The development of recommendations for the use of physical activity for diabetes management with Pacific people in New Zealand

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Introduction

The prevalence of diabetes in Pacific communities is high and increasing. Its debilitating effects are apparent at both individual and community level with high social and economic costs being borne by Pacific people and the healthcare industry. Current attempts at managing the disease have focussed upon dietary intervention and personal education of risk factors. A major risk factor for diabetes is lack of exercise. Recently, the efficacy of physical activity as a method of managing Non Communicable diseases and in particular diabetes has been validated.

This paper then, focuses upon how the physical activity levels of Pacific people can be raised to impact upon the incidence and prevalence of diabetes. To achieve this, the paper reviews the extent of the disease in the Pacific population in New Zealand, the antecedents of health for Pacific people, the validation for the use of physical activity to manage diabetes and the current approaches to raising physical activity levels. The paper concludes by drawing these together to develop recommendations for raising physical activity levels in Pacific populations.

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The extent of the diabetes problem

Diabetes, and in particular noninsulin dependent diabetes has progressively gained recognition as a major public health problem in New Zealand. Pacific people have the highest hospitalisation rates for Diabetes (NZHIS data cited in MOH 1996) and are expected to have a 120% increase in prevalence by 2026 (South Auckland Diabetes Planning Group cited in Simmons 1996). Ethnic differences are seen in the severity of the disease, underreporting, non - diagnosis, types of complications and delay in reporting with Maori and Pacific people have higher rates of all these (ibid).

Mortality data underestimates the true impact of diabetes due to several factors. Firstly, many people with diabetes die of heart disease so the death is not attributed to diabetes. Secondly, there is a high misreporting evident in Pacific mortality statistics with Pacific people being reported as Maori or European (Finau pers comm.) Lastly, the research methodology used impacts upon the quality of the data received i.e. if the approach to ethnic groups is inappropriate the information gained can be incorrectly reported (Durie cited in Spicer et al 1994).

In economic terms diabetes is estimated to cost between $133 to $242 million per annum with a further approximately $200 million from the additional indirect costs through lost productivity, personal costs and reduced tax revenue (MOH 1996). Also, there are a range of indirect costs for individuals, families and society who provide support and care for people with diabetes.

Diabetes has an enormous impact on society with the potential to cause an even greater impact due to the increase in incidence. Exacerbating the situation is the high level of unreported cases, late presentation and poor care received by significant numbers of the affected and at risk population. Finally the quality of the data describing the rate of the disease is poor.

Along with obesity and dietary habits, lack of physical activity is one of the major risk factors for Diabetes. The remainder of this paper explores the context of raising physical activity levels in Pacific populations and concludes with recommendations for developing physical activity interventions.

It is paramount that activity levels for people with diabetes are increased. However, Pacific people with Diabetes are likely to be obese, sedentary and also affected by the sociocultural context in which they reside. When developing physical activity interventions it is necessary then to investigate the elements of sedentary behaviour, obesity and

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Pacific culture and diabetes, and their interaction and representation in Pacific people with diabetes.

Validation of physical activity to impact on diabetes

The use of physical activity as a public health mechanism has gained momentum in recent times with the publication of various reviews and studies that have validated the health impacts of sedentary lifestyle on Non Communicable Diseases such as Diabetes and the subsequent need to raise physical activity levels. For example, the Da Qing study (cited in Simmons et al 1997) demonstrated a 30% reduction in progression from impaired glucose tolerance to type 2 diabetes through dietary advice and increased exercise and exercise alone. Further, the Malmo study (ibid) in Sweden showed that 50% fewer patients with impaired glucose tolerance progressed to type 2 diabetes when subjected to a structured exercise programme. In addition, a longitudinal study from Finland showed a decreased risk of diabetes in middle aged men and women who either increased their energy expenditure through leisure time physical activity and who moved from inactive to active leisure lifestyles. (Haapanen et al 1997).

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In New Zealand, physical activity has been used in several diabetes interventions. Simmons (1996) used a structured exercise programme as part of a diabetes awareness intervention in two worksites raising both the awareness of diabetes risk factors and activity levels. Swinburn et al (1997) utilised a structured exercise programme in the form of aerobics conducted by church members in church halls as part of an intervention programme aimed at Pacific Churches again causing a small rise in physical activity levels.

These studies along with the US Surgeon Generals report on Physical Activity and Public Health (1996) validate the use of physical activity as a public health mechanism for Diabetes management.

The antecedents of Pacific peoples health

The health status of an individual and population has a strong relationship with the socioeconomic and sociocultural context in which they reside (NHC 1998). It is important then to examine the global health issues for Pacific people. This can then provide the contextual framework for developing physical activity interventions.

The Family unit provides a system of support and care. It is a basic and important institution among Pacific populations providing the material, emotional and cultural environment of the individual. A family can socialise individuals to conform to behaviours conducive to health, better than any health agency available (Finau and Foliaki cited in MoH 1997) It also has a role in the transmission of knowledge and information to the young through practice, involvement and subconscious imitation. (ibid)

Pacific populations have a system of health beliefs that are inherent in their lives. These **Traditional health practices** are enabling factors that protect and provide for the health of the community through social practices such as rituals, social and economic exchanges, passing of knowledge and treatments that are integrated into the customs of the community. These practices have evolved as a society's response to an array of illnesses that interfere with the activities within the social, economic, political and religious systems (Finau 1982). It has been recommended that health services for Pacific people be integrated into traditional health practices to ensure an holistic approach to generating health and a chance for self reliance and self determination of health by Pacific people. (Finau ibid)

Socioeconomic capacity has a direct impact upon health of Pacific people (NHC 1998).This capacity is formed from education level, income and family status and directly affects housing, access to transport (ibid) and physical leisure activities. (Wilson et al). Pacific people have a lower average income, education level, access to transport and poorer housing than Europeans. The result is lower health status due to socioeconomic conditions.

For health services to be effective for Pacific people they need be both economically available and accessible. Furthermore, effective Pacific health services are sensitive to the sociocultural context of the specific Pacific population. Pacific people living in New Zealand represent at least 22 different cultures and speak and even greater number of languages. The term "Pacific People" is used as a collective term for a diverse range of people from the Pacific region. It is necessary to understand the cultural distinctions between each group and subsequently the design, delivery and evaluation of health services must involve comprehensive consultation with representatives of all major Pacific groups (Finau and Foliaki cited in MOH 1997).

Explaining sedentary lifestyles: implications for getting sedentary people active

People with diabetes tend to have no or low activity levels. It is important then to examine why these people are inactive and what has constructed their sedentary lifestyle so that physical activity interventions can be tailored to the level that they are presently at.

The construction of sedentary lifestyle or behaviours is due to a multiplicity of factors ranging from physical factors such as chronic injury, disability and low skill level to psychosocial factors such as low self esteem, low self eficacy, poor early experiences in physical activity and low self motivation. Indeed, Dishman (1994) states that those people who are able to maintain an exercise programme may have a different set of psychological skills from those who drop out.

Corbett, (1996) formulated the "Lycraphobia" concept looking to describe sedentary behaviour as a consequence of low exercise self efficacy due to unrealistic advertising images, exercise programming that was too intense for newly active people and the lack of leadership skills from exercise leaders, these factors constructing a fitness culture that pervades society and establishes very real psychosocial barriers to exercise for sedentary people. In effect the barriers reinforce further the individual's sedentary lifestyle.

In an ecological perspective (Egger and Swinburn 1998), sedentary behaviour is seen as a consequence of economic and social policy, transport and buliding design policy and action, and, further as a consequence of the automation of society with many domestic and vocational tasks now being performed without physical activity.

In addition, for Pacific people, the actions and mores that validate sedentary behaviour may be well defined and interwoven into the culture of the society. Factors such as age, gender and position in the village hierarchy may strongly influence the motivations of a person to exercise. requires the promotion, programming and elements of the intervention to be matched to the physiological and psychosocial level of the person. Further, the intervention must also take into account the efficacy of the setting in which the person resides i.e both the sociocultural and physical setting, to enable the person to become active.

For Pacific people with diabetes, it is highly likely that they are in a precontemplative stage of behaviour change with no intention to exercise. This stage would have been constructed by the physical disability due to the diabetic condition, the long term development of perceptions and attitudes towards being active and also the social norms of the cultural group. The precontemplative stage is the hardest stage from which to move people (Hillary Commission 1998) therefore more accessible and effective physical activity interventions are required.

Obesity has high prevalence in minority populations, in people of lower socioeconomic status and older people. These same groups also have low exercise rates.

Sedentary lifestyle then is a manifestation of cultural, social, physical and environmental elements in which the person resides. These manifestations construct a situation of Inactive Inertia that is very difficult to overcome. Only empathetic multidisciplinary programming that takes into account the behavioral and cultural elements that construct sedentary lifestyle will allow a person to construct a habit of being active.

Explaining obesity: implications for getting people active

There is a strong relationship between Obesity and diabetes (Haapenan 1997) that is due to inactive lifestyle, dietary practices or the condition of diabetes itself. It is highly likely that a person with diabetes will also be obese therefore the consequences and implications of working with obese people need to be taken into account when developing recommendations for the use of physical activity for diabetes management.

Importantly, US studies have shown a strong relationship between obesity and demographics. Obesity has high prevalence in minority populations, in people of lower socioeconomic status and older people. These same groups also

Table 1. Examples of levels of physical activity

Level of intervention	Channel	Target	Strategy
Personal	Face to face: GP clinic, Health clinic. Mediated: mail, telephone, self help kits.	Patients	Information on risk and health benefit, counselor support, personal monitoring, problem solving
Interpersonal	Classes, telephone/mail systems, peer led groups	Patients, healthy individuals, families, peers	Information, family and counselor support, group affiliation, personal or public monitoring, group problem solving
Organisational/ Environmental	Schools, worksites, neighborhoods, community facilities. Churches, daily living programmes	Students body, employees, residents, social norms	Curricula, point of choice education, organisational support, public feedback, incentives
Institutional/ Legislative	Policies, laws, regulations	Broad community or population	Standardisatioin of exercise related curricula, insurance incentives for regular exercisers, flexible work time to permit exercise, monetary incentives for developing public incentives, Surgeon Generals report on physical activity and health

Source: King (in Dishman 1994 pp 184 – 185)

For an obese person, exercise helps to manage weight through various mechanisms such as energy expenditure, increased metabolic rate, reducing the risk factors associated with obesity such as diabetes and improvements in psychological profile.

Previous research identifies that endurance type activities have the most effect upon glucose control and blood lipid profiles (Zierath and Wallberg - Henriksson 1992). Furthermore, lifestyle activity programmes which fit with the persons existing lifestyle and allow goal setting and activity choice flexibility show a higher rate of adherence than vigorous exercise programmes resulting in greater weight loss and easier weight management. It appears that lifestyle programmes increase adherence through the relative ease of incorporating lifestyle exercise into daily life which in turn may enhance confidence to perform physical activity (self efficacy) (Wilfley and Brownell cited in Dishman 1994)

Obese people face barriers to exercise that need to be allowed for in physical activity interventions. Many overweight people find exercise unpleasant because of their excess weight and poor physical condition. They are likely to experience pain, discomfort, injury and fatigue in becoming active.

Further, obese people tend to have a high level of psychological barriers to exercise developed through previous negative experiences with exercise from school, workplace and exercise settings and the attendant social costs of body image, lack of confidence, self esteem and social interactions. (ibid)

In addition, older obese patients are likely to have a combination of diabetes related complications and other diseases such as CVD, visual impairment, disability, and impaired foot and lower limb function. Further, if the person has not been involved in physical activity before or during childhood, their level of motor skill development may be impaired preventing them from participating in activities. Their self efficacy to attempt activities is also likely to be low.

It is therefore paramount that an activity intervention is developed at a level that matches the physiological and psychosocial development of the obese individual in order to prevent injuries, enhance exercise self efficacy, and sustain adherence and that the intervention is set in the environmental context.

In summary, developing physical activity interventions for Pacific people with Diabetes must involve an investigation of the antecedents and interrelationships between obesity, sedentary behaviour and diabetes both separately and as a combined entity. Current exercise adherence interventions have had little effect on increasing initiation and maintenance of the general population to exercise, their effect upon Pacific people with diabetes with the attendant socioeconomic, sociocultural, physiological and psychosocial barriers will be minimal.

Now that the context is described the development of physical activity interventions can be more effectively matched to the context of the individual and community. Currently there are several approaches taken in physical activity interventions.

Approaches to physical activity interventions

Present approaches to increasing levels of physical activity have focussed at several levels. Personal, interpersonal, organisational/environmental and institutional/legislative, examples of which are summarised in Table 1.

Current New Zealand approaches are similar. Personal interventions via GP's have been developed into the Green Prescription, a GP prescribed written exercise programme by the Hillary Commission. Peer led groups have been utilised in programmes for Maori by Te Puni Kokori and obese people by the National Heart Foundation while environmental/setting approaches have been applied in schools, workplaces and churches by the National Heart Foundation and the Hillary Commission (NHC 1997).

At present a large Social marketing approach is being undertaken by the Hillary Commission in New Zealand, the aim being to raise awareness of the need to be active to improve health and also to show the value of daily lifestyle activity rather than vigorous exercise. This programme is to be continued for 3 years from 1999 to 2002. This campaign will hopefully provide the necessary social environment and catalyst for active living type programmes to take place. However, funding is for advertising only with no funding released at a community level to transfer desire into opportunities for action.

Specifically, in New Zealand diabetes interventions, structured exercise programmes have been used to increase levels of physical activity. These have centered on worksites (Simmons 1996) and churches (Swinburn 1997) and community wide programmes (South Auckland Diabetes Project). While these programmes have been successful in raising physical activity levels in the short term they have not been evaluated for their ability to cause long term activity habit change.

However, the exercise intervention centred upon the use of aerobics classes to raise physical activity levels. While these are a time effective method of exercise, timetabled structured exercise driven by an extrinsic leader appeals to only a proportion of people.

It is also unlikely that exercise to music classes are the correct modality to reach precontemplative obese people with diabetes and further they are not easily integrated into the persons lifestyle, elements previously discussed as essential for physical activity interventions for people with diabetes.

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Simmons et al (1997) have identified several community based approaches for the prevention of diabetes in New Zealand. Two major approaches to implementing strategies are identified: the high risk approach and the population approach. Increasing physical activity is seen as essential to both these approaches. The authors identify population approaches as being the most effective of reducing the incidence of NIDDM because they aim to reduce the risk factors for NIDDM across the whole population and have the potential to prevent high risk individuals from developing NIDDM and low risk individuals becoming high risk (ibid). Reduction of risk factors for NIDDM would also have benefits for CVD, hypertension and many other non communicable disease.

International population approaches to raising physical activity levels in people with diabetes have centred upon community activities, training community physical activity leaders, increasing activity levels in schools, walking groups and traditional activities such as hunting and dance. (ibid)

Interestingly, the Simmons et al (1997) identifies that those indigenous groups who return to a traditional lifestyle reduce their incidence of diabetes. This has important implications for Pacific people and is illustrated in the prevalence rates of diabetes in Pacific countries such as Nauru who have had major changes to traditional lifestyles. The authors also identify that for minority and indigenous groups, community development approaches may be the most effective method of intervention development, implementation and evaluation.

The next section investigates the use of community development appraoches to raising physical activity levels as possible development, delivery and evaluation mechnaisms for public health diabetes programmes.

Future possible approaches

The PEOPLE system (Planning and Evaluation Of People Led Endeavours) (Raeburn 1992), is a simple systems orientated organisational framework designed to help community people who want to plan, run and evaluate their own community projects. It is based on community psychology principles of community control, empowerment, deprofessionalisation, positive strength building, a social systems/ecological perspective, and programme evaluation. The PEOPLE system does not attempt to be rigid set of procedures for community controlled projects, but rather to provide guidelines for those wishing to work in this way.

This approach has high potential for Pacific communities and provides an excellent framework for action in diabetes management that can be designed to Pacific peoples needs by Pacific people.

Labonte (1990) continues the theme of Reaburn's PEOPLE system focusing on defining the process of empowerment by describing an integrated "Empowerment Continuum" from personal empowerment, to small group development, community organisation, coalition advocacy and political action. The continuum is built from the collective experiences of health and social service workers in Australia and Canada who have tried to alter the balance of power towards communities rather than professions.

The Active Living Canada (1995) programme is an example of utilising community development and empowerment approaches to raise physical activity levels.

The programme has been in operation in Canada for 10 years and has proved effective in generating community action and raising participation levels by facilitating community led actions to improve the environment for physical activity to occur. Actions include the lobbying of local authorities for improved street lighting, neighbourhood childminding co-ops, community patrols of local parks, visits to Senior Citizens in rest homes, and changes to school Physical Education policies.

These approaches have much potential for use in New Zealand particularly for Pacific people as they can be owned and operated by Pacific communities for Pacific communities. They are however, slow processes but ones that build sustainable change while strengthening communities.

Exercise interventions have had very limited success in increasing activity levels as they have been top down directed efforts to manipulate individuals. The missing link in exercise adherence research is empowerment, both at individual and community level.

In the framework being constructed for public health physical activity approaches to Diabetes management, these three approaches provide a possible solutions to raising physical activity levels and ensuring community ownership of the programme by taking a bottom up community based approach that leverages the antecedents of health for the specific community.

Recommendations for using physical activity as a diabetes management tool in Pacific populations

Development

- § Physical activity interventions need to be developed in partnership with Pacific communities to ensure the interventions match the sociocultural and socioeconomic elements of the community.
- § Resource materials need to be developed through consultation with Pacific communities to match the educational and social context.
- § Interventions need to be matched to the stage of behaviour change of the individual and/or community.
- § Community Development processes should be utilized to ensure the issues and needs of the community are addressed.
- § Activity modality needs to take into account the physical and social barriers that Pacific people with Diabetes experience.
- § Activity needs to matched to the physical and social capacity of the individual.
- § Intervention development needs to be aware of the need to address obesity, sedentary lifestyle and cultural elements and their interrelationship.
- § The socioeconomic and sociocultural factors that construct health for Pacific communities need to be included intervention development.
- § The purpose of physical activity intervention development in Pacific communities should be to make them available, accessible, affordable and achievable

Delivery

- § Existing community systems need to be utilised for delivery of interventions e.g. traditional health practices.
- § Existing community settings need to be utilised for delivery e.g. school, workplaces, community agencies, social gatherings, family units.
- § Activity needs to be incorporated into existing community activities as unobtrusively as possible. The aim should be for the least amount of lifestyle change required by the individual or community.
- § Social marketing empowerment messages need to be developed in consultation with Pacific communities to establish a community culture of active living.
- § Programme delivery needs to include skill building for Pacific communities in the areas of physical activity counseling, community activity leaders/advocates, event and programme management and networking and advocacy.
- § Physical activity interventions need to focus upon increasing exercise self efficacy.

Evaluation

- § Evaluation needs to occur in partnership with Pacific communities
- § The efficacy of increased physical activity to improve glucose tolerance needs to be ascertained.
- § The effectiveness of the physical activity intervention to raise lifestyle activity needs to be identified.
- § The efficacy of long term physical activity habits changes to reduce progression form IGT to Diabetes needs to be evaluated.
- § The process of developing active habits for Pacific People needs to be identified.
- § Process evaluation needs to be a focus to continuously improve the development of community partnership interventions.
- § Mixed methodology including action research, participant feedback focus groups and epidemiological surveys are needed.
- § The ability of the intervention to address socioeconomic and sociocultural factors needs to be assessed.

Conclusion

Current attempts to manage diabetes for Pacific people have proved ineffective in addressing the epidemic with any success being derived from the development of services and support groups driven by specific Pacific communities. The majority of interventions have focussed on nutrition education to either individuals or small communities in an attempt to reduce the level of fats consumed.

While physical activity has been validated as a moderator of diabetes in longitudinal and descriptive epidemiological studies, very few interventions have focussed upon raising physical activity levels in people with, or prone to, diabetes. Several attempts have been made to raise physical activity levels in Pacific Island communities however, they are simplistic in nature and are researcher driven rather than community driven tending to negate the sociocultural and socioeconomic factors that construct health for Pacific people.

In the general population, current attempts to raise levels of physical activity have had little success with low levels of participation level increases reported in the exercise adherence literature. The majority of these approaches have been top down in philosophy and experimental in nature focusing upon the outcome of being active rather than on the process of becoming active. Furthermore, the majority of this literature is generated from the psychology domain which, while providing excellent modelling of cognitive process of changing exercise habits, lacks the ability to account for the antecedents of community action.

There is however, hope in the approaches advocated by Labonte and Raeburn who emphasise community development from within and empowerment of individuals and communities to identify needs and develop strategies personalised to their lives rather than the artificial perspective of the researcher. Using this philosophy and approach may provide the necessary framework for Pacific communities to generate sustainable community led actions that raise the level of participation in physical activity. These in turn can then be utilised by communities and public health agencies as a diabetes management tool.

In summary, it is paramount that new physical activity interventions are generated in partnership with Pacific communities in an attempt to impact upon the epidemic of diabetes in the Pacific population. These interventions need to be contextualised in, and look to leverage, the antecedents of health for Pacific people. An integrated holistic approach is needed. This paper provides the validation and recommendation for developing such an approach.

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