

Reaching hard-to-reach, high-risk populations: piloting a health promotion and diabetes disease prevention programme on an urban marae in New Zealand

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SUMMARY

Maori and other indigenous peoples experience a high prevalence of type 2 diabetes. A pivotal question is how primary and secondary preventative initiatives might be more effectively targeted to embrace those who are at highest risk of developing diabetes and its complications. This paper proposes that, in the case of Maori, as a high-risk population, conventional approaches are insufficient, and that increased consideration needs to be given to how the settings in which health education and services are offered may influence diabetes prevention and earlier diagnosis. Traditionally, the hub of Maori culture and everyday life is the marae, a place where Maori identity, values and cultural practices are affirmed within an over-arching spiritual dimension. We have investigated the potential utility of an urban marae and its member network as a setting for a lifestyle programme focused around diabetes prevention. The research included a cross sectional survey of behavioural and metabolic risk factors for type 2 diabetes

and qualitative data collection as part of a formative and process evaluation of a lifestyle programme established at the marae and connected venues. The programme attracted 436 participants. The majority knew little about diabetes, had low levels of vigorous activity and high intakes of fatty foods. A family history of diabetes was present in >40% of participants. Undiagnosed diabetes, high blood pressure, hypercholesterolaemia, obesity, smoking and self-reported excessive alcohol consumption were common. The advent of diabetes education, a healthy lifestyle support programme, and exercise sessions at the marae and connected venues served as the impetus for the marae community to take over the running of their own health promotion programme, including a declaration of their marae as a 'smoke-free' venue. It is proposed that marae can be useful settings for lifestyle programmes aimed at controlling the diabetes and obesity epidemic in New Zealand.

Key words: disease prevention; high-risk population; Maori; obesity; type 2 diabetes; urban marae

INTRODUCTION

It is well established that much of the damage of diabetes can be prevented with early diagnosis and treatment, and good metabolic control [DCCT Research Group, 1993; UK Prospective Diabetes Study (UKPDS) Group, 1998]. There is increasing evidence that primary prevention of type 2 diabetes

is also possible (Pan *et al.*, 1997; Tuomilehto *et al.*, 2001). Recommended preventative strategies focus on healthy lifestyle behaviours, namely achieving and maintaining a healthy weight, and eating appropriately and exercising regularly. All have wider health and well-being benefits (Simmons *et al.*, 1997).

Type 2 diabetes among Maori is an increasing problem (Simmons, 1996). A study of rural Maori demonstrated an awareness that diabetes is a major issue among their people (Kirkwood *et al.*, 1997). However, risk factors for type 2 diabetes among Maori remain common (Simmons, 1996), diabetes knowledge in the community remains limited (Mandell *et al.*, 1994), and many, despite a profile of 'high-risk' (of which they may or may not be aware), are not seeking testing, with the result that their diabetes remains undiagnosed and untreated (Simmons *et al.*, 2001). While it appears that access to specialist treatment services is similar between European and Maori patients (De Lore *et al.*, 1993; Simmons *et al.*, 1996), barriers to the successful implementation of diabetes self care (Simmons *et al.*, 1998a) and under-utilization of primary care services by Maori (and other low-income New Zealanders) (Malcolm, 1996) contribute to the disproportionately high mortality (Simmons *et al.*, 1999), the prevalence of diabetes-related complications and the loss of quality of life among Maori.

Clearly, for a large proportion of Maori, current approaches to prevent type 2 diabetes and its complications are inadequate. Innovative approaches are needed which are perceived as more user-friendly by those who feel alienated from, or uninspired by, what is currently available.

South Auckland has a large Maori population. The South Auckland Diabetes Project (SADP, now the Diabetes Projects Trust) was formed to address the community-focused aspects of the South Auckland Diabetes Plan formulated in 1992 (Wilson and Simmons, 1994). The development of strategies to promote lifestyles likely to be associated with a reduced incidence of type 2 diabetes was at the heart of the plan. A first step by the SADP was the development of a modular approach for a combined diabetes awareness, detection, support and lifestyle (diabetes prevention) programme. A fundamental question was how best to access populations who were most affected by type 2 diabetes and its complications. It was proposed that the settings that are most conducive to participation and where people feel most relaxed and amenable to learning are their own accustomed community meeting places with familiar social networks.

For Maori, from traditional times to the present, the centre of community has been the marae. Extensive migration of Maori from rural to urban areas throughout New Zealand has been

accompanied by the development of urban marae. Identification with many tribes is a characteristic that distinguishes most urban marae from their rural counterparts, which are usually associated with one tribal group and adhere to the protocol of that tribe. Urban marae also tend to lack the elder support that is readily available to rural marae. The term 'marae' refers to much more than a physical complex of buildings:

It also embraces a human and spiritual dimension and has come to symbolise the essence of Maori health aspirations ... It is where a person has turangawaewae (a place to stand), a sense of belonging or identity and where Maori values, cultural and health practices are reaffirmed [(Ngata and Pomare, 1992), pp. 45–46].

A programme similar to one piloted and evaluated in Samoan churches (Simmons *et al.*, 1998b) was developed among people connected with Whaiora Marae, an urban marae in Otago, South Auckland (Voyle and Simmons, 1999). An asthma control initiative centred around marae in a rural area of New Zealand (Beasley *et al.*, 1993), providing a precedent. Whaiora ('in search of better things') Marae was chosen because of its high standing in the community, the previous location of a diabetes clinic within the marae and the interest shown by its Trust Board in a diabetes intervention. There had been requests for a marae-based programme during an earlier door-to-door survey in Otago (Simmons *et al.*, 1994).

Like its counterparts in rural areas, Whaiora Marae has an enduring network of whanau (extended families) whose unity with one another and with their ancestors is reaffirmed and perpetuated through participation in ceremonials, events and meetings at their marae. An important aspect of everyday activity at Whaiora Marae is a multiethnic employment-training scheme operating under its own Board of Trustees. At the time of this programme, ~100 trainees and tutors were involved annually. The marae complex also includes a kohanga reo (Maori language pre-school) and flats for psychiatric survivors. Whaiora Marae is also part of a network of Maori community organizations within South Auckland. In addition, a range of activities are held at the marae which attract numerous visitors, who may come only once or who may return intermittently.

This paper investigates the potential utility of an urban marae as a setting for a lifestyle programme

for those affiliated with and visiting the marae. Some key questions were:

- What were the characteristics of those who attended?
- What were their risk factors for diabetes?
- How aware were they of their risk factors and of the complications of untreated diabetes?
- How ready were they to take recommended follow-up action and did the marae setting support this?
- What differences were evident between the marae's immediate (regular) and its extended (visitor) communities?

Issues surrounding the establishment and organization of the programme are described elsewhere (Voyle and Simmons, 1999). Resources were not available for an intended quantitative outcome evaluation.

BACKGROUND

In 1994, a partnership was formed between SADP staff and Whaiora Marae members to pilot a community-based programme as a response to the impact on the Maori community in Otarā of type 2 diabetes. Commencing in October 1994, regular partnership meetings continued to be held (at least once a month) until mid-1996 (Voyle and Simmons, 1999). The partnership was responsible for programme planning and implementation. Although a community development model (Labonté, 1993) was the preferred frame of reference for programme development, funding and medical research requirements placed significant constraints on the discretionary powers of the partnership in programme planning (Voyle and Simmons, 1999).

The programme was for the marae community, broadly defined as anyone connected with the marae in a cultural, spiritual, family or social sense. It was intended for frequent attenders at the marae, intermittent visitors, and anyone else marae members wanted to include. There was intensive promotion of the programme among those coming to the marae regularly (e.g. employment trainees and marae workers), the 14 kohanga reo in Otarā, and leaders of local Maori interest groups. The main recruitment work was performed by marae members who moved freely among its social networks. They were supported by promotional brochures and posters supplied by SADP.

The first phase of the programme was to obtain baseline weight and other measurements, self-reports on eating and exercise habits, and diabetes knowledge scores. These were incorporated into health screening sessions with blood pressure testing and laboratory tests for diabetes and lipids. Subsequent aspects of the intervention were a major event to launch an education and healthy lifestyle programme, incorporating diabetes awareness, nutrition, exercise, a support group for those affected by diabetes, and other health-related interventions. While Whaiora Marae was the main venue, some screenings and health education took place at other connected venues within Otarā. A primary aim of the partnership was to develop a continuing programme that marae members would eventually run for themselves.

Everyone attending for screening was asked to name their general practitioner, who would also receive a copy of their results. The research strategy required that baseline measurements be obtained for 200 people before commencing education and lifestyle programmes. However, efforts to involve new participants continued after this target was reached.

All components of the programme, including laboratory tests, were offered free of charge, with the exception of a 50 cent voluntary donation for exercise sessions.

METHODS

Marae community characteristics

Table 1 provides information about participants in terms of their affiliation with Whaiora Marae. The majority of 'members' were whanau (extended family) members, staff and residents at the marae. The kohanga reo group included staff and parents of 14 kohanga reo located within Otarā. The 'visitors' group included those attending meetings and tangi (funerals), those attending the launch of the diabetes education and lifestyle programme, non-marae members attending the diabetes programme, and a community group for the visually impaired linked to the marae.

The first stage was completion by participants of a Diabetes Knowledge and Behaviour questionnaire (DKB) (Mandell *et al.*, 1994), with questions relating to demographic details, diabetes status, family history of diabetes, diabetes

Table 1: Source of participants providing information ($n = 436$)

	<i>n</i> (%)
Marae members and staff committee, staff and tutors	25 (5.7)
Flats, kaumatua/kuia (elders)	11 (2.5)
Other members	38 (8.7)
Kohanga reo network (10 of the 13 Otara kohanga reo)	78 (17.9)
Kohanga reo annual meeting	19 (4.4)
Trainees (1994, 1995, 1996)	172 (39.4)
Arts and crafts, sewing, carving	
Travel and tourism, skills enhancement, hair dressing	
Catering and hospitality	
Visitors	
Visitors to the marae	47 (10.8)
Visually impaired group	30 (6.9)
Diabetes Support Group	16 (3.7)

knowledge (symptoms and complications of diabetes) and exercise questions as described previously (Mandell *et al.*, 1994). A seven-item Fat Index asked about participants' use of fat in cooking, trimming fat from meat, and spreads and milk used (Mandell *et al.*, 1994). The proportion (out of seven) of high- or medium-fat items consumed was converted to a percentage. Other questions related to 'readiness to change' (Simmons and Mesui, 1999), an indication of whether they were already involved in weight control activities or regular exercise, and a self report of whether they perceived themselves as overweight or otherwise. A broad measure of quality of life, the 'Happiness Score' was also included (Kammann *et al.*, 1979). The DKB questionnaire is easy to administer, simply worded, and takes 10–20 min to complete.

Standardized methodology was used to measure weight, height and minimum waist (the mean of three measurements). A standard mercury sphygmomanometer was used to measure blood pressure. Participants were venesected for total cholesterol, fructosamine and glucose. Those with a 'positive screen' (with either random glucose ≥ 6.0 mmol/l or fructosamine ≥ 260 μ mol/l) were referred for a 75 g oral glucose tolerance test (OGTT). Participants with a 'positive screen' were contacted through both letter and personal contact, and encouraged to attend for an OGTT.

Analyses were performed using SPSS for Windows (SPSS Inc, IL, USA). All tests were two-tailed with $p < 0.05$ taken as significant. Discrete variables were compared using χ^2 . Continuous variables are shown as mean \pm standard deviation (SD) and are compared using one-way analysis of variance (ANOVA). Adjustment for

age was undertaken using analysis of covariance where necessary.

Qualitative assessment

Qualitative data collection was by a Community Psychologist (J. A. V.), employed by SADP for purposes of programme evaluation, and who became a partnership committee member. Cultural support was provided by a Maori liaison worker, also employed by SADP. The tasks of formative and process evaluation suggest the appropriateness of qualitative data collection methods (Patton, 1980; Altman, 1986). Information was gathered through participant observation, with the evaluator attending every partnership meeting, the programme launching event, other major promotional events, 15 meetings of the diabetes support group, and exercise sessions at regular intervals. Detailed written research notes were kept, with particular attention being paid to recording participants' comments and questions. The evaluator also conducted in-depth interviews with members of the partnership committee, the marae, and SADP's Maori cultural adviser, Maori liaison worker, medical director and diabetes specialist. Interview questions varied depending on who was being interviewed.

RESULTS

Baseline data

Table 2 shows the demographic characteristics of 436 participants completing the DKB questionnaire by their source. Of these, 64% identified

Table 2: Characteristics of marae network participants

	Marae members and staff, kohanga reo network	Trainees	Visitors	<i>p</i> value
<i>n</i>	171	172	93	
Age (mean ± SD)	37 ± 14	21 ± 8	42 ± 19	0.001
Percentage <20 years	8%	66%	10%	0.001
Percentage female	80%	67%	70%	0.05
Percentage Maori	80%	55%	44%	0.001
Percentage from Pacific Islands	11%	26%	31%	0.001
Percentage not in paid employment	33%	89%	64%	0.001
Percentage who smoke	60%	45%	53%	n.s.
Percentage drink excess alcohol ^a	36%	59%	48%	0.05
Percentage with a family history of diabetes mellitus	51%	49%	43%	n.s.
Percentage with known diabetes	9%	1%	17%	0.001
Those with no diabetes:				
Percentage screened (<i>n</i>)	83% (143)	45% (78)	69% (64)	0.001
Percentage screen-positive (<i>n</i>)	29% (42)	24% (19)	47% (30)	n.s.
Percentage attending OGTT (<i>n</i>)	21% (9)	37% (7)	63% (19)	0.05
Percentage new diabetes	22% (2)	14% (1)	32% (6)	n.s.
Blood pressure 140/90+	31%	8%	37%	0.001
Total cholesterol ≥6.0 mmol/l	28%	4%	33%	0.001

^aExcess alcohol defined as self-report of ≥5 units in one sitting or >21 units/week.
n.s., not significant.

Table 3: Diabetes knowledge and lifestyle behaviours of marae network participants (mean ± SD where appropriate)

	Marae members and staff, kohanga reo network	Trainees	Visitors	<i>p</i> value
Happiness (1 = very happy, 7 = very unhappy)	2.6 ± 1.5	2.7 ± 1.5	2.5 ± 1.4	n.s.
Know no symptoms	68%	79%	57%	0.01
Know no complications	65%	72%	56%	0.01
Total knowledge score	20 ± 19%	15 ± 16%	28 ± 24%	0.001
Fat score (percentage of seven fatty items eaten)	71 ± 23	77 ± 23	66 ± 25	0.01
Exercise vigorously ≥3 days/week	30%	24%	24%	n.s.
Television watching (h/day)	2.4 ± 2.4	2.2 ± 2.3	2.2 ± 2.7	n.s.

n.s., not significant.

themselves as Maori or ‘part Maori’ and 73% were female. Visitors were least likely to be Maori. A family history of diabetes was common in all groups. Known diabetes, high blood pressure and hypercholesterolaemia were frequent in all except the trainees, who were significantly younger. Self-reported excess alcohol consumption was most common among the trainees; smoking was widespread in all groups.

Uptake of screening among participants was high, but follow through with an OGTT was low, except among visitors to the marae. Of the 285 screened for diabetes, 91 (32%) were found to be positive, of whom 35 (38%) attended for OGTT, and of these nine (26%) were newly diagnosed with type 2 diabetes. There were no significant differences in characteristics between those

attending and not attending the OGTT, suggesting that an estimated 8.3% of the total group (26% of 32%) had undiagnosed diabetes. This excludes the further three participants with a random glucose level >11.0 mmol/l and probable diabetes.

Table 3 shows that low knowledge of the symptoms and complications of diabetes was characteristic of the majority of participants. There was a high dietary fat consumption across all groups, but less obesity among the trainees. Television viewing exceeded 2 h daily across all groups. Self-reported vigorous activity on 3 or more days per week occurred in ~25% of participants. The majority of those with a body mass index (BMI) of ≥30 kg/m² considered themselves overweight (Table 4). Very few lacked an intention of exercising regularly or controlling their weight.

SADP intervention

A full-day health promotion event held at the marae to launch the awareness and lifestyle programme attracted 180 people. Education sessions about diabetes prevention and healthy lifestyles (organized either as one full-day session or three sessions of 90–120 min each) were attended by 135 people, predominantly employment trainees and kohanga reo caregivers and parents. Between January 1996 and October 1997, 156 exercise sessions were held, with an average attendance of 11 at each twice-weekly session (1831 attendances in total). A diabetes support group commenced monthly meetings at the marae in November 1995, with attendances ranging from three at initial meetings to 16 in mid-1997. A minority of people are represented more than once in the preceding figures, having participated in more than one health promotion event or activity (as well as baseline screenings).

Sixteen of the visitors came with the intention of joining the diabetes support group, shedding light on the fact that the higher proportion of known diabetes cases was among visitors.

It was not possible to obtain a list of all the members of the marae and kohanga reo networks, as this would have infringed privacy. Consequently, we do not have a denominator for this project and hence are unable to assess participation rates.

Marae run programme

Funding for SADP input into the marae-based programme expired in 1996. The marae subsequently established its own health programme, including the creation of a health and welfare portfolio, the declaration of a 'smoke-free' marae and several health promotion days, attracting 80–100 people. Marae catering now promotes low-fat/high-fibre foods and weekly line-dancing sessions have begun. The marae successfully obtained funding for its activities.

DISCUSSION

Although we know that lifestyle change is likely to prevent type 2 diabetes, implementation of this knowledge in indigenous communities is fraught with difficulties (Simmons *et al.*, 1997; Gray-Donald, 2000). Our paper teases out the answers to two questions that are likely to be

relevant to others involved in lifestyle programmes in urban indigenous communities. First, if an effective urban marae-based lifestyle programme could be developed, would there be sufficient numbers of affiliated people who would take up such an intervention? Secondly, are visitors to an urban marae similar in terms of risk and interest in lifestyle change to those closely affiliated with the marae? An additional feature from the qualitative analysis was the observation that a marae-run lifestyle programme could be stimulated as a result of the initial impetus provided from outside the community (Voyle and Simmons, 1999).

Would sufficient numbers of affiliated people take up a marae-based intervention?

The data here support the marae as a potential venue for reaching large numbers of those at high risk of current and future disease. The profile of lifestyle-related risk factors was found to be similar to the wider local community (Simmons *et al.*, 2001), but worse than that for Maori in the Life in New Zealand Study (e.g. consumption of fatty foods and time spent watching television were high, while the proportion exercising vigorously was probably less) (Hopkins *et al.*, 1991).

The next and related issue is whether the intervention aspects of the programme would be taken up by a marae. Clearly, to maximize the likelihood of attendance, messages need to be relevant and useful to community members. Our data certainly confirm that those present were at high risk of diabetes and many would have been aware of this (e.g. through having a family history). In spite of this high risk and day-to-day exposure to diabetes, knowledge of the symptoms and complications of diabetes, as well as the nature and treatment of diabetes (data not shown), was generally low, as found elsewhere (Mandell *et al.*, 1994; Kirkwood *et al.*, 1997).

The highest risk of type 2 diabetes is among those who are overweight and obese. Having a risk factor does not predict interest in action to reduce the risk of disease. A further significant finding was therefore that Maori with a BMI >30 kg/m² were aware they were overweight and most were contemplating taking action towards controlling their weight, including adopting regular exercise. Subsequently, frequent reports were received demonstrating that having the programme at a marae within their local

Table 4: Weight-related measures among marae network participants

	Marae members and staff, kohanga reo network	Trainees	Visitors	<i>p</i> value
Percentage with large waist ^a	66%	28%	66%	0.001
BMI, kg/m ² (mean ± SD)	34.9 ± 9.1	28.3 ± 8.8	33.5 ± 7.6	0.001
Percentage with BMI ≥30 kg/m ²	65% (91)	28% (38)	60% (51)	0.001
Consider self overweight	91%	71%	77%	0.05
Neither trying nor intending to: control weight	16%	14%	11%	n.s.
exercise regularly	7%	12%	6%	n.s.

^aWaist >102 cm in men and >88 cm in women.

community had stimulated an increase in physical activity.

The diffusion of messages regarding the importance of diabetes was sufficient to stimulate participation, in spite of the low knowledge of diabetes. The attendance for the health day and screening have certainly confirmed that community members were interested and also willing to access personal health care through the marae. Low participation by males in questionnaire completion and initial screening was a major observation consistent with the expectations of marae members, including males themselves (Voyle and Simmons, 1999). Maori males have far worse health than either European males or Maori women (Pomare *et al.*, 1995).

Similarly, the finding that little more than one-third (38%) of those recommended to attend for an OGTT actually did so reflects the challenges of getting people to avail themselves of health services, even when they are free of charge. While mailing results to a nominated general practitioner was a form of safeguard, it may have meant little if the patient was one of the many who do not attend primary care services until symptomatic (Voyle and Simmons, 1999).

Participating in screening and education does not necessarily infer participation in lifestyle change to reduce risk. It was unfortunate that resources were not available for quantitative outcome evaluation of this marae-based programme. A similarly structured programme among Samoans in a church-based setting (Simmons *et al.*, 1998b) did demonstrate an increase in diabetes knowledge, weight stabilization, a reduction in waist circumference, an increase in self-reported activity and a reduction in fatty food consumption. Although we cannot demonstrate such outcomes here, it was significant that the marae subsequently took over the running of their programme.

Are visitors to an urban marae similar in terms of risk and interest in lifestyle change to those closely affiliated with the marae?

Access to a marae-based primary prevention programme for both diabetes and heart disease is particularly important in view of the inequity in access to primary care among Maori (Malcolm, 1996). The data clearly show that those who were visitors to the marae benefited at least equally to others from participation in the education and lifestyle programme. Indeed, the reason for some of the visitors being at the marae was their personal interest in a diabetes programme. The majority of those in the visitor category lived in Otara or an adjacent suburb. The residential status of trainees was more transitory and many relocated to other areas after completing their training courses. One of the challenges in organizing a lifestyle programme was that it was impossible to cater to the needs of all participants in offering exercise sessions. There were huge variations in age and fitness levels, and some already had major health problems.

Visitors to the marae were more likely to attend for an OGTT than marae members, staff and trainees who were part of the regular network of the marae. The reasons for this remain speculative and may simply reflect heterogeneity in cultural and socioeconomic characteristics. The timing of the education and privacy issues may have had some bearing. Visitors were more likely than marae members to have received some diabetes education prior to their screening. As for privacy, maintaining patient confidentiality placed constraints on the type of follow-up measures considered appropriate. Follow-up of positive results was a role for SADP staff, rather than marae members, despite the likelihood that the latter might have exerted a more persuasive

influence on their peers. On a more general note, confidentiality can pose interesting dilemmas when a focal community gives prominence to the place of the extended family, and individual rights, including the right to privacy, tend to be subsumed within that context, as is the case in Polynesian societies.

Caveats to the study

The diabetes prevalence and risk factor data here are not intended to reflect their prevalences in the wider community (Simmons *et al.*, 2001). We have already established this using a more robust sampling framework. Using a cut-off approach to screening will miss some cases with undiagnosed diabetes (Simmons and Williams, 1994). Many participants were likely to have agreed as a result of an interest in diabetes, e.g. because of their family history. However, as a venue for reaching the hard to contact, and linked with referral to primary health care, diabetes support groups and lifestyle programmes, there is potential for improving uptake of preventative health services. Further work is required to balance the population and personal health issues.

The marae as a venue for healthy lifestyle programmes

Bearing in mind the special meaning that Maori attach to marae, as articulated by Ngata and Pomare (Ngata and Pomare, 1992), it is useful to identify some of the potential strengths of a marae as a venue for programmes fostering healthy lifestyle behaviours. The Ottawa Charter for Health Promotion provides a frame of reference (Ottawa Charter for Health Promotion, 1986). The following list is not suggested as exhaustive.

1. *The potential for influencing an environment to become more supportive of healthy behaviours.* A case in point is the marae's review of its catering practices and becoming 'smoke-free'.
2. *The potential for enacting culturally sensitive approaches.* Rappaport's Ecological Theory of Empowerment states 'The cultural context matters ... The match or mismatch between person and setting is of consequence' [(Rappaport, 1987), p. 140]. This will be facilitated by a genuine power sharing balance within an organizing partnership.
3. *The potential for enabling or empowering.* Again, this depends on a genuinely power-sharing

partnership that provides meaningful roles for all members [(Rappaport, 1987), p. 141].

4. *The potential for generating self-efficacy.* Self-efficacy (Bandura, 1982) is receiving increasing recognition as a predictor of health behaviours, including the adoption and maintenance of healthy lifestyle behaviours and quitting unhealthy ones (Strecher *et al.*, 1986). The concept of self-efficacy can be extended to embrace the notion of collective efficacy, which suggests that 'the strength of groups, organisations, and even nations lies partly in people's sense of collective efficacy that they can solve their problems and improve their lives through concerted effort' [(Bandura, 1982), p. 143].
5. *The potential for sustainability (Altman, 1995).* The marae eventually assumed full responsibility for the running of their own health programme, obtaining their own independent funding for this.

In conclusion, there was a high prevalence of diabetes and its risk factors, and low diabetes knowledge among those linked to the urban marae. Among overweight individuals, there was already an awareness and self-reported intention to control their weight and increase their leisure time activity. With the advent of diabetes education, a healthy lifestyle support programme, and exercise sessions at the marae and connected venues, the marae community demonstrated progression from contemplation to action. With consideration to the important place of marae in Maori culture, it is proposed that marae offer particular potentialities as venues for health screenings, health education, and healthy lifestyle programmes and initiatives. However, the reality that there is no single solution to the challenge of getting the 'hard to reach' to avail themselves of health services was evidenced by the failure of some to follow through and have a recommended OGTT.

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