DIETARY INTERVENTIONS TO PREVENT OBESITY IN PRIMARY CARE: A LITERATURE REVIEW

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EXECUTIVE SUMMARY

Obesity is now recognised world wide as a significant public health problem. In New Zealand, more than half of the adult population is overweight or obese, and reducing the prevalence of obesity has become a population health objective. Prevention of obesity is thought to be easier, less expensive and potentially more effective than treatment, however there has been little research into methods for prevention in Primary Care.

Twelve studies of dietary interventions to prevent obesity in Primary Care were examined. Most showed a small positive effect on lowering dietary fat intake in the short to medium term with minimal intensity interventions. Four out of the seven studies that measured BMI or weight showed a small significant improvement, three showed no significant effect. The interventions were provided by GPs, practice nurses or others (educators, researchers). Practical skills' training (counselling, negotiated change, dietary substitution) for GPs and practice nurses was suggested to be beneficial. The provision of written materials was useful in many studies.

More general reviews have found that interventions are more effective if they are based on theoretical models such as the stages of change, use personalised information, and encourage the support of family and others.

Some international obesity workgroups have suggested that obesity prevention could be targeted at those groups at risk of developing obesity. These groups may include: children of obese parents; rapid weight gainers; post-obese; pregnant women; those giving up smoking; those who are physically inactive; post-menopausal women; and particularly Maori and Pacific peoples in these groups.

It is recommended that assessment by the Public Health Dietitians of the type of assistance they may be able to offer Primary Care includes:

- a written aid (such as a script) for general practitioners and practice nurses to assist their discussions with patients on diet and determining their current Stage of Change (this may be developed by adapting and adding to those displayed in the Appendix);
- written materials for patients that are able to be tailored to some extent to the patient's current dietary patterns and Stage of Change;
- nutrition education and skills training for general practitioners and practice nurses.

It is also recommended that development of such resources be in conjunction with an IPA or other Primary Care provider, with the aim of performing a pilot project to be fully evaluated.

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INTRODUCTION

More than half the adult population in New Zealand is either overweight or obese [1]. Obesity is also increasing rapidly in children and therefore the problem is likely to escalate. It is more prevalent in lower socio-economic groups and among Maori and Pacific people. The cost to New Zealand was conservatively estimated to be 135 million per year or 2.5% of health expenditure in 1991. The World Health organisation has estimated that the cost of obesity for a country is 2-7% of the annual health budget, which equates to $303 million in New Zealand. Obesity is a known risk factor for many diseases including heart disease, diabetes, stroke, high blood pressure and some cancers.

It is only in recent years however, that obesity has gained universal acceptance as a significant public health problem. The World Health Organisation (WHO) termed obesity as a 'global epidemic' in 1997 [2]. Reducing obesity is now one of the thirteen population health objectives of the New Zealand Health Strategy (NZHS), which the District Health Boards are required to report progress on annually. Obesity is also a risk factor for several of the other health objectives of the NZHS. This has created new interest into what can be done about obesity in this country. A draft toolkit has been developed by the Ministry of Health which recognises the importance of prevention, however few strategies are suggested at this stage [1].

WHO states that prevention should be easier, less expensive and potentially more effective than treatment of obesity once it has fully developed [2]. This is mainly because the proportion of the population that is overweight or obese is now so large as to overwhelm health care resources, many treatments fail to achieve long-term success, and the health consequences of obesity may not be fully reversible by weight loss.

Prevention to date has mainly consisted of work-site or community-based health promotion programmes, but there has been little of evidence of great benefit from many of these [discussed in [3] [4]]. The focus has recently shifted to environmental methods - those that do not rely on people to self select into a defined educational programme or situation, such as point of choice information (labels & posters), media campaigns, and changes in menu/recipes/prices/formulation of foods sold [discussed in [5]].

Primary Care to date has focused on the treatment of obesity with weight loss programmes. This has tended to result in disillusionment due to perceived lack of 'success', and frequent recidivism. The British Nutrition Foundation Task Force on Obesity included general practitioners (GPs) in the group of 'those in a position to help to prevent obesity', stating that they 'can contribute to the general recognition of the range of weight-for-height at which health risks become significant, so that people entering this range can seek to control their weight gain' [6]. However there has been little written about methods for the prevention of obesity in Primary Care.

The Scottish Intercollegiate Guidelines Network (SIGN) developed a guideline in 1996 that aimed to integrate obesity prevention with management [7]. At this time they found no formal trials of obesity management that related directly to Primary Care,

and no formalised trials of prevention. However, they did recommend that body mass index (BMI) and waist measurements should be measured opportunistically by physicians and recorded at least every 3 years, in order to identify early those gaining weight. They also recommended that all families and individuals at risk of weight gain should have preventive advice on a regular basis.

WHO have produced a Technical Report on 'Obesity: Preventing and Managing the Global Epidemic' (2). This also states that there is little comprehensive evidence on the effectiveness of prevention strategies, but that preliminary evidence suggests low-intensity educational and incentive programmes aimed directly at preventing weight gain in adults can have a positive impact on body weight. The Canadian Task Force on Preventive Health Care has also recommended that the highest priority for research related to obesity should be the development of primary prevention methods (8).

Australia's National Health and Medical Research Council (NHMRC) has developed a strategic plan for the prevention of overweight and obesity (9). This emphasises that general practitioners are key influencers of individuals in terms of creating awareness of the likelihood and dangers of obesity. This was further developed by the Strategic Inter-Governmental Nutrition Alliance (SIGNAL) of the national Public Health Partnership into an agenda for action: 'Eat Well Australia' (10). One of the few practical recommendations for promoting healthy weight involves the training of primary health care professionals, and some examples of this occurring in Australia are given including nutrition manuals, information services, and nutrition seminars. An Overweight and Obesity Working Party is now working on the development of a strategy to prevent weight gain.

Current practice in Primary Care

There is little published information on the current provision of dietary advice or interventions by New Zealand general practitioners. Studies from a variety of other countries have found that in general people would be happy to receive dietary and nutrition advice from their general practitioners. A telephone survey in the Netherlands found that the highest proportion of people referred to their GP for nutrition information (11). Approximately three-quarters of general practice patients surveyed in Sydney said their GP should definitely/probably be interested in their weight (12). Amongst those trying to lose weight in the USA, a quarter of those surveyed reported health professionals as their major source of nutrition and health information, and a half reported reading as their major source (13).

General practitioners whohave been surveyed have stated that they feel nutrition is important in clinical practice (14), that faulty nutrition is a major cause of disease in adults, and that GPs can be influential in getting patients to change their diets (15). However Australian GPs reported giving nutrition advice in only 15% of consultations, and 63% of this was disease-specific rather than general healthy eating advice (15). Of GPs surveyed in the USA, less than 40% usually or always practised more than 17 of 50 nutrition behaviours considered to be important (14). Those that used nutrition-specific resources such as journals, texts, seminars and dietitians, were more likely to have a positive attitude. Another American survey found that 58% of GP respondents had received nutrition training, however 69% stated that less than 40% of their patients received nutrition education (16).

The extent to which GPs provide nutrition education to patients is reported to depend on perception of their own ability to influence lifestyle and eating habits, confidence in their ability to counsel patients about diet, and interest/attitudes about nutrition [17]. The specific barriers to GPs providing nutrition advice have been reported from surveys as:

- lack of nutrition training/deficit of knowledge
- lack of skills
- lack of training in counselling skills
- lack of time
- lack of patient motivation or compliance
- patients attitudes
- inadequate materials
- lack of adequate reimbursement/financial obstacles
- lack of confidence

[18] [16] [15]

GPs have also been asked about effective methods for providing them with nutrition training. One survey found that American GPs thought postgraduate education, scientific journals and study days were effective ways to receive nutrition education [19]. Another American survey reported that GPs wanted free-standing seminars/workshops, nutrition counselling and skills newsletters in order to improve their skills [16]. One trial of a 3-hour programme which taught Primary Care internists skills to conduct brief dietary risk assessments and patient-centred counselling in patients with high lipids, found that this increased counselling skills scores and increased the internists self-perceived preparedness and confidence that they could help patients [20].

OBJECTIVES

The aim of this report is to review the literature on dietary interventions for the prevention of obesity in the Primary Care setting, in order to determine what methods may be effective. The overall objective is to provide some recommendations for the Public Health Dietitians of the Auckland District Health Board on methods to assist Primary Care in providing weight gain prevention for their practice populations.

METHODS

A literature search was undertaken of the following databases: Medline; Evidence Based Medicine; Cochrane Library; Embase; Psychinfo; Sociological Abstracts; Cinahl; Best Evidence; Database of Abtracts of Reviews of Effectiveness; National Health Service Clinical Reviews Database. This search used the headings/keywords: primary health care; diet modification; food habits; nutrition; intervention studies; and obesity.

The following websites were also searched for relevant reports and documents: NZ Ministry of Health; International Obesity TaskForce; National Health and Medical Research Council (Aust); Royal College of Physicians and Faculty of Public Health Medicine; World Health Organisation; British Nutrition Foundation; Australian Department of Health and Aged Services; US Centers for Disease Control; UK Department of Health; American Dietetic Association.

RESULTS

A total of 12 studies were found which addressed the issue of diet in preventing obesity and were based in Primary Care. Most of these studies were aimed at the general practice population, however a few are included which were aimed only at high-risk patients. These studies are described below and in Table 1.

During the search for these studies, other relevant articles that did not fit the criteria were found. These are discussed briefly in the following section on other methods for dietary intervention strategies that may be applicable to Primary Care.

Studies on the use of dietary interventions in Primary Care

Baron et al randomised 368 patients from their general practice register to receive dietary education sessions, written materials, encouragement and follow-up, or to a control group [21]. There were significant reported dietary changes, in terms of trying to eat more fibre and less fat, however there was little effect on weight. Dietary efforts persisted to one year (not measured beyond this time). The authors concluded that general practice was a feasible avenue for promoting dietary change.

Beresford et al performed two similar studies which used low-intensity interventions consisting of self-help written information on a healthy diet. The first involved 242 patients attending two Primary Care clinics in 1987 who were given the material by a study nurse [22]. This showed a small but significant reduction in self-reported fat intake in the intervention group compared to the control group at three months. The second study has been described in two articles [23] [24]. Fourteen Primary Care clinics were randomised and over 2000 patients attending for non-acute reasons were recruited. Patients attending intervention practices received the written material along with a verbal message from the GP to encourage dietary change. The GPs received a short training session and a script to help keep the message brief (see Appendix 1). Two weeks later the patient received a supportive letter from the physician. Three months later 96% of respondents said they received the booklet, however 50% received it from clinic staff other than the GP. Ninety-three per cent reported reading the booklet, and they were more likely to read it if more than 3 minutes had been spent discussing it. There was only a small increase in those reporting that their GP recommended a diet change, however motivation to change related to physician advice was higher in the intervention group at 3 and 12 months. There was a small but significant decrease in self-reported dietary fat intake that persisted to 12 months. There was no difference in fibre intake. The authors concluded that this type of low-intensity intervention was effective in dietary behaviour change.

Campbell et al recruited 558 patients who were booked to attend one of four family practices [25]. Participants completed a survey detailing dietary intake, psychosocial factors such as confidence in ability to change diet, and stage of readiness to change (determined by answers to the questions: 'Have you seriously thought about eating [less fat/more fruit/more vegetables] starting sometime in the next 6 months?' and 'Are you planning to eat [less fat/more fruit/more vegetables] starting sometime in the next 30 days?') (see also in Appendix 2). A newsletter was then tailored to the participant's Stage of Change, dietary intake and psychosocial information. For

example, contemplators received information designed to reduce barriers to change and increase self-efficacy, plus tailored recipes and diet tips designed to promote skills and provide cues to action. Four months later, those who received tailored messages were significantly more likely to remember receiving the information and to have read the whole message, than those who received non-tailored information. The intervention group had also significantly reduced their self-reported fat intakes compared to the control group. Those who received non-tailored information also reduced fat intake, but this was not significant compared to the control group. The authors concluded that tailored nutrition messages are effective in promoting dietary fat reduction for disease prevention.

The Pound of Prevention study invited those who had been screened by the Minnesota Heart Health Program and were of normal weight to participate (n = 3000 - of which 219 enrolled in the programme) [26]. The intervention group received a monthly newsletter for one year on weight control and diet. They were asked to send in their weight and details of any methods used to control weight. A financial incentive and optional education sessions were also offered. Eighty-two per cent of the intervention group maintained or lost weight, compared to 56% of the control group. The authors concluded that programmes for weight gain prevention were feasible. However when the Pound of Prevention intervention was later based in the community, weight change was not significantly different in the treatment and control groups (n = 822) [27].

Lazarus asked patients about their knowledge of nutrition and whether diet was discussed in their consultations before and after a physician-directed intervention [28]. A physician nutrition specialist reviewed charts and gave specific advice for each patient to the GP over a 6-month period. The specialist also provided nutrition education and methods for incorporating dietary advice into the consultation. Written materials were also provided for reviewing with patients. There was a significant increase in the frequency with which GPs discussed nutrition and recommended diets for their patients. There was also a small but significant increase in nutrition knowledge for both physicians and patients on examination. The author concluded that this might be an effective method for nutrition education in a family practice residency/registrar programme.

The OXCHECK study recruited approximately eleven thousand participants from general practice registers and asked them to return a questionnaire [29]. Those that did so were randomised to attend for health checks by a practice nurse over the subsequent four years. Patients receiving health checks in year one (and follow-up in year four) were compared to those attending their first health check in year four. Those with risk factors were followed up as required. Practice nurses received education sessions over the study period. BMI was significantly lower in the intervention group by 1.4%. There were also significant differences in self-reported diet and exercise, and in cholesterol levels. It was concluded that the benefits of systematic health promotion in Primary Care are real, but must be weighed against the costs in relation to other priorities.

In another study, four pairs of general practices from a research framework group were randomised, and recruited 956 patients between 35 and 59 years [30]. Practice nurses in intervention practices were trained by a dietitian to provide dietary advice

based on negotiated change and food substitution. Patients were given leaflets and dietary sheets, and those with a BMI over 25 were given extra advice. They were asked to return in 4-6 weeks and further follow-up was provided only if indicated. Patients in control practices received health education leaflets only. After one year there was a small decrease in self-reported fat intake in those from intervention practices. Weight fell in intervention practices, however the mean difference between matched pairs was only 0.56kg. There was also a marginally significant reduction in serum cholesterol. Due to the modest changes the authors concluded that the use of practice nurses for one-on-one dietary intervention with all patients is probably an ineffective use of resources, and that the focus should be on those at higher risk who may have the potential for a greater long-term absolute benefit.

The Family Heart Study Group took pairs of general practices in fourteen towns who recruited over 8,000 patients from their registers [31]. Intervention participants were screened and given a coronary risk score. Written materials and follow-up were provided according to risk factors. Cardiovascular risk scores were 16% lower after one year in the intervention group than the control groups (12% once adjusted for non-returners and possible accommodation in blood pressure measurements). This was mainly due to lower blood pressure, cholesterol and smoking prevalence. Weight was an average of 1kg lower (BMI 0.4 lower) in the intervention group. The authors conclude that a voluntary health promotion package in Primary Care is not justified by these results.

Some studies focussed on patients with risk factors for diseases related to obesity - three of these are discussed here.

Long-term follow-up of interventions in general practice were reported by Bakx et al from the Nijmegen Monitoring Project [32]. Six practices were randomised to intervention or control. General practitioners were supported for a year to follow-up high cardiovascular risk patients. These patients also received two-monthly health education. Seventeen years later there was no significant difference in BMI or fat intake between the intervention and control groups. The authors commented that further investigation into strategies for use in general practice was required.

Cupples et al targeted 688 patients with angina from general practice registers [33]. The intervention group was given practical advice on cardiovascular risk factors, four-monthly follow-up for 2 years, and health education. Significantly more of the intervention group reported improved dietary habits. However there was no significant difference in BMI or cholesterol between the intervention and control groups. The differences in reported dietary habits did not persist at five year follow-up [34].

Ockene et al targeted a high-risk population with hyperlipidaemia [35]. The intervention consisted of physician nutrition counselling training sessions with or without an office support programme, which included reminders to the physicians and provision of materials. They found a significant effect on weight (2.3kg reduction) and BMI (0.81 reduction) for those patients where the physician received both of these interventions (training and office support). Patients in the intervention group reported a 10.3% decrease in the percent of energy from saturated fat. They also reported that the physicians spent an average of only 5.5 extra minutes discussing

diet. The cost of the intervention was estimated to be $1.86 per patient per year (mainly offset by the lower use of lipid-lowering medication in the intervention group than in the control group). The authors conclude that brief supported physician nutrition counselling can produce beneficial changes in diet and weight.

Table 1: Studies of dietary interventions in Primary Care

Author & year	Type & setting	Intervention	Results
Baron J et al 1990 (21)	RCT General practice UK	Practice nurse group or individual sessions on weight and diet. Written materials. Follow-up encouragement & advice sessions.	Significantly more of the treatment group reported trying to eat more fibre & less fat. Little difference in weight & cholesterol at 3 months & 1year.
Beresford S et al 1992 (22)	RCT Primary Care USA	Self-help materials on a healthy diet, focusing on fat & fibre. Introduced by study nurse & reinforced by phone.	Small significant & consistent reduction in self-reported fat in diet after 3 months.
Beresford S et al 1997 (23) & Lazovich D et al 2000 (24)	RCT Primary Care USA	Self-help booklet & physician verbal message at routine appointment to encourage dietary change. Follow-up support letter.	3 months later 96% remembered receiving book, 50% said received it from someone other than GP. 93% read booklet, & more likely to read it if spent >3mins discussing it. Only small increase in % reported GP recommended diet change, motivation to change related to GP advice higher in intervention group. Small significant decrease in self-reported fat intake at 1year.
Campbell M et al 1994 (25)	RCT Family practice USA	Nutrition newsletter tailored to Stage of Change, dietary intake, & psychosocial information.	More likely to read information through & remember it, compared to those with non-tailored info. Significant reduction (23%) in self-reported fat intake compared to controls.
Forster J et al 1988 (26)	RCT Screening centre USA	Monthly newsletter for 1 year. Return postcard for weight & methods of controlling weight. Financial incentive. Optional education course.	Significantly more in intervention group maintained or lost weight than in control group (82% cf. 56%) after 1 year. Men & non-smokers more responsive.
Lazarus K 1997 (28)	Time series Primary Care USA	Physician nutrition specialist advice for GPs prior to each consultation, education, & written handouts for patients.	Small significant increase in knowledge scores of GPs and patients. Significant increase in frequency diet discussed & recommended (20% to 33%) in consultations. Decrease in nutritionist referrals.
OXCHECK Study Group (29)	RCT General practice UK	Health checks by practice nurse & follow-up visits. Education sessions for the nurses.	After 3 years small (1.4%) but significant reduction in BMI. Self-reported reduction in saturated fat intake. 3.1% reduction in cholesterol & 1.9% reduction BP.
Roderick P et al 1997 (30)	RCT General practice UK	Practice nurses trained by dietitian to give dietary advice based on negotiated change & dietary substitution. Leaflets, dietary sheets given. Follow-up 4-6 weeks, & more if required.	Small decrease in fat intake, small rise in fibre intake, increase in fruit & vegetables, compared to controls at 1 year. Decrease in weight - mean difference between groups only 0.56kg. Marginally significant decrease in cholesterol.
Wood D et al 1994 (31)	RCT General practice UK	Screening interview with research nurse - given a coronary risk score, negotiated lifestyle changes, education, written material, & follow-up according to risk factors (2 monthly to annual).	Slightly lower weight, BP and cholesterol after one year in intervention group. 12% lower risk of coronary events once adjusted.
Bakx J et al 1997 (32)	RCT Primary Care Netherlands	*High cardiovascular risk patients.* GPs received support for 1 year in follow-up of patients. Patients given health education every 2 months by practice nurse.	Seventeen-year follow-up showed no significant difference in BMI, cholesterol, fat intake in intervention group compared with control (had been a difference after 1 year).
Cupples M et al 1994 (33) 1999 (34)	RCT General practice Ireland	*Patients with angina.* Health advice and education every 4 months for 2 years by a research worker at the practice or own home. Follow-up after 5 years	More in intervention group reported improved dietary habits after 2 years. No significant difference in cholesterol, BMI or BP from control group. Increase in daily exercise (44% cf. 24%). No difference in diet, BMI, cholesterol, BP.
Ockene I et al 1999 (35)	RCT Health Maintenance Orgn USA	*Patients with high cholesterol.* Physician training in nutrition counselling (3hr) & an office support programme to remind physicians to discuss dietary change. Written materials.	Significant reduction in weight (2.3kg) & BMI (0.81) compared to control group. 10% reduction in energy from fat. Non-signif decrease in cholesterol. Spent 5.5mins more on counselling. Smaller reduction for training only (no support prog).

Other methods that may be applicable in Primary Care

This section describes reviews and studies of dietary intervention methods that were not based in Primary Care, but where consideration of use in Primary Care is warranted.

A review of effective approaches to healthier eating in the general population was performed in 1997 for the London Health Education Authority and is quoted by Anderson [36]. The main characteristics of effective interventions in a wide range of settings were those that were:

- based on behavioural theories and goals rather than solely on provision of information;
- emphasised personal contact with individuals or small groups using active involvement and specific behaviour-change strategies;
- had some degree of personalisation to individual characteristics;
- provided feedback on individual changes;
- involved multiple contact over a substantial period of time;
- involved encouragement of support by involving family members/colleagues /others.

The authors stated that interventions should also address one related factor such as exercise.

The full report of the Agency for Healthcare Research and Quality (AHRQ) is not yet published, however a summary of their systematic review into the efficacy of interventions to modify dietary behaviour is available [37]. They conclude that interventions with a theoretical basis that included social support, small group work, and food-related activities, were helpful in achieving dietary change.

Brug et al performed a literature review on computer-generated tailored messages for nutrition education [38]. These would involve a baseline questionnaire with the results entered into a datafile. The computer software then uses algorithms to select feedback segments and assemble them into a tailored letter or newsletter. The authors concluded that personalised dietary and psychosocial feedback is more likely to be read, remembered, and seen as personally relevant compared to standard materials. It also appeared to have greater effects in motivating people to change their dietary intake, however the studies were limited and used different materials, theoretical foundations and settings. The authors felt that feedback should include dietary intake levels, dietary patterns, psychosocial factors (such as attitudes and self-efficacy expectations), readiness for change, and suggestions on how to reduce risks.

Several authors have looked at how to personalise nutrition education based on the patient's readiness to change their diet - that is, assessing the Stage of Change that the patient is in. The stages are usually described as precontemplation (not seriously thinking about change), contemplation (seriously thinking about change within the next 6 months), preparation (planning to change within the next 30 days), action (efforts to change of less than the past 6 months), and maintenance (continuing behaviour change for longer than 6 months). With smoking cessation, interventions have been more effective when targeted at those in the preparation and action stages. For those without motivation to change it was seen to be better to encourage the

exploration of the benefits and costs of making changes, in order to avoid increasing their resistance to change or breaking down the relationship.

Greene and Rossi found that individualised Stage of Change dietary feedback on specific behaviour changes and educational materials, was effective at accelerating the rate of change in dietary fat reduction after 6 months, however this effect was no longer significant at 12 or 18 months [39]. Some of the questions that have been used to determine stage of dietary behaviour change are shown in the Appendix 3 [25] [40] [39] [24]. Horwath discusses some of the issues with using Stages of Change such as whether patients should be assigned a stage based on subjective or objective criteria [41]. Details of the debates around the use of such models are beyond the scope of this report. However the above authors have indicated that the use of a simple model in order to target diet information at the patient's readiness to change their diet is worthy of consideration.

Studies in other areas of preventive care have looked at the effectiveness of computer-generated reminders to physicians. The only study found which included weight reduction was based in hospital general medical clinics [42]. Computerised rules/protocols were used to review computerised patient records before each visit and report a reminder to the physician - in this case recommending diet if weight was more than 130% of ideal weight. The computer reminders significantly increased the physician's response to the indication overall and to weight specifically.

DISCUSSION

The majority of the twelve studies on dietary interventions in Primary Care are described as randomised controlled trials, however the unit of randomisation varies from entire general practice, to clinic day, to individual patients. Nine studies were aimed at the general practice population, and three were targeted at patients within the practice population who were found to have cardiovascular disease risk factors. Studies of specific dietary advice for known diseases were not included in this review.

The interventions and their intensity varied considerably across the studies making it difficult to draw many conclusions. Five interventions were carried out by practice nurses, three by general practitioners, and one intervention included both. The remaining three interventions involved researchers, dietitians, or health educators. Seven of the studies involved the use of self-help or other written materials. Only one of these used information that was tailored to the patient's current dietary pattern and stage of change. Five interventions involved follow-up contact with the patient, however the OXCHECK study found no difference between those who attended for annual health checks and those only attending after three years. Only a small number actually involved education on nutrition for the general practitioners or practice nurses.

Some studies would have been affected by selection in that only motivated people would have participated, particularly in follow-up. However this would be the situation in any general practice, and any intervention based in Primary Care should include a strategy for those in the pre-contemplation stage.

Outcomes and their measurement also varied widely. Many outcomes were intermediate with respect to the prevention of weight gain, e.g. dietary fat intake, and many were self-reported. Most of the outcomes were measured up to one year after the intervention. All of these studies (up to 1 year) showed small but significant effects on self-reported diet. Two studies with slightly longer time frames (2 years and 3 years) also showed positive effects, however the only long-term study found no significant effect at 17 years post-intervention. Of the studies which measured change in weight or BMI, four showed a small significant improvement and three showed no significant effect. There was little effect on cholesterol demonstrated. A small number of studies showed an increase in knowledge (1 study) or an increase in the frequency with which diet was discussed or recommended by GPs (2 studies). Two studies demonstrated that patients were more likely to read written information if it was tailored to the individual or was discussed by the GP (for at least 3 minutes).

Some authors of relatively successful interventions concluded that such programmes were not worthwhile uses of resources. However small changes across the whole population, or shifting the population mean BMI, could have significant benefits. For example, Rose estimated that a 25% reduction in the prevalence of obesity could be achieved by an average per person loss of 1kg in weight [43].

The more general reviews and studies on methods for dietary interventions suggest that strategies which are based on theoretical models, such as the Stages of Change or other behaviour change models, may be more successful than just the provision of

information. This in turn means that education sessions for general practitioners and practice nurses may need to include practical skills training, such as counselling, negotiated change, motivational interviewing, and dietary substitution. These reviews also show the importance of more personalised patient information, and encouraging the support of family and others.

Practitioner reminder systems have been studied in other areas of Primary Care, and could be considered in prompting GPs to discuss diet with their patients during routine consultations.

If such interventions were to be provided in Primary Care, practitioners must decide whether to provide this service to their entire practice population or to specifically target those at high risk of developing obesity. There is currently no evidence to suggest one method as being more effective than the other.

The WHO Technical Report on Obesity suggests *selective prevention*, directed at high-risk individuals and groups, as one important part of prevention action [2]. Those at risk may be in certain vulnerable life stages or at genetic predisposition to weight gain. They state that this can be initiated in Primary Care and should aim to improve the knowledge and skills of groups of people so as to allow them to deal more effectively with the factors that place them at high risk of developing obesity. The basic principles suggested are recruitment and referral (including opportunistic screening of patients who present for other conditions, and public health screening within other programmes); comprehensive health assessment; goal-setting; selection and implementation of appropriate management scheme; monitoring and evaluation.

The British Nutrition Foundation Task Force on Obesity identified at-risk groups as obese children and children with obese parents, rapid weight gainers (>5kg in 5 years), post-obese, pregnant women, smoking quitters, physically inactive, and certain ethnic groups [6]. The SIGN Obesity Guideline recommends that weight management be routinely offered in certain clinical situations which are recognised as leading to weight gain, e.g. enforced immobility, steroid therapy, hormone replacement therapy, and smoking cessation [7].

Healthy weight New Zealand Taumaha Tika Aotearoa 2001 describes high risk groups for targeting as including: having both parents overweight or obese; being Maori especially associated with geographical isolation and economic disadvantage; being of Pacific origin and also associated with economic deprivation; being overweight in childhood; being an older male especially with abdominal obesity; and being physically inactive [44].

There have been several studies targeting children and adolescents for obesity prevention, however these have generally been based in schools or the community, or have involved family therapy with dietitians and paediatric services, rather than Primary Care. These studies are discussed in several good reviews [45] [3] [46]. A national American initiative, Bright Futures, is specifically designed to provide information for health professionals on developmentally appropriate nutrition advice from birth to age 21 years and includes information on the prevention of obesity (www.brightfutures.org). It is not known how widely used this is or how effective.

CONCLUSIONS

From international literature it appears that patients would be happy to receive dietary advice from their general practitioners, who they see as a credible source in a mixed message environment. General practitioners also realise the importance of providing this information but feel under-prepared to do so. In this country many general practitioners have been using the 'Green Prescription' to encourage their patients to take more regular exercise. Basic nutrition advice could be given in a similar simple manner, enabling GPs to provide comprehensive weight gain prevention for their patients.

It is difficult to draw strong conclusions from the literature examined. However it is suggested that a minimal intensity intervention by Primary Care providers may have a small positive effect on lowering dietary fat intake in the short to medium term. It appears that either general practitioners or practice nurses could provide this sort of intervention. It may not be necessary to provide a large amount of education on nutrition for Primary Care providers, however more practical training, for example, counselling skills, scripts, and office support systems may be useful. It is appears that the provision of written materials for patients is useful, and that individually tailored information may be more effective.

Such interventions could perhaps be targeted at those groups known to be at risk of developing obesity on an opportunistic basis - that is, when they present for any non-acute condition. These at risk groups are:

- children of obese parents, where the information is targeted at the parents
- rapid weight gainers (>5kg in 5 years)
- those who have recently been obese or overweight
- pregnant women
- those giving up smoking
- those who are physically inactive
- post-menopausal women
- particularly Maori in the above groups
- particularly Pacific peoples in the above groups

RECOMMENDATIONS

It is recommended that the Public Health Dietitians consider the type of assistance that may be effectively offered to Primary Care. This may include:

- a written aid (such as a script) for general practitioners and practice nurses to assist their discussions with patients on diet and determining their current stage of change (this may be developed by adapting and adding to those displayed in the Appendix);
- written materials for patients that are able to be tailored to the patient's current dietary patterns and stage of change;
- nutrition education and skills training for general practitioners and practice nurses. The amount and type of education, and the vehicle for keeping them up-to-date, would need to be determined by discussions with Primary Care providers.

It is recommended that the Public Health Dietitians determine the feasibility of developing such resources, and if indicated approach IPAs or other Primary Care providers with a basic 'mock-up' package in order to determine their support for such a strategy. The aim would be to run a pilot project in conjunction with an IPA, which could be fully evaluated before any further programmes are implemented.

It is recommended that the Ministry of Health is kept informed of any such project to ensure it is in line with their development of the Obesity Toolkit.

It is recommended that this report be widely distributed for comment, including Primary Care and the Ministry of Health.

UPDATE MAY 2003: ACTION

The key points from this Literature Review were included in 'Primary care interventions to prevent obesity,' Public Health Advice 2002.

A tool enabling patients in a general practice setting to be provided with tailored nutrition messages is currently being developed. In effect these messages will take the form of a 'food script' tailored to a patient's readiness to change and current eating habits. The aim of the messages is to assist in preventing overweight people from becoming obese and key contributing food behaviours are targeted.

The Nutrition Team also provides nutrition education and skills training for general practitioners and practice nurses. Contact Kate Sladden: kates@adhb.govt.nz or Christine Cook: ccook@adhb.govt.nz

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APPENDIX

1) **Physician script for introducing dietary intervention during Patient visit**
Lazovich D et al. (24)

Introduction

- Food choices are an important part of maintaining health
- Healthy food choices reduce the amount of fat and raise the amount of fibre in diet
- Benefits
  - Short term: more energy, lose weight
  - Long term: reduce risk of heart disease and cancer

I will give you a booklet of strategies for making healthy eating choices

Have you been making any efforts to eat a healthier diet (i.e. low fat, high fibre)?

↓

If Yes:	**If No:**
• Great! • take this booklet.	• You're not alone. • Many think changing their diet is too complicated or that healthier eating means giving up all their favourite foods.
• I think you'll probably find some new ideas in addition to what you're already doing.	• A few simple changes for big improvement. • Take this booklet. • Read through it, and I think you'll find some useful tips that you may be ready to try.

Please complete

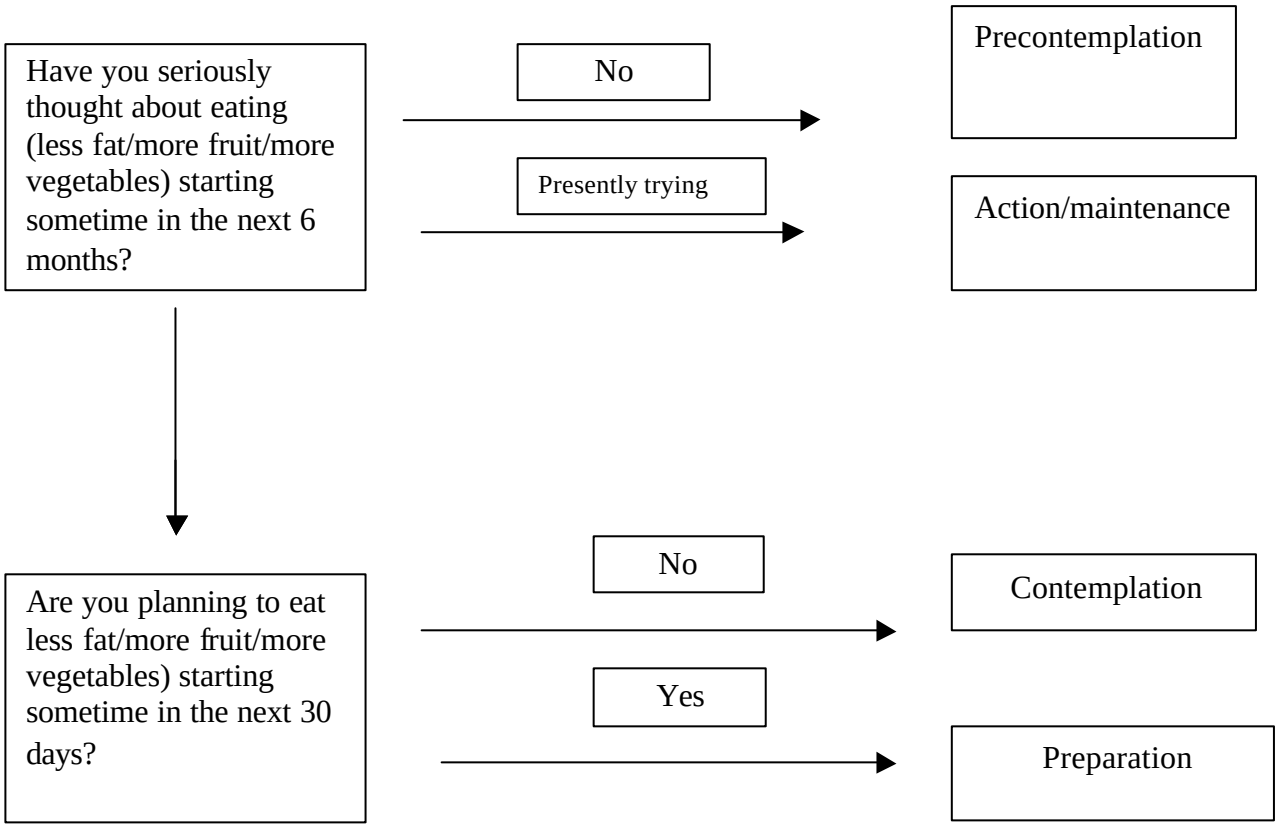
1. Materials given to patient:
   - yes
   - ð no

   If no, the reason was:
   - ð time limitation
   - ð patient illness
   - ð patient refusal
   - ð other (please specify)_____

2. Other dietary advice given:
   - ð referral to dietitian
   - ð MoH pamphlet
   - ð Other:_____

   Signed_____ Date:_____

2. Stages of dietary behaviour change
Campbell M et al. [25]



3. **Three-step stage of change algorithm.**
Greene G et al. [39]

Stage is indicated in italics.

Step 1: Intention assessed

Do you consistently avoid eating high- fat foods?
"Yes, I have been for more than 6 months" *maintenance*
"Yes, I have been but for less than 6 months" *action*
"Yes, I have been for more than 6 months" *preparation*
"No, but I intend to in the next 30 days" *contemplation*
"No but I intend to in the next 6 months" *precontemplation*

Step 2: Behavioural criterion for effective action assessed for subjects answering "Yes" at Step 1

If fat intake <30% of total energy, *action or maintenance as defined in Step 1*
If fat intake >30% of total energy, *unclassified*

Step 3: Unclassified subjects' intentions assessed

1. " Do you almost always take the skin off your chicken?" (if you eat red meat but do not eat chicken, answer "no" . If you do not eat red meat or chicken, answer "yes".)
2. "Do you often eat reduced fat or low-fat cheese?" (If you rarely eat cheese, answer "yes")
3. "Do you often use light, fat-free, or no salad dressing?" (If you do not eat salads, answer "no")
4. "Do you sometimes eat fruit and vegetables as snacks?" (If you do not eat high-fat snacks like chips, pastry or doughnuts answer "yes")
5. "Do you often eat bread, rolls, or muffins without butter or margarine"?

"If you answered "yes' to 4 of the above questions, do you intend to reduce your dietary fat so it is lower than it is now?"*

"If you answered "yes" to 3 or fewer of the above questions, do you intend to reduce your dietary fat intake so you will be able to answer "yes" to at least 4 of the questions?"*

"Yes and I intend to in the next 30 days" *preparation*
"Yes, I intend to in the next 6 months" *contemplation*
"No, and I do not intend to in the next 6 months" *Precontemplation*

* Subsequently refined to a single question: "Do you intend to change what you are eating so that you can answer "yes" to all 5 of the questions?"

4. Questions and algorithm used to assign stages of change for a low-fat diet.
Kristal A et al. [40]

1. How high is your overall diet in fat? Is it------

Low
Very Low

How long have you followed a diet low in fat? Would you say…
Less than 1 month — **Action**
1 to 5 months

6 to 11 months — **Maintenance**
1 year or more

In the middle
High — Go to Question 2
Very high

Don't know — Go to Question 2

2. In the past 6 months, have you tried to eat less fat?:

YES

How successful were you? Would you say…….

Very successful
Somewhat successful — **Preparation**

Not successful — Go to Question 4

NO — Go to Question 3

3. Are you seriously thinking about eating less fat over the next 6 months?

YES — Go to Question 5
NO — **Precontemplation**

4. Do you plan to continue trying to eat less fat over the next 6 months?

YES — **Preparation**
NO — **Contemplation**

5. How confident are you that you can change your diet to eat less fat? Would you say…….

Very confident
Somewhat confident — **Preparation**

Not very confident — **Contemplation**
Don't know