The Development and Implementation of a Family and Home-Based Pilot Programme for Preventing Child Obesity in Pacific Families in Dunedin, New Zealand

Amy McColl

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ABSTRACT

Obesity in childhood has physical, psychological and social consequences that impact on health and quality of life. While there is a need for obesity prevention and treatment programmes amongst all New Zealanders, the need is greatest for Pacific children and their families. Over one in five Pacific children (23%) and three in five Pacific adults (62%) are obese, rates which are at least 2.5 times higher than the rates for non-Pacific children and adults, respectively. Consequently, the rates of obesity-related complications and diseases are also increasing among Pacific children in New Zealand.

Programmes for child obesity prevention in New Zealand, largely school-based, have not proved effective for the Pacific population, nor have they focused specifically on the home environment. It is unlikely child obesity can be treated or prevented without addressing the child's influential family and home environment. However, the research to support such a programme in Pacific communities is lacking, particularly collaborative research that works with Pacific families to develop and evaluate a health promotion programme that will prevent child obesity, improve family health, and benefit Pacific communities.

This thesis describes the development, implementation, and qualitative evaluation of a home-based pilot programme for preventing child obesity by promoting healthy lifestyle behaviours in 'at-risk' Pacific families in Dunedin, New Zealand. The focus of the programme was small changes in lifestyle behaviours tailored to the self-identified priorities, challenges, and strengths of each family with the aim of improving nutrition and physical activity habits. The programme was delivered in the home over 12 weeks and involved the whole family.

This qualitative research was guided by Pacific models including Talanoa (Samoan) methodology and the Kakala (Tongan) research framework. Families were interviewed after participating in the programme and interview transcripts were qualitatively analysed for themes in the experiences and opinions of participating families using a general inductive approach.

The results of this pilot suggest home-based programmes that focus on attainable goals, provide clear information, and involve the whole family are a positive and enjoyable method for prevention of child obesity in Pacific families. Families like the fun and family focused programme with simple and clear messages that were tailored to their unique situation and health goals within a flexible structure. Delivery in the home setting was viewed as a way to enhance the understanding of family context, thereby setting achievable goals, something considered highly important by participating families. There is value in considering a complementary community-based programme

alongside home-based child obesity prevention because Pacific families were strongly influenced by their community and church environments. Recommendations for future research include formal evaluation of a family and home-based obesity prevention programme based on this pilot programme and development of a complementary community-based component, preferably through the church setting.

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1 INTRODUCTION

1.1 THE ISSUE: OBESITY IN PACIFIC CHILDREN IN NEW ZEALAND

The prevalence of obesity across Pacific cultures, regardless of country of residence, is amongst the highest in the world.[1] Pacific peoples in New Zealand have an extremely high prevalence of obesity. Over one in five Pacific children (23%) and three in five Pacific adults (62%) are obese. These rates are at least 2.5 times higher than the rates for non-Pacific children and adults, respectively.[2] Consequently, the rates of obesity-related complications and diseases, such as type 2 diabetes, are increasing among Pacific children in New Zealand.[3]

Obesity in childhood has physical, psychological, and social consequences that impact on children's health and quality of life. Child obesity is known to track into adulthood, with around 70% of obese adolescents growing up to become obese adults.[4] Conventional and current programmes for obesity prevention and treatment in New Zealand have not proved effective for the Pacific population. These consist mainly of school-based obesity prevention programmes for children or church-based obesity prevention programmes for Pacific adults. The majority of studies in New Zealand have not addressed the home environment nor have they been piloted to allow participating families to collaborate on programme development. It is unlikely child obesity can be treated or prevented without addressing the child's family and home environment. Therefore, a programme that effectively works with families to improve overall health is likely to improve children's health and develop lifetime habits that protect against child obesity. However, there is a gap in the research that looks at working with Pacific families using a bottom-up approach to build a health promotion programme that will prevent child obesity, improve family health, and benefit Pacific communities.

DEFINING OVERWEIGHT AND OBESITY

Overweight and obesity are typically defined as abnormal or excessive fat accumulation that may impair health.[5] A common method of classifying overweight and obesity is a measurement of weight-for-height, or body mass index (BMI), which is weight in kilograms divided by the square of height in meters (kg/m^2). The World Health Organization (WHO) classifies a BMI greater than or equal to 25 as overweight, and a BMI greater than or equal to 30 as obese in adults.[5] Using percentiles, the CDC classifies children in the 85th to less than the 95th percentile as overweight, and as obese if they are in the 95th percentile or higher compared to a growth chart representing children of the same age and sex.[6] The New Zealand Ministry of Health recommends CDC growth charts to classify children's weight status. Overweight and obesity are either reported together as "overweight" or separately, which can make direct comparisons of data difficult. While obesity and its related health consequences are the main focus of this study, overweight is clearly a precursor to obesity and increasing numbers of overweight children and adults are contributing factors to the

obesity epidemic. While obesity data are given primary consideration, for the purpose of this thesis results of both overweight and obesity will be included as indicators of the obesity epidemic.

1.2 The Project: A Home-Based Pilot Programme for Preventing Child Obesity in Pacific Families

This thesis describes the development, implementation, and qualitative evaluation of a home-based pilot programme for preventing child obesity by promoting healthy lifestyle behaviours in 'at-risk' Pacific families in Dunedin, New Zealand. The focus of the programme was small changes in lifestyle behaviours tailored to the self-identified priorities, challenges, and strengths of each family with the aim of improving nutrition and physical activity habits. The programme was delivered in the home and involved the whole family. The programme involved families determining their needs, learning how to set attainable goals, and providing feedback on barriers and progress made. Education and resources on nutrition and physical activity were developed based on recommendations from the New Zealand Ministry of Health. The experiences and feedback from these families will contribute to developing this pilot programme into an appropriate and effective child obesity prevention programme for Pacific families in New Zealand. This research was granted ethical approval by the Department of Preventive and Social Medicine at the University of Otago (Appendix A).

1.3 Outline of the Thesis Structure

This introductory chapter briefly explains the research project, including the relevant public health issues and the research gap it addresses. It also outlines the structure of the thesis.

The second chapter describes the background issues related to the research aims. Firstly, the obesity epidemic, its prevalence in New Zealand as a whole and pertaining to Pacific New Zealanders, and its complications. Secondly, a more in-depth description of the Pacific population in New Zealand including traditional backgrounds, present demographics, and current health issues.

The third chapter is a review of the relevant literature. Section 3.1 explores literature on Pacific culture and working with Pacific families. Section 3.2 reviews the literature on child obesity prevention programmes in New Zealand and internationally and the relevance to Pacific populations in particular. Section 3.3 summarizes the reviewed literature and presents the approach of this research, a statement of the research questions and the expected outcome/impact of this study.

The fourth chapter outlines the methods chosen to conduct this study. Section 4.1 details the study's guiding framework and methodology and section 4.2 outlines the research design. The pilot programme development and implementation goals are described. The chapter concludes with an explanation of the procedures followed to conduct the study including recruitment, data collection, and analysis.

The fifth chapter presents the results of the analysis and the key research findings, including quotes and feedback from the participating families.

The sixth chapter discusses the results, and the implications of the key findings. This chapter ends with recommendations for future research.

The thesis concludes with appendices including consent forms, ethical approval, information sheets, and examples of resources used in the pilot programme.

2 BACKGROUND

2.1 GLOBAL OBESITY EPIDEMIC

The prevalence of overweight and obesity is increasing at an alarming rate worldwide and reaching epidemic status for adults, children and young people alike.[7,8] The International Obesity Task Force provides evidence that countries in all regions of the world are experiencing this epidemic. Recent data showed obesity rates as high as 26% for adults in England, 35% for adults in the United States, 25% in Venezuelan men and 47% in Kuwaiti women.[1]

In child obesity, studies across all countries are reporting an increase in the prevalence of overweight and obesity in children and young people.[5, 9] Recent data from Canada showed the prevalence rate of obesity for children aged 6-17 years was 28.9% in boys and 26.1% in girls. Similar rates were observed in the United States for children of the same age: 28.1% in boys and 29.0% in girls. In Australian children aged 5-14 years the prevalence of obesity was 28.2% in boys and 28.8% in girls.[10] In 2011/2012, 10% of children aged 2-14 in New Zealand were obese.[3]

2.1.1 OBESITY IN THE WESTERN PACIFIC REGION

The prevalence of obesity is increasing to high levels in many Pacific Island countries and territories, and the Western Pacific region has the highest overall rates in the world. In 2002, 70.3% of women in Tonga were obese and in 2004 55.7% of Nauru men were obese.[1] The prevalence of overweight and obesity have been reported as high as 75% in Nauru, Samoa, American Samoa, Cook Islands, Tonga and French Polynesia,[11] and child obesity rates are approximately 30%.[10]

2.1.2 OBESITY IN NEW ZEALAND

New Zealand is no exception to the obesity epidemic trends. Prevalence of obesity in New Zealand adults rose from 19% in 1997 to 28% in 2011/2012.[12] New Zealand had the third highest obesity rate in the OECD in 2009.[13] The United States' 34% prevalence and Mexico's 30% prevalence were higher than that for New Zealand, while Australia's prevalence of 25% and the OECD average of 17% were lower.[12, 13]

In New Zealand, between 2006/07 and 2011/12, the obesity rate increased sharply from 14% to 20% in the 15-24 year age group and from 8% to 10% in children aged 2-14 years.[12] In 2011/2012, a further 21% of children aged 2-14 years were overweight but not obese. Thus almost one in three children in this age group were either overweight or obese.[3]

2.1.3 OBESITY IN PACIFIC NEW ZEALANDERS

Pacific adults are more than twice as likely to be obese as non-Pacific adults in New Zealand.[12] Among Pacific peoples, 56.2% of men and 59.5% of women were obese in 2008/09.[14, 15]

Pacific children had higher obesity rates (23%) than non-Pacific children (10%) in 2011/2012.[2] Obesity rates for Pacific adults and children have not changed since 2006/07, but both Pacific children and adults are at least 2.5 times as likely to be obese as non-Pacific children and adults.[2]

2.2 Obesity Risk Factors

Overweight and obesity result from a positive imbalance between energy input and energy expenditure, leading to an accumulation of excess body fat. The issues of obesity prevention and treatment must consider complex interactions of social, physical, psychological, and cultural environments that influence health-related behaviours. There is, however, some strong evidence that certain lifestyle behaviours increase the risk of overweight and obesity. These include skipping breakfast,[16] consumption of excess sugar-sweetened beverages,[17, 18] eating food away from home,[19] and watching excessive amounts of television or spending too much sedentary time in front of a screen.[20] These behaviours, specifically television use, buying food from the dairy or takeaway shops, skipping breakfast, consumption of fruit drinks or soft drinks, and low physical activity, have been shown to correlate with body weight in a nationally representative sample of New Zealand children.[21]

2.3 Complications of Child Obesity

Obesity at a young age has many physical, psychological and social consequences that impact the health and quality of life of children and young people. Excess weight increases the risk of a number of chronic health disorders including type 2 diabetes, delayed maturation, menstrual problems in females, sleep-disordered breathing and asthma, hypertension, fatty liver disease,[9,22, 23] circulatory system issues, and musculoskeletal disorders.[24] Psychological and social consequences can include stigmatization of obese children, issues with self-esteem and self-image due to criticism from others,[9, 25] discrimination and victimization,[26] social isolation, and feeling ugly, lazy, or without self-control.[27]

Child obesity is predictive of adult obesity.[22, 24] Around 70% of obese adolescents grow up to become obese adults.[4] Childhood overweight and obesity increases the risk of early mortality in adulthood from endocrine, nutritional and metabolic diseases, and circulatory system disease.[9]

In New Zealand, an example of the implications of childhood obesity is the emergence of type 2 diabetes (T2DM) in adolescents and children. T2DM, formerly considered an “adult-onset” disease, is a major problem that now accounts for approximately 10% of all new cases of diabetes in children or adolescents in the Auckland region of New Zealand, with particularly high rates in

Pacific Islanders.[28] The adolescent diabetes clinic at the Auckland Diabetes Centre reported that the proportion of T2DM among all cases of diabetes increased six-fold from 1996 (1.8%) to 2002 (11%).[29] In the 2002 study, nine boys and nine girls had T2DM, all of whom were of either Pacific Island or Maori ethnicity. The mean age at diagnosis was 15 years, with a mean BMI of 34.6kg/m.[29] While these clinic data are not nationally representative, they illustrate a clear and disturbing trend. A further study included children seen between January 1995 and December 2007 at the Starship Paediatric Diabetes service, the sole tertiary diabetes provider for children under 15 years in the greater Auckland region.[28] Of the children seen during this period, 52 had T2DM, representing 8% of new diabetes cases in the clinic. As with Hotu's study, the majority of T2DM cases (90%, 43 of 50) were of Pacific Island or Maori ethnicity. The average annual incidence of T2DM was 3.4 per 100,000 in Pacific children compared to 1.3 per 100,000 in all children.[28]

2.4 Pacific Peoples in New Zealand

2.4.1 Traditional Backgrounds

Traditionally, isolation and remoteness served to protect the Pacific Islands and their people from diseases seen in the rest of the world. Pacific island adults following their traditional lifestyle were generally robust, physically fit, and active.[30] Prior to World War II, Pacific peoples were relatively free of nutritional deficiencies and the prevalence of chronic degenerative diseases such as diabetes or ischaemic heart disease was low.[11] While the countries and territories of the Pacific Islands vary in geographic and population size, climate, ethnic composition, and social, economic and cultural aspects, they are all faced with the rapid emergence of obesity-related non-communicable diseases such as heart disease and diabetes.[11]

2.4.2 Migration and Transition

Pacific peoples have a relatively recent history in New Zealand. From a small immigrant community in the 1940s, Pacific peoples have become a population of considerable and increasing size and social significance in New Zealand. In fact, there are more Pacific peoples from Niue, the Cook Islands, and Tokelau living in New Zealand than in their respective home countries and Fijians are the only group in which the majority was born overseas.[31] The Pacific population is diverse and includes many different ethnic groups, of which the largest are Samoan, Cook Island Maori, Tongan, Niuean, Fijian, Tokelauan and Tuvaluan.[31]

In the last few decades, as lifestyles become increasingly modernised, obesity has reached epidemic proportions in Pacific communities.[30] Rapid social change and Western influence have contributed to poor diets and lifestyles of minimal effort. Pacific peoples living in Western countries also face the problematic social trends that have contributed to the obesogenic environments of Western civilizations over the last 20 years. These trends include increased use of motorised transport,

decreased opportunities for physical activity, increased sedentary recreation, more frequent and vast food purchasing opportunities for energy-dense foods, larger portions offering supposed "value for money", and rising consumption of soft drinks and other sugar-sweetened drinks.[9] Changes in nutritional patterns are likely to have contributed to increased rates of non-communicable diseases. For example, root vegetables traditionally consumed such as taro, yams, and sweet potatoes are being replaced by lower-fiber bread and rice, and tinned fish and high-fat, highly salted tinned meats have replaced fresh fish.[11]

2.4.3 Demographics

Pacific peoples currently make up 7% of the total New Zealand population, with today's Pacific population being mostly New Zealand born, predominantly young and highly urbanized.[31] In 1945 there were just over 2,000 people in New Zealand recorded as being of Pacific origin, representing just over 0.1% of the total New Zealand population at the time.[32] The Samoan ethnic group is the largest and makes up almost half of the current Pacific population in New Zealand. In 2006, of 265, 974 Pacific people, 49% were of Samoan ethnicity.[33] The Pacific population is projected to reach 414,000 in 2021. Furthermore, the Pacific share of the total population is projected to rise to 9% in 2021.[34]

Age Structure

The Pacific population in New Zealand has a younger age profile than that of the total New Zealand population.[14] In 2006, the median age of Pacific peoples was 21.1 years, considerably lower than the median age of the overall New Zealand population of 25.9 years[33], and 38% of Pacific peoples were under the age of 15 years compared with 22% of the total population.[14] In 2006, 12% of the overall New Zealand population was aged 65 and over, compared to just 4% of Pacific peoples in New Zealand.[33]

2.4.4 Centrality of the Church and Community

In 2006, 83% of Pacific peoples in New Zealand stated they had at least one religion, compared to 61% of New Zealanders overall, and 97% of those Pacific peoples identified with the Christian religion.[33] Most Pacific communities have strong social connections, often centered on church and community activities.[31] Pacific cultures are not homogenous, yet the shared centrality of kin-based relationships and belief in an ancestral spirituality are generally agreed to be core values.[35]

2.4.5 Role of Food

Food is both an expression of cultural identity and a means of preserving family and community unity.[22] The sharing of a meal is an opportunity for family members or friends to get together and socialize and to strengthen relationships,[36] and important social values of friendship, respect, hospitality, and reciprocity often involve giving and receiving food. In some cultures the type and

amount of food involved is more heavily weighted by these values, resulting in a socially driven overprovision and overconsumption of food.[37]

Food plays several important roles for Pacific peoples, with symbolic meanings in certain settings, such as the context of family, church, and community gatherings. The ability to give food away, whether as a sign of affection, to help someone in need, or to sponsor a large community feast, is important for Pacific peoples. It allows them to both demonstrate their *'ofa* (generosity) and to show that they have been blessed or stand in good stead with the "Creator".[38]

This symbolic role extends to the type of food and size of portions given to others. "Western" foods, or those that were once rare in Pacific countries, are considered higher status. These foods are not necessarily healthy, and often are high in salt, sugar, and fat. As an example, in a study on obesity in Samoan church communities in Auckland, it was found that tradition and protocol, rather than health, dictated that tinned corned beef rather than fruit and vegetables be given as a gift at special occasions.[39] Pacific peoples from many Pacific cultures point out the connection between portion size and cultural values of honouring others by giving them the best of what you had, including the portion size served at family, cultural, and church gatherings.[36]

2.5 New Zealand's Pacific Population

2.5.1 Health status of Pacific adults

Life expectancy for Pacific peoples in New Zealand is about 4 years less than for the overall population, and Pacific peoples' health is shown to be worse than other New Zealanders from childhood through to later stages of life.[14] However, in 2011/2012, 86% of Pacific adults aged 15 and over rated their health to be excellent, very good, or good and 98% of Pacific children aged 0-14 were rated by their parents to have excellent, very good, or good health.[2] Pacific peoples are over-represented in health statistics relating to obesity-related conditions such as diabetes and stroke.

A study on the national prevalence of diabetes and pre-diabetes in New Zealand showed 15.4% of Pacific adults had diabetes and 24.0% had pre-diabetes.[40] These rates were notably higher than the overall rates of 7.0% with diabetes and 18.6% with pre-diabetes.[40] Prevalence of undiagnosed diabetes was highest amongst Pacific peoples (6.4%) compared to Maori (2.2%) and New Zealand European and Others (NZEO) (1.5%). Pre-diabetes was also highest in Pacific peoples (24.0%) compared to 20.5% for Maori and 18.1% for NZEO.[40] Pacific peoples are more likely to experience complications of diabetes. T2DM occurs earlier in Pacific peoples than Europeans (about 10 years earlier), which contributes to an increased risk of chronic health conditions and mortality, including cardiovascular disease,[14, 41] renal replacement therapy, and foot amputations as a result of diabetes.[41]

Pacific peoples have the highest rate of hospitalisation for stroke, and are three times more likely than New Zealand Europeans to be dependent 12 months after suffering a stroke.[42] Between 1981-82 and 2002-03, the incidence of stroke for people 35-84 years old increased by 66% among Pacific peoples, while over the same period incidence rates remained constant for Maori and fell by 19% for Europeans.[41] In 2011/2012, Pacific adults were more likely to be taking medication for high cholesterol than non-Pacific adults (7% of Pacific adults compared to 10% of the total population).[12]

2.5.2 Health of Pacific Children and Young People in New Zealand

The 2006/2007 New Zealand Health Survey showed that obesity is a primary area where there are large health inequalities between Pacific and non-Pacific children in New Zealand.[43] One quarter of Pacific children aged 2-14 years were obese compared with one in 16 non-Pacific children of the same age. In New Zealand extreme obesity (defined as a BMI above 40 kg/m^2) affects one in ten Pacific children compared with one in 20 Maori children and one in 100 NZEO children.[44]

2.5.3 Obesity-Related Behaviours

National surveys have indicated that there are disturbing trends in the nutrition and health-related behaviours of Pacific children and adults in New Zealand that are likely to be contributing or related to their high levels of obesity and poor health outcomes.

Pacific adults were less likely to eat at least three servings of vegetables each day (46%) than the population overall (68%) in 2011/2012. They were also less likely to be physically active (46%) than the general population (54%).[2] The percentage of Pacific children (83%) who ate breakfast at home was lower than that for NZEO children (89%) and children overall (87%). Pacific children were three times more likely to have eaten fast food more than three times in the past week as non-Pacific children and more likely to have had a fizzy drink three or more times in the past week.[3] About 59% of Pacific children watched two or more hours of television a day, which was higher than for non-Pacific children (53%).[3]

2.5.4 Implications

The Pacific population is increasing and they will have a significant role in the future of New Zealand. Their poorer health will place elevated stress on their communities and the health system. This is likely to worsen substantially if current disturbing health trends are not stalled or reversed. It is important to improve the health status of Pacific youth in order to improve the current disparate health outcomes seen in New Zealand.

Obesity has significant direct and indirect costs. The World Health Organization estimates that it accounts for between two and seven percent of a country's total healthcare costs.[8] An inquiry into obesity and T2DM in New Zealand suggested government-funded health-care costs for T2DM were estimated at around $540 million for the 2006/07-year, or three percent of state health spending.[45] If

unchecked this is predicted to increase to $1.78 billion by 2021, or 15% of state health spending.[45] It is projected that in less than a decade nearly 400 000 New Zealanders will have diabetes, primarily due to increased T2DM as a result of increasing obesity rates. This growth would cost the country over $1 billion each year in health costs alone, not including costs that would follow in other related areas.[46]

2.6 SUMMARY: OBESITY IN PACIFIC CHILDREN AND THEIR FAMILIES IN NEW ZEALAND

While there is a need for obesity prevention and treatment programmes amongst all New Zealanders, the need is greatest for Pacific children and their families. Without prevention and treatment effective for Pacific peoples, the incidence and impact of chronic non-communicable diseases in New Zealand's Pacific population will continue growing. This will have far-reaching effects on Pacific communities. Current obesity prevention strategies must be reviewed and evaluated in terms of effectiveness for children and Pacific populations. Developing strategies and programmes that effectively target Pacific children and their families for obesity prevention is an important step in stalling and reducing the obesity epidemic for this population. The next chapter will examine what has been done to address the obesity epidemic among Pacific peoples in New Zealand.

3 LITERATURE REVIEW

Behaviours shown to be associated with weight status in children, such as vegetable and fruit consumption, physical activity, sugary-beverage consumption, consumption of energy-dense foods and snacks, and TV watching, are potential areas for intervention.[17, 18, 20] In New Zealand and internationally, several settings have been explored to target groups for obesity prevention and/or treatment. This chapter looks at the evidence for current programmes for child obesity prevention, most of which were school and community based, and obesity prevention or related programmes with Pacific communities.

The literature review for this study was conducted April 2012-June 2012, and updated throughout the study to keep up to date with the most recent studies. The review focused on New Zealand child obesity prevention studies, health-related interventions with Pacific peoples, and international evidence on school, community, and family based interventions for child obesity. Online databases Pubmed, ProQuest Central, Scopus, Web of Knowledge, Web of Science, and EMBASE were searched for terms including or related to "overweight/obesity", "child/children/young people", "health promotion/health education/public health", "intervention/prevention", "family/home", "school/community", "New Zealand/Pacific" and "Pacific Island/Pasifika". Reports and papers from New Zealand health authorities were also reviewed for best practice evidence and guidance on working with Pacific peoples and implementing health promotion programmes in Pacific communities.

3.1 PACIFIC VIEWS OF HEALTH AND WORKING WITH PACIFIC PEOPLES

There are several Pacific frameworks of health, including the Samoan *Fonofale* and *Faafeletui* models, the Tongan *Kakala* model and the Cook Islands *Tivaevae* model.[35, 47] Common principles throughout Pacific health frameworks include reciprocity, love and compassion ("ofa" in Tongan), respect and deference ("faaaloalo" in Samoan), and notions of family interconnectedness ("magfoa" in Niuean or "kopu tangata" in Cook Island Maori).[35] A Pacific view of health incorporates links between well being of the community and society and those within it. It goes beyond an individual's physical health to incorporate a balance with spiritual and mental health[35] and harmony with the environment and with the family.[47-49] A Pacific-wide paradigm of health should consider cultural perceptions of well being, encompassing values and obligations centered on the relationships with extended family and community.[50] The social and collective context of relationships reflects the important points of reference for Pacific self-identity.[51] For a Pacific young person, "good health" encompasses connections to their family, God, church, school and

peers, and includes self-esteem and character traits.[36] This includes the ability to meet obligations to themselves, their family, and their village and community.[36]

3.1.1 Pacific Cultural Influences on Body Size

Historically, Pacific peoples have valued large body size as a sign of beauty, wealth, power, authority, and status.[52, 53] In 1998, a study conducted with Samoans in both New Zealand and Samoa sought to find whether traditional idealisation of large body size still existed among these groups.[52] This study found that Samoan participants had ideal body sizes slimmer than perceived body size, and significant proportions of both men and women attempted or desired to lose weight. This suggested that the traditional valuation of large body size was no longer apparent as a significant social value. Similarly, a study with Pacific Islanders in Australia, New Zealand, and in the Pacific Island countries found an increasing idealisation of thinner bodies.[54, 55] Despite an apparent shift in the ideal body size, the Samoans in the 1998 study perceived being above normal weight at larger body sizes compared to Western groups and ranked obese bodies as more attractive and were unlikely to define themselves as overweight even at larger sizes.[52]

Forty percent of New Zealand's Pacific population lives in the Counties Manukau District.[36] In 2004, the Counties Manukau District Health Board (CMDHB) conducted focus groups with Pacific peoples in order to develop action plans to prevent and treat obesity at a community level. Many people in these groups commented on how their culture perceived "being big as beautiful", and associated size with family status and being healthy. This was particularly the case for Tongan and Samoan groups who suggested skinny or thin children were sometimes viewed as sickly or not looked after properly.[36] Another study found weight loss among Pacific peoples could be interpreted as a public signal of family distress or individual illness.[38] Discussion across all focus groups also spoke on how being overweight or obese had become "normalized" within Pacific communities and was generally accepted.[36]

3.1.2 Working with Pacific Families

When working with families, ethnic and socio-cultural factors must be considered because traditional values, social and support networks, food preferences, and recreational choices are all influenced by these factors.[56] As socio-cultural factors are often deeply embedded, they are not easily changed. However, as these factors can contribute to behaviours associated with obesity, it is imperative that they are considered and targeted in obesity prevention programmes.[37]

There are several concepts that need to be considered in order for health interventions with Pacific peoples to be culturally appropriate.[47] These include, a view of health within conceptions of traditional ways of living; possible conceptual differences between Western and Indigenous

illnesses and Western and Indigenous treatments; the applicability of Western health explanations in a given situation; relevance to local factors such as level of education and traditions; emphasis on oral or visual as opposed to written material, and; emphasis on practical explanations of how to decrease health risks and increase healthy behaviours rather than technical and scientific explanations.[47] Awareness and sensitivity to Pacific values such as family, communality, reciprocity, spirituality, flexibility, respect and humility improves the likelihood of developing and implementing successful interventions.[36, 57] Pacific peoples are strongly connected to their family and root themselves in relationships between their family members and their community. It has been suggested that obesity prevention programmes with Pacific peoples need to be holistic and consider the cultural, socioeconomic, family, and spiritual contexts of Pacific peoples, including how health is prioritised.[36] Ethnic and socio-cultural influences create differences in health behaviours; therefore family-based interventions developed within the cultural context of the family may result in more effective and sustainable behaviour change.[56] There are no such interventions that have been conducted with Pacific families in New Zealand published. Therefore this pilot programme seeks to understand and target the family context and the home environment of Pacific families to encourage behaviour changes to prevent child obesity.

3.1.3 Models for Working with Pacific Peoples in New Zealand

As part of a plan to reduce the prevalence of obesity, the Counties Manukau District Health Board (CMDHB) undertook a review of existing obesity prevention programmes and best practice evidence relevant to obesity interventions for the Pacific population. This review identified strategies, programmes, and community action initiatives targeting Pacific peoples in order to inform the development of an Obesity Implementation Plan for the Pacific community in the Counties Manukau District.[36] This stock-take of existing interventions and programmes found a particular gap: childhood obesity initiatives that targeted Pacific parents and caregivers or the family as an entity.

The CMDHB considered that empowering the Pacific community to have more control over their own health and well-being should be central to the development of the Pacific Community Obesity Implementation Plan. Based on this approach, the Ministry of Pacific Island Affairs (MPIA) and the Counties Manukau District Health Board (CMDHB) developed a "Community Action Model for Guiding Principles of Community Development" in 2004. There were five guiding principles underpinning this approach:

1. The experience should be empowering for the community and enable individuals and communities to have more control over their health.

2. Communities should identify their own priorities, resources, solutions, issues, and strengths to meet their needs.

3. Communities should be actively involved and participate equally in decision-making processes.

4. There should be a sharing of skills, knowledge, expertise and resources between groups.

5. The process should be collective, with people working collaboratively to influence social, economic, cultural, political and environmental change as appropriate.[36]

The MPIA and Counties DHB also published a "Model of Pacific Capacity Building", which listed seven phases to applying the community action model specifically to obesity:

1. *Mobilize* community and obtain buy-in to the vision by participants

2. *Identify issues* to be addressed as part of community initiatives

3. *Identify community resources*, skills, talents and what resources are required from external sources

4. *Programme of action*, where communities develop their own programme of action to implement their initiatives or activities

5. *Implementation*, where communities implement their programmes of action

6. *Monitor*, progress against programmes of action, and

7. *Evaluate*, review progress outcomes[36]

This model also incorporated suggestions for evaluating the effectiveness and success of using these strategies to reduce obesity and improve nutrition and physical activity levels for the Pacific population. The suggested evaluation process included:

- Measure whether there is an increase in the knowledge base of participants and/or a change in behaviour towards living healthier lifestyles as a result of communities participating in community action initiatives.

- Evaluate to what extent the Pacific community obesity implementation framework has been implemented and progress against key performance indicators.

- Gather qualitative reflections from Pacific communities on whether the community action initiatives have influenced behaviour change or resulted in lifestyle modification, and

- Identify any gaps or barriers that exist in service delivery and make recommendations for future development.[36]

This model provides useful guidance for working with Pacific communities. With slight modifications it could also be applied to working with Pacific families.

3.2 Programmes for Child Obesity Prevention in New Zealand

In 2004, the Ministry of Health performed a stock-take of interventions and programmes aimed at childhood obesity prevention and management in New Zealand. The report found no national register of obesity and management interventions. Pacific and Maori children and adults had significantly higher rates of obesity and its associated diseases when compared to NZ Europeans, therefore it was recommended that programmes and strategies needed to be developed and evaluated with these ethnic subgroups.[58] This section reviews the literature regarding child obesity prevention and weight-related interventions with Pacific peoples conducted in recent years in New Zealand and internationally.

3.2.1 School-based interventions for child obesity

The school environment is a popular context for intervention programmes for children. Schools have staff and resources that can potentially support the dissemination of interventions (for example teachers, coaches, other staff, and facilities and equipment for activity).[59, 60] There are meals and snacks consumed at school, facilities for physical activity and sports, and an opportunity to incorporate food, nutrition, and physical education into core curriculum.[59, 61, 62]

In 2009, Brown and Summerbell conducted a systematic review of school-based interventions that focused on changing dietary intake and activity levels to prevent childhood obesity.[63] Thirty-eight randomized controlled or controlled clinical trials of lifestyle interventions that were school-based and at least 12 weeks in duration were included. Lifestyle interventions were defined as including healthy eating, increased physical activity, reduced sedentary behaviours, behaviour therapy, and social support and education for diet and activity behaviours. The interventions were grouped into diet change only, physical activity change only, and diet plus physical activity. Of the 38 studies, 23 were in primary schools, 12 were in secondary schools, two were in a kindergarten/pre-school setting and one study included adolescents age 16-18. Children were aged 4-18 years, and the duration of interventions and follow up ranged from 12 weeks to 22 years. Most interventions (22) had follow up of less than one year, nine had follow up between one and two years, four had follow up between three and five years and two had longer follow up. One of three (33%) diet studies, five of fifteen (33%) physical activity studies and nine of twenty (45%) combined diet and physical activity studies demonstrated significant differences between intervention and control groups for

BMI.[63] The heterogeneity of studies caused difficulty in generalising as to what types of interventions were effective. The review found results were inconsistent, but overall suggested combined diet and physical activity school-based interventions may help prevent children becoming overweight in the long term.[63] Similar conclusions were reached in an earlier 2006 review on preventing childhood obesity in school settings between 1999 and 2004 in the United States and United Kingdom.[59] The 2009 review looked at BMI as a primary outcome measure while the 2006 review also considered behaviour changes. The earlier review included studies conducted in grades from kindergarten to high school, and most interventions targeted both physical activity and nutrition behaviours. Overall the authors concluded that the school-based interventions resulted in "modest" changes in behaviours such as TV watching, physical activity, and increased vegetable consumption and mixed results for anthropometric measures such as BMI and waist circumference.[59] Studies since 2009 have found similar results in school settings, with some positive outcomes in behavior changes, such as vegetable consumption[64] but minimal effect on changing BMI and other anthropometric outcomes.[65, 66] However, even "modest" changes can produce significant results over time because schools are able to target large groups of children at once, therefore they may be effective in preventing children becoming overweight in the long term. A review of interventions for the prevention of overweight and obesity in preschool children was consistent with these findings, in that while in some cases small effects have been observed in dietary and/or physical activity behaviours, none of the interventions had an effect on weight gain or BMI.[67] While behaviour changes such as increased vegetable consumption and decreased television watching are positive, they may or may not translate to decreases in weight or prevent obesity and overweight.

Despite the potential for schools to make food, nutrition, and regular physical activity essential parts of life and learning,[59, 61, 62] there has been a shift away from a holistic concept of education towards a strongly academic-focused environment internationally.[62] The increased emphasis on academic achievement can make it more difficult for schools to allocate time to incorporate lifestyle intervention programmes effectively. For teachers specifically, interventions can be viewed as an additional component, and thus burden, to a full academic curriculum, and take time away from academic pursuits in an already busy school day. In the 2006 review 10 of the 11 (91%) interventions studied utilized existing teachers to implement the school-based interventions, because with additional training it seemed to be the most feasible and practical approach.[59] While it was suggested that the use of specialists in some studies most likely improved the quality of implementation, other issues, such as fiscal or time constraints, can make it impractical to provide external specialists as part of school-based programmes.[59]

Schools are one of many environments to facilitate behavioural change. Prior to school age, however, children have developed social and cultural eating customs and intake and exercise expenditure patterns influenced by their family and home environment.[61] While school-based programmes have shown some positive results, for behaviour modifications and mixed results with anthropometry, few programmes have specifically targeted non-Caucasian populations and few programmes have focused on children who are already overweight or obese.[59-61] For children at high risk of overweight and obesity, or who are already overweight or obese, school may not be the most effective place for treatment. However, any changes at school could provide a supportive environment if treatment were offered elsewhere.

3.2.1.1 Interventions in New Zealand Schools

APPLE project

A Pilot Programme for Lifestyle and Exercise (the APPLE project) targeted primary school children at four schools in a rural community in Otago, New Zealand and compared them to children at three schools in another comparable yet geographically separate rural community. The two-year controlled, community intervention was designed to prevent obesity in children by enhancing extra-curricular opportunities for physical activity.[60] The subjects were primarily Caucasian (81.8%) and from middle-class backgrounds (according to decile rating). Each intervention school was provided a community activity coordinator to develop community-based activity programmes that encouraged wider community involvement and increased physical activity among the children. Healthy eating initiatives included promoting reduced sugary-drink intake, increased fruit and vegetable consumption, reduced television time, and activity breaks in class.[60] Community activities such as parent and child tae-kwon-do, children's golf club, and community walks were introduced [68]. The primary outcome, BMI z-score, was lower in intervention compared with control children by -0.12 units ($p<0.05$), but the prevalence of overweight did not differ significantly. More intervention children who were overweight at baseline tended to be classified as normal weight at the end of the intervention than control children, however this was not statistically significant. Six percent of intervention children became overweight during the intervention compared with 12% of control children. No intervention effect was observed on waist circumference, blood pressure, or pulse rate, but results found that intervention children were spending on average 26 more minutes per day in activities of a moderate to vigorous nature than control children.[60] It was observed that intervention children were leaner and more physically active at baseline, so it is possible they had established good physical activity habits prior to the intervention, which further increased their daily physical activity times.

Despite improvements in healthy behaviours at the end of the two-year APPLE intervention, statistically significant decreases in weight status were only observed in normal weight children,

and no significant weight changes occurred in overweight or obese children.[69] The relatively simple approach of the APPLE project reduced the rate of excessive weight gain in children, although this may be limited to those not initially overweight.

> "What school based interventions may be unable to do is reduce weight in those children who are overweight before the intervention is initiated. Such children may require more intensive intervention than is typically offered in community-based prevention efforts," [70]

The APPLE study introduced community family based activities, but there were no activities specifically addressing the home environment. Activities in the community can encourage families to participate in healthy behaviours, however there are potentially structural and cost barriers to these types of activities depending on the community and the socioeconomic status of the parents and children involved.

PROJECT ENERGISE

Project Energise was a primary and intermediate-school based programme in the Waikato region of the North Island aimed at improving nutrition and physical activity levels, reducing obesity rates, and reducing cardiovascular risk factors in students from 2004 to 2006. Energize, a randomized control study of one hundred twenty four schools, was the largest and most comprehensive school-based intervention for New Zealand children of mixed ethnicity from a large geographical area.[71] Each intervention school was assigned an "Energizer" who promoted active transport, lunchtime games, bike days, and leadership training for students to be leaders of physical activities before and after school. Nutrition information was provided in a weekly school newsletter, and there was a home-school link programme that provided opportunities for parents to attend three information-based sessions. The local community was also targeted through dietician run education evenings for parents to raise awareness of healthier food choices, open house days, and edible gardens. At the time of Energize, the Healthy Eating Health Action (HEHA) Strategy was introduced nationwide in New Zealand. Control schools may have been influenced by HEHA initiatives such as social marketing, monitored food regulations, and fruit supplied to low-SES schools. This could have reduced the discernable effect of Project Energise.[71]

In Energise, the prevalence of overweight and obesity did not substantially change in intervention children between 2004 and 2006. Percent body fat was reduced significantly among normal weight 7 year olds and non-significantly among obese 12 year olds.[71] Of the sixty-two intervention schools, fifty-six reported there had been a change in the children's knowledge of healthy eating and physical activity. As with APPLE, Energize resulted in a lack of positive outcomes for children in the interventions who were already overweight or obese at baseline. There were no specific data or results comparing participating students of Pacific ethnicity.

Similar to APPLE, Energize attempted to involve parents and community through community events and dissemination of resources to the home through the children. While these approaches are valuable, they do not specifically address or intensively target the home environment. Moreover, they rely on the responsibility of children to take information home to their parents, and parents to make time to read the education material and attend events in the community. These may not be the most effective methods to target the influential home environment.

3.2.1.2 Pacific Obesity Prevention in Communities Project (OPIC)

The largest contribution to research on obesity prevention among Pacific peoples comes from the Pacific Obesity Prevention in Communities (OPIC) project. Obesity prevention was recognized as a priority by the World Health Organization and health authorities in New Zealand, Australia, and the Pacific at least 15 years ago, but evidence for effective obesity prevention was limited.[72] Thus, the OPIC study, a large-scale, comprehensive programme targeting obesity in adolescent Pacific populations in New Zealand, Australia, Fiji and Tonga, was established. OPIC was conducted in four countries across eight cultural groups in different community settings between 2004 and 2009.[73] OPIC consisted of school-based, whole of community interventions to promote healthy lifestyles amongst Pacific adolescents. The primary outcomes assessed changes in anthropometry and body composition (percentage body fat) and secondary outcomes including changes in behaviours such as eating and activity patterns, knowledge about nutrition-related concepts, quality of life, body size perceptions, and community capacity.[72, 74] The outcomes were assessed using a before-and-after design with measurements taken prior to and post-intervention in control and intervention schools. Alongside intervention studies, OPIC also conducted analytical studies on economic, sociocultural, and policy issues that potentially influence Pacific adolescents weight-related behaviours. The OPIC study design was based on the evidence of effective community capacity building approaches in European adolescents,[75] however the outcomes seen in the European studies did not occur in the OPIC sample of Pacific adolescents.

Anthropometric Methods and Results

The New Zealand arm of the OPIC project, Living 4 Life, was conducted in South Auckland. Living 4 Life was a large, school-based obesity prevention programme that targeted adolescents, whereas APPLE and Project Energise targeted younger children. Living 4 Life was implemented to reduce the prevalence of obesity in young people through a youth-led school intervention.[76] Four intervention schools were in the Mangere area and two control schools were in other parts of South Auckland. All schools were from low socioeconomic status communities. 59.1% of the students in the New Zealand schools were Pacific ethnicity. The interventions, implemented during 2006-2008, targeted key obesity-related behaviours documented in the 2002 National Children's Nutrition survey. Thus, the objectives were to reduce consumption of sugar sweetened beverages, increase

consumption of breakfast eating, increase physical activity before and after school, improve the quality of foods sold at school, and decrease television use.[76] This youth-led intervention may have resulted in positive improvements in student perceptions about health and healthy eating and activity behaviours within individual schools, but there was no significant reduction in the prevalence of obesity.

Living 4 Life also did not specifically target the home environment. The lack of effect on measures of excess weight may have been because the Living 4 Life intervention was not intensive enough.[76] If the intervention had been piloted, this issue may have been recognized and steps taken to increase the intensity of the intervention while maintaining the collaborative approach of using youth leaders.

Most other OPIC intervention sites found similar results, that is, no change in anthropometric outcomes. The only site that demonstrated a statistically significant result in primary outcomes was in Australia with the It's Your Move project. It's Your Move showed a significant reduction in weight gain over the study period in students from intervention schools.[74] It's Your Move, however, did not report on specific outcome results for Pacific students. Also, children who dropped out of the study had higher BMI z-scores than those who were followed-up, therefore challenging the external validity of the results.[77]

Socio-cultural Studies

OPIC's sociocultural sub study involved approximately 18,000 adolescents in four countries.[72] The first of its kind in terms of assessing socio-cultural aspects of obesity in Pacific peoples, the aim was to describe the social structures, values, beliefs, perceptions, attitudes and expectations[78] that have a significant influence on individual behaviours related to eating, activity and body image.[72] Despite no improvement in anthropometric measures at most of the OPIC project sites, the socio-cultural studies led to important insights on obesity in Pacific populations and how cultural factors can help to identify potential barriers to healthy lifestyle behaviours.[74]

Socio-cultural Results

OPIC found parents, peers, the media, and religion influenced the type of body valued by adolescents (Fijians, Tongans in Tonga, Tongans in New Zealand, and Australians). These influences also shaped the type and frequency of physical activity and the type and volume of food consumed.[78]

Among the OPIC groups, the Pacific adolescents (Fijians and both Tongan groups) reported several common socio-cultural influences. These included seeing family as a main source of socio-cultural messages and pressure; desire for muscularity, a stronger body and a larger body size (especially for boys); and the view that larger adolescents were well respected and cared for. Central aspects of

Tongan and Fijian community life include respect and care, which are reflected in the way family, community and church members relate to one another, as well as in the type and amount of food provided and consumed.[78] Tonga and Fiji are both hierarchical societies, where rank influences expected and actual patterns of body size perception, physical activity and eating, and food is selected and differentially distributed on the basis of status (as opposed to individual preference) within both the family and the community. High-status, highly valued members of the community obtain the largest volume and the best quality food, which is likely to be the most energy-dense and highest in calories, sugar, and fat. As a result of this provision a large body size is seen as a sign of care and nurturance.[78]

Changing Attitudes and Westernization

Socio-cultural perspectives were markedly different in the islands compared with Australia and New Zealand in the OPIC study. The quest for large body size was frequently at odds with obtaining healthy or thinner bodies, yet this "Western ideal" was starting to be valued by these Pacific communities. This is reflected in contradictory ways adolescents were trying to build or change their bodies.[79] Tongan adolescents in New Zealand were likely to have a higher BMI, however adolescents in Tonga were more likely to engage in weight-loss strategies.[78] Tongans in both Tonga and New Zealand had the highest BMI of all groups yet low levels of body dissatisfaction.[78] In Pacific countries there are no vernacular terms for obesity and it is not commonly perceived as a health problem.[80] McCabe found health reasons were noted as important motives to improve body shape and body change strategies in all groups of adolescents.

Behaviours, Beliefs and Values of Pacific Adolescents and their Parents

Another OPIC sub-study examined sociocultural factors that may promote or prevent obesity in Pacific communities in New Zealand. These factors included behaviours, beliefs, and values related to food consumption and physical activity demonstrated by Pacific adolescents and their parents. Patterns among obese and non-obese Pacific adolescents and their parents were examined.[81] This study was a mixed-methods design. 782 obese and 814 healthy weight New Zealand Pacific adolescents participated and a qualitative interview was conducted with 30 Pacific households (adolescents and parents). Most families (70%) lived in extended families, most parents (86%) were Island born, and most parents (86%) were bilingual. These factors were similar between obese and non-obese students.[81]

Obese Pacific adolescents were less likely to consume breakfast or lunch meals compared to their healthy weight Pacific counterparts, and more parents of healthy weight students reported regular consumption of breakfast than parents with an obese student. Healthy weight adolescents and their parents typically consumed vegetables at evening meals, but parents with an obese child did not mention vegetables. Parental presence at home was different between the two groups. Healthy

weight student households were more likely (86%) to have a full-time or part-time parent at home than obese student households (53%). 76% of healthy weight adolescents interviewed were currently "active" according to Ministry of Health guidelines, compared to 19% of obese students.[81]

The study found adolescents and parents held the same beliefs and values for physical activity regardless of adolescent weight status. Most students attributed excess body weight to both inactivity and over-consumption of food, valued physical activity, and thought it was important to participate in daily physical activity. Most students and their parents were familiar with the recommendations for physical activity required per week to gain health benefits. Results were also consistent, regardless of adolescent weight status, for reasons for being active (having fun, achievement, better health) or inactive (unskilled, no money to join, no transport or time), regardless of their weight.[81] While health knowledge is important, these results suggest the implementation and practice of healthy behaviours is more difficult to attain.

Challenges of OPIC

In OPIC the intervention plans had to be flexible due to various structural differences between locations. Thus the intensity and types of activities varied considerably between sites and within sites, and the interventions lacked homogeneity.[74] For example in Fiji the intervention was conducted in several schools all with the aim of reducing unhealthy weight gain in Fijian adolescents.[75] The intervention plan included behavioural objectives such as reduced television viewing, reduced intake of sugary drinks, and increased fruit intake. The two-year intervention found no consistent intervention effect, and Kremer proposed the intervention may not have been strong enough to combat a prevailing physical, economic and socio-cultural set of forces that contribute to unhealthy weight gain in Fijian adolescents.[75]

Implications of Results of the Sociocultural Studies

The authors suggest that the interventions could have been more effective if the information from the socio-cultural studies was known beforehand and incorporated into the programmes. While their conclusions suggest that external sociocultural factors may have been highly influential over adolescents' behaviours and knowledge, this is difficult to ascertain from the study design. If the study had been designed as a randomized controlled trial it may have been possible to discern or conclude that external sociocultural factors were or were not influential on adolescents' knowledge and behaviours. OPIC acknowledges the difficulty, however, in randomly allocating interventions in "real-life" experiments given political, administrative, and economic concerns.[74] The results of OPIC suggest that piloting programmes is valuable in ascertaining aspects such as sociocultural influences and time constraints that may impact how programmes are implemented and experienced, and ultimately how successful they are.

3.2.2 Church-based interventions with Pacific peoples

For Pacific peoples in New Zealand, the church is often the centre point of communities, replacing the village in the usual community-based structure of the Pacific Islands.[82] Implementing intervention programmes in a church context has several benefits when targeting Pacific peoples. Church-based programmes require support from church ministers and other leaders in the community.[39] This increases trust and confidence of community members and improves willingness to participate. Interventions held in churches can include all family members, and provide culturally appropriate settings for programme delivery. Pacific churches often have a regular programme of activities, providing a built-in structure and familiar gathering place for participants. In the past, churches have been successfully used as a setting for weight loss and smoking-cessation programmes in Pacific Island and African American communities.[83-85] Interventions to promote weight loss held in Samoan and Tongan churches in Auckland have resulted in some positive results.[39, 82]

The Ola Fa-autauta Study

The Ola Fa-autauta (Life-Wise) study attempted to promote weight loss in Samoan church communities through exercise and nutrition education.[39] A quasi-experimental design was chosen to assess weight change over one year in cohorts of people aged 20-77 years from three non-randomized Samoan church communities in Auckland from 1995-1997. The churches were selected based on similar denomination characteristics, socio-economic status, size (one large church matched with two smaller churches) and location in geographically distinct areas. The initial design was for the large church to implement intervention activities for one year while the smaller churches served as controls. The design was modified so that the large church and one small church received intervention activities (one implemented during 1995 and one during 1996) and the second small church served as a control, implemented during 1996. The larger intervention church was followed up for one year to assess the sustainability of the impact of the intervention.[39]

The Ola Fa-autauta study invited 609 adults, 55% of whom were obese using the BMI classification. The response rate was 81% in intervention churches and 66% in the control church. In the intervention churches, participants who were lost to follow up, compared to those who remained in the study, were significantly younger, less obese, and more likely to have had eight years or more of education. In the control church those who were lost to follow up were similar to those who remained in the study in terms of demographic and body weight characteristics.

The intervention consisted of informal education sessions approximately one hour long delivered to families, caterers, and to the church as a whole. Pacific Islands Heartbeat, a programme run by the National Heart Foundation of New Zealand, conducted the initial sessions. Recommendations were guided by the healthy food pyramid and national dietary recommendations, fat lowering and low-fat

cooking methods were demonstrated, and increased physical activity was promoted through weekly aerobics sessions built into the regular programme of church activities. Several walking groups were also initiated. A major component of the intervention was training church members to become leaders of the nutrition education and aerobic sessions.[39]

The intervention churches lost an average of 0.4+/-0.3kg, a significant difference from the mean increase of 1.3+/-0.6kg in the control church. Compared to controls, knowledge of the fat content of food did not increase significantly in the intervention churches, nor did the numbers of people who frequently or always ate green vegetables at dinner, removed the fat from meat or the skin from chicken, or diluted coconut cream. The number of people who were vigorously active increased by 10% in the intervention churches compared to a 5% decline in the control church. An assessment of nutritional knowledge suggested the nutrition education had little apparent impact on knowledge or behaviour.[39]

The church-based intervention programme slowed the high rates of annual weight gain of the large intervention church community in the short term. By the end of the maintenance year the weight lost among participants in the large intervention church had almost completely been regained. There was a significant increase in the proportion of people who were sedentary and a decrease in the proportion of people who were moderately active one year after the intervention ceased. The number of people who removed chicken skin and excess fat from meat also declined. However, the proportion of people engaged in vigorous activity continued to increase, and by the end of the follow-up period 50% of participants from this church reported being vigorously active at least once a week and their average blood pressure was lower than at baseline.[39]

There was weight loss among people in the community overall, but those who were sedentary remained sedentary one year following the intervention. It was concluded that weight loss occurred in those who shifted from moderate to vigorous activity during the intervention. Specifically, it was observed that people who were *already* active increased intensity of their activity, while people who were inactive at baseline did not become active. No quantitative changes in nutrition related behaviours were observed. In the Ola-Fautauta study it was difficult to achieve a "high-dose" nutrition intervention at the community level within a 1-year time frame. Long periods of time were spent training individuals to lead education sessions. Also, it was difficult establishing a concept of "eating for health" in the church environment. This concept was sometimes in conflict with cultural concepts of food, but there were suggestions that "eating for health" was becoming a higher priority in the community at the end of the intervention. The intervention may have begun to alter the community's values and beliefs in terms of healthy eating and moved the communities closer to making these changes.[39] Despite the time spent training church members to lead nutrition education

and aerobic sessions, the results of the intervention did not show sustainability after 1 year, perhaps because the sessions were not continued after the intervention year.

SOUTH AUCKLAND CHURCH STUDY

In South Auckland, a prospective non-randomized controlled study was conducted to compare the impact on weight and exercise of a two-year church-based diabetes risk reduction programme in four Pacific churches. This study involved complete church congregations, two Tongan and two Samoan, with 516 participants at baseline start of the intervention.[82] The intervention and control churches were matched for denomination, socio-economic status, and organization. In the intervention churches, South Auckland Diabetes Project (SADP) staff members who were also congregation members performed important tasks, including introductions. In general, core programme components were adopted for both the Samoan and Tongan churches but specific applications differed. Detailed tailoring of programmes occurred through language, different approaches to presentations including humour and current affairs issues relevant to the Island group, different foods and cooking methods, and different kinds of exercise, often to traditional music. Topics included the nature of diabetes, its symptoms, long-term consequences if uncontrolled, and nutrition (including cooking demonstrations). Exercise sessions were commenced which included sitting exercises, low-impact aerobics, traditional dance movements, walking and sports.[82]

285 (55.2%) participants in the study had a second assessment taken at the end of two years. Measurements included weight, height, waist and hip circumferences, and a diabetes knowledge and behaviour questionnaire was completed. As a result of the intervention, diabetes knowledge increased significantly in both intervention churches when compared with their control church, but more so among the Samoans. Weight, waist circumference, and exercise improved in the Samoan intervention church (weight gain was controlled and regular exercise increased), but not the Tongan intervention church. This could be related to the existing interest in health education and diabetes prevention indicated by this church's relationship with SADP, however the Tongan intervention church also worked with the SADP. The Tongan intervention church did increase diabetes knowledge but no other changes were observed. Both churches introduced healthy food policies for church celebrations. Participation rates were much lower in the Tongan intervention church in all intervention components except for the food/cooking and video sessions, and among those who did attend, session usefulness was rated lower among Tongans for receiving of results, diabetes and lifestyle and awareness, and exercise sessions.[82] No significant change was seen in either control church. At one control church, the weight gain was 3.1+/-9.8kg and 0+/-4.8kg at the other.[82]

The authors concluded that a moderate-intensity community-based diabetes awareness and lifestyle programme can slow weight gain, but it is important to maximize initial and on-going participation.

The stabilisation of both weight and waist circumference over the two year period in the Samoan intervention church was not seen in the Tongan intervention church, and the greater transience in the Tongan church community may have explained the minimal effect of the intervention. Attendance and perceived utility of the programme were greater in the first intervention church (the Samoan church). The Samoan church organized prize-givings for the best attendance at the exercise sessions, reduced membership fees at a local gymnasium, and acquired funding for exercise equipment owned by the church. It was suggested that additional strategies might be needed to increase participation and motivation in the church setting.[82] No significant change occurred in readiness to change weight in the Tongan intervention church or regular exercise in any church. These results may indicate that for a church intervention to be successful, some initial groundwork must have been laid previously in terms of the desire for the intervention and the readiness to participate and change behaviours. The perceived value of a programme could also be increased if the programme was developed collaboratively with church participants, in order to determine what intervention components would be most valuable to them and decrease drop-out and transience. Successful community project development, implementation, and sustainability have been shown to depend on community engagement and ownership of all components of a programme.[86] This relationship building and collaboration from the outset of programme planning is critical for these types of interventions.

3.2.3 Family-based interventions for obesity

It has been suggested that collective societies such as those of Pacific Islanders may find interventions that target social groups (such as families or churches) to be more effective than those that rely on individual behaviour changes.[87] Multifaceted strategies that consider nutrition as well as activity within Pacific families and communities could be the most effective and sustainable form of promoting health for children and other family members.[88]

Several studies and reviews on child obesity prevention and treatment have found family-based interventions or programmes can provide positive results.[56, 61, 89-95] The family and home environment is valuable for influencing and shaping children's activity and nutrition behaviours.[56, 96] A large-scale review evaluated randomized controlled trials and non-randomized intervention studies all directed at prevention of excessive weight gain in children or weight loss in presently overweight children, most of which were overweight treatment programmes. It included studies of various sizes (from 50-100 to over 1000 children) and variable follow-up lengths (three months to three years), which were conducted in both general and high-risk populations in countries including USA, UK, Germany and Thailand.[90] None were conducted in New Zealand and none were conducted with Pacific families. Overall, the review found that nutritional education, promotion of

physical activity, behaviour modifications, decreased sedentary activities and working with the family could be determining factors in child obesity prevention.[90]

A family-based intervention conducted in the Six Nations Aboriginal community in Canada had several parallels to working with Pacific communities in New Zealand. Aboriginals in Canada are a high-risk group for overweight and obesity and the related health complications. Although genetic factors may increase the propensity to develop obesity, prevalence of obesity increased in most Aboriginal communities only in the past two generations.[89] The Six Nations people may be disproportionately affected by obesity because of their rapid change from a physically active to a relatively sedentary lifestyle as well as their dietary transition from lower energy non-processed foods to energy-dense processed foods, all of which is compounded by the relatively low socio-economic status of their community.[89]

A randomised open trial of 57 Aboriginal households from the Six Nations Reserve in Ontario was conducted between May 2004 and April 2005, with the objective to determine if a household-based lifestyle intervention was effective at reducing energy intake and increasing physical activity among the Aboriginal families after six months. The household structure was chosen to build upon the strengths of the family unit in Aboriginal culture and to invoke role modeling of healthy lifestyle practices within the households. Aboriginal health councilors made regular home visits over six months to assist families in setting dietary and physical activity goals. The intervention households decreased consumption of fats including trans fatty acids, oils, and sweets compared to control households. Water consumption increased and soda pop consumption decreased in intervention households compared to control households. These behavior changes were statistically significant. A trend toward increased knowledge about healthy dietary practices in children, increased leisure time activity and decreased sedentary behaviours was observed, although these differences were not statistically significant. A culturally sensitive intervention among Aboriginal households was associated with some positive change in dietary practices and activity patterns.[89] While the Six Nations Aboriginal community experienced particular structural barriers to change (all families lived on a reserve, and there was no fresh grocer on or near the reserve and unsafe roads and walkways) which are likely be different from barriers specific to other populations, the results of this intervention provide support for working in the family context within high-risk, cultural minority populations with high prevalence of overweight, obesity and related health consequences. Other studies have found positive results for targeting the family and parents in child obesity prevention and treatment,[56, 92, 93, 97] however few studies have conducted interventions in the home environment, which is known to be influential on child weight status.[98, 99]

3.2.3.1 Parent-Child Similarities, Parent Modeling, and the Influence of the Home Food Environment

Parental health behaviour guides the development of health behaviours in children through parent modeling of healthful eating, parent levels of physical activity, and modeling of sedentary habits and attitudes toward food and activity.[56, 93, 98] The home environment, coupled with parents' behaviours themselves, contributes to shaping the dietary practices, physical activity, sedentary behaviours, and ultimately weight status of children.[92, 93] Children's lifelong habits are influenced by parental knowledge of nutrition, parental influence over food selection, meal structure and home eating patterns[92, 93] and a strong association has also been found between a parent's and their children's snack food intake.[98] Parental encouragement, involvement in, and modeling of physical activity have been shown to positively predict activity in children, and parents can increase children's daily activity levels by controlling television viewing and computer use.[95] Parental weight status is one of the strongest and most robust predictors of a child's risk for obesity.[92]

The association between the home food environment and obesity-promoting dietary behaviours in adolescents supports home and family-based intervention.[99] Evidence shows there are relationships between several aspects of the home food environment and obesity-promoting characteristics of 12 to 13 year old adolescent diets, such as frequency of consuming high-energy drinks, sweet or savoury snacks and takeaway foods.[99] The availability of unhealthy food at home appeared to predict consumption of obesity-promoting food/drinks for both sexes (particularly girls). Availability of obesity-promoting foods in an adolescent's home promoted consumption of these foods and, possibly by exclusion, reduced the consumption of lower energy density alternative (e.g. fruits and vegetables).[99] Evidence also supports family-based intervention strategies with Pacific families to address childhood and adolescent obesity, as parents (particularly mothers) were identified as the most influential person for adolescent food habits and the home environment and family unit was most influential for promoting health behaviours among Pacific adolescents.[81]

3.2.3.2 Opportunities for intervention

The family environment provides various opportunities for health behaviour improvement including meal planning and preparation, food shopping, eating and snacking, and family recreation and sedentary behaviours.[56] Parental overweight, obesogenic parental eating, high levels of television watching and screen time, low levels of physical activity, and habitual "food away from home consumption" are part of the familial influences on child obesity.[61] Other risk factors for childhood obesity can also be modified in the home, such as low intakes of fruits and vegetables, high intakes of energy dense-food and high energy-density diets, high intakes of sweetened drinks, and large portions.[61]

3.2.3.3 Barriers to Healthy Lifestyles

An important area of obesity research is discovering what barriers exist, or are perceived to exist, when families are trying to achieve healthy behaviours or healthy lifestyles. Most studies in this area have described barriers to physical activity only. Potential “barriers” were evaluated in qualitative research in New Zealand. The Sport and Recreation Council of New Zealand (SPARC) attempted to understand the value of sport and attitudes, motivations, and barriers to participation among adolescents.[100] Key barriers to physical activity for all adolescents were lack of transportation, lack of family support, lack of energy and motivation, time constraints, and a great amount of sedentary activities on offer such as computer games. Among Pacific adolescents, sport participation was a lower priority than other commitments such as religion and part-time work to support the family. Further, Pacific females were expected to focus on academic or musical activities since these were perceived as more “ladylike” or respectful.[100] In Australia, another study evaluated both parent and child perceptions on healthy eating, activity and obesity prevention.[101] Safety concerns, increasing distances between children’s homes and schools, distractions within the home such as TV and computers, and reduced time for physical activity at school were obstacles to participating in physical activity and a lack of parent’s time was a major barrier for participation in organised sport. It was also found that for children, contradictory messages were a barrier to adopting a healthy lifestyle. For example, the contradiction between what adults taught children and the actual behaviour of those adults themselves, or the mass marketing of unhealthy foods despite common knowledge that they are unhealthy.[101] Many of the barriers to sport participation and healthy lifestyles in these studies relate to the home and family environment. Further information on barriers to implementing healthy eating and lifestyle behaviours could help inform effective child obesity interventions.

3.2.3.4 Sustainability

There is evidence for the sustainability of interventions that include parents in the treatment of childhood obesity. Family based intervention is implemented on the premise that parental support, family functioning, and home environment are important determinants of outcomes.[102] Treatments designed to target and reinforce a change in habits and weight loss over one year in obese parents and children together have proved more effective over 10 years compared to treatments that focus on the child’s habits and weight change independent of parental success.[102] The long-term outcome in obese children following a family-based, health-centered approach where only parents participated in group sessions was compared with a person-based intervention where only children participated in group sessions and the family environment was not directly targeted. Children were randomly assigned to either the parent only group or the child-only group, with the two groups being matched for sex, age, and socioeconomic status. The parent only group had only parents participate in sessions and all suggested changes were intended for the entire family. Parents

attended 14 one hour support and educational group session, first weekly for four weeks, then bi-weekly for four weeks, and every six weeks for the last six sessions. In the child only group, each child was given a diet plan allotting 1500kcal/day. The first seven sessions with the child only group were conducted weekly and the rest were held bi-weekly for a total of one year.[102]

Fifty of the sixty children recruited to the study were located after seven years, with five participants missing from each of the control and intervention groups. At follow up the children were aged 14-19 years. Weight and height were measured one, two, and seven years after the end of the programme. At the end of the one year intervention, the children in the parent only group achieved a significantly higher reduction in percent overweight compared with the children in the child-only group (14.6% vs. 8.43%).[102] This difference in weight reduction was observed even though there was no significant difference in height between the two groups over the intervention year. At the end of the intervention, 35.0% of the children in the parent only group were non-obese, whereas in the child only group only 14.0% were non-obese. At one-year follow-up, the weight loss in the children of the parent only group was statistically significant compared with that of the child-only group (-13.6 vs. 0 change in children's percentage overweight). At the two-year follow up, there was a mean reduction in overweight of 15.0% of children of the parent only group and an increase of 2.9% in children in the child-only group. At the seven year follow up, both treatment groups demonstrated substantial weight loss, however the mean reduction in the percent of children classified as overweight was 29.0% of children in the parent only group and 20.2% of those of the child only group. At this point 60.0% of the children in the parent only group compared to only 31.0% of children in the child only group were non-obese. The differences between the groups were statistically and clinically significant at each time point.[102] The higher percentage of weight reduction and better weight maintenance observed in children of the parent only group compared with the children only group might be explained by a reduction in obesogenic factors in the child's home environment due to targeting parents and suggesting changes for the entire family.

In a prospective, randomised controlled study, the effect of behavioural family-based treatment on overweight and growth over 10 years in obese 6-12 year old children was examined.[103] Seventy-six obese children aged 6-12 years with at least one obese parent and both parents living at home were randomised to three groups. Obese children and their parents were randomised to three groups that provided similar diet, exercise, and behaviour management training but differed in the reinforcement for weight loss and behaviour change. The child and parent group reinforced both parent and child behaviour change and weight loss, the child group reinforced only child behaviour change and weight loss, and the nonspecific control group reinforced families for attendance but not behaviour change or weight loss. The three groups were given identical information on diet, exercise and behavioural principles, with all families given eight weekly treatment meetings and six

additional meetings distributed during the next six months, and then seen at 21, 60, and 120-month follow-up meetings.[103] At the five-year follow up, data were obtained from 67 of the 76 eligible families.[104] At 10 years, data from 55 families, of whom 53 were Caucasian, were analysed.[103]

The results of this study provide the first evidence for the long-term treatment of childhood obesity from preadolescence through young adulthood.[103, 104] Children in the child and parent group showed significantly greater decreases in percent overweight (that is, the percent of children classified as overweight in each group) after five and 10 years (-11.2% and -7.5%, respectively) than children in the nonspecific control group (+7.9% and +14.3% respectively). At the end of treatment parents in all groups showed significant decreases in the percent who were overweight, with these effects lasting up to the 21 month follow-up; by five years, the percent of parents overweight had returned to baseline levels.[103, 104] No significant differences across groups were shown in percent overweight changes for the participating parents at 10 years.

3.3 Considerations for Obesity Prevention programmes and the approach of this pilot programme

Unless preventive measures and treatment are tailored so that they are effective for Pacific peoples, the incidence and impact of obesity and associated chronic diseases in Pacific populations in New Zealand will continue to grow.[14] The suggestion that the OPIC intervention in Fiji may not have been "strong enough to combat…forces that contribute to unhealthy weight gain", raised the issue of the larger ecology in which adolescents live outside school time consisting of their family life, home environment, and physical, social and cultural surroundings.[75] It is possible that this larger ecology or certain aspects of it have a stronger influence on the weight of Pacific adolescents than the school environment.

The literature shows that in New Zealand, most child obesity prevention research has occurred in schools, and studies with Pacific peoples have largely been implemented in schools or churches. Most studies have shown little or no effect on obesity rates. The results of both the APPLE and the Living 4 Life studies suggest there are possibly better ways or wider contexts in which child obesity interventions can target Pacific children.[70, 76]

While there is some evidence to support obesity prevention and treatment in family settings, most studies have been conducted in motivated, middle class, Caucasian populations.[94] In general, prevention or treatment of obesity in minority children have not used families or parents as the primary target of the intervention, and there is a increasing interest in identifying culturally appropriate family-based interventions to meet needs of some high-risk families.[92] In the study of home-based health promotion with Aboriginal households in Canada, it was concluded that a

culturally sensitive intervention among Aboriginal households was associated with some positive changes in dietary practices and activity patterns. The family unit was proclaimed an attractive unit for health promotion because parental behaviour guided the development of children's behaviour and social support within families for behaviour change had a significant positive influence.[89]

Several considerations stem from the limitations of the studies in this review. Firstly, very few studies were piloted in order to determine any implementation challenges and barriers, and the post OPIC sub study on socio-cultural factors demonstrated the importance of undertaking such pilot work.

Secondly, few studies have been designed to address the home environment and target the whole family in child obesity prevention. Several studies concluded that the context of the home environment is influential and crucial to child behavior change (APPLE, Energize, OPIC) yet their study designs did not take an intensive approach to home intervention. The literature review presented evidence to suggest that targeting families, as opposed to individual children, is an effective way to prevent or treat child obesity, and interventions in the home environment provide an opportunity to work within the influential context of the family. In particular, there are no programmes that specifically target the family or the home environment for Pacific peoples, let alone work in both contexts. This evidence, coupled with the cultural influence of strong ties to family in Pacific cultures, creates a strong argument for conducting Pacific health promotion in the family home, targeting whole-family changes to improve child health and prevent obesity. The opportunities for intervention in the family home also provide several avenues and methods of tailoring a programme to individual families in order to consider their unique family structure and environment.

Third, there was a lack of information about effective obesity prevention interventions for Pacific peoples, and particularly for Pacific children. Child obesity prevention studies in New Zealand schools showed some positive outcomes but did not report on effectiveness for Pacific children. The OPIC projects were conducted with Pacific adolescents, however they did not report positive outcomes for changes in weight status. What OPIC did provide was further evidence that other non-school environments may be particularly influential to Pacific young people's weight status, therefore strengthening the argument to target the homes of Pacific families for child obesity prevention.

3.3.1 APPROACH OF THIS PILOT PROGRAMME

It has been suggested that for the greatest benefit it is important to consult and engage with people within the context of their community.[101] The New Zealand Ministry of Health states Pacific programmes and interventions are most likely to be effective when Pacific values and ideals are

represented, that is, when Pacific peoples are involved in the development of the intervention. Despite this recommendation, there is limited evidence for Pacific populations and no direct evidence for weight management programmes or interventions with Pacific peoples.[24] The poor health outcomes of Pacific peoples compared to other New Zealanders are coupled with a lack of effective programmes and interventions being run within Pacific communities. Significant value could come from developing health-promoting and disease-prevention programmes within Pacific families and communities using Pacific models of health.

The approach of this project is to build a programme from the "bottom" upwards, by working with individual families to assess their needs and strengths. This pilot programme aims to help families improve their health-related behaviours and give them ownership and control of their situation and their own health by making small changes in their daily routines.

3.3.2 Objectives of the Study

The objectives of this study are as follows:

1. To develop and pilot a tailored, family-based, health promotion programme using evidence-based information and strategies to prevent child obesity in at-risk Pacific families in Dunedin, New Zealand.
2. To evaluate the content and implementation of the pilot programme with participating Pacific families, including determining barriers to participation.
3. To describe themes and important aspects of Pacific families' experience of participating in the programme.

3.3.3 Expected outcome/ Impact

The primary outcome goal of this research is the development of a home-based, tailored health promotion programme that is acceptable within Pacific families and uses strategies to reduce child obesity and promote overall family health. By developing and piloting the programme within the Pacific community, the expectation is that feedback from participants will shape and tailor the programme into an effective and acceptable programme for Pacific families, which can subsequently be formally evaluated in a trial to determine its effect on weight outcomes.

4 METHODS

This chapter describes the study methods taken to address the research objectives. The first section presents the health research framework and methodology chosen to inform the research process and outlines the steps in the research design. Two Pacific models have been chosen to guide the research process. Specifically, the Samoan *Talanoa* methodology[105] has been applied within the Tongan *Kakala* research framework.[106] The second section explains the development of the pilot programme and the implementation plan. The third section describes the qualitative research approach and the corresponding role and influence of the researcher in participative research. The chapter concludes with explanations of the specific steps in the research process, including participants, recruitment methods, data collection and data analysis.

4.1 FRAMEWORK AND METHODOLOGY

4.1.1 *"KAKALA"* RESEARCH FRAMEWORK (*TONGAN*)

"Kakala" is Tongan for fragrant flowers and leaves woven together in specific, special ways according to a particular occasion.[105, 106] *Kakala* is "*lei*" in Hawaiian, "*hei*" in the Cook Islands, and "*salusalu*" in Fiji. *Kakala* involves three processes, "*toli", "tui"* and "*luva"*, each of which requires a particular etiquette.[106] *Toli* is the process of deciding on, selecting and picking the various flowers and leaves for the kakala. This process would equate to deciding the type of community that the research is to benefit and the knowledge or solution sought.[105, 106] *Tui* is the making or weaving of the kakala. In Pacific research this represents the research process of integrating, synthesising, and weaving of the knowledge made available through interaction with the research participants. *Luva* is the giving away of the kakala to its intended wearer. This process is important in the context of Pacific Island values of "*ofa"* (Tongan: love, compassion), "*faka'apa'apa"* (Tongan: respect) and "*fetokoni'aki"* (Tongan: reciprocity and responsibility for each other). In research terms, *luva* would be when the research is for the benefit of the community, and the new knowledge is passed on to benefit others.[105-107]

4.1.2 "TALANOA" METHODOLOGY (SAMOAN)

"Talanoa" is a Samoan word meaning "dialogue", and it represents a research methodology that can be used within the *Kakala* framework. *Talanoa* generally means a conversation, talk, or exchange of ideas. This exchange can be informal or formal and is usually face-to-face.[105] *Talanoa* involves talking things over rather than taking a rigid stand, and willingness to negotiate. It has been suggested that *Talanoa* removes the distance between the researcher and the participants because it provides research participants with a human face they can relate to.[105] This is important because relationships are crucial for Pacific peoples.[36, 57, 105, 106, 108] There is an assumed reciprocity embedded in *Talanoa*. This reciprocity raises the expectations that researchers and participants have

of each other, promotes mutual accountability, and ultimately adds to the trustworthiness and quality of the research. It is argued that *Talanoa* can be a rigorous research approach, in that it allows Pacific peoples to help identify issues then co-create knowledge and solutions for themselves. Implementation of findings based on *Talanoa* research methodology are more likely to be trustworthy, relevant and widely supported by Pacific peoples, because of the meaningful engagement in the research process.[105]

4.2 Research Design and Rationale

Guidelines and recommendations have been developed for building the capacity of Pacific communities and guiding community development that can be adapted and applied to the family setting. There are also suggestions for applying these guidelines to addressing obesity, such as those recommended by the Counties Manukau DHB.[36] However, there is a lack of evidence to support that the approach suggested in these guidelines is effective.

The Model of Pacific Capacity Building, detailed in the literature review, recommends a particular approach to obesity prevention with Pacific communities [36]. This study utilises the overall approach from this model. Table 1 shows the Model of Pacific Capacity building steps modified for the current research in the home setting [36]. The stages in the research procedures are explained in more detail later in this chapter.

Table 1: The Model of Pacific Capacity Building applied to the Family-based Pilot Programme to Prevent Childhood Obesity in Pacific Families

Model of Pacific Capacity Building Steps	Research Design Procedure
1. Mobilize community and obtain "buy-in" to the vision by participants	- Development of rapport and relationships in local Dunedin Pacific community - Recruitment with **University of Otago Pacific Advisory Group** and **Pacific Trust Otago** - Meeting and talking with each family
2. Identify issues to be addressed as part of community initiatives	- Review Nutrition and Activity recommendations - Discuss current diet and activity habits - Discuss potential areas for change
3. Identify family resources, skills, talents and what resources are required from external sources (capacity assessment)	- Discuss and set tailored goals - Review possible resources
4. Programme of action, where families develop their own programme of action to implement their initiatives or activities	- Discuss strategies to achieve goals - Work with chosen resources
5. Implementation, where families implement their programmes of action	- Families attempt chosen goals - Use of resources - Regular meetings with researcher to feedback/discuss
6. Monitor	- Regular meetings with researcher to feedback/discuss - Self-monitor (using resources)
7. Evaluate, progress against programmes of action is monitored and reviewed 36	- Discuss progress/experiences with researcher - Recorded interview to feedback on programme and discuss experiences

4.3 QUALITATIVE APPROACH

Qualitative research provides in-depth, detailed information that explores issues and their context. Qualitative researchers seek to provide a fully rounded, empathetic understanding of issues, concepts, processes and experiences, and identify and explain any patterns and themes across people and their behaviours.[109] The qualitative approach was chosen for this study in order to elucidate the thick, rich descriptive data about participants' experiences of the programme, and to inform improvements prior to wider implementation in a formal trial of effectiveness. *Talanoa*

methodology and *Kakala* framework lend themselves to a qualitative approach because discussion and interaction are vital in these processes. Qualitative research is appropriate for work with Pacific families because it allows a relationship to develop between the researcher and the participant.[57, 107, 108] These relationships are important for participants to put a face and a personality to the researcher, and also to feel as though the researcher understands their background and there is a mutual obligation between the two parties. This type of relationship and mutual obligation strengthens the development of a programme appropriate for Pacific peoples because it has involved Pacific families from the outset. This approach is collaborative, in that the research belongs to the participants as well as the researcher.[110]

Role of the Researcher, Interacting with the Research Process

In qualitative research, the researcher becomes the primary instrument for data collection and data analysis,[111] constantly interacting with and influencing the research process. The researcher's worldview and theoretical assumptions affect the research design, the methods chosen to conduct the research, and all interactions with the research participants. There are a number of paradigms that one can choose to operate from, depending on one's ontology (view of the world) and epistemology (how one comes to know the world).[111] In an interactive, participatory qualitative study such as this, the researcher is an instrument and an influence.[111-113] It is important, therefore, for the researcher to consider and identify one's personal worldview and how one's interaction with the research process and its participants affects the research. Who the researcher is (background, age, gender, ethnicity), what she believes, how she understands and interprets knowledge, and what assumptions and views she holds all play a role in her interaction with and influence upon the research process and results. Naturally ontology and epistemology vary between individuals depending on their background, culture, and life experiences.

In contrast to all other sections of this thesis, the following reflection is written in first-person. As it is a personal reflection of my influence as the researcher on this collaborative research process, personal pronouns are used to fit the context of the section. This section explores my epistemology and ontology as the researcher, and how my interaction with the research influences the research process and my interpretation of the results and analysis. It also explores my understanding of Pacific cultures. A clear understanding of where I come from is imperative in my ability to conduct reflexive research and be aware of the subjective nature of my interpretations and analysis.

Epistemology is concerned with how one acquires and understands knowledge.[111, 113] My worldview is primarily constructivist, which is also the approach I have taken for this research. Constructivism states that all knowledge is a "compilation of human-made constructions".[110] A constructivist believes that individuals interacting with their world socially construct meaning, rather than the truth being a singular and fixed quality from which all understanding of the world emanates.[111]

Constructivism presents a pragmatic point of view in that it allows for both objective truths and the influence of individual experiences and social and personal perceptions to create subjective truths, whereas positivism or objectivism, for example, require one or the other.[110]

In addition to my worldview, there are several considerations that I am aware of in my role as researcher and how they influence my interactions with the research process and the participants. Firstly, there are variables such as age, gender, ethnicity, and background. I am a Caucasian female in my mid-twenties, born, raised, and educated in Canada. I have lived in New Zealand for two years and my experiences and perceptions of New Zealand are based around my role as an international Masters of Public Health postgraduate student. My educational background is based in Kinesiology, Anatomy and Nutrition and my prior knowledge and experience with health promotion comes primarily from working with primary school children in Canada. Secondly, I am a non-Pacific person conducting research with Pacific people. It is important to be aware of the fact that this research could have very different outcomes if conducted by a Pacific researcher, or a researcher with different views and interpretations of Pacific culture. My introduction to Pacific culture came in 2010 when visiting the countries of Fiji, Tonga and Samoa as a backpacker. This interaction gave me a strong impression of the importance of family, a passion for talking and laughing with each other, and a generally more relaxed approach to daily life amongst these countries than the society I came from. These experiences, while unrelated to my education or work background, formed the initial impressions of my understanding of Pacific culture. My travels have also been a foundation for the relationships I have built with Pacific peoples in New Zealand, as they create a talking point that leads to common ground and mutual understanding. My impressions of Pacific culture were further formed when I came to study Public Health in New Zealand and began to interact with data about the health of the New Zealand people, and particularly the disparities between different ethnic groups. While I lived and studied in New Zealand I became more aware of the health issues here. I took a particular interest in those of Pacific peoples because I had been drawn to the positive, communal, joyful approach to living I had witnessed in the Pacific islands. Through exploration, education, and discussions and guidance from some Pacific friends and colleagues I developed a further understanding of the cultures and the health issues. I then started to make connections with local Pacific leaders to explore and discuss the option of conducting research with Pacific peoples.

Over the course of this research, as I worked with different Pacific groups, organisations and families, my relationship and understanding of the cultures continued to grow, however I was constantly recognizant of my research interactions and influences being impacted by who I am. The results and analysis of this research, therefore, are my interpretations of what has been observed and the feedback that has been received from families. The implications and recommendations in the

discussion are influenced by my experience, observations, and personal interpretation of the feedback and results from families. From this point forward, the text of this thesis is again written in the third person.

4.4 Development of the Pilot Programme

The pilot programme for this research was designed for child obesity prevention with Pacific families in the family home setting. The pilot programme was developed with the following aims:

- Use evidence-based messages from New Zealand health authorities about nutrition and physical activity recommendations
- Use simple English language intended for the whole Pacific community
- Use a family-based approach that includes children
- Use resources and recommendations appropriate for the home setting
- Use implementation and delivery approaches that are guided by Pacific notions of health and relationships
- Use simple, clear messages and explanations
- Use resources and messages that can be tailored to each family's background and health goals
- Encourage feedback and input from families on all aspects of the programme

In order to compile a breadth of evidence-based messages about nutrition and physical activity, the researcher reviewed a wide variety of information from several New Zealand health organisations, including the Ministry of Health, Diabetes New Zealand, Sport New Zealand (formerly SPARC), and the Heart Foundation. The purpose of this process was to gain an understanding of and become familiar with the wealth of resources and information available. The websites for these organisations were searched for appropriate and up to date nutrition and activity recommendations and information about improving health-related behaviours. Information from these sources was used to develop the package of information and resources used for this pilot programme.

4.4.1 REVIEWING THE EVIDENCE AND RECOMMENDATIONS

The primary source of information was the New Zealand Ministry of Health. The key information sourced included:

- The food and nutrition guidelines for all age groups
- Serving sizes and daily nutrient recommendations
- Physical activity recommendations for adults and children and young people
- Clinical Guidelines for Weight Management with New Zealand young people[24]
- Reports on health of Pacific peoples in New Zealand[2]
- The HealthEd website, affiliated with the Ministry of Health, containing nutrition and activity related resources available in English and some Pacific languages[114]
- The Green Prescription, a Ministry of Health programme for clinicians to subscribe activity and nutrition plans for individuals, and its associated resources[115]
- Diabetes New Zealand, for nutrition information and resources and relevant publications[116]
- The Heart Foundation, for programmes and resources such as the "Guide to Heart Healthy Eating", and a specific section on Pacific health which includes resources such as "Pacific Healthy Eating"[117]
- Sport New Zealand (formerly SPARC, Sport and Recreation New Zealand), including activity surveys and resources for the Push Play programme, which aims to get New Zealander's more active in their everyday lives[118]

4.4.2 PACKAGING THE INFORMATION

As part of the pilot programme, a package of appropriate, relevant health-related information was compiled for families. This was called the Introductory Information Package (IIP). The purpose of the IIP was to provide families with clear, simple messages about health and suggestions of healthy behaviours. The information and resources from the evidence review was consolidated into important messages and recommendations that were suitable within a home-based programme. The package was constructed under the principles of simplicity, clarity, and a family-oriented approach. The complete IIP presented to families is presented in Appendix B.

The following steps were taken in constructing the information package:

- Simplification of text to basic English words suitable for all ages
- Addition of pictures alongside messages in text wherever appropriate
- Simple explanations of recommendations and terms using minimal wording

The key points in the information package were:

- National recommendations for nutrition and physical activity for both children and adults
- Explanations of the four food groups (vegetables and fruits, breads/cereals/starchy vegetables, meats and alternatives, milk and milk products), the nutritional value of each group and examples of food types
- Daily servings recommendations including how many servings of each food group and serving sizes
- Advice and simple tips for adding healthy foods into meals
- Benefits of activity and what different types of activity exist (flexibility, strength, endurance)
- Advice for how to include activity in the day and week, and how to replace sedentary time
- Suggestions of nutrition and activity topics to learn more about, such as tricks to remember portion sizes, importance of breakfast, how to choose healthier beverage options
- Suggestions of simple goals such as increasing vegetable consumption, decreasing sugary drink intake, increasing daily activity and decreasing daily TV time

4.4.3 ASSESSING BASELINE BEHAVIOURS

Alongside the IIP was a set of nine questions (Appendix C). The questions inquired about typical dietary and activity habits and provided baseline information with which to make comparisons with recommendations in the IIP. Comparing the family's health behaviours with the evidence-based recommendations allowed families to identify potential areas for improvement and starting points for setting goals. Six questions were selected from the 2008/2009 New Zealand Adult Nutrition survey[15] and they included questions about typical breakfast consumption, fruit and vegetable consumption, fast food and takeaway consumption, and types of beverages regularly consumed. Three further questions were developed and they inquired about regular activity habits, types of activities and regular daily non work-related screen time.

4.4.4 Resource Development

The pilot programme also included some new activity and goal related resources. New resources were specifically developed for this pilot programme because available resources did not satisfy the programme objectives.

The development criteria for the programme resources were:

- Use of evidence based information
- Simplicity and use of basic English
- Ease of use
- Family-orientation
- Adaptability

The resources developed and used for this programme were considered "drafts" and families were encouraged to adapt them or make changes if necessary. Three new resources were developed for the pilot programme.

1. The "Goal Tracker" (Appendix D)

The Goal Tracker was a paper resource that families used to mark progress of their goals over days in the week. One sheet of paper covered six weeks. The goal tracker could be used in several ways:

- If tracking a single goal, such as daily exercise - to indicate "yes or no" for a given day for a given goal, using a tick or an "x".
- If tracking multiple goals, such as fruit consumption and water consumption - a different symbol was used for each goal, (for example, a square for water, a star for fruit). On any day the goal was performed, that shape was entered into the square (so a square with both shapes meant both goals were successfully achieved that day). The example Goal Tracker in Appendix D is partially completed this way.
- For children – stickers were used to reward meeting goals. For example, all children in one family are encouraged to eat breakfast every day. For each day they have breakfast, they get to put a sticker on their goal tracker.

By developing a relatively simple, multi-use resource, the same sheet could be given to all families and they could adapt how they used it according to their goals. The overall result of visually monitoring goal progress was the same regardless of the method used.

2. The "Activity Tracker" (Appendix E)

Similar to the Goal Tracker, the Activity Tracker was a paper resource with minimal written information and blank graphs for filling in blocks of activity time. One sheet of paper covered one week, with a blank bar graph for each day, and families colored or filled in a square for each ten minutes of activity performed that day. The purpose was for families to have a visual record of their time spent in physical activity. An option on this resource was to vary the colour of the graph squares depending on the intensity of the activity (ex. Red for high intensity exercise, yellow for low intensity activity). This option was explained in text on the bottom of the resource with examples of different activities and their intensity levels.

3. The "Board Game" (Appendix F)

The Board Game consisted of questions about nutrition and activity and small bouts of physical activity. The game was developed to teach nutrition and activity concepts, to test the knowledge of families, to promote family time, and to incorporate physical activity into family time. Game questions were based on the information in the introductory information package. There were two main ways to play the game.

- Version 1: Players moved individual tokens around the board, and choose to answer the question or complete the activity on the card corresponding to the colour of the square they landed on.
- Version 2: Each colour square represented an activity of the family's choice, such as a push up or squat. A player rolled the dice, and whatever colour they landed on they performed that activity the same amount of times as the number on their dice.

The board game could be tailored to the background knowledge level of the family. For example, with younger children the questions were open to all players at once, so they could work together to answer them. If any player answered the question correctly, everyone succeeded. With older or more knowledgeable children each player was responsible for his or her own multiple-choice question in order to proceed. To increase difficulty, the multiple-choice option could be taken away and players had to answer the question without hearing the potential answers first.

4. Extra Resources (Appendix G)

Other more detailed resources were available for families who desired them, including indoor exercises and office-suitable exercises. For the exercise-related resources, all the listed exercises had to be explained and the proper technique demonstrated when the resource was given to the family.

4.4.5 Plan for implementation: Programme Goals and Structure

4.4.5.1 First Home Session

The purpose of the first programme session with each family was to provide and go through the IIP, and to administer the set of nine questions to the parents. The question set and the IIP were used to start general discussions about the health of families, answer any questions that arose, and explain the process and purpose of the pilot programme in more detail. At the end of this session, goal setting and potential areas of change were discussed.

4.4.5.2 Home Visits

The proposed structure of the programme was to visit each family weekly or fortnightly after their first home session. Each family was in contact with or visited by the researcher for a minimum of twelve weeks, either weekly or fortnightly depending on each family's needs and schedule. The goal was to meet with each family at least six times.

4.5 Participants

4.5.1 Inclusion criteria

This intervention was aimed at the entire family. Behaviour changes for children need support and guidance from parents, and parents are able to lead and set examples as role models by changing their own behaviours.

The inclusion criteria were:

Families of any Pacific ethnicity resident in the central Dunedin area:

- With at least one child of pre-school or school age, and
- With at least one member of the family or household who was overweight, and
- Who wanted to make improvements to their overall health, and
- Willing to provide feedback on their experiences and participate in an audio-recorded interview at the end of the programme.
- With a family home accessible by public transport
- Who spoke English
- Who were able to be contacted via phone or email

4.5.2 Recruitment Strategy

The recruitment strategy was a collaborative process between the researcher and the research supervisors.

Important factors considered before recruiting families were:

- The aims of the research project (family-based child obesity prevention)
- Protocols and recommendations for conducting research with Pacific peoples
- Advice from members in the local Pacific community
- Issues of sample accessibility and manageability, including practical issues of contacting and visiting families

The recruitment target for number of families was between five and eight. This number of families was considered large enough to provide variation in families yet not overly large for one researcher to have sufficient time to implement the pilot as planned.

Recruitment of families was undertaken with the assistance of the Pacific Trust Otago (PTO) and the University of Otago Pacific Advisory Group (PAG). These groups had access to and knowledge of potential participant families in the Pacific community. The researcher also had established relationships with some members of these groups. It was thought that families being approached first by members of their own community would be more suitable and likely to increase their willingness to meet with the researcher and further discuss their participation.

4.5.3 Building rapport and relationships in the local Pacific community

Initial awareness of this project was established in April 2012 when the researcher attended a PAG meeting at the invitation of one of the research supervisors who sits on this committee. At this meeting the researcher explained who she was and her intended research in the community. This was an opportunity for leaders in the Pacific community to advise and comment on the project.

Members of the PAG emphasised the value of building relationships and "getting one's face out there". Therefore, participation and interaction with the Pacific community by the researcher was a crucial first step in recruitment procedures. This interaction allowed community members to meet and get to know the researcher on an informal level and begin the development of relationships, prior to the explanation of the intended research. It also provided the researcher with a more holistic view of the community. By utilising existing relationships with contacts on the PAG and the local PTO, the researcher was able to attend and participate at several community events. During some community events a PAG leader would introduce the researcher and explained the purpose of the programme, while at others the researcher interacted informally with community members.

4.5.4 Recruitment Process

Participants were recruited through purposive snowball sampling. The intent of purposeful sampling is to select information-rich cases whose study will illuminate the questions being researched.[113] Information rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the research.[113] Snowball or chain sampling is an approach for locating information-rich key informants or critical cases, which begins by asking well-situated people "Whom should I talk to?".[119] The sample was purposive because potential families were identified with the assistance of the PTO and the University of Otago PAG, who had been advised of the eligibility criteria.

Two months after the researcher attended the PAG meeting in June 2012, the members of this committee were asked to identify appropriate families they thought would be interested in participating in the pilot programme. Nine families were identified during July and August 2013.

After initial in-person conversations and follow-up contact with the nine families, six families were enrolled in the study. Three families were excluded due to scheduling conflicts, difficulty making and maintaining contact or the school-age child lived mostly outside the household. Subsequent contact with families occurred via phone, email, or meetings at their homes.

4.6 Procedures

Contact information was obtained from families either directly in person or in three cases from a PTO member. This information consisted of parents' names and contact phone numbers. For each family, the first meeting was an informal general conversation in order for the researcher and the parents to get to know each other. At this first meeting the researcher also explained the study and the programme and answered any questions that arose for the family. Following the initial conversations the researcher and the family agreed upon a time and location to go over the process of consent and the first steps of the programme. Each family chose their home as the meeting location.

4.6.1 Process of informed consent

At the first home session each family was presented with an information sheet and an informed consent sheet (Appendix H). The content of these documents was first explained verbally to the parents then given to them to read. Parents were also given the option of having the researcher reading the documents aloud. The parents and researcher reviewed the consent form together and any questions about the form or the programme were answered. Although families were given the option to keep the consent form and sign it whenever they felt ready, they all signed the forms at the meeting. Each family was given a copy of the information sheet and an unsigned consent form to

keep for their records. Confidentiality issues were discussed. The families were assured that they would not be identifiable in the research write-up. Consent forms and other identifying information were kept in a locked drawer in the researcher's office. Due to the close contact and relationships of participating families with one another and the snowball sampling most families knew who was involved in the programme.

4.6.2 Home/Family Visits

The rationale for family visits was to see first-hand what was occurring in the context of the home as well as build relationships with the family. Conducting family sessions allowed participants to reflect on the reality of having a researcher in their homes and the challenge of fitting this type of programme into daily family life. This gave the families involved the opportunity to tailor the pilot programme to their unique situation. The home visits were run for a twelve-week period.

The first programme priority was goal setting and introduction of resources. At home visits each family set goals or identified areas of nutrition or activity related behaviours they wished to work on. This was done on an individual basis or as a family unit, or both. During these sessions families were provided with appropriate programme resources. The purpose of subsequent home visits was to bring the family and the researcher together to engage in further education, discuss progress, introduce and explain new resources, answer questions, offer advice or set a new goal. There was an outline for topics to be discussed at family visits, however after the initial session, the programme was generally guided by what the family wanted and needed at that time.

The visits also allowed for the researcher to observe the context of the home environment. Each session began with informal conversation not necessarily related to the programme. The *Talanoa* method allowed for growth of the relationship between the researcher and the families and facilitated further open discussion when it came to talking about the programme.

4.6.3 Data Collection

Qualitative data collection methods used in this study included taking field notes and transcribing audio-recorded interviews. As this study involved participant-observation from the researcher, several observational methods were also used to enhance and validate the data from the field notes and transcripts. In the subsequent content analysis these methods ensure the data collected are robust and trustworthy.

4.6.3.1 Observational methods

Participant observer and prolonged engagement

In qualitative research that involves participant-observer collaborations such as this project, the researcher is considered an instrument because their subjective opinions and values are reflected in their observations and field notes.[111, 113, 120] Ultimately this influences their interpretation and

inferences of the themes in the data. A researcher's role as a participant observer involves a degree of collaboration in the programme and the family's experience. This role also allows the researcher to develop a sense of the context of each family and their participation in the programme. Understanding context is essential to a holistic perspective because interviewees may be unwilling to provide information on sensitive topics, especially on tape or recorded, so observation and un-recorded conversations can facilitate more sensitive data and thick descriptions of issues.[121] This prolonged engagement and development of the researcher's relationship with families also helps to corroborate or discover distortions in the data from the analysed transcripts.[112]

Non-verbal communication

Developing a rapport and being a participant in prolonged engagement with each family allows a researcher to interpret non-verbal communication. In this study this could be reflected in the type of meeting that occurred on any given day, on the way the families were progressing towards achieving their goals, and on the amount of stress they felt they were under. These non-verbal cues were an important part of the observational field notes and researcher's interpretations about how each family handled participating in the programme while maintaining their usual everyday schedules.

4.6.3.2 Field notes

After each family visit, detailed field notes were recorded about the session, including what was discussed and observed. Field notes were used to guide question development for the final interview. They were also used in the analysis process to triangulate data from the interview transcriptions, in order to check for inconsistencies or validate themes that had been inferred from interview data. A benefit of field notes and observation is the ability to record, understand and interpret things that are not necessarily said or shared by the family. By being in the homes and developing personal relationships with each family, observation can lead to rich findings that may not be possible to elucidate through interview questions, surveys or focus groups only.

4.6.3.3 Interviews

Primary data collection was in-depth, open-ended interviews. After 12 weeks of meetings with each family the post-programme audio-recorded interview was scheduled. These interviews were recorded in the family homes with the parents. Parents were chosen as the sole interviewees because they were knowledgeable spokespeople for the experience of their families. Using only parents also allowed for consistency in interviews since ages of participating children varied. The interview was open-ended and guided by an interview schedule (Appendix I) that had been developed using the research questions and the field note data as a guide.

Twelve interview questions were drafted and agreed upon by the researcher, the research supervisors, and a qualitative research advisor. Drafts were revised to ensure the interview

questions minimised leading and assumption and covered all relevant topic areas. The field notes guided the probes listed on the interview schedule, however probes were not always used. Guidance was sought on appropriate and proper protocols for conducting qualitative interviews, including literature and advice from experienced qualitative interviewers.[122, 123] Interview protocol and conduct was practiced on peers in order to improve interview skills and test interview questions for eliciting answers to the intended questions.

Each family was asked the 12 questions on the schedule. However, the schedule was flexible and allowed for further in-depth questioning on certain issues if they arose for a particular family. This allowed for in-depth exploration of different families' feedback. This was important because it reflected on the varied perspectives of participating families and how that affected their experience of this programme. This flexibility also allowed for recommendations or observations on certain programme components such as the resources offered.

4.6.4 Data analysis

Audio-recorded interviews were transcribed within 24 hours of being conducted, using the transcription software Express Scribe. The interview transcriptions and field notes were both analyzed in the qualitative data analysis software QSR NVivo 10. The most weight was given to the interview transcription data with the field notes being used to corroborate themes derived from the interview data and check for inconsistencies. The data were analyzed using a conventional qualitative content analysis approach. This approach involves the subjective interpretation of the content of text data through systematic classification processes of coding and identifying themes or patterns.[124] The purpose of the analysis was firstly to deductively identify the answers to the programme feedback questions, that is whether families found the programme appropriate, acceptable and/or worthwhile; whether families made changes and/or identified barriers to change, and; whether families had recommendations or suggestions for the programme. Secondly, inductive analysis of the data as a whole was conducted to identify themes in the experiences and opinions of the participating families.

Qualitative content analysis offers researchers a flexible, pragmatic method for developing and extending knowledge of the human experience of health and illness.[124] This analysis method begins by reading and/or listening to all data repeatedly in order to understand the context of the data as a whole and become intimately familiar with it. Data are then broken down line by line to derive codes that capture key thoughts or concepts. The researcher explores these codes in order to develop reflexive and context-rich meaning to each one and begin to see how they are related. Codes are sorted into categories based on how they are related or linked, and these emergent categories are used to organise codes into meaningful groups.[124] The analysis process moves through stages of data management description and explanation via a series of platforms from

which the researcher can reflect on what she has done and move forward. This process is fluid and non-linear; the researcher develops the analysis by moving backwards and forwards between the original data and the emerging interpretations.[125]

4.6.4.1 Deductive Analysis: Programme Feedback

All interview data were first coded based on themes from the programme feedback questions (Appropriateness and acceptability of programme, worthwhile participation in programme, changes and barriers, and recommendations and suggestions). These codes and corresponding data from the transcripts and field notes were used to develop contextual answers to the programme feedback questions according to this sample of families.

4.6.4.2 Inductive Analysis: Themes and Relationships

The second approach to the analysis was a general inductive approach to the whole of the data in order to develop themes in the participants' experiences and understand relationships between the themes and experiences. A general inductive approach is compliant with conventional qualitative content analysis, and it involves four purposes:

1. To condense raw data into a summary format
2. To establish clear links between research objectives and summary findings from raw data
3. To ensure these links are both transparent (able to be demonstrated to others) and defensible (justifiable given the objectives of the research)
4. To develop a model or theory about underlying structure of experiences of processes evident in the text data[126]

A general inductive approach is focused on the process of analysis without going into the theoretical assumptions of "grounded theory" or "phenomenology".[126] In this inductive phase of analysis, open coding produced codes that came from the themes and comments that arose in the data rather than pre-determined questions or topics.[124]

The next stage of the general inductive analysis was to reassemble open coded data into related categories, building robustness with increasing number of mentions and using researcher's judgment about what categories or themes are important.[126] The process of understanding each code, realising relationships or links to other codes, and combining categories continued until it was considered all the overarching or underlying themes were found.

The credibility of the data analysis process was enhanced by the appropriate research methods. Prolonged engagement and interaction with families allowed the researcher to check for distortions in the interview data or themes. The relationship between the researcher and each family allowed

the researcher to gain an understanding of these families and to judge whether the themes that arose from the data were consistent with what was known about them.

The conversations and relationship between the researcher and the families, detailed field notes of interactions, and open ended interview questions that allowed participants to speak freely and richly ensured that the participants' experiences were explored in sufficient detail. Developing communication between the researcher and the families prior to the final interview allowed for the audio-recorded interview to proceed as an informal conversation. This ensured participants were comfortable and the interviewer and interviewee were accustomed to communicating and understanding one another. Particularly in situations where language barriers may occur, the opportunity to develop effective communication prior to an interview facilitated more valid answers from participants. For example, where families spoke English but not fluently, or tended to mix up or misunderstand certain words. The credibility of the data analysis process was established through the methods above as well as the development and adherence to a coding scheme and transparent analysis process.[124]

5 Results/Research Findings

This chapter begins with a description of the context of the participating families' lives, followed by a description of the different themes, identified, and how these themes relate to participants' feedback on the programme. The chapter concludes with a summary of the important research findings.

5.1 Participating Families

The six participating families belonged to Tongan, Samoan, Cook Island or Tokelauan cultures. All families were actively involved in the community and regularly attended church and community events. Some of the participants held leadership roles in the community such as a position in a church or a Pacific-led organization. Two of the six families were related, and many of the families saw each other regularly and participated in common community events. Families varied in ethnicity, family size, occupation, education level of parents, and number of years living in Dunedin. Two of the families had moved to New Zealand from their Pacific Island country within the last five years, while the remaining four families had lived in Dunedin for several years.

All families were two parent families and had at least one child of primary or intermediate school age. Half of the families had children who had finished secondary school and were working, and one family had children of pre-school age. The ages of the participating children ranged from two to seventeen years. The number of participating children in each family ranged from one to four, while the total number of children in the families ranged from three to six. Children who lived outside the home, and children who were older than high school age or who were under the age of three did not participate in the programme. Some families had extended family members living in the household, such as a grandparent or cousin. At some point during the programme all families had a family member or other guest visiting and staying in the household. Two of the six families had at least one member with diabetes or pre-diabetes. Five of the six families had participated in health related sessions or programmes in the community in the past, either through the University of Otago, the Pacific Trust Otago, or another organisation. Four of the six families had attended weight loss programmes or attempted to lose weight in the past.

Family schedules varied depending on children's school and extra-curricular commitments, parents' work schedules, and involvement in community events and activities. Three families had at least one member who worked shift work with two families having more than one. Four families had two working parents. One family had one parent who was retired while the second parent and the older children worked. One family had one parent studying at the University and the second parent taking a computer class, and both parents volunteered frequently at their church. Parents participated in

community run exercise classes and recreational sports, as well as preparing and contributing to church, school and community events such as culture nights and children's performances at church and school. Children participated in after-school activities including sports, choir, and cultural groups, as well as youth groups at church. Weekend activities included sport and church commitments. Several families had roles in church or community organisations and were involved in planning events as well. Children spent time practicing for church events and culture nights in the community. Parents contributed to several events by preparing and serving food, teaching and leading children's groups, volunteering at sport days and fundraisers for schools, community organisations and churches, preparing cultural dress for church and community events, and sitting on committees or groups within their communities.

Table 2: The characteristics of the six participating families

Family	Ethnicity	Number of participating children	Total number of children	Number of working family members	Number of family members employed in shift-work
A	Tongan	3	4	3	1
B	Tokelauan/Tongan	2	4*	4	0
C	Cook Island	2	4*	2	0
D	Tongan	4	4	2	2
E	Tongan	3	5	4	2
F	Samoan	2	3	2	0

***The total number of children in these families was not determined as they had older children living outside the household**

5.2 Actual Programme Implementation

Programme implementation was adapted to the reality of the schedules of participating families. The goal of implementation was to conduct the home sessions with both parents and children, however in actuality the attendance of family members and the nature of the sessions were dictated by the daily lives of the families.

Some families found it most appropriate to meet after school, some in the mornings after their work shifts, and some during the weekends. Three families had regular or semi-regular meeting times with the researcher, whereas the other three families changed time and day of meetings from week to week. All families were able to meet with the researcher at least six times and up to ten times. However, this was achieved with varying degrees of difficulty in terms of maintaining contact and rescheduling missed meetings, depending on the family. Some families always had children in attendance, whereas others sometimes had only parents or only one parent. In two families some sessions were with the researcher and the children with no parents present. The length of meetings varied with some families preferring shorter, more focused visits and others preferring longer visits that allowed time for more conversation. Meeting length also varied between sessions for some families, depending on their schedule and energy level that day. All families offered food and/or drink to the researcher during home visits.

5.2.1 Challenges to Implementation

The greatest challenges to programme implementation were families' varying and busy schedules and commitments, and communication between families and the researcher. In some instances the researcher would arrive for a session to find either nobody at home, only the children at home, or the family was there but wanted to reschedule. On some occasions, families would forget about their scheduled meetings, despite communication from the researcher to remind them. Families with changing shift-work schedules could be difficult to contact so attempts were always made at varying times of day until a parent could be reached. Families who worked shift work sometimes found it hard to confirm meeting times because they could be called into work at short notice. Occasionally the session that the researcher had planned, such as playing a family board game, was adapted because some family members were not in attendance. With some families there was as much as a three-week time period in between some meetings.

Table 3: A description of the actual implementation schedule of family programmes in each home

Family	Number of home visits	Any missed meetings?	Typical meeting time	Typical meeting length	Typical family members in attendance for meetings	Any child-only meetings?
A	10	0	Weekends	1 hour	Parents and 3 children	Yes
B	7	0	Weekday morning	1 hour	Mother and 1 child	No
C	10	0	After school	0.5 hour	Parents and 1 child	No
D	9	1	After school	1 hour	Parents and 1-4 children	Yes
E	7	3	Weekday morning	20 min-1 hour	Mother	Yes
F	6	3	Weekends	0.5 hour	Mother and 0-1 child	No

5.3 Experiences of the Programme

The families' experiences of the programme were an important part of the bottom-up approach of developing and testing the pilot programme. The acceptability and appropriateness, the perceived worth, the changes families felt they had made, the barriers they identified, and any recommendations and/or suggestions they had are described below.

5.3.1 Acceptability/Appropriateness of the Programme

Working with the Pacific families to prevent child obesity in their home was a novel approach. Overall, families were accepting and comfortable with the programme being in their home and involving the whole family. Indeed, they considered the home-based programme to be better and have greater benefits than those outside the home. Families found the programme was appropriate because it was tailored to their goals and background knowledge, it considered their home environment, and it focused on the health of the whole family. Appropriate communication and a sense of trust and comfort between the families and the researcher were features that made the programme acceptable to the family. Effective and appropriate communication was an important component of delivering lifestyle information that could be understood by all members of the family. This good understanding allowed families to increase awareness of health within their

whole family, and to realise and value the opportunity to work together within a family-oriented programme.

> It's quite something to look forward to the family looked forward to so that's something quite good to have, (Interview #2; Line 64)
>
> I think it was good in that it helped us to work as a family on an issue of health rather than just individually…I think it's just been good in terms of raising awareness of the health of the family as a whole rather than individually (Interview #1; Line 22)
>
> I think it's very appropriate for family…the understanding is right down to [our youngest son]'s level, it's very family-orientated you know it's good (Interview #2; Line 38)

5.3.2 Worthwhile/Perceived Helpfulness of the Programme

The different interpretations of what made the programme "worthwhile" reflected the holistic worldview and values of the families. Valuing the programme was related to accomplishing goals or seeing changes in family members, feeling supported in attempts to make healthy choices by family members and the researcher, and feeling like participating in the programme kick-started healthier behaviours or reminded families to "get back on track". Most families commented that they wanted the programme to continue.

5.3.2.1 Seeing changes in the family and accomplishing goals

The ability to make healthy changes and attain goals was strongly valued by families. Both personal changes and changes in other family members were valued. Children making changes or demonstrating nutrition and activity knowledge pleased parents.

> I'm pleased, I needed to exercise and get myself in better shape to deal better with the stress, rather than waiting until I feel better and then I'll go to the gym…so I think it has been a good thing, (Interview #1; Line 340)
>
> I liked that because that really helped [my husband] to get into drinking water, yeah the tracking because that was one thing that I always said to him you gotta drink water…and through that tracking thing he actually got into a habit of doing, so I was that was for me hurray (Interview #1; Line 108)
>
> For me the kids, even listening to them doing the games it's quite good that they start having that learning…it's a confirming, affirming stuff that's quite positive (Interview #2, Line 345)

5.3.2.2 Feeling supported

The support of other family members and the researcher was valuable for individuals as it helped them to make healthier choices. Working in the home on whole family health enhanced the support between family members, and the relationship between the researcher and the families added value

to the time spent together during visits. Families considered that the visits from the researcher provided additional support to that provided within the family.

> It was really good because I really enjoy your time coming too, even we talk about research but we talk about other things too and we learn something from it too, (Interview #3; Line 87)
>
> Yeah I'd like to keep it going, this programme I'd like to keep it going…I think it's good for everybody if you keep it going. Because most people when you stop, they stop, they stop doing what they know… (Interview #5; Line 114)
>
> Next year keep on coming to stopping me control my eating! If you keep on coming then I will keep on going on and on (Interview #4; Line 232)
>
> It kind of reminded for all of us…the whole family in the house so where everybody was sort of making an effort to do some form of exercise and also eating well (Interview #1; Line 36)

5.3.2.3 Kick-starting or re-starting healthier behaviours

Families commented on their participation in the programme being an opportunity to "kick-start" new healthy behaviours or to re-start previous attempts. Participating in the programme reminded them that their decisions about activity and diet are important for their health.

> I think worthwhile because we are always wanting good health for ourselves…and as a family, but sometimes thinking it is one thing but doing it is another and I think this…sort of kicked us into action you know to do something about it, (Interview #1; Line 329)
>
> Yes it was good, for our family as I say I think every activity or programme…our family being exposed in relation to something like weight watch, diet…always a reminder to the family that…you're at risk and that you need to do something...just a continuous reminder, (Interview #6; Line 176)

5.3.3 Changes Made During the Programme

The changes made by families were self-reported and therefore not quantified. However, they were an important measure of the families' perceptions of the value of the programme. The type of changes made varied and reflected each family's goals. Most families decided on a combination of both (nutrition and physical activity) as they considered both eating right and being active to be important.

> You just have to get the eating habit down, eat your portion right and all those things and doing exercise as well (Interview #2; Line 553)

In general, goals were simple and guided by the recommendations from the introductory information package. For example, one child's goal was to drink four glasses of water per day, while another child's was to eat breakfast every morning before school. Changes reported by

families included increased water consumption, more regular exercise, increased vegetable and fruit consumption, decreased fizzy drink or sugary beverage consumption, increased frequency of breakfast consumption, and decreased portion sizes.

5.3.4 Barriers Identified

Throughout participation in the programme, families identified barriers to making changes to their health related behaviours. This also involved recognising patterns in behaviours, such as eating less healthily during weekends, and recognising less healthy environments, such as community events where large amounts of food are served. The barriers identified by the families included poor time management and busy schedules, difficulty developing and maintaining healthy routines and habits, helping children stick with health goals, and coping with the influence of less healthy environments.

Families also discussed strategies to deal with some of these barriers. These included organisation, renewing commitment to goals, planning for weekends or holidays, cutting down on portions at church and community events, and persisting with children

5.3.4.1 Lack of time and busy schedules: Commitments and Obligations

Hectic daily schedules caused stress for some families and resulted in a perceived lack of time for certain activities such as attending an exercise class or shopping for groceries to cook dinner at home. These busy schedules were particularly complex for Pacific families due to their many family and community commitments and obligations. Families recognised that the lack of available time and having issues arise in extended family or community took time away from other priorities, such as health. This made it difficult to make changes for oneself. One participant emphasised this struggle by describing a “rehab” environment where there were no obligations and one could focus and commit to achieving health goals.

> Time was a challenge at times (Interview #1; Line 265)
>
> It was because a lot of things were going on within our family itself, and taking the load off our extended family, and things that are happening at home you know, there’s quite a lot of everything going on (Interview #6; Line 163)
>
> You can’t be in two places at one time (Interview #6; Line 206)
>
> I think most of the time I was just thinking you know if I was in a hospital where just diet, exercise, diet, exercise you know nothing to think about I could achieve it within three months, and then you don’t have to think about anything, other people, you know a rehab place and environment just to go… (Interview #6; Line 181)

5.3.4.2 Developing and maintaining a healthy routine/habit

The ability to develop and maintain healthy habits and routines amongst daily life commitments was described as a challenge. Families found it challenging to prioritise and organise their busy schedules to focus on healthy habits. Even when routines had been developed, some families found those routines could be upset and the process of getting back on track was also difficult. Some families found these changing routines made it harder to be constantly aware of healthy choices. Busy schedules distracted from the changes they were making and sometimes resulted in lapses in healthy decision-making or new routines.

> I think the hardest part is just to do it, the action part of it (Interview #3; Line 81)
>
> I think it's from our side we need to organize ourselves with the time and with the things it's still a task (Interview #6; Line 59)
>
> When your routine gets upset you know and then when you can't train properly it sort of ...affects your motivation as well (Interview #1; Line 268)
>
> I find with our family it works for the first three weeks and then it sort of drop off...so it needs renewal of mind and commitment (Interview #2; Line 99)

5.3.4.3 Recognising less healthy environments

Families recognised that certain environments were prone to unhealthier choices, but some of these environments were important parts of their lives. These environments included church or community gatherings where large amounts of food were served, weekends when meals weren't structured or planned, or the tendency for meals to be less healthy when certain family members cooked. How to develop or maintain healthy behaviors when in a less healthy environment was viewed as a challenge. Strict avoidance of these environments was not desirable. Therefore, strategising as to how to cope in these environments helped families to be mindful of their health while still participating in social and community events that were important to them.

> That's the thing that I was saying with my weekends it was always the fall down, and discovering as well that was one of the big ones (Interview #2; Line 361)
>
> We're trying to cut down with the food that we eat when we come to the gathering at the church, that sort of thing (Interview #6; Line 32)
>
> Sometimes I go eating in work after tea time because you know they eat like small meal, and vegetable...not like here (kitchen at home) only the meat and no more vegetable (Interview #4: Line 117)

5.3.4.4 Persistence with children to make changes

Families described the difficulty of keeping children on track with their goals, and particularly with introducing new healthy foods that children were unaccustomed to or disliked. To deal with this barrier, parents found that persistence with children was important in order to get the children accustomed to healthier behaviours, such as eating vegetables. Parents described the effort to improve their children's health as an "on-going" struggle; first to establish healthy habits and second to ensure those habits were maintained.

> Yeah I guess for me it's just to establish the new habit for me and my family, it's just my challenge always is making sure the kids are following through… (Interview #2; Line 412)
>
> So I guess it's an on-going struggle (Interview #2; Line 437)

One participant persistently served vegetables to her children in the hopes that eventually they would start to like them. There were five children in this family, the youngest in primary school and the eldest of university age. The younger children in this family were particularly resistant to vegetables despite efforts in the past year from the parents pushing healthier eating habits. However, the mother sees the eldest daughter as an example for remaining persistent.

> I think it's very hard for the kids to like it (more vegetables in food) you know, but that's okay they all growing up like [our eldest daughter] she didn't like eat vegetable but she's going now like gym and then she just eating like now to eating like vegetable…that's why I think the kids gonna be growing up they gonna be like it (Interview #4; Line 261)

5.3.4.5 Observed barriers

In addition to the barriers identified by families, there were other barriers observed by the researcher. The observed barriers related to understanding programme resources and concern over the costs of healthy foods. Although these observed barriers were prompted in the interviews, none of the families considered them to be barriers at that time.

Understanding resources

During the programme, the researcher observed that sometimes families forgot to use or did not correctly understand how to use a resource at the end of a meeting. Therefore, these families had to wait until their next session to ask about the resource. This may have impeded their ability to start making changes earlier. While families were directly asked about whether there were any issues with resources in the interview, none of the families considered the actual resources of the explanation of how to use the resources to be a barrier.

Financial cost of healthy foods

A concern raised by one family during the programme was the relatively high cost of nutritious foods and their limited budget for food. This was addressed during the programme by focusing on attainable goals within the families' resources, such as more frequent consumption of breakfast foods in the house as opposed to purchasing more vegetables. Cost of food was prompted with all families when asking about barriers. None of the families, including the ones who had previously spoken about money, discussed financial constraints in their interview, despite being directly questioned.

5.3.5 Recommendations and Suggestions

When given the opportunity to make recommendations and suggestions about the programme, families suggested three main improvements. The first two suggestions related to the actual home-based programme. They were encouraging even more family time and increasing positive reinforcement of progress. The third suggestion was the addition of a community-based component to the programme, either through a church or community hall. This third suggestion was strongly recommended by all families.

5.3.5.1 Promoting family time and activity

Families enjoyed activities and resources that promoted family time and support. They wanted a focus on fun and family time. Families recommended an even greater emphasis on these factors in future programmes.

> I really enjoy the [board game] I wasn't here but the kids said 'oh that was so much fun' especially the two young boys and I guess being part of the game today I think it's one of the highlights so maybe using kind of games more…engaging the whole family in a game situation (Interview #2; Line 106)
>
> I like the game… I can see that it's a good family time activity, you know so I really liked that one (Interview #2; Line 105)

5.3.5.2 Positive reinforcement, inspiration and motivation in resources

Families also supported resources and activities that provided positive reinforcement and feedback on their efforts. This included the suggested use of inspirational and reinforcing images to motivate people to action. Parents in particular supported positive images of active children or opportunities to see their children's learning.

> Using kind of games more and where to find out at the beginning where people are at and then using also the game as a feedback as well how well they know this (Interview #2; Line 108)
>
> If you show before and after type things, or show ones of children that are actually involved you know, like I look at this photo of our youngest son…he's

got the ball and I look and that...to me that's really encouraging because that shows me how active he can be, and the potential he has to do better things... (Interview #1; Line 160)

5.3.5.3 Addition of a community-based component

There was support from all families for running complementary programme sessions in community locations such as a church or community hall. Families mentioned the opportunity for more families to get involved, socialisation, fun, and gain support from others as reasons to include a community component. Families thought it would be good to get together with others and that potentially it could incorporate a challenge aspect to the programme to motivate everyone involved.

> It would be good with other peoples, like a group or something, with other peoples it would be really good. See a lot of the Pacific people there, but it's only us you know, it's good to meet other people you know, have fun, and doing you know exercise and whatever together! That'd be really good. (Interview #5; Line 44)
>
> That'd be really good if it's a competition or something to all the families to see who can get there. Yeah something really good, I think it's something everybody enjoy, if it's like competition or something (Interview #5; Line 72)

There was also a belief that running church based sessions could facilitate participation of more families due to the influence of the church and the involvement of families in the community.

> I guess for me it would be easier to have a target church, and the leader of the church buy in and the church are moving forward, and then using the families of the church, so it would be a good avenue, (Interview #2; Line 130)
>
> ...I think it's once if the leaders buying in it's easier for the complications and then it's easier for families (Interview #2; Line 139)

Considerations with community programmes

Despite support from all families for some form of community or church-based component to the programme, there were also some concerns raised. The first of these was selective disengagement for families attending the church or community event that did not want to participate. The second was the inability of some families to consistently attend community-based programmes because of their work schedules.

> The only other way is just identifying families who are really willing to make a change because it's really hard trying to take programmes to people and they are not even, like they just not even... (Interview #2; Line 141)
>
> If they don't want it they don't want it, you can't push them to help, (Interview #2; Line 146)

> But if you'd be like a group or like a community that's alright, I'll coming in that, yeah but in the daytime, in the morning not when I'm working (Interview #4; Line 91)

5.3.5.4 Continuing home-based component

The concerns about community based programmes led to discussions about whether families would prefer a programme to be solely home-based, solely community-based, or incorporate both settings. These families clearly stated they would prefer to have both. They valued the home-based programme as it tailored to their specific needs and a community programme would provide additional needed support. The following was a comment from one of the parents who works on public health promotion programmes in the community.

> One good thing about this programme ...that I'm really supportive of is that it needs to go to individuals, even if a family change, it needs to go there and start from where they're at to see so you can see since the environment what kind of food they eat because sometimes when you start doing a public programme or whatever, you have no idea what's coming up behind a lot of the families, but going there you have a sense more of knowing where they're at, their background and then you can work with them and I think it's worthwhile (Interview #2; Line)

5.4 Themes

Despite the variances in ethnicity, family mix, employment type, and daily schedules between the participating families, the themes that emerged from the analysis were common amongst all families. The themes from the data reflect the structures and complexities of family life and organisation.

Six emergent themes arose from the data analysis. Emergent themes were grouped into internal operational themes and external influences. The internal operational themes were related to the structures and complexities of the families' daily lives. They reflected where families spent their time and the commitments and obligations they had.

The three internal operational themes were:

- Participation in a home-based programme,
- Focusing on whole family health, and
- Engagement within the community.

The external influences reflected the values of the families and influenced how they experienced the programme. The three external themes were:

- The importance and impact of all relationships,
- The value of effective communication, and
- The influence of Pacific culture.

These internal and external themes provided the context for the overall feedback on the programme.

5.4.1 Internal Operational Themes

The internal operational themes were related to the structures and complexities of the families' daily lives. They reflected where families spent their time and the commitments and obligations they had. The internal themes were participation in a home-based programme, focusing on whole family health, and engagement within the community.

5.4.1.1 Participation in a home-based programme

The approach of family oriented health education in the home was a novel one for these Pacific families. Families described several benefits of participating in a home-based programme. Families found the home environment to be convenient and comfortable. They felt that with the researcher coming into their home, their background was understood and therefore their programme could be tailored to suit their family needs. Families enjoyed the flexible nature of the programme because meeting times could be scheduled or re-scheduled to fit with their other commitments. Families also described the importance of addressing the home environment and facing the reality that decisions made in the home were influential to their health.

Comfort and convenience of the home

The home-based programme was convenient, particularly for families with shift-work schedules or very busy changing schedules. Families felt that programmes run outside the home were sometimes not possible to attend primarily because of their busy schedules and other commitments.

> Yeah that's what I think it's best in here (the home). Um I liked it because like last night I am working and I am working double shift yesterday so if I am tired it's okay for me I'll be here and sometimes if you joins me some other place I don't know where I'm going. Yeah so that's why I like it here we meeting here, (Interview #4; Line 68)

> I think this is what we went through (being busy) when we were having this engagement it was absolutely good for us, from our side because you know rather than us coming down or meeting somewhere we are here at home" (Interview #6; Line 56)

One mother mentioned she had stopped attending a morning exercise class across town because she was too tired after night shifts at work. She liked the fact that even if she was tired from work she could rely on the researcher visiting her home with this programme.

> But it's hardly now I'm going because I'm sometimes coming from work and I'm tired yeah didn't go there, that's why I like when you always coming in here, because if you, if we meet somewhere maybe you can not be seeing me, that's why I like it here (Interview #4; Line 81)

Tailoring programme goals

The families reported that the tailoring of the programme to fit with their situation and their expectations was a positive aspect. This included determining their own goals that were achievable and took into account what their family wanted to address. Families felt that having a tailored programme took into consideration both what their background was (where they were "at" with their health goals) and what they wanted to achieve (where they wanted to be with their health goals). This tailoring aspect was considered an important difference from other programmes families had attended in the past.

> And I guess it's targeting to whatever suits us I think that's one of the best thing that instead of giving us ideas and stuff but it's working finding out what the family would like, what the family would want even though we have the objectives and the goals to try to changes the lifestyle and stuff but it's still from where the family is at and what the family wants to happen so I think that was the cool thing (Interview #2; Line 43)

> I think it's quite good is whatever the family decided, the family, so its from their point of view of the family instead of some of the programme is to suits a variety of family but this is targeted to your own family where you are at so I think that's one thing that is quite good about it (Interview #2; Line 55)

Tailoring also allowed families to choose feasible goals achievable within their resources. One example was a family whose parents were concerned about the cost of buying healthier foods their children might not eat. Through discussion at the beginning of the programme this family revealed that they always had breakfast foods on hand, however neither the parents nor the children ate breakfast regularly. This family's initial goal was to eat breakfast consistently. This goal focused on an existing resource in their home and making a positive behaviour change without extra expenses.

Flexibility

The flexibility to change or reschedule meeting times and locations was described as important. In light of the many commitments for these families, a flexible format suited their lived reality and allowed them to continually participate in the programme while maintaining their other obligations.

> I think that has been a key thing, you know that you were still able to meet with us we were able to just juggle things around and I think if there was no flexibility then this…would have struggled (Interview #1; Line 64)

> …for us the flexibility of it you know if it doesn't suit then we delay, and you know that really worked. Especially for Pacific that's key as well, being flexible to suit because there is a whole other commitments and stuff that families are involved with in school, especially in the weekends as well (Interview #2;Line 89)

The home environment setting

Families noted that having the programme run in the home raised awareness of their home environment and its influence on their health. Families described the home-based programme as a "reality check", and that it increased awareness of their health-related decisions in the home among all household members.

> I think when you come to the home primarily you were to see us and our youngest son, but it gave an opportunity for other family members to see you, and then they inquire about why and what's this about, and so again the awareness of health is not just with us it permeates to others, so I dunno you know I think it's a good place (Interview #1; Line 94)

> I think homes are good because that's you know that's where people that's the reality. That's where all the eating and you know the discussions about health issues and that are happening you know that's the place where the plan will rise or fall I think. It's all very well saying yeah I'm going to go to the gym, but the gym is the place to exercise but home is where you eat and you know you can decide whether you're going to get out of the house and go to the gym or to whatever the exercise. And for [our youngest son] so I think when you do the interviews at the home it's like a reality check. You're there in the place where things are happening (Interview #1; Line 77)

In light of the many commitments of these Pacific families, bringing the programme into the family home was also important because it gave families the opportunity to focus on themselves and their health rather than other people's problems or commitments in the wider community. This participant explains how even though their family is concerned about their health they tend to forget their own situation amongst their busy lives and obligations outside the home.

> I think all the time that we've been sitting down and talking about it, it reminds us you know it's just a double reminder to us you know what's going on within the family. Like you know if I think with everything that's the environment that we are in you know sometimes you tend to forget you know that you're the especially the crisis that you're in, your situation (Interview #6; Line 19)

5.4.1.2 Focusing on whole family health

Addressing the health of the entire family, particularly the inclusion of children, was valued by all participants. Families enjoyed resources that promoted family time and opportunities to work together. Parents were encouraged by children's participation in the programme. Support and accountability were both mentioned by participants as results of the whole-family approach. Parents felt that both parents and children were supporting one another in achieving their goals, and also holding each other accountable.

Family-oriented resources

The resources that families liked most were those that involved family participation, support, accountability, and opportunities to share in goals and activities.

> I like the game. That was like, that one you know my daughter was watching and saying oh what are they doing and eventually she joined in. So I can see that it's a good family time activity, you know so that I really liked that one (Interview #1; Line 105)

> The kids [said] 'oh that was so much fun' especially the two young boys…but I guess engaging the whole family in a game situation (Interview #2; Line 106)

Inclusion and education of children

The opportunity for involvement and education of children was a highlight for parents, who were encouraged by their children's learning. Parents valued the time spent with children learning and discussing health, and considered it positive reinforcement and feedback when they saw their children attaining goals and participating in health-related games.

> Yes because the understanding is right down to our youngest son's level, it's very family-orientated you know it's good (Interview #2; Line 38)

> Especially the kids yeah, it's really good and helpful for the kids to change what they eat, and doing a wee bit of exercise you know, yeah it's good (Interview #5; Line 126)

> …for me the kids, even listening to them doing the games it's quite good that they start having that learning. I'm comparing my kids that age to a whole lot of Pacific kids that wouldn't really have that understanding which for me as a Mom I say 'oh well my youngest son knows that!' you know it's quite good, it's a confirming, affirming stuff that's quite positive so, and I guess that's what I really enjoy it just tailors to the kids as well (Interview #2; Line 345)

Support and accountability

Including the whole family in the programme encouraged cooperation because both parents and children were involved and aware of their goals. Families mentioned that they paid more attention

to the amount of time everyone in their family exercised and what they ate. Parents said that their children checked their goals and held them accountable, and they checked their children's goals, thus creating a family system of support and accountability.

> We had sat down and our youngest son was there and set his goal and he was doing stuff and he checks up, checks up on his parents (Interview #1; Line 180)
>
> Just thinking about how our youngest son exercises, the amount of time he exercises, what he eats. I think just being a part of a research about health, I think it's just been good in terms of raising awareness of the health of the family as a whole rather than just individually (Interview #1; Line 23)
>
> Yeah and I think…you know it kind of reminded for all of us, you know for the family, the whole family in the house so where everybody was sort of making an effort to do some form of exercise and also eating well, um, because yeah the fizzy drink started, cuz it came back, and then it started disappearing and everyone's right for us and especially our [daughter who moved back home during the programme] because she wanted to lose weight and with what we were doing you know it kind of made her oh I'll do that too (Interview #1; Line 36)

5.4.1.3 Engagement within the community

All families were highly engaged within their community. Whether it was through the church or other Pacific community organisations, these families spent a lot of time participating in, preparing for, and helping to put on community events. These connections with the community could be seen in the commitments family members had made to events and organisations, as well as the concerns they voiced for their community and their desire to help. These connections and obligations give a strong sense of who these families are and how they define themselves within the context of their community.

The role of the church in the community

Church was important to all participating families, and a considerable amount of time was spent there, particularly on weekends. One family who has been involved in several programmes in the community, both as leaders and as participants, suggested a church setting for Pacific people would be a complementary component to a home-based health programme. This suggestion of a church-based component was posed to other families and they supported this idea.

> But for the church can you target more for the kids involvement its probably the parents more involved but its good to have because that's part of their outside, I mean every weekend they'll be there, and then their home, so its transferring from both I think so both ends, a combination of both, a big session to catch up with and then individual families (Interview #2; Line 153)

Concern and care for the community

All families showed an investment in and genuine care for their communities. Some families mentioned concern for the health of their community and a desire to help as one of their reasons for participating in research. This concern for the community and desire to give of oneself in order to help others related back to the strong relationships between these families and their communities, their sense of self as belonging to the community, and the importance of maintaining those relationships.

> Um first of all I just wanted to help you, you know because I think it's a really really good, a good cause. You know you're doing a really good training you know for it will not only benefit for myself and my family but also the wider communities (Interview #3; Line 7)

> Basically you know if this can be you know if we can add to what is been there already you know helping with our Pacific people with the problems that they've having in terms of the diabetes, the overweight and the hypertension and heart attacks and all sort of things. You know if some recommendation or some suggestion will put into the system how to help, how to help and engage with our Pacific people it will be a fantastic thing to me. And that's a bigger picture but yeah (Interview #6; Line 44)

> It's good to see somebody doing this because I do believe in it, I do believe wholeheartedly in it because you know the health of the … people, well not only the … people but the Pacific islanders it's dragging the economy of New Zealand down a whole lot and we need a new turn on that (Interview #2; Line 545)

5.4.2 External Influencing Themes

The external influences reflected the values of the families and influenced how they experienced the programme. The external influencing factors were the importance and impact of all relationships, the value of effective communication, and the influence of Pacific culture.

5.4.2.1 The importance and impact of relationships

Relationships had the capacity to influence the experiences of the participants and how they saw and interpreted the programme. These included the relationships between family members, such as between parents and their children, the relationship between the family and their community, and the relationship between the family and the researcher. "Relationship" for Pacific people was considered to have a different set of values and meanings related to it than a conventional western definition. It included a sense of trust and obligation, and a need to save face with people with a relationship was established. Relationships were founded on both parties giving of oneself in order to foster trust and mutual obligation. Overall, maintenance of all relationships was a priority and important consideration for these families.

> …relationship for Pacific people or even for … it's very different concept compared to [your kind] of relationship. And for Pacific it's more like, come to the sense of being obligated like by us knowing you (the researcher), for example, and we get to know you we want to save face by being obligated when you turn up we're here you know because you're kind of at that stage to know each other well and we don't want to let you down you know that's kind of that's part of the relationship (Interview #2; Line 256)

Relationships between family members

Each family had unique relationships between family members. The relationship between parents and children was important to consider in terms of whom made decisions about health. In all families the parents mentioned the cultural value of providing food as a sign of love for their children. It was important to all parents to show love for their children, but how this was done with food varied between families. While some families felt that ensuring their children ate healthily was the best way to show love, others felt that giving the children what they wanted was their way of showing love. Some families described the Pacific nature of overprovision of food as "loving their kids to death".

In some families, parents considered themselves the "dictators" for health. In these situations the parent enforced certain nutrition or activity related behaviours with the children, such as serving certain foods, only allowing certain foods in the house, and insisting on participation in certain activities. In other families, the parents let the children choose for themselves and they tried to serve the types of foods their children liked, and they did not force their children to participate in various activities if the children did not want to. These families described themselves as "go with the flow". All families enjoyed opportunities to spend time together as a family and strengthen their relationships.

Relationships in extended families and community

Another important relationship was the strong ties between participating families and their extended families and communities. These ties influenced several aspects of these families' lives, such as obligations to other (extended) family members and community events, participation in community events, and care, love and concern for other family members and their community. Maintaining these relationships was important to all families. When issues occurred in extended families it was important that family members were there to help and support, regardless of what else may be going on.

> …it was because a lot of things were going on within our family itself, and taking the load off our extended family, and things that are happening at home you know…there's quite a number of things, things that comes up all of a sudden which we haven't planned (Interview 6; Line 163)

The relationships between families and their communities, particularly their church community, were described as influential. Decisions and actions in the community had the potential to influence families. This could be positive or negative in terms of health related behaviours. For example, whether a health programme was implemented in the community level or not. Leaders and important people in the community were well respected, and families described the opinions of respected leaders as highly influential in getting families in a community to participate in health programmes in the past, such as anti-smoking and anti-violence campaigns.

> The minister, the church ministers have a lot of power, a lot of power you don't underestimate it. If you get the one minister you are in, so you know if you can target that then of course everybody follows. Because he's in a position to tell people this is what we need to do, and you don't need to do that, he'll do it, but they of course he has to buy in, but once he has then he will do it all for you (Interview #2; Line 181)
>
> And while the church members are there as one member, it's easy for them to follow the leader, once he says this is it, they'll follow. Even though some of them may hold back but it's much easier for him to bring them around. If you're going and they are against you, there's no way you can bring them (Interview #1; Line 194)

RELATIONSHIP BETWEEN FAMILIES AND THE RESEARCHER

The relationship between each family and the researcher was raised during families' reflections on the programme. Some families explained that sometimes the relationship between the person delivering information and the person receiving it is important than the information itself.

> ...sometimes it's not necessarily about the materials and the learning it's about the person so that's where the relationship is quite different...it's not a facial level you have to get a bit deeper with it" (Interview #2; Line 266)

The families described the relationship with the researcher as influential in the way they experienced the programme. The key aspects of this relationship for the families were mutual obligation, trust, and feeling supported by the researcher. The researcher visiting the home and learning about the families was perceived as demonstrating care and support.

> [The kids] were always looking forward to [the researcher] coming (Interview #2; Line 52)
>
> Yeah it was really good you know because I really enjoy (the researcher)'s time coming too, even we talk about what research you're doing but we talk about other things too and we learn something from it too (Interview #3; Line 87)
>
> ...not only that but family saw us saying oh you know for example you (the researcher), you're concerned for our wellbeing so you're coming to us

rather than us coming to you or meeting you somewhere else, you come into our home and see who we are and I think that's really good, that's positive (Interview #1; Line 88)

5.4.2.2 The value of effective communication

Communication was the cornerstone of interactions between the researcher and the families and crucial to the way families were able to understand, interpret, and use resources. Several families considered communication and its impact on learning and programme implementation was important. Families described the most effective communication as being clear and simple. This applied to both verbal and written communication. Families also noted the importance of mutual respect between the sender and receiver of a message, such as the health education in this programme. Respect improved how messages were understood and interpreted, and allowed for open and comfortable discussion about the messages. Effective communication facilitated the researcher and the families understanding of one another, and enabled the programme and its components to be tailored appropriately by the researcher to the level of each family's knowledge and understanding. It also opened channels for comfortable discussion on appropriate nutrition and activity behavior goal setting.

Clarity and simplicity

An important aspect of effective communication with these families was simplicity of information and an emphasis on small manageable goals. Families appreciated clear, simply health messages. They explained that even when they knew something was important, if the message was overly complicated they would not feel like they had the time to decipher it.

> …I think the simplicity of it is key, because if something is too complicated then you know I think if you've got the time to sort of figure things out that's okay but when you've got children and you've got you know this schedule during the day to get through the last thing you want is something complicated. And yet you know it's important but if it's complicated you know you can easily just push things to the side or back and then you don't really achieve much (Interview #1; Line 135)

Who is delivering the health message

Within some families there was generally one key person who promoted healthier behaviour, often the mother. While family members acknowledged this person cared for their health, they often resisted suggestions to change their behaviours either because they had heard it all before or felt like that person was "nagging". One family noted a new method of communication, even if the overall message is the same, could make a greater impact for certain people.

> I think for me it's that instead of [my wife] saying it from her point of view of being a mother wanting her family to be well off physically, it's coming from [the researcher], and there's a different view from me. I'm not looking at it that here's Mom with the big stick, I'm looking at it as this is what you need to do to get it right, you know rather than you just have to do this because she's nagging. You know it's coming from [the researcher] and [she's] saying the same thing that she's saying but you are not nagging you're just telling the facts, you know (Interview #2; Line 387)

> I'd say I'm more open to it…I'm more responsive to it rather than I have to do it because she's nagging you know but now I'm doing it because I want to do it (Interview #2; Line 399)

> …I think it's just back to the similarity that [my husband] says, that the kids knowing it's not only me because I want the best for them, but it's the same message having consistently coming from other people, so hopefully it will stick (Interview #2; Line 419)

Another family who routinely received health advice from extended family members noted that the act of sitting and discussing health with someone outside the family made them aware of new opportunities for change.

> …But when you sit down with [the researcher] and talk about it and then share with, you know, I know it's very simple methods and very, it sounds simple but I think [we] know we are fortunate just to be part of this (Interview #6; Line 25)

Potential disadvantages of poor communication

While effective communication facilitated positive thinking about health and changing health behaviours, families felt there was potential for ineffective communication to hinder the progress of a programme such as this one. For example, if families do not have a certain level of knowledge necessary to enable use of the tools they are given, the tools are unlikely to be useful. Although this was not a problem for the six participating families in this pilot, one family expressed this concern.

> The way I look at it is because our background…you know it's just like a glove you know it (the programme) just fits for us but I'm not too sure how other families with their very limited knowledge of where you're coming from will find it (Interview #2; Line 74)

This reinforces the importance of initial assessments and appropriately tailored information in this type of programme.

5.4.2.3 The influence of Pacific culture

Pacific cultural values and norms influenced food and physical activity choices for these Pacific families. Families reflected on cultural influences that created specific challenges for them with respect to healthy nutrition and activity environments and behaviours. Families described the importance of food in Pacific culture, the large servings of less healthy foods at gatherings and special occasions, and the tendency to eat all of the large portions. While families recognised the importance of eating well, they found the cultural significance of food, its prevalence in the community setting, and the norms around how much should be eaten was a difficult challenge.

> We like food! And it's part of our culture, you know (Interview #2; Line 490)
>
> You know I told you before it's very hard for us to stop eating you know, control, because our routine from the island is to eat as much as we can yeah (Interview #4; Line 11)
>
> And we know that staying healthy and eating right is what needs to be done, and like I said about the culture it's fighting against the culture (Interview #2; Line 550)

Cultural beliefs also influenced activity norms, particularly for older people in the Pacific community and the belief that they had earned their time to rest. One family reflected on the struggle of encouraging their grandparents to be active despite insistence from other family members that they should be resting.

> It's because the expectation from our culture point of view you get at this stage then you don't do anything anymore, you just sit and relax and expect things, people to serve you, (Interview #2; Line 558)
>
> …like for his parents here I am telling them, I tell my daughter who lives with them 'don't do that let them do it it's good for them" and then her other side of the family says 'oh what is [she] doing' you know it's that because they deserve now to rest they've done their bit and here I am saying 'use it or lose it (Interview #2; Line 563)
>
> …so it's always a battle but his parents now they benefit, they know the benefits of the moving so they keep doing, but when they get sick that side of the family keeps saying 'we told you you do too much' so it's really hard. And just imagine that, and here I am coming and telling them 'no no it's good for you (Interview #2; Line 568)

For cultures with such norms for activity and strongly embedded relationships to food, the consensus was that changes must be slow and incremental.

> But you don't change the culture that's one thing, and we'll be here and we'll be gone and that culture will still be moving but it's ever so slow, and that's what is so hard about your job and what you are trying to do because you are

> like fighting against the ... that's a real...you know that's not how it is (Interview #2; Line 486)
>
> In ... community, you know you can only do a little bit at a time (Interview #2: Line 483)

5.4.2.4 Connections between external themes

Not only are the three external influences of culture, relationship, and communication separately related to experiences of the programme, they are also inherently linked to one another. The Pacific cultural influence plays a role in the importance of relationships, which are developed through respectful and mutual communication. The communication is most appropriate when cultural differences are considered and common ground is sought, which further facilitates a strong relationship. The following quote was part of a discussion about getting Pacific families to "buy-in" to programmes.

> ...and the ... if they feel that you're part of it if you're part of the group, it's easier for them to join in, and if you're standing outside then it's hard, you know so you know it's easier always easier to be make known to them you are there and you are there for them, and then everything should be easier then. But if you are a stranger to them the ... people are very shy people too... (Interview #2; Line 243)

This quote reflects the intertwining of the external themes. In this example the father elucidates the cultural importance of communicating the intention and willingness to be there for people and develop a relationship. Without it, as a "stranger" to the culture, there is a barrier to working in these communities. Clearly these three themes are important both for Pacific families and for those working with them. Figure 1 demonstrates the interconnected nature of the three external influencing themes.

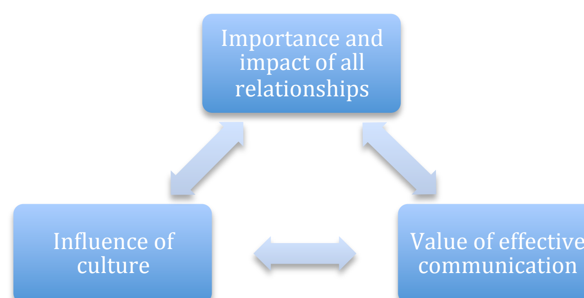

Figure 1: The inter-connected nature of the external influencing themes

These inter-connected external themes were also apparent as overarching influences on the internal operational themes.

5.5 Summary of Findings

Overall, families found this home-based health education programme acceptable, appropriate, and worthwhile. The flexibility and tailoring of a programme in their home environment and the focus on whole family health was highly valued. Supportive and accountable relationships between family members and between families and the researcher also contributed to the value of the programme.

Effective communication was seen as a crucial component of the programme with emphasis on information being simple and tailored appropriately to each family's needs and background. Families reported successful changes in behavior, although there were a number of challenges. Culture strongly influenced families' perceptions of the role of food and the norms of physical activity.

Busy schedules with many commitments (work, school, church, extended family) influenced the daily lives of all families and how they were able to operationalise the programme. Barriers to change included poor time management, difficulty developing and maintaining healthy routines and habits, helping children make healthy choices, and identifying and coping with less healthy environments and behaviour patterns.

There was strong support for a home-based programme with the recommendation that a greater emphasis was placed on family time and increased positive reinforcement. The addition of a community or church based component in order to utilise the support and relationships in the community, improve community health, and spread awareness of health and programme participation to more families was strongly recommended.

6 Discussion

This pilot programme is the first home and family-based Pacific child obesity prevention programme in New Zealand, to the author's knowledge. The positive feedback from the pilot and the literature from other countries suggest the home is an effective setting for child obesity prevention programmes. The primary outcome goal of this research was the development of a tailored, home-based programme to prevent child obesity that was acceptable within Pacific families. By developing and piloting the programme within Pacific households the expectation was that feedback from participants would shape and tailor it into an effective and acceptable programme for Pacific children and their families, which could be evaluated for effect on relevant clinical measures in a formal trial in the future.

This research found several strengths to a home-based, tailored health promotion programme for child obesity prevention with Pacific families. The programme, which was piloted in at-risk Pacific families for twelve weeks, received positive support and feedback. Families enjoyed the fun-focused, simple and clear education that involved their whole family and particularly targeted children. Families felt the information enabled them to make positive changes to health behaviours and they felt supported in doing so by their family members and by the researcher. The results of this pilot suggest home-based programmes that focus on attainable goals, provide clear information, and involve the whole family are a positive and enjoyable method for prevention of child obesity in Pacific families. This chapter discusses the results of this pilot programme with recommendations for future research.

6.1 Framework for selecting priority groups for obesity prevention

A systematic framework for organising and assessing evidence for selecting priority groups for obesity prevention was developed after a review of published approaches to selection of priority groups or target populations.[127] The new framework described specific types of evidence that should be considered in the assessment of a potential priority group for obesity prevention and had implications for funding and implementing community-based or settings-level obesity prevention interventions and research. The framework was structured around four key topics, or required evidence, which were proposed to be necessary to build a case for priority action on obesity for a population group. The four key topics were then expanded to provide specific questions to be investigated within each topic. The framework consisted of the following topics and questions:

1. Prevalence and trends of overweight and obesity

a. What is prevalence?

b. What is trend?

c. Are there inequalities?

d. How severe and imminent are health consequences?

2. Behavioural risk and protective factors

a. Evidence of behavioural correlates of current weight status or behavioural risk factors for obesity?

b. Prevalence of identified obesogenic behaviours?

c. Socio-economic or demographic inequalities in prevalence of obesogenic behaviours?

Pacific communities currently satisfy these first two criteria regarding prevalence, trends, and behavioural risk factors of overweight and obesity. Over one in five Pacific children (23%) and three in five Pacific adults (62%) are obese. These rates are at least 2.5 times higher than the rates for non-Pacific children and adults, respectively.[2] In 2008/09 the prevalence of diabetes and pre-diabetes among Pacific adults in New Zealand was 15.4% and 24.0%, respectively.[40] Pre-diabetes was highest in Pacific peoples (24.0%) compared with Maori (20.5%) and NZ European and Other ethnicities (18.1%.[40]

There is evidence that certain lifestyle behaviours that increase the risk of overweight and obesity are practiced more frequently by Pacific peoples than non-Pacific New Zealanders. Pacific adults were less likely to eat at least three servings of vegetables each day (46%) than the population overall (68%) in 2011/2012. They were also less likely to be physically active (46%) than the general population (54%).[2] The proportion of Pacific children (83%) who ate breakfast at home was lower than that for NZEO children (89%) and children overall (87%). Pacific children were three times more likely to have eaten fast food more than three times in the past week as non-Pacific children and more likely to have had a fizzy drink three or more times in the past week.[3]

3. Environments and opportunities for intervention

a. Are there accessible settings to reach the population group and have role in influencing behaviours?

b. Are there potential improvements to current practices to support eating and physical activity?

c. How willing and able are the group?

This third criterion was the basis of this pilot programme, which sought to identify if the home was a suitable environment for child-obesity prevention interventions with Pacific families. The results suggest home and family-based programmes are promising for child obesity prevention among Pacific families. The results of this pilot programme and the feedback from families also suggested the inclusion of a church-based community intervention programme to compliment and support home-based programmes.

4. Effectiveness of interventions

   a. Are interventions effective?

   b. How effective and cost-effective?

   c. Are there known barriers?

   d. How long are effects of intervention sustained?[127]

The final criterion forms the basis of the recommendations from this pilot programme. The effectiveness of the pilot on the weight of children and their parents must be evaluated in a formal trial, with a pre-post design study being best suited to the Pacific community. Formal evaluation of future home and community-based programmes would also provide evidence for sustainability of such interventions. This evidence would complete the criteria and present a strong case for Pacific communities as a priority group for obesity prevention. Fulfilling the remaining criteria could potentially garner more attention at a societal or policy level of change. While the bottom up approach is important for addressing issues relevant to families and the community to start making healthier choices in their daily lives, there is inevitably a need for a top-down policy level approach to improve the health environments of people as a whole. Outcomes and formal evaluations of programmes in the Pacific community for child obesity prevention will build an evidence base from which to argue for high priority prevention strategies.

6.2 Evaluating the Pilot programme

6.2.1 Key positives

All families found the home-based pilot programme to be acceptable, appropriate, and worthwhile. Delivery in the home setting was viewed as a way to enhance the understanding of family context. This was considered highly important by participating families and facilitated the setting of realistic goals.

6.2.1.1 Having a whole-family orientation

The key benefits of a whole-family focus included the opportunity for family time, the inclusion of children, the development of supportive and accountable relationships, and the potential to spread awareness of health to other family members and the community. The influence of parents and the benefits of working as a whole family are particularly relevant for Pacific families. Pacific adolescents have reported the family as the main source of socio-cultural influences and guidance on nutrition and activity behaviours.[78] Pacific adolescents identified parents, particularly mothers, as the most influential person that determines food habits, and the home environment and the family unit as the most influential for promoting health behaviours.[81] Working with the whole family, and particularly involving parents, in child obesity treatment is effective and potentially sustainable long-term.[97, 103] Parental encouragement, involvement in, and modeling of physical activity has been shown to positively predict activity in children.[95]

Families working together within the home created a network of support and accountability between family members. This support network was an important foundation for encouraging healthy behaviours in the home environments of these families. Supportive environments recognise the relationship between people and their environments and the ensuing impact on their health.[128] Strengthening this foundation could also provide support and accountability for behaviours outside the home.

Helping children to make healthy choices

Targeting the whole family involved the inclusion and education of children, and gave support and advice to parents for helping their children make healthy choices, which they liked. This is consistent with literature that suggests targeting messages to children is a way of both educating and involving them, as well as supporting their parents to encourage healthy eating and exercise.[129] Supporting parents has improved their confidence in taking responsibility for their child's weight.[130] Providing parents with opportunities to role model positive behaviours and giving them simple steps or ideas for how to get children active or eating healthy foods can increase parents' self-efficacy to help children make healthy choices.[130]

Family oriented games and resources

The board game was a popular activity because it created opportunities for family time and involved families working together on nutrition knowledge and activity participation in a fun-focused environment. The popularity of the game suggests games and resources that get families active together should be incorporated into home-based programmes. Parents found resources that allowed children to track their health goals in a fun manner, such as using sticker-charts or playing board games, were effective. Parents felt a sense of affirmation when they witnessed their children actively involved in healthy behaviour and demonstrating their health knowledge, such as in the

board game activity. They also found children less resistant to their recommended healthy choices after using these resources and games. While there is no discernable literature about games and projects that involve the whole family, this pilot suggests they could be a positive effective way to teach healthy behaviours and prevent child obesity.

6.2.1.2 Running a programme within the home

Families felt the home-based programme increased their awareness of the decisions they made at home and helped them create a healthier home environment. The home was a space where families could focus on themselves and their own health away from the obligations and commitments to extended family and community. Home-based programmes for families have been shown to improve health related behaviours in children and their parents.[131] In a multi-level study on community and home interventions, the home based intervention resulted in changes in obesity related child behaviours, such as increase in fruit and vegetable consumption, and changes in parenting variables such as parent monitoring of children's eating and activity behaviours.[131] Positive results have also been seen in home-based interventions in Canada for Aboriginal populations where intervention households decreased consumption of fats, oils and sweets, increased water consumption, and decreased soda pop consumption compared to control households after a six month programme of home visits.[89]

The Pacific families in this pilot programme reported having the programme based in the home was a "reality check" about their behaviours and decisions. Community or school-based programmes may not effect change for families if they do not consider they are relevant or able to be implemented within their personal family environment. Home-based programmes address families' unique environments and situations through tailoring specific health messages. Therefore, these health messages may seem more realistic and applicable than those received outside the home.

6.2.1.3 Delivering simple, clear messages and setting attainable goals to suit each family: Tailoring the programme

Tailoring the programme to suit each family was a distinct feature that families had not witnessed in other programmes they were involved with previously. This process is consistent with the collaborative negotiation model, a research and practice framework which has been employed to engage families in management of children's weight.[132] Collaborative negotiation involves parents and children identifying health concerns and working together with a researcher or collaborator to develop strategies tailored to fit the family's lifestyle and resources. Families are central to the process and should be active participants in planning and attaining healthy eating and activity goals for their children. The collaborative negotiation process helped families in an obesity treatment programme to make small changes mostly pertaining to increased activity, improved dietary intake, and altered fluid consumption.[132]

Setting attainable goals that were realistic within each family's particular situation was a key part of the tailoring of the pilot programme. Progress in working towards these goals improved families' self-efficacy and confidence in their ability to achieve and sustain healthier behaviours. Personal self-efficacy refers to a person's action control, where a person who believes that he or she can produce a desired effect can conduct a more active and self-determined life course.[133] By building the self-esteem and self-efficacy of individuals through attainment of small goals and changes, the individual has more personal control over their health behaviour. Having the personal belief that they are both in control of and capable of changing behaviour increases the chance for success. In a previous qualitative study on health messages, the two most relevant and motivational health concepts for parents and children were "attainable goals" and "self-esteem".[134]

The families in this pilot programme liked the simple, clear information about health, both in written materials and in verbal advice and conversations. This finding is supported by other studies on effective health messages for children and parents.[134] Evidence suggests parents and children need positive, realistic approaches to health messages, including ideas for healthier eating and physical activities and ways the family can work together.[134] Clarity and ease of use of programme resources were important to families. While families did not consider the occasional misunderstanding of resources as a barrier, the researcher observed that this potentially delayed proper use of resources. Waiting until the next visit to ask about the resources could have been due to families not realising they did not fully understand a resource, or wanting to please the researcher by saying they understood. The relationship between the researcher and the families must be developed so that families are comfortable asking questions if there are materials they do not understand. Further, having several visits is a sign of support and an opportunity to ask those questions if they in fact arose after families were first given the resource.

The format and content of the pilot programme resources were guided by recommendations in the guide to developing health education resources in New Zealand.[135] The guide recommends using clear, plain language with simple familiar words that reflect the audience's own common language, using face-to-face discussions to explain and demonstrate a message, giving examples for new or difficult concepts, and providing images to explain complex issues. It also recommends providing information that is clear, precise, and easy-to-follow and using positive statements and inclusive and friendly language.[135] All families used the resources in the pilot programme readily.

6.2.1.4 Flexibility and comfort of the home-based programme

The flexibility and comfort of home-based programmes have not been covered in the literature. However, Pacific families liked these two aspects of the pilot programme. Families supported the programme because they were comfortable in their home setting and they avoided potential stress of meeting at a location that was new or difficult to get to. Not having to travel to another place

increased the level of participation of the families with busy lives. This was evident particularly for shift-working families, who commented that after long night shifts they would not travel elsewhere to attend a health programme.

Families found the programme flexibility made it easier to fit in with their busy daily lives. The ability to reschedule meeting times and the option of meeting on weekends enabled families to participate in the programme alongside other commitments. This was necessary for the success of this programme, as some families mentioned without this flexibility they would have struggled or not been able to continue participation. The Family-Centered Action Model of Intervention Layout and Implementation (FAMILI), while yet to be tested for effectiveness, suggests family-centered programmes have a flexible and tailored nature and have the ability to be adaptive and responsible to family needs and cultural values.[136] This 'flexible' process, however, is labour intensive for researchers who have to fit in meetings with families and potentially reschedule those meetings. If programmes are too flexible this could increase potential implementation costs in terms of time and labour. Programmes need a pragmatic balance of flexibility and practicality in terms of cost for those implementing the programme. A practical number of visits in order to effect change is necessary, while also showing continued support for the family. A previous study with overweight children and their parents showed four sessions with parents (weekly on weekends for one month) were effective in changing behaviour and perceptions of parents involved.[137] This is encouraging to suggest parents may only need a small amount of sessions, however the children in this programme attended several day camps over the course of a month, which could have influenced the results reported by parents and is highly intensive in time and labour costs.[137]

6.2.2 Key challenges

6.2.2.1 Scheduling home meetings

The flexible nature of home-based programme meant there were times when the researcher struggled to reach families or confirm meeting times. Challenges occurred when other commitments were prioritised above scheduled meetings. A continued effort to remain in contact and a friendly demeanor was important in encouraging continued participation from families. It was also helpful to stay in frequent communication and contact in order to be up to date with families' routine activities and daily schedules, as these may change depending on work shifts, sport seasons, school holidays, or other circumstances.

6.2.2.2 Finding time to implement programme changes

Busy schedules with many commitments influenced the daily lives of all families and how they were able to implement and experience the pilot programme. These schedules were particularly

complex for these Pacific families due to their many commitments and obligations to help and be involved with extended family and community. Families found that developing and maintaining healthy routines or habits were difficult, particularly when unexpected events occurred or they were especially busy because of other commitments. While all families had busy schedules, those who made it a priority to schedule times for healthy behaviours, such as eating breakfast or doing some form of daily exercise, found it easier to maintain those behaviours. For this programme, this highlighted the importance of tailoring each family's goals to be achievable within their busy life situations. This finding is similar to literature from New Zealand exploring the variance in behaviours between obese and non-obese Pacific adolescents and their parents.[81] In a study on the differences in health behaviours and knowledge between these two groups, time constraint was found to be a key barrier to healthful eating.[81] Busy families with changing schedules found it most difficult to create healthy habits or stick to health goals. Time constraints and busy schedules may not be causative for unhealthy behaviours, however the lack of prioritising health and scheduling in time for healthy behaviours could explain these relationships. These findings suggest that the busiest families may be in greatest need of intervention. For families struggling with busy schedules and time management, a home-based programme may be the solution to learning how to improve health behaviours.

6.2.2.3 Less healthy environments and their influence

The positives and challenges of the pilot programme suggest that while the home environment is crucial in targeting family health behaviours, other environments where families spend time, develop and maintain cultural understandings, and sustain relationships influence health behaviours and could potentially be effective targets for obesity interventions. Despite being involved in a home-based programme, families were still influenced by external environments such as their church and their community. The connections between Pacific families and their communities were strong and influential. They were a large part of how families defined themselves in a social and cultural context. Evidence suggests that the influence of socio-cultural factors and religious environments could be utilized for obesity prevention with Pacific peoples.[74, 81] Families in this pilot programme spent a considerable amount of time at church and involved in church-related activities. Families noted that church and community events were not only important to their family identity, but also challenging environments for healthy dietary and activity behaviours. In the home setting, families were able to discuss options for how to deal with important environments that presented challenges to their health goals. Strategies from families regarding less healthy environments included planning and preparing healthy snacks for weekends or holidays and cutting down on portions at church and community events.

Families showed concern and care for their communities and recognized the difficulty of creating healthier Pacific communities where there are strong cultural influences on food and activity.[78] The families in this pilot programme recommended the addition of a community or church based component to the home-based programme. The potential benefits are the development of a larger support network for families trying to make changes, improved community health, increased awareness of health, and involvement of more families in the community. This is consistent with the Ottawa Charter for Health Promotion's recommendation of creating supportive environments and recognizing the inextricable links between people and their environment.[128] In targeting the best definition of "community" for Pacific families, it is important to consider where in the community families spend their time and how they are influenced. A strong recommendation from this research is to utilize the church environment for a community based component.

6.3 CREATING SUPPORTIVE ENVIRONMENTS FOR HEALTHY BEHAVIOURS

The findings above suggest families involved in health programmes could benefit from programmes that work on multiple levels and help to create supportive environments. The socio-ecological health model, the Pacific Fonua health model, and the Ottawa Charter provide frameworks and concepts to support focusing on multiple levels and supportive environments to support families in practicing healthy behaviours.

6.3.1 SOCIO-ECOLOGICAL HEALTH MODEL

The socio-ecological model predicts that efforts to change behaviour will be enhanced when they are carried out at multiple levels, including individual, social, cultural, environmental, and policy.[138] This model is similar to Pacific views of health that encompass not only the individual and the family but also relationships between the community and the wider environment and how those influence behaviours and perceptions of health. A Pacific view of health involves being in harmony with the environment and with the family and goes beyond physical aspects to other realms including social and spiritual.[47] While the primary focus of obesity interventions should lie, at least in part, with the family, other societal institutions should adopt supportive roles to compliment the home-based programme.[130]

6.3.2 FONUA MODEL: PACIFIC FRAMING OF A SOCIO-ECOLOGICAL APPROACH TO HEALTH

The Fonua model, a Tongan health framework, provides a socio-ecological approach to health with foundations of important Pacific values and cultural influences, such as the importance of maintaining relationships and the willingness to accept change and flexibility in daily life.[139] *Fonua* is a Tongan word which means "land and its people and their on-going relationship," a concept that is present in many other Pacific cultures. It is *vanua* in Fiji, *fanua* in Samoa, *whenua* in Maori, and '*enua* in the Cook Islands.[139] Fonua has five levels, *taautaha* or individual, *kainga* or family, *kolo* or

village, *fonua* or nation, and *mamani* or global society. The five levels are inter-dependent and complement each other. In order to maintain the health and wellbeing of society, health issues must be addressed at all levels.[139] *Tauhi va* is "maintaining relationships" and it is central to Fonua. Health and wellbeing, peace and harmony and progress depend on the on-going and successful maintenance of *va*-the relationship between human beings and the environment. Another central characteristic of Fonua is change or *liliu*. Fonua accepts change as natural.[140] This coincides with the need for flexibility that became evident in the results of this pilot programme. The *tala-e fonua* are the values and knowledge system associated with the health model. The values include *fe'ofo'ofani*-love, *fetokoni'aki*-reciprocity, *fefaka'apa'apa'aki*-respect, and *fakapotopoto*-prudent, judicious, wise leadership and management.[140] By utilizing the Fonua framework, interventions can work at multiple levels with important Pacific values at the centre of their approach, with the intention of creating effective and appropriate interventions for Pacific families and communities.

6.3.3 Ottawa Charter for Health Promotion

The Fonua model and the socio-ecological health model are consistent with the Ottawa Charter for health promotion. The Ottawa Charter states that health is created by caring for oneself and others, by being able to take decisions and have control over one's life circumstances, and by ensuring that the society one lives in creates conditions that allow the attainment of health by all its members.[128] The Ottawa Charter advocates five tenets of health promotion: creating supportive environments, strengthening community action, developing personal skills, reorienting health services, and building healthy public policy.[128] Home-based programmes should develop a foundation for healthier behaviours and a proximal support network for families by building on the successful aspects of this pilot programme in accordance with the Ottawa Charter principle of developing personal skills. Developing personal skills supports personal and social development through providing information and education for health and enhancing life skills. This increases the options available to people to exercise more control over their own health and over their environments, and to make choices conducive to health.[128] Strengthening community action involves community involvement in setting priorities, making decisions, planning strategies and implementing them to achieve better health. Community development draws on existing human and material resources in the community to enhance self-help and social support, and to develop flexible systems for strengthening public participation and direction of health matters. Building healthy public policy recommends that beyond health care, health should be put on the agenda of policy-makers in all sectors and at all levels. Health promotion policy combines diverse but complementary approaches including legislation, fiscal measures, taxation and organizational change. Reorienting health services says the role of the health sector must move increasingly in a health promotion direction, beyond its responsibility for providing clinical and curative services, and embrace a mandate that is sensitive and respects cultural needs.[128]

The Socio-ecological health model, the Fonua model, and the Ottawa Charter together reinforce that implementation of a multilevel intervention for childhood obesity prevention could be effective for Pacific families. The need for multilevel approaches and using strategies geared to changing social norms and improving community understanding is also supported by the WHO Global strategy on diet, physical activity and health.[8]

6.3.4 MULTILEVEL INTERVENTIONS

The evidence for multi-level approaches is limited. The Aventuras Para Niño's study in California[131] and the KOALA project in Brisbane, Australia[130] are multilevel projects aimed at improving childhood obesity.

The Aventuras Para Niño's study (Aventuras) was a three year multi-level intervention to prevent and control childhood obesity among Latino children in San Diego, California, USA.[131] Aventuras examined the direct and indirect effects of modifying home and community environments for preventing childhood obesity in elementary school-aged Latino children. Thirteen elementary schools were randomised to one of four intervention groups: family-only, school and community only, combined family and school and community, and a control measurement. In Aventuras, the home intervention component targeted key healthy lifestyle behaviours. The home intervention was conducted by "promontoras" (advisors from the Latino community with training in delivery of the programme as well as cultural competency), who visited each family monthly for seven months over the first school year of the intervention and made yearly "booster" phone calls to each family the next two years.[131] The school and community interventions were based on a structural approach and designed to alter physical structures (such as playgrounds and cafeteria salad bars), and target social structures and policies (such as availability of physical education equipment and healthy menus in restaurants). The community programmes were built and maintained over the 3-year intervention period.[131]

While Aventuras found no significant intervention effects on children's BMI z-scores, the family intervention changed several obesity related child behaviours such as fruit and vegetable consumption, and these were mediated by changes in parenting variables such as parent monitoring of what children ate and how active they were. Aventuras found children in all the groups increased their overall mean BMI score over the course of the study and the proportion of children classified as obese increased in all except the family-only condition at the final measurement.[131] There were no main effects from the community-only intervention. The family-only intervention showed some positive results. There were significant increased parent-reports of child physical activity, child's daily consumption of fruits and vegetables, increased behavioural strategies for fat, and reduced child frequency of watching TV when getting ready for school. Despite multiple changes to school and community environments, Aventuras' main finding was that the family intervention, by

creating more changes in the child's "proximal" environment, resulted in favourable child behavioural outcomes.[131]

The Kinder Overweight Active Living Action (KOALA) healthy lifestyle programme in Brisbane, Queensland, Australia took a different multilevel approach. KOALA was a 12 month randomised obesity prevention intervention study designed to provide an understanding of how school, family, and community can work in partnership to holistically address childhood obesity.[130] While long-term outcomes are yet to be evaluated, perspectives of parents, children and teachers regarding the KOALA programme are that there is value in planning childhood obesity interventions that link families with community programs. Within KOALA, families were randomly assigned to two different trial groups. All families were encouraged to participate in a weekly activity programme. Families allocated to the intervention group were also invited to participate in additional intervention strategies including a positive parenting programme (a 16 week course involving ten group sessions and six one on one sessions addressing family behavioural change), four one on one sessions with a dietician, three weekend camps run by Scouts Queensland, and invitations to attend their local scout group on a weekly basis.[130]

The KOALA project was designed to address the complexity of overlapping sites in obesity intervention and chose a strategy that promoted shared responsibility across those sites. The scout camps in KOALA were designed to be family-focused (all members of the family were invited), with an emphasis given to healthy eating and physical activity in a fun environment. The parents and siblings were included in the activities and encouraged to work together.[130]

In KOALA, parents expressed feeling ownership in influencing their child's physical activity patterns, and while they accepted the responsibility of addressing their child's obesity, they were more comfortable in this role after the KOALA experience. Children in the KOALA study saw family as the most prominent site affecting their attitudes and behaviours regarding a healthy lifestyle. One of the key points presented by the parents was how KOALA had positioned them in a way that allowed their children to view them as role models, which it was generally agreed positioned them to continue being role models when they returned to the home. This empowered parents and encouraged greater respect from their children. The most valued aspect of the KOALA programme was its ability to empower families with the necessary knowledge and resources to effectively address obesity within the home.[130] The results of KOALA in terms of weight outcomes are yet to be published.

6.3.5 Considerations for developing community level intervention

These examples of multilevel interventions present considerations for how to incorporate the home-based programme of this research into a multilevel, socio-ecological approach. While targeting the community alongside the home constitutes a multilevel approach, it is important how the "community" is defined, how intervention levels are integrated, the intensity and duration of the intervention, and the time needed to properly develop and tailor interventions within communities and families.

6.3.5.1 Effectively defining "community"

It is important to properly address what "community" means and how it is identified in order to appropriately target an intervention. Socially cohesive neighbourhoods, through shared goals, collective trust, and social norms, can encourage healthy behaviours such as physical activity.[141] A nationally representative study of New Zealand young people used multilevel methodologies to assess social and physical contexts of schools and neighbourhoods and their impact on physical activity. It found that social aspects of neighbourhoods, rather than physical attributes, may be particularly important.[141] While the Aventuras project developed structural changes to communities, it is possible that families were not using these structures initially, so despite altering them to be more health conducive (for example, the playgrounds), families may not start using them just for this reason. While structural changes are supportive to health in the long run, on their own they may not be the most effective at instigating health behaviour changes for families in the short term.

A strengths-based approach to a Pacific-based community level intervention would consider how to effect change in environments that are particularly influential on families. The OPIC study, which delivered interventions in multiple community settings (schools, religious groups, villages), recommended future obesity prevention with Pacific peoples build on the role of religious groups and their influence on eating patterns.[80] This recommendation, along with the view of families in this study, suggests that targeting the church environment alongside a home-based programme could be beneficial for obesity prevention in Pacific children.

However, it is important to consider the challenges of previous church obesity prevention programmes. Major issues with church-based programmes have been difficulty achieving "high-dose" intervention at the community level, transience in the church community, inconsistent attendance, and variance in perceived utility of programmes.[39] Some of these issues could be addressed by a co-existing home-based programme, which previous church-based programmes did not have.

6.3.5.2 Communicating and integrating intervention levels

The notion of "shared governance" in the KOALA study fostered effective communication between families, community programmes, and schools, and families were particularly happy about their

confidence in utilising community resources and transferring the skills they learned in community settings into their homes.[130] Aventuras, on the other hand, saw no aggregate effects of community and family interventions, which could have been a result of ineffective communication with participating families about how to access the community level interventions. This discrepancy could be related to how the community level intervention was targeted and how the levels were related to one another. Families in the KOALA study felt it helped to connect them to community resources. KOALA targeted "community" aspects that involved the whole family, gave them skills to work with others, and built a support network with other families involved. Aventuras exemplifies the importance of the home and family-based programme, as this level of intervention was the only one that presented health related changes.[131] This suggests that home-based programmes should be first priority; however there is great opportunity with Pacific families to run complementary community-based programmes, and attention must be paid to how the levels are integrated with one another. Collaborative community sessions could enhance feelings of obligation, socialisation and identity between and amongst families.

6.3.5.3 Intensity and Duration of Programmes

In order to deal with the reality of the home environment and challenges implementing a programme in this setting, the intensity and duration of the home level intervention must be considered. In the Aventuras study, the promontora visited the family monthly for seven months over one school year and called four times over the next two years. Based on the results of this study it is suggested that this was not intensive enough intervention, which could have explained the lack of change in children's BMI scores.[131] A programme for obese children and their parents in Ontario, Canada, found parents were pleased with the impact of the programme after only four sessions over one month with the parents, however the children attended several intensive day camps over the course of that month.[137] The positive behavior change outcomes in Anand's study in Canada after six months of "regular" home visits with families are encouraging, however the exact meaning of "regular" was not defined explicitly.[89] KOALA held more frequent (weekly), more intensive (full day camps with parents and children) sessions than Aventuras, however the costs of a programme such as KOALA would be high and this must also be taken into consideration when planning future programmes.

6.3.5.4 Taking time to develop and tailor interventions

The perceived success of KOALA was in its ability to link parents with their children, and both children and parents with supportive community resources. This collaboration took a great deal of time as the disparate partners struggled to agree on shared goals, language, and intervention and evaluation strategies.[130] This notion of time is an important consideration. Developing tailored interventions for Pacific families and communities is likely to take a considerable amount of time.

Programmes should be prepared to invest time in developing relationships and rapport in the community, and facilitating agreement between community goals and expectations of the programme. It is necessary to expect a considerable amount of time to be spent collaborating before a programme is implemented.[86, 142] This time should be spent working with church and community leaders and members to obtain buy-in and build a collaborative programme and agree on goals, and identifying and recruiting families for home-based programmes.

6.4 BUILDING THE EVIDENCE BASE FOR HIGH PRIORITY PREVENTION

Top-down approaches and high-level interventions to address structural barriers, such as taxes on high-fat foods and subsidies on fruits and vegetables, are necessary to reverse the epidemic of child obesity.[62, 81] However, these approaches and policy changes are extremely difficult to enact.[143] Structural factors such as cost and affordability of healthy foods have been stated to determine food and physical activity behaviours more than cultural beliefs about food and activity among Pacific adolescents and their parents.[81] While financial constraints were not reported to be a concern for this pilot programme, cost of food was taken into account when setting goals and tailoring advice. The KOALA programme was funded and families felt that the opportunity to participate in a programme at no personal cost made the decision to take part easier.[130] KOALA, however, involved high cost activities (such as the weekly camps) that would have to be funded externally in order to keep the costs to participants low.

Other potential policy approaches that could reduce obesity rates have also been considered.[144] These include soft drink taxes, initiatives to restrict or tax high fat meat supplies, and various issues of targeting pricing, availability, and accessibility of healthy and unhealthy foods such as controlling food advertising to children and school environments, lowering taxes on healthy foods or implementing price controls, and increasing taxes on unhealthy foods.[144] It is widely recognised, however, that these issues span beyond the health sector and require complex collaborations, and it is a long and difficult process of getting these issues onto political agendas in the first place.[81, 144] Thus, these strategies are unlikely to be seen in the near future.

Bottom-up approaches, therefore, are crucial for two reasons. Firstly, they provide people and communities with the tools and skills to increase control over their own health and make healthier choices in their existing environments.[86] Secondly, successful bottom-up interventions provide evidence for future programmes, and build support networks for people to use a collective voice to push for top-down approaches to support the work being done at the family and community level.[62, 136]

The World Cancer Research Fund recommends that people and communities be the impetus for larger-scale changes. The World Cancer Research Fund (WCRF) and American Institute for Cancer Research (AICR) "Policy and Action for Cancer and Obesity Prevention: Food, Nutrition, and Physical Activity: a Global Perspective" provided evidence-based recommendations to key groups in society on how to help people make healthier choices to reduce their risk of developing cancer and obesity.[62] The report aimed its recommendations at nine acting groups across all levels of society. These included multinational bodies, civil society organisations, government, industry, media, schools, workplaces and institutions, health and other professionals, and people. The overarching recommendation was for all actors to work together to control and prevent cancer and other diseases and to promote positive health and well being throughout life.[62] The "people" group included people as individuals; as members of close knit groups such as networks, communities, clubs, friends, families and households; and as policy makers and decision-takers. The aim for the "people" acting group was to act as members of households and communities and as citizens, not just as customers and consumers, in achieving healthy ways of life. This included developing policies and setting examples within the household and community to enable healthy eating, sustained physical activity, and weight control.[62] This approach was emphasised for the families in this pilot programme. The WCRF report supports the notion that eventually it is people who make the difference in society, not simply as accumulations of individuals, but as members, and leaders, of groups. The influence of people acting together as citizens, represented by effective civil society organisations and amplified by the media, is considerable and could have a decisive and lasting effect on the policies and actions of governments and industry.[62]

6.5 Strengths and Limitations

6.5.1 Following Pacific protocols

This pilot programme achieved successful positive engagement with the Pacific community, particularly for a programme conducted by a non-Pacific researcher. The researcher followed Pacific protocols and suggestions from those in the community for recruitment and engagement with the Pacific community.[57, 108] This engagement was crucial to being able to successfully pilot the programme.

6.5.2 Strengths

The integrity of qualitative research projects can be protected throughout the research process, particularly when qualitative researchers attend to issues of validity, reliability, and generalisability.[125] Rigorous research should be transparent and explicit, using appropriate tools for the particular aims of the study. This qualitative research, including design, data collection, analysis and interpretation, followed an ordered and rigorous process. The rigour of this research was

enhanced by the prolonged engagement and triangulation,[112, 122] along with reflexivity and transparency in the research design, collection, and analysis processes.[122]

6.5.2.1 Prolonged Engagement

Prolonged engagement is a qualitative research strategy that ensures that the observer has had adequate time to become thoroughly familiar with the processes under study and that the participants have had time to become accustomed to the researcher's presence.[125] In this research, prolonged engagement with the families facilitated a comfortable relationship and opened communication channels between family members and the researcher. This allowed the researcher time to observe participants in the programme, and was particularly important for the interview process. The relationship developed through prolonged engagement enhanced the validity of the interview questions because the researcher was experienced in speaking with the families and had become accustomed to different language use or meanings of commonly used words. The improved understanding between the researcher and the families meant the interview questions could be presented appropriately. Prolonged engagement enhanced the value and amount of feedback provided by the participants, as well as the researcher's ability to evaluate that feedback compared to what was observed.

6.5.2.2 Triangulation

Triangulation is an approach to data collection in which evidence is deliberately sought from a wide range of different, independent sources, and often by different means, in order to improve validity of findings by identifying inconsistencies or building robustness of results.[125,122] In this research, text data from interview transcriptions, text data from field notes, and personal observations from the researcher were used to triangulate results. Investigator triangulation also occurred in the analysis of results. The steps in the analysis were discussed at each stage between the researcher and the research supervisors, and supervisors were provided with transcriptions of interviews. This ensured the codes and themes derived from the data were agreed between different investigators.

6.5.2.3 Reflexivity

Reflection and introspection are important parts of qualitative participatory research. The impressions and feelings of the observer become part of the data used in attempting to understand and describe a process and the people involved in it.[122] As a participant observer, the researcher in this programme was the facilitator of the programme and developed a relationship with the families. As such, the families saw the work put into the programme by the researcher. This relationship and acknowledgement of effort could have made families more likely to report positive outcomes and feelings towards the programme than if an impartial person had either conducted the programme or the interview component. To address these potential influences, families were asked about programmes they had been in previously, to see if there were similarities or differences in

perception of the programmes or programme outcomes depending on who ran the programme and where it was held. The researcher also emphasised the importance of being critical and was careful to be accepting and encouraging of criticisms in order to allay any concerns about offending the researcher. Participants were open with the researcher throughout the process about being critical of certain aspects of the programme. The researcher was confident that the responses from families were unbiased, not only because of the open discussions between the researcher and the families but also because the researcher had ample opportunity to observe families during the programme and determine whether their feedback was an accurate account according to what was observed.

6.5.2.4 Transparency

The researcher met regularly with the research supervisors to discuss the work process and progress. Supervisors provided critical comments on writing drafts and programme observations, which helped the research process to be more rigorous and transparent. Having an audit trail of interview question development and an audit trail of theme development through analysis also provided transparency in these processes. Detailed field notes and observations of programme sessions, audio of interview sessions, and transcriptions of those interviews were also kept in order to reflect upon the analysis process and allow research supervisors to evaluate the audit trails created by the researcher.

6.5.3 Limitations

The limitations of the research process can influence the generalisability of the process and the results. The limitations of this study are presented along with discussion of how they were addressed, if possible, to limit influence on this research. In cases where the limitations could not be addressed, the potential extent of their influence is discussed.

6.5.3.1 Observational research

The personal, subjective nature of observations can be regarded as both a strength and a weakness in the research process. The fact that personal involvement allows for first-hand experience and understanding could be seen as a strength. Selective perception as a result of that personal involvement, however, could be interpreted as a weakness.[122] The relationship developed between participants and the researcher in this study influenced the programme and the families' perceptions of the programme. To a large extent these relationships were positive, and therefore could have resulted in more positive feedback and reporting of outcomes by families than was truly experienced. However, the nature of relationships has proven to be a significant factor for Pacific families in their perceived value of programmes, therefore while the influence of the relationship could be viewed as a confounder, it may also be an integral part of the programme itself and a reason for positive perceptions. If conducted by a different individual it is possible this research would result in different feedback, not only because the personal relationships would differ, but

methods of delivering and implementing programme material could vary also. Specifically, if a Pacific person had conducted the research, the relationship between that researcher and the families could have been very different, as could the interpretations of the families' feedback.

6.5.3.2 Self-reported changes

This study does not present objective measurements of health outcome results for the participating families, and changes in health-related behaviours are self-reported. The rationale for this was to allow families to focus on a health-related programme without concern about weight-related outcomes. Also, the duration of the programme was not sufficient to assess changes in weight-related outcomes. The process and implementation of the pilot programme and the feedback from families were the primary outcomes in this research, as opposed to objective measurements. A future study with a longer duration and formal evaluation would measure and collect such data to determine programme effectiveness and sustainability.

6.5.3.3 Variance in families

The many differences between the families in this research and the aspect of tailoring programmes to each respective family makes it impossible to develop a single, explicit package and programme structure that would fit all families. Despite this variance, however, the experiences and the themes in the feedback were common to all families. The basic information presented and resources used were the same for all families. Therefore, the pilot programme and its ensuing recommendations could be acceptable and applicable to the Pacific community as a whole.

6.5.3.4 Snowball and volunteer sampling

This study used a snowball sampling method where participating families put themselves forward. Thus, these families may be more likely to be the type of families that are comfortable with a researcher in their home and who enjoy participating in programmes. While this is true, the process of implementing healthy behaviour changes in Pacific families and communities is not likely to progress with resistant families regardless of their involvement in programmes. Therefore, if effective programmes can be developed for those families seeking support for healthy lifestyles and willing to make positive changes; there is the potential that success in these families and the visible benefits they are receiving will influence others in the community to think about making changes. With the close connections of all families to their Pacific community, it was impossible to blind families to who else was participating. This did not concern families, however, and in fact they were happy to know about their friends and peers participating and encouraged one another. This reflected a sense of support in knowing that other families were going through the same process.

6.6 Considerations for future researchers

The results of this research provide useful information and recommendations for researchers. For policy-makers the findings of this pilot programme provide evidence that work in the home is viable, however multi-level interventions would be ideal and funding for a study to assess a combined community and home based programme is recommended. In practice it suggests that while people know the home is important, few programmes or interventions seek to understand the home environment and target it, preferring to reach it distally via interventions run in the community or schools.

The Dunedin Pacific Community

In terms of generalisability, the Pacific community is different in Dunedin compared to other New Zealand cities, such as Auckland. Due to the Dunedin Pacific community being smaller, there is a tendency for programmes to have a pan-Pacific approach. In Auckland, where there are larger numbers of individual ethnic groups, there is more opportunity and scope for ethnic specific approaches. This could present challenges in targeting a programme to the Pacific community as a whole in larger cities. It could also affect the process of recruitment for programmes depending on the approach chosen. However, if a programme utilised an ethnic-specific approach, the same basic strategies of this pilot programme could be employed. Further to these strategies, the programme could be more ethnically specific and tailored by creating resources in certain Pacific languages and incorporating examples of traditional foods and activities.

6.7 Summary

The results of this pilot suggest home-based programmes that focus on attainable goals, provide clear information, and involve the whole family are an acceptable, appropriate, and worthwhile method for prevention of child obesity in Pacific families. Families enjoyed that the programme was fun and family focused, simple and clear, and addressed their unique situation and health goals within a flexible structure. Delivery in the home setting was viewed as a way to enhance the understanding of family context, something considered highly important by participating families. There is value in considering a complementary community-based programme alongside home-based child obesity prevention because Pacific families are strongly influenced by their community and church environments. This multilevel approach would help to address influential environments of Pacific families, build a larger support network for families involved in a home-based programme, and spread awareness to a greater number of families in the community.

Major Recommendations

The major recommendations for future research are:

1. Formal evaluation (recommended pre-post trial design) of a home based programme for child obesity prevention with Pacific families based on this pilot programme, to determine effectiveness and objective outcomes (such as BMI and waist circumference) of participants. Such a trial should include a process evaluation to enable an understanding of the social and cultural context, which may influence implementation and study outcomes.

2. Develop a complementary community-level intervention to address influential environments and run alongside the home-based intervention, preferably through the church setting.

3. Collaborate with the community and tailor the interventions to effectively address community and family needs and maintain a strengths-based approach.

4. Utilise the evidence and outcomes of interventions in Pacific communities to develop a strong argument for Pacific families as a high priority group for child obesity prevention, and to argue for change in top-down policy level environments that impact all communities and families.

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APPENDIX A: ETHICAL APPROVAL

Reporting Sheet for use ONLY for proposals considered at departmental level

Copied to Cady Nitte & Tai Sopoaga 16/5/12

FILE

Form Updated: February 2011

HUMAN ETHICS APPLICATION: CATEGORY B

(Departmental Approval)

1. **University of Otago staff member responsible for project:** Dr. Faafetai Sopoaga
2. **Department:** Preventive and Social Medicine
3. **Contact details of staff member responsible:**

   Dr. Faafetai Sopoaga,

   Email: tai.sopoaga@otago.ac.nz

   Phone: 479 7088

4. **Title of project:**

   DEVELOPMENT OF A TAILORED HEALTH PROMOTION PROGRAMME WITH PACIFIC FAMILIES IN DUNEDIN, NEW ZEALAND.

5. **Indicate type of project and names of other investigators and students:**

Staff Research	☐	**Names**	
Student Research	X	**Names**	Amy McColl
Level of Study (e.g. PhD, Masters, Hons)			Masters
External Research/ Collaboration	☐	**Names**	

1

Institute/Company

6. **When will recruitment and data collection commence?**

Recruitment will commence in May/June of 2012, following ethics approval. Data collection will commence shortly after recruitment, likely June 2012 (possibly July).

When will data collection be completed?

Data collection will be completed after 3 months of meeting with families and one month of follow-up interviews. This is likely to be October 2012.

7. **Brief description in lay terms of the aim of the project, and outline of research questions:**

The goal of the research is to develop a tailored programme involving education, resources and family involvement with Pacific families in Dunedin that has been shaped by each family's individual needs, input and feedback. The project seeks to build on Pacific family culture and capacity to improve and maintain healthy lifestyle behaviours.

Families will shape their own project by setting health goals and self-identifying priority areas with guidance from the researcher. Programmes will include advice on making simple changes to behaviours that fit with heath goals, and education and resources on nutrition and physical activity.

The research questions will seek feedback from participants as to whether having Pacific family members involved in all facets of the programme -from initial goal setting through to lesson content and feedback- results in an acceptable, worthwhile programme for health promotion with Pacific families.

8. **Brief description of the method.** Please include a description of who the participants are, how the participants will be recruited, and what they will be asked to do:-

This is a pilot study that will recruit families (6-8 Pacific families/households) through the Pacific Trust Otago and the local Pacific community networks. The programme will be presented and explained at community meetings (such as the Pacific Advisory Group meeting and events put on by the Trust) in order to make families aware of the opportunity to participate.

Participants will be Pacific families/households in the Dunedin area with at least one child of pre-school or school age, and one member of the family or household who is overweight or obese (classified using World Health Organization standards for children and BMI for adults). Participating families will include only those where all family members are willing to participate, and have the desire to make improvements to overall health.

Each family will be invited to...

- have an assessment of current health behaviours
- participate in focus groups to set health goals

- meet (at a time and place convenient to them) weekly or fortnightly over 3 months for sessions involving health-promoting nutrition and activity behaviours
- provide input and feedback into lessons, resources and all facets of the programme

Family members will also undergo individual interviews at the end of the 3 months that will be audio-recorded. Recorded interviews and feedback from throughout the programme will be used in a qualitative, thematic analysis to develop final programme recommendations.

9. Please disclose and discuss any potential problems: (For example: medical/legal problems, issues with disclosure, conflict of interest, etc)

This programme does not deal with medical records or any form of medical treatment. If a participant is already under medical treatment for an existing condition, recommendations from this programme will not interfere with current treatment. Activity lessons/recommendations will be suggested after careful consideration of participants' current health and fitness levels. Only small to moderate changes to diet and/or lifestyle will be considered.

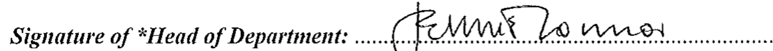
In terms of disclosure, it will be made clear to participants that their feedback and input are of primary importance, however if they wish to remain anonymous or have some of their information withdrawn every effort will be made to handle information in a way that is acceptable to the participant.

If the researcher identifies or suspects any participant may be at risk of health complications or a health condition while working with the families (eg. Extremely obese individual whom the researcher believes should undergo a health screening), the issue will be discussed confidentially between the researcher and her supervisors to decide further course of action (eg. Speaking with the individual about concerns, possibly recommending a visit to his/her GP).

No problems with conflict of interest or legal issues are foreseen.

Applicant's Signature: ... .

*(Principal Applicant: as specified in Question 1, Must **not** be in the name of a student)*



*Signature of *Head of Department:* ....

Name of Signatory (please print): ......JENNIE CONNOR......

Date: ......16/5/12......

Departmental approval: *I have read this application and believe it to be scientifically and ethically sound. I approve the research design. The Research proposed in this application is compatible*

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with the University of Otago policies and I give my consent for the application to be forwarded to the University of Otago Human Ethics Committee.

**(In cases where the Head of Department is also the principal researcher then an appropriate senior staff member in the department must sign)*

IMPORTANT: The completed form, **together with copies of any Information Sheet, Consent Form and any recruitment advertisement for participants**, should be forwarded to the Manager Academic Committees or the Academic Committees Assistant, Registry, **as soon as the proposal has been considered and signed at departmental level**. Forms can be sent hardcopy to Academic Committees, Room G23 or G24, Ground Floor, Clocktower Building, or scanned and emailed to gary.witte@otago.ac.nz.

[Reference Number *as allocated upon approval by the Ethics Committee*]
[*Date*]

GUIDELINES/ RECOMMENDATIONS FOR HEALTH

ACTIVITY

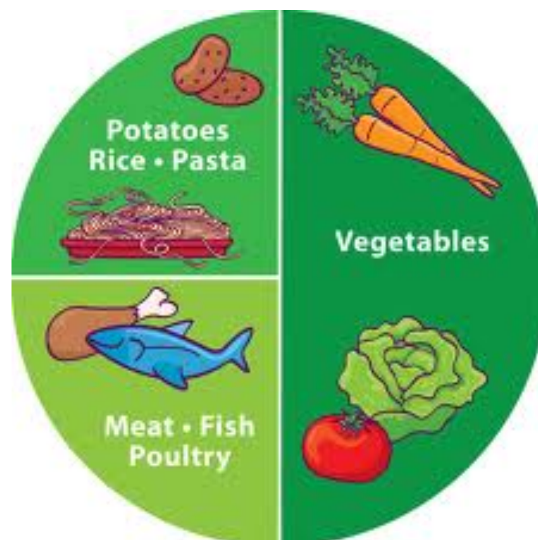
- **Adults**: recommended at least **30 minutes** of *moderate* physical activity per day

  - *Moderate* = breathing a bit harder, heart beating faster than normal, still able to hold a conversation
- **Children:** recommended **60 minutes** of *moderate-vigorous* physical activity per day
  - V*igorous* = puffing, much faster heart rate, only say a few words before you catch your breath
- You can *snack on activity* for shorter periods of time to add up to the right amount
- Try and **limit non work-related screen time** to **2 hours** or less each day (eg. Video games, computer games, TV)

Guidelines/ Recommendations for Health

Nutrition

- Eat from **all four food groups** each day
- Plenty of **Vegetables** and **Fruits** – ***5** Servings*
- **Breads, Cereals** and **Starchy Vegetables** – ***6** Servings*
- **Milk** and **Milk products** – ***2** Servings*
- **Meat, Poultry**, **Seafood**, **Eggs** and Alternatives – ***1-2** Servings*
- Drink **water** more often and sugary drinks less often (eg. Fizzy drinks, juices)
- **Balance your PLATE**: Try to make your plate half non-starchy vegetables or fruits, one quarter whole grains and one quarter meat or protein



Small Steps to Improving Nutrition, Activity and Health

Nutrition

- Eat breakfast
- Eat more Vegetables and Fruits
- Eat more meals at home
- Plan meals ahead of time
- Eat less Sugar
- Eat less Salt
- Eat better Fat
- Drink smarter: Water instead of sugary drinks

Activity

- Spend more minutes in motion
- Snack on activity, 10 minutes at a time
- Get active as a family
- Take the stairs
- Mix it up, try something different
- Get outside
- Skip screen time, spend less time at the TV or computer

Getting There: Lessons to Improve Our Nutrition and Activity Knowledge

Nutrition

- Importance of breakfast and regular meals
- Servings
  - How big is a serving and how many do we need
  - Why packages can be hard to understand
- Portion sizes
  - How big are portion sizes for children and adults
  - How can we remember the sizes

- Reading nutrition labels
  - What to look for and why
- Why all the food groups?
  - What are the benefits of each group
- Where is the sugar? Salt?
  - What do sugar and salt do in the body
  - Where do we find sugars or salt in foods
  - What are the different types of sugars

- Why whole grains?
- Good fats and bad fats
  - What is the difference
  - How do we get MORE good fats and LESS bad fats
- Choosing smarter drinks
  - Benefits of drinking water
  - What does “drinking your calories” mean

Activity

- So many benefits!
    - What are the reasons to be more active?
- How to get to 30 or 60 minutes-activity snacking
    - Working it into your day/week
- Mix it up- flexibility, strength, endurance
    - What are the different types of activity
    - How can we mix up the types of activity
- Spice up everyday activities
    - What are examples of getting more movement into daily activities
- Tv-free days
    - Why should we watch less TV?
    - What else can we do instead

Benefits of Getting Active

*Just **30** minutes a day can help…*

Increase Energy

Beat stress, feel more relaxed

Maintain a healthy weight

Improve sleep

Keep our muscles and bones strong

Improve cholesterol and blood-sugar levels

Reduce risks of obesity, heart disease, diabetes, strokes and some cancers

Let us live independently and functionally for longer

***60** minutes a day for children helps them…*

Develop strong muscles, bones and joints

Move with balance and flexibility

Develop and maintain a healthy heart and lungs

Build self-confidence and social skills

Maintain a healthy weight

Have fun!

Vegetables and Fruits

Fruits

*Up to **3-4** Servings per day*

One serving = 1 medium sized fruit or the size of a handful

YOUR serving size is the size of YOUR hand, children's hands are smaller than adults so they need smaller servings

Good for the eyes and skin, high fiber and water content, help keep your body healthy.

Vegetables

*At least **3-4** servings of **non-starchy** veggies each day*

Examples: Asparagus, bean sprouts, broccoli, carrots, cauliflower, leeks, onions, tomatoes, salad greens, peppers

One serving = ½ cup cooked veggies or 1 cup of salad

*Vitamins, minerals, and fiber. **Low in Fat,** and Healthy intakes of vegetables and fruits help protect against major illnesses*

Tips

Fit veggies or fruit into each meal

- *Load sandwiches, wraps, stews and pizzas with veggies*
- *Add a side salad to your meal*
- *Put fruit on our cereal, yogurt or even dessert*
- *Take fruit to work or school or on the go for an easy snack*

Breads / Cereals / Starchy Vegetables

E.g. Bread, breakfast cereals, potatoes, kumara, yams, corn, taro, rice, pasta etc.

*At least **6** servings each day*

One serving = 1 roll, 1 slice bread, 1 cup of cereal, ½ cup cooked oatmeal or porridge, 1 cup cooked pasta or rice

Carbohydrates, fiber and nutrients give us energy for the day. Help us to concentrate for school and work and power us for sport and exercise AND Whole grains keep us fuller for longer

Tips

- *Choose wholegrains as often as possible, switch from the "white" version of your favourite breads and try a "grainier" version*
- *Wholegrain varieties include porridge and muesli*
- *Watch out for spreads and sauces on your breads and starchy veggies (these can be full of fats!)*
- ***Watch** some "healthy" foods like muesli bars and cereals can be FULL of SUGAR, and some crackers and breads are HIGH in SALT, avoid these*

Meats and Alternatives

e.g. Meats, Chicken, Seafood, Eggs, Cooked Dried Beans, Peas, Lentils

*Eat **1-2** servings each day*

One serving = meat/fish/poultry portion the size of the palm of your hand, or a deck of cards; or 1 egg; or ¾ cup dried, cooked beans

Remember children's hands are smaller so their servings are smaller too

Give us protein, iron, zinc and other nutrients

Important for muscle building and repair

***Bonus:** Aim to eat fish at least twice a week*

Tips

- *Choose lean meats, chicken and seafood*
- *Trim visible fat off meat and remove skin from poultry*
- *Cook smarter, try grilling or roasting instead of frying*
- *Legumes (like beans and lentils) are cheap and filling, keep cans of these for quick, easy meals*

Milk and Milk Products

*Choose **2** servings each day*

One serving = 1 cup of milk, 1 small yogurt, 2 slices of cheese

Calcium and other vitamins and minerals for strong bones and teeth; carbohydrate for fat and energy

***Bonus**: Protein for growth and repair of muscles*

Tips

- *Choose lower fat milks such as trim (green top), lite (light blue top), or trim with added calcium (yellow top)*
- *Try low fat yogurt for desserts instead of creams*
- *Choose lower fat cheeses such as edam, cottage cheese or low fat cream cheese*
- *Ask for trim milk in coffees (could mean 10g of fat less in your latte)*

Appendix C: Introductory Questions

Family:

Date:

New Zealand Adult Nutrition Survey Questions

1. How many days in an average week do you have something to eat for breakfast? (may have eaten at home, in a car, at work or in a café) -*including both weekends and weekdays, breakfast drinks including smoothies and shakes-*
    - Adults

    - Children

2. On average, how many servings of fruit- fresh, frozen, canned or stewed- do you eat per day? (not including fruit juice or dried fruit) – *a servings is the same as a medium piece of fruit or about one handful-*

Never; Less than one serving a day; 1 serving; 2-3 servings; 4 or more servings; I don't know

- Adults

- Children

3. On average, how many servings of vegetables – fresh, frozen or canned – do you eat per day? (do not include juices; serving is one potato/kumara, half a cup of peas or cup of salad…again about a handful)
    - Adults

    - Children

4. How often do you eat fast food or takeaways from places like Mcdonalds etc.? (think about breakfast, lunch, dinner and snacks. Do not include times when you have only purchased a drink/beverage)

Never; Less than once; 1-2 times per week; 3-4 times per week; 5-6; 7 or more times per week; I don't know
- Adults

- Children

5. How often do you drink fruit juices and drinks? (such as freshly squeezed varieties and brands like Just Juice, Fresh-Up, Keri, Ribena and Charlie's) – *excludes soft drinks, energy drinks, flavoured waters and sports waters*

- Adults
- Children

6. How often do you drink soft drinks or energy drinks, not including diet varieties?
   - Adults
   - Children

ACTIVITY

1. On average how much physical activity would you say you get in a week?

2. What types of activities does your family enjoy?

3. How much time do you spend in front of a screen (non work-related) each day

Appendix D: Goal Tracker

OUR GOALS

Week 1:

SUN	MON	TUES	WED	THURS	FRI	SAT
**	**<>	<>	**<>	**	**<>	<>

Week 2:

S	M	T	W	TH	F	SAT

Week 3:

S	M	T	W	TH	F	SAT

Week 4:

S	M	T	W	TH	F	SAT

Week 5:

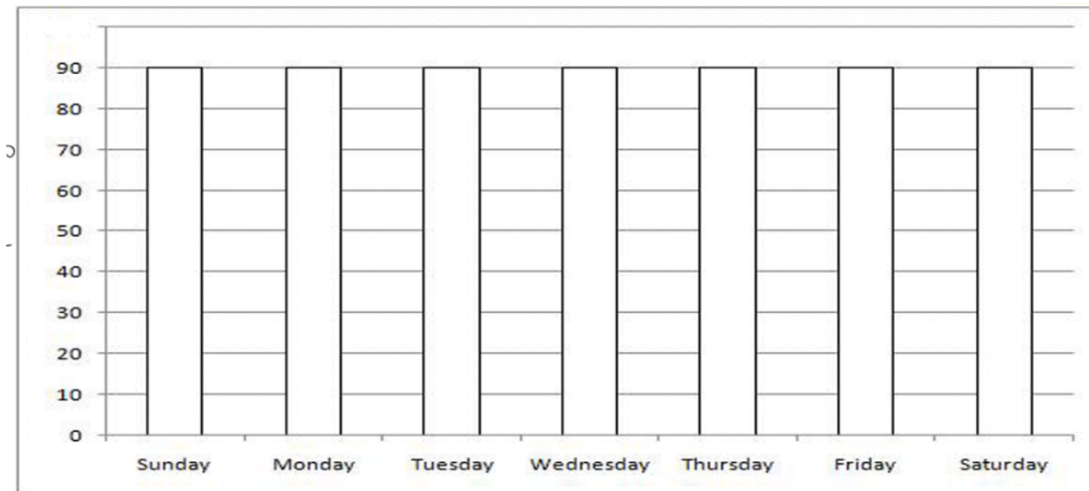
S	M	T	W	TH	F	SAT

Goal Tracking Legend:

1. Drink 5 glasses of water per day : **
2. Exercise 20 minutes each day <>

APPENDIX E: ACTIVITY TRACKER

Activity Tracker



Keep track of your daily activity. Colour in each 10 minutes of activity you do during the day.

*Want to track your **intensity**? Colour the blocks different colours.*

Yellow	**Orange**	**Red**
Low Intensity: Minimal effort, could sing while you're doing the activity (easy walking, doing housework)	Moderate Intensity: Could carry on a conversation (Fast walking, Sit-ups or Push-ups, Squats)	High Intensity: Heart is beating fast, out of breath (Running, Zumba, Aerobics)

Appendix F: Board Game

HOW TO PLAY
VERSION #1

1) CHOOSE A TOKEN AND PLACE IT ON THE START LEAF!

2) YOUNGEST PERSON GOES FIRST, THEN TAKE TURNS CLOCKWISE

3) ON YOUR TURN, ROLL ONE DICE AND MOVE THE NUMBER OF SPACES YOUR DICE SHOWS

4) CHOOSE A QUESTION CARD FROM THE PILE OF THE COLOUR YOU LANDED ON AND GIVE IT TO THE PLAYER ON YOUR LEFT TO READ.

5) IF YOU GET THE QUESTION RIGHT - ROLL AGAIN! IF NOT, YOUR TURN IS OVER

6) PURPLE SQUARES ARE ACTIVITIES, COMPLETE WHAT THE CARD SAYS AND ROLL AGAIN

7) FIRST TOKEN TO THE END WINS!!!

HOW TO PLAY VERSION #2

1) CHOOSE A TOKEN AND PLACE IT ON "START"

2) DECIDE ON 5 DIFFERENT EXERCISES, ONE FOR EACH COLOUR SQUARE ON THE BOARD EX. PRESS-UP, SQUAT, ETC.

3) ON YOUR TURN ROLL 1 WHITE DICE TO TELL YOU HOW MANY SPACES TO MOVE AND 1 RED DICE TO TELL YOU HOW MANY TIMES TO DO THE ACTIVITY YOU LAND ON

4) COMPLETE YOUR ACTIVITY TO FINISH YOUR TURN

5) WHEN YOU REACH THE STAR, CHOOSE A ☆ CHALLENGE CARD

6) COMPLETE YOUR CHALLENGE TO FINISH THE GAME!!

APPENDIX G: EXTRA RESOURCES

DO ANYWHERE EXERCISES

WORK YOUR HEART

- JUMPING JACKS
- HIGH KNEES/RUN ON THE SPOT
- STAIR STEPPING

- *JUMP ROPE (YOU DON'T NEED A ROPE!)*
- *HOP ON ONE FOOT, THEN SWITCH*

- *STAR JUMPS*
- *TUCK JUMPS*
- *BURPEES*

GET GOOFY

- CRAB WALKING
- SQUIRM SQUIRM I'M A WORM
- BEEP BEEP I'M A JEEP

- *BEAR CRAWL*
- *SUPERMAN*

GOT A PARTNER?

- MIRROR DANCE
- SIMON SAYS

- *EXERCISE STATIONS*

ARMS, CHEST, BACK

- PUSH UPS
- BICEP CURLS

- *PLANK*
- *TRICEP DIPS*

AT THE CORE

- CRUNCHES
- TOE TOUCHES
- SIDE ANKLE TOUCHES

- *FLUTTER KICKS*
- *BICYCLES*
- *SIDE PLANKS*

USE YOUR LEGS

- WALL SIT
- CALF RAISES
- STEP-UPS

- *LUNGES*
  - *FORWARD*
  - *BACKWARD*
  - *WALKING*
- *SQUATS*

STRETCH IT OUT

- YOGA POSES
  - CHILD'S POSE
  - DOWNWARD DOG
  - CAT/COW
  -
  - *COBRA*
  - *WARRIOR POSE*
- ARM CIRCLES

- INCHWORMS

LEGEND:
- EASIER
- *HARDER*
- *HARDEST*

Office Exercises

Shoulders and Arms

Tricep Dips

Standing in front of your desk or a strong surface facing away, place your palms on the edge, fingers curled over the front. Straighten your legs out so your heels are on the floor and your legs form a triangle with the floor and the desk, keep your back only about 10cm from the edge of the desk. Slowly bend your elbows and lower your body down until your upper arms are parallel with the floor, then push back up. Try for 10 reps.

Prayer/Handshake

Put your hands together in a "prayer" position and push against one another strongly for 10 seconds, flexing your biceps and shoulders. Now clasp your hands together like a handshake and pull against one another strongly for another 10 seconds. Repeat 2 more times.

Reverse Hug and Flap

Sitting at your desk, reach your arms behind you as if you were hugging someone behind you, thumbs pointing downward. Pulse your arms together for 10 reps. Then turn your palms to the sky and flap your arms up and down for 10 (small flaps only about 10 cm)

Arm Circles

Stretch your arms out wide, straight out from your shoulders. Circle them forward and back, big and small circles. Try 20 forward then 20 back, first small then bigger circles.

Office Supply Bicep Curl

Grab anything heavy in your office and curl it!

Cardio

Twinkle Toes

Sitting up straight at your desk with your feet on the floor. Engage your core and raise both feet off the ground 4 cm. Alternate tapping left and right toes, keeping core engaged. Go for 1 minute at a time

Toe Taps

Standing up in front of an object about 20 cm off the ground, alternate tapping your right and left foot on the front edge. Go for 30 seconds

Block Walk

Get outside for a quick lap of your block, see how long it takes you

Chest and Back

Pencil Pinch

Sitting up straight at your desk, squeeze your shoulder blades together as if you were holding a pencil between them. Keep your shoulders down away from your ears. Hold the squeeze for 10 seconds. Try 5 reps.

Shoulder shrugs

Bring your shoulders up under your ears, hold for 5 seconds and release. Repeat 5 times.

Wall Push-Ups

Standing about 50 centimetres from a wall, put your hands on it shoulder-width apart at the height of your chest. Lower your body towards your hands and push back outward. Try 15 reps.

Core

Desk Chair Swivel

If your chair rotates, engage your core and lift your feet slightly off the ground. Rotate your chair pushing lightly with your hand on your desk, then stop and go the other way, trying to use your core to resist the swivel.

Ab Squeeze

Sitting up straight at your desk, contract your abs tightly as if someone was going to hit you in the stomach. Hold for ten seconds and release. Repeat 10 times.

Side Bends

Sitting tall at your desk, keep your shoulders square and bend straight to the right as if you were picking up a pencil you dropped. Come back up and bend to the left side. Do 10 on each side.

Twists

This time, pretend you dropped your pencil on the opposite side. Rotate your shoulders and reach your right hand over to your left foot. Come back up and switch sides. Try 10 each side.

Legs and Lower Body

Wall Sits

Find some empty wall space and take a seat, with your whole back pressed against the wall and your legs at 90^0 angles. Try for 30 seconds at a time.

Calf Raises

Standing, raise yourself up on your toes keeping your core engaged to keep your balance and lower. Try one leg at a time for 10 each.

Silent Seat Squeeze

Sitting up straight at your desk, squeeze your bum and hamstring muscles tight and hold for 10 seconds. Do 5 sets.

Seated Leg Raises

Sitting up straight at your desk, slowly raise your legs up until they are parallel with the floor. Engage your core and squeeze your quadriceps muscles for 5 seconds, then lower. Do 10 at a time.

Desk Squat

Stand up about 20 cm in front of your chair, facing away. Squat down so you are almost sitting on the front edge of your seat, while keeping your back straight. Try for 10 at a time.

Standing Leg Moves

Stand up next to your desk. Try a standing hamstring curl (curl your leg backwards as if you're trying to kick yourself in the butt…slowly); or a side leg raise, slow raising your leg straight out to the side. Hold the desk for balance if necessary.

APPENDIX H: INFORMATION SHEET AND INFORMED CONSENT FORMS

Reporting Sheet for use ONLY for proposals considered at departmental level

DEVELOPMENT OF A TAILORED HEALTH PROMOTION PROGRAMME WITH PACIFIC FAMILIES IN DUNEDIN, NEW ZEALAND: HEALTH-PROMOTING NUTRITION AND PHYSICAL ACTIVITY BEHAVIOURS AIMED AT CHILD OBESITY PREVENTION

INFORMATION SHEET FOR FAMILIES

Thank you for showing an interest in this project. Please read this information sheet carefully before deciding whether or not to participate. If you decide to participate we thank you. If you decide not to take part there will be no disadvantage to you and we thank you for considering our request.

What is the Aim of the Project?

The aim of this project is to develop a tailored health-promotion programme to improve the health of your family and other Pacific families with your input.

What Type of Participants are being sought?

We are looking for Pacific families in the Dunedin area

- with at least one child of pre-school or school age, and
- at least one member of the family or household who is overweight, and
- who want to make improvements to their overall health

What will Participants be Asked to Do?

Should you agree to take part in this project, you will be asked to ......

- answer some questions and discuss with the researcher your family's current health behaviours
- participate in focus groups to set health goals (approx. 2 hours)
- meet (at a time and place convenient to you) weekly or fortnightly over 3 months for health promotion sessions (approx. 1 hour each session)
    - Note: All activities and sessions are chosen with your family to target your goals and maximize your benefit from the programme.
- provide input and feedback into lessons, resources and all facets of the programme
- participate in an audio-recorded individual follow-up interview at the end of the 3 months (approx. 1 hour)

What Data or Information will be Collected and What Use will be Made of it?

Information collected will include personal information (name, age, height, weight –note: height and weight are measured once ONLY to confirm eligibility); handwritten notes and observations from focus groups, programme sessions and interviews; feedback from participants about any and all facets of the programme; videotapes and/or photographs of some sessions and; audio tapes of final interviews.

The information we collect will be used to combine all our family's feedback into an acceptable and worthwhile programme. Videotapes and photographs may be used with your permission to promote the programme in the future. Audiotapes of final interviews will be used in an analysis to see if there are themes in the answers from different participants.

During the programme, only the family members (participants), researcher, and the researcher's supervisors will have access to the information. When the programme is finished some generic information may be shared with the public as part of the published research. At the end of the project any personal information will be destroyed immediately.

On the Consent Form you will be given options regarding confidentiality. Please be aware we will make every attempt to ensure all information provided will remain confidential. However, with your consent, there may be instances where it would be preferable to attribute contributions made to individual participants concerned. It is absolutely up to you which of these options you choose.

You will have the opportunity to view data or information at any time during the course of the project and you will be provided with the results of the project.

This proposal has been reviewed and approved by the Department of Preventive and Social Medicine, University of Otago.

You may withdraw from participation in the project at any time and without any disadvantage to yourself of any kind.

If you have any questions about our project, either now or in the future, please feel free to contact either:-

Amy McColl

Department of Preventive and Social Medicine

Wellcome Building, G09

Email Address : mccoll.amy@gmail.com

Phone: 021 082 69938

Or

Dr F Sopoaga

Preventive and Social Medicine, Health Sciences Pacific Division, Dunedin School of Medicine

Phone: 479 7088

Email: tai.sopoaga@otago.ac.nz

This study has been approved by the Department stated above. If you have any concerns about the ethical conduct of the research you may contact the Committee through the Human Ethics Committee Administrator (ph 03 479-8256). Any issues you raise will be treated in confidence and investigated and you will be informed of the outcome.

DEVELOPMENT OF A TAILORED HEALTH PROMOTION PROGRAMME WITH PACIFIC FAMILIES IN DUNEDIN, NEW ZEALAND.

CONSENT FORM FOR PARTICIPANTS

I have read the Information Sheet concerning this project and understand what it is about. All my questions have been answered to my satisfaction. I understand that I am free to request further information at any stage.

I know that:-

1. My participation in the project is entirely voluntary and I am free to withdraw from the project at any time without any disadvantage;

2. Personal identifying information [*video-tapes / audio-tapes/ photographs*] will be used in future advertisement of the programme if my consent is given. Any information not consented for future use will be destroyed at the conclusion of the project;

3. This project involves an open-questioning technique. The general line of questioning includes information on usual health behaviours as well as views on health, community and family. In the event that the line of questioning develops in such a way that I feel hesitant or uncomfortable I may decline to answer any particular question(s) and/or may withdraw from the project without any disadvantage of any kind;

5. If I experience discomfort of any kind during the programme (uncomfortable with nature of questions, experiencing discomfort during an activity session, or any other situation) I may withdraw from that particular activity and/or may withdraw from the project without any disadvantage of any kind;

6. I/my family will be compensated for any expenses related to travelling to focus groups/intervention sessions and or/interviews if necessary. (Every attempt will be made to hold these sessions in a place convenient to your family where travel expense is not necessary);

7. If I give consent, my information (see below) and my views on the programme (through feedback and interviews) may be used to explain the programme and research to others;
   photographs ☐ audiotapes ☐ quotes ☐

8. The results of the project may be published and available in the University of Otago Library (Dunedin, New Zealand) but every attempt will be made to preserve my anonymity if I wish to remain anonymous.

9. **Consent for Identifying Information:** Please select one...

☐ I consent to the use of my photograph and/or video of me participating in this project

☐ I DO NOT consent to the use of my image, please do not take and/or use identifying photographs and/or video of me

I agree to take part in this project.

....
(Signature of participant) (Date)

APPENDIX I: INTERVIEW SCHEDULE

Qualitative Interview: Development of a pilot programme for child obesity prevention with Pacific Island families.

Areas to be addressed with open-ended questions:

- Reasons for participating in the programme, why they value health
- Acceptability of the programme format and observations of experiences scheduling meetings and fitting the programme into busy schedules
- Usefulness and information about resources used and other potential resources
- Information about any changes they may have made during the programme
- Information about any difficulties they may have faced while trying to make changes
- Information about whether challenges or difficulties were overcome and how
- Information about whether changes could be or intend to be sustained
- Suggestions for programme improvement or modifications
- Any other comments

Questions

Thank-yous

Explanation of the purpose of the interview, how long it might take, brief outline

Reassurance and explanation of confidentiality

Participation

Can you share with me about why your family decided to participate in this programme please?

Can you tell me about whether or not you felt it was worthwhile for your family to participate and why or why not?

Prompts: *Health as a priority, Concerns with health, Intentions to change, Value of programme/help, Expectations*

Acceptability

I'd like to know what you think about our meetings. Can you share with me about whether there were any issues for you when we were deciding when & where to meet?

If you could choose, where do you think would be the best type of place to meet or run a programme like this?

Prompts*: Scheduling issues, Other commitments, Busy schedules, Routine, Comfortable/acceptable*

Resources

I would like to talk to you about the information I gave you and the things we talked about during our meetings. We looked at a range of resources, some of which may have been useful for your family and some of which may not have been. Could you tell me any observations or thoughts you had on any of the resources I gave you?

Now could you tell me if you have any suggestions on different resources that would have been more useful to you, or changes to the ones we used that you think would make them more useful or helpful?

Prompts: *Goal tracker, Activity tracker, Information on MOH guidelines, Were resources used, Other suggestions/Improvements, Goal setting, Helpfulness, Ease of use*

Changes Made

I would like to talk about any changes you may have made during the programme. This could include any changes such as exercise, routine, eating choices etc. Could you share with me any changes you made?

Prompts*: Goal setting, Dietary/Excercise/Sustainability, Decision makers and influencers on food purchase and choice, Priorities for children's eating, Financial issues, Time pressures*

Barriers

Now that we've talked about some of the changes you made or might want to make in the future, I'd like you to tell me if you came across any challenges or difficulties when you were trying to make those changes. Could you talk me through any challenges or difficulties if you experienced them?

Those challenges you talked about, could you tell me about if you were able to come up with solutions or strategies to deal with them and talk me through those solutions?

Prompts: *Financial issues, Time pressures, Unhealthy environments, Commitments and obligations, Negative messages, Support systems, Strategies, Sustainability*