Developing nutrition education resources for a multi-ethnic population in New Zealand

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Abstract

In New Zealand, the burden of nutrition-related disease is greatest among vulnerable and disadvantaged groups, including Maori and Pacific peoples. However, little research is currently available on effective ways to improve nutrition in these communities. This paper describes the development of six paper-based nutrition education resources for multi-ethnic participants in a large supermarket intervention trial. Six focus groups involving 15 Maori, 13 Pacific and 16 non-Maori, non-Pacific participants were held. A general inductive approach was applied to identify common themes around participants’ understanding and thoughts on relevance and usefulness of the draft resources. Feedback from focus groups was used to modify resources accordingly. Five themes emerged across all focus groups and guided modification of the resources: (i) perceived higher cost of healthy food, (ii) difficulty in changing food-purchasing habits, (iii) lack of knowledge, understanding and information about healthy food, (iv) desire for personally relevant information that uses ethnically appropriate language and (v) other barriers to healthy eating, including limited availability of healthy food. Many issues affect the likelihood of purchase and consumption of healthy food. These issues should be taken into account when developing nutritional materials for New Zealanders and possibly other multi-ethnic populations worldwide.

Introduction

The impact of nutrition on health is substantial, with high blood pressure, high cholesterol, high body mass index and low fruit and vegetable intake accounting for 30% of deaths worldwide each year [1]. Risk of disease is also influenced by socio-economic and cultural factors; in New Zealand, more deaths (47%) among Maori (indigenous New Zealanders) than among non-Maori (39%) can be attributed to nutrition-related risk factors [2], and substantially more Pacific Island people living in New Zealand (6.5% of the population) are overweight or obese (82% of males and 79% of females) compared with their total population counterparts (60 and 47%, respectively) [3]. However, small improvements in nutrition-related risk factors could have a major impact on population health within a decade [4–6].

The World Health Organization has reviewed the evidence for diet and the prevention of chronic disease [7], and most developed countries have translated this evidence into national nutrition goals. The New Zealand Ministry of Health recommends...
consumption of a variety of nutritious foods from each of the four major food groups each day, including fruit and vegetables; wholegrain breads and cereals; low fat milk and milk products and lean meat, poultry, seafood, eggs or alternatives [8]. In addition, pre-prepared foods should be low in added fat, especially saturated fat, salt and sugar, and we should drink plenty of fluids each day, keeping alcohol to a minimum [8]. Although national healthy eating guidelines seem straightforward, evidence suggests individuals may not always be aware or know how to interpret or implement guidelines when shopping for and consuming food [9, 10].

Information and knowledge are important with regard to making healthy food choices [11] and thus achieving national nutrition goals. However, nutrition education interventions do not always achieve success [12, 13], and positive effects are often small [12] or not followed up to determine whether they are sustained [14]. Lack of effectiveness may be due to failure to address the context of food choice [14]. Focussing on behaviours or practices, providing intensity of support [14], and addressing influences on behaviours with personal, appropriate and relevant advice have been identified as common components of successful dietary intervention studies [12, 14].

The context, or factors affecting food choice, may differ across population groups. Thus it is essential to explore these issues when developing nutrition education messages [15]. It has been documented that effective health messages for Maori and Pacific communities may differ from those of other New Zealand cultures and are largely dependent on relevance of the message to the individual or family [16]. Because Maori and Pacific are at greater risk of nutrition-related disease [2, 3] compared with European and other groups, it is critical to establish successful nutrition interventions for these communities.

In 2004, the Supermarket Healthy Options Project (SHOP) feasibility study was undertaken to test the viability of a large, randomized controlled trial of strategies for the promotion of healthier supermarket food purchases [17]. The subsequent SHOP trial [18] includes a tailored nutrition education intervention arm to improve supermarket food purchases (primary aim to decrease saturated fat content) in Maori, Pacific and non-Maori, non-Pacific (NMNP) shoppers. Nutrition education resources for the trial were to be tailored by household demographics (ethnicity and age), special dietary requirements (diabetes and vegetarianism) and usual food purchases (individualized, electronic sales data).

The research team, including Maori and Pacific researchers, drafted a set of six, paper-based, personally tailored nutrition education resources to form the basis of the SHOP nutrition education intervention.

Our aim was to:

(i) Establish if Maori, Pacific and NMNP shoppers considered the draft nutrition education resources useful, easy to understand, relevant and acceptable.
(ii) Determine what improvements could be made to the draft nutrition education resources to make them more suitable, useful and acceptable for the intended study populations.

Methods

Initial development of the tailored nutrition education resources

As part of the SHOP feasibility study [17], six focus groups were completed in December 2004 [two with Maori (n = 25), two with Pacific (n = 32) and two with NMNP (n = 22) shoppers], with one aim being to gather information on the potential nutrition education intervention for the main trial. Two major relevant findings from these focus groups were: (i) Pacific participants expressed a strong preference for nutrition materials in their own language and (ii) higher price was reported by all groups as a barrier to buying healthy food.

Based on this background knowledge, a research team including Maori and Pacific researchers (with expertise in developing nutrition education resources for their respective communities) conceived the following aims for the SHOP trial nutrition education intervention:

(i) Using individualized, electronic supermarket sales data, provide tailored feedback to
trial participants promoting healthier options as substitutes for ‘less healthy’ supermarket foods currently bought.

(ii) Where possible, suggest healthier alternatives that are either cheaper or of similar cost to their less healthy counterparts.

(iii) Provide nutrition education that is culturally appropriate for Maori, Pacific and NMNP shoppers.

Based on these three aims and the Food and Nutrition Guidelines for Healthy New Zealand Adults [8], the research team drafted a package of six nutrition education resources to form the basis of the tailored nutrition education programme (Table I). The draft resources were developed in collaboration with a graphic designer experienced in developing nutrition education resources for Maori and Pacific ethnic groups.

**Focus groups**

**Participants and methods**

Six focus groups including 15 Maori, 13 Pacific and 16 NMNP participants were conducted between January and March 2007. Maori and NMNP groups were carried out in the Auckland region and Pacific groups in Wellington region of New Zealand. The primary purpose of the focus groups was to evaluate the draft resources in terms of appropriateness for the target populations and ascertain whether they addressed the main barriers these groups face when shopping for and consuming healthy food. Therefore, although some resource design issues may have also been addressed, they are not the focal point of this paper.

Participants were recruited using flyers distributed at supermarkets, libraries, Citizen’s Advice Bureaus and learning institutions, and through Maori and Pacific networks. Participants were aged over 18 years and were the main food shopper for their household. Informed consent was obtained from all participants. Ethics approval for the SHOP trial and associated protocol and documents were received from the University of Auckland Human Ethics Committee.

**Procedures and analysis**

Maori and Pacific focus groups were run by trained facilitators of the same ethnicity as participants, and NMNP focus groups were run by a trained facilitator

**Table I. Draft nutrition education resources pre-tested in the focus groups**

<table>
<thead>
<tr>
<th>Resource name</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The Fat in Our Food</td>
<td>Introduces and explains fat and saturated fat; what these nutrients are, which foods they are found in, why we should minimize intake and practical tips.</td>
</tr>
<tr>
<td>2. Tailored Feedback Letters</td>
<td>Shows the amount (% of total energy) of total and saturated fat currently purchased, compared with national guidelines. Introductory letter shows baseline compared with national guidelines. End of intervention letter shows baseline compared with guidelines and post-intervention.</td>
</tr>
<tr>
<td>3. Food Group Resources</td>
<td>Five resources, each based on a main food group (fats and oils, meat and alternatives, milk and milk products, cereal and cereal products and fruit and vegetables). Shows the major foods in the food group, healthier choices, number of serves per day and examples of appropriate serving sizes.</td>
</tr>
<tr>
<td>4. Healthy Recipes</td>
<td>Healthy recipes centred on the main food groups. Predominantly main meals.</td>
</tr>
<tr>
<td>5. Tailored Messages</td>
<td>Pictorial messages showing participants’ healthier options for foods they currently buy at the supermarket which are considered less healthy. Major nutrients and price are compared between ‘healthier’ and less healthy products, and health benefits of choosing the ‘healthier’ option are shown.</td>
</tr>
<tr>
<td>6. Tailored Healthy Shopping List</td>
<td>Lists healthier foods already purchased and recommendations for healthier alternatives to less healthy foods usually purchased. The shopping list is cumulative so that each month new foods are added, resulting in a complete healthier shopping list at end of intervention.</td>
</tr>
</tbody>
</table>
of European descent. Following an introductory section to describe the SHOP trial (including intended use of the final materials), participants were shown the six resources for the first time. Nutrition education resources were revealed one by one using Microsoft Power Point presentation slides or overhead projector transparencies. Laminate hard copies were also provided (enough for one between every two to three focus group participants). A semi-structured interview schedule was used to guide group discussion (Appendix 1); however, the facilitators transcribed the key findings and applied a general inductive approach to identify themes. Therefore, the results of the focus groups are presented under ‘themed’ headings, rather than under the specific questions included in the interview schedule.

Focus group sessions were scheduled to last for between 1 and 2 hours, providing ~10–20 minutes for discussion of each resource. Facilitators moved on to the next resource when the questions outlined in the semi-structured interview schedule were completed and saturation in new themes appeared to be reached. The focus groups explored participants’ understanding and thoughts on the relevance and usefulness of the draft nutrition education resources. Focus group sessions were audiotaped with full consent, and participants were provided with petrol and supermarket vouchers on completion of the sessions as reimbursement for time and travel. Light refreshments were also provided.

Following completion and analysis of the focus groups and identification of the main themes, the research team modified the resources for each ethnic group accordingly, incorporating the focus group findings.

**Relationships and processes with Maori and Pacific researchers**

From the conception of the feasibility study, a research partnership was created including Maori and Pacific community organizations. These organizations were provided with appropriate resources for their researchers to lead the drafting of the nutrition education resources, recruit Maori and Pacific focus group participants, organize and facilitate their respective focus group sessions and contribute to the analysis, interpretation and dissemination (including publication) of results.

**Results**

The six focus groups involved a total of 44 participants (15 Maori, 13 Pacific and 16 NMNP). Groups consisted of between four and nine participants each (predominantly females aged between 18 and 50 years). All the main Pacific Island groups were represented in the two Pacific focus groups [Tongan (n = 4), Samoan (n = 2), Cook Island (n = 3), Tokelauan (n = 2) and Niuean (n = 2)].

Five themes emerged: (i) cost; (ii) habit; (iii) knowledge, understanding and information; (iv) relevance and language and (v) additional barriers to healthy eating. All five themes were common across the six focus groups, regardless of the ethnicity of the group.

**Theme one: cost**

The biggest barrier facing focus group participants in making healthy food choices was perceived to be cost, especially for large families, which were the case for Maori and Pacific participants. Participants often purchased private label (home brand) food brands or low-cost brands, and healthier alternatives were not always seen to be available within these ranges. Some participants said they would only buy healthier food if the benefit was 2-fold; the price cheaper and the food healthier than what they would usually choose. When asked about barriers to healthy eating, responses included:

- When you have a whanaū (family) to feed, the main thing you think about is everyone on a budget. (Maori participant)
- They should lower the price of healthy foods because I usually go for the cheaper stuff. Cost is an issue. (Pacific participant)
- Price, definitely. (NMNP participant)
Theme two: habit

Focus group participants acknowledged that nutrition information was likely to be the first step towards changing their behaviour concerning healthy food choices. However, they conceded that behaviour change was likely to be a long-term process because of established habits around shopping, buying and consuming food. Participants felt that a significant incentive (such as losing weight, living longer and being around for children/grandchildren) would be needed to change food habits because they are intergenerational. Focus group participants also noted that taste preference is related to food choice, but felt this could be changed by small incremental steps (such as moving from full fat milk to reduced fat milk and then to skim milk). Messages around changing habits should focus on positive changes rather than negative ones and be empowering rather than discouraging. When asked about reasons for making food choices, responses included:

It was what you were bought up on … (Maori participant)

When I found out I had diabetes, that’s what made me change my habits. (Maori participant)

Habit, because you usually spend at least 20 minutes in the supermarket running from aisle to aisle. (Pacific participant)

… like I bought this cereal and it just tasted like grated branches. I thought it’s healthier but I’m never going to eat that. (NMNP participant)

Theme three: knowledge, understanding and information

The type of education, how it is delivered and who it is targeted to are all very important when trying to influence decision making around healthy food. Focus group participants wanted to know alternative healthy options for foods as well as the cost of these healthier foods so they could make comparisons when shopping. Information needed to be practical, such as provision of specific examples of healthy foods and ‘how to’ information, including recipes and tips. Participants felt any recipes provided should be quick and easy to prepare and focus around the main meal of the day, as this was when most people had time to prepare food. Pictures were preferred over text and only one or two mail-outs per month so as not to overwhelm people with information. When asked about what they would find helpful to be included in nutrition education resources, responses included:

Need information about what brands to get rather than just floury potatoes … (Maori participant)

Should put down healthy choices throughout the pamphlet. (Pacific participant)

The only time anyone has the time to do anything even slightly different is just dinner or dessert. (NMNP participant)

… it would be good to have comparisons between the different two types of milk so you can think ‘oh that is the better choice’. (NMNP participant)

Theme four: relevance and language

Participants felt that it was important for nutrition information to be relevant to the ethnicity that they identified with, including pictures used, examples of foods, and any use of language. For Maori and Pacific participants, the native language was preferred, but not so much that it would seem ‘scary’. Where native language was used it needed to be common words that were clear and correctly spelt. Different options suggested for a slogan as an ethnic-specific healthy eating theme across resources included:

Kia ora ai tō whanau (so that your family may be well). (Maori participant)

‘Shop Smart, Make Healthy Pacific Families’ at the top and put at the bottom ‘Make the healthy choice’. Push positive for Pacific. (Pacific participant)
Just enough Maori on the Pakeha side—too much will be scary—not enough will be not Maori enough. (Maori participant)

**Theme five: barriers to healthy eating**

In addition to cost (theme one), several other barriers to healthy eating were identified. These were: poor availability of healthy food in some community areas, lack of knowledge about how to cook healthy food, difficulty in changing the food that you were bought up on, lack of access to information about choosing healthy food, little time to prepare food, lack of nutrition information/tools, and education needed for the whole family in order to make changes possible. When asked about barriers to healthy eating, responses included:

Whanaū education—they WILL buy what’s cheaper. (Maori participant)

Other options need to be available—and we need to be told about them on a regular basis. (Maori participant)

It’s hard to compete with the Pacific food and taste. We are used to eating it. (Pacific participant)

…it like tofu or something if you don’t know how to marinate it. (NMNP participant)

**Findings by ethnic group**

Although the five themes emerged from all the focus groups, cost, relevance and language and two barriers to healthy eating (difficulty in changing the food that you were bought up on and education needed that involves the whole family) were especially pertinent for participants in the Maori and Pacific sessions. Although these themes also emerged from the NMNP sessions, habit and little time to prepare food (an additional barrier to healthy eating) were more common issues for this group.

**How focus group results guided resource development**

The key themes derived from the focus groups were used to guide the modification of the six draft nutrition education resources as follows.

**Cost**

All recipes and resources were checked and any expensive food items (such as fresh herbs and higher quality cuts of meat) were made optional, removed or replaced with a lower cost alternative (such as dry herbs and lower quality meat cuts that are still relatively low in fat). Tips were also included in the recipes explaining practical substitutions for foods, such as canned fruit to replace fresh fruit. Further, the word ‘affordable’ was added to the byline on each recipe: ‘tasty, easy, affordable’. For the tailored messages, the average cost of each ‘healthy’ and less healthy alternative was added so that a price comparison could be made between usual food choices and those recommended. Where possible, healthy foods recommended were cheaper or of similar cost to their less healthy counterparts.

**Habit**

Resources were checked and healthy tips and messages were changed to ensure that they were framed positively. Further, positive messages such as ‘contains heart-healthy fats’ and ‘lower your family’s chance of heart disease’ were added to the tailored messages to empower participants to make changes and to show them that buying healthy food could have a 2-fold incentive (cheaper and lower risk of disease). Participants were encouraged to make small incremental changes, such as moving from full fat milk to low fat milk to skim milk. Within the shopping list, all recommendations (‘healthier’ alternatives for less healthy foods that they usually purchase) were listed with a star alongside the product name so that participants could identify these new items and make good, quick decisions at the point of purchase.

**Knowledge, understanding and information**

Text was minimized and more pictures were added to the nutrition resources. To explain the concept of serving size within each food group, pictures were taken showing appropriate servings of healthy foods in the palm of a hand. For the tailored messages, the amount of fat and saturated fat was changed from text to being represented in teaspoons, and the amount of sodium changed from milligrams
to grams of salt (depicted as circles). In addition, a free telephone number was set-up for participants to call should they have any questions about the nutrition education information provided.

**Relevance and language**

Three templates including bylines were developed; one each for NMNP, Maori and Pacific participants. The bylines were as follows—(i) NMNP: ‘Shop Smart! For a Healthy Family. Healthy Choice, Healthy Family’; (ii) Maori: ‘Kia mái, kia ū! Kia ora ai tō whanau’ (Healthy Food: Be brave, stick to it, for family wellbeing) and (iii) Pacific: ‘Shop Smart! Make Healthy Pacific Families. Healthy Choice, Healthy Pacific Family’. Maori language was used to a moderate degree throughout Maori resources, with only common words such as whānau (family) replacing English text. Foods were checked to ensure they were relevant and familiar for each ethnic group (e.g. kumara for Maori and taro for Pacific), and the recipes chosen reflected a balance of new and healthy versions of traditional ethnic food.

**Additional barriers to healthy eating**

Recipes were chosen that were simple, quick to prepare, used familiar ingredients and included healthy versions of traditional ethnic food. The theme of family was taken into account by adding a picture of a healthy family, adding family to the byline of each template and including recipes suitable for children.

Examples of the final resources are shown in Figs 1–5.

**Discussion**

We identified five themes that are important when developing nutrition education resources for a multi-ethnic population: (i) cost; (ii) habit; (iii) knowledge, understanding and information; (iv) relevance and language and (v) other barriers to healthy eating. These themes emerged across all focus groups, irrespective of ethnicity. However, cost, relevance and language and two other barriers to healthy eating (difficulty in changing the food that you were brought up on and education needed for the whole family) emerged as more common issues for Maori and Pacific shoppers. The most common issues for NMNP were habit and little time to prepare food.

As far as we are aware, this is the first New Zealand research describing factors determining the purchase and consumption of healthy food for Maori, Pacific Island and other New Zealanders. Nevertheless, our findings are consistent with those of international studies in other ethnic, minority and majority population groups. In addition, our findings were similar across all ethnic groups studied, which is also a frequent finding of similar international research.

Previous research conducted in the United States and UK has investigated the barriers to buying and consuming healthy food [19–22]. When exploring attitudes and obstacles towards eating more fruit and vegetables, cost, [20, 21, 23], habit [21], taste [21, 23] and time [20, 21, 23] have all been identified as key barriers. In addition, family has been identified as the important unit when making food choices and preparing food [19, 20, 22], and lack of knowledge has been perceived as a barrier to choosing healthy food [20, 22].

In the United States, Strolla et al. [22] used mixed methods (focus groups, professional interviews and a telephone survey) to explore barriers and motivators to healthy eating for the development of a tailored nutrition education intervention for low-income Hispanic and non-Hispanic adults. Participants were a convenience sample recruited through face-to-face methods, flyers and posters at low-income housing, health fairs and public health clinics. In a combined analysis of all methods, barriers to eating less fat and more fruit and vegetables included; not liking the taste, lack of knowledge on how to choose and prepare low fat food, not a habit, too expensive, traditional foods are not low in fat, and lack of time [22]. Motivators to healthy eating included; wanting to set a good example for one’s family, and losing weight and feeling good about one’s self [22]. Similar to our results, these themes were found across both the minority (Hispanic) and other (non-Hispanic) respondents. However, some themes were identified by Strolla et al. [22] that were not found in our research, such as the following...
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Fig. 1. ‘The Fat in Our Food’ resource for NMNP shoppers.

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The Fat in Our Food

▲ Be aware of the amount of FAT you eat, especially SATURATED FAT

**THERE ARE TWO TYPES OF FAT:**

1. **SATURATED FAT**
   - A type of fat from palm, coconut and animal sources

2. **UNSATURATED FAT**
   - Other types of plant fats

**SATURATED FAT IS FOUND IN:**

- Coconut, Eggs, Meat, Butter, Chocolate, Cream, Cheese, Cakes & Biscuits

**UNSATURATED FAT IS FOUND IN:**

- Nuts & Seeds, Soy, Avocado, Oil, Margarine

**WHY EAT LESS FAT?**

- Eating less FAT can help to keep your family in healthy shape
- A healthy weight and normal blood cholesterol lower your family’s chance of heart disease

**HOW TO DECREASE FAT & RISK OF HEART DISEASE**

- Buy oil and margarine instead of butter
- Buy low fat milk and milk products
- Choose low fat fat cream, coconut cream, mayonnaise and dressing
- Buy less pies, pizza, chips, chocolate and biscuits

Make one small change at a time. This will help you stick to it

Healthy Choice, Healthy Family
Fig. 2. Fruit and vegetable food group nutrition education resource for Pacific shoppers.
Shop Smart! For a Healthy Family

Tasty, easy, affordable

Minestrone Soup

Serves

Ingredients

- olive oil or canola oil spray
- 1 onion, chopped
- 1 potato, cubed
- 1 carrot, cubed
- 400g can tomatoes in juice, chopped
- 1 pkt Maggi Rich Tomato Soup Mix
- 2 tsp Maggi Garlic Stock Powder
- 3½ cups water
- 1 cup courgette, cubed
- 1 cup chopped green beans
- ¼ cup dried pasta
- 2 tbsp chopped fresh or dry parsley

Method

1. Spray a large saucepan with oil and heat. Add onion and cook for 2 minutes.
2. Add potato, carrot, tomatoes, soup mix, stock powder and water. Bring to boil, stirring. Cover and simmer for 15 minutes, stirring occasionally.
3. Add courgette, green beans and pasta. Simmer uncovered for a further 15 minutes or until pasta is cooked, stirring occasionally.
4. Stir in chopped parsley and serve with bread.

Fig. 3. Example of healthy recipe for NMNP shoppers.
Make the Healthy Choice…

YOU USUALLY CHOOSE...
Brand X Unsalted Butter

HEALTHIER CHOICE...
Brand X Low Salt Spread

SATURATED FAT?
11½ Teaspoons
TOTAL FAT?
16½ Teaspoons
COST?
$0.50*
per 100g

SATURATED FAT?
2 Teaspoons
TOTAL FAT?
14 Teaspoons
COST?
$0.40*
per 100g

* Based on the usual cost at a supermarket over one year. Actual cost may vary with season and specials.

Fig. 4. Example of tailored nutrition education message for Maori shoppers.
barriers to healthy eating; the family not wanting to eat less fat, most food being eaten at restaurants and vegetables not thought to be satisfying. Nevertheless, despite different countries and different cultural groups, in general, the main findings parallel ours [22].

Similarly, Denham et al. [19] completed several focus groups (52 over a 5-year period) to investigate cultural themes relevant to health education in Appalachia (a mostly rural and largely isolated region in the United States). Focus group participants were a self-selected convenience sample recruited through personal networks, word of mouth and snowballing techniques and were predominantly adult women [19]. As in our research, the family unit was consistently reflected as the central component to health, and older members of the family were seen to as role models for health-related behaviours for younger family members [19]. Moreover, when looking at effective health messages, participants preferred pictures over words, did not like messages that ‘preached to them’ and expressed a desire to be given information that was relevant to their lives and practical within their circumstances [19]. Participants also expressed that it was the woman’s role to maintain the health of individual family members [19]. Although not an explicit finding of our research, it may be implicit in the suggested focus on family/whanau.

We have shown that there are many important issues to consider when developing nutrition education for a multi-ethnic population. Following our focus groups, we modified our resources to take into account the barriers Maori, Pacific and NMNP face when shopping for and consuming healthy food. We collaborated with experienced Maori and Pacific health community workers, ensuring they were well resourced to enable their skills and knowledge to be used to inform the research. The management of the focus groups by an experienced facilitator of the same ethnicity as study participants was essential to recruit Maori and Pacific Island participants and make them feel comfortable in sharing their thoughts and ideas during the sessions. The individual experience and skills of the facilitators further enabled them to draw out ideas and ensure the sessions remained focussed. Our collaboration with Maori and Pacific researchers was also crucial to encourage possible acceptance and success of the nutrition intervention programme across a multi-ethnic population. Furthermore, previous experience of our Maori and Pacific researchers in developing nutrition education resources and training courses for their communities supported that our

Fig. 5. Healthy shopping list for Pacific shoppers.
findings were reflective of those expressed in earlier focus group and course sessions and were thus representative of the intended study population.

However, although the use of appropriate focus group facilitators of the same ethnicity as participants was crucial, it meant that each pair of ethnic-specific focus groups was transcribed and analysed by a different researcher (three researchers in total; one for each ethnicity). This is unusual in focus group work and may have affected the consistency of interpretation of the focus group discussions. Nonetheless, the uniformity of our results across ethnic groups suggests that the larger number of facilitators did not greatly affect our findings.

In conclusion, improved nutrition is central to reducing many of our largest risks to health, and even modest improvements in shopping habits and the nutrient content of purchased and consumed foods are likely to have substantial health benefits, if they are adopted widely. This is particularly true if the interventions are adopted by the population groups at the greatest risk of nutrition-related diseases, including those in multi-ethnic populations. However, to effectively intervene in these groups, it is important for researchers to use a participatory approach in developing nutrition education materials. In addition, we strongly recommend relationships with experienced nutrition researchers in the communities of the intended study population and provision of resources to enable collaboration from conception of the research. This should increase the acceptability of study methods and interventions by the populations they are intended for.

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**Conflict of interest statement**

None declared.

**References**

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Appendix 1. Format and questions from the tailored nutrition education focus groups

Introduction

1. Thank participants for attending
2. Introductions/mihimihi
3. We’d like to show you nutrition pamphlets created for Maori/Pacific/Non-Maori, Non-Pacific supermarket shoppers who volunteered to take part in a nutrition study
4. We’re hoping the pamphlets will help improve their understanding of healthy eating and encourage them to make healthy kai/food choices at the supermarket
5. The nutrition study will last 6 months. Each month, Maori/Pacific/Non-Maori, Non-Pacific in the study will receive a package of nutrition information in the post
6. The package will include:
   a. Personalised health messages—giving healthier options for food they have recently bought at the supermarket
   b. Serving size information
   c. Healthy recipes
   d. A healthy shopping list
   e. Some general pamphlets about healthy eating
7. Each month’s package will have a different theme based on a group of similar foods e.g. dairy products, or bread and cereal products etc
8. We’d like to hear your views on 5 different pamphlets that have been created for one of the nutrition packages
9. We want to make sure they are appealing, useful and easy to understand
10. I will show one pamphlet at a time and ask a number of questions about each one, opening discussion for all of your responses and input
11. It doesn’t matter if you have different opinions. The aim is not to have you all agree on what you think about the pamphlets, but to have everyone share their own views.

12. The session will last 1.5–2 hours. *(The scribe)* will take written notes and record our korero/discussion on audio-tape. Afterwards, she/he will listen to the tape and write up our entire korero/discussion for the session. No one else will listen to the tape and you will not be identified in the written record of the tape.

13. We will then make changes to the pamphlets based on the feedback you give tonight, so that they will be more useful for Maori/Pacific/Non-Maori, Non-Pacific in the nutrition study.

14. Any questions so far?

### Introductory Letter and Information on Fat Intake

1. First letter to go out to Maori/Pacific/Non-Maori, Non-Pacific participants
2. Purpose is to welcome them to the study and introduce them to what fat is and how it relates to healthy eating.
3. Do you like the overall design and look?
4. Do you like the format/layout—is easy to follow?
5. Do you like the font style and is the size suitable?
6. What do you think are the main messages of pamphlet?
7. Is it simple, clear, easy to understand? *(language, pictures etc)*
8. Is information included useful?
9. Would you make changes to your kai/food?
10. Show graph from NMNP resource—we are thinking of adding this info to the pamphlet
   a. What is it trying to show? (then explain what it is trying to show)
   b. Is it a clear way to present this information?
11. What else would you like included in the letter?

### Personal Nutrition Messages

1. These messages will be sent out in the nutrition package every month to Maori/Pacific/Non-Maori, Non-Pacific in the study.
2. These messages are personalised to each person in the study, based on what they have recently bought at the supermarket.
3. The purpose is to show them healthier alternatives to food they are buying with a hope that they will purchase these healthier options when they next go shopping.
4. Do you like the overall design and look?
5. Do you like the format/layout—is it easy to follow?
6. Do you like the font style and is the size suitable?
7. What do you think are the main messages of pamphlet?
8. Is it simple, clear, easy to understand? *(language, pictures etc)*
9. Are teaspoons a good way of showing the amount of fat/sugar in kai/food? Would you prefer gram amounts instead?
10. Do you have a preference for showing summary info about amount of fat/sugar and money you are saving, instead of showing amounts of fat and costs for each product?
11. Is the information useful?
12. Would you make changes to your kai/food?
13. What other messages/info would help motivate you to make the healthy choice?
   a. Health benefits e.g. you will have more energy
   b. Health consequences e.g. lower risk of diabetes
   c. Focus on whanau/family e.g. more energy to spend with your whanau/family
14. If a healthier product was recommended that was more expensive, would you likely buy it? What if you were given some more information about how to make it go further?
15. How useful would it be to receive feedback messages congratulating you if you bought a healthy food, or reminding you if you did not?

16. How many of these messages would you find useful to receive in the nutrition package each month (2/5/10)?

Serving Size/Food Group Information

1. We can divide food that we eat into groups of similar foods (food groups) e.g. milk and dairy products, meat and meat alternatives, bread and cereal products
2. For each food group there is a recommended number of servings that we should eat to stay healthy, and this depends on age.
3. A pamphlet about serving sizes will be sent out in the nutrition package every month to Maori/Pacific/Non-Maori, Non-Pacific in the study
4. Do you like the overall design and look?
5. Do you like the format/layout—is it easy to follow?
6. Do you like the font style and is size suitable?
7. What do you think are the main messages of pamphlet?
8. Is it simple, clear, easy to understand? (language, pictures etc)
9. Does it clearly explain what a serving size is?
10. Does it clearly show what types of food are in this food group?
11. Is this information useful? (Would you use it to help you work out if you are eating the right amounts?)

Healthy Recipes

1. Healthy recipes will be sent out in the nutrition package every month to Maori/Pacific/Non-Maori, Non-Pacific in the study
2. Do you like the overall design and look?
3. Do you like the format/layout—is it easy to follow?
4. Do you like the font style and is the size suitable?
5. By-line “tasty, affordable, easy”—does this make it appealing?
6. What type of recipes would you find most useful? (easy to prepare, affordable, use familiar ingredients or breakfast, snacks, lunch, dinner, dessert?)
7. What size pamphlet would be best? (A5, A4)
8. What type of paper? (regular, glossy paper, card)
9. Would it be useful to receive a folder to collect recipes in?
10. How many recipes would you like to receive each month?
11. What else would be useful to be included on the recipe pamphlet?
   a. Health tips?
   b. Total cost of ingredients for the recipe?

Healthy Shopping List

1. A healthy shopping list will be sent out in the nutrition package every month to Maori/Pacific/Non-Maori, Non-Pacific in the study
2. How do you think this shopping list is meant to be used? (then explain the intended use of this resource)
3. Would you use it?
4. Is the language simple, clear, easy to understand?
5. Do you like the overall design and look?
6. Do you like the font style and is the size suitable?
7. Do you like the format/layout—is it user-friendly?
8. Are the categories useful? Would you like them to be ordered in the same way you walk around supermarket?
9. Would you like space for quantities?
10. What size would be most useful? (A4, A5)
11. Paper or card?
12. Is there a different fold-out format you would prefer?

**General Questions**

1. Use of Te Reo Maori (Maori groups only)
   a. More? Less?
   b. How?

2. What do you think of the motivational phrase “Kia ora ai to whanau?"/“Shop Smart, Make the Healthy Choice” that is used on most pamphlets? Other suggestions?

3. What do you think of the mandate: “Kia kaha—make the healthy choice”/“For a healthy family” used on most pamphlets? Other suggestions?

4. Do you like the range of nutrition pamphlets we are planning to provide as a package, each month to Maori/Pacific/Non-Maori, Non-Pacific in the study?
   a. Are they useful and relevant?
   b. Too much/too little information?
   c. Any other resources/info that might help?
   d. Would they help you make healthy changes to your kai/food?
   e. Would you keep them and return to look at them again?

5. What are some things that might prevent you from buying healthy kai/food?

6. What are the reasons why you would choose healthier kai/food?