

Workshop on ‘Changing nutrition behaviour to improve maternal and fetal health’

Changing health behaviour of young women from disadvantaged backgrounds: evidence from systematic reviews

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Observational evidence suggests that improving the diets of women of child-bearing age from disadvantaged backgrounds might be an important component of public health strategies aimed at reducing the burden of chronic disease in their offspring. The development of an intervention to improve the nutrition of young women needs to be informed by a systematic collation of evidence. Such a systematic collation of evidence from systematic reviews of interventions directed at changing health behaviours including diet, breast-feeding, physical activity and smoking has been conducted. Of 1847 potentially-relevant abstracts, fourteen systematic reviews met inclusion criteria. Four aspects of intervention design were identified that were effective at changing one or more of the health behaviours considered in the present review: the use of an educational component; provision of continued support after the initial intervention; family involvement; social support from peers or lay health workers. The findings of the present review suggest that interventions to change the health behaviour of women of child-bearing age from disadvantaged backgrounds will require an educational approach and should provide continued support after the initial intervention. Family involvement and social support from peers may also be important features of interventions that aim to improve diet.

Health behaviour interventions: Disadvantaged young women: Systematic review of evidence: Maternal nutrition

The nutritional status of mothers is an important determinant of the growth and well-being of their offspring⁽¹⁾. Maternal diet and nutrition influence growth and development of the baby during pregnancy and in postnatal life, and growth and development at these stages will influence risk of chronic disease later in life.

Women from disadvantaged backgrounds are more likely to have poor diets. Studies of women taking part in the Southampton Women’s Survey, a population-based study of women aged 20–34 years⁽²⁾, have demonstrated that women of lower educational attainment have less-healthy dietary patterns⁽³⁾. There is also evidence that infants born to mothers of lower educational attainment are

less likely to have healthy diets; of mothers participating in the Southampton Women’s Survey who became pregnant, those with less-healthy diets were also found to be less likely to follow guidance on infant feeding⁽³⁾.

Associations between maternal nutrition and infant growth and development suggest that improving the diets of women of child-bearing age from disadvantaged backgrounds might be an important component of public health strategies aimed at improving diet and reducing the burden of chronic disease in their offspring, as well as improving the health, nutrition and well-being of women themselves.

The development of an intervention to improve young women’s nutrition needs to be informed by a systematic collation of evidence; the first step in designing a complex public health intervention⁽⁴⁾. The present paper describes the collation of evidence from systematic reviews of interventions that aim to change health behaviours. Women

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from disadvantaged groups are at greater risk of a number of unhealthy behaviours; they are more likely to smoke and less likely to choose to breast-feed their babies⁽⁵⁾. The reasons underlying the choices women make about these different health behaviours are likely to be similar and to relate directly to their social and family circumstances. Interventions and strategies that have been effective in relation to these health behaviours will therefore have relevance when designing interventions to improve diet. The aim of the present review was to look for evidence relating to the features of interventions that are effective in achieving behaviour change. This process represents the first phase in the collation of evidence to inform the design of an intervention to improve the diet of young women of child-bearing age from disadvantaged backgrounds.

Methods

The methods for review of systematic reviews set out by the Centre for Reviews and Dissemination, University of York, UK⁽⁶⁾ were followed.

Completed systematic reviews of the effectiveness of interventions that aimed to change health behaviours were included. The focus was on reviews in which the findings were based at least in part on studies of women of child-bearing age. However, studies that included children were considered if the interventions required change in health behaviour by family groups including the mothers. An *a priori* list of health behaviours was drawn up: diet; physical activity; smoking; breast-feeding. Systematic reviews that focused on interventions targeted at more than one of these health behaviours were also eligible for inclusion. The focus was on reviews of primary studies carried out in developed country settings, since our interest was in intervening to improve the diets of women living in the UK.

Recognised database sources of systematic reviews were searched, including the Cochrane Database of Systematic Reviews, the Database of Abstracts of Reviews of Effectiveness (at the University of York) and the Health Technology Assessment Database. Medline was searched from 1966 to January 2008.

The application of inclusion criteria and data extraction was carried out by a single reviewer (J.B.). However, the assessment of each review for evidence of effectiveness was independently validated by two further reviewers (H.M.I. and C.C.). Where the reviewers' assessments were discordant, further assessment was carried out by the first reviewer and then disagreements resolved through consensus. The quality of systematic reviews was assessed according to Centre for Reviews and Dissemination guidance⁽⁶⁾. A narrative approach to synthesis of findings was taken.

Results

Searches of Medline resulted in the identification of 1847 potentially-relevant abstracts, which were assessed for relevance to the listed topic areas. This procedure led to the identification of sixty-one reviews that were assessed in

more detail. In addition, seventy-two abstracts were identified as a result of searches of the Cochrane Database of Systematic Reviews, the Database of Abstracts of Reviews of Effectiveness and the Health Technology Assessment Database. Overall, fourteen systematic reviews met review inclusion criteria. Of the fourteen reviews, five related to diet, three to breast-feeding, one to physical activity, four to smoking and one to both diet and smoking. The methods and main findings of the fourteen systematic reviews are described in Table 1.

Diet

Six systematic reviews of interventions to improve diet were included in the review. One related specifically to dietary knowledge and attitudes in women of child-bearing age⁽⁷⁾, three to fruit and vegetable consumption in a range of age-groups^(8–10) and one to healthy eating in the general population⁽¹¹⁾. The sixth review related to a range of health behaviours including diet and smoking⁽¹²⁾. Although one of the reviews related to fruit and vegetable consumption in children and adolescents aged 5–18 years, it was included because many of the interventions were targeted at families rather than just children⁽⁹⁾. Much of the evidence considered by these six reviews came from intervention studies set in the USA. Three of the reviews drew specific conclusions relating to disadvantaged groups^(7,8,10). All six reviews were of good quality. The review that focused on interventions to improve the dietary knowledge and attitudes of women of child-bearing age identified only nine controlled trials of relevance, five of non-pregnant women and four of pregnant women, and highlighted the lack of good-quality research in this area⁽⁷⁾. The findings of this review suggested that interventions that had an educational component and that aimed to support and empower women can improve nutrition knowledge and behaviour in both the general population and low-income groups of women. The 1999 systematic review of community interventions to increase fruit and vegetable consumption in children and adults showed that the most effective interventions used clear messages about the benefits of fruit and vegetables and multiple strategies to enforce the messages and were delivered to families over a longer period than just one or two contacts⁽⁸⁾. This review also suggested that peer educators may be an effective means of delivering intervention to low-income families. The 2006 review examined the effectiveness of interventions targeted at children aged 5–18 years⁽⁹⁾. While the majority of the intervention studies considered in the review was based on children in a school setting, one of the features associated with effectiveness was family involvement in the intervention. The review of interventions to increase fruit and vegetable consumption in adults suggested that personal counselling or education were effective in increasing fruit and vegetable consumption in low-income and other population groups⁽¹⁰⁾. The fifth review focused on interventions to promote healthy eating in the general population⁽¹¹⁾. While this review suggested that interventions employing behavioural strategies such as goal setting and self-monitoring and involving personal contact with those delivering the intervention were effective, the precise relevance of this

review to women of child-bearing age from disadvantaged backgrounds was not entirely clear, as findings were not reported according to gender or socio-economic status. However, such findings in general-population samples of women were considered relevant to the questions posed. The sixth review included sixty-four studies of patient education and counselling interventions delivered to disease-free populations in a range of clinical settings as part of disease-prevention programmes⁽¹²⁾. Although disease-free, many of the participants in trials were selected because they were at greater risk of disease; for example, many of the intervention studies focusing on diet were of individuals with raised serum cholesterol. Overall, patient education and counselling were effective in changing health behaviours; behavioural techniques, particularly self-monitoring and the use of a range of communication materials (such as media and personal communication), were most effective for improving diet and reducing smoking.

Breast-feeding

Three systematic reviews of interventions to promote and prolong breast-feeding were identified. Two of the reviews related to interventions to promote the initiation of breast-feeding^(13,14). Both had rigorous methods; the first was a Cochrane review⁽¹³⁾ and the second was a Health Technology Assessment review⁽¹⁴⁾. Many of the studies considered in these reviews were of women from disadvantaged backgrounds. The Cochrane review was based on randomised controlled trials only, whereas the HTA review included non-randomised controlled studies and before-and-after studies. Both reviews suggested that one-to-one education is effective in improving breast-feeding initiation rates. In addition, the HTA review findings suggested that peer support may be effective in improving initiation in women from disadvantaged backgrounds; this evidence came from two controlled studies⁽¹⁴⁾. The third systematic review was a Cochrane review of interventions to provide support for mothers in order to prolong the duration of breast-feeding⁽¹⁵⁾. This review, updated in 2006, showed that professional support is effective in prolonging any breast-feeding but its effect on exclusive breast-feeding is unclear. Additional lay support was effective in prolonging exclusive breast-feeding while its effect on duration of any breast-feeding was unclear.

Physical activity

A single systematic review of interventions to promote physical activity was identified, which was a Cochrane review of seventeen randomised controlled trials to assess the effectiveness of interventions promoting physical activity in adults aged ≥ 16 years⁽¹⁶⁾. Interventions giving professional guidance followed by continued support had short-term positive effects on physical activity levels, but there was little evidence of an effect on longer-term outcomes because the majority of studies considered in the review finished after 1 year of follow-up.

Smoking

Four Cochrane systematic reviews of smoking cessation were identified^(17–20). The first related to interventions during pregnancy⁽¹⁷⁾. Pooled data from forty-eight trials of a range of interventions were considered and overall were effective at reducing smoking (relative risk 0.94 (95% CI 0.93, 0.95)). Of the forty-eight trials the largest group was cognitive behavioural therapy interventions; their effect size was similar to that for the overall group. The smallest group of randomised controlled trials ($n = 2$) was of social support and financial reward interventions targeted at women from disadvantaged groups. The effect size in this group was larger than overall (RR 0.77 (95% CI 0.72, 0.82)). The other three systematic reviews focused on smoking cessation interventions in the general population^(18–20). In the first review evidence from twenty-one randomised controlled trials of approximately 7000 individuals (the precise number of participants was not reported in this systematic review) demonstrated that individual counselling is effective in reducing the prevalence of smoking⁽¹⁸⁾. The review of the influence of group programmes on smoking cessation found that they were more effective than self-help approaches⁽¹⁹⁾. However, there was insufficient evidence to assess whether group programmes were more effective than individual counselling. Both forms of counselling (individual and group) have an educational component in that they involve explanation of the health risks of smoking and the benefits of smoking cessation. The final review explored the effectiveness of community interventions targeted at whole populations⁽²⁰⁾. Only four of the thirty-seven studies included in the review used random assignment of communities. Overall, community interventions had a small effect on smoking prevalence, which was true even for the trials of most rigorous design.

Aspects of intervention design associated with effectiveness

Four aspects of intervention design were identified that were effective at changing more than one of the health behaviours considered in the present review: the use of an educational component; provision of continued support after the initial intervention; social support from peers or lay health workers; family involvement with the intervention. Table 2 summarises evidence of effectiveness in relation to these four aspects of intervention design for each of the included systematic reviews. Reported findings are based on independent assessments carried out by three reviewers, as outlined in the methods. Assessments were concordant at initial assessment in eight of the fourteen systematic reviews. In the remaining six reviews consensus was reached following further assessment and discussion of the review findings. All fourteen reviews suggested that an educational component involving some explanation of the health risks associated with a particular behaviour and the benefits of change was effective in changing health behaviours. This outcome applied to all the health behaviours considered. Seven of the fourteen reviews^(8,9,11,13,14,16,19) suggested that continued support

Table 1. Description of systematic reviews and summary of their main findings

Review	Objectives of review	Review methods and quality	Main findings	Relevance to design of an intervention in women of child-bearing age
Diet				
Health Education Authority review ⁽⁷⁾	To address the question: do women of child-bearing age and women who are pregnant change their dietary knowledge, attitudes and/or behaviour in response to specific interventions	Clearly-defined question and inclusion criteria. Thorough search and data extraction methods, although did not search for unpublished or grey literature Good quality	Of nine studies reviewed (seven RCT, two non-randomised studies), five (of 973 non-pregnant women of child-bearing age) related to interventions that were delivered in the community (two in USA, two in UK and one in Australia). Four of the five studies showed that education, empowerment and support could improve nutrition knowledge and behaviour (reduction in fat intake). Studies only assessed outcomes in the short term; the longest period of follow-up was 1 year but most were <6 months. The fifth study did not demonstrate an effect but sample size was small (<i>n</i> 48). Of four studies of 3102 pregnant women, only one (a UK-based RCT) provided outcome data relating to healthy diet. The intervention, consisting of written information on nutrition at booking and at 26 weeks, led to small improvements in knowledge and attitudes, but had little effect on diet	Some evidence to suggest that education, social support and empowerment can improve nutrition knowledge and behaviour Some evidence specific to low-income groups of women, two of the studies demonstrating improvements in nutrition knowledge and behaviour of non-pregnant women were based on low-income populations
Effective Public Health Practice Project, Ontario Ministry of Health review ⁽⁸⁾	To identify community interventions that were effective at increasing fruit and vegetable consumption in subjects aged ≥ 4 years	Rigorous methods, although no searches for unpublished or grey literature Internal validity was used as basis for inclusion and of sixty potentially-relevant articles, only eighteen of higher quality (relating to fifteen primary studies) were included in the review Good quality	Reviewed fifteen studies set in the USA. Four were of interventions targeted at parents with young children: three (two based on the Expanded Food and Nutrition Education Program and one on the Special Supplemental Program for Women, Infants and Children) that used peers or paraprofessionals to deliver multi-component interventions over a number of sessions during a 6–24-month period, showed significant increases in fruit and vegetable consumption. The fourth study was not effective; it consisted of an intervention delivered over a relatively short 13-week period as part of the Head Start initiative. The other eleven studies included in the review related to schoolchildren (<i>n</i> 6) and other groups of adults (<i>n</i> 5)	The review suggests that interventions that have an educational component, provide continued support after the initial intervention and involve families in the intervention will improve fruit and vegetable consumption. Some evidence to support the use of peer educators and paraprofessionals with low-income mothers
Systematic review ⁽⁹⁾	To collate evidence from published and grey literature on evaluations of programmes that promote fruit and vegetable consumption. The review focused on findings in children aged 5–18 years	Methods as for Pomerleau <i>et al.</i> ⁽¹⁰⁾ Good quality	Fifteen studies relating to 5–18-year-old children and adolescents were reviewed. Most studies were based in developed countries. Ten of the fifteen showed a significant effect on fruit and vegetable consumption. Most were school-based (nine in primary schools and only one of four in secondary schools was effective). Common features of successful interventions included emphasis on fruit and vegetables rather than nutrition generally, hands on exposure to fruit and vegetables such as preparation and tasting, use of peer leaders, family involvement and longer follow-up	The review found that family involvement, and longer periods of follow-up were features of effective interventions.

Systematic review ⁽¹⁰⁾	To collate evidence from published and grey literature on evaluations of programmes that promote fruit and vegetable consumption. The review focused on findings in adults	Clearly-defined question and inclusion criteria; only studies with ≥ 3 -month follow up were included Rigorous search including contact with experts, increasing potential to identify grey literature. Rigorous CRD methods Good quality	Forty-four studies were reviewed (>70% were set in the USA). Five studies (all in USA) focused on low-income populations. Consistent positive effects were seen in studies involving face-to-face education and counselling, but interventions using telephone contact or computer-tailored information were also effective in some circumstances. Workplace interventions were more effective if they included an element of social support such as peer educators or family members. All five studies in low-income populations used personal counselling or education approaches and all were effective in increasing fruit and vegetable consumption	Personal counselling and education were effective in increasing fruit and vegetable consumption in low-income and other population groups
Health Education Authority health promotion effectiveness review ⁽¹¹⁾	To review the effectiveness of interventions to promote healthy eating in the general population	Review of published and unpublished interventions completed between 1985 and 1996 that aimed to promote healthy eating in the general population. Methods followed CRD guidelines. Included studies with an experimental or quasi-experimental design that used a control group Good quality	Seventy-six studies of healthy eating interventions were reviewed based in six different settings (schools and universities, workplace, primary care, community, supermarket and catering). The majority of studies were set in the USA. The most effective healthy eating interventions in schools, workplaces, primary care and the community tended to focus on diet only or diet and exercise. The most effective interventions were based on theories of behaviour change (e.g. clear goal setting, self-monitoring), and involved an extent of personal contact with individuals or small groups, some family involvement and scope for personalisation	Personal contact and family involvement were features of effective interventions. Relevance to women of child-bearing age is not clear as findings were not reported according to age, gender or socio-economic status
Diet and smoking Meta-analysis ⁽¹²⁾	To examine the effectiveness of patient education and counselling for three groups of preventive health behaviours	Rigorous methods with two reviewers assessing papers against inclusion criteria and carrying out data extraction. Searches up to end 1993, included contact with experts to identify unpublished studies	Sixty-four studies reviewed. All were based on disease-free populations in clinical settings (workplaces, school clinics, home health care, nursing homes and inpatient medical services). Seventeen studies on nutrition and weight control, thirty-nine on smoking and alcohol and eighteen relating to other topics. Almost all the nutrition studies were of individuals at elevated risk (e.g. raised serum cholesterol). Overall, meta-analyses suggested that education and counselling do contribute to behaviour change for smoking and nutrition. Features most commonly associated with effectiveness were use of behavioural techniques especially self-monitoring, personal communication and written or other audio-visual materials	Education and counselling are effective in changing health behaviours. Relevance somewhat limited given that the studies of nutrition interventions were mainly based on individuals with elevated risk of disease
Breast-feeding Cochrane systematic review ⁽¹³⁾	To assess the effectiveness of interventions for promoting the initiation of breast-feeding	Rigorous methods; Cochrane review of RCT Last update February 2005 Good quality	Of seven RCT (involving 1388 participants) reviewed five RCT were based on 582 women mostly from low-income backgrounds in the USA Health education interventions were effective in increasing initiation rates (RR 1.53 (95% CI 1.25, 1.88)) Facets of effective interventions included one-to-one education and support (two to four sessions with lactation consultant), self-help manual, lecture, leaflet, video and materials, and visit to paediatrician	Interventions using education and one-to-one support are effective in increasing breast-feeding initiation rates. Many studies were targeted at women from low-income backgrounds

Table 1 (Continued)

Review	Objectives of review	Review methods and quality	Main findings	Relevance to design of an intervention in women of child-bearing age
Health Technology Assessment systematic review ⁽¹⁴⁾	To evaluate the effectiveness of interventions to promote the initiation of breast-feeding	Used CRD methods No exclusion on the basis of study design Good quality	Fifty-nine studies (fourteen RCT, sixteen non-randomised controlled studies and twenty-nine before-and-after studies) were reviewed. Peer support effective in improving initiation in women from low-income groups; evidence from two non-randomised controlled studies, one based in Glasgow and one in USA. One-to-one education was also effective in women from low-income groups; evidence came from USA studies. Small-group health education was effective in increasing initiation rates in women from different income groups. Breast-feeding literature alone had little impact	Evidence from two controlled studies suggests that peer support and one-to-one education may be effective in increasing breast-feeding initiation rates in women from low-income groups
Cochrane systematic review ⁽¹⁵⁾	To assess the effectiveness of interventions that provide support for mothers who are breast-feeding	Cochrane review methods Last update November 2006 Good quality	Thirty-four RCT of 29 385 mother–infant pairs, showed that all forms of extra support together were associated with an increased duration of ‘any’ (includes partial and exclusive) breast-feeding (RR for stopping breastfeeding before 6 months 0.91 (95% CI 0.86, 0.96). Additional (over and above standard care) professional support was effective in increasing any breast-feeding and additional lay support was effective in increasing exclusive breast-feeding. Exclusive breast-feeding was prolonged with use of WHO/UNICEF Baby Friendly Initiative (BFI) professional training. RR for stopping exclusive breast-feeding was 0.69 (95% CI 0.52, 0.91) in the six RCT using the BFI	Any form of additional support (professional or lay) for mothers who are breast-feeding increases the duration of breast-feeding The support provided included explanation of the benefits of breast-feeding usually in the form of one-to-one counselling
Physical activity Cochrane systematic review ⁽¹⁶⁾	To assess the effects of interventions for promoting physical activity in adults aged ≥ 16 years	Cochrane review methods Included RCT with a minimum of 6 months follow up, with either an intention to treat analysis or <20 % loss to follow up Good quality	Seventeen RCT (minimum 6 months duration) reviewed. The effect of intervention on self-reported physical activity (eleven studies, 3940 participants) was moderate (pooled standardised mean difference 0.31 (95 % CI 0.12, 0.50). Effect on predetermined threshold of physical activity (six studies, 2313 participants) was not significant (OR for increased activity 1.30 (95 % CI 0.12, 0.50). Interventions comprising professional guidance followed by continued support appeared to be most effective in increasing frequency of physical activity in the short to medium term. Little evidence on longer-term outcomes	Interventions that provided professional guidance followed by continued support achieve moderate increases in self-reported physical activity
Smoking Cochrane systematic review ⁽¹⁷⁾	To assess the effects of smoking cessation programmes implemented during pregnancy on the health of the fetus, infant, mother and family	Cochrane review methods; particularly robust given that four reviewers independently extracted data and assessed quality. Included RCT and quasi-RCT Most recent update July 2004 Good quality	Overall smoking cessation programmes were effective in reducing smoking; pooled data from forty-eight trials showed RR 0.94 (95% CI 0.93, 0.95), absolute difference of six in 100 women stopping smoking in intervention group. Small but significant effect on low birth weight (<2.5 kg) with a 33 (95% CI 11, 55)g increase in mean birth weight. Cognitive behavioural strategies (largest group of trials) had similar effect size to overall. One intervention (social support plus financial reward) tested in two RCT led to significantly greater smoking reduction than others (RR 0.77 (95% CI 0.72, 0.82))	Some evidence of effectiveness of social support interventions in smoking cessation. Many studies were based on women from low-income or deprived backgrounds.

Cochrane systematic review ⁽¹⁸⁾	To determine the effects of individual counselling on smoking cessation	Cochrane review methods Most recent update December 2004 Good quality	Evidence from twenty-one RCT with >7000 participants Individual behavioural counselling is effective in bringing about smoking cessation. However, there is insufficient evidence to show that intensive counselling is any more effective than brief counselling	Individual counselling is effective in bringing about smoking cessation
Cochrane systematic review ⁽¹⁹⁾	To assess the effects of smoking cessation programmes delivered in a group format compared with self-help materials or to no intervention. The review also compared group therapy and individual counselling	Cochrane review methods Main outcome measures were abstinence from smoking after at least 6 months follow up in patients who were smoking at baseline. Subjects lost to follow-up were analysed as continuing smokers Last updated in February 2005 Good quality	Fifty-five RCT met inclusion criteria. Sixteen compared a group programme with a self-help programme. Group programmes led to a significant increase in smoking cessation (OR 2.04 (95% CI 1.60, 2.60)). Seven RCT compared group programmes with no intervention. Group programmes were more effective than no intervention (OR 2.17 (95% CI 1.37, 3.45)). There was no evidence that group therapy was more effective than a similar intensity of individual counselling	Group programmes are more effective for helping individuals to stop smoking than being given self-help materials without face-to-face interaction. The chances of quitting are more than doubled
Cochrane systematic review ⁽²⁰⁾	To assess the effectiveness of community interventions for reducing the prevalence of smoking	Cochrane review methods Community interventions defined as coordinated multi-dimensional intervention aimed at changing smoking behaviour, including several segments of the community and conducted in a defined geographical area, such as a town, city, county or other administrative district	Evidence from thirty-seven controlled studies was included. Only four studies used random assignment of communities to either intervention or comparison group. Twenty-one of the studies measured decline in smoking prevalence using cross-sectional follow-up data. The estimated net decline in smoking, calculated from eleven of the studies was (%/year) from -1.0 to +3, and for men alone the decline ranged from -0.4 to +1.6 (data from twelve studies) and for women alone from -0.2 to +3.5 (data from eleven studies). The overall conclusion of the review was that community interventions have a small effect on smoking prevalence	Community interventions have a limited effect on smoking prevalence

RCT, randomised controlled trials; CRD, Centre for Reviews and Dissemination; RR, relative risk.

Table 2. Summary of systematic review evidence of the features of interventions that are effective at changing health behaviours

Review	Educational component*	Prolonged support†	Family involvement‡	Social support from peers§
Diet				
Health Education Authority review ⁽⁷⁾	++	NA	NA	++
Effective Public Health Practice Project, Ontario Ministry of Health review ⁽⁸⁾	++	++	++	-
Systematic review ⁽⁹⁾	++	++	++	++
Systematic review ⁽¹⁰⁾	++	NA	-	-
Health Education Authority health promotion effectiveness review ⁽¹¹⁾	++	++	++	-
Diet and smoking				
Meta-analysis ⁽¹²⁾	+	-	-	-
Breast-feeding				
Cochrane systematic review ⁽¹³⁾	++	++	NA	NA
Health Technology Assessment systematic review ⁽¹⁴⁾	++	++	NA	++
Cochrane systematic review ⁽¹⁵⁾	++	NA	NA	++
Physical activity				
Cochrane systematic review ⁽¹⁶⁾	++	+	NA	NA
Smoking				
Cochrane systematic review ⁽¹⁷⁾	+	-	+	-
Cochrane systematic review ⁽¹⁸⁾	++	-	NA	NA
Cochrane systematic review ⁽¹⁹⁾	+	+	-	-
Cochrane systematic review ⁽²⁰⁾	++	-	NA	+

++, Strong evidence to suggest that this feature of interventions is important in achieving behaviour change; +, some limited evidence that this feature of interventions is important in achieving behaviour change; -, limited evidence that this feature is ineffective; NA, effectiveness of feature not assessed as part of this systematic review.

*Explanation of health risks associated with a health behaviour and of the benefits of change.

†Ongoing support after the initial intervention over a period of months rather than weeks.

‡Family involvement; active involvement of one or more family member in the intervention.

§Involvement of peers or lay workers in the delivery of the intervention.

after the initial intervention of months rather than weeks duration was a feature of effective interventions, particularly in relation to diet and to breast-feeding, although the evidence in relation to physical activity was weaker⁽¹⁶⁾, and it appeared that prolonged support may be ineffective in relation to smoking cessation^(17,18,20). Evidence for the importance of family involvement came mainly from the reviews of diet, with three of the five reviews suggesting that this feature was an important component of effective interventions^(8,9,11). Evidence of the importance of social support from peers or lay workers came from two of the five reviews relating to diet^(7,9) and from two of the three reviews of breast-feeding^(14,15). There was weaker evidence on the importance of social support from one of the four reviews of smoking, which related specifically to smoking cessation in pregnancy⁽¹⁷⁾.

Discussion

Main findings of the study

The evidence relating to interventions that might bring about behaviour change in women of child-bearing age is relatively limited, particularly for interventions to improve diet and nutrition in this group. Despite the paucity of evidence in some areas, there were some consistent findings across the systematic reviews assessed and four intervention features were identified that were effective in

relation to more than one of the health behaviours considered. Interventions with an educational component were effective at bringing about improvements in behaviour for all the health behaviours considered, suggesting their potential to improve diet, increase and prolong breast-feeding, increase physical activity and induce smoking cessation. Prolonged support was important for diet, breast-feeding and physical activity but was of more limited relevance for smoking because of the evidence that brief interventions for smoking cessation can be effective. Evidence for the importance of family involvement came mainly from the diet reviews, and social support from peers and lay workers was of most importance for changing diet and breast-feeding behaviour.

Comparison with other research

There are similarities between the present findings and those of a more recent review of the content and effectiveness of behaviour-change interventions in low-income groups⁽²¹⁾. This review considered thirteen studies of diet, smoking and physical activity interventions delivered to men and women aged ≥ 18 years. Consistent with the present findings, the conclusions of this review are that providing information about health behaviours, together with goal setting may be effective in low-income groups.

Two recent reviews of evidence carried out to inform the development of National Institute for Health and Clinical

Excellence public health programme guidance^(22,23) have relevance to the present review. While the main focus of the National Institute for Health and Clinical Excellence review of maternal and child nutrition was on specific nutrients, including folic acid and *n*-3 fatty acids, and on the avoidance of alcohol during pregnancy, a small number of intervention studies aimed at improving nutrition knowledge were considered⁽²²⁾. Consistent with the present findings, the National Institute for Health and Clinical Excellence concludes that interventions with an educational component are effective at improving nutrition knowledge, although the evidence that was considered was related to pregnant women rather than all women of child-bearing age. The National Institute for Health and Clinical Excellence has also issued recent programme guidance on behaviour change⁽²³⁾. It identifies evidence of good quality showing that nutrition counselling interventions delivered to primary-care populations of men and women can change eating habits. However, it was considered that insufficient evidence was available to draw any conclusions about dietary interventions in women of child-bearing age.

Strengths and weaknesses

The methods set out by the Centre for Reviews and Dissemination for reviews of systematic reviews⁽⁶⁾ were followed. *A priori* inclusion criteria were developed and recognised sources of completed systematic reviews were searched for relevant systematic reviews. While screening of abstracts and data extraction were carried out by a single reviewer, the assessment of review evidence was independently validated by two further reviewers. The majority of the systematic reviews included in the present review had rigorous methods and were of high quality; many of them were Cochrane reviews. However, most reviews did not comprehensively search the 'grey literature' or report on the findings of unpublished studies. Thus, publication bias is possible. Most of the reviews highlighted the lack of good-quality primary studies and identified important gaps in the literature that need to be addressed through further research. Most reviews also found that there was little evidence of cost-effectiveness in the studies considered. Despite these limitations, there are some consistent findings across a number of the systematic reviews that seem relevant to the design of an intervention study to change the health behaviours of women from disadvantaged backgrounds.

Conclusions

Consistent evidence was found of intervention features associated with effectiveness in bringing about change in a number of health behaviours. The findings of the present review suggest that interventions to change the health behaviour of women of child-bearing age from disadvantaged backgrounds will require an educational approach delivered in person by professionals or peers and should provide continued support after the initial intervention. There is also some evidence to suggest that social support from peers and family involvement in the intervention may

be important features of interventions that aim to bring about dietary behaviour change. These findings are of relevance to the design of an intervention to improve diet in this group of women.

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