Food choices in primary care: a summary of the evidence

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One of the main challenges facing primary care is trying to encourage people to change their diet and to help them maintain that change. There is evidence that primary care interventions can influence food choice and this article highlights the factors that influence food choice, focusing on those studies that are most relevant to nurses.

One of the challenges facing health professionals, especially those working in primary care settings, is trying to encourage people to change their diets and to help them maintain that change. To do this effectively it is important to have an understanding of the vast array of factors that can influence the food choices people make.

In February 2003 the Food Standards Agency commissioned the British Nutrition Foundation to carry out a critical review of the psychosocial basis of food choice as part of its Food Acceptability and Choice Programme. The review focused particularly on the identification of factors that influence positive food choices, examples of positive interventions and gaps in the evidence base.

The review excluded specialist areas, such as slimming and sensory analysis, and focused on interventions in the general free-living population (excluding those with special dietary needs and underlying medical conditions) within the age range of 5–65 years old.

This article highlights the factors that influence food choice but focuses on those studies that are most relevant to nurses – work undertaken in primary care settings, the main findings of these studies and the recommendations made to the Food Standards Agency in this specific area.

A summary report of the review is available from the Food Standards Agency Library on 020 7276 8181/8182 or e-mail: library&info@foodstandards.gov.uk.

Factors influencing food choice

The factors influencing food choice can be interpreted in a number of different ways, for example the widest definition would encompass all possible answers to: “Why do we eat what we do?”

For the purpose of the British Nutrition Foundation review it was necessary to limit the scope to the major psychological and social factors influencing food choice, so most biological factors were excluded – except where psychosocial factors may also play a role, such as for taste.

An extensive literature search (using key words identified with guidance from an advisory group and searching a total of 10 databases as well as searching key journals and books by hand), produced vast amounts of information on a variety of factors. Existing conceptual frameworks were originally going to be used to present this information pictorially, but some of the information gathered did not fit these models. Therefore the factors were divided into three different categories (Table 1):

- Influences. Those factors that are more amenable to modification; that is, factors that had been modified in one or more intervention studies and/or the Food Standards Agency could consider targeting;
- Mechanisms that may be useful for influencing food choice, for example food labelling;
- Other variables.

Studies from primary care settings

Many people of all ages come into contact with health professionals on a regular basis, so it is unsurprising that primary care settings such as GP surgeries are a target for health behaviour change programmes and a number of studies have used a primary care setting to influence food choices. Many of these interventions have used screening programmes to identify and target people with underlying risk factors for disease, such as raised cholesterol or hypertension.

Interventions with higher risk individuals have generally been more successful and interventions with such groups may be more intense than interventions with lower risk populations. In some intervention trials, several disease risk factors have been targeted simultaneously. Often the outcomes measured include changes in weight and changes in blood pressure and blood cholesterol levels, but studies often do not evaluate changes in dietary intake or physical activity, for example the
Hypertension Prevention Trial Research Group, 1990.

As the BNF’s review focused on the general free-living population, it excluded those with special dietary needs and underlying medical conditions. Nurses were directly involved in four of the studies that were reviewed.

Most successful primary care studies

The best effect for fruits and vegetables was seen in a UK study (Steptoe et al, 2003), which found an increase of 1.5 portions per day in those individuals who received behavioural counselling. However, this study had no true control group and suffered from a low recruitment response rate (12 per cent). On the other hand, this increase was reported at 12 months, following an intervention period of only eight weeks.

John et al (2002) also reported an increase of around 1.5 servings of fruit and vegetables per day among adults in two separate GP practices in Oxfordshire following two counselling sessions with the practice nurse.

The best effect for fibre was more difficult to judge. In the UK intervention by Baron et al (1990) it was possible to increase fibre in the intervention group by a mean of 7g a day in men, and almost 6g a day in women after three months (from a baseline of 20.4 g/day in men and 18.9g/day in women in the intervention group). At one-year follow-up there was regression back towards baseline intakes, for example intakes of fibre at one year were 22.8g/day for men and 12.6g in women.

The best effect for fat was found in a US study when intensive counselling helped women on a low-fat diet to decrease the percentage of energy from fat to 19 per cent by four weeks and to 17 per cent by 12 weeks (Djuric et al, 1999), but this is a very low fat intake and may not necessarily be beneficial or sustainable in the long term.

Another US study by Campbell et al (1994) reduced fat intake by 23 per cent (10.3g) in a group receiving information individually tailored to their stage of change and dietary intake. Taking into account psychosocial factors the decrease was nine per cent (3.6g) in those who received non-tailored information and three per cent (1.3g) in the control group.

Some studies aimed to change just one aspect of the diet, such as fruit and vegetables (Steptoe et al, 2003). Other studies have targeted several aspects of diet, for example dietary fat, fruit and vegetables and wholegrains. The best effect seen was in the US EatSmart study (Delichatsios et al, 2001) which aimed to increase fruit and vegetable consumption, decrease red and processed meat consumption and replace full-fat dairy products with low-fat dairy.

### Table 1. Psychosocial Factors Involved in Food Choice

<table>
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<tr>
<th>INFLUENCES</th>
<th>MECHANISMS</th>
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<td>Availability and access</td>
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<td>Biological and physiological signals</td>
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<td>Beliefs and attitudes</td>
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<td>Food preferences</td>
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<td>Neophobia (fear of anything new)</td>
<td>Palatability</td>
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<td>Social networks</td>
<td>Satiety and satiation</td>
<td>Stress</td>
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<td></td>
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### References


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Hypertension Prevention Trial


products. At three-monthly follow-ups, those in the intervention group had increased their intake of fruits and vegetables from a mean of 2.9 servings per day to 4.0 servings per day, compared with an increase in the control group from 3.3 servings per day to 3.7 servings per day – a difference of 0.6 servings per day after adjustment.

Compared with the control group, the intervention group also decreased its consumption of full-fat dairy products by an extra 0.4 servings per week. No differences in changes in consumption of red and processed meats and of low-fat dairy foods between the two groups were seen.

Most successful intervention technique in primary care
A range of different techniques were used including: nutrition counselling (Räsänen et al, 2001; Steptoe et al, 2003); behavioural counselling (Steptoe et al, 2003); self-help materials (Beresford et al, 1992) and computer-tailored messages (Stevens et al, 2002). However, it is difficult to compare the various types of interventions as only two studies directly compared different methods. Steptoe et al (2003) found behavioural counselling to be more effective than nutrition counselling, with an average increase of 1.5 portions fruits and vegetable/day (from a baseline intake of 3.6 portions/day), compared with 0.9 portions/day (from a baseline intake of 3.67 portions/day). No significant differences were seen between people sent non-tailored nutrition information and people in the control group in the study by Campbell et al (1994). In the study, significant differences were found when comparing the group receiving tailored information and the control group (for example, t-tests showed between-group differences for total fat of -2.14 (p<0.05) and for saturates of -2.11 (p<0.05)), demonstrating that tailored information is more successful in achieving dietary changes.

There is limited evidence to suggest prolonged interventions may not always produce greater results than shorter ones. For example, the study by Patrick et al (2001) found that teenagers who received an extended intervention did not have better four-month outcomes than those who received only the computer and counselling components.

The results suggest that with this age group extra contact may not be justified in a primary care setting. Similarly, when this study was repeated in an adult population the extended intervention did not produce different results with respect to mode (phone or mail) or intensity (frequent or infrequent) (Callas et al, 2002).

A number of barriers to health care provider-based interventions have been identified by Sallis et al (2001), including a lack of external incentives and reinforcement (for example, financial reimbursement, administrative support, licensing accreditation), lack of provider knowledge and skills, and lack of tested cost-effective intervention strategies.

Moore and Adamson (2002) found that among a sample of health practitioners in Newcastle 99 per cent thought nutrition was important, but 76 per cent thought they had insufficient time to advise patients adequately. Ammerman et al (1992) identified the need for a simple method of dietary assessment that is culturally specific for regional eating habits, requires no nutrition skills to interpret, provides food-based rather than nutrient-based results and which guides nutrition counselling.

A study evaluating a nutrition education programme found that for primary care interventions to be integrated into general practice, provision of training for existing staff alone was unlikely to be sufficient (Moore and Adamson, 2002).

Research conducted in the 1990s indicated that while the majority of a sample of the general public and samples of practice nurses and GPs were aware of the basic healthy eating messages, their ability to translate this advice into appropriate food alternatives was relatively poor, and there was little difference between the public and the professionals (Buttriss, 1997).

More recently a survey of Scottish GPs, practice nurses and dietitians, investigating the beliefs, attitudes and knowledge about the links between obesity, nutrition and health, concluded that further training was needed to ensure effective provision of nutritional advice to patients (Hankley et al, 2004).

These studies highlight the importance of nutrition education for health professionals, tailored to their needs and backgrounds. Additionally, as behavioural counselling appears to be an effective strategy in the health care setting, consideration should also be given to incorporating this into the training of health professionals such as practice nurses, dietitians and GPs.

Primary care interventions are likely to be most useful in groups that have regular contact with their health care providers, such as pregnant women and older people. Such interventions may have limited impact for the most vulnerable groups, which are less likely to be registered with a GP. Alternative ways of accessing these groups need to be explored.

Research opportunities identified
The review highlighted research opportunities in a number of different areas. With regard to the primary care settings several areas were identified.

It was felt that, as there are still unanswered questions regarding which health care providers can have the greatest effect on patients’ diets, a study comparing, for example, dietitians, pharmacists, GPs and practice nurses using the same intervention technique would be useful.
### TABLE 2. SUMMARY OF PRIMARY CARE INTERVENTIONS INVOLVING NURSES

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<tr>
<th>Reference details</th>
<th>Type of study and main intervention</th>
<th>Main findings</th>
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| Baron et al. (1990) | **RANDOMISED CONTROLLED TRIAL**  
Nutritional advice given by nurse on optimal body weight and diet, either individually or in small groups. Dietary advice was directed towards a modest decrease in total fat intake (to 30-35% of E), with an increase in the ratio of polyunsaturates to saturates. Dietary fibre was stressed and the potential benefits of physical activity, and moderation of salt, alcohol and tobacco intake were also mentioned. Brief follow-up/counselling sessions were scheduled for one to three months after entry to the study. Control group were followed up but received no dietary advice. | Increased intakes of fibre and use of polyunsaturates and decreased use of saturates in intervention subjects versus controls, for example, at three months fibre intake in the intervention group was 27.8g/day in men and 24.8g/day in women versus 21.2g/day in men and 15.7g/day in women in the control group; 70% men and 77% women in intervention group versus 8% men and 12% women in control (p=0.05 versus intervention group) using products rich in polyunsaturates for spreading. These patterns persisted at one year (some regression towards baseline values). Modest beneficial effects seen in plasma lipid levels among men (for example, at three months mean LDL-cholesterol intervention group was 2.57 ±0.08mM vs. 2.83 ±0.08mM in control group (p<0.05). No important differences seen in women. |
| Beresford et al. (1992) | **RANDOMISED CONTROLLED TRIAL**  
Self-help materials introduced by a study nurse and reinforced by a telephone call about 10 days later. Materials were professionally printed in attractive folders with card inserts and emphasised a healthy diet, focusing on fat and fibre. Included a checklist, sample food record with a fat and fibre counter booklet and menus offering a variety of food choices with modified fat and fibre levels. Control group received baseline interview only. | Daily fat and E intake decreased between baseline and follow-up in both groups. Adjusted between-group differences (intervention versus control) -3.8g fall in daily fat (95% CI -9.4, 1.9) and -2.0g change in E-adjusted fat (95% CI -4.9, 0.9). Daily fibre intake increased in intervention group and decreased in control, adjusted differences between groups (intervention vs. control) 0.6g/day (95% CI -0.4, 2.1). Greater effects seen among those in the intervention group who had some responsibility for preparation of meals, for example, fat fell by 6.9 g/day (95% CI -13.2, -0.6). Small differences seen in food choices, such as estimated group difference in low-fat behaviours was 0.3 (95% CI -0.4, 1.1). |
| John et al. (2002) | **RANDOMISED CONTROLLED TRIAL**  
Two appointments at a six-month interval with trained nurse using the ‘brief negotiation’ method to encourage an increase in consumption of fruit and vegetables to at least five daily portions. Subjects were provided with leaflets and other materials designed to address possible barriers, a copy of their action plan, a fridge magnet with the ‘5 a day’ logo, a portion guide and a two-week self-monitoring record book. Phoned by research nurse two weeks after the initial intervention, to reinforce the message and discuss any problems. At three months a letter was sent reinforcing the five a day message, plus a booklet of seasonal recipes and a strategy checklist. Control group received baseline health check and follow-up at six months. | Intervention group reported a greater increase in fruit and vegetable intake (mean change from 3.4 to 4.9 portions), and after adjustment for baseline characteristics the difference in change between the groups was 1.4 daily portions (p<0.0001). Intervention group showed greater increases than control in alpha-carotene (adjusted difference 7% of baseline in the intervention group, p=0.027); beta-carotene (7%, p=0.005); and ascorbic acid (7%, p=0.023). Diastolic and systolic blood pressures fell in intervention group and a small reduction in diastolic but not systolic blood pressure occurred in controls (difference in changes between groups for systolic pressure 4.0mmHg (2.0–6.0, p<0.0001) and for diastolic pressure 1.5mmHg (0.2–2.7, p=0.02). |
| Steptoe et al. (2003) | **RANDOMISED CONTROLLED TRIAL**  
Two 15-minute consultations with a nurse, two weeks apart either using behavioural counselling or nutrition education counselling to increase fruit and vegetable consumption. | Consumption of fruit and vegetables increased from baseline intakes of 3.67 and 3.60 portions/day to 1.5 and 0.9 portions/day by 12 months in the behavioural and nutrition groups (mean difference 0.6 portions, 95% confidence interval 0.1 to 1.1; p=0.021). Plasma beta-carotene and alpha-tocopherol concentrations increased in both groups, with the greatest rise in beta-carotene in the behavioural group (mean difference 0.16μmol/l, 0.001μmol/l to 0.14micromol/l, p<0.05). No changes in body weight, body mass index, blood pressure or serum cholesterol. |
There is a need to establish the minimum amount of follow-up intervention needed to maintain behaviour change. As high-intensity interventions are more costly and may not necessarily lead to greater benefits, a study comparing a high-intensity with a low-intensity intervention would also be useful.

It may be useful to investigate the possibility of using other primary care settings, such as pharmacies and dental practices. For example, Barton et al (2001) demonstrate that there was some support from patients and dentists for dietary advice in general dental practices.

**Limitations identified by the review**

From undertaking this review it has become apparent that there was a lack of validated objective measures for most interventions – a large number of the studies identified used inadequate and highly subjective outcome measures (for example simply asking subjects if they had changed a particular behaviour) and these methods were often not validated.

Studies often failed to recognise the importance of choosing robust and appropriate tools to accurately assess changes in food intake, knowledge and attitudes and this has implications for the quality of the conclusions that may be drawn from such studies.

It was also apparent that studies provided scant detail about the dietary messages used, making it difficult to judge how appropriate or otherwise the messages were. Size and specificity of the population group and short study duration, with a lack of longer-term follow-up, also introduced difficulty in generalising or extrapolating to other groups or settings. The review also highlighted that many studies did not consider sustainability or cost-effectiveness.

**Conclusions**

Despite the limitations identified there is evidence that primary care interventions can offer a beneficial influence on food choice. It appears that behavioural counselling and tailored nutrition messages are the more successful methods for bringing about positive food choices in primary care interventions.

However, several unanswered questions remain, including which health care providers can have the greatest effect on patients’ diets, what is the minimum amount of follow-up intervention needed to maintain behaviour change, and are high-intensity interventions more effective than low-intensity ones? Additionally, information on cost-effectiveness and sustainability of interventions in primary care and other settings is needed to ensure that sound science underpins any future initiatives.