (ed). *Sustaining human settlement: a challenge for the new*	Series of discussion papers

millenium. North Shields, UK: Urban International Press; 2000.	and literature reviews about sustainable cities.
Lawrence RJ. Wanted: designs for health in the urban environment. *World Health Forum* 1996;17(4):363–6.	General discussion paper.
Lawrence SA. Behavioral interventions to increase physical activity. *Journal of Human Behavior in the Social Environment* 2002;6(1):2002–44.	Literature review – reference list checked.
Lawton CL, Delargy HJ, Smith FC, Hamilton V, Blundell JE. A medium-term intervention study on the impact of high- and low-fat snacks varying in sweetness and fat content: large shifts in daily fat intake but good compensation for daily energy intake. *British Journal of Nutrition* 1998;80:149–61.	Not community-based study
Leather S. Eating away the future: the unsustainable food economy. *Scotland's 21 Today*. 1997;13:5.	Discussion paper.
Leather S. Poverty and food: will the Food Standards Agency make a difference. *Poverty* 2000;107:11–13.	Flyer re Food Standards Agency.
Lenamond SG, Franckowiak S, Zuzak KB, Cummings ES, Crespo CJ, Andersen RE. A community intervention to promote stair use among African American commuters across the age spectrum. *Journal of the American Geriatrics Society* 2001;49(4):114.	Passed to Teesside; Meeting abstract only.
Levin JS. The role of the Black church in community medicine. *Journal of the National Medical Association* 1984;76:477–83.	Pre-1990 non-RCT.
Levy AS, Mathews O, Stephenon M, Tenney JE, Schucker RE. The impact of a nutrition information program on food purchases. *Journal of Public Policy Marketing* 1985;4:1–13.	Pre-1990 non-RCT.
Li F, Fisher KJ, Bauman A et al. Neighbourhood influences on physical activity in middle-aged and older adults: a multilevel perspective. *Journal of Aging and Physical Activity* 2005;13:87–114.	Research design.
Librett JJ, Yore MM, Schmid TL. Local ordinances that promote physical activity: a survey of municipal policies. *American Journal of Public Health* 2003;93(9):1399–403.	US survey of municipal ordinances – not relevant to review.
Lobstein T, Dibb S. Evidence of a possible link between obesogenic food advertising and child overweight. *Obesity Reviews* 2005 Aug;6(3):203–8.	Corroborative and includes UK data but excluded from December update – since RCTs and systematic reviews only included. Data are also old – from 1996.
Lusk A. Safewalks: Neighborhoods stroll to peaceful existence. *Parks and Recreation (Arlington)* 1995;30(8):44–9.	Overview.
Macaskill L, Dwyer JJM, Uetrecht C et al. An evaluability assessment to develop a restaurant health promotion program in Canada. *Health Promotion International* 2000;15(1):57–69.	Logic model.
Mackett RL. The health benefits of walking to school (Paper presented at the Sustrans National Conference on 'Championing safe routes to school: citizenship in action, September 2003). London: Centre for Transport Studies; 2003.	Duplicate of Anonymous. Food issues: a partnership approach. *Community Health UK Action* 2004;63:14–5..
Marcus BH, Owen N, Forsyth LA, Cavill NA, Fridinger F. Physical activity	– Quality systematic review.

interventions using mass media, print media and information technology. *American Journal of Preventive Medicine* 1998;15:362–78.	reference list checked.
Mayer JA, Heins JM, Vogel JM, Morrison DC, Lankester LD, Jacobs AL. Promoting low-fat entree choices in a public cafeteria. *Journal of Applied Behaviour Analysis* 1986;19(397):402.	Pre-1990 non-RCT.
Mayor of London. *Draft guide to preparing play strategies: towards the provision of safe and attractive play spaces in London's neighbourhoods.* London: Greater London Authority; 2004.	Preparing play strategies for London neighbourhoods as part of 2004 London Plan.
McClelland JW, Demark-Wahnefried W, Mustian RD, Cowan AT, Campbell MK. Fruit and vegetable consumption of rural African Americans: baseline survey results of the black churches united for better health 5. A Day project. *Nutrition and Cancer* 1998;30(2):148–57.	Baseline data but no outcomes reported.
McClintock H, Cleary J. English urban cycle route network experiments: the experience of the Greater Nottingham network. *Town Planning Review* 1993;64(2):169–92.	UK government funded and not suitable for local implementation.
McCormick J. *Healthy food policy: on Scotland's menu*? (Paper no 15). Edinburgh: Scottish Council Foundation; 2000.	Discussion of policy and no relevant evidence.
McDermott L, Stead M, Hastings G, Angus K. A systematic review of the effectiveness of social marketing nutrition and food safety interventions. University of Stirling: Institute for Social Marketing 2005;1–88 (plus appendices).	Studies included overweight participants or were not relevant to this review. Studies checked to confirm already included, if meet inclusion criteria.
McMillan TE. Urban form and a child's trip to school: The current literature an a framework for future research. *Journal of Planning Literature* 2005;19(4):440–56.	Non-systematic review.
McNabb W, Quinn M, Kerver J, Cook S, Karrison T. The PATHWAYS church-based weight loss program for urban African-American women at risk for diabetes *Diabetes Care*. 1997;20(10):1518–23.	All overweight and obese.
Meiselman HL, Hedderley D, Staddon SL, Pierson BJ, Symonds CR. Effect of effort on meal selection and meal acceptability in a student cafeteria. *Appetite* 1994;23:43–55.	Schools-based.
Metcalf B, Voss L, Jeffrey A, Perkins J, Wilkin T. Physical Activity cost of the school run: impact on schoolchildren of being driven to school (Early Bird 22) *British Medical Journal* 2004;329:832–3.	Already in Community 2, Metcalf 2004.
Micucci S. Environmental interventions to improve nutrition and increase physical activity in children and youth. In: Thomas H, Ciliska D, Micucci S, Wilson-Abra J, Dobbins M, Dwyer J, eds. *Effectiveness of physical activity enhancement and obesity prevention programs in children and youth*. Hamilton, Ontario: Effective Public Health Practice Project; 2004.	Schools-based.
Miles G, Eid S. The dietary habits of young people. *Nursing Times* 1997;93(50):46–8.	Schools-based.
Miles A. Using the mass-media to target obesity: An analysis of the characteristics and reported behaviour change of participants in the BBC's 'Fighting Fat, Fighting Fit' campaign. *Health Education Research* 2001;16(3):372.	Country-wide and not suitable for local implementation.

Mullis RM, Pirie P. Lean meats make the grade – a collaborative nutrition intervention program. *Perspectives in Practice* 1988;88(2):191–5.	Pre-1990 non RCT.
Mulvihill C, Rivers K, Aggleton P. A qualitative study investigating the views of primary-age children and parents on physical activity. *Health Education Journal*. 2000;59:166–79.	No intervention.
Murphy S, Powell C, Smith C. A formative evaluation of the Welsh heartbeat award scheme. *Nutrition and Health* 1994;9:317–27.	No relevant evidence.
Mutrie N, Blamey A. Encouraging stair walking. *British Journal of Sports Medicine* 2000;34(2):143–4.	Short report of before and after study with no methodological information and no outcomes – reference list checked.
Mutrie N, Blamey A, Mitchell J. *What stops people choosing the stairs?* Proceedings of the American College of Sports Medicine Physical Activity Interventions Conference, Dallas; 1997.	Unobtainable – not held at British Library.
Myers R, Roth DL. Perceived benefits of and barriers to exercise and stage of exercise adoption in young adults. *Health Psychology* 1997;16(3):277–83.	Transtheoretical reasoning.
National Institutes of Health NCI. *Five-a-day for better health program. Evaluation report*. Rockville, MD: National Cancer Institute; 2002.	Nationwide programme and not suitable for local implementation.
National Recreation and Park Association. *Hearts 'n Parks – report of 2003. Magnet Center performance data*. Bethesda Maryland: National Recreation and Park Association, 2003.	Nationwide and not suitable for local implementation. NB: Suggested by GDG.
NHS Health Scotland. *Routes to Health: case studies of two community-run mobile food shops*. Scotland, NHS Health Scotland, 2005.	Pamphlet on setting up mobile food shops – two case studies but little actual data
NHS Health Scotland. *Community food initiatives in Scotland: activities and issues.* Scotland: NHS Health Scotland, 2003.	General discussion of initiatives – no outcome or corroborative data.
Nies M, Vollman M, Cook T. Facilitators, barriers and strategies for exercise in European American women in the community. *Public Health Nursing* 1998;15(4):263–72.	Too general.
Northridge ME, Sclar ED, Biswas P. Sorting out the connections between the built environment and health: a conceptual framework for navigating pathways and planning healthy cities. *Journal of Urban Health*2003;80(4):556–68.	Not relevant.
Norton G, Suk M. America's public lands and waters: the gateway to better health? *American Journal of Law, Medicine and Ethics* 2004;30:237–43.	Non-systematic literature review.
NSW Centre for Public Health Nutrition. *Best options for promoting healthy weight and preventing weight gain in NSW*. Sydney, Australia: NSW Centre for Public Health Nutrition; 2004.	Non-systematic review of reviews – reference lists examined. Passed to identification review.
O'Brien C. Planning transportation for and with children. *NCBW Forum Article* 2004;Oct 1:1–12.	General discussion paper on child friendly approaches to planning transport and roads.

	NB: Suggested by GDG.
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Oexmann MJ, Thomas JC, Taylor KB et al. Short-term impact of a church-based approach to lifestyle change on cardiovascular risk in African Americans. *Ethnicity and Disease* 2000;10(1):17–23.	Church-based Afro-American.
Ogilvie D, Egan M, Hamilton V et al. Targeted health promotion activities encourage people to walk and cycle instead of using cars. *Evidence Based Healthcare and Public Health* 2005;9:139–40.	Abstract of Ogilvie 2004 already included.
Olson CM, Bisgoni CA, Thonney PF. Evaluation of a supermarket nutrition education program. *Journal of Nutrition Education*. 1982;14:141–5.	No data point before intervention.
Office of the Deputy Prime Minister, Home Office. *Safer places: the planning system and crime prevention.* London: Thomas Telford Ltd; 2004.	Not relevant to review – crime prevention case series. NB: Suggested by GDG.
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Perdue WC, Gostin LO, Stone LA. Public health and the built environment: historical, empirical, and theoretical foundations for an expanded role. *Journal of Law, Medicines and Ethics* 2003;31:557–66.	Non-systematic literature review.
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Polic MZ, Klemencic M, Kos D, Kucan A, Marusic I, Natek K. Environmental interventions and values. *International Journal of Psychology* 2000;35(3–4):83.	No relevant outcomes and abstract only.
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Reisman AB, Gross CP. Increasing stair use. *Annals of Internal Medicine* 1999;130(7):616–7.	Letter.
Resnicow K, Campbell MK, Carr C et al. Body and Soul – A dietary intervention conducted through African-American churches. *American Journal of Preventive Medicine* 2004;27(2):97–105.	Afro-American Churches. Sent to Teesside.
Resnicow K, Wallace DC, Jackson A et al. Dietary change through African American churches: baseline results and program description of the Eat for	Baseline results but no trial outcomes.

Life trial. *Journal of Cancer Education*. 2000;15(3):156–63.	
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Richard L, O'Loughlin J, Masson P, Devost S. Healthy menu intervention in restaurants in low-income neighbourhoods: a field experience. *Journal of Nutrition Education*. 1999;31(1):54–9.	No control group – better evidence available
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Ruesch A, Gilmore G. Developing and implementing a healthy heart program for women in a parish setting. *Holistic Nursing Practice* 1999;13(4):9–18.	No relevant outcomes.
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Sadler M, Fine G, Richards S et al. Health Heart Store Tours – a useful communication tool? *Nutrition Bulletin* 2003;28(179):186.	Before and after study. No control group – better evidence available.
Saegert SC, Klitzman S, Freudenberg N, Cooperman-Mroczek J, Nassar S. Healthy housing: A structured review of published evaluations of US interventions to improve health by modifying housing in the United States, 1990–2001. *American Journal of Public Health* 2003;93(9):1471–7.	No relevant papers identified from included studies.
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cycling: findings from the transportation, urban design, and planning literatures. *Annals of Behavioral Medicine* 2003;25(2):80–91.	environmental influences on PA.
Saelens BE, Sallis JF, Black JB, Chen D. Neighborhood-based differences in physical activity: an environment scale evaluation. *American Journal of Public Health* 2003;93(9):1552–8.	Causation.
Saelensminde K. Cost–benefit analyses of walking and cycling track networks taking into account insecurity, health effects and external costs of motorized traffic. *Transportation Research Part A: Policy and Practice*. 2002;38(8):593–606.	Brief summery of two cost–benefit analysis papers – reference list checked.
Sallis J, Owen N. *Physical activity and behavioral medicine*. Thousand Oaks, CA: Sage Publications; 1999.	Narrative overview – reference list not checked as this paper identified from the reference list of an excluded paper.
Sallis JF, Bauman A, Pratt M. Environmental and policy interventions to promote physical activity. *American Journal of Preventive Medicine* 1998;15(4):379–397.	Narrative overview – reference list checked.
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Scarpello T, Lambert N. *Using village shops to promote healthier food choices in rural Norfolk.* Project number NO9018. Norwich: Food Standards Agency; 2004.	Role of village store in general – healthy eating mentioned in passing.
Scheuermann W, Razum O, Scheidt R et al. Effectiveness of a decentralized, community-related approach to reduce cardiovascular risk levels in Germany. *European Heart Journal* 2000;21:1591–7.	Large (1.23 million persons) multi-centre intervention.
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Schucker RE, Levy AS, Tenney JE, Mathews O. Nutrition shelf-labelling and consumer purchase behaviour. *Journal of Nutrition Education* 1992;24(2):75–81.	Controlled before and after – better evidence available.
Scott D, Jackson EL. Factors that limit and strategies that might encourage people's use of public parks. *Journal of Park and Recreation Administration* 1996;14:1–17.	Theoretical, USA.
Scott JA, Begley AM, Miller MR, Binns CW. Nutrition education in supermarkets: the Lifestyle 2000 experience. *Australian Journal of Public Health* 1991;15:49–55.	Intervention component of the Minnesota Heart Health Program and not suitable for local implementation.
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Sharpe PA. Community-based physical activity intervention. *Arthritis and Rheumatism (Arthritis Care and Research)* 2003;49(3):455–62.	Discussion paper – reference list checked.
Shaylor M, Fergusson M, Rowell A. *Costing the benefits: the value of cycling.* Cyclists' Touring Club: 1993.	Costings evidence not for relevant outcomes.

Silzer JS, Sheeska J, Tomasik HH, Woolcot DM. An evaluation of 'Supermarket Safari' nutrition education tours. *Journal of the Canadian Dietetic Association* 1994;55:179–83.	Less than 3-months follow-up.
Simon C, Wagner A, DiVita C et al. Intervention on adolescents' physical activity and sedentary behaviour (ICAPS): concept and 6-month results. *International Journal of Obesity* 2004;28: S9–S103.	Relevant to school review.
Sjolie AN, Thuen F. School journeys and leisure activities in rural and urban adolescents in Norway. *Health Promotion International*. 2002;17(1):21–30.	Causation study – predictors of PA based on existing facilities.
Sleap M, Warburton P. Are primary school children gaining heart health benefits from their journeys to school? *Child: Care, Health and Development* 1993;19:99–108.	No information on barriers or facilities. Just statistical information on methods of getting to school.
Speers MA, Schmid TL. Policy and environmental interventions for the prevention and control of cardiovascular diseases. *Health Education Quarterly* 1995;22(4):476–7.	Workshops outcomes – reference list checked.
Stanilov K. Health and community design: The impact of the built environment on physical activity. *Journal of Planning Education and Research* 2004;24(1):107–8.	Book review – reference list checked.
Staunton CE, Hubsmith D, Kallins W. Promoting safe walking and biking to school: the Marin County success story. *American Journal of Public Health* 2003;93(9):1431–4.	No control group. Methodology seriously flawed.
Steenhuis I, Van Assema P, Reubsaet A, Kok G. Process evaluation of two environmental nutrition programmes and an educational nutrition programme conducted at supermarkets and worksite cafeterias in the Netherlands. *Journal of Human Nutrition and Dietetics* 2004;17(2):107–15.	Process evaluation – reference list checked.
Sternfield B, Ainsworth BE, Quesenberry CP. Physical activity patterns in a diverse population of women. *Preventive Medicine* 1999;28:313–23.	Survey of PA among US women – suggests methods to improve accuracy.
Stokols D. Establishing and maintaining healthy environments: toward a social ecology of health promotion. *American Psychologist* 1992;47:6–22.	Psychological study.
Stroebele N, De Castro JM. Effect of ambience on food intake and food choice. *Nutrition* 2004;20(9):821–38.	Non-systematic review.
Strong WB, Malina RM, Blimkie CJR et al. Evidence based physical activity for school-age youth. *Journal of Pediatrics* 2005;146(6);732–7.	No relevant and interpretable data in review. Would need unpicking and essentially relevant to Schools and review of 2–5 year olds.
Strychar IM, Potvin L, Pineault R, Pineau R, Prevost D. A supermarket cardiovascular screening program: analysis of participants' solicitation of follow-up care. *American Journal of Preventive Medicine* 1994;10(5):283–89.	No relevant outcomes.
Strychar IM, Potvin L, Pineault R, Pineau R, Prevost D. Changes in knowledge and food behavior following a screening-program held in a supermarket. *Canadian Journal of Public Health – Revue Canadienne de Sante Publique* 1993;84(6):382–388.	Before and after study. No control group – better evidence available.
Sun WY, Sangweni B, Chen J, Cheung S. Effects of a community-based nutrition education program on the dietary behavior of Chinese-American	Relevant to BMEG review.

college students. *Health Promotion International* 1999;14(3):241–9.	
Sustrans. *The health benefits of safe routes to school*. Information Sheet FS15. Bristol: Sustrans Routes for People; 2000.	Non systematic literature review.
Sustrans. *Safe routes to school: three year review*. [Date unknown] [254]	Non systematic literature review..
Sutherland MS, Harris GJ, Barber M. *Church-based health promotion activities*. Program presented at the American Public Health Association Convention Washington, DC.1992.	Not held by British Library. Unable to locate.
Tarry J. Class action. *Surveyor* 1999;186:16–8.	Very brief description of a project to increase walking to school.
Thomas H. Interventions to increase physical activity in children and youth. In: Thomas H, Ciliska D, Micucci S, Wilson-Abra J, Dobbins M, Dwyer J, eds. *Effectiveness of physical activity enhancement and obesity prevention programs in children and youth*. Hamilton, Ontario: Effective Public Health Practice Project; 2004.	All bar two studies related to schoolchildren.
Thomson H, Petticrew M, Morrison D. Housing improvement and health gain: a summary and systematic review. *British Medical Journal* 2001;323:187–90.	No relevant papers identified from included studies.
Tolley R, Bickerstaff K, Shaw S. Beyond public health: benefits of walking on children's social development. Staffordshire: The Centre for Alternative and Sustainable Transport; 1999.	– Quality study.
Trayer T. *Impact of environment based changes.* UKPHA; 2005.	Not available from British Library. Unable to locate.
Troped PJ, Saunders RP, Pate RR, Reininger B, Ureda JR, Thompson SJ. Associations between self-reported and objective physical environmental factors and use of a community rail-trail. *Preventive Medicine* 2001;32(2):191–200.	No control group – better evidence available.
Trost SG, Owen N, Bauman AE, Sallis JF, Brown W. Correlates of adults' participation in physical activity: review and update. *Medicine and Science in Sports and Exercise* 2002;34(12):1996–2001.	Causation – reference list checked.
Tudor-Locke C, Ainsworth BE, Adair LS, Popkin BM. Objective physical activity of Filipino youth stratified for commuting mode to school. *Medicine and Science in Sports and Exercise* 2003;35(3):465–71.	Survey of physical activity behaviour – no relevant evidence.
Turner LW. Cardiovascular health promotion in north Florida African-American churches*. Health Values* 1995;19(2):3–9.	Afro-American church-based. Sent to Teesside.
Unwin NC. Promoting the public health benefits of cycling. *Public Health* 1995;109(1):41–6.	Non-systematic review – causation.
Viner R. Predictors of change in body mass from childhood to adolescence. *Journal of Adolescent Health* 2004;34:121.	UK corroborative but only an abstract.
Vitetta-Miller R. Strategy 3: shop till you drop (pounds). *Shape* 2002;21(9):8.	Suggestions to consumers for a healthy shopping list.
Von Bernuth RD. 'The built environment and public health'. *Proceedings of the NSF Housing Research Agenda Workshop*, February 12–14, 2004, Orlando, Florida.. Syal M, Mullins M, Hastak M, eds. Vol. 2, Focus Group	Call for research into relationship between land use

4: 274–7.	and obesity.
Wagner EH, Wickizer TM, Cheadle A et al. The Kaiser Family Foundation Community Health Promotion Grants Program: findings from an outcome evaluation. *Health Service Research* 2000;35(3):561–89.	Multi-centre state/country-wide intervention and not suitable for local implementation.
Wagner J, Winett R. Promoting one low-fat, high-fiber selection in a fast food restaurant. *Journal of Applied Behavior Analysis* 1988;21:179–86.	Pre-1990 non-RCT.
Wagner JL, Winett RA, Walbert-Rankin J. Influences of a supermarket intervention on the food choices of parents and their children. *Journal of Nutrition Education* 1992;24(6):306–11.	Family study.
Wakefield J. Fighting obesity through the built environment. *Environmental Health Perspectives* 2004;112(11):A616–8.	Discussion paper.
Walden K. Back to school. *Green Places* 2004;3:25–7.	Discussion paper – no relevant outcomes. NB: Suggested by GDG.
Wang G, Macera CA, Scudder-Soucie B, Schmid T, Pratt M, Buchner D. A cost-benefit analysis of physical activity using bike/pedestrian trails. *Health Promotion Practice* 2005;6(2):174–9.	Pass information to Paul Trueman at York University.
Wang G, Macera CA, Scudder-Soucie B et al. Cost analysis of the built environment: the case of bike and pedestrian trials in Lincoln, Neb. *American Journal of Public Health* 2004;94(4):549–53.	Already excluded from Community 2 review, Wang 2004 [173].
Wansink B, Linder LR. Interactions between forms of fat consumption and restaurant bread consumption. *International Journal of Obesity* 2003;27(7):866–868.	No baseline measures.
Wansink B. Environmental factors that increase the food intake and consumption volume of unknowing consumers. *Annual Review of Nutrition* 2004;24:455–79.	Narrative overview.
Wardle J, Rapoport L, Miles A, Afuape T, Duman M. Mass education for obesity prevention: the penetration of the BBC's 'Fighting Fat, Fighting Fit' campaign. *Health Education Research* 2001;16(3):343–55.	Relevant to awareness review.
Webb K, Hawe P, Noort M. Collaborative intersectoral approaches to nutrition in a community on the urban fringe. *Health Education and Behavior* 2001;28(3):306–19.	Descriptive evaluation – no evidence provided.
Webster J. Tackling food poverty: the options for local authorities. *Benefits* 1999;(24):7–10.	Discussion paper.
Weinehall L, Westman G, Hellsten G et al. Shifting the distribution of risk: results of a community intervention in a Swedish programme for the prevention of cardiovascular disease. *Journal of Epidemiology and Community Health* 1999;53(243):250.	In Community 1 review.
Westerterp-Plantenga MS, Wijckmans-Duijsens NEG, Verboeket-van de Venne WPG, de Graaf K, van het Hof KH, Weststrate JA. Energy intake and body weight effects of six months reduced or full fat diets, as a function of dietary restraint. *International Journal of Obesity and Related Metabolic Disorders* 1998;22(1):14–22.	Intervention to determine whether reduced-fat foods aid weight loss.
Weststrate JA, van het Hof KH, van den Berg H et al. A comparison of the effect of free access to reduced fat products or their full fat equivalents on	Intervention not relevant.

food intake, body weight, blood lipids and fat-soluble antioxidants levels and haemostasis variables. *European Journal of Clinical Nutrition*. 1998;52(6):389–95.	
White RR. Health and community design: The impact of the built environment on physical activity. *Ecological Economics* 2005;52(2):258–9.	Book review.
Wilson L. Implementation and evaluation of church-based health fairs. *Journal of Community Health Nursing* 2000;17(1):39–48.	Evaluation of success of a program planning model – no relevant evidence.
Winett RA, Anderson ES, Whiteley JA et al. Church-based health behavior programs: Using social cognitive theory to formulate interventions for at-risk populations. *Applied and Preventive Psychology* 1999;8(2):129–42.	Overview and protocol.
Winett RA, Anderson ES, Bickley PG et al. Nutrition for a Lifetime System: A multimedia study for altering food supermarket shoppers' purchases to meet nutritional guidelines. *Computers in Human Behaviour* 1997;13(3):371–92.	Excluded at critical appraisal stage as RCT – but data extraction completed.
Winett RA, Wagner JL, Moore JF et al. An experimental evaluation of a prototype public access nutrition information system for supermarkets. *Health Psychology* 1991;10(1):75–8.	Less than 3-months follow-up.
Wing RR, Jeffery RW. Food provision as a strategy to promote weight loss. *Obesity Research* 2001;9(Suppl 4):S271–5.	All obese or overweight.
Wong F, Huhman M, Heitzler C et al. VERB – A social marketing campaign to increase physical activity among youth. *Preventing Chronic Disease: Public Health Research, Practice and Policy* 2004;Jul;1(3):1–7.	Description of components of a physical activity campaign for 9–13-year-olds in USA. NB: Suggested by GDG.
Wrieden WL, Anderson AS, Longbottom PJ et al. *Assisting dietary change in low-income communities: assessing the impact of a community-based practical food skills intervention (CookWell).* N09011. London: Food Standards Agency; 2002.	Included in Community 1 review.
Wrigley N. 'Food deserts' in British cities: policy context and research priorities. *Urban Studies* 2002;39(11):2029–2040.	Introduction and overview of 'food deserts' theme – reference list checked.
Wrigley N, Warm D, Margetts B, Whelan A. Assessing the impact of improved retail access on diet in a 'food desert': a preliminary report. *Urban Studies* 2002;39(11):2061–2082.	Covered by included paper Wrigley (2003).
Wrigley N, Warm D, Margetts B. *Deprivation, diet and food retail access: findings from the Leeds 'Food Deserts' study*. Southampton: University of Southampton; 2002.	Covered by included paper Wrigley (2003).
Yancey AK. Building capacity to prevent and control chronic disease in underserved communities: expanding the wisdom of wisewoman in intervening at the environmental level. *Journal of Women's Health* 2004;13(5):644–9.	General discussion of research with no outcome data.
Yanek LR, Becker DM, Moy TF, Gittelsohn J, Koffman DM. Project Joy: faith based cardiovascular health promotion for African American women. *Public Health Reports* 2001;116(Suppl 1):68–81.	Afro-American church-based. Sent to Teesside.
Zaccari V, Dirkis H. Walking to school in inner Sydney. *Health Promotion*	Schools-based.

Journal of Australia 2003;14:137–40.	
Zifferblatt S, Wilbur CS, Pinksy JL. Changing cafeteria eating habits. *Journal of the American Dietetic Association* 1980;76:15–20.	Pre-1990 non-RCT/workplace-based.
Zimring C, Joseph A, Nicoll GL, Tsepas S. Influences of building design and site design on physical activity: research and intervention opportunities. *American Journal of Preventive Medicine* 2005;28(2)(Suppl 2):186–93.	Non-systematic review.
Zunft HJF, Friebe D, Seppelt B et al. Perceived benefits of healthy eating among a nationally representative sample of adults in the European Union. *European Journal of Clinical Nutrition* 1997;51(Suppl 2):S41–6.	Europe-wide survey to determine main perceived benefits of healthy eating.

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Appendix 11

THE EFFECTIVENESS OF INTERVENTIONS TO PREVENT WEIGHT GAIN TARGETED AT BLACK AND MINORITY ETHNIC GROUPS, AT VULNERABLE GROUPS AND AT INDIVIDUALS AT VULNERABLE LIFE-STAGES

EVIDENCE SUMMARY TABLES

EVIDENCE SUMMARY TABLE 1: INTERVENTIONS TO PREVENT WEIGHT GAIN, OR IMPROVE BEHAVIOURS ASSOCIATED WITH THE MAINTENANCE OF A HEALTHY WEIGHT (DIET AND ACTIVITY), IN BLACK AND MINORITY ETHNIC GROUPS

SUMMARY

Sixteen randomised controlled trials (RCTs) were included overall within Black and minority ethnic groups (BMEGs). Ten RCTs in adult African American or Black American populations were identified (four included only females), six RCTs in 8–10-year-old African American girls (Baranowski 1990; Stolley 1997; Baranowski 2003; Beech 2003; Robinson 2003; Story 2003) (one study included both mothers and their daughters and reported outcomes for both [Stolley 1997], another study included both adults and their children [Baranowski 1990]), one RCT in 11–15-year-old African American adolescents [Wilson 2002], and one study in Black preschool children (Fitzgibbon 2005). All the studies were published between 1997 and 2005, with the exception of Baranowski, which was published in 1990. All were conducted in America and five of the RCTs in adults were set in churches. Seven adult RCTs had follow-up between 5 and 30 months duration, seven RCTs that included children had 12- to 14-week follow-ups and one RCT in preschool children had a 2-year follow-up.

Regarding the adult RCTs, mean age ranged from 37 to 60 years; mean age in the two family interventions was 31–32 years (Baranowski 1990; Stolley 1997). 73–80% of the study populations consisted of females, with a mean BMI ranging from 29 to 33 kg/m^2 and dropout rate ranging from 0 to 44% and sample size varying from 52 (Newton & Perri 2004) to 1325 (Hall 2003). Although the study by Hall and colleagues (2003) was targeted at minorities and assessed outcomes according to race, only 28% of the population were classified as 'Black'. All the other included studies in this section were virtually exclusively in African American or Black American populations.

Four RCTs concentrated on a dietary intervention in adult Black/African American populations (three studies specifically focussing on increasing fruit and vegetables and one study of a low-fat diet). Two RCTs concentrated on an exercise only intervention (walking) in adults and another ten studies had a diet and exercise intervention. Two of the ten adult RCTs reported weight, eight reported dietary intake (five studies focussing solely on fruit and vegetable intake). Two studies that conducted physical activity (PA) interventions (walking) reported PA outcomes only and two diet and exercise studies reported energy expenditure (Baranowski 1990; Yanek 2001). The four GEMS pilot studies and the study in preschool children reported weight, dietary intake and PA, two other studies that included children reported dietary intake only (Stolley 1997; Wilson 2002) and another study including children reported PA outcomes only (Baranowski 1990).

Evidence of efficacy for weight management/reduction

Two RCTs were identified which reported weight outcomes out of nine studies that included adults (Yanek 2001; Hall 2003). The study by Hall and colleagues (2003) showed modest but statistically significant decreases in weight (–1.4 kg), BMI (–0.6 kg/m^2), waist (–1.9 cm) and hip (–0.9 cm) circumference in Black American women following a low-fat diet for 6 months. Yanek and colleagues (2001) showed a significant reduction in BMI (–1.1 kg/m^2) and waist (–0.66 inches [1.7 cm]) circumference but not weight or % body fat at 1 year in African American female churchgoers following a diet and moderate aerobic activity intervention.

Eight RCTs were identified in African American/Black American children with four studies conducted as pilots for one trial (GEMS). All eight studies included diet and PA components and all the GEMS pilots included an active control. Two studies randomised either a mother and child dyad (Stolley 997) or a family unit, which included one or two adults and varying number of children living in the same household (Baranowski 1990). Mothers were actively involved in on of the GEMS pilot studies (Beech 2003). All four GEMS pilot studies reported no change in BMI at 12-weeks follow-up, two studies did not report weight outcome data at 12 weeks for the children, but one of these studies reported 'no weight change' between intervention and control group mothers (Stolley 1997) and the other study reported 'no significant differences' between groups for anthropometric measures (Baranowski 1990). Seven of the studies were not adequately powered to detect weight changes at 12–14 weeks. Ethnic minority children from Head Start programmes in Chicago that received a 14-week diet and PA intervention (Hip Hop to Health Jr) had significantly smaller increases in BMI compared with control children at 1-year follow-up (0.06 vs. 0.59 kg/m^2; difference –0.53 kg/m^2 (95% confidence interval [CI] –0.91, –0.14), p = 0.01; and at 2-year follow-up, 0.54 vs. 1.08 kg/m^2; difference –0.54 kg/m^2 (95% CI –0.98, –0.10), p = 0.02, with adjustment for baseline age and BMI. This study was adequately powered.

Evidence of efficacy for diet/physical activity outcomes

Diet

Seven adult RCTs reported dietary intake with four studies aimed at increasing fruit and vegetable intake amongst African American churchgoers (Campbell 1999; Resnicow 2001, 2004, 2005). Two of the fruit and vegetable interventions (Campbell 1999; Resnicow 2001) acted as parent studies for the third fruit and vegetable study (Resnicow 2004). In all four studies, fruit and vegetable intake was significantly increased in the intervention church populations up to 2 years, and one study reported significant difference in % energy intake from fat (Resnicow 2004). A culturally tailored diet and PA intervention significantly increased fruit and vegetable intake at 1 year compared with controls, who received education materials only; motivational telephone counselling had an additive effect (Resnicow 2005). A low-fat dietary intervention produced significant decreases in % energy intake from fat (–10.98%) and total energy intake (–379 kcal [–1.59 MJ]) at 6 months in postmenopausal Black American women (Hall 2003). A diet and moderate aerobic activity intervention produced significant decreases in total energy intake (–117 vs. –7 kcal [–490 vs. –29 kJ]) and total fat intake (–8.1 vs. 2.3 g/d) but not % energy from fat (Yanek 2001) at 1 year. Saturated fat intake (–2.1 oz [59 g]) and % energy from fat (–7.9%) was significantly reduced at 12 weeks in African American mothers following a diet and PA intervention (Stolley 1997).

Physical activity

Two adult RCTs promoted walking and included a home-based element, among sedentary ethnic minority populations. Both studies significantly increased the amount of walking in all participants from baseline to follow-up, but brief education was just as effective as adding mail and telephone counselling (Chen 1998) and a culturally tailored programme was no more effective than the standard programme (Newton 2004). One study including diet and moderate aerobic activity failed to show a significant difference in energy expenditure between intervention and control at 1 year (Yanek 2001). A culturally specific low-fat diet and aerobic exercise intervention in Black American families did not produce significantly increased metabolic equivalent tasks (METs) or energy expenditure at 14 weeks compared with control; both significantly increased energy expenditure from baseline (Baranowski 1990). A culturally tailored diet and PA intervention significantly increased PA at 1 year compared with controls, who received education materials only; however, motivational telephone counselling did not increase effectiveness of the culturally tailored diet and PA intervention (both active interventions increased PA compared with controls).

Within the RCTs in girls, all four GEMS pilots failed to show significant difference between study groups with regard to dietary intake or PA at 12 weeks (NB: controls were active controls in GEMS). There were a few exceptions: the parent and child intervention groups combined significantly reduced intake of sweetened drinks compared with non-active control in the Memphis GEMS study (Beech 2003). The Stanford GEMS pilot showed significant reduction in television (TV) viewing in the intervention group (Robinson 2003). The GEMS Minnesota pilot (Story 2003) and the study by Stolley (1997) both showed significant reduction in % energy from fat in the intervention girls. The Hip Hop to Health Jr study demonstrated only one significant difference between intervention and control preschool children regarding diet/activity outcomes and this was a difference in % energy from saturated fat at 1-year follow-up (11.6 vs. 12.8%, $p = 0.002$).

Amongst African American adolescents, social cognitive theory (SCT) and SCT plus motivational interviewing to increase fruit and vegetable intake, were equally effective compared with control at 12 weeks (Wilson 2002). The children of a family diet and exercise intervention actually decreased activity (METs) compared with the control children who increased activity (METs) and energy expenditure (Baranowski 1990).

Evidence of corroboration in the UK

Six population surveys, two reviews and two intervention studies of diet and PA in BMEG populations in Britain were identified for corroborative evidence. The majority focused on South Asian women and one focused on White Irish adults. Another two non-UK surveys including African Americans were also included.

EVIDENCE TABLE 1: INTERVENTIONS TO PREVENT WEIGHT GAIN, OR IMPROVE BEHAVIOURS ASSOCIATED WITH THE MAINTENANCE OF A HEALTHY WEIGHT (DIET AND ACTIVITY), IN BLACK AND MINORITY ETHNIC GROUPS

(A) ADULTS

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/comments
Hall et al. 2003 Women's health trial: feasibility study in minority populations RCT 1++ **Aim:** To examine the effect of a low-fat diet on anthropometric and biochemical variables in postmenopausal women of diverse ethnic backgrounds.	**Eligibility criteria:** Postmenopausal women 50–79 years, consuming diet with at least 36% total energy derived from fat. Women were 165% above ideal body weight, special minority focussed recruitment. Women taking medications to lower blood lipids or insulin were excluded. This study was included in the review because not only was it in minority ethnic groups but it met all our inclusion criteria, i.e. the subjects were not all obese at baseline. **Setting:** Atlanta, Alabama and Miami, USA, multi-site. Intervention *n* = 1325 Control *n* = 883 56% non-Hispanic White, 28% Black, 16% Hispanic; mean age 60 years.	**Intervention:** Reduce total fat intake to 20% or less of total energy, also reduce saturated fatty acids and cholesterol, increase fruits, vegetables and wholegrain, no emphasis on reduced energy intake, weight loss or exercise; groups of 8–15 led by research nutritionist, weekly sessions for initial 6 weeks, then monthly for 9 months, then quarterly. **Control**: Control group received pamphlet on general dietary guidelines. **Follow-up:** Minimum 6 months and maximum 18 months. The duration of follow-up varied because the end of the study was the same for all participants, regardless of the date when they joined the study.	**Lost to follow-up**: Intervention: 649 of 1720 Control: 234 of 649 (see confounders/comments) **Weight (kg):** Mean difference between baseline and 6 month follow-up measurements. Negative values indicate positive health changes with intervention compared with control. White –1.4 (–1.9 to –0.99) Black –1.7 (–2.27 to –1.02) Hispanic –1.2 (–2.31 to 0.00) **BMI (kg/m^2):** White –0.6 (–0.72 to –0.38) Black –0.6 (–0.88 to –0.41) Hispanic –0.5 (–0.90 to –0.03) **Waist (cm):** White –1.7 (–2.27 to –1.08) Black –1.9 (–2.71 to –1.08)	Funded by National Cancer Institute and the National Heart, Lung and Blood Institute Women were randomised over 18-month period and the duration of follow-up varied because the stop date was same for all participants, regardless of their entry date. Many women were recruited relatively late in the study with administrative censoring prior to their schedules 12 or 18 month visit. A large number of women (*n* = 1720) completed the 6-month visit and this represented 81% of the women randomised to the intervention group and 74% of the women

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/comments
	Baseline BMI (kg/m^2) (mean) Intervention White 27.8 (SD 4.6) Black 30.1 (SD 4.3) Hispanic 29.2 (SD 4.4) Control White 28.1 (SD 4.5) Black 30.5 (SD 4.3) Hispanic 29.8 (SD 5.5)		Hispanic –0.9 (–2.44 to 0.59) **Hips (cm):** White -1.7 (–2.22 to –1.12) Black –0.9 (–1.67 to –0.17) Hispanic –0.9 (–2.44 to 0.59) **Diet:** Fat (% energy) White –11.9 (–12.97 to –10.8) Black –10.98 (–12.28 to –9.29) Hispanic –5.7 (–8.52 to –2.78) Energy (kcal/d) White –306 (–402 to –210) (–1.28 [–1.68 to –0.88] MJ) Black –379 (–510 to –247) (–1.56 [–2.13 to –1.03] MJ) Hispanic –695 (–948 to –442) (–2.91 [–3.97 to –1.85] MJ) **Authors' conclusion**: In older White, Black and Hispanic women, a long-term low-fat dietary intervention in the absence of any particular focus on reducing energy intake was accompanied by modest but generally statistically significant	randomised to the control group. The change in total number of participants at baseline and 6-month interval primarily reflects follow-up time available from randomisation rather than dropout. Some degree of under-reporting of dietary intakes likely as degree of weight loss was less than would be expected by reported decreased energy intake – occurred in both intervention and control groups. Power calculations were not reported so it is not clear if the study was sufficiently powered to detect a significant effect of intervention when compared with control.

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/comments
			decreases in weight and anthropometric indices. **Physical activity:** Not reported.	
Yanek et al. 2001 Project Joy RCT 1+ **Aim:** To test nutrition and PA interventions in the church environment to reduce cardiovascular risk in urban communities where most African American women are regular churchgoers.	**Eligibility criteria:** African American women aged ≥40 years regularly attending Inner city churches in Baltimore with known level of high interest and participation in local activities, 80% African American congregation, average Sunday attendance at least 150 individuals, no currently active programme in weight control, exercise or smoking cessation for women aged ≥40 years, churches stratified by denominations. Pregnancy, myocardial or stroke, renal dialysis or undergoing treatment for cancer were exclusions. **Setting:** Baltimore, MD, USA. SP *n* = 267 SI *n* = 188 SH *n* = 74 529 women in total from 16 churches.	**SI intervention:** Behavioural model based on standard group methods with weekly sessions including weigh-in and group discussion then 30–45 min nutrition education module that included taste test or cooking demonstration (standardised for initial 20 weeks and taught by study staff who were female African American health educators), 30 min moderate intensity aerobic activity (could include brisk walking, water aerobics, Tae Bo and varied between churches), goals behaviours included 30 min or more exercise 5 to 7 days per week, five servings fruits and vegetables every day, 25 g fibre/day, fat consumption ≤40 g/day, 1200–1800 kcal [5.02–7.53 MJ] per day, sodium intake ≤2400 mg/day , smoking cessation. **SP intervention:** Same as above supplemented with spiritual and church cultural component which included group prayers and health messages enriched with scripture and	**Lost to follow-up**: 44% (235 of 529) Intention to treat (ITT) analysis carried out (i.e. on the 529) Results combined for SP and SI groups (see confounders/comments). **Weight:** Mean change intervention vs. control at 1 year: Weight (lb): –1.1 (SE 0.42) vs. 0.83 (SE 0.52) (–0.50 [SE 0.19] vs. 0.37 [SE 0.24] kg) BMI (kg/m^2): –1.1 (SE 0.42) vs. 0.14 (SE 0.09)* Waist (inches): –0.66 (SE 0.11) vs. –0.007 (SE 0.20)* (–2.79 [SE 0.28]	Intensive community involvement in design and pilot of study to encourage cultural relevance and ownership; intervention based on community action and social marketing model. Most women from churches randomised to self-help group were not interested in the intervention and so recruitment was lower. SP and SI significantly more likely to return for follow-up; completers significantly older, lower income, less likely to be employed and attended more sessions.

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/comments
	Mean age 52–54 years, most had completed high school, three out of four were employed, slightly more than half had hypertension, more than two out of five had arthritis. **Baseline BMI (kg/m^2):** SP+SI: 32.6 (SD 7), *n* = 455 SH: 31.7 (SD 8), *n* = 74	PA conducted with gospel music or praise or worship dance. **SH intervention:** Control group of non spiritual, self-help interventions, received all Project Joy educational materials plus American Heart Association guidelines and no further help except a hotline number for consultation from professional Project Joy health educators. **All groups:** Separate retreats held for each church following baseline assessment to kick-start the programme. **Follow-up:** 1 year.	vs. –0.02 [SE 0.51] cm) Body fat (%): –0.37 (SE 0.11) vs. –0.11 (SE 0.10) **Diet:** Mean change intervention vs. control at 1 year: Energy intake (kcal/d): –117 (SE 16) vs. –7 (SE 32)* (–489 [SE 67] vs. –29 [SE 134] kJ/d) Total fat (g/d): –8.1 (SE 0.99) vs. –2.3 (SE 2.0)* % Energy from fat: –1.7 (SE 0.27) vs. –1.2 (SE 0.47) Energy expenditure (kcal/d): 38 (SE 21) vs. 28.2 (SE 45) (159 [SE 88] vs. 118 [SE 188] kJ/day) ***Significant** **Physical activity:** Not reported.	SI and SP became very similar as women in SI women initiated prayer and scripture of their own accord. Power calculations were not reported so it is not clear if the study was sufficiently powered to detect a significant effect of intervention when compared with control.

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/comments
			Authors' conclusions: Intervention participants achieved clinically important improvements in cardiovascular disease risk profiles after 1 year that did not occur in the self-help groups; church-based interventions can significantly benefit cardiovascular health of African American women.	
Stolley 1997 Cluster RCT 1+ **Aim:** To examine the effectiveness of a culturally specific obesity prevention programme for preadolescent girls and their mothers. Mothers were included in the study for numerous	**Eligibility criteria:** African American girls (7–12 years old) and their mothers living in Chicago's inner city and attending a local Cabrini-Green tutoring programme (to address educational needs of children living at the poverty level). Chicago, USA **Intervention:** *n* = 32 mother–daughter pairs **Control:** *n* = 30 mother–daughter pairs **Mean age:** Mothers:	**Intervention:** Culturally specific low fat, low-energy diet and increased PA (including meal planning, tasting, music and dance, one session low-impact aerobics delivered by qualified staff from the tutoring programme). Two forms of incentives were offered; in return for participating in each of the health screenings, mothers received US$25.00 and daughters received US$10.00. As well as this each mother-daughter pair received US$5.00 gift certificate for a local grocery store chain at the end of each week's session. **Control:** General health programme. This programme was run similar to the	**Lost to follow-up:** At the end of the intervention 22% (*n* = 11) of mothers and 17% (*n* = 11) of daughters had dropped out the study. **Weight:** Weight of women remained unchanged from baseline in both intervention and control group. No data on weight change in daughters reported. **Diet:** Significant reductions in intervention mother's daily saturated fat intake (–2.1 oz [59 g], $p < 0.05$) and %	Thinner mothers were more likely to drop out The drop out mothers had a mean weight of 158 lb (71.7 kg), whereas the finishers had a mean weight of 179 lb (81.2 kg) ($p < 0.05$). 62% of the mothers and 19% of the daughters were obese and analyses of baseline values on all dependent variables showed no differences across treatment and control groups. It is not clear if the study

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/comments
reasons: 1) they are the primary people who shop and cook for their families; 2) girls would more likely to attend regularly if their mothers also attended; 3) girls are more likely to make and maintain positive eating behaviour changes if they received support and role modelling from their mothers; 4) mothers are more likely to support changes in their daughters behaviours if they played a role in the change.	Intervention = 31.5 years Control = 33.7 years Daughters: Intervention = 9.9 years Control = 10.0 years **Intervention mothers:** 56% unemployed, 72% single, mean years education 11.4. **Control mothers:** 60% unemployed, 70% single, mean years education 11.3. **Baseline BMI (kg/m^2):** Mothers, intervention: 29.1 (6.7) Mothers, control: 30.8 (8.7) Daughters, intervention: 18.4 (4.0)(Daughters, control: 20.1(6.4) **% Overweight:** Mothers: Intervention group: 31.4% Control group: 38.7% Daughters: Intervention group: 7.9% Control group: 16.3% Not reported if the differences	treatment group, with control subjects meeting in small groups (n = 7–10) with group leaders. The focus of each session was on general health topics such as communicable disease control, relaxation techniques and stress reduction (i.e. not a culture-specific curriculum). The groups attended separate programs for 1 hour per week for 11 weeks. **Follow-up:** Post-test at 12 weeks.	energy from fat (–7.9%, $p < 0.001$) compared with controls. For daughters, authors found a significant effect of group on saturated fat, dietary cholesterol intake and percentage daily fat. Percentage of energy as fat in the treatment group diet was 39.1 at baseline and 35.2 at post-test ($p < 0.05$). To assess changes in eating behaviour during over the course of the intervention 2 × 2 (Group × Time) repeated measures multivariate analysis of variance (MANOVA). For daughters there was a Group × Time interaction for percentage of energy from fat, i.e. daughters reduced their percentage of energy from fat over the 12 weeks. **Authors' conclusions:** Intervention mothers exhibited significant decrease in intake of saturated fat and	was sufficiently powered to detect a significant effect of intervention compared with control. Randomisation was by cluster and analysis was by individual, which may limit reliability of the results.

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/comments
	between groups was significant at baseline.		dietary fat. Results of the study were stronger for treatment mothers than for treatment daughters. Daughters in the treatment group reported only minor changes in their percentage of energy from fat as post treatment. Mothers appeared to be more concerned about their health and weight status than the daughters, the majority of whom were normal weight. **Physical activity:** Not reported.	
Baranowski et al. 1990 Cluster RCT 1– **Aim:** To improve diet and increase PA among a sample of predominantly low-income,	**Eligibility criteria:** Inclusion: Families (people living in the same household) of self-identified Black American ethnicity with a child in the 5th, 6th or 7th grades, healthy and willing to participate. Exclusion: Diagnosed chronic illness that would impose dietary or exercise restrictions.	**Intervention:** Culturally specific, one 90-min evening education session followed by two fitness sessions per week which were followed by fruit juice and low-fat low-salt snack for 14 weeks. Educational sessions included individual counselling (10–20 min each session with each family), small group education (20 min) and minimised lecturing/maximised participation.	**Lost to follow-up:** Not reported. **Weight:** Data not reported but authors report no significant differences between groups regarding anthropometric measures. **Diet:** Reported in another	Study participants were not self-selected – families were vigorously recruited from Black American students enrolled in 5th, 6th or 7th grade private and public schools (included home visits to recruit). There were significant

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/comments
Black American families	**Setting:** Galveston, TX, USA. Intervention: *n* = 50 families (63 adults, 64 children) Control: *n* = 44 families (51 adults and 56 children) **Mean age (years):** Adults Intervention: 31.8 Control: 32.9 Children Intervention: 10.6 Control: 10.9 **Gender:** Intervention: 21% male, 79% female Control: 12% male, 88% female **Socio-economic data** Unemployed: 22% of subjects in both the intervention and control group were unemployed. Family income no more than US$15000 (this value is not corrected for the 2004 inflation value): Intervention: 91%	Included testimonials, aerobic activity and snack components; located in a convenient building within the community (formerly a Black high school). Aerobic activity sessions in a fitness centre (gym was refitted as modern fitness facility). Incentives included free transport and babysitting, weekly raffle, family fitness album containing picture of family taken each time attended evening session, sun visors, jump ropes, exercise shorts, etc; reminders and monetary rewards for accurately completing food and activity records; low fat, low-energy diet and increased PA (including meal planning, tasting, music and dance, one session low-impact aerobics). This occurred for first 7 weeks then in response to low participation and comments from participants – small group education component was dropped and didactic information included in the individual family component, participants no longer required to attend education session before the fitness session nor required to complete daily food and activity record; Black professionals hired for key staff positions. Providers of the intervention were University staff, exercise physiologists and qualified fitness centre staff.	publication, which has been ordered for appraisal. **Physical activity:** Energy expenditure in METs (a validated way of measuring energy expenditure. It is a way of expressing the rate of energy expenditure from a given PA) Adults (pre–post) Intervention: 241.4 (SD 22.8) – 247.8 (SD 46.6), *n* = 50 Control: 235.5 (SD 16.1) – 248.0 (SD 29.4), *n* = 48. Pre to post changes were detected in METS for both intervention and control group adults. Post values for energy expenditure were higher than pre values in both the intervention and control group ($p < 0.01$). In children an interaction effect in METs indicated a decrease in activity for the intervention group and an increase in activity for the control group ($p < 0.01$).	problems with lack of adherence to the intervention. Only eight out of 60 adults and ten of 64 children attended more than half the fitness sessions. The average participation across all education/fitness sessions was 28%. The authors suggest that factors such as a bomb scare, hurricane alert, centennial celebration and start of school year may have affected attendance. It is not clear if the study was sufficiently powered to detect a significant effect of intervention when compared with control. Randomisation was by cluster and analysis was by individual, which may limit reliability of the

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/comments
	Control: 83% NB. The federal poverty level for a family of four (2004) is US$18.850. Less than high school education: Intervention: 13% Control: 27%, ($p < 0.05$) In both groups subjects were Predominantly blue collar and clerical. **Baseline BMI:** Not reported.	**Control:** No contact. **Follow-up:** 14 weeks.	No differences were detected between the intervention group and control groups on indicators of cardiovascular fitness (pulse or blood pressure). **Energy expenditure in kcal per week (7-day exercise recall):** Adults (pre–post) Intervention: 19,073 (SD 6152) – 19,592 (SD 6630) (79.80 [SD 25.73] – 81.97 [SD 27.74] MJ per week), $n = 50$ Control: 17,483 (SD 4941) – 18,544 (SD 4958) (17.15 [SD 20.67] – 77.59 [SD 20.74] MJ per week), $n = 48$ Adult METs were significantly increased ($p < 0.01$) in both intervention and control from pre to post 14 weeks; post values were higher than pre values in both intervention and control for energy expenditure, and the intervention adults had consistently higher values	results.

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/comments
			than control. A significant interaction effect ($p < 0.05$) was detected on weight and body surface area. However, this was probably due to two males in the intervention group who lost a significant amount of weight **Authors' conclusions:** The intervention programme did not increase the aerobic activity/PA in intervention group families. Although adults reported moderate energy expenditures (2499 kcal/day [10.46 MJ/day] in the control group and 2724 kcal/day [11.40 MJ/day] in the intervention group), there was little aerobic activity after our programme, except among children. The frequency of PA at the end of the intervention was highest ($p < 0.05$) among children in the intervention group who attended more than half of the fitness sessions (5.4 times per week)	

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/comments
			and was identifiable between those attending none (2.5 times per week) or less than half the sessions (2.8 times per week). No differences were detected among adult subjects. Programme ineffectiveness was not due to the subjects already being fit or engaging in exercise outside of the intervention but could have been due to the fact of low final participation rates in the intervention programme.	
Physical activity				
Newton & Perri 2004 RCT 1+ **Aim:** To compare the effects of three home-based exercise promotion programmes for improving	**Eligibility criteria:** African American, 30–69 years, sedentary lifestyle (<1 hour per week leisure time PA over previous 12 months), free from significant medical illnesses. **Setting:** Florida, USA PA (physician advice control): *n* = 10 SB (standard behavioural counselling): *n* = 22 CS (culturally sensitive counselling):	This study was part of a larger study which had a physician advice group and four groups that varied in frequency and intensity of exercise, (walk 3–4 or 5–7 days per week, at 45–55% or 65–75% of their heart rate reserve (no further details reported); participants within each active intervention group had different frequency and intensity of exercise prescribed but this was similar across groups. Participants could be prescribed to walk 3 or 4 (M) days or 5 to 7 days per week (H). In addition they received an intensity prescription of 45–55% or 65–	**Lost to follow-up:** PA: zero SB: 5 (23%) CS: 4 (15%) **Weight:** Not reported. **Diet:** Not reported. **Physical activity:** Number of days of exercise completion (derived from PA)	CS and SB produced significant improvements in cardiorespiratory fitness (VO_{2max}) that was superior to PA. It is not clear if the study was sufficiently powered to detect a significant effect of intervention when compared with control groups.

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/comments
cardiorespiratory fitness in sedentary African American adults.	*n* = 20 **Age (mean) (years):** PA: 47.3 SB: 44.0 CS: 45.0 Majority were female (81%) married (59%) had some college education or greater (92%) were working full-time (86%) and had personal income of at least US$25,000 per year (75%). **Baseline BMI (kg/m^2):** PA: 30.18 (SD 8.58), *n* = 10 SB: 32.02 (SD 4.94), *n* = 22 CS: 31.65 (SD 7.17), *n* = 20 Not all subjects were obese; no significant difference.	75% of their heart rate reserves (no further details reported) This meant the four intervention groups were made up of the four intensity frequency combinations: LM, LH, HM, HH. The duration of exercise for intervention subjects was set at 30 min. **Physical activity:** Minimal treatment, met with physician who gave general advice on exercise based on national guidelines and American Heart Association booklet 'Exercise and Your Heart', followed by monthly (× six) physician-led meetings of various health topics. All subjects in this group were African Americans. **SB:** Ten × group sessions over 6 months (weekly month 1, biweekly months 2–3, monthly months 4–6); led by counsellors with graduate training in exercise and/or behavioural science held in university hospital, attended groups as part of larger study (see above) The subjects in the SB condition attended groups with predominantly White group members and White group leaders (70% of the participants recruited into the larger walking study were White); written	showed that there was no significant difference between SB, CS and PA groups at 6 months ($p = 0.679$). However, within group analyses showed that participants in the CS and SB groups significantly increased their frequency/days per week of walking (only walking was assessed in the study from baseline to 6 months ($p < 0.05$). Note: subjects in the CS and SB groups were the only groups to significantly increase their days walking from baseline to 6 months ($p < 0.05$). **Authors conclusion:** The study showed that CS produced significant improvements in cardiorespiratory fitness that was superior to PA. Subjects in the CS groups showed significantly greater improvements in cardiorespiratory fitness compared with those in the	

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/comments
		materials and key behavioural components were goal setting, self-monitoring, problem solving, relapse prevention. **CS**: Identical to SB with exception that all group participants were African American, led by African American counsellors, conducted at suite located in African American community, materials designed to address socio-cultural concerns regarding exercise. **Follow-up:** 6 months	PA group. Subjects in the CS group also were more satisfied with various aspects of their treatment than were members of the other two groups. Although all three groups led to increases in self-reported PA but only the CS treatment demonstrated significant improvements ($p < 0.05$) in cardiorespiratory fitness. The results also showed that the culturally sensitive group produced additional positive changes in social support and participant satisfaction.	
Chen et al. 1998 RCT 1+ **Aim:** To evaluate a minimal intervention programme designed to promote walking among	**Eligibility criteria:** Women not currently exercising more than once per week or walking more than 90 min per week, able to speak comprehend and read English, free of any heart disease, at least 6th grade education. **Setting:** San Diego, USA Mean age 37 years, 58% married or living with partner, 63% employed	**Intervention:** Subjects received two pamphlets published by the American Heart Association (AHA). The first was ' Exercise and Your Heart' (a 32-page pamphlet with guidelines for beginning and maintaining an exercise program). The second, 'Silent Epidemic: the truth about women and heart disease' is a 27-page booklet on heart disease and risk factors in women. Subjects also received the Stanford walking kit and one-page tip sheet salient to ethnic minority women	**Lost to follow-up**: Significantly more women were lost to follow-up at 5 months in the intervention group, compared with control: (19 of 62 [30%] in intervention vs. 4 of 63 [6%] in control; $p < 0.05$). **Weight:** Not reported. **Diet:**	It is not clear if the study was sufficiently powered to detect a significant effect of intervention when compared with control.

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/comments
sedentary ethnic minority women.	outside home; 57 Latinas, 51 African Americans, 9 Asian or Pacific Islanders, 8 other/mixed ethnic origin. Behavioural intervention *n* = 62 Educational control *n* = 63 **Baseline weight:** Intervention: 163.7 (SD 41.8) lb (74.25 [SD 18.96] kg) Control: 166.6 (SD 44.0) lb (77.57 [SD 19.96] kg) Rational for including this study was that it met all the criteria. Although it is likely that the subjects are overweight (based on average height), the subjects are not obese so can it is included.	regarding barriers to exercise, and telephone counselling (based on SCT, six × 20–30 min, by graduate and advanced undergraduate student counsellors who received training) over 8 weeks in individually tailored home-based programme. Participants (from each group) paid US$5 at 2-month and again at 5-month follow-up plus pair of exercise shoes at 2-month follow-up. **Control:** Received same AHA written materials and 5 min telephone call. **Follow-up:** Five months and subset at 30 months.	Not reported. **Physical activity:** Both groups reported significantly increased walking at 5-month follow-up (mean change from baseline = 40 min in intervention vs. 52 min in control group, no significant difference); both groups continued to report more walking than baseline at 30-month follow-up of 50 participants (53 min intervention vs. 57 min control, no significant difference between groups). However, there was no significant difference in increase of PA levels between groups at either 5 months or 30 months follow-up **Authors conclusions:** Home-based behavioural intervention using mail and telephone counselling was not more effective than brief education – both increased walking among sedentary	

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/comments
			ethnic minority women;	
Diet				
Resnicow 2005 Healthy Body Healthy Spirit trial RCT (cluster) 1+ **Aim:** To test effectiveness of culturally targeted self-help intervention compared with standard education materials.	**Setting:** Sixteen Black churches in Atlanta metropolitan area, USA **Mean age:** Intervention 2: 46.6 years Intervention 1: 45.9 years Control: 46.3 years **Female (%):** Intervention 2: 78% Intervention 1: 76.1% Control: 74.2% More than 60% had income >US$40,000 **Completed college or higher:** Intervention 2: 44.9% Intervention 1: 50.0% Control: 41.2% Majority middle to upper socio-economic status (SES) African Americans. Intervention 2: *n* = 304 Intervention 1: *n* = 335	**Intervention 2:** Culturally targeted self-help nutrition and PA materials plus 4 telephone counselling calls based on motivational interviewing. **Intervention 1:** Culturally targeted self-help nutrition and PA materials. **Control:** Standard nutrition and PA materials Nutrition intervention focused on increasing fruit and vegetable consumption. Intervention and follow-up = 1 year.	1056 adults recruited and 906 followed up at 1 year (86%). **Mean change in fruit and vegetable intake at 1 year:** Intervention 2: 1.13 servings Intervention 1: 0.44 servings Control: 0.17 servings (mean of 2-, 19- and 36-item FFQs). Total time of PA increased significantly more in interventions 1 and 2 compared with group 1 for 'all activity', over 3 METs, and 'exercise items' (using CHAMPS instrument). Authors conclude there was a clear additive effect for motivational interviewing (intervention 2) on fruit and vegetable intake, whereas motivational interviewing did not enhance intervention 1 for PA measures.	Churches received financial incentives to participate.

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/comments
	Control: *n* = 267			
Resnicow et al. 2004 Body and Soul Cluster RCT 1++ **Aim:** To test the impact of the intervention when delivered by volunteer members of African American churches with less training, monitoring and support (real-world conditions).	**Eligibility criteria:** African American adults attending church. **Setting:** California, south-east and north-east. 1022 individuals across 15 churches. Intervention group *n* = 8 churches. Comparison group *n* = 7 churches. Number of participants in the study *n* = 854. All subjects were African American, 73–76% female, mean age 51 years, 60% married or living with partner, 50% had household income >US$50,000 and almost 70% reported at least some college education. **Baseline BMI:** Not reported.	**Intervention:** Churches agreed to implement several core church wide activities including a kick-off event, forming a project coordination committee, conducting at least three church-wide nutrition events plus one additional event involving the pastor and making at least one policy change; The American Cancer Society (ACS) provided churches with implementation manual and trained a volunteer liaison within each church; all individuals received *Eat For Life* cookbook which contained recipes submitted by church members from Eat for Life Trial and contained at least one-quarter serving fruit or vegetable per serving and low in fat; each church received a video developed for the study targeting fruit and vegetable intake using spiritual and secular motivational messages and lasting 18 min for public screening; motivational interviewing provided to individuals for voluntarily enrolled (unlike church-wide activities) provided by lay members (mainly with degree and background in a helping profession) who received training by ACS staff. The intervention lasted for 6 months and individuals which did not	**Lost to follow-up**: 15% intervention, 17% comparison (no significant difference). 854 of 1022 assessed in total at 6 months **Weight:** Not reported. **Diet:** At 6 months, participants in intervention group reported significantly greater consumption of fruits and vegetables than those in comparison group, adjusted post-test difference was 0.7 servings per day based on a two-item measure and 1.4 servings for the 17-item measure change in fruits was 0.4 servings (2-item) and 0.9 servings (17-item, 0.15 attributable to increase in fruit juice); change in vegetables was 0.2 (2-item) servings and 0.5 servings (17-item).	Constructed from two independent interventions to increase fruit and vegetable intake among African Americans in African American churches in southern USA 'Black Churches United for Better Health' and 'Eat for Life'. (Both parent trials included in this review.) Funded by ACS. Primary costs for the motivational interviewing training (trainer fees US$750 per day). Churches received US$5 incentive per completed baseline interview and again at 6-month follow-up plus US$500 if obtained completed questionnaires for at least 90% of their baseline participants.

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/comments
		respond to the 6-month post-test questionnaire were contacted by telephone by trained staff from the University of North Carolina and offered to receive a second questionnaire by mail or to complete it over the phone. **Control:** No details reported. **Follow-up:** 6 months. Two measures of fruit and vegetable intake were obtained at baseline and the 6-month follow-up. One was the National Cancer Institute (NCI) 19-item fruit and vegetable FFQ that assessed dietary intake over the past 4 weeks. Two items assessing French fry intake were excluded from the questionnaire, which left 17 items. The second measure was composed of two items used to assess usual fruit and vegetable intake that had a separate item for total fruits and total vegetables consumed each day.	There was a small but significant difference between groups in % energy from fat (32.8 [SE 0.27] in intervention vs. 33.7 [SE 0.31]; $p < 0.05$) in control. **Authors' conclusion:** Positive effects on behaviour change can be achieved in real-world conditions. Effect sizes were smaller but significant compared with parent efficacy trials **Physical activity:** Not reported.	Self-report. It is not clear if the study was sufficiently powered to detect a significant effect of intervention when compared with control. Authors report that all 15 churches 'reached the baseline quota of 60 participants'. Randomisation was by cluster and analysis was by individual, which may limit reliability of the results.
Resnicow et al. 2001 Eat For Life Trial	**Eligibility criteria:** African American adults attending Baptist and Methodist churches. **Setting:**	**Intervention**: Culturally sensitive multi-component self-help intervention: 23 min video, cookbook with recipes submitted by members that contained at least one-	**Lost to follow-up**: 150 of 1011 dropped out. (15%) Control attrition: 33%	This study was used in the development of Resnicow 2004, not same participants.

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/comments
Cluster RCT 1++ **Aim:** To increase fruit and vegetable intake in African Americans delivered through Black churches.	Atlanta, USA. **Churches:** *n* = 14 Control group: *n* = 4 Self-help intervention with one telephone cue call: *n* = 6 Self-help group with one cue call and three counselling calls: *n* = 4 Total number of subjects in the study: *n* = 1011 The number of participants per church averaged 72 (range 53–130) Mean age 44 years, 73% female, 54% married or living together, 45% income >US$39,999, 9.3% less than high school education. **Baseline BMI:** Not reported.	quarter serving fruit or vegetable per serving and low in fat; other education materials and quarterly newsletter. **Intervention 1:** Above plus one telephone call 2 weeks after baseline health fair to cue participants to use materials. **Intervention 2:** Above plus one telephone call 2 weeks after baseline health fair to cue participants to use materials plus three counselling calls based on motivational interviewing at 3, 6 and 10 months from baseline. Providers of the intervention included University researchers, national non-governmental health agency and the National Institutes of Health. To encourage participation, churches were provided with a US$10 donation for each adult subject (up to 60 per church) that completed baseline assessment. Churches received incentives ranging from US$250 to US$2000 (from the NCI depending on the proportion of baseline participants that attended the post-test health fair.	Culturally sensitive multi-component self-help intervention with one telephone cue call, attrition: 6% Culturally sensitive multi-component self-help intervention with one cue call and three counselling calls, attrition: 18% Dropouts were significantly younger, less likely to be married, to attend church more times per week and more likely to report alcohol use in the past 30 days. **Weight:** Not reported. **Diet:** At 1 year, the increase from baseline in fruit and vegetable intake was largest in Intervention 2; net difference between intervention 2 and control: 1.38, 1.03, 1.21 daily servings of fruits and vegetables (2-, 7- and 36-item FFQs respectively). Net	Dropouts were significantly younger, less likely to be married, less likely to attend church more times per week and more likely to report alcohol use in last 30 days. This study had power to detect a difference of one half serving of fruits and vegetables between intervention group 2 and control, with a power of 0.80 and alpha 0.05 Randomisation was by cluster and analysis was by individual, which may limit reliability of the results.

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/comments
		Control: Received standard nutrition education materials initially and culturally sensitive intervention materials 1 year post-test i.e. they received their intervention materials 1 year after the post-test. **Follow-up:** 1 year. **Diet**: Multiple measures of dietary intake were obtained to provide a converging estimate of actual intake. All subjects completed a seven-item FFQ, based on the behavioural Risk Factor Surveillance System that assessed fruit and vegetable intake in the past month. A two-item measure was used to assess usual fruit and vegetable intake. The third instrument was a 36-item fruit and vegetable FFQ, based on the Health Habits and History Questionnaire that was developed for this particular study.	difference between intervention 2 and intervention 1 was 1.14, 1.10 and 0.97 servings (2-, 7- and 36-item FFQs respectively) ($p < 0.05$). NB. Fruit and vegetable intake increased in both interventions compared with the control group. **Authors' conclusions:** Motivational interviewing when given in conjunction with a culturally appropriate multi-component self-help intervention appears to be a promising strategy for modifying dietary behaviour. **Physical activity:** Not reported.	
Campbell et al. 1999 The Black Churches United For Better Health Project	**Eligibility criteria:** African American church members. **Setting:** Fifty Black churches in ten rural counties in eastern North Carolina, USA.	**Intervention:** Based on a holistic approach that focussed on numerous factors to help improve fruit and vegetable consumption. This included targeting activities at individual, social network and community levels; used PRECED-	Response rate was 77.3% **Weight:** Not reported. **Diet:** Mean difference (portion	Funded by NCI. Survey was pilot tested and validated with a 3-day food record obtained form 146 members of the

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/comments
Cluster RCT 1++ **Aim:** To increase fruit and vegetable consumption by at least 0.5 daily servings among rural African American church members (for cancer prevention).	Intervention: *n* = 1198 Control: *n* = 1321 73% female, 98% African-American, average age 53.8 years, 55% married, 67% at least a high school education, 59% household income below $20,000 per year. **Baseline BMI**: Not reported. **Knowledge that five or more daily servings needed for health (baseline):** Intervention: 11.4% Delayed intervention/ control: 10.0% **Baseline fruit and vegetable consumption (number):** Intervention Fruits and vegetables: 3.84 Fruits: 2.14 Vegetables: 1.69 Delayed intervention: Fruits and vegetables: 3.65 Fruits: 2.04 Vegetables: 1.61	PROCEED model incorporating stages-of-change transtheoretical model, SCT and social support models. Intervention included planting gardens, 5-a-day educational sessions (at least two in each church), cookbook and recipe tasting, serving more fruits and vegetables at church functions, church members attended bimonthly training sessions to help other church members, coalitions were formed between church members and received training to plan community events, pastor support from the pulpit, grocer-vendor involvement and church initiated activities such as 5-a-day Sundays. The intervention was provided by Research staff, participating churches and local agencies, lay advisors (church members identified as natural helpers) and pastors. Intervention churches received funds to implement programme US$2500 per year, all churches received discretionary funds US$1000 per year. **Control:** Delayed intervention (received no advice). **Follow-up:** 20 months	serving) at 2 years adjusted for demographic and baseline intakes: Total fruits and vegetables: 0.85 (SE 0.12), *p* = 0.0001. Fruits: 0.66 (SE 0.09), *p* = 0.0001. Vegetables: 0.19 (SE 0.04), *p* = 0.003. Largest increases in fruit and vegetable consumption were observed among people aged 66 years or older (1 serving), those with education beyond high school (0.92 servings), widowed or divorced (0.96 servings), attending church frequently (1.3 servings); least improvement occurred amongst those aged 18–37 years and those who were single. **Authors' conclusions:** Study was successful in achieving dietary change among rural African Americans.	same subsample that completed the 1-year interim survey. Income level significantly higher in control group compared with intervention. It is not clear if the study was sufficiently powered to detect a significant effect of intervention compared with control.

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/comments
			Physical activity: Not reported.	

1

2 **(B) CHILDREN**

Weight				
Fitzgibbon 2005 Hip Hop to Health Jr RCT 1+	African American and Latino minority children (3–5 years old) in 24 Head Start sites in Chicago. **Mean age (months):** Intervention: 48.6 (SD 7.6) Control: 50.8 (SD 6.4) **% Female:** Intervention: 49.7% Control: 50.5% **% Black:** Intervention: 99% Control: 80.7% **Baseline BMI (kg/m^2):** Intervention: 16.5 (SD 1.5) Control: 16.7 (SD 2.0)	Reduction in fat, increase in fibre, increase in PA and inclusion of family are main elements of intervention. Theoretical base is combination of social learning theory and transtheoretical model of stages of change. Children had 45 min, three times per week for 14 weeks, hands-on learning about go and grow foods (' foods that will help you go and grow') vs. slow foods (' will make you slow'), using puppets of characters from each of the food groups. Parents had weekly newsletter, homework (compensated US$5 if completed), and twice weekly 30-min low-impact aerobic classes at children's Head Start sites. Control had 20-min class once per week for 14 weeks, spent on general health	14-week active intervention plus 2 years follow-up. Intervention *n* = 179 Control *n* = 183 Intervention children had significantly smaller increases in BMI compared with control children at 1-year follow-up (0.06 vs. 0.59 kg/m^2; difference –0.53 (95% CI –0.91, –0.14) kg/m^2, *p* = 0.01; and at 2-year follow-up, 0.54 vs. 1.08 kg/m^2; difference –0.54 (95% CI –0.98, –0.10) kg/m^2, *p* = 0.02, with adjustment for baseline age and BMI. Demonstrated only one significant difference between intervention and control children regarding diet/activity	Trial was piloted for 3 weeks where elements were changed. Curriculum materials translated and taught in both English and Spanish. Twelve of the sites were randomly assigned to receive the intensive intervention and 12 were assigned to the general health intervention.

		activity. Parents had weekly newsletter,	outcomes and this was a difference in % energy from saturated fat at 1-year follow-up (11.6 vs. 12.8%, *p* = 0.002).	
Baranowski 2003 GEMS – Baylor RCT 1+ **Aim:** To prevent obesity in African American girls.	**Eligibility criteria:** Eight-year-old African American girls, at least 50th percentile for age and gender BMI, with a parent willing to be involved, children needed access to internet, aimed at middle-income families, Texas, USA Intervention: *n* = 16 Control: *n* = 19 **Mean age:** Intervention: 8.3 (SD 0.3) years Control: 8.4 (SD 0.3) **Sex:** Girls only.	**Intervention:** All participants received below plus self-esteem enhancement and cultural awareness programme. **Control:** Set in a day summer camp (4 weeks) then in homes (8-week internet intervention), the intervention was delivered by trained personnel in camp and researchers via a website, aimed at increasing fruit and vegetable and water consumption and enhance PA. **Follow-up**: 12 weeks.	ITT analysis. **Weight, diet and physical activity:** No significant difference between groups for BMI, waist circumference, PA (accelerometer, checklist and questionnaire), or dietary intake at 12 weeks. There were diet differences in lower total energy (–231 kcal [–966 kJ]) and the total % of energy from fat, greater consumption of water and fruit juice and lesser consumption of sweetened beverages. It was also shown that the treatment group girls heavier at baseline showed a trend ($p < 0.08$) toward lower BMI compared with the heavier girls in the control group. Only subjects in the intervention group improved.	This study was a pilot study to assess feasibility and was not intended to be sufficiently powered to detect a significant intervention effect. Fully powered studies of two of the GEMS pilots are currently underway.
Beech 2003 GEMS-Memphis RCT	**Eligibility criteria:** African American girls, 8–10 years old, at least 25th percentile for age and gender BMI, able to participate in physical education (PE) classes at	School- and home-based intervention delivered by a trained researcher and a community lay health educator. **Intervention 1:**	ITT analysis, 100% follow-up. **Weight, diet and physical activity:** No significant difference	This study was a pilot study to assess feasibility and was not intended to be sufficiently powered to

1+ **Aim:** To prevent obesity in African American girls.	school, with a parent willing to be involved. Set in low-income areas, Tennessee, USA **Sample size** Intervention 1: *n* = 21 Intervention 2: *n* = 21 Control: *n* = 18 **Mean age:** Intervention (child): 8.7 (SD 0.8) years. Intervention (parent): 9.1 (SD 0.7) years . Control: 8.9 (SD 0.8) years. Mean age of parents varied from 34 to 39 years and was significantly different between groups (older mothers in control group). **Socio-economic data:** 35% total household income less than US$20,000 per year (i.e. low income, as earlier definition), 50% of girls lived in female-headed households. **Baseline BMI (kg/m^2) of the children:** Intervention 1: 25.5 (SD 7.4). Intervention 2**:** 23.0 (SD 5.6). Control: 22.6 (SD 5.6). Therefore, the baseline measurements show that the	Child-targeted intervention with girls only, 30 min hip-hop aerobics (also promote enjoyment) and 30 min healthy eating (decrease high-fat foods, increase water/reduce sweetened beverages, increase fruit and vegetable intake, promote healthy nutrition-related behaviours; take home element and gift incentives; 12 × weekly 90 min sessions. **Intervention 2:** Parent-targeted intervention with parents only, 25 min dance segment and 25 min interactive and didactic nutrition components 12 × weekly 90 min sessions. **Control:** Three × monthly 90 min sessions to improve self-esteem (nutrition and PA not addressed). **Follow-up:** 12 weeks.	between groups for BMI, waist circumference, PA (accelerometer and questionnaire), or dietary intake at 12 weeks with the exception of: parent and child intervention groups combined were consuming significantly fewer sweetened drinks (34% less, *p* = 0.03) compared with the control group at 12 weeks. **Authors' conclusion:** Study demonstrates feasibility, acceptability and efficacy of culturally relevant obesity prevention intervention in preadolescent African American girls and their parents/caregivers.	detect a significant intervention effect. Fully powered studies of two of the GEMS pilots are currently underway. Based on SCT Twelve-week non-randomised feasibility study conducted before this intervention. The control received less contact than intervention groups, which may have contributed to difference in effect between groups.

	subjects are not obese and although the mean BMI of intervention group 1 shows they are slightly overweight. Significance of these differences are not reported. **Baseline BMI of parents:** Not reported.			
Robinson 2003 GEMS-Stanford RCT 1+ **Aim:** To prevent obesity in African American girls.	**Eligibility criteria:** African American girls (8–10 years old), at least 50th percentile for age and gender BMI, with a parent having a BMI >25 kg/m^2, willing to be involved. Set in Oakland and Palo Alto, CA, USA. Intervention: *n* = 28 Control: *n* = 33 **Mean age:** Intervention: 9.5 (SD 0.8) years. Control: 9.5 (SD 0.9) years.	**Intervention:** After-school dance classes set in community centres designed to improve PA, reduce sedentary behaviours and enhance diet. The intervention called START (Sisters Taking Action to Reduce Television) was delivered by trained university-based dance instructors and a female African American intervention specialist. The programme consisted of daily dance classes during school weeks and reducing TV viewing time was covered in five home-based lessons. Four community lectures were also provided. **Control:** The control intervention was implemented to be an up-to-date information-based health education programme to promote healthful diet and activity patterns. It included presenting monthly community health lectures, delivered by volunteers from the African American task forces of the local chapters of the AHA and the American Diabetes Association. The content of the newsletter focussed on reducing risks for	ITT analysis. **Weight, diet and physical activity:** No significant difference between groups for BMI, waist circumference, PA (accelerometer and checklist), or dietary intake at 12 weeks. Significantly less TV viewing in the intervention group at 12 weeks (p = 0.007). At follow-up, the treatment group reported 23% less media use, relative to controls (–4.96/21.33) and a significant decrease in total household TV use relative to controls.	This study was a pilot study to assess feasibility and was not intended to be sufficiently powered to detect a significant intervention effect. Fully powered studies of two of the GEMS pilots are currently underway.

		obesity, heart disease, stroke, hypertension and diabetes and included age-related and culturally targeted educational materials. **Follow-up:** 12 weeks.		
Story 2003 GEMS-Minnesota RCT 1+ **Aim:** To prevent obesity in African American girls.	**Eligibility criteria:** 8–10-year-old African American girls, at least 25th percentile for age and gender BMI, with a parent willing to be involved. Set in low-income areas, Minnesota, USA Intervention: *n* = 26 Control: *n* = 28 **Mean age:** Intervention: 9.3 (SD 0.9) years. Control: 9.4 (SD 0.9) years. **Sex:** Girls only.	**Intervention:** Lunchtime clubs in school designed to improve nutrition, PA and self-esteem through a range of activities. The intervention which was conducted twice per week, focused on increasing healthy eating and PA. Intervention meetings, designed in a 'club meeting' format, were held twice per week for 1 hour after school at each of the schools used in the study. The intervention was based on SCT (Bandura) and targeted key points from three domains: 1) environmental factors such as peer support; 2) personal factors such as knowledge and values; and 3) behavioural factors such as goal setting and social reinforcement. Providers of the intervention included University Staff, Trained African American GEMS staff and school staff. **Control:** The control group served as an 'active placebo', non-nutrition/PA condition and focussed on promoting positive self-esteem and cultural enrichment. Participants attended monthly Saturday morning meetings (three meetings over	ITT analysis. **Weight, diet and physical activity:** No significant difference between groups for BMI, waist circumference, PA (accelerometer and questionnaire), or dietary intake at 12 weeks. % Energy from fat (parental reported) and low-fat food practices (parental reported) were significantly better in intervention group compared with control.	This study was a pilot study to assess feasibility and was not intended to be sufficiently powered to detect a significant intervention effect. Fully powered studies of two of the GEMS pilots are currently underway.

		12 weeks). This included arts and crafts; self-esteem activities, creating memory books and a workshop on African percussion instruments. **Follow-up:** 12 weeks.		
Baranowski et al. 1990 Cluster RCT 1– **Aim:** To improve diet and increase PA among a sample of Black American families.	**Eligibility criteria:** Inclusion: Families (people living in the same household) of self-identified Black-American ethnicity with a child in the 5th, 6th or 7th grades, healthy and willing to participate. Exclusion: Diagnosed chronic illness that would impose dietary or exercise restrictions. **Setting:** Galveston, TX, USA. Intervention: *n* = 50 families (63 adults, 64 children) Control: *n* = 44 families (51 adults and 56 children) **Mean age (years):** Adults Intervention: 31.8 Control: 32.9 **Gender:** Intervention: 21% male, 79% female Control: 12% male, 88% female **Unemployed:**	**Intervention:** Culturally specific, one 90-min evening education session followed by two fitness sessions per week which were followed by fruit juice and low-fat low-salt snack. Fourteen weeks, educational sessions included individual counselling (10–20 min each session with each family), small group education (20 min) and minimised lecturing/maximised participation and included testimonials, aerobic activity and snack components. Located in a convenient building cherished by the community (formerly a Black high school). Aerobic activity sessions in a fitness centre (gym was refitted as modern fitness facility). Incentives included free transport and babysitting, weekly raffle, family fitness album containing picture of family taken each time attended evening session, sun visors, jump ropes, exercise shorts, etc; reminders and monetary rewards for accurately completing food and activity records; low fat, low-energy diet and increased PA (including meal planning, tasting, music and dance, 1 session low-impact aerobics); this occurred for first 7 weeks then in response to low	**Lost to follow-up:** Not reported, average 28% participation. **Weight:** Data not reported but states that no significant differences between groups regarding anthropometric measures. **Physical activity:** 1) Energy expenditure in METs per week (7-day exercise recall): Children (pre – post) Intervention: 238.1 (SD 22.3) – 231.2 (SD 14.3), *n* = 59 Control: 231.2 (SD 12.0) – 237.2 (SD 21.8), *n* = 52 2) Energy expenditure in kcal per week (7-day exercise recall): Children (pre – post) Intervention: 9559 – 9684 (40.00–40.52 MJ/week),	*Not* self-presenting volunteers, families were vigorously recruited from Black American students enrolled in 5th, 6th or 7th grade private and public schools in Galveston, TX, USA (included home visits to recruit). Only 8 out of 60 adults and 10 of 64 children attended more than half the fitness sessions, average participation = 28%. Bomb scare, hurricane alert, centennial celebration and start of school year may have affected attendance. Diet outcomes reported in another publication but not relevant

	22% both groups. **Family income less than US$15,000:** Intervention: 91% Control: 83% **Less than high school education:** Intervention: 13% Control: 27%, $p < 0.05$ **Mean age children (years):** Intervention: 10.6 Control: 10.9 Predominantly blue collar and clerical. **Baseline BMI:** Not reported.	participation and comments from participants – small group education component was dropped and didactic information included in the individual family component, participants no longer required to attend education session before the fitness session nor required to complete daily food and activity record; Black professionals hired for key staff positions. **Control:** No contact. **Follow-up:** 14 weeks	*n* = 59 Control: 10,226 – 11,031 (42.77–46.15 MJ/week), *n* = 52 For the children an interaction effect in METs indicated a decrease in activity in the intervention group and an increase in activity in the control; control children increased energy expenditure more than the intervention children. **Authors' conclusions:** Programme did not achieve goal of increased habitual aerobic activity for the intervention group families, final participation was low therefore it is not surprising there was no differential effect of the programme on activity or fitness.	outcomes for this report (sodium only). It is not clear if the study was sufficiently powered to detect a significant effect of intervention compared with control.
Diet and /or physical activity				
Wilson et al. 2002 Cluster RCT 1+ **Aim:** To assess the effects of SCT plus	**Eligibility criteria:** Inclusion: Healthy 11–15-year-old African Americans from three middle schools, normotensive, no pre-existing cardiovascular disease or chronic disease, not currently taking medications, within 30% ideal weight for height.	**SCT:** SCT principles which include education, behavioural skills training, feedback and reinforcement; increase fruit and vegetable intake to six to eight servings per day and increase aerobic activity to 30–60 min/day for 7 days per week by the end of the programme; all	**Lost to follow-up:** SCT + MI = 17% SCT only = 30% Control = 31% **Weight:** Not reported.	Control group all male and SCT + MI had significantly greater number of married parents. Significantly more

motivational interviewing to increase fruit and vegetable intake in African American adolescents.	**Setting:** Richmond, Virginia, inner-city area, USA. SCT + MI (Social Cognitive Theory and Motivational Interviewing): *n* = 17 SCT only: *n* = 20 Control: *n* = 16 **Mean age:** 11–15 years. **Gender (male/female):** SCT + MI: 8/9 SCT only: 7/13 Control: 16/0 **Weight:** SCT + MI: 52 (SD 9) kg SCT only: 57(SD 22) kg Control: 53 (SD 19) kg	participants recruited from and took part in after-school intramural sports programme Team Up, 3 × per week and a fruit and vegetable cooking class 1 day per week. **SCT + MI:** As above with additional 30 min of self-presentation videotapes where participates given interview questions prior to interview and asked to generate several coping strategies to increase fruit and vegetable intake and PA that they had used as effective coping strategies, then videoed and allowed to view videos. **Control:** Twelve weekly sessions to maintain usual diet and exercise, general health related issues provided in education materials. **Follow-up:** 12 weeks. Providers of the intervention were the research team and school staff.	**Diet:** Pre – post fruit and vegetable servings/per day: SCT + MI: 2.6 (SD 1.4) – 5.7 (SD 2.2), $p < 0.05$ SCT: 2.5 (SD 1.2) – 4.8 (SD 2.4), $p < 0.05$ Control: 2.3 (SD 1.0) – 3.3 (SD 2.1), $p>0.05$) Correlation analyses revealed that only the SCT + MI group showed that dietary self-concept and dietary self-efficacy were both significantly ($p < 0.05$) correlated with post treatment fruit and vegetable intake and change in fruit and vegetable intake, respectively. **Physical activity:** 'No significant time or group effects for any of the physical activity measures.' **Authors' conclusion:** These findings suggest that the change in fruit and vegetable intake in the SCT + MI group resulted from strategic self-presentation, which induced positive shifts in self-concept and self-efficacy. It appears that SCT + MI and SCT alone were both effective	people were lost to follow-up in the SCT + MI group, compared with SCT alone and control groups. The study lacked sufficient power to detect a significant difference in fruit and vegetable intake between groups.

			at increasing fruit and vegetable intake compared with control. (Study reports in relation to fruit and vegetable intake and PA that no interaction or main effects were significant). The two active treatments changed significantly from baseline to follow-up on intake of fruit and vegetable but the control group did not.)	
Stolley 1997 Cluster RCT 1+ **Aim:** To examine the effectiveness of a culturally specific obesity prevention programme for preadolescent girls and their mothers.	**Eligibility criteria:** 7–12-year-old African American girls and their mothers living in Chicago's inner city and attending a local Cabrini–Green tutoring programme (to address educational needs of children living at the poverty level). Chicago, USA. Intervention: *n* = 32 mother–daughter pairs. Control: *n* = 30 mother–daughter pairs. **Mean age (years):** Intervention: 9.9 Control: 10.0 **Baseline BMI (kg/m^2)** Daughters, intervention: 18.4 (4.0) Daughters, control: 20.1 (6.4)	**Intervention:** Culturally specific low-fat, low-energy diet and increased PA (including meal planning, tasting, music and dance, one session low-impact aerobics). Providers of the intervention included researchers and staff from the Cabrini Green tutoring programme. Financial incentives were also given. In return for taking part in each of the health screenings, mothers received US$25.00 and daughters received US$10.00. Additionally, each mother daughter pair in attendance got a US$5.00 gift certificate for a local grocery store chain at the end of each week's session. **Control:** General health programme. Twelve weekly 1-hour meetings then every 3 months for 15 months.	**Lost to follow-up**: At the end of the intervention 22% (*n* = 11) of mothers and 17% (*n* = 11) of daughters had dropped out the study. **Weight:** Not reported. **Diet:** Intervention girls had significant reductions in % energy from fat (–3.9%, $p < 0.05$) compared with controls. **Weight:** Weight of women remained unchanged from baseline in both intervention and control group. No data on weight change in daughters reported.	This study had a number of limitations which will affect reliability of the results: There were very few participants, a large proportion of which dropped out of the study. Analyses were not by ITT. Outcomes were only reported for 12 weeks follow-up. Weight outcomes were not reported for daughters. Finally, it is not clear if

	19% of daughters were obese at baseline.	**Follow-up:** 18 months.	**Diet:** Significant reductions in mother's daily saturated fat intakes (–2.1 oz [59 g], $p < 0.05$) and % of energy from fat (–7.9%, $p < 0.001$) with intervention when compared with controls. Intervention daughters reported only minor changes in % energy from fat. **Authors' conclusions:** Intervention mothers exhibited significant decrease in intake of saturated fat and dietary fat. Results of the study were stronger for treatment mothers than for treatment daughters. Daughters in the treatment group reported only minor changes in their % energy from fat as post-treatment. Mothers appeared to be more concerned about their health and weight status than the daughters, the majority of whom were normal weight.	the study was sufficiently powered to detect a significant effect of intervention compared with control.

Evidence of corroboration (external validity)

Evidence of salience from studies conducted in the UK

First author	Study population	Research question	Length of follow-up	Main results	Confounders/comments

Evidence of implementation					
First author	**Study design**	**Study population**	**Research question**	**Length of follow-up**	**Main results**
Fox 2004	Case studies	South Asians (mainly at risk for heart disease).	Best practice guide to support delivery of heart disease services to South Asian communities in UK.	N/a	**Coventry 5-a-day scheme:** Provides people with money-off vouchers to spend on fruit and vegetables (£2 per week for 4 weeks, participants required to spend £4 of their own money at same time), valid in two stores in each area plus city centre and market, linked with delivery scheme that charges 50p to deliver, which can come off the voucher; free recipe cards, community nutrition scheme can give one-on-one help on preparing and cooking food in people's homes; there is evidence of groups of people shopping together. **The Coriander Club, Spitalfields City Farm:** Group of Bangladeshi women who get together and grow vegetables, two weekly gardening days and one weekly healthy cookery class, take home the vegetables in return for labour on the farm, growing vegetables is culturally acceptable hobby and opportunity to be physically active; Coriander Club is member of Taste of a Better Future project which is a national network of ethnic minority women's food growing groups (40-plus groups) set up in 1999, 40-plus group using spaces on housing estates and disused inner city plots to grow organic fruit and vegetables; as well as nutritious foods they enjoy making friends, sharing skills and bolstering communities. **Birmingham Food Net:** Cook and taste sessions run by community food workers, evaluation at end of five-session course shows participants (high South Asian population) include more fruit and vegetables, fish, cereals and starchy foods, use less oil and change to unsaturated fats; some report being more physically active and have learnt about healthy eating; some have had little exposure to education sessions, some women need convincing they have more to learn about cooking, some have low-level of knowledge about healthy eating, but all link diet with health.

					Bradford Trident Healthy Living Project weight management programme: Twelve-week group programme, emphasis on food and diet, discuss recipes, cooking methods, food labels, encouraged to keep food diaries, many have lost weight, learn recipes from all over world, low-budget recipes, active participation and ownership and empowerment are vital principles, subsidised health and fitness club membership given as incentive at end of programme. **Dietary intervention in high risk families with coronary heart disease in Ealing:** Family-based programme in cardiology department at Ealing hospital, cardio-protective diet emphasising low glycaemic index approach, shopper and cook attend as well as the patient, hold classes in evenings to ensure high attendance, lowers cholesterol by 18%, systolic blood pressure by 3 mmHg, body weight by 3.7 kg compared with a conventional care group, and persist beyond 1 year beyond completion of intervention programme and has impact on children (low intensity, easy to put into practice in primary care with modest extra resources. **Walking for Health in Wolverhampton:** Asian Community Walking Developer promotes walking within the community, she leads five different weekly group walks and trains volunteers, important to build trust and friendship into the meetings, gift voucher incentive of £1 for each five led-walks a person does, can collect up to £20 in vouchers to use in shops and leisure facilities in Wolverhampton. **Sitara:** Women-only project in West Yorkshire (75% South Asian), activities include exercise to music, swimming, aquafit, weights room, circuits and sauna; entailed hard work, co-operation and commitment to overcome problems around cultural issues, self-financing, prices kept low, holds four sessions per week and attracts up to 300 visits per week, couldn't have worked without commitment of all organisations involved (Primary Care Trusts [PCTs], council, local leisure). **Hamara Healthy Living Centre, Leeds:** Includes men's walking group, father-and-son swimming sessions and circuit training, participants encouraged to train as volunteers; sister organisation,

					Leeds Health Focus runs women's aerobic classes and women-only swimming, activities are designed around needs of participants, outreach work includes encouraging taxi drivers to incorporate PA into everyday lives (cleaning taxis), Hamara trainers offer after school aerobics and circuit training, basketball, football and cricket to four local schools (there is now a waiting list). **Al-Badr Health and Fitness:** New fitness centre in East London serving entire Muslim community; encourages and enables Muslim men and women to participate in physical fitness and health awareness programmes, state of the art equipment, separate male and female sessions (no male staff during female sessions) advertised on website.
Women's Health Initiative Study Group, Women's Health Initiative Dietary Modification Trial	FFQ as part of RCT	Postmenopausal women (USA).	To assess adherence to a low-fat diet.	5 years	This paper describes adherence to a low-fat dietary pattern (<20% energy from fat, five or more fruit/vegetable and six or more grain servings daily) in years 1 and 5 of the Women's Health Initiative Dietary Modification Trial, which was designed to examine the effects of a low-fat dietary pattern on risk of breast and colorectal cancers and other chronic diseases in postmenopausal women. Participants were randomly assigned to a low-fat dietary intervention arm (40%, *n* = 19,542) or a usual diet control arm (60%, *n* = 29,294). Women in the intervention arm completed 18 group sessions during the first year, followed by quarterly annual maintenance sessions. Adherence was assessed as control minus intervention (C – I) group differences in % total energy from fat as estimated by a FFQ. Based on these self-reported dietary data, mean C – I was 10.9 % points of energy from fat at year 1, decreasing to 9.0 at year 5. Factors associated with poorer adherence were being older, being African American or Hispanic (compared with White), having low income, and being obese. Group session attendance was strongly associated with better dietary adherence.
French 2000	Survey	Women aged 25–45 years, enrolled in Pound of Prevention Study	To examine demographic, behavioural and dietary correlates of frequency of fast food restaurant	3 years	Twenty-one percent of the sample reported eating three or more fast food meals per week. Frequency of fast food restaurant use was higher among younger women, those with lower income, non-White ethnicity, greater body weight, lower dietary restraint, fewer low-fat eating behaviours, and greater TV viewing. Intake of several other foods, including fruits and vegetables, did not differ by frequency of fast food restaurant use.

		(USA).	use.		
Williams 1999	Uncontrolled 6-week study.	Fifteen overweight or obese Asian women in Old Trafford, Manchester.	Examine perceptions of and change in weight from a healthy eating and exercise intervention.	17-month follow-up after 14-week programme.	45-min low-impact stretch and tone exercises to music led by fitness instructor each week for 14 weeks; home exercise advice; dietitian then gave advice regarding increasing fruit and vegetable intake, reducing amount of fat and oil in cooking, reducing intake of fatty and sugary foods; link worker available to interpret. Ten of 13 women lost weight, median weight loss after 14 week: –2.6 kg (range –0.7 to –10.7); from 14 weeks to 17 months eight of the women lost weight with median of –2.4 kg (range –0.4 to –7.5). Formal methods of recruiting had very little impact, verbal recommendation of the group by link worker and participants was more effective, intervention fulfilled social and weight loss functions and both functions were interrelated and affected weight, difficulty getting to venue and needs of family coming first were cited as reasons for none attendance; women who said they would definitely re-attend were generally those with a higher BMI.
White 1998	Review of interventions.	Papers published in English language 1985–96 in minority ethnic groups.	To review the effectiveness of health promotion in minority ethnic groups.	Various.	Dearth of relevant research on nutritional health promotion among minority ethnic groups in UK; 29 studies, 19 studies in African American population, two in UK that were supplementation studies in infant and toddlers (not relevant here); 13 of 29 studies demonstrated some degree of effectiveness, though only seven judged effective for their main nutritional aims in minority ethnic groups; educational approaches (one-to-one, group or community-wide in homes, schools or community settings); policy measures (school food policies); and technological measures (food supplements) demonstrated some degree of effectiveness; behavioural modification was more likely to be effective in European origin groups than minority ethnic groups (when compared), few studies can be directly applicable to UK, most were experimental or demonstration studies; many community-based projects to promote healthy eating in ethnic minorities in UK were identified in 'grey' literature, lacked formal evaluation and any sound evidence of effectiveness.
Bush 1998	Review	South Asians,	To evaluate opportunities fro	Various.	**South Asians:** GP clinic in Leeds for screening for coronary heart disease risk factors; high

		African Caribbeans, White Irish in UK.	and barriers against good nutritional health in minority ethnic groups.		attendance thought due to interpreter, increase in number of families reducing fat in cooking and changing to vegetable oil, several patients lost weight and a lot of women wanted to lose weight but had difficulty reconciling with family eating patters, failure to take up advice explained by family commitments, habit, health beliefs, environment and finances. Primary care initiative in Tower Hamlets, The Healthy Eastender project; dietary advice and materials appropriate to minority ethnic groups including Bangladeshi and African Caribbean– no evaluation. Dietary survey of Bengali women in Tower Hamlets concluded that unfamiliar food objects without verbal explanations are not likely to be recognised and pictures alone may not convey messages – implications for dietary surveys in this population. **African Caribbean:** Primary care initiative in Tower Hamlets, The Healthy Eastender project; dietary advice and materials appropriate to minority ethnic groups including Bangladeshi and African Caribbean – no evaluation. Studies in Manchester and Birmingham showed that African Caribbeans purchased more expensive imported Caribbean foods and because of lower incomes they spent a larger proportion on food. **White Irish:** Lack of intervention with Irish migrants in Britain. Lifestyle intervention in workplace in Galway aimed specifically at women concluded key to promoting healthy eating is in providing access to healthy options in canteen and reinforcing availability of these options through clear, simple and specific messages.
Carroll 2002	Literature review, survey, case studies and uncontrolled trial pilot	South Asian Muslim women in UK.	How effective is 'exercise on prescription' in promoting PA in South Asian women in UK?	6 weeks for pilot study.	**Case studies:** West Pennine Health Authority: 'A prescription for exercise' Bradford Health Authority: 'Bradford encouraging exercising people' Leicestershire Health Authority: 'Activity for life' Birmingham Health Authority: 'Exercise for prescription' Blackburn with Darwen: 'Fitness for life'

	intervention with interviews.				Women expressed positive effect of exercise on health and well-being, increased energy levels and motivation, social aspects, but many significant barriers: access, cost, childcare, cultural codes of conduct, language, racism and religious discrimination. Exercise on Prescription schemes suffer following shortcomings: 1) some areas have special provision for Asian Muslim women but many areas do not; issues with promoting the scheme in general and specifically for South Asian women; 2) dependent upon commitment of staff vital especially when lack of continuous funding, programmes are short-term and oversubscribed, and difficult for women to finance continuing exercise; 3) dependent upon good communications between multi-agencies that are not used to working together; 4) lack of clarity regarding roles and functions; 5) no direct links between community and the agencies to encourage participation (poor awareness and access to schemes); 6) lack of evaluation/monitoring of schemes; 7) difficulties with location of facilities (need to use local community facilities), inadequate public transport, fears of safety of walking; 8) need for more Asian members of staff at leisure facilities to communicate and understand needs of Asian women and availability of written materials in appropriate languages; 9) difficult to provide women-only sessions, female instructors; 10) need to consider childcare facilities; 11) GPs and leisure centre staff and instructors need to be supportive and receive appropriate training. The pilot programme ‘Exercise to Health’ in Beeston, Leeds, was seen as being successful by both providers and women who participated (14 women interviewed at 6-week follow-up), good attendance and far more demand for the service than could be met. Women were willing to pay if had to, but only if classes were kept local, expectations were fulfilled, energy levels increased and more motivated, happier

					and healthier with positive attitude towards continuing exercising.
Health Education Authority, 1999	Survey	England	To evaluate health and lifestyle in BMEGs.	N/a	Indian, Pakistani and Bangladeshi people reported lower levels of familiarity with terms such as 'starchy foods', 'dietary fibre' and 'fat', and knowledge of foods high in these terms was poor; Indian women most likely not to have time to exercise; good understanding amongst all ethnic groups that exercise was important to maintain health; some reasons for not exercising appear specific to ethnic minority groups such as modesty, fear of mixed sex activity and of going out alone (not confined to Muslims); language and culture were otherwise rarely mentioned as perceived barriers; low levels of knowledge of recommended levels of physical exercise were reported, unemployment and patterns of employment had significant impact on levels of PA.
Rai, 1997	Survey	UK-wide	To evaluate PA.	N/a (cross-sectional)	Barriers to exercise are not culturally specific (barriers similar in White adult population and South Asian and Black communities; differences faced by South Asian Muslim women were related to importance of Islam and being Muslim. Mainly enjoyment but also habit, appearance, health, being a role model to children and social benefits were factors that motivated physically active people. Similar to rest of UK, South Asian people said low participation in PA due to low motivation (could be due to high level of stress in this population which could be caused by poverty and racism). No fundamental cultural or religious reasons for prohibition of PA amongst South Asian population. Lack of time, burden of domestic duties and family responsibilities cited as main barriers to participation. South Asians give low priority to PA; part of normal everyday life and concept of paying for it was strange; self-conscious about body size or shape. Lack of privacy, dress-codes, separate sex provision, actual or potential experiences of racism all acted as barriers to exercise, also 'not fitting in', high costs, personal safety, transport, opening hours, childcare facilities.
Asian Arts & Leisure	Survey	South Asian	To evaluate use of local leisure	N/a	South Asian women emerged as particular cause for concern; barriers included poor knowledge of English language, nervousness about dress, acceptance by

Planners, 1996		population in Hounslow	facilities.	(Cross-sectional)	other service users and possible injury.
Shelley 1995	Population survey	White Irish	To evaluate cardiovascular risk changes following 5-year health promotion community programme.	Five years – population survey (cross-sectional) before and after programme in Kilkenny and reference country (Offaly).	Kilkenny Health Project for cardiovascular disease prevention; BMI increased in men and women in intervention and reference counties; resources should be targeted at those with least education and those at increased risk of coronary heart disease (CHD) fish, chicken, fruit and vegetables eaten more frequently post-intervention.
Majmudar 1995	Survey	South Asian women in Bristol	To evaluate PA.	N/a (cross-sectional)	South Asian women most likely not to exercise were those >24 years old who were less fluent in written and spoken English. Fear of racial harassment discourages women from walking or jogging alone and using public transport to get to leisure facilities.
Verma 1994	Survey	Six non-European (with national distribution) ethnic groups in Manchester, UK	To evaluate PA.	N/a (cross-sectional)	Women of all ethnic groups who would like to take part in exercise have many common barriers. South Asian women, particularly Pakistanis and Bangladeshis, suffer additional barriers to exercise related to culture and custom (expected approval of other members of community, including religious teachers, parents, siblings and friends). Religion powerfully reinforced the authority and behaviour patterns which appeared to reduce participation; racism acted as constraint.

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EVIDENCE SUMMARY TABLE 2: INTERVENTIONS TO PREVENT WEIGHT GAIN, OR IMPROVE BEHAVIOURS ASSOCIATED WITH THE MAINTENANCE OF A HEALTHY WEIGHT, IMPROVE DIET AND INCREASE ACTIVITY LEVELS, IN VULNERABLE GROUPS (LOW-INCOME, LOW-LITERACY, SPASTIC CEREBRAL PALSY, DOWN'S SYNDROME AND LEARNING DIFFICULTIES)

SUMMARY

Six of the 14 RCTs of BMEGs were of low-income subjects. Both of the pregnancy studies were in low-income women. None of the seven smoking studies or the study during menopause was in low-income populations. Three further studies were identified here in low-income populations, one which separately recruited low-income women and analysed results by income for the women only (Jeffery 1997, Pound of Prevention study), one study in Mexican American mainly women with low-income and low-literacy (Howard-Pitney 1997) and one study in low-income Mexican American 10-year-old schoolchildren (Trevino 2004, 2005). The results of these three studies and three further studies, one study in children with spastic cerebral palsy, one study in adults with learning difficulties and one study in adults with Down's syndrome, are reported here.

Two of the studies included in the BMEGs were in low-come populations; one in a church-setting that significantly increased fruit and vegetable consumption (Campbell 1999) and one partially home-based study that showed brief education was just as effective as adding counselling to increase amount of walking (Chen 1998). Two of the GEMS pilots recruited African American mothers and girls from low-income areas (Beech 2003; Story 2003). One family-based intervention targeted single mums with children living at the poverty level (Stolley 1997) and another family intervention included 83–91% with less than US$15,000 annual income (Baranowski 1990).

One of the studies that aimed to prevent excessive weight gain during pregnancy was set in an obesity clinic for low-income women (Polley 2002) and the other study in pregnancy included 40% women who had household incomes below 185% federal poverty line and analysed weight outcome by income.

Evidence of efficacy for weight management/reduction

Low-income women who received the intervention to prevent excessive weight gain during pregnancy had a significantly reduced risk of excessive gestational weight gain (OR 0.41, 95% CI 0.20, 0.81); overweight women within this subgroup were at significantly reduced risk of retaining more than 2.27 kg at 1 year postpartum (OR 0.24, 95% CI 0.07, 0.89). The RCT of diet and exercise using a stepped care approach to prevent excessive weight gain in pregnancy was effective in reducing the frequency of excessive weight gain in normal weight women (58 vs. 33% gained above recommended weight, intervention vs. control), but had no significant effect among overweight women, with a trend in the opposite direction.

The low-intensity diet and exercise intervention 'The Pound of Prevention Study' showed no significant difference by treatment group (education, education plus lottery incentive and control) at 1 year regarding weight (education plus lottery incentives: 3.23 [SE 0.98] lb [1.47 {SE 0.45} kg]; education only: 2.11 [SE 0.99] lb [0.96 {SE 0.45} kg; control: 1.30 [SE 0.72] lb [0.59 {SE 0.33} kg]). The authors suggest intervention may be having a greater impact on high- than low-income women. A culturally specific low-fat dietary intervention in Mexican American women of low-literacy and low-income, set in California (both included 6-weeks intervention vs. standard nutrition, with intervention having further 12 weeks maintenance) failed to increase the effect of a stand nutritional education course without maintenance period, and there was no weight change in either group at 18 weeks but the study was not powered to detect any changes in

weight. Mexican-American children from economically disadvantaged households who received a diet and exercise intervention to prevent diabetes (none had diabetes at baseline) did not improve % body fat compared with control at 1 year.

A 9-month aerobic exercise programme (45 min, four times per week) in 9-year-old children (n = 20) with spastic cerebral palsy, set in Germany reported 'no changes' in fat mass compared with an average 1.1 kg increase in the control group. A 12-month intervention to reduce obesity using health practitioner input with adults with learning difficulties in Manchester, UK, showed that in the control group obesity levels deteriorated in 10.2%, remained the same in 81.6% and improved in 8.2%. In the intervention group 10.5% deteriorated, 63.2% remained the same and 26.3% improved. Mean BMI did not appear to significantly differ from baseline or between groups at 1 year. (The mean BMI in the intervention group was significantly higher than in the control at baseline, BMI 34 vs. BMI 28 at baseline.) A 12-week cardiovascular and strength exercise programme in adults with Down's syndrome showed a significant difference between groups ($p < 0.01$) with a slight reduction in weight at 12 weeks whereas control group weight increased. BMI was not significantly different between groups at 12-weeks.

It is important to note that in both the two adult studies (in adults with learning difficulties and Down's syndrome) the majority of participants were obese (69% in total in adults with Down's syndrome).

Evidence of efficacy for diet/physical activity outcomes

One study significantly increased the amount of walking in all participants from baseline to follow-up, but brief education was just as effective as adding mail and telephone counselling in low-income previously sedentary ethnic minority women (Chen 1998). One church-based intervention significantly increased fruit and vegetable intake amongst low-income African Americans (Campbell 1999).

Saturated fat intake (–2.1 oz [59 g]) and % energy from fat (–7.9%) was significantly reduced at 12 weeks in African American mothers following a diet and PA intervention (Stolley 1997). A culturally-specific low-fat diet and aerobic exercise intervention in low-income Black American families did not produce significantly increased METs or energy expenditure at 14 weeks compared with control; both significantly increased energy expenditure from baseline (Baranowski 1990).

The parent and child intervention groups combined significantly reduced intake of sweetened drinks compared with non-active control in the Memphis GEMS study (Beech 2003). The GEMS Minnesota pilot (Story 2003) and the study by Stolley (1997) both showed significant reduction in % energy from fat in the intervention girls. The children of a family diet and exercise intervention actually decreased activity (METs) compared with the control children who increased activity (METs) and energy expenditure (Baranowski 1990).

The RCT to prevent excessive weight gain during pregnancy in low-income women reported a lack of significant effect of the intervention on changes in intake of high fat foods and changes in exercise level from recruitment to 30 weeks were not related to treatment condition or BMI (Polley 2002).

The low-intensity diet and exercise intervention 'The Pound of Prevention Study' showed no significant difference by treatment group (education, education plus lottery incentive and control) at 1 year regarding dietary intake or PA. The authors suggest intervention may be having a greater impact on high than low-income women.

Within the low-literacy, low-income population, both the intervention and the standard nutrition education group significantly reduced % energy from fat. Within the cerebral palsy children, PA ratio (24-hour energy expenditure/resting energy expenditure) did not differ between intervention group and control group but both significantly increased from baseline. Mexican American children from economically disadvantaged households who received a diet and exercise intervention to prevent diabetes (non had diabetes at baseline) dietary fat intake did not differ between groups ($p = 0.52$). Using a modified Harvard step test the change in physical fitness score between pre-intervention and post-intervention was significantly different between intervention and control children after adjusting for age and pre-intervention BMI ($p < 0.003$). It is important to note that the PA outcomes are based on a smaller sample of the original cohort (Trevino 2005) and the dietary outcomes are based on the larger cohort sample (Trevino 2004).

Evidence of corroboration in the UK

No corroborative evidence was identified regarding PA and low-income populations. The health practitioner intervention to reduce obesity in adults with learning difficulties was conducted in Manchester, UK, and so has direct relevance to this population within the UK.

EVIDENCE TABLE 2: INTERVENTIONS TO PREVENT WEIGHT GAIN, IMPROVE DIET AND INCREASE ACTIVITY LEVEL IN VULNERABLE GROUPS (LOW-INCOME, LOW-LITERACY, SPASTIC CEREBRAL PALSY, DOWN'S SYNDROME AND LEARNING DIFFICULTIES)

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/ comments
Jeffery & French 'Pound of Prevention' study, 1997 RCT 1+ **Aim:** To examine whether weight gain can be prevented using low-intensity intervention.	**Eligibility criteria:** Age 20–45 years, not currently pregnant or having given birth within 12 months, not currently in treatment for serious medical or psychological disorder, willingness to participate for 3 years. **Setting:** Four local health departments in the Minneapolis/St Paul, Minnesota metropolitan areas. **Sample size (numbers analysed, numbers randomised by treatment group not reported, 404 in total):** Education plus lottery incentives: *n* = 82 Education only: *n* = 82 Control: *n* = 150 60% of high-income and 20% of low-income women were	**Education only:** Behavioural and educational messages: pay attention to weight by weighing yourself at least once per week, eat two servings of fruit each day, eat three servings of vegetables each day, reduce intake of high-fat foods, walk three times per week for at least 20 min; monthly newsletter to deliver above messages; postcard sent with newsletter to be returned by participants with questions about whether participant has completed the above messages and opportunity to write any questions of which a selection will be answered in next month's newsletter; face-to-face education to individuals twice in first year held by health department nutritionist covering basic nutrition and exercise principles. **Education plus lottery incentives:**	**Lost to follow-up:** 14% did not differ between groups but differed significantly within low-income women across treatment groups compared with high-income women and men across treatment groups; see table below for the proportion completing 1-year follow-up by treatment group and participant type. **Weight:** No significant difference by treatment group in any of the participant subgroups at 1 year. Education plus lottery incentives: +3.23 (SE 0.98) lb (1.47 [SE 0.44] kg). Education only: +2.11 (SE 0.99) lb (0.96 [SE 0.45] kg). Control: +1.30 (SE 0.72) lb (0.59 [SE 0.33] kg)	Additional recruiting for low SES women; low-income defined as self-report of US$25,000 per year or less, low-income women paid US$20 for completing initial 1.5-hour assessment. Because of the different ways participants were recruited and differed regarding risk of weight gain, participants were subgrouped and analysed

	Education only	Education and lottery	Total
Men	74	66	70
High-income women	78	81	80
Low-income women	57	67	62
Total	70	73	72

<table>
<tr><th>First author, study design, research type, quality, weight</th><th>Study population</th><th>Intervention details and length of follow-up</th><th>Results</th><th>Confounders/ comments</th></tr>
<tr>
<td></td>
<td>married, high-income participants were well-educated compared with low-income women, majority of population were White; high-income women were less likely to smoke and low-income women were more likely to smoke. No differences between treatment groups were statistically significant. Three differences approached significance: BMI, which was about one unit higher in the education only group than in the education plus lottery group; PA, which was slightly higher in the control group than the other groups; and prior participation in a formal weight loss programme, which was higher in the education only condition than in the other two conditions. (These three variables were adjusted for statistically.)

Baseline BMI (kg/m^2):
Not reported by treatment group, mean 28.2 for low-income women, mean 26.1 for high-income women.</td>
<td>Received same as above plus opportunity to have name entered into US$100 lottery draw each month if they mail back their monthly postcard.

Providers of the intervention included researchers from the School of Public Health, University of Minnesota.

Control:
No details.

Follow-up:
3 years; this paper reports 1 year results by low-income.</td>
<td>Results showed there was less weight gain among intervention subjects versus control subjects in men and high-income women, but more weight gain was shown by low-income women in the intervention vs. control groups.

<table>
<tr><th>All mean (SE)</th><th>Low-income women</th><th>High-income women</th></tr>
<tr><td>Energy intake (kcal/day):</td><td></td><td></td></tr>
<tr><td>Education + lottery</td><td>–208 (104)</td><td>–27 (42)</td></tr>
<tr><td>Education only</td><td>–336 (108)</td><td>–66 (44)</td></tr>
<tr><td>Control</td><td>–218 (79)</td><td>–62 (29)</td></tr>
<tr><td>Energy intake (MJ/day):</td><td></td><td></td></tr>
<tr><td>Education + lottery</td><td>–0.87 (0.44)</td><td>–0.11 (0.16)</td></tr>
<tr><td>Education only</td><td>–1.40 (0.45)</td><td>–0.28 (0.18)</td></tr>
<tr><td>Control</td><td>–0.91 (0.33)</td><td>–0.26 (0.12)</td></tr>
<tr><td>Energy from fat (%)</td><td></td><td></td></tr>
<tr><td>Education + lottery</td><td>–1.76 (0.79)</td><td>–1.96 (0.56)</td></tr>
<tr><td>Education only</td><td>–2.49 (0.81)</td><td>–1.98 (0.59)</td></tr>
<tr><td>Control</td><td>–1.04 (0.60)</td><td>–0.87 (0.39)</td></tr>
<tr><td>Vegetables (servings per day:</td><td></td><td></td></tr>
<tr><td>Education + lottery</td><td>0.02 (0.13)</td><td>0.02 (0.09)</td></tr>
<tr><td>Education only</td><td>0.07 (0.13)</td><td>–0.05 (0.09)</td></tr>
<tr><td>Control</td><td>–0.12 (0.10)</td><td>0.13 (0.06)</td></tr>
<tr><td>Fruits (servings</td><td></td><td></td></tr>
</table>
</td>
<td>separately; men, high-income women and low-income women; only outcomes for women by treatment group are reported here.

Less than 10% participated in face-to-face sessions.

It is not clear if the study was sufficiently powered to detect a significant effect of intervention when compared with control.</td>
</tr>
</table>

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results			Confounders/ comments
			per day):	–0.02 (0.08)	0.10 (0.07)	
			Education + lottery	–0.05 (0.09)	–0.001 (0.07)	
			Education only	–0.14 (0.06)	–0.01 (0.05)	
			Control			
			Physical activity score*			
			Education + lottery	2.00 (3.30)	1.80 (2.10)	
			Education only	–0.30 (3.50)	0.40 (2.20)	
			Control	–4.40 (2.60)	0.50 (1.50)	
			Walks per week:			
			Education + lottery	0.38 (0.27)	0.19 (0.79)	
			Education only	–0.02 (0.28)	–0.21 (0.20)	
			Control	–0.22 (0.21)	–0.05 (0.13)	
			• Frequency per week of each activity multiplied by estimated intensity score in METs • Increased walking was associated with less weight gain in women ($p < 0.01$), in high-income women ($p < 0.06$) and low-income women. **Authors' conclusion:** These results suggest the intervention may be having a greater impact on high than low-income women. The only significant treatment effect was observed at one year was an increase in the frequency of reported weighing amongst subjects in the intervention group. Among men and high-income women, early results relating to weight gain were encouraging and if			

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/ comments
			sustained for 3 years would produce a positive outcome. Oppositely, trends in low-income group were negative at 1 year. This was a discouraging finding given their high risk for weight gain and obesity.	
Howard-Pitney et al. 1997 SNAP Cluster RCT 1+ **Aim:** To test the effectiveness of the Stanford Nutrition Action Program (classroom-based nutrition curriculum), an experimental trial to reduce dietary fat intake among low-literacy, low-income adults.	**Eligibility criteria:** Not reported. **Setting:** Twenty-four vocational training and general education degree classes (six community sites), San Jose, CA, USA. **Sample size:** Intervention: *n* = 183 Control: *n* = 168 Average grade level reading ability across two group = 7.4, 66% at 8th grade or below, majority were young women, Hispanic, born in USA, most spoke English at home, lived in poverty, had children <18 years old living with them, 82% of the Hispanic participants identified themselves as Mexican American. **Mean age:**	**Intervention group ('SNAP')**: 6-week classroom-based; six × 90 min sessions taught by professional nutrition health educators, organised into lessons covering sources of dietary fat, food guide pyramid, food label reading and low-fat eating when away from home; interactive learning with few written materials; culturally appropriate to majority of Hispanic women; low-fat recipes, food tasting and demonstrations, behavioural goal setting. Followed by 12 weeks maintenance: telephone (15 min scripted calls made by SNAP teachers and research assistants) or mail contact every 2 weeks to provide support and encourage regarding low-fat eating. **Control:** General nutrition classes taught by paraprofessional nutrition	**Lost to follow-up:** 31% did not differ between groups. Subjects lost from the study were most often from vocational training sites and had gained employment during the study. Missing data for cases were imputed from the subjects most recent measurement and assumed no change in outcome measures. A Cochran–Mantel–Haenszel statistical test indicated that there was no difference in attrition between the SNAP and the general nutrition classes. **Weight:** Net change, SNAP vs. control at 6 weeks: BMI: 0.0 (SD 0.1) kg/m^2, *p* = 0.87 Net change, SNAP vs. control from 6 weeks to 18 weeks: BMI: 0.0 (SD 0.2) kg/m^2, *p* = 0.94 **Diet:** Net change, SNAP vs. control at 6 weeks: Total dietary fat, g/d: 7.6 (SD 19.2), *p* = 0.20 Total saturated fat, g/d: –2.9 (SD 7.5), *p* = 0.21 Energy from total fat, %: –2.3 (SD 2.6), *p* = 0.01	In about half of the six sites the nutrition course was mandatory. Low-literacy was defined as eighth grade or lower reading ability. BMI was not a direct focus of the intervention. A large proportion of subjects was lost to follow-up. This may limit the reliability of the

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/ comments
	Intervention: 31 years Control: 31 years **Education, % 12 years or less:** Intervention: 78% Control: 76% **Hispanic:** Intervention: 58% Control: 59% **Family income <US$10,000 per year, %:** Intervention: 63% Control: 66% **Baseline BMI:** Not reported.	educator, to improve knowledge and nutrition choices of low-income families from different ethnic backgrounds, five lessons on food guide pyramid, one on food safety and meal-planning; didactic presentation with handouts and recipes; received no maintenance intervention. **Follow-up:** 18 weeks	Energy from saturated fat, %: –0.9 (SD 1.2), $p = 0.02$ Net change, SNAP vs. control from 6 weeks to 18 weeks: Total dietary fat, g/d: +4.5 (SD 17.4), $p = 0.39$ Total saturated fat, g/d: +1.5 (SD 6.7), $p = 0.44$ Energy from total fat, %: –0.4 (SD 2.4), $p = 0.56$ Energy from saturated fat, %: –0.3 (SD 1.0), $p = 0.45$ **Authors' conclusion:** Results of the study indicate that SNAP's nutrition education curriculum for low income, low literacy was significantly ($p < 0.05$) more effective in achieving fat-related nutritional changes than a strong alternative general nutritional curriculum. The general nutrition curriculum showed equal or better improvements on components (which was not evaluated in this study, e.g. daily nutrition requirements and food safety) the results showed significant gains ($p < 0.05$) for SNAP participants in fat-related nutrition knowledge, attitudes, self efficacy and percentage of energy from total and saturated fat (which was reduced over 5 months 37.1 to 33.2% and 13.3 to 11.9%, respectively. Although both groups reduced their total daily energy intake by more than 300 kcal (1.26 MJ), it was shown that SNAP classes made better choices than the general nutrition group about energy levels in	results. Randomisation was by cluster and analysis was by individual, which may limit reliability of the results. It is not clear if the study was sufficiently powered to detect a significant effect of intervention compared with control.

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/ comments
			their diet by selecting lower fat foods. Although the curriculum showed significant ($p < 0.05$) results for dietary reductions in fat intake, BMI showed no change. This is probably due to the fact that SNAP emphasised eating less fat but not necessarily less energy, did not mention exercise and only touched upon the potential weight benefits that dietary fat reduction might achieve.	
Trevino 2004, 2005 Cluster RCT 1+	**Eligibility criteria:** Not clearly described. **Participants:** Fourth-grade students. **Setting:** Elementary schools located in low-income inner city neighbourhoods of the San Antonio Independent School District, TX, USA. Intervention (five schools): *n* = 200 Control (four schools): *n* = 187 **Age (mean):** Intervention: 9.8 years Control: 9.7 years 97% of students were Mexican	To evaluate the effect of the Bienestar Health Program (programme designed to reduce risk factors associated with the onset of type 2 diabetes) on physical fitness in low-income Mexican American children. The Bienestar Health Program was based on SCT and designed to decrease dietary fat and increase dietary fibre consumption and to promote participation in moderate to vigorous PAs. Programme activities were bilingual and included a parent education and involvement programme, a classroom health and PE curriculum, a student after-school health club and a	**Lost to follow-up:** All fourth grade students were invited to participate. 88% returned parental consent forms. Complete data was collected from 387 students (78%). Of 189 students in control group at baseline, complete data collected from 187. All 200 students in the intervention group at baseline returned complete data. **Weight at follow-up:** Not reported in Trevino 2005. In Trevino 2004 (larger sample of same study): % body fat, adjusted difference intervention (*n* = 619) vs. control (*n* = 602) +0.18 (95% CI, –1.75 to 2.11), $p = 0.56$ **Dietary intake:** Not reported in Trevino 2005; in Trevino 2004 dietary fat intake did not differ between groups ($p = 0.52$). **Physical activity (from Trevino 2005):** Outcome reported is physical fitness measured using a modified Harvard step test. Change in physical	All except body fat data are from Trevino 2005 paper. Parents and students who participated in the programme received coupons denoted in dollar amounts as an incentive and reinforcement, which could be exchanged for merchandise. These papers report interim

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/ comments
	American, more than 95% were in US Department of Agriculture food assistance programmes, 53% female, an average of 3.5 people occupied each household, mean household incomes US$10,337 in the intervention group and US$11,691 in the control schools. **Baseline BMI (kg/m^2):** No difference in baseline BMI between intervention and control groups. Control boys: 19.18 (SD 4.14) Intervention boys: 19.23 (SD 4.78) Control girls: 19.90 (SD 5.42) Intervention girls: 18.92 (SD 4.87)	school cafeteria programme. **Length of intervention:** 8 months. **Follow-up:** No further follow-up after 8-month intervention.	fitness score (PFS) between pre-intervention and post- intervention was significantly different between intervention and control groups after adjusting for age and pre-intervention BMI, $F(1,381) = 8.69$, $p < 0.003$. **Mean change in physical fitness score:** Control boys: –0.52 (SD 1.08) Control girls: 0.13 (SD 1.08) Intervention boys: 3.37 (SD 1.08) Intervention girls: 2.52 (SD 1.01) **Authors' conclusion:** It is possible to improve the physical fitness of low-income Mexican American preadolescent children through a comprehensive school-based programme.	results as this is ongoing 4-year study. Independent consultants performed randomisation using random numbers table. Significantly more Mexican American children in intervention group which may potentially bias in favour of intervention (which is tailored to Mexican American children)
Van Den Berg-Emons et al. 1998	**Eligibility criteria:** Age 7–13 years, day students with spastic cerebral palsy (normal intelligence and mild	**Intervention:** 45-min exercise sessions four times per week above the normal school and therapy programme;	**Lost to follow-up:** Zero. **Weight:**	Aerobic power, anaerobic power and muscle

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/ comments
RCT 1+ **Aim:** To assess whether 9-month predominantly aerobic sports programmes (four or two sessions per week) are effective in increasing the level of daily PA in school children with spastic cerebral palsy.	mental retardation). **Setting:** Children's Rehabilitation Centre Franciscusoord in Valkenberg, Germany. Half the children were ambulant and half were wheelchair-bound, 16 were diplegic and four were tetraplegic. **Sample size:** Intervention: *n* = 10 Control: *n* = 10 **Gender, male/female:** Intervention: 4/6 Control: 7/3 **Age (years):** Intervention: 9.5 (1.6) Control: 8.8 (1.1) **BMI (kg/m^2):** Intervention: 19.0 (4.3) Control: 18.1 (2.6)	predominantly aerobic: cycling, wheelchair driving, running, swimming, training on a 'flying saucer', mat exercise; **Control:** No extra physical training. Providers of the intervention were staff from the Children's Rehabilitation Centre Franciscusoord in Valkenberg. **Follow-up:** 9 months.	Change in fat mass at 9 months: Intervention: 'no changes' Control: +1.1 (SD 1.6) kg **Physical activity:** PA ratio (24-hour energy expenditure/sleeping (resting) energy expenditure), pre – post: Intervention: 1.34 (SD 0.25) – 1.55 (SD 0.18) Control: 1.24 (SD 0.21) – 1.34 (SD 0.20) Average increase from baseline to 9 months was significant in intervention group at p = 0.07, control did not significantly differ from pre to post and no significant difference between intervention and control at 9 months. **Authors' conclusion:** Although aerobic training has a limited effect on PA in children with cerebral palsy, it may prevent deterioration in body composition and improve muscle strength.	strength also reported. Only results for initial 9 months reported here because same participants used as historical control in second 9-month programme. Generalisability of this study would be limited. The study lacked sufficient power to detect a significant difference in fruit and vegetable

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/ comments
				intake between groups.
Rimmer 2004 RCT (individual) 1+ **Aim:** To evaluate the effects of combined programme of strength and cardiovascular conditioning in adults with Downs Syndrome;	**Participants:** Sedentary adults with Down's syndrome who lived with family members or resided in group homes and other supported-living facilities. **Setting:** University of Illinois, Chicago, USA **Mean age:** 39.4 years, 56% female, 54% White Intervention: *n* = 30 Control: *n* = 22 69% were obese (BMI >30 kg/m^2), another 17% were overweight (BMI >25 kg/m^2).	**Intervention:** 30 min cardiovascular exercise and 15 min of strength exercise, 3 days per week for 12 weeks, supervised by one registered clinical exercise physiologist and two assistants. Participants had three or four initial familiarisation sessions. Study adequately powered to detect 5 to 10% mean difference in effect between intervention and control.	**Change in weight pre – post (kg):** Intervention: 80.5 (SD 20) vs. 79.5 (SD 19.9) Control: 76.8 (SD 18.1) vs. 78.5 (SD 17.9), $p < 0.01$ **Change in BMI pre – post (kg/m^2):** Intervention: 35.2 (SD 8.7) vs. 34.7 (SD 9.2) Control: 33.9 (SD 7.6) vs. 34.4 (SD 7.1), non-significant Authors concluded significant difference between groups for weight but not BMI or skinfold thickness. Intervention weight slightly reduced at 12 weeks whereas control group weight increased.	Four participants had potential structural heart disease.
Chapman et al 2005 CBA 2– Prospective pre-/post-	**Eligibility criteria:** Adults with learning disabilities referred to Healthy Living Coordinator (HLC). **Setting:** Not clear, Manchester, UK.	To evaluate health practitioner input to reduce obesity for adults with learning disabilities. The intervention involved a physiotherapist employed to act as an HLC. The HLC provided input to individuals referred for	**Lost to follow-up**: Not clear between baseline and follow-up. Thirty-eight assessed in intervention and 49 in control. **Weight:** The authors report that differences in weight change between the two groups reached statistical significance with a greater weight reduction in the	Significant differences between groups at baseline, comparison group were from 3-day

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/ comments
intervention design with a comparison group. **Aim:** To evaluate health practitioner input to improve healthy living and reduce obesity for adults with learning difficulties.	Intervention: *n* = 38 Control: *n* = 50 **Age (mean):** Intervention: 37.12 (SD 8.75) years Control: 43.32 (SD 10.97) years 43% of total group were women, 57 % men. No significant differences in gender between intervention and control groups. People in the intervention group were significantly less likely to be in adult placement or family homes and more likely to be in dispersed housing. **Baseline BMI (kg/m^2):** 97% of the intervention group and 64% of the control group were initially classified as overweight or obese. Statistically significant differences between the intervention and control groups for initial weight and BMI. The control group had a lower initial weight (mean 70.4 [SD 17.22] kg) than the input	support to improve their lifestyle. The intervention incorporated home visits, advice, design of activity programmes in conjunction with support staff and relatives, providing health promotion information. The assessment addressed issues such as: current PA levels; previous activities enjoyed; likes and motivations; support available; current dietary strategies in place; barriers to a healthy lifestyle; provision of resources. **Length of intervention:** 12 months. **Follow-up:** No further follow-up after 12-month intervention.	intervention group but this is not entirely clear from the data presented. **Body mass index (kg/m^2):** Control: Baseline BMI: 28.35 (SD 6.45); 6 months BMI 28.70 (SD 6.39); 1 year BMI 28.76 (SD 6.4). Intervention: Baseline BMI 34.89 (SD 5.72); 6 months BMI 34.57 (SD 5.49); 1 year BMI 34.28 (SD 5.58). In the control group obesity levels deteriorated in 10.2%, remained the same in 81.6% and improved in 8.2%. In the intervention group 10.5% deteriorated, 63.2% remained the same and 26.3% improved. **Diet:** Not reported. **Physical activity:** Not reported. **Authors' conclusions:** There was greater weight reduction in the intervention group (see above)	resource centres who did not receive HLC and outcome measures were measured by day centre and physiotherapist (HLC measured outcomes in intervention group).

First author, study design, research type, quality, weight	Study population	Intervention details and length of follow-up	Results	Confounders/ comments
	group (mean 86.48 [SD 15.02] kg). The control group had a lower initial BMI than the input group (mean 28.35 [SD 6.45] kg/m^2) than the input group (mean 34.89 [SD 5.72] kg/m^2).			

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Evidence of corroboration (external validity)

Evidence of salience from studies conducted in the UK

First author	Study population	Research question	Length of follow-up	Main results	Confounders/comments
Chapman 2005	As above.	Adults with learning difficulties in Manchester, UK.	As above.	As above.	As above.

Evidence for implementation – Will it work in the UK?

First author	Study design	Study population	Research question	Length of follow-up	Main results
Chapman 2005	As above.	Adults with learning difficulties in Manchester, UK	As above.	As above.	The intervention involved a physiotherapist employed to act as an HLC. The HLC provided input to individuals referred for support to improve their lifestyle.
Food Standards Agency (FSA) 2003	Review.	Low-income, UK	To review food and low-income initiatives in UK.	Various,	Great deal of existing work to tackle food poverty by local sector health workers running statutory initiatives focussing on individual behaviour change. Very low numbers of projects are reporting actual changes in behaviour or attitudes. Structural factors on not being addressed. Consultation with the community is not being done. Other agencies as well as health sector need to get involved.

Tingay 2003	Questionnaire	Subjects attending ten general medical practices in inner-city London.	To evaluate experiences of food insecurity in relation to income.	N/a	Responses were obtained from 431/495 (87%) subjects. Overall 87 (20%) of subjects were classified as food insecure. Food insecurity was negatively associated with household income (p = 0.004). University-educated subjects (8%) were less often food insecure than all others (26%). Subjects who were food insecure were less likely to report eating fruit daily (food secure 48%, food insecure 33%, p = 0.017) or vegetables or salads daily (food secure 56%, food insecure 34%, p = 0.002). Experiences of food insecurity may be common in households with incomes at the level of the UK national minimum wage or lower.
Dibsdall 2003	Questionnaire survey	Participants were 680 low-income men and women, aged 17–100 years. Homes owned by a large UK housing association.	To determine low-income consumers' attitudes and behaviour towards fruit and vegetables, in particular issues of access to, affordability of and motivation to eat fruit and vegetables.	N/a	Age, employment, gender, smoking and marital status all affected attitudes towards access, affordability and motivation to eat fruit and vegetables. Few (7%) participants experienced difficulty in visiting a supermarket at least once a week, despite nearly half having no access to a car for shopping. Fruit and vegetables were affordable to this low-income group in the amounts they habitually bought; purchasing additional fruits and vegetables was seen as prohibitively expensive. Less than 5% felt they had a problem with eating healthily and yet only 18% claimed to eat the recommended five or more portions of fruit and vegetables every day. Findings from this particular group suggest that, of the three potential barriers, access and affordability were only a small part of the 'problem' surrounding low fruit and vegetable consumption.
Kennedy 2001	Review of SUPER project	Low-income adults in Liverpool.	To identify the various benefits and obstacles involved and to identify links with progress at the local level.		The European Food and Shopping Research Project (SUPER project) was established under the World Health Organization (WHO) European network of Healthy Cities to help local projects implement the principles of health promotion (World Health Organization, 1986). This paper describes the SUPER project and its implementation in Liverpool (1989–97), where levels of unemployment, deprivation and ill health are amongst the highest in the UK. Research consistently demonstrates that low-income households find it difficult to adopt healthy eating guidelines. Contrary to popular belief, this is due to economic and circumstantial barriers such as lack of income, access to shops, or inadequate storage and cooking facilities, not lack of

					nutrition knowledge (Dobson et al. 1994) More recent attempts involve tailoring nutrition education to the socio-cultural needs of poorer groups and the development of local food initiatives such as 'cook and taste'. Here, participants are shown how to implement guidelines under difficult financial circumstances. However, critics argue this fails to address the real issue of food poverty: lack of money. Moreover, previous work demonstrates that this type of approach is labour intensive and is unable to reach a sufficiently large proportion of those in need to be cost-effective (Kennedy et al. 1998). More recent work suggests that although worthy, most projects reach a small population and are rarely sustained beyond initial funding (McGlone et al. 1999). The emphasis is on changing the physical and social environment to facilitate lifestyle changes by individuals (Vaandrager et al. 1992). The stated aims of SUPER are: • to describe the food patterns, nutritional problems and food policy issues in five European cities; • to describe the processes relating to health promotion activities in communities and to identify the optimum conditions for best practice; • to achieve a positive change in dietary behaviour, and attitudes to food and health; • to decrease differences in nutritional status between higher and lower socio-economic groups within the Study population; and • to develop more sustainable nutrition promotion in communities by incorporating activities initiated by local projects into organisational structures. According to project reports, in the period 1989–95, the approach remained focussed on nutrition education and disseminating information. Since the introduction of the lay food workers, the approach in Liverpool

					has become much broader, focusing more on health promotion and less on nutrition education. A major strength, and possibly the most important outcome, of the project in Liverpool was the process of reorientation experienced by participating health professionals and organizations. Experience demonstrated, however, that community involvement or community participation was much more difficult to achieve in practice. Local people were involved in the data collection process, but because they were excluded from planning what questions to ask they were provided with no real sense of ownership. It is essential that communities share responsibility for the rapid appraisal and help identify local needs in order to develop a sustainable programme of activities. Vaandrager describes the key elements of the approach used to promote healthy eating in Liverpool (Vaandrager, 1989): • participation in the Health Education Authority's (HEA) 'Look after your heart' programme – nutrition education campaign; • the main activity in 1988 was the 'lifestyle fair' – a 3-day health fair; • Liverpool Health Authority signed up to the HEA 'Look after your heart' Workplace Charter – incorporating activities to promote healthier eating amongst employees; • establishment of a Local Authority Food Policy Network. Illing (1992) describes three activities developed for the Croxteth area for the 14-month intervention period • school recipe competition; • nutrition open days in health clinic – information stalls, posters, leaflets; • a Nutrition in Action Group established (1991) to help develop nutrition strategy for Liverpool and to examine issues re: school meals (Illing, 1992). In 1993 more comprehensive but similar activities were organised over 4–14 months. Supermarkets: • monthly promotional activities and healthy eating themes:

					– 'enjoy your food with less fat' (poster) – 'the importance of fruit and vegetables' – 'enjoy your food with less sugar' – 'a varied diet a healthy diet'; • a dietitian held a stall in the foyer of local supermarket offering promotional literature, such as information leaflets, posters or display boards, and to answer customer questions. Schools: • dietitian gives talks on healthy eating themes; • competition – pupils to design healthy eating leaflet; • posters and leaflets distributed; • school meals– healthier menu items highlighted for a limited period (every fourth week); • parent support group – practical demonstration sessions: healthier cooking. Community group: • healthy eating talks and practical demonstrations with mums and toddler groups (Smit & Rolling, 1993); • activities for the period 1995–97: – increased involvement in the work of the West Everton Community Health Forum; – Liverpool Food and Health Strategy Development Group established to represent wider agenda (1999); – introduction of lay nutrition workers – community food workers (1996); – food workers use an outreach work approach and consult communities to develop responses to help local people address barriers to healthy eating; – practical advice on 'how-to' implement healthy eating messages is provided for small community groups; – represent community members on health forums or committees to place local food issues (e.g. lack of shops) on the agenda; – offer referrals to people requiring help with non-nutrition problems (e.g. debt). (Sources: Judd & Jones, 1995; Heeson, 1996.)

French, 2000	Survey	Women aged 25–45 years, enrolled in Pound of Prevention Study (USA)	To examine demographic, behavioural and dietary correlates of frequency of fast food restaurant use in a community-based sample of 891 adult women.	3 years	Twenty-one percent of the sample reported eating three or more fast food meals per week. Frequency of fast food restaurant use was higher among younger women, those with lower income, non-White ethnicity, greater body weight, lower dietary restraint, fewer low-fat eating behaviours, and greater television viewing. Intake of several other foods, including fruits and vegetables, did not differ by frequency of fast food restaurant use.
Women's Health Initiative Study Group, 2004 Women's Health Initiative Dietary Modification Trial	FFQ as part of RCT	Postmenopausal women (USA)	To assess adherence to a low-fat diet.	5 years	This paper describes adherence to a low-fat dietary pattern (less than 20% energy from fat, five or more fruit/vegetable and six or more grain servings daily) in years 1 and 5 of the Women's Health Initiative Dietary Modification Trial, which was designed to examine the effects of a low-fat dietary pattern on risk of breast and colorectal cancers and other chronic diseases in postmenopausal women. Participants were randomly assigned to a low-fat dietary intervention arm (40%, *n* = 19,542) or a usual-diet control arm (60%, *n* = 29,294). Women in the intervention arm completed 18 group sessions during the first year, followed by quarterly annual maintenance sessions. Adherence was assessed as control minus intervention (C – I) group differences in percent total energy from fat as estimated by a food frequency questionnaire. Based on these self-reported dietary data, mean C – I was 10.9 percentage points of energy from fat at year 1, decreasing to 9.0 at year 5. Factors associated with poorer adherence were being older, being African American or Hispanic (compared with White), having low income, and being obese. Group session attendance was strongly associated with better dietary adherence.

EVIDENCE SUMMARY TABLE 3a: INTERVENTIONS TO PREVENT WEIGHT GAIN, IMPROVE BEHAVIOURS ASSOCIATED WITH THE MAINTENANCE OF A HEALTHY WEIGHT, IMPROVE DIET AND INCREASE ACTIVITY LEVELS IN INDIVIDUALS AT VULNERABLE LIFE-STAGES (MENOPAUSE)

SUMMARY

One systematic review of 18 RCTs assessed the effect of exercise (walking, other aerobic training, resistance training, strength training with weights machines or combinations) in postmenopausal women. One RCT was included that aimed to prevent excessive weight gain during the menopause, with the full anthropometric results at 54 months published in 2003. The study was conducted in Pittsburgh and followed women from pre-menopause for 54 months when 35% of the women had become postmenopausal. The aim of the intervention was to provide modest weight loss to keep the women at their baseline weight by the end of the study. The study reported changes in weight, BMI, % body fat, % fat-free mass, PA and energy intake. The intervention included 1300 kcal (5.44 MJ)/day (25% of energy from total fat, 7% of energy from saturated fat and 100 mg cholesterol), PA expenditure of 1000–1500 kcal (4.19–6.28 MJ)/week (mainly through increasing walking and lifestyle activities) other lipid-lowering dietary strategies, i.e. increasing soya protein, fruits and vegetables and fibre if necessary; provided in a cognitive-behavioural programme and compared with an assessment-only control.

In the study, women were predominantly White, college-educated and employed full-time. 53.6% were of normal weight at baseline and all women were healthy with average risk factor levels. Mean age was 47 years and mean BMI was 25 kg/m^2. Women (n = 535) were randomised and the study was adequately powered to detect statistically significant differences in outcomes, with only 5% dropout and an ITT analysis.

Evidence of efficacy for weight management/reduction

In the systematic review, weight and body fat were studied in 18 studies with 1804 subjects. Body composition was improved in nine studies and most studies showed a small loss of body weight and fat. The effect seemed to be optimal when combining exercise with a weight-reducing diet. The most effective results were accomplished in three studies with overweight participants who used weight-reducing diets in combination with exercise training. The mean weight loss ranged was 2–10 kg in 12 weeks to 1 year.

At 54 months 55% of the intervention women were at or below their baseline weight compared with 26% in the control.

Mean weight change (kg) at 54 months was also significant between groups (–0.1 [SD 5.2] intervention vs. +2.4 [SD 4.9] control. There was a significant reduction in waist circumference (cm) at 54 months compared with control (–2.9 [SD 5.3] vs. –0.5 [SD 5.6], $p < 0.001$). There was a significant reduction in BMI (kg/m^2) in intervention women compared with control at 54 months (0.05 [SD 2.0] vs. 0.96 [SD 1.8], $p < 0.001$). Change in % body fat was also significantly reduced in the intervention group compared with control at 54 months (–0.5 [SD 4.1] vs. 1.1 [SD 3.9], $p < 0.01$). Fat-free mass (kg) was also significantly reduced in the intervention group compared with control at 54 months (0.0 [SD 1.9] vs. 0.5 [SD 2.1], $p < 0.05$).

Evidence of efficacy for diet/physical activity outcomes

In the systematic review the most effective exercise prescription for losing body fat was 30–60 min of walking or other aerobic training at 45–75% VO_{2max} on 3–5 days per week for 15 weeks to 1 year, or strength training with weight machines, five exercises with 80% of one repetition maximum with eight repetitions and three sets twice a week for 1 year.

Energy intake (kcal/day) was significantly reduced in the intervention group compared with control at 54 months (–160 [SD 465] vs. –25 [SD 560] [–0.67 {SD 1.95} vs. –0.10 {SD 2.34} MJ/day], $p < 0.01$). The intervention group reported eating significantly less dietary fat and cholesterol than controls.

There was a significant increase in the amount of energy expended through physical exercise (kcal/day) in the intervention group compared with controls at 54 months (275 [SD 1173] vs. –113 [SD 1261] [1.15 {SD 4.91} vs. –0.447 {SD 5.28} MJ/day], $p < 0.001$) (blocks walked (***no further details reported)*** (kcal/188 [SD 615] vs. –83 [SD 611] kcal/day [0.79 {SD 2.57} vs. –0.35 {SD 2.56} MJ/day], $p < 0.001$). There was no significant difference between the groups in terms of energy expended through sport and recreational activity (kcal/day) (intervention vs. control): 57 (SD 1023) vs. –47 (SD 1104) (0.24 [SD 4.28] vs. –0.20 [SD 4.62] MJ/day). There was a significant increase in the intervention group (counts/hour of activity) when measured with the activity monitor at 54 months compared with control (2.3 [SD 9.1] vs. –0.26 [SD 7.8], $p < 0.01$).

Evidence of corroboration in the UK

Evidence of corroboration was limited. Although none of the identified RCTs focussing on pregnancy, menopause or smoking cessation were UK-based, it is likely that the findings are applicable to the UK population.

Cost-effectiveness data

No cost-effectiveness data were reported.

EVIDENCE TABLE 3a: INTERVENTIONS TO PREVENT WEIGHT GAIN IN INDIVIDUALS AT VULNERABLE LIFE-STAGES (MENOPAUSE)

First author, study design, research type, quality	Study population	Intervention details and length of follow-up	Results	Confounders/ Comments
Asikainen et al. (2004) Systematic Review (RCTs with >25 subjects and <35% attrition) 1++	All the subjects used in the studies were postmenopausal women aged 50–65 years. If a study had younger or older women then it was accepted providing the mean age was in the range of 50–65 years. Subjects had either been selected either on a voluntary basis or from a population-based sample. All subjects were sedentary at baseline or had some leisure PA that was kept constant during the study. Healthy women were accepted as well as subjects with diseases or risk factors such as dyslipidaemia, hypertension, obesity or osteoporosis. Hormone replacement therapy (HRT) and other medications were allowed.	To evaluate data from RCTs on exercise training studies with special reference to improving health in early postmenopausal women. Walking, other aerobic training, resistance training, strength training with weights machines or combinations of these were used. Exercise could be in addition to diet. Minimum 8 weeks. No further details on length of follow-up	Weight and body fat were studied in 18 studies with 1804 subjects. Body composition was improved in nine studies. Most studies showed a small loss of body weight and fat. The effect seems to be optimal when combining exercise with a weight reducing diet. The most effective results were accomplished in three studies with overweight participants who used weight-reducing diets in combination with exercise training. The mean weight loss ranged from 2 to 10 kg in 12 weeks to 1 year. The most effective exercise prescription for losing body fat was 30–60 min of walking or other aerobic training at 45–75% VO_{2max} on 3–5 days per week for 15 weeks to 1 year, or strength training with weight machines, five exercises with 80% of one repetition maximum with eight repetitions and three sets twice per week for 1 year.	Training programmes were relatively short in duration. VO_{2max} and muscular strength also reported in paper but not extracted for this review.
Simkin-Silverman et al.	**Eligibility criteria:** **Inclusion:**	**Intervention:** **Phase 1:** Cognitive-	**Lost to follow-up:** Intervention: *n* = 14	Some activity self-reported as

First author, study design, research type, quality	Study population	Intervention details and length of follow-up	Results	Confounders/ Comments
2003 RCT 1++ **Aim:** To test whether an intensive behavioural lifestyle intervention aimed at dietary and PA behaviour could prevent: 1) menopausal-related increases in LDL-cholesterol: and 2) weight gain NB. This is the only one RCT that met the criteria for inclusion.	Women aged 44–50 years who by self-report were pre-menopausal and not taking HRT, BMI 20–34 kg/m^2, fasting total cholesterol 140–260 mg/dl, fasting LDL-cholesterol 80–160 mg/dl, fasting glucose levels >140 mg/dl, diastolic blood pressure >95 mmHg **Exclusion:** Women taking lipid-lowering medication, antihypertensive medication, thyroid medication, psychotropic medication. **Setting:** Health Studies Clinic, University of Pittsburgh, USA. **Sample size:** Intervention: *n* = 260 Control: *n* = 275 Predominantly White, married, college educated, employed full-time. **Baseline BMI (kg/m^2):** Normal weight (BMI ≤24.9):	behavioural approach to weight control with strong emphasis on increasing PA and cholesterol lowering. Weeks 1–20 included 15 group meetings (20 women per group), given homework assignments and handouts, given weight loss goal in order to prevent any weight gain above baseline by end of the trial (BMI [kg/m^2] ≤24 asked to lose 2.3 kg, BMI 25–26 asked to lose 4.5 kg, BMI 27–34 asked to lose 6.8 kg). For first month followed daily diet of 1300 kcal (5.44 MJ], 25% energy from fat, 7% energy from saturated fat, 100 mg cholesterol, then could modify to suit their taste preferences; sessions on recipe modification, food labelling, social support, assertiveness training, restaurant eating; calcium supplement plus vitamin D (1200 mg/day) recommended, asked to increase PA expenditure to	Control: *n* = 12 **Weight outcomes:** Weight change from baseline (mean kg, intervention vs. control): 6 months: –4.9 vs. –0.4 18 months: –3.0 vs. +0.3 54 month: –0.1 (SD 5.2) vs. +2.4 (SD 4.9) At or below baseline weight at 54 months (intervention vs. control): 55 (136/246) vs. 26% (68/261); $p < 0.05$ Waist circumference (cm) at 54 months (intervention vs. control): –2.9 (SD 5.3) vs. –0.5 (SD 5.6), $p < 0.001$ Change in BMI (kg/m^2) (intervention vs. control): 0.05 (SD 2.0) vs. 0.96 (SD 1.8), $p < 0.001$ Change in % body fat (intervention vs. control): –0.5 (SD 4.1) vs. 1.1 (SD 3.9), $p < 0.01$ Fat-free mass (measured with a Hologic QDR 2000 dual-energy X-ray absorptiometer [DEXA]) (kg) (intervention vs. control):	was dietary intake, activity monitor actually measured PA. This study had power to detect an effect size of intervention of 90% or greater for weight and LDL-Cholesterol compared with control, at a significance level of 0.05 (two-tailed comparisons with an alpha level of 0.05)

First author, study design, research type, quality	Study population	Intervention details and length of follow-up	Results	Confounders/ Comments
	53.6% Overweight (BMI 25–29.9): 35.5% Obese (BMI ≥30.0): 10.8% Mean BMI: 25	1000–1500 kcal [4.19–6.28 MJ)/week (e.g. brisk walking 10–15 miles [16–24 km]) combining moderate aerobic activity with lifestyle activity, women monitored intake and activity and received feedback. **Phase 2:** Months 6–54, group meetings: months 6, 7, 8, 10, 12 and 14 provided women with additional behavioural skills, support and motivation, and offered 6-week refresher programmes (cooking demonstrations, low-fat taste panels, group walks, dance classes, exercise classes, mail and telephone follow-up continued, incentives and group competitions also, energy intake gradually increased as women met their weight goal, received individual small group consultation if experienced weight gain (two to three times	0 (SD 1.9) vs. 0.5 (SD 2.1), $p < 0.05$ **Dietary outcomes:** Change in energy intake (kcal/day) from baseline (intervention vs. control): –160 (SD 465) vs. –25 (SD 560) (–1.09 [SD 1.95] vs. –0.10 [SD 0.01] MJ/day), $p < 0.01$ Intervention group reported eating significantly less dietary fat and cholesterol than controls. **Physical activity outcomes (change from baseline):** Physical activity (kcal/day) (intervention vs. control): 275 (SD 1173) vs. –113 (SD 1261) (1.15 [SD 4.91] vs. –0.47 [SD 5.27] MJ/day), $p < 0.001$ Blocks walked [no further details reported***]*** (kcal/day) (intervention vs. control): 188 (SD 615) vs. –83 (SD 611) (0.79 [SD 2.57] vs. –0.35 [SD 2.56] MJ/day), $p < 0.001$ Change in sport and recreational activity from baseline (kcal/day) (intervention vs. control): 57 (SD 1023) vs. –47 (SD 1104) (0.24	

First author, study design, research type, quality	Study population	Intervention details and length of follow-up	Results	Confounders/ Comments
		per year), cholesterol rise (three to six individual consultations and cholesterol monitoring, emphasising soy protein, fruit and vegetable and fibre to lower cholesterol) or exercise relapse. The research team from the University of Pittsburgh and nurses from the Health Studies Clinic provided the intervention. **Control:** Assessment only control group. **Follow-up:** 54 months (follow-up assessment done at 6, 18, 30, 42 and 54 months).	[SD 4.28] vs. –0.20 [SD 4.62] MJ/day), $p < 0.0001$ Changes in activity monitor from baseline (counts/hour) (intervention vs. control): 2.3 (SD 9.1) vs. –0.26 (SD 7.8), $p < 0.01$ **Authors' conclusion:** In healthy women, weight gain and increased waist circumference during the peri- to postmenopause can be prevented with a long-term lifestyle dietary and PA intervention.	

Evidence of corroboration (external validity)					
Evidence of salience from studies conducted in the UK					
First author	**Study population**	**Research question**	**Length of follow-up**	**Main results**	**Confounders/comments**
Evidence for implementation – Will it work in the UK?					

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EVIDENCE SUMMARY TABLE 3b: INTERVENTIONS TO PREVENT WEIGHT GAIN, IMPROVE BEHAVIOURS ASSOCIATED WITH THE MAINTENANCE OF A HEALTHY WEIGHT, IMPROVE DIET AND INCREASE ACTIVITY LEVELS IN INDIVIDUALS AT VULNERABLE LIFE-STAGES (PREGNANCY)

SUMMARY

Two studies (one RCT and one CBA) were included that aimed to prevent excessive weight gain during pregnancy and were published in 2001 and 2002. One further CCT was included that aimed to test the hypothesis that continuing a regular regimen of recreational exercise alters the time specific rate of maternal weight gain and subcutaneous fat deposition during pregnancy. The CBA study was conducted in New York and followed women from early pregnancy to 1-year postpartum (Olson 2004). The RCT was conducted in Pittsburgh and followed women from prior to 20-weeks gestation to 8-weeks postpartum (Polley 2002). The CCT was conducted in Cleveland and followed women from pre-pregnancy to 37-weeks gestation (Clapp 1995). All of the studies reported weight change; one reported dietary and PA outcomes (Polley 2002). The CBA study included an intervention group that had their gestational weights monitored and received education about appropriate weight gain during pregnancy and healthy eating and exercise advice, compared with a historical control group. The RCT included an intervention group that received advice about weight gain during pregnancy and a diet substituting high-fat 'fast foods' with fruit and vegetables and increasing moderate exercise (walking). This intervention was a stepped care approach where women received additional sessions and behavioural goals were increasingly structured should she exceed recommended levels of weight gain at any time during the pregnancy, compared with standard nutritional counselling. The CCT compared participants who continued with the same regular exercise as before pregnancy to those who voluntarily stopped regular exercise. Most of the intervention participants continued to exercise at least three times per week for 30 min or more at an intensity >50% VO_{2max} throughout pregnancy to 37th week.

A Cochrane systematic review of diet in pregnancy reports that the limited evidence available suggests that protein/energy restriction of pregnant women who are overweight or exhibit high weight gain is unlikely to be beneficial and may be harmful to the developing fetus. Only three studies were included, two in Scotland that were both published prior to 1990, one in obese women and the other in women with high gestational weight gain between weeks 20–30.

In the CBA study, 94% were aged between 20–40 years, 75% were of normal pre-pregnancy BMI, 41% were having first baby and 40% had household incomes below 185% federal poverty line. In the RCT, mean age was 25.5 years, 47% were first pregnancies, 57% were unemployed (setting was an obesity clinic for low-income women) just under half of both the control and intervention group women were classed as overweight (BMI 31–34 kg/m^2). One hundred and twenty women were randomised in the RCT and 179 participants in the intervention group of the CBA study were compared with 381 women in the historical control group. In the CCT participants mean age was 31 years, parity ranged from 0 to 2; participants were well educated with family incomes at or above 75th percentile for their state of origin, they were non-smoking White females. There were significantly more homemakers and/or part-time workers in intervention group (31 vs. 14%, $p < 0.05$) and the percentage of women with jobs known to require moderate PA was significantly higher in the control group (39 vs. 23%. $p < 0.05$). Forty-four women in the exercise intervention group and 35 women were in the control group. Baseline body mass (before pregnancy) was 58.1 kg in the intervention group and 60.2 kg in the control group. Mean weekly duration of exercise was 172 min and mean exercise intensity was 66% VO_{2max} for all participants at baseline.

Evidence of efficacy for weight management/reduction

All three studies reported weight change. The CBA study demonstrated that the diet and exercise intervention reduced the risk of excessive gestational weight gain in the low-income subgroup only. Low-income women who received the intervention had a significantly reduced risk of excessive gestational weight gain (OR 0.41, 95% CI 0.20, 0.81); overweight women within this subgroup were at significantly reduced risk of retaining more than 2.27 kg at 1-year postpartum (OR 0.24, 95% CI 0.07, 0.89).

The RCT of diet and exercise using a stepped care approach was effective in reducing the frequency of excessive weight gain in normal weight women (33% intervention vs. 58% control), with the intervention having no significant effect among overweight women but a trend in the opposite direction. The CCT demonstrated that continuing a regular exercise regimen throughout pregnancy resulted in significantly less total weight gain (13.0 [SD 0.5] vs. 16.3 [SD 0.7] kg, $p < 0.0001$). Increases in the sum of skinfold thicknesses were 22 ± 2 and 31 ± 2 mm intervention vs. control at 37 weeks. The intervention did not influence the rate of early pregnancy weight gain or subcutaneous fat deposition but decreases both in late pregnancy. However, overall pregnancy weight gain remains well within the normal range.

Within the Cochrane systematic review (Kramer 2003) of diet during pregnancy, three trials involving 384 women were included. Both Campbell trials (UK) reported that energy/protein restriction was associated with a significant reduction in weekly maternal weight gain, although the magnitude of the reduction was much larger in the 1975 trial (random effects weighted mean difference [WMD] –254.81 [95% CI –436.56, –73.06] g/week). The two trials reporting on birth weight (Campbell 1983; Badrwai 1993) yielded highly (and statistically significantly) heterogeneous results, with Campbell 1983 reporting virtually no effect of the intervention (WMD 6.00 [95% CI –121.55, +133.55] g) but Badrwai (1993) finding a large significant adverse effect (WMD –450.00 [95% CI –624.72, 275.28] g). Postpartum weight retention was not reported.

Evidence of efficacy for diet/physical activity outcomes

The RCT reported a lack of significant effect of the intervention on changes in intake of high-fat foods and changes in exercise level from recruitment to 30 weeks were not related to treatment condition or BMI.

Evidence of corroboration in the UK

Although none of the individual studies was conducted with the UK, the interventions could be implemented in the UK. Two studies published in 1975 and 1983 and included in the review of diet in pregnancy (Kramer 2003) were conducted in Scotland.

EVIDENCE TABLE 3b. INTERVENTIONS TO PREVENT WEIGHT GAIN IN INDIVIDUALS AT VULNERABLE LIFE-STAGES (PREGNANCY)

First author, study design, research type, quality	Study population	Intervention details and length of follow-up	Results	Confounders/comments
Kramer 2003 Cochrane systematic review 1+	Pregnant women	Energy and protein intake in pregnancy. Review of the effects of advice to increase or reduce energy or protein intake, or of actual energy or protein supplementation or restriction during pregnancy on energy and protein intakes, gestational weight gain and the outcome of pregnancy. Various follow-up Campbell 1975 intervention included 1200 kcal (5.02 MJ)/day low-carbohydrate diet from 30 weeks gestation compared with normal diet. Campbell 1983 intervention involved 1250 kcal (5.23 MJ)/day diet in obese women compared with control. Badrwai intervention involved 1500–2000 kcal	Three trials involving 384 women were included. Both Campbell trials reported that energy/protein restriction was associated with a significant reduction in weekly maternal weight gain, although the magnitude of the reduction was much larger in the 1975 trial (random effects WMD –254.81 [95% CI –436.56, –73.06] g/week). Energy/protein restriction had no effect on either (proteinuric) pre-eclampsia or pregnancy-induced hypertension (with or without proteinuria), although the small number of trials and participants provides inadequate statistical power to exclude a small effect. The two trials reporting on birth weight (Campbell 1983; Badrwai 1993) yielded highly (and statistically significantly) heterogeneous results, with Campbell 1983 reporting virtually no effect of the intervention (WMD 6.00 [95% CI –121.55, +133.55] g) but Badrwai (1993) finding a large significant adverse effect (WMD –450.00 [95% CI –624.72, –275.28] g).	This review just focuses on one element of the Cochrane review: evaluation of low-energy diets in pregnant women who are obese or have high gestational weight gain. Two Campbell studies were conducted in Scotland, one in obese women and the other in women with high gestational weight gain between weeks 20–30. Both were conducted prior to 1990.

First author, study design, research type, quality	Study population	Intervention details and length of follow-up	Results	Confounders/comments
		(6.28–8.37 MJ)/day diet in obese Egyptian women compared with normal WHO-recommended diet;	These large differences in results could reflect either differences in study samples (Scotland vs. Egypt) or differences in the degree of energy/protein restriction achieved. Only Campbell (1983) reported results bearing on gestational duration; the results appear to exclude an important adverse effect of dietary restriction (WMD in mean gestational age +0.25 (95% CI –0.17 to +0.67) weeks). Other outcomes, including fetal/infant mortality and other measures of maternal morbidity (e.g. Caesarean section) or postpartum weight retention, have not been reported. The limited evidence available suggests that protein/energy restriction of pregnant women who are overweight or have high weight gain is unlikely to be beneficial and may be harmful to the developing fetus.	
Olson et al. 2004 CBA (historical control) 2++ **Aim:**	**Eligibility criteria:** Women with normal (19.8–26.0 kg/m^2) and high (26.1–29.0 kg/m^2) BMI entered prenatal care before third trimester, ≥18 years old at delivery, no medical condition	**Intervention:** Graphic design of the Institute of Medicine gestational weight gain grid, separate colour-coded grid was developed for of the four pre-pregnancy BMI	**Lost to follow-up:** Not reported; 21 excluded from intervention group and 22 excluded from control group. Details of the historical control group and recruitment details are described elsewhere in studies by Kendall et al. (2001) and Hinton & Olson	Twelve women who participated in historical control group also participated in prospective intervention group. Bias was detected in the historical control self-reported pre-pregnancy

First author, study design, research type, quality	Study population	Intervention details and length of follow-up	Results	Confounders/comments
To evaluate the efficacy of an intervention to prevent excessive gestational weight gain.	that might impact body weight, mentally competent, planned to deliver locally and keep the infant, gave birth to live, singleton, term infant. 20% single, 41% having first baby. 96% White **Setting:** Bassett Healthcare (hospital and primary care clinic system serving ten-county area in upstate New York). **Sample size:** Intervention: *n* = 179 Historical control: *n* = 381 **Age:** 94% between 20 to 40 years in both groups. **185% or less below the Federal poverty line:** Intervention: 37.4% Control: 43.3% **Baseline BMI (kg/m^2):** Normal BMI (median, range):	groups, used to determine pre-pregnancy BMI, plotting gestational weight gain (2-hour orientation programme given for interested providers, attendance voluntary with continuing education credits given; patient education component included health check book that contained weight gain and self-monitoring tools; also food guide pyramids and tips for healthy eating and exercise in pregnancy; five × 1-page newsletters (pre-tested in focus groups that included low-income women); postcards sent with newsletters encouraging active participations, asking questions that were answered in next newsletter and prize incentives for sending back postcard. Providers of the intervention included Bassett Healthcare staff and the researchers	(2001). **Gestational weight gain (mean, kg):** Intervention: 14.10 (SD 4.51) Control: 14.80 (SD 4.68), *p* = 0.09 **Proportion of women gaining more than recommended weight:** Intervention: 41% Control: 45%, *p* = 0.3 Low-income women in intervention: 33% Low-income women in control: 52%, *p* < 0.01 Significant difference in excess weight gain within low-income women also seen in overweight and normal BMI groups. **Normal BMI:** Low-income women in intervention: 29% Low-income women in control: 45%, *p* = 0.05 **Overweight:** Low-income women in intervention: 44% Low-income women in control: 72%, *p* = 0.04 No significant effect of intervention detected in high-income women.	weight so weight in both groups was calculated from last prenatal visit where weight was measured. This study had power to detect an effect size of intervention of 90% statistical power to detect a 50% reduction from the observed 71% gaining above the weight range in the historical group, with a 5% false-positive rate using a two-sided test of significance. Within low-income women, there was a 96% statistical power to detect 50% reduction from the observed 52% gaining above the weight range in the historical group with a two-sided 5% false-positive rate.

First author, study design, research type, quality	Study population	Intervention details and length of follow-up	Results	Confounders/comments
	Intervention: 22.6 (19.8–26.0), *n* = 290 Control: 23.1 (20.0–26.0), *n* = 131 Overweight (BMI median, range): Intervention: 27.2 (26.1–29.0), *n* = 91 Control (historical control group): 27.2 (26.0–29.0), *n* = 48	**Control:** Not reported. **Follow-up:** 12-months postpartum.	**Weight retention at 1-year postpartum (kg):** Intervention: 0.59 (4.74) Control: 1.31 (5.60) **Women retaining 2.27 kg or more at 1-year postpartum:** Intervention: 31% Control: 38%, *p* = 0.14 Low-income and overweight women: Intervention: 25% Control: 55%, *p* = 0.04 High-income and normal BMI: Intervention: 24% Control: 36%, *p* = 0.07 **Diet:** Not reported. **Physical activity:** Not reported. **Author's conclusion:** The intervention reduced the risk of excessive gestational weight gain in the low-income subgroup only. Low-income women who received the intervention had a significantly reduced risk of excessive gestational weight gain (OR 0.41, 95% CI 0.20, 0.81).	

First author, study design, research type, quality	Study population	Intervention details and length of follow-up	Results	Confounders/comments
			Overweight women within this subgroup were at significantly reduced risk of retaining more than 2.27 (OR 0.24, 95% CI 0.07, 0.89) kg.	
Polley et al. 2002 RCT 1+ **Aim:** To determine whether a stepped care behavioural intervention will decrease the percentage of women who gain more than the Institute of Medicine recommendation for gestational weight gain.	**Eligibility criteria:** Low-income women before 20 weeks gestation **Exclusion:** Women underweight (BMI <19.8 kg/m^2), <18 years old, first prenatal visit was above 12 weeks gestation, those with high-risk pregnancy **Setting:** Obstetric clinic for low-income women at a hospital in Pittsburgh, PA, USA. Age 25.5 (SD 4.8) years, 39% Black, 45% high school or less, 57% unemployed, 47% first pregnancy. **Sample size:** Intervention: *n* = 61 (32 normal weight and 29 overweight) Control: *n* = 59 (33 normal weight and 26 overweight)	**Intervention:** Delivered by masters and doctoral level staff with training in nutrition or clinical psychology, participants given information on appropriate weight gain during pregnancy, exercise and healthful eating, newsletters mailed biweekly, sent personalised graph of weight gain after each clinic visit, women exceeding weight gain given additional individualised nutrition and behavioural counselling (stepped care approach with increasingly structured behavioural goals if weight continued to exceed recommended levels). Focus on decreasing high fat foods such as 'fast food' items, substituting with fruit and vegetables, increasing walking and developing a	**Lost to follow-up:** Intervention: *n* = 27 Control: *n* = 19 **Proportion of women gaining more than recommended weight and mean weight gain:** Intervention Normal weight: 33.3%, *n* = 10, 23.6 kg Control Normal weight: 58.1%, $p < 0.05$ *n* = 18, 19.1 kg Intervention Overweight: 59.3%, *n* = 16, 17.7 kg Control Overweight: 31.8%, $p = 0.07$, *n* = 7, 17.3 kg Although intervention significantly reduced percent normal weight women who exceed weight gain goal, intervention had no significant effects on average weight gain from pre-pregnancy to delivery and weight gains were	Randomisation was stratified by BMI category and race. Pre-pregnancy weight was self-reported. Women whose weight exceeded guidelines were given additional sessions No significant effects of race on percentage of women with excessive weight gain ($p > 0.3$). Weight gained before recruitment was strongly related to excessive weight gain ($p < 0.0001$). It is not clear if the study was sufficiently powered to detect a significant effect on weight outcomes with intervention compared with control.

First author, study design, research type, quality	Study population	Intervention details and length of follow-up	Results	Confounders/comments
	Baseline BMI (kg/m^2): Normal weight Intervention: 22.8 (1.9), *n* = 30 Control: 22.5 (2.0), *n* = 31 Overweight Intervention: 31.4 (6.0), *n* = 27 Control: 34.1 (7.2), *n* = 22	more active lifestyle. Contacted by telephone between clinic visits **Control:** Standard nutritional counselling provided by physicians, nurses, nutritionists and Women, Infants and Children (WIC) counsellors emphasising well balanced diet and multivitamin/iron supplement. **Follow-up:** 8-weeks postpartum (from prior to 20 weeks gestation).	comparable between Black and White women. **Weight retention at mean 8-weeks postpartum:** Intervention Normal weight: 4.4 (SD 5.4) kg Control Normal weight: 6.2 (SD 4.5) kg Intervention Overweight: 3.6 (SD 5.6) kg Control Overweight: 0.3 (SD 7.0) kg Weight retention was strongly correlated with weight gain during pregnancy (r = 0.89, p < 0.001). **Diet:** No effect of intervention on changes in intake of high-fat foods. **Physical activity:** Changes in exercise level from recruitment to 30 weeks were not related to treatment condition or BMI. **Authors' conclusion:** The intervention was effective in	

First author, study design, research type, quality	Study population	Intervention details and length of follow-up	Results	Confounders/comments
			reducing the frequency of excessive weight gain in normal weight women, the intervention had no significant effect among overweight women but the trend was in the opposite direction; the more intensive stepped care element that occurred subsequent to excessive weight regain may have been a less effective component than the prevention component (fewer women in the intervention group exceeded recommended weight gain at any point during their pregnancy (63 vs. 94%);	
Clapp 1995 CBA 2– **Aim:** To test the hypothesis that continuing a regular regimen of recreational exercise alters the time specific rate of maternal weight gain and subcutaneous fat deposition during pregnancy.	**Eligibility criteria:** Normal women with generally active lifestyles who also engaged in regular exercise at or above a basic conditioning level for the primary purpose of health and recreation for at least 6 months and who conceived and experienced a normal pregnancy. Participants were unselected and consecutively enrolled. **Exclusion:** Women with infertility or pregnancy complications. **Setting:**	**Intervention:** Participants continued with same regular exercise as before pregnancy; exercise levels varied widely between but not within participants during pregnancy. Most continued to exercise at least three times per week for 30 min or more at an intensity greater than 50% VO_{2max} throughout pregnancy to 37th week. **Control:** Participants who voluntarily stopped their regular	**Lost to follow-up:** Intervention: *n* = 27 Control: *n* = 19 When covaried for the minor differences in preconceptional weight the rate of weight gain was similar in the control (0.3 kg/week) and intervention groups (0.25 kg/week) through to the 15th week. Between 15th–23rd week and 23rd–30th weeks the rate of weight gain was significantly ($p < 0.05$ and $p < 0.002$) less in the intervention group. Averaging 0.47 vs. 0.57 kg/week in the control group. Although the rate of weight gain decreased between 30 and 37 weeks in both groups, the women in the intervention group continued to gain	Randomisation was stratified by BMI category and race. Not aimed at preventing excessive weight gain in pregnancy. Intervention and control groups were self-selecting Significant important differences at baseline which may confound results.

First author, study design, research type, quality	Study population	Intervention details and length of follow-up	Results	Confounders/comments
	Obstetric clinic, Cleveland, OH, USA. Age 31 (SD 0.3) years, parity ranged from 0 to 2; well educated (mean 17.3 years), family incomes at or above 75th percentile for their state of origin, non-smoking White; significantly more homemakers and/or part-time workers in intervention group (31 vs. 14%, $p < 0.05$); percentage of women with jobs known to require moderate PA was significantly higher in control group (39 vs. 23%, $p < 0.05$); **Sample size:** Intervention: $n = 44$ Control: $n = 35$ **Baseline body mass: (prior to pregnancy):** Intervention: 58.1 (SD 1.0) kg Control: 60.2 (SD 1.2) kg Mean height for all participants 166.7 (SD 0.6) cm **Mean weekly duration of exercise:** All participants: 172 ± 6 min **Mean exercise intensity:**	exercise regimen because of concern that it would have negative effects on pregnancy, $n = 31$ or reduced it below baseline fitness levels in very early pregnancy, $n = 4$). All participants consumed a balanced diet, reported energy intake rose consistently during pregnancy with no significant differences between the two groups; however, 12 aerobics instructors who were intervention participants had significantly greater energy intake. **Follow-up:** 37 weeks	significantly ($p < 0.001$) less than the controls (0.31 vs. 0.47 kg/week). As a result total weight gain was significantly ($p < 0.0001$) less in the intervention group (13.0 [SD 0.5] vs. 16.3 [SD 0.7] kg). Increases in the sum of skinfold thicknesses were 22 ± 2 mm and 31 ± 2 mm intervention vs. control at 37 weeks. Authors conclude that continuing a regular exercise regimen throughout pregnancy does not influence the rate of early pregnancy weight gain or subcutaneous fat deposition but decreases both in late pregnancy. However, overall pregnancy weight gain remains well within the normal range.	

First author, study design, research type, quality	Study population	Intervention details and length of follow-up	Results	Confounders/comments
	All participants: 66 ± 1% VO_{2max}. **Significant differences at baseline:** Sum of five skinfold thicknesses greater in control group, also subjects who continued to exercise (intervention group) spent 44% ($p < 0.01$) exercising each week than those subjects who stopped (control group) representing average difference in energy expenditure of 600 kcal (2.51 MJ)/week.			

Evidence of corroboration (external validity)					
Evidence of salience from studies conducted in the UK					
First author	**Study population**	**Research question**	**Length of follow-up**	**Main results**	**Confounders/comments**

Evidence for implementation – Will it work in the UK?					
Pregnancy Anderson 1995	CCT	Maternity hospital in Aberdeen.	To assess the effect of dietary advice education intervention on nutrient intake during pregnancy.	From booking to 26 weeks gestation.	Intervention participants received information packs on nutrition at time of booking and at 26-weeks gestation, all participants received general pregnancy health guide. Results showed that knowledge about nutrition was significantly higher in the intervention group (magnitude unlikely to make difference in practice), but no significant differences were noted on attitude variables or nutrient intake (fat, energy).

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EVIDENCE SUMMARY TABLE 3c: INTERVENTIONS TO PREVENT WEIGHT GAIN, OR IMPROVE BEHAVIOURS ASSOCIATED WITH THE MAINTENANCE OF A HEALTHY WEIGHT, IMPROVED DIET AND INCREASED ACTIVITY LEVELS, IN INDIVIDUALS AT VULNERABLE LIFE-STAGES (SMOKING CESSATION)

(METHODOLOGY: Report continuous abstinence [no smoking since quitting] rather than point prevalence abstinence [no smoking in past 7 days], report weight gain by quitters in each treatment group only, report latest follow-up point only.)

SUMMARY

Seven smoking cessation studies (six RCTs and one CBA) were included that aimed to prevent excessive weight gain when stopping smoking. Five of the RCTs only included women. Five of the studies were published between 1999 and 2004 and two studies were published in 1992 (Hall 1992; Pirie 1992). Five studies were conducted in North America, one in Sweden (Danielsson, 1999) and one in Iceland (Jonsdottir, 2001). All studies had at least 12-months follow-up from when participants quit smoking. All of the studies reported % rates of continuous abstinence and weight change; none reported dietary or PA outcomes. All the studies included a smoking cessation intervention, three RCTs focussed on dietary interventions including energy reduction, food replacements, and early and late introduction of diet. Two RCTs focussed on diet and exercise intervention (Hall 1992; Pirie 1992; both arms had identical exercise) and two studies focussed on an exercise only intervention (Marcus 1999; Jonsdottir 2001).

Participants mean age within the studies ranged from 39 to 47 years, BMI ranged from 24 to 28 kg/m^2 at baseline. Numbers of cigarettes smoked per day ranged from 19 to 32 cigarettes and where reported years of smoking ranged from 22 (Marcus 1999) to 30 years (Hall 1992; Danielsson 1999). Numbers of participants in each arm ranged from 33 (Jonsdottir 2001) to 150 (Danielsson 1999). The majority of studies only included women who wanted to stop smoking and control their weight and were therefore a motivated population.

Evidence of efficacy for weight management/reduction

All seven studies reported weight change; only weight change in women who remained continuously abstinent is reported here.

One RCT (Spring 2004) compared a low-energy (150 kcal [630 kJ]/day deficit) diet given in the initial 8 weeks alongside exercise and smoking cessation programme with diet given in the later 8 weeks of the 16-week treatment period, with both compared with a control which consisted of the smoking cessation programme only. Nine-month abstinence did not differ between the groups (weight control did not undermine smoking cessation) with 18.2% in the control, 21.4% early diet and 19.5% in the late diet group. Nine-month weight change also did not differ between the groups (6.20 kg in control, 7.57 kg in early diet, 4.88 kg in late diet).

In one CBA study (Jonsdottir 2001) of an exercise intervention in a convenience sample of self-referred participants, the addition of exercise in a gym did not significantly improve abstinence rates (20.6 vs. 39.4%, $p = 0.16$) or prevent weight gain (3.0 vs. 5.0 kg, $p = 0.37$) compared with control in a healthcare centre, despite the exercise group having paid more money to take part (all participants received option of nicotine replacement therapy [NRT] and received health education and both individual and group behavioural modification).

One study (Perkins 2001) demonstrated that cognitive behavioural therapy (CBT) for weight concerns (to promote acceptance of and reduce concerns about modest weight gain when stopping smoking) significantly attenuated weight gain (2.5 vs. 7.7 kg) and significantly increased rates of abstinence (21 vs. 9%), compared with standard smoking cessation counselling in weight concerned women (13% abstinence in weight control group, no significant weight control vs. CBT for weight concerns). The third arm of the intervention included a 500 kcal (2.10 MJ)/day deficit, but there was no significant difference in weight change between this weight control arm and the standard intervention arm (5.4 vs. 7.7 kg).

One exercise intervention (Marcus 1999) in sedentary women significantly improved smoking abstinence compared with control (11.9 vs. 5.4% $p = 0.05$), but there was no significant difference in weight gain (8.92 vs. 5.76 kg respectively) at 60 weeks post-quit.

One intervention (Danielsson 1999) included a very-low-energy (6.7 MJ/day) food replacement supplied to female participants for three 2-week periods; this was in addition to nicotine gum, which all participants could use. At 12 months the food replacement group had 28% abstinence compared with 16% abstinence within the control group ($p = 0.02$). There was, however, no significant difference between the groups regarding weight gain (2.5 kg in intervention vs. 3.8 kg in control, $p = 0.61$).

One study (Hall 1992) included a low energy, low-fat diet if participants gained 2 lb (0.90 kg) or more, plus aerobic exercise, this intervention had three arms: specific (individualised diet and exercise plan); non-specific (not individualised) diet and exercise; and a standard control group. At 12 months both active interventions (specific and non-specific diet and aerobic exercise) had a greater risk of smoking than the control group (specific intervention 21%, non-specific intervention 22%, control 35% continuous abstinence). The authors reported no significant difference between the three groups regarding weight change (0.86 kg specific intervention, 3.35 kg non-specific intervention, 3.61 kg control).

One RCT (Pirie 1992) included four arms all including smoking cessation treatment with weight control added in one arm, nicotine gum in another arm and both nicotine gum plus weight control in another arm. The two arms that included weight control element also included a walking element. At 12-months post-treatment, the arm that included smoking cessation plus nicotine gum and the highest rate of abstinence and there was no significant difference between the intervention arms regarding weight change (ranged from 9.77 to 14.15 lb [4.43 to 6.42 kg]).

Evidence of efficacy for diet/physical activity outcomes

None of the studies reported diet or PA outcomes relevant to this review.

Evidence of corroboration in the UK

Although none of the studies were conducted with the UK, many of the interventions cited within the included studies could be implemented in the UK.

EVIDENCE TABLE 3C. INTERVENTIONS TO PREVENT WEIGHT GAIN IN INDIVIDUALS AT VULNERABLE LIFE-STAGES (SMOKING CESSATION)

First author, study design, research type, quality	Study population	Intervention details and length of follow-up	Results	Confounders/comments
Perkins et al. 2001 Cluster RCT 1+ **Aim:** To identify most effective approach to addressing weight gain concerns in women quitting smoking.	**Eligibility criteria:** Women, 18–65 years old, smoking at least ten cigarettes per day, free of any major health problem or illicit drug use, significantly interested in quitting smoking, endorsing concerns about weight gain after quitting. **Exclusion:** Women trying to become pregnant or following medically prescribed diet were excluded. **Setting:** Allegheny County, Pennsylvania. **Sample size:** Total *n* = 219 Weight control group:	**All:** CBT smoking cessation counselling (ACS Fresh Start program). Therapists were women with master's degrees in clinical or counselling psychology that received intensive didactic training and weekly supervision. Participants received ten × 90 min group sessions (ten to twelve participants) over 7 weeks, two sessions per week during first 3 weeks and one session per week in last 4 weeks. Participants instructed to quit smoking after group's fourth session and before fifth session, follow-up at 3, 6 and 12 months post-quit; asked not to use NRT **Weight control intervention:** Subjects were given daily energy goals (typically less than 500 kcal [2.09 MJ] less than would be required to maintain baseline weight if still smoking) and were instructed to self-monitor daily food intake in a	**Lost to follow-up:** By the end of the 7 weeks of treatment (4 weeks post-quit) was 19% for CBT group, 10% for the weight control group and 21% for the control/standard group. Also the difference between weight control and standard was significant ($p < 0.05$). Mean attendance at the three follow-up sessions was 62% and did not differ between the three groups. **12-month continuous abstinence: (assumed dropouts resumed smoking):** Weight control: 13% CBT for weight concerns: 21% Standard: 9% (Not significant between weight control vs. CBT for weight concerns, but significant between CBT for weight concerns vs. standard.) **Weight gain (only in abstinent women):**	Significantly more participants in CBT for weight concerns vs. weight control had dieted in last 12 months at baseline Outcome results not changed when analyses were repeated excluding participants who used nicotine replacement therapy. Pre-quit BMI predicted cessation outcome at 1 year Self-reported abstinence verified by exposed air carbon monoxide readings Randomisation was by cluster and

	n = 72, mean BMI 25.6 kg/m^2 CBT: *n* = 72, mean BMI 25.8 kg/m^2 Standard: *n* = 75, mean BMI 25.5 kg/m^2 **Age:** Weight control: 45.7 (SD 10.4) CBT: 44.3 (SD 9.5) Standard: 43.6 (SD 10.0) **College graduate:** Weight control: 51.4% CBT: 43.0% Standard: 46.7% **Smoking rate (years):** Weight control: 27.4 (SD 10.4) CBT: 24.7 (SD 10.9) Standard: 24.9 (SD 10.1) **Baseline BMI (kg/m^2):** Weight control: 25.6 (SD 5.4) CBT: 25.8 (SD 4.7) Standard: 25.5 (SD 4.7)	diary, which was reviewed weekly by the group therapist. Subjects also graphed their weight on a chart containing a solid horizontal line across time at their pre-quit baseline weight. Participants encouraged to practice self-monitoring and stimulus control particularly to reduce between-meal snacking. **Cognitive bevioural therapy for weight concerns:** Promote acceptance of and reduce concerns about modest weight gain, self-monitor negative thoughts, promote health benefits of quitting smoking superseding health risks of weight gain, reducing dietary restraint, improving body image, discourage dieting and encourage moderate consumption of healthy foods during between-meal snacking. **Control (standard advice):** Non-specific social support, discussed other aspects of quitting, discussion of weight gain concerns was discouraged. **Follow-up:** 12-months post-quit.	Weight control: 5.4 (SD 3.3) kg CBT for weight concerns: 2.5 (SD 4.2) kg Standard: 7.7 (SD 4.7) (Significant between CBT for weight concerns vs. standard but not significant between weight control vs. standard or CBT vs. weight control.) **Diet:** Not reported. **Physical activity:** Not reported. **Author's conclusion:** CBT to reduce weight concerns but not weight control, improved smoking abstinence in weight concerned women beyond that produced by standard cessation counselling; weight control group attenuated post-cessation weight gain, unexpectedly, weight gain in the CBT group was also less than weight gain in the standard group but not different from that in the weight control group.	analysis was by individual, which may limit reliability of the results. It is not clear if the study was sufficiently powered to detect a significant effect with intervention when compared with control.

Marcus et al. 1999 Commit to quit RCT 1+ **Aim:** To determine if regular, vigorous exercise, a healthful alternative to smoking, enhances the achievement and maintenance of smoking cessation and reduces weight gain among sedentary female smokers.	**Eligibility criteria:** Inclusion: Healthy sedentary women aged 18–65 years, regularly smoked ten or more cigarettes per day for at least 3 years, exercised less than twice per week for at least 6 months. Exclusion: Current or planned use of NRT, medical problems or use of medications that would make compliance difficult, current psychiatric illness, alcohol or substance abuse, were excluded. **Setting:** The Miriam Hospital, Providence, RI, USA. **Sample size:** Exercise: *n* = 134 Control: *n* = 147 **Age (years):** Exercise: 40.7 (SD 9.1) Control: 39.7 (SD 8.8)	**All:** 12-week group- (approximately 15 participants) based smoking cessation programme, quit at week 4, then 8-week treatment programme. **Exercise intervention:** Resting heart rate plus 60–85% heart rate reserve, started 3 weeks before quit date, three exericse sessions per week for 12 weeks, 5-min warm up, 30–40 min aerobic activity, 5-min cool-down with stretching, supervised by exercise specialist. Providers of the intervention included an exercise specialist and staff from the Miriam Hospital and Brown University School of Medicine in Providence, Rhode Island. **Control:** 12-week wellness programme started 3 weeks before quit date, three × 45–60 min supervised sessions per week, advised not to adopt exercise. **Follow-up:** 60 weeks post quit.	**Lost to follow-up:** At 12 months: Exercise 44% Control 49.7% (not significant). ITT analysis on all 281 participants (lost to follow-up assumed to have relapsed). **60-weeks continuous abstinence:** Exercise: 11.9% (*n* = 16) Control: 5.4% (*n* = 8) *p* = 0.05 **Weight:** Only in abstinent women –among quitters, exercise participants gained significantly less weight at 8 weeks but difference was not significant at 20 and at 60 weeks. **60 weeks weight:** Exercise: 8.92 (SD 8.9) kg, *n* = 15 Control: 5.76 (SD 12.6) kg, *n* = 6 **Diet:** Not reported. **Physical activity:** Not reported (only VO_{2max}). **Authors' conclusion:** Vigorous exercise as part of CBT for smoking cessation leads to improved rates of continuous abstinence in young to middle-aged	Significantly higher BMI and body weight in exercise group at baseline compared with control. Exercise participants exercised at 83% maximum heart rate. Self-reported abstinence verified by exposed air carbon monoxide readings A total sample size of 150 at 12-months was projected to provide a power of 80% (alpha=0.05) and to detect a 21% net difference in smoking rates between intervention and control.

	Education (years): Exercise: 13.8 (SD 2.1) Control: 13.8 (SD 2.1) **Smoking rate, cigarettes per day:** More than 20. Exercise: 22.9 (SD 9.7) Control: 21.8 (SD 9.0) **Smoking (years):** Exercise: 22.6 (SD 8.8) Control: 22.2 (SD 9.0) **Baseline BMI (kg/m^2):** Exercise: 26.1 (SD 5.2) Control: 24.8 (SD 4.7)		female smokers who averaged more than one pack of cigarettes per day for more than 20 years, maintained at 12 months, CBT to attenuate weight gain was only effective during treatment period (when participated in exercise).	
Danielsson et al. 1999 RCT 1++ **Aim:** To determine whether intermittent use of very-low-energy diet	**Eligibility criteria:** Inclusion: Female smokers aged 30–60 years who wanted to stop smoking and maintain their body weight, BMI 23–31 kg/m^2, smoke at least ten cigarettes per day for at least 3 years, have made at least one serious	**All:** Eleven sessions over 16 weeks including three group sessions with a dietitian and standardised written information, each session 45 min in groups of 10–15 women, follow-up at 21, 26,3 9 and 52 weeks. 2 mg nicotine gum (Nicorette) (could switch to 4 mg if consumed more than 20 pieces per day), free gum for 3 months then advised to	**Lost to follow-up:** At 12 months Intervention: *n* = 35 women Control: *n* = 51 women ITT analysis. **52 weeks complete and continuous abstinence:** Intervention: 28% (*n* = 38) Control: 16% (*n* = 24) *p* = 0.02	96 of 201 women at 12 month follow-up were still using NRT Significantly more women reported headaches in VLED compared with control. Self-reported abstinence verified by

(VLED) to improve weight control affected the success of a smoking cessation programme.	attempt to stop and restarted because of weight gain. Exclusions: Cardiovascular disease, participation in another clinical study in previous 6 months, clinical important renal or hepatic disease, pregnancy or lactation, lactose intolerance, alcohol or drug abuse, use of smokeless tobacco or NRT, gout, acute porphyria, insulin-dependent diabetes mellitus, vegetarian diet, any serious metabolic or malignant disease likely to interfere with compliance. **Setting:** Obesity Unit, University Hospital, Sweden. **Sample size:** Intervention *n* = 137 Control *n* = 150	taper consumption, on request gum supplied up to 12 months; standardised balanced diet of 6.7 MJ/day, behaviour modification sessions for stopping smoking and providing support for weight control. **Intervention:** Nutrilett 1.76 MJ/day (420 kcal total food replacement given free of charge for three × 2-week periods (weeks 1 and 2, 7 and 8, 13 and 14). Compliance with the VLED was based on self-reported adherence and verified through ketone body analysis in urine, sampled by the women at home. Women with missing samples were asked to provide a urine sample after the VLED period. **Follow-up:** 52 weeks	**Weight (abstainers):** 52 weeks weight loss: Intervention: 2.5 (95% CI 0.78–4.3) kg Control: 3.8 (95% CI 2.5–5.1) kg, *p* = 0.61 **Diet:** Not reported- not known reported if the subjects actually used the meal replacement product. **Physical activity:** Not reported. **Authors' conclusion:** Smoking can be stopped for up to 1 year with acceptable weight control in women selected for their previous weight control problems when attempting to quit. (Significant difference in quitting in favour of VLED but no differences in weight gain at 12 months.)	exposed air carbon monoxide readings. This study had power to detect an effect size of intervention of 80% compared with control, at a significance level of alpha 0.05.

	Age (years): Intervention: 46.9 (SD 7.0) Control: 46.8 (SD 6.9) **Mean number of cigarettes smoked per day:** Intervention: 20.0 (SD 6.3) Control: 19.1 (SD 6.2) **Smoking (years):** Intervention: 29.6 (SD 6.9) Control: 28.1 (SD 7.4) 210 of 287 women had used NRT before. **Baseline BMI (mean, kg/m^2):** Intervention: 26.7 (SD 2.2) Control: 26.9 (SD 2.3)			
Hall et al. 1992 RCT 1+ **Aim:** To evaluate an innovative weight gain prevention programme to reduce smoking	**Eligibility criteria:** Inclusion: Smoke at least ten cigarettes per day in past week or be at least 10% above ideal weight. Exclusions: Cardiovascular or pulmonary disease,	**All:** Smoking treatment programme of Seven × 90 min group sessions (five to eight participants) of aversive smoking and relapse prevention skill training in initial two weeks, assessed at weeks 2, 6, 12, 26 and 52; four female therapists (one master's level social worker and one doctoral level	**Lost to follow-up:** Not reported, participants with missing data were coded as smoking. **52 weeks abstinence:** Tailored intervention: 21% (*n* = 11) Non-tailored intervention: 22% (*n* = 11) Standard control: 35% (*n* = 19) Two active interventions had	Standard intervention smoked significantly more cigarettes per day pre-treatment, innovative intervention had significantly greater variance in cigarettes smoked and pre-treatment body weight.

relapse risk.	diabetes, hospitalisation for major mental illness in previous year, any chronic condition that would influence eating or activity levels. **Setting:** San Francisco. **Sample size:** Intervention, *n* = 53 Control, *n* = 51 Standard treatment control, *n* = 54 **Age (years):** Tailored intervention, 40.68 (SD 8.71) Control, 41.22 (SD 8.96) Standard treatment control, 39.24 (SD 8.92) **Female:** Tailored intervention: 77% Control: 67% Standard treatment control: 74% **Smoking rate, cigarettes per day:** Innovative	psychologist treated 88% of participants), two female dietitians and a male exercise consultant also participated. **Tailored intervention:** Weight-gain prevention sessions weeks 3–6, daily monitoring. Eat what liked unless gained 2 lb (0.91 kg) or more then encouraged to use low calorie low fat diet designed to lose 2 lb (0.91 kg) per week individualized exercise plan of aerobic exercise three or more times per week, behavioural self-management of eating. **Non-tailored intervention**: Weight gain prevention sessions weeks 3–6, no attempt to individualize diet or exercise or behavioural components **Control:** Standard (?) assessment at week 6 only, information pack on good nutrition and exercise at last smoking treatment session not targeted at smoking-cessation induced weight gain. **Follow-up:** 52 weeks. Providers of the intervention	greater risk of smoking compared with control. **Weight (non smokers):** 52 weeks weight: Tailored intervention: 0.86 (3.95) kg, *n* = 10 Non-tailored intervention: 3.35 (2.38) kg, *n* = 7 Standard control: 3.61 (3.99) kg, *n* = 14 **Diet:** Only reported on subgroup of 68 (75%) of the original sub-sample that completed dietary recalls at every assessment. These subjects did not differ from either the whole sample or the sample of 91 on whom the researchers attempted to collect data on cigarettes smoked or body weight. **Physical activity:** Only reported on subgroup. **Authors' conclusion:** Because there was no significant difference between abstinent and smoking subjects in the tailored intervention condition suggests that the condition prevented weight gain, particularly when this lack of difference is compared with the significant differences found between abstinent and smoking	Self-reported abstinence verified by exposed air carbon monoxide readings. It is not clear if the study was sufficiently powered to detect a significant effect of intervention when compared with control.

	intervention: 25.65 (SD 12.56) Control: 24.91 (SD 10.80) Standard treatment control: 31.59 (SD 11.74) **Baseline mean body weight (kg):** Innovative intervention: 72.68 (SD 17.72) kg Non-specific control: 69.23 (SD 12.38) kg Standard treatment control: 67.65 (SD 12.51) kg	included four female therapists, two female registered dietitians and a male exercise consultant.	subjects in the non-specific intervention. Differences in the control group also failed to reach significance, which meant interpretation of results was difficult. In the tailored intervention there was evidence of early compliance with dietary instruction, especially among women and abstinent subjects. Higher smoking rates in two active interventions is troubling, complicated interventions may have detracted from non-smoking	
Pirie et al. 1992 RCT 1++ **Aim:** To evaluate a weight control programme in addition to nicotine gum to enhance smoking cessation	**Eligibility criteria:** Inclusion: Women aged 20–64 years who wanted to quit smoking and maintain weight. Exclusions: Women who wanted to gain weight, pregnancy, history of gastric ulcer, substance abuse previous 6 months, cardiovascular disease including hypertension, temporal mandibular	**All:** 8-week programme (orientation session plus seven treatment sessions) with follow-up 6- and 12-months post-treatment, social support, cognitive behavioural skills, quit night occurs in week 4; facilitators were female ex-smokers trained by American Lung Association to be group leaders for the Freedom From Smoking (FFS) standard advice/control programme also given extra training regarding specific additional treatments for this study. Standard advice/control + behavioural weight control and	**Lost to follow-up:** 8% at 12 months but were contacted by telephone resulting in 100% follow-up **12-months post-treatment continuous abstinence (%):** Freedom from Smoking (FFS/ standard advice/control): 14.6 (95% CI 7.8, 21.4) Standard advice/control + behavioural weight control: 23.1 (95% CI 15.2, 31.0) Standard advice/control + nicotine gum: 31.5 (95% CI 22.7, 40.3)	US$100 deposit returned to participant at 12-months follow-up Self-reported abstinence verified by exposed air carbon monoxide readings Lack of success in producing differential weight changes among groups meant could not test hypothesis that females who gain more weight following

	joint syndrome, active cancer treatment. **Setting:** Minneapolis, USA **Sample size** Smoking/standard advice/control (FFS): *n* = 103 Standard advice/control + behavioural weight control: *n* = 108 Standard advice/control + nicotine gum: *n* = 108 Standard advice/control + nicotine gum + behavioural weight control: *n* = 98 **Age (years):** FFS: 42.3 Standard advice/control + behavioural weight control: 44.0 Standard advice/control + nicotine gum: 42.9 Standard	Standard advice/control + nicotine gum + behavioural weight control: weight control counselling accompanied each of the seven standard advice/control sessions and included decreasing energy intake by 100 to 300 kcal (420 to 1260 kJ)/day and gradually increasing exercise to 1 hour of walking or its equivalent three times per week. Standard advice/control **+ nicotine gum and** Standard advice/control **+ nicotine gum + behavioural weight control:** 2 mg nicotine polacrilex chewing gum issued free for 8 weeks and 3-months follow-up, encouraged to chew at least three pieces per day. Providers of the intervention included researchers and Health care centre/clinic staff **Follow-up:** 14 months (12 months post-quit).	Standard advice/control + nicotine gum + behavioural weight control: 14.3 (95% CI 7.4, 21.1) Standard advice/control + nicotine gum had highest abstinence **Weight change abstainers:** 12-months post-treatment weight (mean lbs): Control (*n* = 15): 10.08 (95% CI 4.57, 15.59),lb *n* = 15 + Behavioural weight control (*n* = 25): 9.77 (95% CI 5.50, 14.04) lb + Nicotine gum (*n* = 34): 9.97 (95% CI 6.30,13.64) lb + Nicotine gum + behavioural weight control (*n* = 14): 14.15 (95% CI 8.45, 19.85) lb No significant difference in weight gain among abstainers within each treatment group at 12 months follow-up. **Diet:** Not reported. **Physical activity:** Not reported.	smoking cessation would demonstrate higher levels of relapse. Power not reported. Study reports: 'in order to yield a sufficient sample' ... 'goal of recruiting and randomising 360 individuals was surpassed by 57'.

	advice/control + nicotine gum + behavioural weight control: 43.4 **College graduates (%):** FFS: 31.3 Standard advice/control + behavioural weight control: 27.8 FFS + nicotine gum: 24.1 Standard advice/control + nicotine gum + behavioural weight control: 20.6 **Mean number cigarettes per day**: FFS: 25.6 Standard advice/control + behavioural weight control: 26.9 Standard advice/control + nicotine gum: 24.9		**Author's conclusion:** Behavioural weight control programme did not reduce smoking cessation but did not attenuate weight gain.	

	Standard advice/control + nicotine gum + behavioural weight control: 25.1 **Baseline BMI (mean, kg/m^2):** FFS: 23.7 (95% CI 23.1, 24.3) Standard advice/control + behavioural weight control: 24.5 (95% CI 23.7, 25.3) Standard advice/control + nicotine gum: 24.2 (95% CI 23.4, 25.0) Standard advice/control + nicotine gum + behavioural weight control: 24.0 (95% CI 23.4, 24.6)			
Spring et al. 2004 RCT 1+ **Aim:** To re-examine	**Eligibility criteria:** Inclusion: Women aged 20–75 years who smoked ten or more cigarettes per day for last year, willing and able to participate, follow a	**All:** 16 weeks behavioural smoking cessation treatment, quit smoking at week 5, followed up 9 months after quit date; led by licensed clinical psychologist and psychology graduate student, group sessions and additional telephone support,	**Lost to follow-up:** At 16 weeks: Early diet *n* = 29 (27%), late diet *n* = 18(17%), control *n* = 32 (30%) At 9 months: Early diet *n* = 59, late diet *n* = 59, control *n* = 67 (72 in first cohort not	Self-reported abstinence verified by exposed air carbon monoxide readings – 58.1% reported smoking that escaped detection by the ecolyser on at

whether adding behavioural weight control to cessation treatment suppresses weight gain but undermines abstinence and to determine whether outcomes differ depending on whether weight control intervention begins concurrently or after smoking cessation treatment.	pre-packaged meal plan and PA programme, be willing to accept random assignment. Exclusions: Current substance abusers, pregnant, lactating, current using of NRT, appetitive suppressants, beta-blockers, history of diabetes, hypoglycaemia, eating disorder, psychosis, surgery for obesity, currently dieting, strong biases against or prior experience with Nutri/System meal plan. **Setting:** Three centres: University of Illinois, Chicago; Finch University of Health Sciences-Chicago Medical School; and the Hines Veterans Affairs Medical Center.	traditional behavioural techniques taught including contract for quit date. **Early diet intervention:** Diet and exercise during first 8 weeks cessation treatment; 150 kcal (630 kJ) per day decrease, pre-packaged three meals per day plus two high-carbohydrate low-fat snacks per day to be consumed late afternoon/evening, received meals each week during 16 weeks, supplemented by fresh fruits and vegetables, final transition week with 4 days low-fat grocery store meals plus 3 days meal plans; encouraged to do 30 min moderate intensity activity at least 5 days per week, trained in self-monitoring heart rate and led on 30 min group walks at end of initial 8 weeks treatment. **Late diet intervention:** Received identical exercise at same time as early diet group and received identical diet during final 8 weeks cessation treatment. **Control:** Focused on smoking cessation and received weight loss counselling at week 16 **Follow-up:**	asked to attend follow-up). ITT analysis. **9-months post-treatment continuous abstinence** (measured from week 7 which was 2 weeks after quit date, missing data coded as smoking): Early diet: 21.4% Late diet: 19.5% Control: 18.2% No significant difference between early diet versus control and late diet vs. control on smoking cessation at 12 months. **Weight change** (continuous abstainers, measured change from week 7): 9 months post-quit weight change (mean): Early diet: 7.57 (SD 8.24) lb (3.43 [SD 3.74] kg) Late diet: 4.88 (SD 7.06) lb (2.21 [SD 3.20] kg) Control: 6.20 (SD 6.65) lb (2.81 [SD 3.02] kg No significant difference in weight gain between late diet and control at 9 months. **Diet:** Not reported.	least 1 occasion Statistical power was low for weight change outcome because 9-month data were available for only 37% of the sample. This study was not sufficiently powered to detect a significant effect of intervention compared with control.

	Sample size: Early diet: *n* = 104 Late diet: *n* = 104 Control: *n* = 107 66% White, 31% African American, 3% other; middle-aged, mildly depressed, moderately overweight, mildly weight concerned women who were moderately heavy smokers and mildly to moderately nicotine dependent. **Mean age (years):** Early diet: 41.45 (SD 9.80) Late diet: 43.20 (SD 9.81) Control: 43.39 (SD 11.28) **Smoking rate, cigarettes per day:** Early diet: 20.24 (SD 8.64) Late diet: 21.02 (SD 510.90) Control: 19.75 (SD 8.88) **Baseline BMI**	9 months post-quit.	**Physical activity:** Not reported. **Authors' conclusion:** For post-cessation weight control, the findings suggest superiority for a sequential approach that addresses smoking cessation before initiating weight control treatment.	

	(mean, kg/m^2): Early diet: 27.23 (SD 4.99) Late diet: 28.26 (SD 5.95) Control: 26.80 (SD 5.44)			
Jonsdottir & Jonsdottir, 2001 CBA 2++ **Aim:** To examine whether adding exercise to a multi-component smoking cessation programme will increase smoking cessation and suppress weight gain.	**Eligibility criteria:** Participants self-referred. **Setting:** One health centre and one health club in Reykjavik, Iceland **Sample size:** Intervention 1: *n* = 34 Intervention 2: *n* = 33 **Female:** Intervention 1: 61.8%, *n* = 21 Intervention 2: 36.4%, *n* = 12 **Mean age (years):** Intervention 1: 43.5 (SD 11.9) Intervention 2: 39.3 (SD 9.0) Participants had smoked 1 to 40 years. Not significant between groups	**Intervention 1 (usual intervention/control):** NRT (nicotine medication, gum and spray adjusted to individual needs), health education, behavioural modification and individual and group counselling all provided by one nurse (author of study). Group counselling for 1 month with five sessions and individual counselling for 1 year, contacted four times by telephone 3 weeks after last group session, 6 weeks, 3 months and 6 months later (12 months after first smoke-free day); second day after the first group session was defined as the quitting day. **Intervention 2:** Same as intervention 1 except the group counselling lasted for 2 months with seven meetings and the four telephone contacts started one month after last session with 3-month intervals until 12 months after first smoke-free day; in addition an exercise specialist supervised physical exercise	**Lost to follow-up:** Zero (NB: convenience sample) **12 months lapse-free abstinence (%):** Intervention 1: 20.6% (*n* = 7) Intervention 2: 39.4% (*n* = 13), *p* = 0.16 **Weight (abstainers):** 12 months post-quit weight gain (mean, kg): Intervention 1: 3.0 (SD 3.9) (*n* = 5) Intervention 2: 5.0 (SD 3.8) (*n* = 11), *p* = 0.37 **Diet:** Not reported. **Physical activity:** Not reported. **Author's conclusion:** A non-significant difference in abstinence at one year and weight gain was demonstrated between the two interventions, further studies with a larger sample size are needed.	Participants self-referred and paid for the intervention. Intervention 2 was more expensive as subjects paid more for their intervention and they had more often attempted to quit smoking, which may indicate that they were more motivated to quit than the participants in intervention 1/control. Self-reported abstinence verified by exposed air carbon monoxide readings. Weight measured at baseline and mainly self-reported at 1 year, 20 participants in intervention 1 and seven participants in

	on years smoked or smoked cigarettes per day. Baseline BMI not reported.	programme three times per week (increasing from 40 to 80 min) during 2 months of group counselling and the following 4 months participants continued without exercise specialist and at their own time schedule; aerobic training, 40% consisting of treadmills and stationary biking, weight lifting (40%) and stretching exercises (20%). Providers of the intervention were one nurse from the health care centre, plus staff from the University of Iceland. **Follow-up:** 265 days (8 months) post-quit.		intervention 2 were not willing to be weighed at follow-up. Difference in frequency and timing of contacts varied between groups. Intervention 2 participants had more often attempted to quit (may have therefore been more motivated) Convenience sample. Only 15.8% (*n* = 8) participants used nicotine medication by end of intervention, no statistical difference between smokers and abstainers regarding use of NRT. This study was not sufficiently powered to detect a significant effect of intervention compared with control.

Evidence of corroboration (external validity)

Evidence of salience from studies conducted in the UK

1

Evidence of salience

First author	Study population	Research question	Length of follow-up	Main results	Confounders/comments

2

Evidence for implementation – Will it work in the UK?

First author	Study design	Study population	Research Question	Length of follow-up	Main results
Perkins 1997	Review	Weight concerned women who want to stop smoking (USA).	To assess rationales for three different treatment approaches.	Various.	Three approaches: more effective weight control; direct reduction in weight concerns by CBT; and smoking cessation only. Although weight concern is a serious obstacle to quitting smoking, particularly for women, it is not clear how best to address these concerns in the context of smoking cessation. The authors conclude that a more logical approach may be to assist weight-concerned smoker in attitudes to weight in relation to health risks of continuing smoking.
Ussher 2003 Smoking cessation	RCT	UK adults	To examine whether exercise counselling increases smoking abstinence and reduces tobacco withdrawal and gains in weight and body fat.	6 weeks	Male and female smokers (*n* = 299) were assigned randomly to a 7-week smoking cessation programme, including nicotine replacement therapy plus either: (1) exercise counselling; or (2) health education advice with equal contact time as for the exercise counselling condition. There was no significant difference in smoking abstinence between the exercise group (*n* = 154) and the controls (*n* = 145) at 6 weeks (39.6 vs. 38.6%), nor was there any difference in gains in weight or body fat, although those in the exercise group increased their exercise levels. Exercise participants reported less tension, anxiety and stress than the controls during the first week of smoking abstinence (*p* = 0.03, 0.01 and 0.04, respectively), less irritability throughout 2 weeks of abstinence (*p* = 0.03) and less

					restlessness throughout 3 weeks of abstinence (p = 0.04). Adding brief exercise counselling to a smoking cessation programme did not increase smoking abstinence or reduce gains in weight or body fat significantly, although exercise levels were raised and there were some beneficial effects on psychological symptoms.

SEARCH STRATEGY

1. exp OBESITY/
2. exp Weight Gain/
3. exp Weight Loss/
4. obes$.af.
5. (weight gain or weight loss).af.
6. (overweight or over weight or overeat$ or over eat$).af.
7. weight change$.af.
8. ((bmi or body mass index) adj2 (gain or loss or change)).af.
9. body mass.ti,ab.
10. or/1-9
11. exp Behavior Therapy/
12. exp Social Support/
13. exp Family Therapy/
14. exp Psychotherapy, Group/
15. ((psychological or behavio?r$) adj (therapy or modif$ or strateg$ or intervention$)).af.
16. (group therapy or family therapy or cognitive therapy).af.
17. ((lifestyle or life style) adj (chang$ or intervention$)).af.
18. counsel?ing.af.
19. social support.af.
20. (peer adj2 support).ti,ab.
21. (children adj3 parent$ adj therapy).af.
22. or/11-21
23. exp OBESITY/dh [Diet Therapy]
24. exp Diet, Fat-Restricted/
25. exp Diet, Reducing/
26. exp Diet Therapy/
27. exp FASTING/
28. diet$.af.
29. (diet$ adj (modif$ or therapy or intervention$ or strateg$)).af.
30. (low calorie or calorie control$ or healthy eating).af.
31. (fasting or modified fast$).af.
32. exp Dietary Fats/
33. (fruit or vegetable$).af.
34. (high fat$ or low fat$ or fatty food$).af.
35. formula diet$.af.
36. or/23-35
37. exp EXERCISE/
38. exp Exercise Therapy/
39. exercis$.af.
40. (aerobics or physical therapy or physical activity or physical inactivity).af.
41. (fitness adj (class$ or regime$ or program$)).af.
42. (aerobics or physical therapy or physical training or physical education).af.
43. dance therapy.af.
44. sedentary behavio?r.af.
45. or/37-44
46. exp Complementary Therapies/
47. (alternative medicine or complementary therap$ or complementary medicine).af.
48. (hypnotism or hypnosis or hypnotherapy).af.
49. (acupuncture or homeopathy or homoeopathy).af.
50. (chinese medicine or indian medicine or herbal medicine or ayurvedic).af.

51. or/46-50
52. ((diet or dieting or slim$) adj (club$ or organi?ation)).af.
53. (weightwatcher$ or weight watcher$).af.
54. (correspondence adj (course$ or program$)).af.
55. (fat camp$ or diet$ camp$).af.
56. or/52-55
57. exp Health Promotion/
58. exp Health Education/
59. mass media/
60. (health promotion or health education).af.
61. (media intervention$ or community intervention$).af.
62. (community adj2 program$).af.
63. (family intervention$ or parent$ intervention$).af.
64. or/57-63
65. exp Health Policy/
66. exp Nutrition Policy/
67. (health polic$ or food polic$ or nutrition polic$).af.
68. or/65-67
69. exp OBESITY/pc [Prevention & Control]
70. exp Primary Prevention/
71. (primary prevention or secondary prevention).af.
72. (preventive measure$ or preventative measure$).af.
73. (preventive care or preventative care).af.
74. (obesity adj2 (prevent$ or treat$)).af.
75. or/69-74
76. exp Controlled Clinical Trials/
77. exp Random Allocation/
78. exp Double-Blind Method/
79. exp Single-Blind Method/
80. exp PLACEBOS/
81. exp Research Design/
82. exp Intervention Studies/
83. exp Evaluation Studies/
84. exp Cost Benefit Analysis/
85. (time adj series).tw.
86. ((singl$ or doubl$ or trebl$ or tripl$) adj5 (blind$ or mask)).af.
87. controlled clinical trial.pt.
88. placebo$.af.
89. (matched communities or matched populations).af.
90. (control$ adj (trial$ or stud$ or evaluation$ or experiment$)).af.
91. (comparison group$ or control group$).af.
92. matched pairs.af.
93. (outcome study or outcome studies).af.
94. (quasiexperimental or quasi experimental or pseudo experimental).af.
95. (nonrandomi?ed or non randomi?ed or pseudo randomi?ed).af.
96. randomi?ed.hw.
97. (cohort or survey: or qualitative).ti,ab.
98. or/76-97
99. exp Meta-Analysis/
100. meta-analys$.ti,ab.
101. metaanalys$.ab,ti.
102. meta analys$.ab,ti.

103. Cochrane.ab,sh,ti.
104. (review$ or overview$).ti.
105. review$.pt.
106. (synthes$ adj3 (literature$ or research or studies or data)).ab,ti.
107. pooled analys$.ab,ti.
108. ((data adj2 pool$) and studies).mp.
109. ((hand or manual or database$ or computer$) adj2 search$).ab,ti.
110. ((electronic or bibliographic$) adj2 (database$ or data base$)).ab,ti.
111. ((review$ or overview$) adj10 (systematic$ or methodologic$ or quantitativ$ or research$ or literature$ or studies or trial$ or effective$)).ab.
112. or/99–111
113. (retrospective$ adj2 review$).ab,sh,ti.
114. (case$ adj2 review$).ab,sh,ti.
115. (record$ adj2 review$).ab,sh,ti.
116. (patient$ adj2 review$).ab,sh,ti.
117. (patient$ adj2 chart$).ab,sh,ti.
118. (peer adj2 review$).ab,sh,ti.
119. (chart$ adj2 review$).ab,sh,ti.
120. (case$ adj2 report$).ab,sh,ti.
121. (rat or rats or mouse or mice or hamster or hamsters or animal or animals or dog or dogs or cat or cats or bovine or sheep).ab,sh,ti.
122. or/113-121
123. 122 not (122 and 112)
124. 112 not 123
125. 22 or 36 or 45 or 51 or 56 or 64 or 68 or 75
126. 10 and 98 and 125
127. 10 and 124 and 125
128. 126 or 127
129. Residence characteristics/
130. Delivery of health care/
131. Community Networks/
132. Social Change/
133. Social Support/
134. Community Health Aides/
135. Community Health Nursing/
136. Community Health Planning/
137. Community Health Services/
138. Community-Institutional Relations/
139. Community Medicine/
140. Community Pharmacy Services/
141. Rural Health Services/
142. Public Health/
143. Public Health Practice/
144. Public Health Nursing/
145. Preventive Health Services/
146. Primary Prevention/
147. (primary prevention or secondary prevention).af.
148. (preventive care or preventative care).af.
149. Physician's role/
150. Peer Group/
151. Self-Help Groups/
152. Health Personnel/

153. Allied Health Personnel/
154. mass media/
155. ((gp$ or general practitioner$ or physician$) adj5 (intervention$ or refer$ or advi$ or train$ or run$)).af.
156. ((nurse$ or health visitor$ or pharmacist$ or pharmacy) adj5 (intervention$ or refer$ or led or support$ or advi$ or train$ or run$)).af.
157. ((health professional$ or nutritionist$ or dietician$) adj5 (intervention$ or refer$ or led$ or support$ or advi$ or train$ or run$)).af.
158. ((peer$1 or lay or professional$1 or community or agenc$) adj5 support).af.
159. ((peer$1 or lay or community) adj5 (group$1 or network$1 or program$ or clinic$)).af.
160. health promotion/mt
161. (exercise$ prescri$ or exercise$ refer$).af.
162. ((nutrition or diet) adj2 advi$).af.
163. community wide.af.
164. social support.af.
165. social network$.af.
166. ((lifestyle$ or life style$) adj2 (change$ or advi$)).af.
167. or/129–166
168. 128 and 167
169. animal/
170. human/
171. 169 not (169 and 170)
172. 168 not 171
173. limit 172 to yr=1990-2005
174. exp OBESITY/
175. exp Weight Gain/
176. exp Weight Loss/
177. obes$.ti,ab.
178. (weight gain or weight loss).ti,ab.
179. (overweight or over weight or overeat$ or over eat$).ti,ab.
180. weight change$.ti,ab.
181. ((bmi or body mass index) adj2 (gain or loss or change)).ti,ab.
182. body mass.ti,ab.
183. or/174-182
184. exp Behavior Therapy/
185. exp Social Support/
186. exp Family Therapy/
187. exp Psychotherapy, Group/
188. ((psychological or behavio?r$) adj (therapy or modif$ or strateg$ or intervention$)).ti,ab.
189. (group therapy or family therapy or cognitive therapy).ti,ab.
190. ((lifestyle or life style) adj (chang$ or intervention$)).ti,ab.
191. counsel?ing.ti,ab.
192. social support.ti,ab.
193. (peer adj2 support).ti,ab.
194. (children adj3 parent$ adj therapy).ti,ab.
195. or/184-194
196. exp OBESITY/dh [Diet Therapy]
197. exp Diet, Fat-Restricted/
198. exp Diet, Reducing/
199. exp Diet Therapy/
200. exp FASTING/

201. diet$.ti,ab.
202. (diet$ adj (modif$ or therapy or intervention$ or strateg$)).ti,ab.
203. (low calorie or calorie control$ or healthy eating).ti,ab.
204. (fasting or modified fast$).ti,ab.
205. exp Dietary Fats/
206. (fruit or vegetable$).ti,ab.
207. (high fat$ or low fat$ or fatty food$).ti,ab.
208. formula diet$.ti,ab.
209. or/196-208
210. exp EXERCISE/
211. exp Exercise Therapy/
212. exercis$.ti,ab.
213. (aerobics or physical therapy or physical activity or physical inactivity).ti,ab.
214. (fitness adj (class$ or regime$ or program$)).ti,ab.
215. (aerobics or physical therapy or physical training or physical education).ti,ab.
216. dance therapy.ti,ab.
217. sedentary behavio?r.ti,ab.
218. or/210-217
219. exp Complementary Therapies/
220. (alternative medicine or complementary therap$ or complementary medicine).ti,ab.
221. (hypnotism or hypnosis or hypnotherapy).ti,ab.
222. (acupuncture or homeopathy or homoeopathy).ti,ab.
223. (chinese medicine or indian medicine or herbal medicine or ayurvedic).ti,ab.
224. or/219–223
225. ((diet or dieting or slim$) adj (club$ or organi?ation)).ti,ab.
226. (weightwatcher$ or weight watcher$).ti,ab.
227. (correspondence adj (course$ or program$)).ti,ab.
228. (fat camp$ or diet$ camp$).ti,ab.
229. or/225-228
230. exp Health Promotion/
231. exp Health Education/
232. mass media/
233. (health promotion or health education).ti,ab.
234. (media intervention$ or community intervention$).ti,ab.
235. (community adj2 program$).ti,ab.
236. (family intervention$ or parent$ intervention$).ti,ab.
237. or/230-236
238. exp Health Policy/
239. exp Nutrition Policy/
240. (health polic$ or food polic$ or nutrition polic$).ti,ab.
241. or/238–240
242. exp OBESITY/pc [Prevention & Control]
243. exp Primary Prevention/
244. (primary prevention or secondary prevention).ti,ab.
245. (preventive measure$ or preventative measure$).ti,ab.
246. (preventive care or preventative care).ti,ab.
247. (obesity adj2 (prevent$ or treat$)).ti,ab.
248. or/242-247
249. exp Controlled Clinical Trials/
250. exp Random Allocation/
251. exp Double-Blind Method/
252. exp Single-Blind Method/

253. exp PLACEBOS/
254. exp Research Design/
255. exp Intervention Studies/
256. exp Evaluation Studies/
257. exp Cost Benefit Analysis/
258. (time adj series).tw.
259. ((singl$ or doubl$ or trebl$ or tripl$) adj5 (blind$ or mask)).ti,ab.
260. controlled clinical trial.pt.
261. placebo$.ti,ab.
262. (matched communities or matched populations).ti,ab.
263. (control$ adj (trial$ or stud$ or evaluation$ or experiment$)).ti,ab.
264. (comparison group$ or control group$).ti,ab.
265. matched pairs.ti,ab.
266. (outcome study or outcome studies).ti,ab.
267. (quasiexperimental or quasi experimental or pseudo experimental).ti,ab.
268. (nonrandomi?ed or non randomi?ed or pseudo randomi?ed).ti,ab.
269. randomi?ed.hw.
270. (cohort or survey: or qualitative).ti,ab.
271. or/249-270
272. exp Meta-Analysis/
273. meta-analys$.ti,ab.
274. metaanalys$.ab,ti.
275. meta analys$.ab,ti.
276. Cochrane.ab,sh,ti.
277. (review$ or overview$).ti.
278. review$.pt.
279. (synthes$ adj3 (literature$ or research or studies or data)).ab,ti.
280. pooled analys$.ab,ti.
281. ((data adj2 pool$) and studies).mp.
282. ((hand or manual or database$ or computer$) adj2 search$).ab,ti.
283. ((electronic or bibliographic$) adj2 (database$ or data base$)).ab,ti.
284. ((review$ or overview$) adj10 (systematic$ or methodologic$ or quantitativ$ or research$ or literature$ or studies or trial$ or effective$)).ab.
285. or/272-284
286. (retrospective$ adj2 review$).ab,sh,ti.
287. (case$ adj2 review$).ab,sh,ti.
288. (record$ adj2 review$).ab,sh,ti.
289. (patient$ adj2 review$).ab,sh,ti.
290. (patient$ adj2 chart$).ab,sh,ti.
291. (peer adj2 review$).ab,sh,ti.
292. (chart$ adj2 review$).ab,sh,ti.
293. (case$ adj2 report$).ab,sh,ti.
294. (rat or rats or mouse or mice or hamster or hamsters or animal or animals or dog or dogs or cat or cats or bovine or sheep).ab,sh,ti.
295. or/286–294
296. 295 not (295 and 285)
297. 285 not 296
298. 195 or 209 or 218 or 224 or 229 or 237 or 241 or 248
299. 183 and 271 and 298
300. 183 and 297 and 298
301. 299 or 300
302. Residence characteristics/

303. Community Health Planning/
304. Community Health Services/
305. Community-Institutional Relations/
306. Public Health/
307. Environment Design/
308. City planning/
309. Social Environment/
310. Housing/
311. Restaurants/
312. restaurant$.ti,ab.
313. neighbo?rhood$.ti,ab.
314. community wide.af.
315. built environment$.ti,ab.
316. shop$.ti,ab.
317. supermarket$.ti,ab.
318. vending machine$.ti,ab.
319. food desert$.ti,ab.
320. church$.ti,ab.
321. urban environment$.ti,ab.
322. (barriers adj10 food).ti,ab.
323. guide to community preventive services.ti,ab.
324. (youth club$ or gym$ or leisure cent$ or leisure service$).ti,ab.
325. or/302-324
326. 301 and 325
327. animal/
328. human/
329. 327 not (327 and 328)
330. 326 not 329
331. limit 330 to yr=1990-2005
332. exp OBESITY/
333. exp Weight Gain/
334. exp Weight Loss/
335. obes$.ti,ab.
336. (weight gain or weight loss).ti,ab.
337. (overweight or over weight or overeat$ or over eat$).ti,ab.
338. weight change$.ti,ab.
339. ((bmi or body mass index) adj2 (gain or loss or change)).ti,ab.
340. body mass.ti,ab.
341. exp Diet, Fat-Restricted/
342. exp Diet, Reducing/
343. (fruit or vegetable$ or healthy eating or diet$).ti,ab.
344. (high fat$ or low fat$ or fatty food$).ti,ab.
345. exp EXERCISE/
346. (physical activity or physical inactivity or physical fitness).ti,ab.
347. or/332-346
348. exp Behavior Therapy/
349. exp Social Support/
350. exp Psychotherapy, Group/
351. ((psychological or behavio?r$) adj (therapy or modif$ or strateg$ or intervention$)).ti,ab.
352. (group therapy or cognitive therapy).ti,ab.
353. ((lifestyle or life style) adj (chang$ or intervention$)).ti,ab.

354. counsel?ing.ti,ab.
355. social support.ti,ab.
356. (peer adj2 support).ti,ab.
357. or/348-356
358. exp OBESITY/dh [Diet Therapy]
359. exp Diet, Fat-Restricted/
360. exp Diet, Reducing/
361. exp Diet Therapy/
362. exp FASTING/
363. diet$.ti,ab.
364. (diet$ adj (modif$ or therapy or intervention$ or strateg$)).ti,ab.
365. (low calorie or calorie control$ or healthy eating).ti,ab.
366. (fasting or modified fast$).ti,ab.
367. exp Dietary Fats/
368. (fruit or vegetable$).ti,ab.
369. (high fat$ or low fat$ or fatty food$).ti,ab.
370. formula diet$.ti,ab.
371. or/358–370
372. exp EXERCISE/
373. exp Exercise Therapy/
374. exercis$.ti,ab.
375. (aerobics or physical therapy or physical activity or physical inactivity).ti,ab.
376. (fitness adj (class$ or regime$ or program$)).ti,ab.
377. (aerobics or physical therapy or physical training or physical education).ti,ab.
378. dance therapy.ti,ab.
379. sedentary behavio?r.ti,ab.
380. or/372-379
381. exp Complementary Therapies/
382. (alternative medicine or complementary therap$ or complementary medicine).ti,ab.
383. (hypnotism or hypnosis or hypnotherapy).ti,ab.
384. (acupuncture or homeopathy or homoeopathy).ti,ab.
385. (chinese medicine or indian medicine or herbal medicine or ayurvedic).ti,ab.
386. or/381-385
387. ((diet or dieting or slim$) adj (club$ or organi?ation)).ti,ab.
388. (weightwatcher$ or weight watcher$).ti,ab.
389. (correspondence adj (course$ or program$)).ti,ab.
390. (fat camp$ or diet$ camp$).ti,ab.
391. or/387-390
392. exp Health Promotion/
393. exp Health Education/
394. (health promotion or health education).ti,ab.
395. media intervention$.ti,ab.
396. or/392–395
397. exp Health Policy/
398. exp Nutrition Policy/
399. (health polic$ or food polic$ or nutrition polic$).ti,ab.
400. or/397-399
401. exp OBESITY/pc [Prevention & Control]
402. exp Primary Prevention/
403. (primary prevention or secondary prevention).ti,ab.
404. (preventive measure$ or preventative measure$).ti,ab.
405. (preventive care or preventative care).ti,ab.

406. (obesity adj2 (prevent$ or treat$)).ti,ab.
407. or/401-406
408. exp Controlled Clinical Trials/
409. exp Random Allocation/
410. exp Double-Blind Method/
411. exp Single-Blind Method/
412. exp PLACEBOS/
413. exp Research Design/
414. exp Intervention Studies/
415. exp Evaluation Studies/
416. exp Cost Benefit Analysis/
417. (time adj series).tw.
418. ((singl$ or doubl$ or trebl$ or tripl$) adj5 (blind$ or mask)).ti,ab.
419. controlled clinical trial.pt.
420. placebo$.ti,ab.
421. (matched communities or matched populations).ti,ab.
422. (control$ adj (trial$ or stud$ or evaluation$ or experiment$)).ti,ab.
423. (comparison group$ or control group$).ti,ab.
424. matched pairs.ti,ab.
425. (outcome study or outcome studies).ti,ab.
426. (quasiexperimental or quasi experimental or pseudo experimental).ti,ab.
427. (nonrandomi?ed or non randomi?ed or pseudo randomi?ed).ti,ab.
428. randomi?ed.hw.
429. (cohort or survey: or qualitative).ti,ab.
430. or/408-429
431. exp Meta-Analysis/
432. meta-analys$.ti,ab.
433. metaanalys$.ab,ti.
434. meta analys$.ab,ti.
435. Cochrane.ab,sh,ti.
436. (review$ or overview$).ti.
437. review$.pt.
438. (synthes$ adj3 (literature$ or research or studies or data)).ab,ti.
439. pooled analys$.ab,ti.
440. ((data adj2 pool$) and studies).ti,ab.
441. ((hand or manual or database$ or computer$) adj2 search$).ab,ti.
442. ((electronic or bibliographic$) adj2 (database$ or data base$)).ab,ti.
443. ((review$ or overview$) adj10 (systematic$ or methodologic$ or quantitativ$ or research$ or literature$ or studies or trial$ or effective$)).ab.
444. or/431-443
445. (retrospective$ adj2 review$).ab,sh,ti.
446. (case$ adj2 review$).ab,sh,ti.
447. (record$ adj2 review$).ab,sh,ti.
448. (patient$ adj2 review$).ab,sh,ti.
449. (patient$ adj2 chart$).ab,sh,ti.
450. (peer adj2 review$).ab,sh,ti.
451. (chart$ adj2 review$).ab,sh,ti.
452. (case$ adj2 report$).ab,sh,ti.
453. (rat or rats or mouse or mice or hamster or hamsters or animal or animals or dog or dogs or cat or cats or bovine or sheep).ab,sh,ti.
454. or/445-453
455. 454 not (454 and 444)

456. 444 not 455
457. 357 or 371 or 380 or 386 or 391 or 396 or 400 or 407
458. 347 and 457 and 430
459. 347 and 457 and 456
460. 458 or 459
461. animal/
462. human/
463. 461 not (461 and 462)
464. 460 not 463
465. exp workplace/
466. exp working conditions/
467. exp occupations/
468. exp occupation/
469. exp business/
470. exp staff development/
471. exp employee incentive plans/
472. exp incentives/
473. exp management/
474. exp personnel management/
475. exp office management/
476. exp work/
477. exp occupational health/
478. exp occupational health services/
479. exp employer/
480. exp employer-employee relations/
481. exp employer health costs/
482. exp employee assistance programs/
483. exp named groups by occupation/
484. exp 'occupational health and safety'/
485. employment:.ti,ab.
486. occupation:.ti,ab.
487. (worker: or employe: or staff: or personnel: or workforce).ti,ab.
488. (employ: adj2 (place: or site: or locat: or set: or environ:)).ti,ab.
489. (work: adj2 (place: or site: or locat: or set: or environ: or condition:)).ti,ab.
490. (work?place: or work?site: or work?locat: or work?set: or work?environ:).ti,ab.
491. (job: adj2 (place: or site: or locat: or set: or environ:)).ti,ab.
492. (job?place: or job?site: or job?locat: or job?set: or job?environ:).ti,ab.
493. (corporat: or business: or public sector: or private sector:).ti,ab.
494. office:.ti,ab.
495. vocation:.ti,ab.
496. trade:.ti,ab.
497. or/465–496
498. and/464,497
499. limit 498 to yr=1990-2004
500. exp OBESITY/
501. exp Weight Gain/
502. exp Weight Loss/
503. obes$.ti,ab.
504. (weight gain or weight loss).ti,ab.
505. (overweight or over weight or overeat$ or over eat$).ti,ab.
506. weight change$.ti,ab.
507. ((bmi or body mass index) adj2 (gain or loss or change)).ti,ab.

508. body mass.ti,ab.
509. or/500-508
510. exp Behavior Therapy/
511. exp Social Support/
512. exp Family Therapy/
513. exp Psychotherapy, Group/
514. ((psychological or behavio?r$) adj (therapy or modif$ or strateg$ or intervention$)).ti,ab.
515. (group therapy or family therapy or cognitive therapy).ti,ab.
516. ((lifestyle or life style) adj (chang$ or intervention$)).ti,ab.
517. counsel?ing.ti,ab.
518. social support.ti,ab.
519. (peer adj2 support).ti,ab.
520. (children adj3 parent$ adj therapy).ti,ab.
521. or/510–520
522. exp OBESITY/dh [Diet Therapy]
523. exp Diet, Fat-Restricted/
524. exp Diet, Reducing/
525. exp Diet Therapy/
526. exp FASTING/
527. diet$.ti,ab.
528. (low calorie or calorie control$ or healthy eating).ti,ab.
529. (fasting or modified fast$).ti,ab.
530. exp Dietary Fats/
531. (fruit or vegetable$).ti,ab.
532. (high fat$ or low fat$ or fatty food$).ti,ab.
533. formula diet$.ti,ab.
534. or/522–533
535. exp EXERCISE/
536. exp Exercise Therapy/
537. exercis$.ti,ab.
538. (aerobics or physical therapy or physical activity or physical inactivity).ti,ab.
539. (fitness adj (class$ or regime$ or program$)).ti,ab.
540. (aerobics or physical therapy or physical training or physical education).ti,ab.
541. dance therapy.ti,ab.
542. sedentary behavio?r.ti,ab.
543. or/535-542
544. exp Complementary Therapies/
545. (alternative medicine or complementary therap$ or complementary medicine).ti,ab.
546. (hypnotism or hypnosis or hypnotherapy).ti,ab.
547. (acupuncture or homeopathy or homoeopathy).ti,ab.
548. (chinese medicine or indian medicine or herbal medicine or ayurvedic).ti,ab.
549. or/544–548
550. ((diet or dieting or slim$) adj (club$ or organi?ation)).ti,ab.
551. (weightwatcher$ or weight watcher$).ti,ab.
552. (correspondence adj (course$ or program$)).ti,ab.
553. (fat camp$ or diet$ camp$).ti,ab.
554. or/550-553
555. exp Health Promotion/
556. exp Health Education/
557. mass media/
558. (health promotion or health education).ti,ab.

559. (media intervention$ or community intervention$).ti,ab.
560. health promoting school$.ti,ab.
561. ((school or community) adj2 program$).ti,ab.
562. (family intervention$ or parent$ intervention$).ti,ab.
563. (parent$ adj2 (behavio?r or involv$ or control$ or attitude$ or educat$)).ti,ab.
564. or/555-563
565. exp Health Policy/
566. exp Nutrition Policy/
567. (health polic$ or food polic$ or nutrition polic$).ti,ab.
568. or/565–567
569. exp OBESITY/pc [Prevention & Control]
570. exp Primary Prevention/
571. (primary prevention or secondary prevention).ti,ab.
572. (preventive measure$ or preventative measure$).ti,ab.
573. (preventive care or preventative care).ti,ab.
574. (obesity adj2 (prevent$ or treat$)).ti,ab.
575. or/569-574
576. exp Controlled Clinical Trials/
577. exp Random Allocation/
578. exp Double-Blind Method/
579. exp Single-Blind Method/
580. exp PLACEBOS/
581. exp Research Design/
582. exp Intervention Studies/
583. exp Evaluation Studies/
584. exp Cost Benefit Analysis/
585. (time adj series).tw.
586. ((singl$ or doubl$ or trebl$ or tripl$) adj5 (blind$ or mask)).ti,ab.
587. controlled clinical trial.pt.
588. placebo$.ti,ab.
589. (matched communities or matched schools or matched populations).ti,ab.
590. (control$ adj (trial$ or stud$ or evaluation$ or experiment$)).ti,ab.
591. (comparison group$ or control group$).ti,ab.
592. matched pairs.ti,ab.
593. (outcome study or outcome studies).ti,ab.
594. (quasiexperimental or quasi experimental or pseudo experimental).ti,ab.
595. (nonrandomi?ed or non randomi?ed or pseudo randomi?ed).ti,ab.
596. randomi?ed.hw.
597. (cohort or survey: or qualitative).ti,ab.
598. or/576-597
599. exp Meta-Analysis/
600. meta-analys$.ti,ab.
601. metaanalys$.ab,ti.
602. meta analys$.ab,ti.
603. Cochrane.ab,sh,ti.
604. (review$ or overview$).ti.
605. review$.pt.
606. (synthes$ adj3 (literature$ or research or studies or data)).ab,ti.
607. pooled analys$.ab,ti.
608. ((data adj2 pool$) and studies).mp.
609. ((hand or manual or database$ or computer$) adj2 search$).ab,ti.
610. ((electronic or bibliographic$) adj2 (database$ or data base$)).ab,ti.

611. ((review$ or overview$) adj10 (systematic$ or methodologic$ or quantitativ$ or research$ or literature$ or studies or trial$ or effective$)).ab.
612. or/599-611
613. (retrospective$ adj2 review$).ab,sh,ti.
614. (case$ adj2 review$).ab,sh,ti.
615. (record$ adj2 review$).ab,sh,ti.
616. (patient$ adj2 review$).ab,sh,ti.
617. (patient$ adj2 chart$).ab,sh,ti.
618. (peer adj2 review$).ab,sh,ti.
619. (chart$ adj2 review$).ab,sh,ti.
620. (case$ adj2 report$).ab,sh,ti.
621. (rat or rats or mouse or mice or hamster or hamsters or animal or animals or dog or dogs or cat or cats or bovine or sheep).ab,sh,ti.
622. or/613-621
623. 622 not (622 and 612)
624. 612 not 623
625. 521 or 534 or 543 or 549 or 554 or 564 or 568 or 575
626. 509 and 598 and 625
627. 509 and 624 and 625
628. 626 or 627
629. animal/
630. human/
631. 629 not (629 and 630)
632. 628 not 631
633. limit 632 to yr = 1990–2004
634. exp child/
635. exp adolescent/
636. exp infant/
637. (child$ or adolescent$ or infant$).af.
638. (teenage$ or young people or young person or young adult$).af.
639. (schoolchildren or school children).af.
640. (pediatr$ or paediatr$).af.
641. (boys or girls or youth or youths).af.
642. or/634-641
643. 642 and 633
644. exp OBESITY/
645. exp Weight Gain/
646. exp Weight Loss/
647. obes$.af.
648. (weight gain or weight loss).af.
649. (overweight or over weight or overeat$ or over eat$).af.
650. weight change$.af.
651. ((bmi or body mass index) adj2 (gain or loss or change)).af.
652. body mass.ti,ab.
653. or/644-652
654. exp Behavior Therapy/
655. exp Social Support/
656. exp Family Therapy/
657. exp Psychotherapy, Group/
658. ((psychological or behavio?r$) adj (therapy or modif$ or strateg$ or intervention$)).af.
659. (group therapy or family therapy or cognitive therapy).af.
660. ((lifestyle or life style) adj (chang$ or intervention$)).af.

661. counsel?ing.af.
662. social support.af.
663. (peer adj2 support).ti,ab.
664. (children adj3 parent$ adj therapy).af.
665. or/654-664
666. exp OBESITY/dh [Diet Therapy]
667. exp Diet, Fat-Restricted/
668. exp Diet, Reducing/
669. exp Diet Therapy/
670. exp FASTING/
671. diet$.af.
672. (diet$ adj (modif$ or therapy or intervention$ or strateg$)).af.
673. (low calorie or calorie control$ or healthy eating).af.
674. (fasting or modified fast$).af.
675. exp Dietary Fats/
676. (fruit or vegetable$).af.
677. (high fat$ or low fat$ or fatty food$).af.
678. formula diet$.af.
679. or/666–678
680. exp EXERCISE/
681. exp Exercise Therapy/
682. exercis$.af.
683. (aerobics or physical therapy or physical activity or physical inactivity).af.
684. (fitness adj (class$ or regime$ or program$)).af.
685. (aerobics or physical therapy or physical training or physical education).af.
686. dance therapy.af.
687. sedentary behavio?r.af.
688. or/680–687
689. exp Complementary Therapies/
690. (alternative medicine or complementary therap$ or complementary medicine).af.
691. (hypnotism or hypnosis or hypnotherapy).af.
692. (acupuncture or homeopathy or homoeopathy).af.
693. (chinese medicine or indian medicine or herbal medicine or ayurvedic).af.
694. or/689–693
695. ((diet or dieting or slim$) adj (club$ or organi?ation)).af.
696. (weightwatcher$ or weight watcher$).af.
697. (correspondence adj (course$ or program$)).af.
698. (fat camp$ or diet$ camp$).af.
699. or/695-698
700. exp Health Promotion/
701. exp Health Education/
702. mass media/
703. (health promotion or health education).af.
704. (media intervention$ or community intervention$).af.
705. (community adj2 program$).af.
706. (family intervention$ or parent$ intervention$).af.
707. or/700-706
708. exp Health Policy/
709. exp Nutrition Policy/
710. (health polic$ or food polic$ or nutrition polic$).af.
711. or/708-710
712. exp OBESITY/pc [Prevention & Control]

713. exp Primary Prevention/
714. (primary prevention or secondary prevention).af.
715. (preventive measure$ or preventative measure$).af.
716. (preventive care or preventative care).af.
717. (obesity adj2 (prevent$ or treat$)).af.
718. or/712-717
719. exp Controlled Clinical Trials/
720. exp Random Allocation/
721. exp Double-Blind Method/
722. exp Single-Blind Method/
723. exp PLACEBOS/
724. exp Research Design/
725. exp Intervention Studies/
726. exp Evaluation Studies/
727. exp Cost Benefit Analysis/
728. (time adj series).tw.
729. ((singl$ or doubl$ or trebl$ or tripl$) adj5 (blind$ or mask)).af.
730. controlled clinical trial.pt.
731. placebo$.af.
732. (matched communities or matched populations).af.
733. (control$ adj (trial$ or stud$ or evaluation$ or experiment$)).af.
734. (comparison group$ or control group$).af.
735. matched pairs.af.
736. (outcome study or outcome studies).af.
737. (quasiexperimental or quasi experimental or pseudo experimental).af.
738. (nonrandomi?ed or non randomi?ed or pseudo randomi?ed).af.
739. randomi?ed.hw.
740. (cohort or survey: or qualitative).ti,ab.
741. or/719-740
742. exp Meta-Analysis/
743. meta-analys$.ti,ab.
744. metaanalys$.ab,ti.
745. meta analys$.ab,ti.
746. Cochrane.ab,sh,ti.
747. (review$ or overview$).ti.
748. review$.pt.
749. (synthes$ adj3 (literature$ or research or studies or data)).ab,ti.
750. pooled analys$.ab,ti.
751. ((data adj2 pool$) and studies).mp.
752. ((hand or manual or database$ or computer$) adj2 search$).ab,ti.
753. ((electronic or bibliographic$) adj2 (database$ or data base$)).ab,ti.
754. ((review$ or overview$) adj10 (systematic$ or methodologic$ or quantitativ$ or research$ or literature$ or studies or trial$ or effective$)).ab.
755. or/742-754
756. (retrospective$ adj2 review$).ab,sh,ti.
757. (case$ adj2 review$).ab,sh,ti.
758. (record$ adj2 review$).ab,sh,ti.
759. (patient$ adj2 review$).ab,sh,ti.
760. (patient$ adj2 chart$).ab,sh,ti.
761. (peer adj2 review$).ab,sh,ti.
762. (chart$ adj2 review$).ab,sh,ti.
763. (case$ adj2 report$).ab,sh,ti.

764. (rat or rats or mouse or mice or hamster or hamsters or animal or animals or dog or dogs or cat or cats or bovine or sheep).ab,sh,ti.
765. or/756-764
766. 765 not (765 and 755)
767. 755 not 766
768. 665 or 679 or 688 or 694 or 699 or 707 or 711 or 718
769. 653 and 741 and 768
770. 653 and 767 and 768
771. 769 or 770
772. animal/
773. human/
774. 772 not (772 and 773)
775. 771 not 774
776. limit 775 to yr=1990-2005
777. (vulnerable adj group).ti,ab.
778. inequalit$.ti,ab.
779. (deprivation or deprived).ti,ab.
780. (health adj inequalit$).ti,ab.
781. (social adj inequalit$).ti,ab.
782. (urban adj renewal$).ti,ab.
783. (inner adj cit$).ti,ab.
784. (social adj class).ti,ab.
785. unemploy$.ti,ab.
786. (low adj income).ti,ab.
787. ((single or lone or sole) adj (parent$ or mother)).ti,ab.
788. homeless$.ti,ab.
789. jobless$.ti,ab.
790. exclusion.ti,ab.
791. (inequity or inequitable$).ti,ab.
792. (social adj exclusion).ti,ab.
793. (socially adj excluded).ti,ab.
794. (social adj disadvantage$).ti,ab.
795. (social adj isolation).ti,ab.
796. (social adj gradients).ti,ab.
797. ((deprived or disadvantaged) adj communit$).ti,ab.
798. underprivileged.ti,ab.
799. ((low or lower or less or poor or poorer or level) adj (socioeconomic or education or income)).ti,ab.
800. (income adj differentials).ti,ab.
801. (income adj gap).ti,ab.
802. (income adj distribution).ti,ab.
803. ((assist$ or support$ or improv$) adj ((single adj (parent$ or mother)) or homeless$ or jobless$ or unemploy$ or refugee$ or (socially adj excluded) or disadvantaged or underprivileged)).ti,ab.
804. stigma.ti,ab.
805. socioeconomic factors.ti,ab.
806. (child$ adj (abandoned or neglected or abused or hospital$ or disadvantaged or disabled)).ti,ab.
807. (special adj (school$ or education or need$)).ti,ab.
808. (exclusion adj (education or school$)).ti,ab.
809. (child$ adj (special adj need$)).ti,ab.
810. (child$ adj care).ti,ab.

811. (learning adj (disorder$ or difficult$ or disabilit$)).ti,ab. [mp = title, original title, abstract, name of substance word, subject heading word]
812. institution$.ti,ab.
813. (secure adj housing).ti,ab.
814. (care adj home).ti,ab.
815. (nursing adj home).ti,ab.
816. or/777-815
817. *Menopause/ph [Physiology]
818. menopaus$.ti,ab.
819. *Smoking/pc [Prevention & Control]
820. smok$.ti,ab.
821. *postpartum period/ or *pregnancy/
822. pregnan$.ti,ab.
823. or/817–822
824. exp continental population groups/
825. exp ethnic groups/
826. vulnerable populations/
827. minority groups/
828. (minority adj group).ti,ab.
829. (black or blacks or ethnic$ or refugee$).ti,ab.
830. or/824-829
831. 816 or 823 or 830
832. 776 and 831
833. 173 or 331 or 499 or 643
834. 832 not 833
835. 833 and 832
836. (cohort or survey: or qualitative).ti,ab.
837. 834 and 836
838. 834 not 837

DATA SOURCES

The following information sources were initially searched. No references were identified which had not already been identified through searches for other rapid reviews.

AMED
ASSIA
British Nursing Index
CAB Abstracts
CENTRAL (Cochrane Controlled Trials Register)
CINAHL
Clinical Evidence - http://www.clinicalevidence.org
Cochrane Database of Systematic Reviews
CRD (EED database) http://www.york.ac.uk/inst/crd
DARE
Embase
EPPI-Centre - http://eppi.ioe.ac.uk/
ERIC
Food Standards Agency - http://www.food.gov.uk/science/research/
HDA Evidence Base - http://www.hda-online.org.uk/html/research/effectiveness.html
Health Evidence Bulletins – Wales - http://hebw.cf.ac.uk
HealthPromis
IUHPE (International Union for Health Promotion and Education) - http://www.iuhpe.nyu.edu/pubs/index.html
Medline
NCCHTA - http://www.ncchta.org
NICE – www.nice.org.uk
Public Health Effectiveness (Hamilton, Ontario) - http://www.health.hamilton-went.on.ca/CSCARB/EPHPP/ephpp.htm
PsycINFO
SIGN – http://www.sign.ac.uk
Social Science Citation Index (equiv. to Current Contents)
Sociological Abstracts
Sport Discus

A second search was then developed with CPHE to ensure that no potentially relevant references had been overlooked. This search was run in Medline only and did not produce any additional references to those identified in previous rapid reviews. Search terms included terms for Black and minority ethnic groups, vulnerable groups and vulnerable life-stages.

The Cochrane database was also double checked for relevant RCTs – as the agreed review parameters. Bibliographies of included studies were also searched, as were key reports and systematic reviews with these topic areas (Bush 1997, Ciliska 2004, Fox 2004, Hunter 2004, Thomas 2004, Summerbell 2005) and a database of references identified for the ongoing systematic review funded by the World Cancer Research Fund at Teesside.

EXCLUDED REFERENCES

1. Agurs-Collins TD, Kumanyika SK, Ten Have TR et al. A randomized controlled trial of weight reduction and exercise for diabetes management in older African-American subjects. *Diabetes Care* 1997;20:1503–11.	Participants with non-insulin-dependent diabetes mellitus.
2. Aiello EJ, Yasui Y, Tworoger SS et al. Effect of a yearlong, moderate-intensity exercise intervention on the occurrence and severity of menopause symptoms in postmenopausal women. *Menopause* 2004;11:382–8.	One-year RCT to reduce menopausal symptoms in obese postmenopausal women (does report weight but not main aim).
3. Allison DB, Kanders BS, Osage GD et al. Weight-related attitudes and beliefs of obese African-American women. *Journal of Nutrition Education* 1995;27:18–23.	Questionnaire of obese African American women's attitudes to weight.
4. Anderson JV. Bybee DI, Brown RM et al. 5 A day fruit and vegetable intervention improves cosumption in a low-income population. *Journal of the American Dietetic Association* 2001;101*:*195-202.	Controlled study only 2 months duration in low-income population.
6. Austin SB, Field AE, Wiecha J et al. The impact of a school-based obesity prevention trial on disordered weight-control behaviors in early adolescent girls. *Archives of Pediatriatric and Adolescent Medicine* 2005;159:225–30.	Report published March 2005 on use of diet pills in Planet Health (study included in schools review and this publication to be included in update of school review).
7. Balcazar H, Castro FG, Krull JL, Balcazar H, Castro FG, Krull JL. Cancer risk reduction in Mexican American women: the role of acculturation, education, and health risk factors. *Health Education Quarterly* 1995;22:61–84.	Not intervention (Mexican American women).
8. Bayot A, Capafons A, Cardena E, Bayot A, Capafons A, Cardena E. Emotional self-regulation therapy: a new and efficacious treatment for smoking. *American Journal of Clinical Hypnosis* 1997;40:146–56.	Not aimed at preventing weight gain during smoking cessation.
9. Beckmann CR, Beckmann CA. Effect of a structured antepartum exercise program on pregnancy and labor outcome in primiparas. *Journal of Reproductive Medicine* 1990;35:704–9.	Pregnancy but not aimed at preventing weight gain (main aim pregnancy and labour outcome).
10. Bhargava A, Guthrie JF, Bhargava A, Guthrie JF. Unhealthy eating habits, physical exercise and macronutrient intakes are predictors of anthropometric indicators in the Women's Health Trial: Feasibility Study	Women's Health Trial: feasibility study in minority populations- reports predictors of anthropometric

in minority Populations. *British Journal of Nutrition* 2002;88:719–28.	indicators but not results of actual intervention (main trial paper included in report).
11. Blocker DE, Freudenberg N, Blocker DE, Freudenberg N. Developing comprehensive approaches to prevention and control of obesity among low-income, urban, African-American women. *Journal of American Medical Women's Association* 2001;56:59–64.	Literature review only, US-based.
12. Boraz MA, Simkin-Silverman LR, Wing RR et al. Hormone replacement therapy use and menopausal symptoms among women participating in a behavioral lifestyle intervention. *Preventive Medicine* 2001;33:108–14.	Only reports menopausal symptoms: Women' Healthy Lifestyle Project.
13. Boury JM, Debra A. Factors related to postpartum depressive symptoms in low-income women. *Women Health* 2004;39:2004–34.	Only baseline data.
14. Bronner Y, Boyington JEA. Developing weight loss interventions for African-American women: Elements of successful models. *Journal of the National Medical Association* 2002;94(4):224–235.	Review of weight loss interventions for African American women (may be relevant for 'public health management of obesity review').
16. Chiechi LM, Secreto G, Vimercati A et al. The effects of a soy rich diet on serum lipids: the Menfis randomized trial. *Maturitas* 2002;41:97–104.	Soya-rich diet for postmenopausal women to reduce cardiovascular disease risk.
18. Coday M. Health Opportunities with Physical Exercise (HOPE): social contextual interventions to reduce sedentary behavior in urban settings. (Project among disadvantaged overweight adults in the inner city. 56 refs). *Health Education Research* 2002;637(Oct): 17.	Ongoing – no outcome results reported.
19. Covington C. Cybulski MJ, Davis TL et al. Kids on the move: preventing obesity among urban children. *American Journal of Nursing* 2001; 101(3):73-77,79,81-2.	Not aimed at preventing obesity – literature review of treatments and recommendations.
20. Covington DL, Peoples-Sheps MD, Buescher PA, Bennett TA, Paul MV. An evaluation of an adolescent prenatal education program. *American Journal of Health Behavior* 1998;22:323–33.	Review of an uncontrolled programme not aimed at preventing weight gain.

21. Crawford V, Scheckenbach R, Preuss HG, Crawford V, Scheckenbach R, Preuss HG. Effects of niacin-bound chromium supplementation on body composition in overweight African-American women. *Diabetes Obesity and Metabolism* 1999;1:331–7.	Eight-week crossover study of chromium for weight loss in African-American women.
22. Cullen KW, Karen W. Validity and reliability of a behavior-based food coding system for measuring fruit, 100% fruit juice, vegetable, and sweetened beverage consumption: Results from the Girls health Enrichment Multisite Studies. *Preventive Medicine* 2004;38 (suppl):s33-s42.	Baseline data for GEMS only.
23. DeBate RD & Davis TA, Program: LEAP: Lifestyle Enhancement for African American Women Population. *Health Education and Behavior* 2004;31(6):662-667.	Overview of 10-week intervention, diet and exercise in African American women within churches – no outcomes reported.
24. Demark W. Partnering with African American churches to achieve better health: Lessons learned during the Black Churches United for Better Health 5 A Day project. *Journal of Cancer Education* 2000;15:164–7.	Literature review only, US-based.
25. Dennis KE, Tomoyasu N, McCrone S. Self-efficacy targeted treatments for weight loss in postmenopausal women. *Scholarly Inquiry for Nursing Practice* 2001;15(3): 259-276.	Behavioural intervention for weight loss in obese postmenopausal women with 6-month follow-up
26. Douchi T, Matsuo T, Uto H et al. Lean body mass and bone mineral density in physically exercising postmenopausal women. *Maturitas* 2003;45:185–90.	Cross-sectional study.
27. Drayton-Brooks S, White N. Health promoting behaviors among African American women with faith-based support. *ABNF Journal* 2004;15:84–90.	Literature review only, US-based.
28. Dwyer JJM, Hansen B, Barrera M et al. Maximising children's physical activity: an evaluability assessment to plan a community-based, multi-strategy approach in an ethno-racially and socio-economically diverse city. *Health Promotion International* 2005*;*18(3):199-208.	Not intervention.

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30. Egger G, Fisher G, Piers S, Bedford K, Morseau G, Sabasio S et al. Abdominal obesity reduction in indigenous men. *International Journal of Obesity Related Metabolic Disorders* 1999;23:564–9.	Not controlled study, Torres Strait Islanders (not included BMEG).
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32. Fitzgibbon ML, Stolley MR. Environmental changes may be needed for prevention of overweight in minority children. *Pediatric Annals* 2004;33:45–9.	6-week pilot study.
33. Fitzgibbon ML. Quantitative assessment of recruitment efforts for prevention trials in two diverse Black populations. *Preventive Medicine* 1998; 27(6): 838-845.	Review of recruitment efforts for prevention trials in minority children, US-based.
34. Ford BS, McDonald TE, Owens AS, Robinson TN. Primary care interventions to reduce television viewing in African-American children. *American Journal of Preventive Medicine* 2002;22:106–9.	Four-week intervention in primary care to reduce TV in African American children.
35. Fulton JE, McGuire MT, Caspersen CJ, Dietz WH. Interventions for weight loss and weight gain prevention among youth: current issues. *Sports Medicine* 2001;31:153–65.	Literature review only.
36. Gans KM, Kumanyika SK, Lovell HJ et al. The development of SisterTalk: a cable TV-delivered weight control program for black women. *Preventive Medicine* 2003;37:654–67.	Ongoing study, no outcome results reported.
37. Gris JC, Schved JF, Feugeas O et al. Impact of smoking, physical training and weight reduction on FVII, PAI-1 and hemostatic markers in sedentary men. *Thrombosis and Haemostasis* 1990;64:516–20.	Aim to assess effect of physical training and smoking cessation on plasma levels (not to prevent

	weight gain).
38. Hardeman W, Griffin S, Johnston M et al. Interventions to prevent weight gain: a systematic review of psychological models and behaviour change methods. *International Journal of Obesity and Related Metabolic Disorders* 2000;24:131–43.	Systematic review (two relevant studies included in BMEG review).
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40. Hermann J, Williams G, Hunt D. Effect of nutrition education by paraprofessionals on dietary intake, maternal weight gain, and infant birth weight in pregnant Native American and Caucasian adolescents. *Journal of Extension* 2001;39(1):http://www.joe.org/joe/2001february/rb2.html.	To decrease low maternal weight gain in adolescents.
41. Jeffery RW. Correspondence programs for smoking cessation and weight control: a comparison of two strategies in the Minnesota heart health program. *Health Psychology* 1990;9:1990–598.	Two interventions (Improve Your Health, part of Minnesota Heart Health Programme): one is smoking cessation only (not to prevent weight gain) and the other is weight control (not aimed specifically at BMEG vulnerable groups or life-stages).
42. Jeffery RW, Gray CW, French SA et al. Evaluation of weight reduction in a community intervention for cardiovascular disease risk: changes in body mass index in the Minnesota Heart Health Program. *International Journal of Obesity and Related Metabolic Disorders* 1995;19:30–9.	Minnesota Heart Health Programme (not aimed specifically at BMEG, vulnerable groups or lifestages).
43. Kanders BS, Ullman-Joy P, Foreyt JP et al. The Black American Lifestyle Internvetion (BALI): a weight loss program for working class African American women. *Journal of the American Dietetic Association* 1994;94:310–2.	10-week pilot study- not controlled, obese, weight loss not prevention.
44. Klem ML, Viteri JE, Wing RR. Primary prevention of weight gain for women aged 25–34: the acceptability	Not vulnerable life-stage (women are not pregnant

of treatment formats. *International Journal of Obesity and Related Metabolic Disorders* 2000;24:219–25.	and cannot generalise these results to pregnant women), also US-based.
45. Kuller LH, Simkin-Silverman LR, Wing RR, Meilahn EN, Ives DG. Women's Healthy Lifestyle Project: A randomized clinical trial: results at 54 months. *Circulation* 2001;103:32–7.	Although this meets all parameters – another report of 5-year results is already included in the review.
46. Kumanyika SK, Charleston JB. Lose weight and win – A church-based weight-loss program for blood-pressure control among Black-women. *Patient Education and Counseling* 1992;19:19–32.	Weight loss intervention in obese Black women (church-based) with 6-month follow-up, for blood pressure control, 47% taking antihypertensive medication not clear why excluded as other church-based also obese.
47. Lenamond SG, Franckowiak S, Zuzak KB, Cummings ES, Crespo CJ, Andersen RE. A community intervention to promote stair use among African American communters across the age spectrum. *Journal of the American Geriatrics Society* 2001;49:114.	Abstract only, 1 month intervention of culturally appropriate sign to encourage walking in African-American commuters.
48. Lloyd C, Sullivan D. NEW solutions: an Australian health promotion programme for people with mental illness. *International Journal of Therapy and Rehabilitation* 2003 May;10(5):204–10.	Uncontrolled intervention re mainly drug-induced weight gain.
49. Luke B, Luke B. Improving multiple pregnancy outcomes with nutritional interventions. *Clinical Obstetrics and Gynecology* 2004;47:146–62.	Review and intervention to improve twin pregnancy interventions (not specifically aimed at preventing excessive weight gain).
50. Marcus BH, King TK, Albrecht AE et al. Rationale, design, and baseline data for Commit to Quit: an exercise efficacy trial for smoking cessation among women. *Preventive Medicine* 1997;26:586–97.	Ongoing – no outcome results reported.
51. Marshall D. Obesity in people with intellectual disabilities: the impact of nurse-led health screenings and health promotion activities. *Journal of Advanced Nursing* 2003; 41.(2):147-153.	Not controlled, 8 weeks duration, in obese adults and aimed at weight reduction, with learning difficulties in Northern Ireland.
52. Matvienko O, Lewis DS, Schafer E. A college nutrition science course as an intervention to prevent weight gain in female college freshmen. *Journal of Nutrition Education* 2001;33:95–101.	Not included BMEG, vulnerable group or life-stage.

53. McCarran MS, Andrasik F. Behavioral weight-loss for multiplie-handicapped adults: Assessing caretaker involvement and measures of behavior change. *Addictive Behavior* 1990;15:1990–20.	Controlled study of eight adults with cerebral palsy, 19-week intervention with 12-month follow-up, weight and BMI outcomes reported, obese at baseline.
54. McClelland JW, Demark-Wahnefried W, Mustian RD, Cowan AT, Campbell MK. Fruit and vegetable consumption of rural African Americans: baseline survey results of the black churches united for better health 5 A Day project. *Nutrition and Cancer* 1998;30:148–57.	Baseline data only for ongoing Black Churches United for Better Health project.
55. McMahon A. Kelleher CC. Helly G. Duffy E. Evaluation of a workplace cardiovascular health promotion programme in the Republic of Ireland. *Health Promotion International* 2002;17(4):297–308.	Uncontrolled study in White Irish workers, no useable outcomes.
56. Melnyk mg, Weinstein E. Preventing obesity in black women by targeting adolescents: a literature review. *Journal of the American Dietetic Association* 1994;94:536–40.	Literature review only – US based.
57. Oexmann MJ, Thomas JC, Taylor KB et al. Short-term impact of a church-based approach to lifestyle change on cardiovascular risk in African Americans. *Ethnicity and Disease* 2000;10:17–23.	Uncontrolled study of eight educational sessions in African-American churches to improve cardiovascular risk factors, with follow-up at 10 weeks reported with follow-up at 1 year planned. All obese at baseline.
58. Perkins KA, Levine MD, Marcus MD et al. Addressing women's concerns about weight gain due to smoking cessation. *Journal of Substance Abuse Treatment* 1997;14:173–82.	Not an intervention, US-based.
59. Peterson KE. Design of an intervention addressing multiple levels of influence on dietary and activity patterns of low-income, postpartum women. *Health Education Research* 2002;17(5):531-540.	Ongoing – no outcome results reported.
60. Poston WS 2nd, Haddock K, Olvera NE et al. Evaluation of a culturally appropriate intervention to increase physical activity. *American Journal of Health Behavior* 2001;25(4): 396-406.	Mexican American (not included in BMEG review).

61. Prentice R, Thompson D, Clifford C et al. Dietary fat reduction and plasma estradiol concentration in healthy postmenopausal women. The Women's Health Trial Study Group. *Journal of the National Cancer Institute* 1990;82:129–34.	Plasma hormone concentrations only in intervention arm of Women's Health Trial (postmenopausal women).
62. Quinn RD, Quinn Rothacker D. Five-year self-management of weight using meal replacements: comparison with matched controls in rural Wisconsin *Nutrition* 2000;16:344–8.	Baseline only data for ongoing Eat for Life Trial to increase fruit and vegetable consumption in African-American churches, 1-year follow-up to be reported.
63. Resnicow K, Wallace DC, Jackson A et al. Dietary change through African American churches: Baseline results and program description of the Eat for Life trial. *Journal of Cancer Education* 2000;15:156–63.	Review.
64. Reusser ME, DiRienzo DB, Miller GD et al. Adequate nutrient intake can reduce cardiovascular disease risk in African Americans. *Journal of the National Medical Association* 2003;95:188–95.	Review.
65. Rossner S. Physical activity and prevention and treatment of weight gain associated with pregnancy: current evidence and research issues. *Medicine and Science in Sports and Exercise* 1999;31:S560–3 .	Five-year weight control study in rural Wisconsin, no further details reported, not BMEG, vulnerable group or life-stage.
66. Sachdeva R, Mann SK, Sachdeva R, Mann SK. Impact of nutrition education and medical supervision on pregnancy outcome. *Indian Pediatrics* 1993;30:1309–14.	Controlled study of nutritional intervention to increase weight gain in pregnancy in Indian women.
67. Sanderson B, Littleton MA, Pulley LV. Environmental, policy, and cultural factors related to physical activity among rural, African American women. *Women Health* 2002;36:75–90.	Focus groups of barriers, enablers and suggestions for physical activity interventions in rural African American women.
68. Schmitz K, Jensen M, Kugler K et al. Strength training for obesity prevention in midlife women. *International Journal of Obesity and Related Metabolic Disorders* 2003;27(3):326-333.	Not included BMEG, vulnerable group or life-(women are not experiencing menopause and cannot generalise these results to menopausal women), also US-based.
69. Shapses SA, Heshka S, Heymsfield SB, Shapses SA, Heshka S, Heymsfield SB. Effect of calcium supplementation on weight and fat loss in women.	All obese premenopausal and postmenopausal women in three separate RCTs –

Journal of Clinical Endocrinology and Metabolism 2004; 89:632–7.	aim of interventions was weight loss.
70. Simkin-Silverman LR, Wing RR, Simkin-Silverman LR, Wing RR. Weight gain during menopause. Is it inevitable or can it be prevented? *Postgraduate Medicine* 1953;108:47–50.	One-year results of Women's Healthy Lifestyle Project- 5 year results included in report.
71. Simmons D Fleming C. Cameron M. Leakehe L. A pilot diabetes awareness and exercise programme in a multiethnic workforce. *New Zealand Medical Journal* 1996;109(1031):373–6.	Obese Maori and Pacific Islanders.
72. Simpson M, Earles J, Folen R et al. The Tripler Army Medical Center's LE3AN program: a six-month retrospective analysis of program effectiveness for African-American and European-American females. *Journal of the National Medical Association* 2004;96:1332–6.	Retrospective weight loss study and obese at baseline.
73. Steegers EA, Van Lakwijk HP et al. (Patho)physiological implications of chronic dietary sodium restriction during pregnancy; a longitudinal prospective randomized study. *British Journal of Obstetrics and Gynaecology* 1991;98:980–7.	Six-month RCT to assess effects of low sodium intervention in pregnancy (reports weight change but aim is not to prevent excessive weight gain).
74. Stolley MR, Melinda R. Addressing multiple breast cancer risk factors in African-American women. *Journal of the National Medical Association* 2004;96(1):76-86.	One-year pilot study in obese women targeting multiple breast cancer risk (diet and exercise and breast health).
75. Talcott GW, Fiedler ER, Pascale RW, Klesges RC, Peterson AL, Johnson RS. Is weight gain after smoking cessation inevitable? *Journal of Consulting and Clinical Psychology* 1995; 63(2):313-316.	Six-week intervention, US-based.
76. Turner. Cardiovascular health promotion in north Florida African-American churches. *Health Values* 1995;19:3–9.	CBA study in African American churches to increase awareness of cardiovascular disease, improve blood pressure, nutrition behaviour and PA. No weight outcomes but are diet intake and physical activity outcomes. Excluded as better quality study

	included in review for this population.
77. Van der Maten GD, van Raaij JM, Visman L et al. Low-sodium diet in pregnancy: effects on blood pressure and maternal nutritional status. *British Journal of Nutrition* 1997;77:703–20.	Low sodium vs. ad libitum diet to assess effects on blood pressure and nutritional status in pregnancy (women in both groups did not receive dietary advice, main aim was not to prevent excessive weight gain).
78. Wadden TA, Stunkard AJ. Obesity in black adolescent girls: a controlled clinical trial of treatment by diet, behavior modification, and parental support. *Pediatrics* 1990;85:345–52.	All obese at baseline.
79. Weinsier RL, Hunter GR, Gower BA et al. Body fat distribution in white and black women: different patterns of intraabdominal and subcutaneous abdominal adipose tissue utilization with weight loss. *American Journal of Clinical Nutrition* 2001;74:631–6.	Aim – to compare racial differences in fat patterns following weight loss. Compared Black and White women overweight at baseline who then received weight loss >10 kg over 22–25 weeks then anthropometric data compared with control group of never overweight Black and White women.
80. White J. Minority patients: clinical strategies to promote exercise. *Physician and Sportsmedicine* 1993;21:136–44.	Overview of strategies, not relevant to British ethnic minorities.
83. Wing RR, Hamman RF, Bray GA et al. Achieving weight and activity goals among diabetes prevention program lifestyle participants. *Obesity Research* 2004;12:1426–34.	Diabetes Prevention Programme, designed to prevent diabetes in obese women, 3-year RCT, weight loss, 18.9% African-American.
84. Wing RR. Changing diet and exercise behaviors in individuals at risk for weight gain. *Obesity Research* 1995;3(Suppl 2):s277–82.	Unobtainable from British Library.
85. Wolfe WA. A review: maximizing social support--a neglected strategy for improving weight management with African-American women. *Ethnicity and Disease* 2004;14:212–8.	Literature review, US-based.

86. Yancey AK, Miles OL, McCarthy WJ et al. Differential response to targeted recruitment strategies to fitness promotion research by African-American women of varying body mass index. *Ethnicity and Disease* 2001:11(1):115–23.	Ongoing, no outcomes reported.