Original Article

A new approach to design and implement a lifestyle intervention programme to prevent type 2 diabetes in New Zealand Maori

Eleanor Murphy[1], Kirsten A McAuley MBCHB, PhD[2], Damon Bell MBCHB[1], Rebecca T McLay MSc[2], Alex Chisholm PhD[1], Roanne Hurley BPhEd[2], Gretchen Story BphEd (Hons)[2], Jim I Mann DM,PhD[2], Ruth Thomson BSc[1], and Sheila M Williams BSc (Hons)[3]

[1] *Diabetes Department, Dunedin Hospital, HealthCare Otago, Great King Street, Dunedin, New Zealand*
[2] *Department of Human Nutrition, University of Otago, PO Box 56, Dunedin, New Zealand*
[3] *Department of Preventive and Social Medicine, University of Otago, PO Box 56, Dunedin, New Zealand*

Lifestyle programmes provide the greatest opportunity to stem the developing epidemic of type 2 diabetes. This is especially relevant to indigenous people worldwide, and to Maori in New Zealand. The shift from traditional diets and activities to a westernised energy dense diet and a sedentary lifestyle has precipitated the rapid increase in Maori developing type 2 diabetes in New Zealand. Attendance of Maori to mainstream health clinics or programmes has been poor, and a unique approach developed specifically for Maori is required if Maori are going to attend and benefit from lifestyle programmes. We describe the process involved in developing a successful community programme for Maori and outline the novel aspects of the programme which contribute to its acceptability and success in the local community.

Key Words: indigenous people, type 2 diabetes, diabetes prevention, lifestyle intervention, New Zealand Maori

Introduction

The increasing frequency of diabetes is one of the major health issues for New Zealand Maori, as it is for other indigenous people worldwide. The adult prevalence may be as high as 20% (Cooper – unpublished data), with type 2 diabetes accounting for more than 95% of cases of diabetes in Maori.

Lifestyle programmes provide the greatest hope of reducing the risk of developing diabetes and of achieving optimal management in those who have already developed the condition. Previous attempts to recruit Maori participants into mainstream programmes have not been successful. This is because recruitment has been undertaken by inappropriate hospital or general-practice based staff and because the programmes themselves have not been culturally appropriate. A new approach is needed. This programme has evolved in an attempt to provide a comprehensive lifestyle intervention programme which is acceptable to local Maori.

Methodology

Community approval and recruitment

Ms Eleanor Murphy (Tribal affiliation: Ngai Tahu nõ Otakou) and Dr Damon Bell (Tribal affiliation: Ngai Tahu nõ Oraka Aparima) consulted with local Maori over a 6-12 month period. Approval was obtained from many community groups (eg Ngai Tahu Maori Research Unit, Te Wakahauora, Otakou Maori Womens Welfare League) to initiate a lifestyle programme (Te whai matauranga o te ahua noho) specifically designed for Maori. Instead of the conventional approach of health professionals recruiting participants, Eleanor Murphy identified key leaders in the Maori community who agreed to participate in the pilot and they recruited other family members and work colleagues (a novel 'snowballing' technique). The research was performed under kaupapa Maori (Maori protocol), thereby ensuring the research was conducted in a culturally sensitive manner.

Funding was obtained from the Health Funding Authority for 12 months to continue the programme in the community as Te Whai matauranga o te ahua noho/ Lifestyle Intervention Programme, under Healthcare Otago, Dunedin Hospital.

Setting

Initially the setting was in the Diabetes Department of Dunedin Hospital. However, the hospital environment was a barrier for Maori, with rooms being difficult to find, lack of signage using Te Reo (Maori language), and

Correspondence address: Dr Kirsten McAuley, Department of Human Nutrition, University of Otago, PO Box 56 Dunedin, New Zealand.
Tel: + 0064 3 479 5359; Fax: + 0064 3 479 7958
Email: kirsten.mcauley@stonebow.otago.ac.nz
Accepted 8 May 2003

insufficient space appropriate for collecting clinical data. The programme was eventually shifted to a separate building outside the hospital environment. The new setting contained office space for the programme staff, a group education room, and a private room for collecting anthropometric data and other sensitive information. Kitchen facilities were provided for healthy kai (food) practical sessions, an exercise room for group exercise sessions and toileting and showering facilities. An existing indoor swimming pool, was located in the same building. Other lifestyle educators, including smoking cessation, cardiac and pulmonary rehabilitation educators shared the facilities. This setting was conducive to running a compreensive lifestyle intervention programme and was acceptable to Maori.

Programme Staff

A combination of specialised skills are required to carry out a successful lifestyle intervention programme. Eleanor Murphy as the Maori Diabetes Educator led the programme, approached Maori participants and promoted the programme in the community. She also influenced the food and exercise habits at hui (traditional gatherings) and on the marae (meeting houses). Given the complexity of making lifestyle changes a dietitian and exercise trainer were essential members of the intervention team. Ideally, a Maori dietitian and exercise trainer would be employed, however, in this case no-one as yet had completed their training or were available for these positions. Because non-Maori personnel were used, they were introduced to the Maori community and attended immersion Te Reo weekends on the marae.

Lifestyle intervention programme details

Assessment and visits

All participants gave oral and written consent prior to any information being obtained. The initial clinical assessment involved collecting demographic details, medical history, medication details, family history, smoking and alcohol history, dietary habits (based on an interview with the dietitian and a four day diet record) and an exercise history (based on an interview with the exercise trainer and exercise recall questionnaire).[1] A Physical Activity Readiness Questionnaire[2] was completed to screen for any contraindications to exercise. Baseline measures included: weight, height, BMI, waist circumference, blood pressure, one mile walk test,[3] and a blood test for fasting glucose, lipids and insulin. Participants were then given an individualised dietary and exercise programme in oral and written form and invited to attend group exercise sessions four times per week and a healthy kai session in the form of a group cooking class once per month. Participants were seen fortnightly for a check of progress and a check of their weight. At four weekly intervals, all the baseline clinical measures were repeated except the blood sample. These measures, plus a repeat four day diet record and blood test were obtained at the end of the four month intensive period and participants were given an explanation of their results, and a written summary. If participants had abnormal fasting glucose or lipid levels then medical advice was sought. A plan was made for follow-up to maintain the changes and participants were then seen at one to two monthly intervals. This maintenance phase focused on community-based exercise programmes, walking groups and cultural activities such as waka ama (canoe paddling), kapahaka (traditional song and dance) etc. The number of clinical visits and measures collected are outlined in Table 1.

Dietary programme

The dietary targets for the lifestyle intervention programme are outlined in Table 2 and an example diet is shown in Table 3. Foods rich in nutrients believed to enhance insulin sensitivity were recommended.[4] These foods include: low glycaemic index foods, fish, nuts, seeds, grains, pasta, rice, fruit, vegetables, legumes and low fat dairy products. Participants were encouraged to consume three servings of these 'special' foods daily. Particular emphasis was placed on foods important to Maori such as seafood, shellfish, puha (sour thistle) and mutton bird. Foods which may not be part of the current Maori diet eg nuts, seeds and grains, were introduced during the cooking classes. Low-fat food options were also discussed so that healthy food choices could be promoted at hui and on marae. Information regarding the food programme, the dietary targets, special foods and recipes were given in the form of a booklet. Weekly tick sheets were used to encourage the inclusion of the specified foods.

Healthy kai cooking classes were conducted by the dietitian and Eleanor Murphy. Participants shared in the preparation of a meal, tasting the results, and discussed any issues or concerns. Whanau (family) were welcome to attend. The choice of topics covered in these sessions was guided by feedback from participants. The focus was on simple, quick and easy meals using the programme's 'special' food items.

Table 1. Summary of clinical visits for Te whai matauranga o te ahua noho/Lifestyle Intervention Programme

	Visits (month)								
Measures	0	1	2	3	4	5-6	7-8	9-10	11-12
Demographics	X								
Diet Record	X				X		X		X
Weight	X	X	X	X	X	X	X	X	X
Height	X	X	X	X	X	X	X	X	X
BMI	X	X	X	X	X	X	X	X	X
Waist circumference	X	X	X	X	X	X	X	X	X
Blood pressure	X	X	X	X	X	X	X	X	X
Bloods†	X				X		X		X
One mile walk test	X	X	X	X	X		X		X

† lipid profile (fasting cholesterol, triglycerides, HDL), fasting insulin, fasting glucose

Table 2. Dietary and exercise targets for Te Whai matauranga o te ahua noho/Lifestyle Intervention Programme

Dietary Targets		Exercise Targets
Protein %E[#]	18%	30 minutes of vigorous exercise 5 times per week, with 20 minutes at a heart rate of 80% to 90% of age predicted maximum, and resistance training at least 2 days per week.
Carbohydrate %E	50%	
Total fat %E	<32%	
Saturated %E	11%	
Monounsaturated %E	14%	
Polyunsaturated%E	7%	
Cholesterol mg/day	<200	
Fibre g/day	>25g	

[#] %E = percentage of energy intake

Table 3. Example of diet consumed during Te Whai matauranga o te ahua noho/Lifestyle Intervention Programme

Meal	Food Consumed
Breakfast	Breakfast cereal (high fibre)/ reduced-fat milk/banana
	Wholegrain toast/reduced fat margarine/peanut butter
Mid-morning	Tea or coffee
	Low-fat muffin/raw fruit/tea
Midday	Vegetable and pipi (shellfish) soup
	Modified rewana bread (wholemeal flour)/reduced fat margarine
	Reduced fat (edam) cheese/pickles
Mid-afternoon	Raw fruit/tea
	Reduced fat yoghurt/tea
Evening meal	Baked blue cod fish fillet/spices
	Basmati rice
	Kumara (sweet potato)/kamo kamo (marrow)/corn/puha
	Fruit crumble
Supper	Low-fat crackers/tomato

Exercise programme

Participants were prescribed activity 5 times per week for 30 minutes a day, with at least 20 minutes of each session spent exercising at an intensity of 80-90% of age predicted maximum heart rate. This was based on the 1990 American College of Sports Medicine guidelines for developing and maintaining cardiorespiratory and muscular fitness.[5] Participants were instructed on how to measure and calculate their heart rate manually at either the radial or carotid pulse. Participants could also borrow a digital heart rate monitor to check they were achieving the heart rate targets during exercise at home. The exercise prescribed was designed to be inexpensive, home-based and community-based activities, unless the participant wanted to join a gym at their own expense. Specific cultural activities such as waka ama and kapahaka were included in the programme. An example of an individual participants exercise programme is given in Table 4.

Of the four group exercise sessions made available, two sessions were in the indoor swimming pool. This was relatively private and allowed any clothing to be worn so that many people took part in water activities when they would not normally have done so. Instruction was given on the use of various exercise equipment items for those that had avoided these settings in the past.

Support during the Programme

Fortnightly contact by specialist staff was provided, especially during the four month phase of the intervention. Techniques to enhance motivation and compliance were employed. Eleanor Murphy took part in the programme also, which was considered an important aspect of the programme by the Maori community.

Qualitative assessment

A formal focus group session was run by an independent facilitator to get feedback from participants regarding acceptability of the programme and aspects that were and were not useful for them.

Results

It was clear the programme was acceptable to the local Maori community. Qualitative outcomes only are discussed in this paper. The most useful aspects of the programme for participants were the regular contact and monitoring, being able to discuss food issues regularly with a dietitian, and weekly motivation and encouragement from an exercise trainer. The majority felt it would not have been possible on their own, or with advice only, and did consider they would need ongoing support to maintain the changes. The times of visits needed to be flexible, and it was important that the Maori staff running the programme also took part in the visits, exercise sessions etc, so that it was obvious they were making lifestyle changes also. Group rather than individual education sessions were preferred.

The difficulties identified were that whanau (family) were not always prepared to adopt changes in food habits and healthy food choices were often not available on the marae, where the focus was on talking and eating with no time allowed for exercise. Costs of healthy foods were an issue, however the overall food budget was not increased when pies, biscuits, chocolates and other snack foods were not regularly bought. Overall the programme was acceptable to the participants and many requested an ongoing maintenance programme, which is now in place.

Reported reasons for individuals stopping the programme (19%) were lack of time, not feeling 'ready to commit' and medical illness or injury. These individuals were welcomed back to the programme at any time they wished. An attempt was made to keep in contact with these participants, even if it was only in a social setting, acknowledging that some may be in the precontemplation phase, and not yet ready to take action.

Attendance at fortnightly appointments was excellent (90%). The main difficulty was ongoing recruitment of participants and further novel approaches are currently being explored. These include: ‘Warrant of Fitness’ health checks in conjunction with the University of Otago Maori Student Centre; production of posters to be circulated to local Kohanga Reo groups, the Maori

Table 4. Example of individual exercise programme for Te Whai matauranga o te ahua noho/Lifestyle Intervention Programme

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Aqua fitness group session Shallow water partner races and leg work Deep water aqua jogging with belts	(Beach) Walk Alternate between hard and soft sand	Aerobics group session Simple body weight exercises which can tried at home Swiss ball exercises for fun	Whanau Walk Whanau outing which includes some hill and flat walking	Rest Day	Waka ama Warm-up, technique and hoe-a (paddling)	*Rest Day*

Women's Welfare League, Women's Refuge and other community groups; and targeting the children of parents already diagnosed with diabetes.

Conclusions

This lifestyle intervention programme (which continues to run) has evolved over a long period of time, and changes are constantly being made so that the programme remains acceptable to local Maori. Feedback from the participants is sought and changes based on this feedback are made. This is an essential component to ensure Maori participation in such a programme.

A second important aspect of the programme has been the inclusion of trained staff, who understand the stages of behavioural change required for a lifestyle change. Detailed dietary advice is necessary on an individual basis from a dietitian, and an appropriate, safe and achievable exercise programme should be prescribed.

The frequent contact is crucial and this requires substantial time to see people, discuss issues, and contact those who have not attended, and flexibility to see people at times that they can attend. Without this level of support, it would be unlikely for participants to be able to maintain the change in lifestyle.

Acknowledgements

The project was initially funded by the Health Research Council, Otago University and the Otago Diabetes Research Trust, New Zealand. The ongoing community based programme is funded by $50 000 from the Health Funding Authority, and rooms and facilities and 1.5 full-time salaries from Heathcare Otago, Dunedin Hospital.

References

1. Russell D, Wilson N. Life in New Zealand Commission Report.Executive Overview. Dunedin, New Zealand: University of Otago, 1991.
2. Thomas S, Reading J, Shepard R. Revision of the physical activity readiness questionnaire (PAR-Q). Canadian J Sport Science 1996; 17: 338-45.
3. Kline G, Porcari J, Hintermeister R, Freedson P, Ward A, McCarron R, Ross J, Rippe JM. Estimation of VO2max from a one-mile track walk,gender,age, and body weight. Medicine and Science in Sports and Exercise 1987; 19 (3): 253-9.
4. Riccardi G, Rivellese AA. Dietary treatment of the metabolic syndrome - the optimal diet. Br J Nutr 2000; 83 (1): S143-S8.
5. Stand AP. The recommended quantity and quality of exercise for developing and maintaining cardiovascular and muscular fitness in healthy adults. Medicine & Science in Sports & Exercise 1990; 22: 265-74.