A challenge of 28-day, A Pasifika way

Intervention to Reduce Free Sugar Consumption

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Abstract

Background:

The direct link between excess free sugar consumption with negative health effects including dental caries, heart disease, diabetes and obesity is well documented. Pacific people in New Zealand experience a disproportionate burden from the above said health conditions in term of morbidity and mortality. The World Health Organization defines free sugar as – monosaccharides and disaccharides added to foods and beverages by the manufacturer, cook or consumer, and sugars naturally present in honey, syrups, fruit juices, and fruit juice concentrated. A group-based brief intervention for sugar consumption reduction was piloted among a group of Pacific participants.

Aim:

This study aimed to assess the feasibility of a group-based intervention for sugar reduction with Pacific people.

Methods:

This study explored the feasibility of a brief group-based intervention aimed at reducing sugar consumption within the Pacific community. Participants were recruited via word of mouth from the Auckland community. The pre-post intervention delivered two group based sessions plus ongoing support via social media over a 28 day period. The intervention was grounded on self-determination theory which supports autonomy, competence and relatedness. It delivered goal setting and a simple set of planning techniques (action planning and coping planning) plus self-monitoring. Participants completed baseline assessment via Qualtrics and then again 28 days post-intervention. Data analysis involved a mixed methods approach which involved both quantitative and qualitative data collection.

Results:

Twenty four participants were recruited for the study. Quantitative analysis indicated a significant reduction in sugar consumption and a significant increase in self-efficacy. The majority of participants were mostly or very satisfied with the program materials. Generally they agreed action plans were initially developed and participants knew how, where and when they would reduce sugar consumption. Qualitative data indicated the majority of

participants found the plans very helpful. Interestingly, participants stated they would have liked more ownership of peer support.

Conclusion:

In conclusion, the study findings support the feasibility of a group-based intervention for sugar reduction with Pacific people. Future research can build on these findings to develop improved group-based interventions. Future studies might also ensure recruitment from all Pacific ethnic groups and from the wider Pacific community in New Zealand.

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1 Chapter: Background

Pacific People is a collective term used to describe a diverse group of people living in New Zealand who migrated from the Pacific countries. The term has been used synonymously with 'Pacific Nations people', 'Tangata Pasifika' 'Pasifika People' and 'Pacific Islanders' (Teaiwa & Mallon, 2005). Pacific people are commonly referred to people of Samoan, Cook Islands, Tongan, Fijian, Tokelauan and Tuvaluan descent. In this research study, the term Pacific people will be used through-out this paper.

The 2018 Census, recorded 381,642 Pacific people were living in New Zealand (Statistics New Zealand, 2018). Pacific people are a rapidly growing dynamic population, and increasing in number and social significance through migration and natural increase. The initial growth in the Pacific population was due to a demand for labour which New Zealand sourced during 1960s and early 1970s (Macpherson, 2004). Six out of 10 Pacific people are New Zealand born, and are increasingly multi-ethnic (Foliaki, Kokaua, Schaaf, & Tukuitonga, 2006).

The Pacific people's ethnic group was the fourth-largest major ethnic group in 2013, behind the European, Māori, and Asian ethnic groups. The Pacific population continue to increase in age and influence the demographic pattern, social cultural characteristics and overall health status of New Zealand. The biggest Pacific ethnic group in New Zealand are Samoans (49%) followed by Cook Islands Maori (22%), Tongan (19%), Niuean (8.5%), Fijian (3.7%), Tokelau (2.6%) and Tuvaluan (1%) groups (Statistics New Zealand, 2006). Pacific people are characterised by a history of migration to New Zealand from Pacific Island nations and this has resulted in experiences of rapid acculturation and sociocultural change (Foliaki, Kokaua, Schaaf, Tukuitonga, & Team, 2006).

Pacific population in New Zealand account for a disproportionately significant share of a number of health burdens compared to most other N.Z., population groups and the general population including higher morbidity and mortality rate from non-communicable diseases (NCDs). The direct link between excess free sugar consumption and NCDs is well documented. We assessed the feasibility of a pilot intervention in addressing the excess in sugar intake among a group of Pacific participants in NZ.

1.1 Purpose of the Study

1.1.1 Aim

The overall aim of this study is to assess the feasibility of a group-based intervention for sugar reduction for Pacific people.

1.1.2 Objective

The objective of this study is to test the feasibility of a group-based brief intervention for sugar reduction.

There are two main research questions for this feasibility study:

- RESEARCH QUESTION 1: Is the program content acceptable, comprehensive and easily understood by people who want to limit or reduce their sugar consumption?
- RESEARCH QUESTION 2: Does the program assist Pacific people to reduce or quit their sugar consumption?

1.2 Thesis outline

Chapter 1: introduces the background of Pacific people in New Zealand in relation to the research rationale, the purpose of the study including aim and objective, and two main research questions for this feasibility study. This chapter also provides the thesis outline.

Chapter 2: provides an overview of free sugars and factors affecting people around the world including New Zealand and Pacific people with excessive sugar consumption.

Chapter 3: reviews the literature on global and local perspectives in relation to excess sugar consumption. This chapter provides the definitions, guidelines and prevalence of free sugars, including factors that impact Pacific people with excessive sugar consumption in New Zealand. This chapter also provides potential intervention options and rationale.

Chapter 4: discusses the method of this research study, and specifies the research and study design, participants and recruitment, measures, demographics, outcome measures, program evaluation measures, delivery of intervention, procedures, peer group support, data analysis and the ethical consideration of the study.

Chapter 5: presents the results of study: Session 1 (baseline) and Session 2 (follow-up), participant characteristics, post treatment measures and programme evaluation measure. This chapter also provides key themes and programme evaluation that explores the feasibility of a group-based intervention.

Chapter 6: concludes the thesis with a discussion of key findings, in relation to the literature review. The strengths, limitation and future research, are also discussed. A conclusion of the study is then presented.

2 Chapter: Sugar consumption

2.1 Overview

Free sugars are monosaccharides and disaccharides added to foods and beverages by the manufacturer, cook or consumer, and sugar naturally present in honey, syrups, fruit juices and fruit juices concentrate (World Health Organization, 2015). "Free sugar" is the sugar no longer in its naturally-occurring state (i.e., no longer in whole fruits and vegetables) and can be consumed as is or incorporated into other foods (Bernstein, Schermel, Mills, & L'Abbé, 2016). Sugar is widely present in fast foods and drinks. Fast foods have high level of fat and sugars that are not only unhealthy but addictive which creates a vicious eating cycle that makes it hard to choose healthy food (Kaushik, Narang, & Parakh, 2011).

In New Zealand, sugar, otherwise known as sucrose or table sugar, is found in many manufactured foods and drinks. In 2005, New Zealanders on average consumed more than half a cup (158g) of sucrose (sugar) per day, almost four times the 40g daily intake (one and a half tablespoons) recommended by the World Health Organization (WHO) to prevent NCDs (Thornley, McRobbie, & Jackson, 2010). The United Nations food balance sheet data suggests that New Zealanders, on average, consume about 147g/day (37 teaspoons) (FAOSTAT, 2016). Evidence suggests that soft drink consumption is a growing source of sugar in the New Zealand diet with sales increasing 4% per annum in the early 2000s (Thornley et al., 2010). Sweetened beverages are major contributor to sugar intakes in New Zealand (Ni & Eyles, 2014).

Sugar is widely available because it is an inexpensive method of improving taste of food and beverages (Saksena & Scherdel, 2015). In particular, sugar is found in most fast foods with sugar-sweetened beverages (SSBs) being the most consumed form of added sugar (Aeberli et al., 2011). Free Sugar accounts for up to 50% of caloric intake in New Zealanders' diet (Kibblewhite et al., 2017). Obesity has been widely publicised as a global epidemic worldwide. A review by Wiss et. al., (Wiss, Avena, & Rada, 2018) reports that nutrients like sugar that are often used to make foods more appealing could also lead to habituation and even in some cases addiction thereby contributing to the obesity epidemic. Evidence shows

that people who consume high amounts of sugary foods or drinks are more likely to be at risk of Type-2 diabetes (The Royal Society of New Zealand Te Aparangi, 2016).

Industrialization of food add sugars, grains, and/or fats to food products (Wiss, Avena, & Rada, 2018). Traditionally, sugary foods and drinks were considered as sources of contributing to weight gains and obesity, which are risk factors for diabetes, hyper-tension, gout and other diseases. Adding sugar to diet, for example, confectionery, cakes and sweetened cereals, also cause tooth decay and this constitutes another reason to limiting the intake of these food items particularly in children (Thornley & Sundborn, 2014).

Pacific island countries and territories (PICTs) experience some of the highest rates of NCDs globally and a leading cause of death (Snowdon, 2014). Traditional diets in the Pacific islands are being supplemented with processed, high-sugar foods and beverages, which is now associated with poor quality and dental caries (Aldwell, Caillaud, Galy, Frayon, & Allman-Farinelli, 2018). In the Pacific island countries, the increasing consumption of SSBs, juice concentrates and syrups, as well as sweetened milk drinks have been concerns due to its direct links with diabetes, obesity and other health issues (Snowdon, 2014). Due to concerns about added sugars the risks to health efforts have been made to reduce consumption in a number of countries in the region including the formulation of exercise tax specifically on SSBs (Snowdon, 2014).

3 Chapter: Literature Review

Around the world, sugar is consumed in large quantities. The rise in world sugar production in the eighteenth and nineteenth centuries coincided with a marked rise in sugar consumption, especially in England and the United States (Johnson, Lanaspa, Sanchez-Lozada, & Rivard, 2014). Studies on daily sugar consumption varies from reports of Canadians consuming an average of 110g (21.4% of calories) of total sugar per day (Bernstein et al., 2016) to intakes of 51g total sugars per day in Spain and 131 g per day in the Netherlands (Ruxton, Garceau, & Cottrell, 1999). The amount of added sugar was labelled on US food packages in 2019 (Food & Administration, 2016). In South Africa the excess sugar consumption is associated with weight gain and an increased risk of contracting for NCDs including cardiovascular diseases (CVDs), Type 2 diabetes and cancer, which account for 27 % of all deaths in the country (Tugendhaft et al., 2016).

3.1 Definitions, guidelines and prevalence

3.1.1 Free sugars

Free sugars are defined by the WHO as monosaccharides and disaccharides added to foods and beverages by the manufacturer, cook or consumer. This also includes, sugars that are naturally present in honey, syrups, fruit juices, and fruit juice concentrates. In many countries, SSBs including fruit-based and milk-based sweetened drinks and 100% fruit juices, are a primary source of free sugars (World Health Organization, 2017). Confectionery, cakes, biscuits, sweetened cereals, sweet desserts, sucrose, honey, syrups and preserves are also common sources of free sugars (World Health Organization, 2017).

3.1.2 Guidelines around sugar consumption

The reduction of free or added sugar intake (sugars added to food and drinks as a sweetener) is almost universally recommended for individuals to help them to reduce the risk of contracting NCDs (Kibblewhite et al., 2017). The World Health Organisation (WHO) recommends that individuals reduce their intakes of free sugars throughout their life-span to

less than 10% of total energy intake (World Health Organization, 2015). Similarly, the United States Department of Agriculture (USDA) advises free sugars intakes of individuals to no more than 10% of their total calorie intake to avoid excess energy intake and probable weight gain (Health & Services, 2015). The role of excessive sugar intake on health and disease is currently an active area of scientific and policy debate (Azaïs-Braesco, Sluik, Maillot, Kok, & Moreno, 2017). Following a direction clearly indicated by WHO guidelines (World Health Organization, 2017), many countries are today considering regulations or public health policy measures aiming at lowering sugar intakes by their population, and particularly by children (Popkin & Hawkes, 2016).

The WHO recommends for adults to limit their daily consumption of sugar to less than 40g (World Health Organization, 2015). Free sugars resulting in extra calories being consumed and replacing nutrient-dense foods and beverages. This is the reason that 2010 Dietary Guidelines for Americans recommends limiting the intake of added sugars in the American diet (Goldfein & Slavin, 2015). Several countries have advocated and recommended to regulate the intake of sugars that are not naturally occurring but are added during manufacture and cooking.

3.1.3 Prevalence of excessive free sugar consumption

A study on added sugar intake among US adults showed overall 75% Americans consume more than the recommended <10% of daily calories (Yang et al., 2014). Based on the Korea National Health and Nutrition Examination Survey between 2008-2011, the total sugar intake of Korean adolescents and young adults was much higher in the 12- 29 age group, with the increased sugar beverage consumption accounting for 25% of their total sugar intake (Lee et al., 2014). A New Zealand study reported free and added sugar accounted for 11% and 10% of energy intake daily for men and women respectively (Kibblewhite et al., 2017).

Consumption of SSBs and processed foods has increased in the last decade in developed countries (Maarman, Mendham, Madlala, & Ojuka, 2016). Current estimation is that the mean intake of added sugar by Americans accounts is 15.8% of total energy. The largest source of these added sugars is non-diet soft drinks, which account for 47% of the total added sugars in the diet (Malik, Schulze, & Hu, 2006).

Marketing strategies of added sugar product is one of the various factors associated with the increase in sugar consumption. These marketing strategies are commonly classified under the four P's framework: price (discounts); place (availability and accessibility of products such as end of aisle displays); product (the size and formulation of a food or drink item); and promotion (advertising) (Ells, Roberts, McGowan, & Machaira, 2015). Therefore marketing strategy is considered to play an important contributory role in influencing the obesogenic environment (Butland et al., 2007).

3.2 Health impacts associated with sugar consumption

In addition to poor dental health, excessive consumption of added sugars can lead to CVDs, weight gain and diabetes (The Royal Society of New Zealand Te Aparangi, 2016). A 15 year study on added sugar and heart disease showed that, participants who consume 25% or more of their daily calories dietary requirement of free sugar were more than twice likely to die from heart disease (Corliss, 2014). Excessive consumption of free sugar is among the mechanisms that cause other range of health effects such as high fat in the blood, increased blood pressure, fatty liver disease, insulin resistance and gout are very high doses of fructose in the liver (The Royal Society of New Zealand Te Aparangi, 2016). Early studies had linked sugar intake to dental caries and obesity, particularly in children. This is in addition to its association with other conditions such as diabetes and non-alcoholic fatty liver disease (Stuckler, Reeves, Loopstra, & McKee, 2016). These concerns are justified by studies and reports indicating that high intakes of sugars are associated with an increased risk of dental caries, overweight and cardio-metabolic risk factors and mortality (Azaïs-Braesco et al., 2017).

3.2.1 Dental health

Almost half of the world's population is affected by dental caries, making it the most prevalent of all health conditions (World Health Organization, 2017). Dental caries affects the world's population with almost a quarter of US adults having untreated caries (Moynihan, 2016). A diet high sugar is associated with higher dental caries risk and poor dental health overall (World Health Organization, 2017) such as dental erosion, the prevalence of which

seems to be increasing and development of enamel defects (Moynihan & Petersen, 2004). In addition to negative impacts on quality of life, dental caries is costly to health care systems, accounting for the fourth most expensive disease to be treated (Moynihan, 2016). A systematic review to inform and update evidence on the association between the amount of sugars intake and dental caries showed that an intake of free sugars of 10% while associated with lower risk of dental caries, did not eliminate dental caries (Moynihan, 2016). In New Zealand, SSBs are the leading contributors of sugar to the diets of adults and children and their consumption of SSBs is known to have caused of dental diseases (Panel, 2014). The association of a high intake of free sugar with dental diseases as the most prevalent NCDs, is a major concern (World Health Organization, 2015).

3.2.2 Heart disease

People who consume high amounts of sugary foods or drinks are more likely to be at risk of heart disease (The Royal Society of New Zealand Te Aparangi, 2016). The high consumption will also likely to influence the aetiology of rheumatic fever (Thornley et al., 2017). Added sugar contributes to excessive calories of the American diet and it is a primary risk factor for CVDs (Garber & H Lustig, 2011). A study of biological and epidemiological evidence links excess sugar intake to risk factors for cardiovascular diseases (Kearns, Schmidt, & Glantz, 2016). Recent epidemiological studies also support the positive association between SSBs intake and enhanced risk for heart diseases (Richelsen, 2013). Generally sugar is highly present in fast food and drinks (Kaushik et al., 2011). Another study findings provided relatively consistent evidence of the association between markers of sugar intake and risk factors for CVDs (Thornley, Tayler, & Sikaris, 2012). Yudkin and colleagues in the 1960s (Yudkin, 1978) and 1970s found that a higher sugar intake was associated with increased CVDs in both within-country and cross-country (Howard & Wylie-Rosett, 2002).

3.2.3 Diabetes

Pacific people in New Zealand have a greater prevalence of Type 2 diabetes compared to those of European origin (Rush, Plank, Mitchelson, & Laulu, 2002). A recent study that compared New Zealand Europeans and Pacific peoples in New Zealand who develop Type 2 diabetes mellitus (diabetes) showed that more than two thirds of Pacific peoples have

diabetes compared to just more than one third in New Zealand Europeans (Schmidt-Busby, Wiles, Exeter, & Kenealy, 2019). A study on community-based diabetes control programme among Pacific people in New Zealand have included diabetes awareness and lifestyle programme to reduce diabetes risk (Simmons, Voyle, Fou, Feo, & Leakehe, 2004). Another study in New Zealand on Pacific population with Type 2 diabetes reported that Pacific people are most likely to experience adverse health outcomes including poor metabolic control and diabetes related distress (Paddison, 2010). In a systematic review on the burden of diabetes complications and diabetes related mortality, it was reported that a high proportion of Pacific dialysis patients and new renal disease patients from the ANZDATA registry have diabetes comorbidity (Joshy & Simmons, 2006).

The WHO, the Food and Agriculture Organization and the American Heart Association have recommended to impose a restriction of free sugars intake in order to prevent diabetes and obesity, based on potential detrimental effects on metabolism. They suggested that consumers' free sugars intake is to be limited to no more than 10% of calories intake (Laville & Nazare, 2009). SSBs might increase risk of diabetes because they contain large amounts of high-fructose corn syrup, which raises blood glucose similar to sucrose (Schulze et al., 2004). Higher consumption of sugar-sweetened soft drinks is associated with a greater magnitude of weight gain and an increased risk for development of Type 2 diabetes. This possibly occur due to the existing excessive calories and large amounts of rapidly absorbable sugars (Malik, Popkin, Bray, Després, & Hu, 2010). A study to examine the association between consumption of SSBs, and risk for Type 2 diabetes stated that the consumption of sugar-sweetened soft drinks is positively associated with incidence of diabetes (Welsh & Dietz, 2005). SSBs was identified to be very popular in New Zealand and a leading contributor of sugar to the diets of adults and children. SSBs was found to increase the risk of developing Type-2 diabetes (Panel, 2014). Another study found that the excessive intake of sugar is a risk factor for developing diabetes (Johnson, Lanaspa, Sanchez-Lozada, & Rivard, 2014).

3.2.4 Obesity

New Zealand rates of obesity and being overweight have increased since the 1980s, particularly among indigenous Māori people, Pacific peoples and those living in areas of high deprivation (McLean et al., 2009). New Zealanders of Polynesian origin have a higher

prevalence of obesity than those of European origin (Rush et al., 2002). The continued rise in overweight and obesity in older Pacific adults in New Zealand, raises concerns about programme interventions focussed on overweight and obesity. Any programme will require the adoption of a total Pacific population 'environmental change' approach rather than dietary or physical activity interventions targeted to overweight individuals (Sundborn et al., 2010). A study reported that since 2007 the burden of obesity among adolescents in New Zealand has not improved. For Pacific young people, this has become significantly worse (Utter, Denny, Teevale, Peiris-John, & Dyson, 2015). Another study noted the excess prevalence of early life risk factors for obesity in Pacific infants in New Zealand and it suggested an urgent need for early interventions for this group (Howe et al., 2015).

The obesity epidemic in the United States has been a key public health issue due to the high rate of obesity and the increased healthcare cost associated with it (Goldfein & Slavin, 2015). Twenty five percent of children in the US are overweight and 11% are obese (Dehghan, Akhtar-Danesh, & Merchant, 2005). In New Zealand obesity, defined as a body mass index greater than 30 units, has increased by more than 50% between 1989 and 1997. Currently, it affects nearly one in five adult New Zealanders (Chacko, McDuff, & Jackson, 2003). The consumption of SSBs and saturated fat have been linked to risks for obesity (la Fleur, Luijendijk, Van Rozen, Kalsbeek, & Adan, 2011). SSBs such as soft drinks and fruit punches contain large amounts of readily absorbable sugars. This can contribute to weight gain (Schulze et al., 2004). Consumption of diet high in sugar, saturated fat, salt and calorie content by children can lead to early development of obesity (Kaushik et al., 2011). A study on reduction of sugar to reduce overweight and obesity, identified that 40% reduction in free sugars added to SSBs over 5 years would lead to an average reduction in energy intake of 38·4 kcal per day (95% CI 36·3–40·7) by the end of the fifth year. This reduction would lead to a reduction of roughly 0·5 million adults from being overweight and 1 million adults from being obese (Ma, He, Yin, Hashem, & MacGregor, 2016). The prevalence of overweight or obesity among Australian adults has increased from 56% in 1995 to 63.4% (11.2 million people) in 2014–2015 (Gupta, Smithers, Braunack-Mayer, & Harford, 2018). Although cardiologists have long been concerned about dietary sugars, the concern about dietary added sugars can be dated from the onset of the obesity epidemic. Epidemiologic studies show that from 1970 to 2000, that in adults, the prevalence of obesity tripled (Kavey, 2010). SSBs intake may cause excessive weight gain due in part to the apparently poor satiating properties of sugar in liquid form (Brownell et al., 2009). A meta-analysis study of prospective on

SSBs consumption is positively associated with the coronary heart disease risks (Huang, Huang, Tian, Yang, & Gu, 2014).

3.2.5 Financial impact of excess sugar consumption on the economy

The potentially preventable health conditions mentioned above clearly have a serious financial impact on people in terms of direct costs. In most countries, treatment of obesity and overweight places a heavy burden on public health systems in terms of the prevention and treatment (World Health Organization, 2015). Medical costs associated with obesity in the United States are estimated as $147 billion annually. This figure is increasing and combined with other diet-related chronic disease (cancer, cardiovascular disease, stroke, and diabetes), the total figure could be as much as 5 times higher (Wallinga, 2009). Dental diseases are a costly burden to health care services and treatment of dental caries are expensive for governments of both developed and developing countries. The estimated costs could be between 5 and 10% of total health care expenditures (Moynihan & Petersen, 2004). A research institute revealed that approximately 30%-40% of healthcare expenditures in the United States seek help to address issues that are closely tied to excessive consumption of sugar (Null, 2010). The treatment of dental diseases is expensive which would take up to10% of health-care budgets in industrialized countries, and would exceed the entire financial resources available for the health care of children in most low income countries (World Health Organization, 2015). A health system costs analysis for individual and NCDs for the seven year period between July 2007 and June 2014 for New Zealand showed that the country spent $26.4 billion on treating and managing NCDs (Blakely, Kvizhinadze, Atkinson, Dieleman, & Clarke, 2019).

3.2.6 Health of Pacific People in New Zealand

For Pacific peoples, health is a concept that covers spiritual, emotional, mental, physical, social aspects of life. It emphasises the total well-being of the person within the context of the extended family (Mafi Funaki-Tahifote). When speaking of Pacific cultures, beliefs and values; it generally encompasses key principles such as respect, love, service and reciprocity (Samu & Suaalii-Sauni, 2009). For the majority of Pacific peoples, good health is perceived as a balanced state of physical, spiritual, mental, family and relational wellbeing, that is, more than just absence of disease (Samu & Suaalii-Sauni, 2009). Pacific peoples in New Zealand

have some of the worst health and social statistics compared to other ethnic groups. The trends are of concern as NCDs such as heart disease and diabetes are the leading causes of death and disability among Pacific peoples (Dunsford et al., 2011).

In New Zealand, adults who recorded their ethnicity as Pacific Islander in New Zealand Health Survey 2012, 2013 had comparatively higher levels of obesity and diabetes than the New Zealand population as a whole (obesity 68% vs 31.3% vs 5.8%) (Hawley & McGarvey, 2015). Publications from the Global Burden of Disease study group describing global and regional trends in obesity and diabetes have highlighted Pacific Island nations as being disproportionately afflicted by NCDs (Hawley & McGarvey, 2015). Pacific Island people in New Zealand have high rates of coronary heart disease, hypertension and diabetes compared to Europeans (Schaaf, Scragg, & Metcalf, 2000). Pacific people have some concerns of public health importance as well as a disproportionately high mortality rate compared to non-Māori and, non-Pacific people in New Zealand (Sunia Foliaki, Jeffreys, Wright, Blakey, & Pearce, 2004). With the adoption of Westernised lifestyles and, notably, changes in nutrition and physical activity, we have seen the increase in non-communicable diseases such as diabetes mellitus, cardiovascular diseases, strokes, and obesity as major sources of morbidity and mortality among Pacific people in New Zealand (Meredith, Sarfati, Ikeda, & Blakely, 2012).

3.2.7 Factors that impact Pacific people with excessive sugar consumption

There are number of reasons why consuming too much sugar might harm our health. The food environment, with wide range of fast food takeaways, cafes and restaurants, have a considerable impact on our food choices. Pacific people experience significant premature mortality and preventable morbidity mainly due to NCDs such as diabetes and heart diseases (Tukuitonga, 2013b). In New Zealand, the current food environment is largely dominated by energy–dense, nutrient-poor processed foods that are widely available, relatively inexpensive and heavily promoted (Ni & Eyles, 2014). The 2002 NZ Children's Nutrition Survey (CNS) of 5 to 14 years-old children showed that 29% of Pacific children are classified as obese, compared to under 17% of their New Zealand Maori and 7% of their European counterparts (Grant, Ferguson, Toafa, Henry, & Guthrie, 2004). Pacific people in New Zealand are relatively of low socio-economic status and marginalised by the housing system. These factors have a significant impact on their health status (Milne & Kearns, 1999). A study of

the impact of the housing policy among Pacific Peoples in Auckland, reported that their household expenditures influence their food choices. This consequently result in overweight and diabetes due to the over consumption of more affordable but low quality sugar laden food (Cheer, Kearns, & Murphy, 2002). The Pacific community of New Zealand have a high level of unemployment (23% compared with 9.5% for the total of New Zealand labour-force), and lack of employment is a major factor contributing to the poor health status of Pacific communities (Milne & Kearns, 1999).

3.2.8 Summary

Studies have demonstrated a strong and clear evidence of the direct association between excessive sugar intake and poor health which lead to reduce quality of life and impose risks of developing chronic diseases. Chronic illnesses are "conditions" that last a year or more and they require ongoing medical attention and/or limit activities of daily living (Health & Services, 2010). Although numerous studies demonstrated concern about the health risks of high sugar consumption, progress in reducing sugar consumption in New Zealand has been relatively slow. However, prompt action needs to be in place in order to improve and minimise health harms as mentioned above.

3.3 Potential intervention options

Several studies have recently suggested that sugar consumption is clearly related to poor health outcomes. However there are few interventions specifically targeting the reduction of sugar consumption. A range of public health initiatives have been recommended, including the provision of information and support for sugar reduction. This section outlines key components that could be part of an intervention for sugar reduction.

3.3.1 Group based intervention

Pacific cultural competency and cultural safety texts have been developed to guide social and health services to be more effective as they interact with pacific people and clients (Mila-Schaaf, 2006). The shift is away from the individual, and the individual's rights and

expectations, towards a focus on what constitutes the nature of an ethical relationship between people (Mila-Schaaf, 2006). In the final version of the overarching principle was 'relationships', with the definitive statement: "To develop, cultivate and maintain principled relationships is integral to all ethical practice" (Mila-Schaaf, 2006).

Focus groups capture group interactions that activate memories, feelings, and experiences. Unlike the individual interview, the focus group capitalizes on group interaction and group norms (Asbury, 1995). In addition, focus groups have been used to address many research questions in the behavioural sciences (Strickland, 1999). Focus groups provide platform for discussions on ethnic culture, health treatment, practical application skills, evaluation, assessment and measurement of cultural competency. Pacific cultural competency is the ability to understand and appropriately apply cultural values and practices that underpin Pacific people's worldview and perspectives on health (Samu & Suaalii-Sauni, 2009). Using a group format for a sugar intervention would be novel and capture the benefits of group based interactions.

A recent study on Group-based interventions is widely used to promote health and support health-related behaviour change (Borek et al., 2019). The use of groups to deliver behaviour change interventions is further routinely justified on the basis of time and resources-efficiency, the opportunity for interaction between members, and provision of social group support (Borek, Abraham, Greaves, & Tarrant, 2018). It is also assumed that group members' interaction with each other, and with facilitators, can generate personal change that persists beyond the life of the group (Borek et al., 2019). This assumption is supported by decades of research which suggest that group membership interventions can change members' perceptions, cognitions and behaviours (Brown & Pehrson, 2019).

3.3.2 Planning techniques

Planning is regarded as highly valuable in the process of health behaviour change (Sniehotta, Schwarzer, Scholz, & Schüz, 2005). Researchers have found that good intentions do not always lead to action or desirable outcomes. This gap is referred to as the intention – behaviour gap (Sniehotta et al., 2005). Theoretically this gap can be closed through simple planning techniques that link the intention with the desired behaviour. There are two main evidence based types of planning: Action planning and coping planning. Action Planning is

defined as specifying when, where and how to undertake a specific behaviour (Sniehotta et al., 2005). Action planning, is a well-established method of linking a goal intentions (such as, *'I want to stick to my sugar limits'*) with an action plan specifying how to respond (i.e., *when, where and how*) (Sniehotta et al., 2005). Research demonstrates that action planning is strengthened when accompanied by a coping plan (or back-up plan) that pre-empts obstacles and identifies opportunities to act (i.e. if X happens, then I will do Y) (Hagger & Luszczynska, 2014). Coping planning is defined as planning to overcome barriers or distractions to behaviour change in advance, which may arise during the behaviour change attempt. Coping planning usually takes the format of an "if/then" plan. Action planning helps individuals to implement their intentions, while Coping planning can protect good intentions from distractions because a concrete coping procedure is at hand when the risk situation is encountered (Sniehotta et al., 2005).

One study found it was helpful to use both types of planning in interventions (Sniehotta et al., 2005). Another study tested two brief planning interventions designed to encourage cardiac patients to engage in regular physical exercise following discharge from rehabilitation. The interventions comprised action plans and coping plans on how to deal with anticipated barriers. The findings have been useful in explaining changes in health-related behaviour. It showed that the combined two planning interventions can be applied in the context of cardiac rehabilitation programmes (Sniehotta, Scholz, & Schwarzer, 2006).

3.3.3 Techniques and strategies for change: the content of plans

One way of support action and coping plans is to provide information for the content of plans. This information can come from multiple sources including professionally recommend approaches and consumer initiated. Professionally recommended approaches are detailed in the Behaviour Change Techniques (BCT) literature. BCT's are the smallest components of behaviour change interventions that on their own have the potential to change behaviour (Cane, Richardson, Johnston, Ladha, & Michie, 2015). An example of a BCT would be 'self-monitoring of behaviour' which is defined as instruct self-recording of specified behaviour/s (with or without associate thoughts, emotions, situations) as part of a behaviour change strategy, such as keeping a daily diary of food consumption (Cane et al., 2015).

A second approach to identifying content to suport plan development is to identify consumer initiated strategies. Rodda, Booth, Brittain, McKean, & Thornley (2020) extended the BCT literature by examining how people change without profssional oversight. They identified 25 different categories of strategies people use to reduce their sugar consumption (e.g., avoidance, tapering, substitution). This literature provides detailed information on how people enact BCT's in real world settings and may be especially helpful when developing a real world sugar reduction intervention.

3.4 Rationale

It has been suggested above that sugar is a problem for Pacific people in New Zealand for number of reasons. Pacific people experience significant premature mortality and preventable morbidity mainly due to NCDs. These resulted from the over consumption of sugar laden and other low quality foods. The low socio-economic status of Pacific people has a significant impact on their health status through their food buying power. Given that there is no established free sugar intervention, the current study aims to explore the feasibility of brief group-based intervention for the reduction of sugar consumption with the Pacific community.

Based on a review of the literature the study design will be a group-based approach. This approach is expected to be attractive to Pacific people. It will deliver this in two group sessions with peer support over a 28-day period. The intervention aims to address the intention-behaviour gap by delivering two sessions of action and coping planning with self-monitoring. In both group based sessions, participants will set goals, develop plans, identify barriers and set coping plans. The intervention will be support by a detailed resource booklet outlining tips and strategies used by other people who have reduced their sugar consumption. At follow-up evaluation participants will be asked to evaluate the intervention in terms of their experiences and how the intervention could be improve.

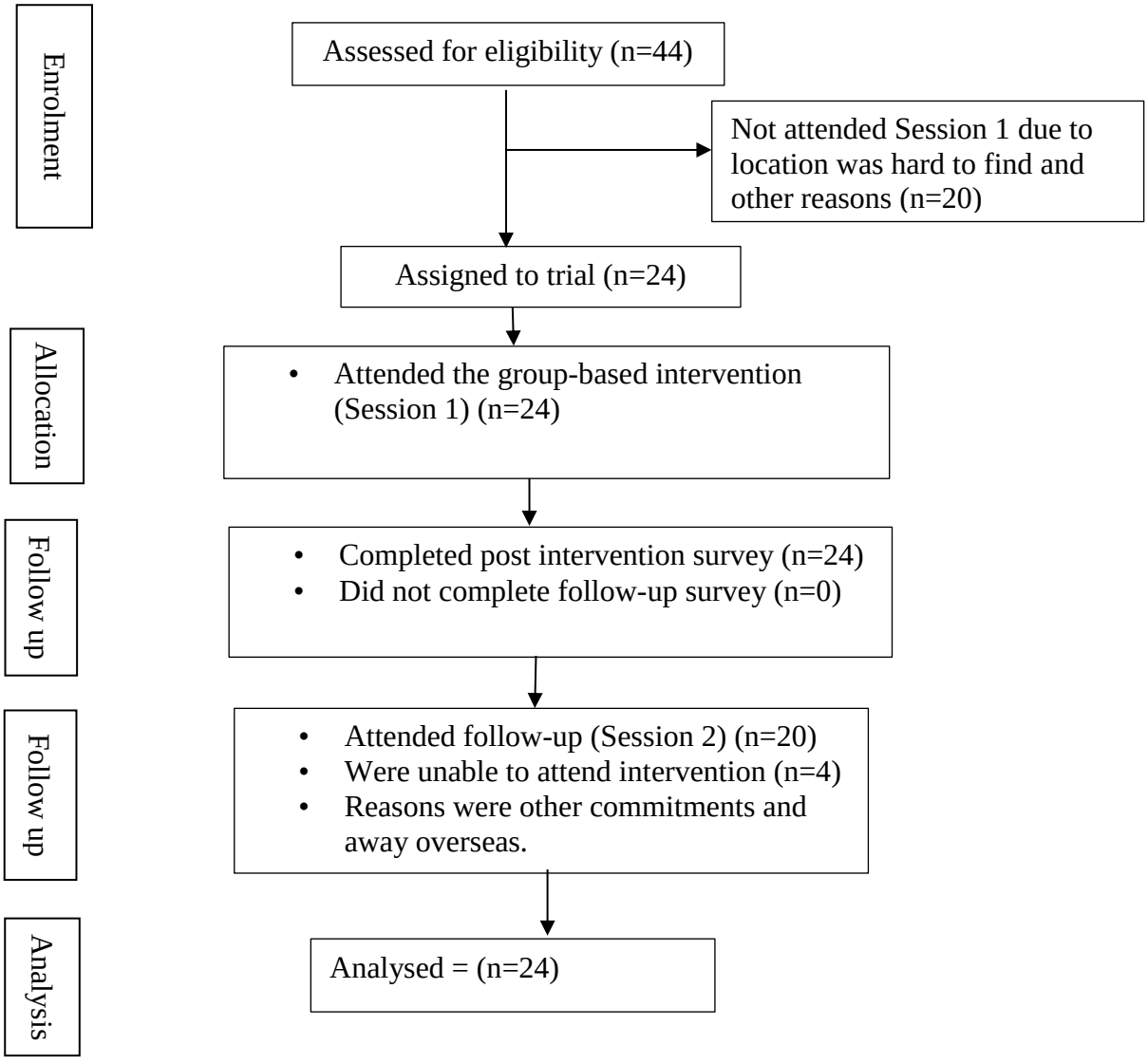
4 Chapter: Methods

This chapter will describe the methodology of the study. It will describe the research and study design, participants and recruitment, study settings, measures, demographics, outcome measures, program evaluation measures, delivery of intervention, intervention workbook, sugar reduction guidelines, RESET guidelines, sugar tracker, procedures, intervention session 1, intervention session 2, peer support group, data analysis and ethical consideration.

4.1 Research and Study design

The mixed methods study explored the feasibility of a group-based intervention for sugar consumption with a pre-post design. Data collection to determine the feasibility will be qualitative and quantitative. This involved a survey delivered via Qualtrics at baseline and 28 days later (post-treatment). The intervention was delivered at 2 time-points at baseline and at 28 days with self-directed implementation and self-monitoring across the 28 days.

Figure 1: Flowchart of participant recruitment to final analysis



4.2 Participants and Recruitment

The study recruited 24 participants of Pacific descent from the Auckland region. Recruitment for the study was focused on Pacific people who are disproportionally impacted by sugar related disease in Auckland, New Zealand (Tukuitonga, 2013a). To our knowledge, this is the first study of this kind, examining a group based intervention, targeting Pacific People for sugar reduction. Participants were self-selected into the study if they were concerned about their sugar consumption and were committed to take action to reduce during a 28 days period.

Participants were self-selected into the study. In order for the participants to be comfortable throughout the program, the researcher ensured that participants made voluntary and informed decision to participate. The Participants information sheet and online consent form had been read and accepted by the participants in order for the survey to progress. Through the intervention in training session 1 and with the provided resources to aid action and coping planning, the program also supported their intrinsic motivation and development of skills to reduce their sugar consumption.

The CONSORT flow diagram describing participants' recruitment is shown in Figure 1. There were 44 participants who enrolled into the intervention online. Participants were recruited from community setting in the greater Auckland region online advertisement (Appendix A), word of mouth and referral within established Pacific networks of the investigator. The study inclusion criteria were: (1) currently reside in the greater Auckland region in New Zealand and of Pacific descent; (2) must be 18 years or over; (3) have desire to reduce their daily free sugar consumption; (4) must be willing to do a 28 day program which could take up to 7 hours in total; (5) be able to attend two training sessions (3.5 hours each training = total 7 hours) at the Southern Cross Campus, Mangere, where height and weight were measured; (6) must have access to a closed Facebook; and (7) be willing to complete the on-line follow-up evaluations.

As remuneration for their time, participants received a $50 Countdown Gift Card for completing the 28-day post- treatment evaluation.

4.3 Study Settings

Both Session 1, intervention at baseline and follow-up Session 2 after 28 days were held Southern Cross Campus School at Mangere. The chosen location was a community-based setting, and most participants resided around the south Auckland area.

4.4 Measures

A summary of the measures and points of data collection are provided in Table 1.

Table 1: Overview of the measures and time-points of data collection.

	Time point of data collection	
Measure	**Baseline**	**28 days**
Demographic: Eligibility criteria		
Demographics	✓	
Measurement Assessment		
Weight	✓	✓
Height	✓	✓
Food Frequency Questionnaires (FFQ)	✓	✓
Yale Food Addiction Scale (YFAS)	✓	✓
Weight Efficacy Lifestyle Questionnaire Short Form (WEL-SF)	✓	✓
Brief Substance Carving Scale (BSCS)	✓	✓
Programme evaluation		✓
Change Strategies Evaluation		✓

4.5 Demographics

Demographics included age, gender, ethnicity and current employment status (employed full time, employed part time, unemployed looking for full time work, unemployed looking for part time work, unemployed not looking for work, or other; requiring a response in a text box, family status (single person household, no children and no other dependents, e.g. elderly parents living at home), single with children still at home (including joint custody) or other dependents, single with children not living at home, couple with no children and no dependents, couple with children still at home, or other dependents, couple with children not living at home, group or shared household, some other arrangement; total household income for the past 12 months (Less than $20,000, $20,000 - $40,000, $40,000 - $70,000, $70,000 - $100,000, $100,000+).

4.6 Outcome measures

Food Frequency Questionnaire (FFQ): The FFQ is a regularly used method of measuring food consumed over a specific period of time. For the current study the FFQ was adapted specifically for sugar consumption. To do this 12 categories of sugar products were identified. These were derived from multiple sources including sugar products purchased in NZ supermarkets (Hamilton, Mhurchu, & Priest, 2007). The list of sugar products used in a paper which assesses the marketing of unhealthy foods to New Zealand children (Mhurchu, Mackenzie, & Vandevijvere, 2016) and New Zealand database of frequently consumed foods – focusing on sugar. The final list used in the scale contained 12 categories of sugar products each containing a number of different products (Appendix B). These were: (1) Soft drinks, a can/bottle (350ml) 25-56g or 6-13 teaspoons, (2) Flavoured milkshakes smoothies, a glass (500ml) 20-40g or 5-10 teaspoons, (3) Fruit juices, a glass (250ml) 10-38g or 2-9 teaspoons, (4) Energy/sport drinks, a can/bottle (350-750ml) 39-70g or 10-17 teaspoons, (5) Flavoured hot drinks e.g., hot chocolate, a cup (350ml) 4-25g or 1-6 teaspoons, (6) Sugar, honey, natural syrups (1 teaspoon) 4-6g or 1-2 teaspoons, (7) Jams, marmalade, sugary spreads (15g) 6-10g or 2-3 teaspoons, (8) Sweets, chocolate, lollies, one portion (25-50g) 8-31g or 2-7 teaspoons, (9) Sweetened yogurt ice cream, one portion (100g) 3-26g or 1-6 teaspoons, (10)

Cake, muffins, cupcakes desserts, pastries, slice, donuts, biscuits, one portion (50-100g) 8-44g or 2-11 teaspoons, (11) Breakfast cereal, muesli bar, fruit and nut bar, one serving (30-50g) 2-20g or 1-5 teaspoons, (12) Sauces, salad dressings, chutneys (15g) 2-7g or 1-2 teaspoons.

The Yale Food Addiction Scale (YFAS2.0) is a 13-item scale originally developed from the DSM-IV-TR substance use criteria, and recently updated to align with the new criteria in the DSM-5 (Schulte & Gearhardt, 2017). This brief, 13-item self-report has an eight point scale which asks participants to select how frequently they have experienced addictive behaviours over the previous month ranging from 'never', to 'everyday'. Eleven of the questions cover diagnostic criteria for substance abuse (e.g., tolerance, withdrawal, loss of control), while two of the questions measure clinically significant impairment and distress. A count can be obtained which is similar to the criteria for substance dependence of the DSM-5. The YFAS was adapted specifically for free sugar consumption by replacing 'food' with 'sugar'.

The Weight Efficacy Lifestyle Questionnaire Short Form (WEL-SF) is a psychometrically sound measure of eating self-efficacy consisting of eight items (Ames, Heckman, Grothe, & Clark, 2012). The eight questions ask how confident a participant is in a variety of situations and emotional states and ask them to rate how confident they feel from 0 (not confident at all) to 10 (very confident). For example, "I can resist overeating when I am anxious (or nervous)". The scores are summed from 0-10, with high scores indicating higher self-efficacy. This questionnaire will be adapted to make it specific to sugar by substituting the word "overeating" with "sugar".

The Brief Substance Craving Scale measures subject desire for alcohol (Mezinskis, Honos-Webb, Kropp, & Somoza, 2001). It was adapted for sugar cravings by replacing 'alcohol' with 'sugar'. It is a composite measure of three cravings domains: intensity, (0) ="None at all" to 4="Extreme", the frequency of craving (0="Never" to 4+ "Almost Constantly"), and the length of time spent craving (0="None at all" to 4="Very Long"). For a fourth item, participants are asked to estimate the number of times they had craving for sugar over the past 24 hours.

4.7 Program evaluation measures (measured at 28 days)

The client satisfaction questionnaire (adopted from Larsen et al., 1979) is a four -item measure which assesses satisfaction with treatment. Four questions are measured on a Like scale, not at all, slightly, somewhat, mostly and very. These questions were: (1) How satisfied were you with the program materials? (2) How useful did you find the information in the program materials? (3) How easy was the information to understand? (4) If difficulties continue or return, how likely would you be to come back to the program materials? We added four open-end questions; (1) How realistic was your overall sugar reduction goal? (2) What skills in sugar reduction have you learned over the 28 days? (3) Who was in your support team and were they supportive? (4) Based on your assessment of your goals and plans what would you need to adjust for next time.

The use of behaviour change strategies was measured with the help of the change strategies questionnaire (Rodda, Booth, Vacaru, et al., 2018). This is a 24 item measure that examines helpfulness of strategies on a scale of 0 = never used to 4 = very helpful.

Participants reported the degree to which they agree that they had an action plan, coping and method for self-regulation. Each planning and monitoring domain contained three questions with response options ranging from strongly disagree to strongly agree.

A series of open questions were used to assess (i) helpfulness of plans for goal achievement (ii) helpfulness of peer support (iii) perception of self-control over sugar (iv) as well as ability to reach goals and identify barriers and implement solutions.

4.8 Delivery of Intervention

This intervention was based on a self-determination theory as well as the Health Action Planning Approach (HAPA) (Schwarzer & Luszczynska, 2008). It was primarily focused on supporting intrinsic motivation through supporting autonomy (i.e., respect and support of an individual's right to choose their own goals), competence (i.e., the development of skills and confidence to achieve goals), and relatedness (i.e., connecting with another person on these goals) (Ryan & Deci, 2000). Consistent with the HAPA model, the intervention was offered

to those who have formed an intention to act and support participants in developing plans and actions to achieve this intention.

The intervention included the following components:

4.8.1 Intervention workbook

This workbook was developed for the participants with detailed information to set them up for the 28 days program. The 23-pages included steps to support the participants (Appendix C) to set up for the 28 days, (1) Set your reasons for change of your sugar consumption, (2) Choose your goal (3) Plan your action (4) Track your sugar intake, (5) Track temptations. The workbook also included pages: write reasons for change of sugar consumption, information on how much sugar WHO recommends for adult daily limits sugar consumption (Appendix D), i.e. 6 teaspoons for female and 9 teaspoons for male, source from Royal Society New Zealand with sugar content in common New Zealand foods, a calendar with 28 days, a page for summarised goals to reinforce commitment, a page to write plan and back-up plan, a tracking sheet to record sugar consumption, a tracking sheet to track temptations, page to list positive things in life, spare calendar and spare note pages.

4.8.2 Sugar reduction guidelines

The participants were provided with a 67-page guideline to support the development of action plans. This behaviour change strategies guideline was developed by (Rodda, Booth, Vacaru, et al., 2018) who identified behaviour change strategies for internet, pornography and gaming addiction. The 67-page guideline contained detailed information and tips on how to implement 16 different strategies (Appendix E) for reducing sugar consumption. These strategies were (1) Avoid sugar, places and events, (2) Clean up your environment, (3) Consumption control, (4) Consumption planning, (5) Curb your urge, (6) Healthy eating focus, (7) Maintain momentum, (8) Manage underlying issues, (9) Professional support, (10) Refocus away from sugar, (11) Support network, (12) Sugar substitutes, (13) Tapering, (14) Track consumption, (15) Wellbeing, (16) Withdrawal management.

4.8.3 RESET guidelines

A hard-copy of these guidelines were given to the participants on post- intervention (day 2 session). This 17 pages RESET guidelines was to provide guidance to participants' on resetting their programme of cutting back on sugar in the future. The RESET guidelines (Appendix F) is similar to the Guidelines of strategies which was based on both the experiences of people who have reduced their gaming, as well as input from researchers, health promoters, and treatment providers (Rodda, Booth, Vacaru, et al., 2018). This guidelines book consisted of four sections: (1) Review the need to change, (2) Strengthen your mindset, (3) Re-establish goals and plans, and (4) Evaluate your progress. In each section of this guideline, there were pages with blank lines for participants to complete the answers to the questions or complete a tick checklist. For example, the section about evaluation of one progress asked the participants to "Evaluate their goal" by ticking one from the checklist and "Write about their experiences" on the blank lines provided.

4.8.4 Sugar Tracker

Participants were provided with a sugar tracker (Appendix G) to assist them in monitoring their daily sugar intake during the 28-day intervention. Participants were prompted to track sugar consumption and the times they were tempted. For example, sharing food at a celebration, being hungry when grocery shopping or needing to drink and there are only soft drinks.

4.9 Procedures

Participants were initially enrolled in the intervention via an online Qualtrics baseline survey. Participants who met the eligibility criteria were presented with a briefing of the structure of the self-directed program, the contact details of the Principal Investigator and the Facilitator, the participant information sheet (Appendix H) online consent form (Appendix I) and the baseline survey. The online baseline survey (Appendix J) was estimated to be 15 minutes. The online survey through Qualtrics, consist of retrospective questionnaires.

The Facilitator was notified by an automated email sent from Qualtrics, at the completion of the baseline survey. The Facilitator emailed the participants within 24 hours to confirm the next step, which is to attend the first training session 1. This email (Appendix K) included the venue, address and directions, the date, duration and the time, an electronic copy of the behaviour change strategies guidelines to familiarise themselves prior to attending the training. After completing training session one, participants were to track their sugar consumption over the next 28 days, and be involved in a closed Facebook group then attend the follow-up training sessions after the 28 days. This project is to complete 90 points thesis requirements for Master of Public Health – duration from 15/072019 - 15/07/2020.

4.9.1 Intervention Session 1

Session 1 group training (Appendix L) involved a series of presentations by 5 facilitators on how to set goals and identify reasons to change sugar consumption habit as well as how to write action and coping plans, monitor sugar consumption and identify potential barriers along the way. Participants were required to: 1) Complete an intake assessment by recording their heights and weights 2) identify and state the main reason their desire to change 3) select strategies for implementing a way to change their sugar consumption from change strategies project book, 4) complete the Action and Coping planning 5) set a daily tracking record.

4.9.2 Intervention Session 2

On the last week at completion of the 28 day programme, the facilitator emailed a reminder to participants, close to the end of the 28 days, with a link of the follow up survey (Appendix M) to be completed. This email (Appendix N) included the confirmed day, time and venue for the follow-up session. At the completion of the follow up online survey by each participant, an automated email was sent to notify the facilitator from Qualtrics.

Session 2 group training (Appendix O) involved another series of presentations by the same 5 facilitators. This involved a facilitated discussion of the outcome of goals, action plans (including the use of change strategies) as well as a detailed discussion on barriers and different methods people used to address these barriers. Participants received a reminder on

goal setting, action planning and coping planning and were guided how to set up a new set of goals and plans for the next 28 days.

4.10 Peer support group

Participants were offered ongoing peer support via a closed Facebook group. This group was moderated by a facilitator who on a daily basis checked on support needs, programme questions and give encouragement. Each day, the facilitator posted a question or tip (Table 2), to the group for discussions, feedback and for sharing of experiences especially by the participants. Members were encouraged to motivate each other, by posting issues or concerns that arise during their daily journey during the 28 day program. A study of empowerment in the online support groups are directly associated with three main attributes of personal empowerment: first, the reliance on self and peers rather than on authoritative professionals contributes to gaining a sense of personal competence. Secondly, the voluntary participation and free choice that relate to decisions and planning contribute to feelings of self-determination. Thirdly, helping others and socially identifying with each other (such as in regard to anger about stigma) contribute to perceptions of social engagement (Barak, Boniel-Nissim, & Suler, 2008). The information communicated through these writings created hope and provided encouragement (Høybye, Johansen, & Tjørnhøj-Thomsen, 2005).

Table 2: List of prompts for 28 day peer support

Intervention 28 Day	Questions/Tips
Day 1	Welcome to the 28 day Sugar Challenge: The Pacific Way. This page is for you to check in with each other and share your progress. We want to hear about what has been going well for you, any challenges you have been facing, or any tips and advice you have for the others. Feel free to post statuses, photos, or comment on other people's posts. We're all in this sugar reduction journey together!
Day 2	(POLL) How confident are you feeling today about this challenge? If you don't feel very confident, feel free to comment about your reasons. (OPTIONS) Very confident, confident, okay, not confident
Day 3	What do you think are your biggest temptations to eat sugary foods? What would you do if you feel these temptations?
Day 4	Remember there are many other things you can choose to replace sugar that makes you feel just as good. You could refocus your attention towards activities such as exercise or spending quality time with your family. What's one thing you're grateful for today?
Day 5	Day 5 of the challenge! What's everyone having for breakfast? Remember- depending on the type of muesli, they are loaded with sugar.
Day 6	Your mind and body deserve the best. How do you feel about what you have been eating for the past few days?
Day 7	Did you know there are: • 7 teaspoons of sugar in Coke • 5 teaspoons of sugar in Red Bull • 10 teaspoons of sugar in ginger beer
Day 8	Tomorrow is Church day! Sometimes it can be quite tricky to make food that does not contain a lot of sugar. What are you planning to take that is healthy and low in sugar?
Day 9	Every accomplishment starts with the decision to try!
Day 10	It's been 10 days since you have started your challenge! What are the biggest obstacles and difficulties that you are facing with your sugar reduction?
Day 11	Who have you told about your sugar reduction journey, outside of your family? What do they think?
Day 12	A healthy lifestyle isn't about what you lose, it's about what you gain. What good things have you gained or experienced after starting your sugar challenge?
Day 13	Sometimes it's easy to forget that sauces and spreads are high in sugar. What ideas do you have for substitutions for sauces and spreads?
Day 14	Remember that even savoury food has a lot of sugar in them. For example, a can of baked beans has 5 and a half teaspoons of sugar (refer to workbook).

Day 15	(POLL) Congratulations, you are over halfway through your 28 day challenge – Day 15! How easy or difficult are you finding it to stick to your plans? (OPTIONS) Very easy, easy, okay, difficult, very difficult
Day 16	Next time you go grocery shopping, remember to look for low-sugar unsweetened foods! For example, you could swap jam for peanut butter, vegemite, or nut butters.
Day 17	Remember your reasons for changing your sugar consumption. Think back to Day 1 when you wrote this down in your booklet. Use this as motivation to keep going.
Day 18	Who's using the substance substitution strategy? What foods have you swapped in for your sugary foods.
Day 19	It is health that is real wealth! What healthy low-sugar foods have you been enjoying lately?
Day 20	(POLL) Day 20 of the challenge! Have you noticed any improvements to your health and wellbeing since the start of the challenge? Comment below to share how you are feeling. (OPTIONS) Yes, no
Day 21	If you are finding it hard to control your sugar consumption, you could try using smaller plates for desserts or smaller cups for drinks. You could also try filling the cup with ice before pouring your sugary drink.
Day 22	Tomorrow is Church day! There will likely be a lot of sugary foods. How are you planning to avoid them, or turn them down?
Day 23	What have you been doing to reduce stress? It could be things like having a daily walk, sitting out in nature, or swimming.
Day 24	Remember, even fruits can be high in sugar. Try to choose fruit that is low-sugar such as strawberries, oranges, watermelon, kiwi, and peaches.
Day 25	Celebrate your progress! Notice how far you have already come, how many days or weeks you have done well. Even if it's just one day - it's still an achievement to be proud of.
Day 26	Has anyone felt moody, irritable, more tired than usual, experienced aches and pains, or is having difficulty going to sleep or staying asleep? If so, try and drink lots of water throughout the day, eat vegetables, get a massage, or try gentle stretching.
Day 27	(POLL) 3 days until the end of your challenge! How well do you think you have managed your sugar urges for the past 27 days? Comment below what has worked well for you or what hasn't worked well. (OPTIONS) Very well, well, okay, not well
Day 28	Congratulations on coming to the end of the 28 day sugar challenge!

4.11 Data analysis

This study used a mixed methods approach to describe participant characteristics and calculate the descriptive statistics (means, standard deviations) of the study. Differences in attrition based on demographic differences of participants who completed and drop-out were examined using the t-test e.g. age or x^2 (e.g. gender). Paired samples t-test was conducted to compare baseline scores for all variables with post-intervention scores. Survey items such as open questions (i.e., was the most helpful part of the program) were analysed for themes using a thematic analysis (Braun & Clarke, 2006). The purpose of thematic analysis is to identify patterns of meaning across a dataset which would provide answers to the research questions being addressed. Patterns are identified through a rigorous process of data familiarisation, data coding, and theme development and revision (Braun & Clarke, 2019). This helped to analyse the qualitative data which share the focus on identifying themes (patterns of meaning) in qualitative data. The open-ended survey questions in the Qualtrics Survey follow-up, allowed the participants to answer in open text format, the research questions based on their knowledge, feeling, and understanding of the program. The patterns of meaning and themes across the dataset were identified to provide answers to the research questions being addressed. The six-phase process approached developed by Braun & Clarke, (2019) helped to deliver the analysis for this study.

The participants' written responses to the research questions at in the Qualitric Surveys were analysed to identify their meanings across the data. These written responses were read over once and followed by a second more detailed read with notes being taken of emerging themes. The collated data were examined to identify the potential themes to determine whether they answers the set of research questions in the Qalitric Survey. The final analytic data were put together to support the existing literature for this study.

4.12 Ethical consideration

This research was approved by the University of Auckland Human Participants Ethics Committee on 15th August, 2019 for three years. The Reference Number 022363 (Appendix P).

5 Chapter: Results

The study explored the feasibility of a brief group-based intervention for the reduction of sugar consumption within the Pacific community. This chapter reports participant characteristics, and baseline scores for each measure. The intervention involvement of participants is also discussed, including the strategies that were implemented by participants. Follow-up evaluation comparing pre-intervention and post-intervention measures are then presented, using both completers and intention-to-treat analyses. Lastly, the results of the program evaluation measures are presented.

5.1 Participant characteristics

The post intervention evaluation survey was completed by all 24 participants who attended session one. Of those who attended session one, 83% (20 out of 24) attended session two. Table 3, displays the participant characteristics. The average age of participants was 43.4 years (SD=14.4). Participants were predominantly female, with 18 (75.0%) female and 6 (25%) males. Over half of participants identified as Tongan (n=16, 66.7%), followed by Samoan (n=4, 16.7%) or Fijian (n=4, 16.7%). The majority of participants were employed full time (n=12, 50%). The majority of participants were couples with children still at home, or other independents (n= 16, 66.7%). Participants also most commonly identified their household income for the past year $100,000+ (n=8, 33.3%).

Table 3: Participants characteristics (N=24)

Characteristics	Number (%)
Gender	
Female), n (%)	18 (75.0)
Male, n (%)	6 (25%)
Age (SD)	43.4 (13.7)
Ethnicity, n (%)	
Tongan	16 (66.7)
Samoan	4 (16.7)
Fijian	4 (16.7)
Employment status, n (%)	
Employed full time	12 (50.0)
Employed part time	3 (12.5)
Unemployed looking for full time work	0
Unemployed looking for part time work	3 (12.5)
Unemployed not looking for work	3 (12.5)
Other (e.g., student, stay at home mum)	3 (12.5)
Family status	
Single person household, no children and no other dependents (e.g. elderly parents living at home)	1 (4.2)
Single with children still at home (including joint custody), or other dependents	2 (8.3)
Single with children not living at home	0
Couple with no children and no dependents	1 (4.2)
Couple with children still at home, or other dependents	16 (66.7)
Couple with children not living at home	2 (8.3)
Group or shared household	2 (8.3)
Other	0
Income, n (%)	
Less than $20,000	3 (12.5)
$20,000 - $40,000	3 (12.5)
$40,000 - $70,000	5 (20.8)

Characteristics	Number (%)
$70,000 - 100,000	5 (20.8)
>$100,000	8 (33.3)
FFQ total (reduced outliers), grams	614 (373)
YALE diagnosed, n (%)	
No food addiction	20 (83.3)
Mild food addiction	3 (12.5)
Moderate food addiction	0
Severe food addiction	1 (4.8)
WEQ, score (SD)	51.0 (20.0)
BSC score (SD)	4.5 (2.2)

Physical measurements indicated the average height of participants as 172 cm and weight 103 kg. This equated to an average body mass index of 34.7 (SD=6.7). As indicated on the table 3 above, the majority of participants did not have a food addiction. Most scored zero on the YALE Food Addiction Scale with 3 reporting a mild problem and one a severe problem. Participants reported an average amount of 614 grams of sugar consumed per week. The weight efficacy scale measured eating self-efficacy and self-control across a range of situations. The average score was 51 (out of a maximum score of 80). The average score on the Brief Substance Craving Scale was 4.5 (out of a possible score of 12) indicating some cravings.

5.2 Post-treatment measures

Among the people who received intervention 24 attended session and one and completed one-month follow-up. The mean difference between pre and post sugar consumption was 312g (SD=418; 95%CI 136-489, p=0.0013) as tested using paired (or repeated measures) two-tailed t-test. There was a statistically significant difference between pre and post YALE Food Addiction Scale diagnostics (four categories) $X^2(6) = 18.84$, $p<0.004$ (Table 4). There was also a significant improvement in the weight efficacy lifestyle Questionnaire. While there was a significant difference in the craving scores it was in the negative direction indicating an increase in sugar cravings.

Table 4: Mean change of main scores (paired two-tailed t-tests)

Measures	Pre intervention	Post intervention	Sig.
FFQ (M,SD)	614 (373) 95%CI 456-771	301 (202) 95%CI 216-387	p=0.0013
WEL-SF (M,SD)	51.0 (20.0) 95%CI 42.5-59.4	66.9 (15.1) 95%CI 60.5-73.3	p=0.0002
BSC (M,SD)	4.5 (2.2) 95%CI 3.6-5.4	6.0 (2.3) 95%CI 5.0-7.0	p=0.0085
YFAS (M,SD)	18 (83.3)		P=0.004

Note
FFQ: Food Frequency Questionnaire
WEL-SF: Weight Efficacy Lifestyle Questionnaire Short Form
BSC: Brief Substance Carving Scale
YFAS: Yale Food Addiction Scale

Participants were asked to report the degree to which they were able to plan and monitor their sugar consumption. As indicated on Table 5 below, there was generally agreement that action plans that had been developed for the participants and they knew how, when and where they would reduce their sugar consumption. While there were similar results for coping planning and self-monitoring, some participants indicated that they needed to have a better plan on what to do when barriers present themselves.

Table 5: Action planning, coping planning, and self-regulation (n, %)

Question	Strong Disagree	Disagree	Neutral	Agree	Strongly Agree
Planned in detail HOW I would reduce my sugar consumption	-	2 (8)	7 (30)	11 (45)	4 (17)
Planned in detail WHEN I would reduce my sugar consumption	-	1 (4)	8 (33)	11 (45)	4 (18)
Planned in detail WHERE I would reduce my sugar consumption	-	4 (18)	6 (25)	11 (45)	3 (12)
I planned in advance WHAT to do if something got in the way of my plans	-	6 (25)	6 (25)	8 (32)	4 (18)
I planned in advance WHAT to do in difficult situations so that I stuck to my intention	1 (4)	4 (18)	5 (21)	11 (45)	3 (12)
I planned in advance WHAT to do if there were setbacks	-	2 (8)	7 (28)	11(46)	4 (18)
I had a system in place on HOW I would track my sugar consumption every day	-	1 (3)	6 (26)	12 (50)	5 (21)
I had a system in place on WHEN I would track my sugar consumption every day	-	3 (12)	6 (26)	12 (50)	3 (12)
I had a system in place on WHERE I would track my sugar consumption every day.	-	3 (12)	8 (34)	9 (36)	4 (18)

5.3 Programme evaluation measure

Participants were asked how satisfied they were with the program materials. As indicated on Table 6, more than half of the participants (n=15, 63%) were very satisfied with the program materials. Six participants reported that they were mostly satisfied with the program materials. Two participants found the program materials somewhat satisfied. Only one participant reported that materials was only slightly satisfactory.

The majority of the participants (n=16, 68%) found the program materials information very useful. Three participants (12%) reported that the program materials information were mostly useful. Four participants (16%) found the program materials information somewhat

useful. Only 1 participant (4%) reported that the program materials information was slightly useful. The majority of participants (n=18, 75%) reported that the information was very easy to understand. The rest of the participants (n=25, 6%) found the information was mostly easy to understand.

Eleven participants (n=11, 46%) were very likely to go back to the program materials when they find difficulties. Ten participants (42%) were mostly likely to go back to the program materials when they find difficulties. Two participants (8%) were somewhat likely to refer to their program materials if they need clarification. Only one participant was only slightly likely to go back to refer to the program materials for clarification.

Table 6: Evaluation and Utility Questionnaire

Question	Not at all	Slightly	Somewhat	Mostly	Very
How satisfied were you with the program materials?	-	1 (4)	2 (10)	6 (23)	15 (63)
How useful did you find the Information in the programme Materials?	-	1 (4)	4 (16)	3 (12)	16 (68)
How easy was the information to understand?	-	-	-	6 (25)	18 (75)
If difficulties continue or return, how likely would you be to come back to the program materials	-	1 (4)	2 (8)	10 (42)	11 (46)

Participants were asked to report on the helpfulness of plans for achieving their goal. As indicated on Figure 2, 70.1% of participants reported their plans to be very helpful or totally helpful towards goal achievement. Only one participant reported the plan as not helpful.

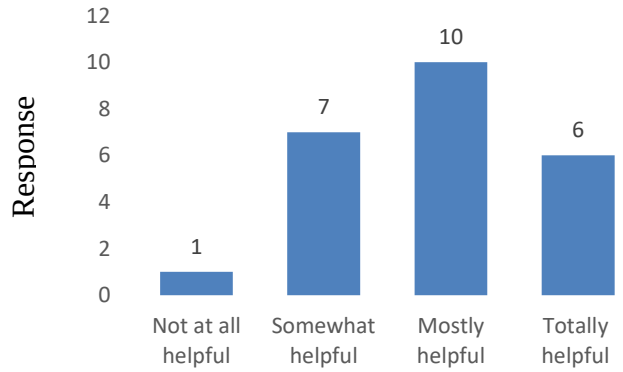


Figure 2: Helpfulness of plans for goal achievement

Participants were asked to indicate the perceived helpfulness of the peer support through Facebook. As indicated in Figure 3, majority of participants (83%) reported that the Facebook forum (peer support) somewhat or very and somewhat helpful towards achieving their goals. There were however four participants who stated that the Facebook page was not at all helpful.

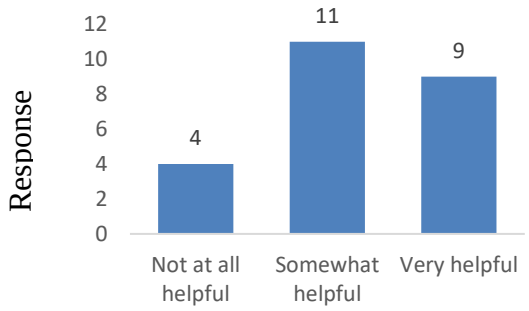


Figure 3: Helpfulness of the Facebook support group

Participants were asked to report the extent to which they felt that they were in control of their sugar consumption. As indicated on Figure 4, one-third (33%) of the participants reported total control over their sugar consumption. A further 13 reported to be in control most of the time (54%) and just three stated that they had a little control. No report of any participant being not in control over their sugar consumption.

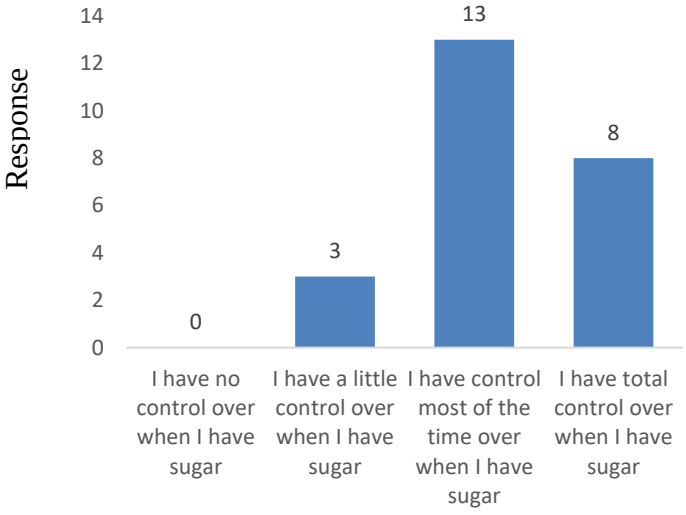


Figure 4: Perceived extent of regained control over sugar consumption

5.4 Key themes and Programme Evaluation

Participants completed a series of open questions in the online follow-up survey. The question covered the usefulness of goals, helpfulness of plans, identified the barriers they experienced and the potential solutions for these barriers. Participants also engaged in a closed Facebook group forum and their responses were analysed.

Four themes were emerged from Programme evaluation. These were (1) Participants embraced the programme as a prevention approach for their illness (2) New skills increase awareness of sugar intake (3) The reduction of sugar consumption was the most important factor (4) Need to do it for loves ones.

Table 7: Participant ID and characteristics at baseline

ID	Age & Gender	Income	Employment Status	Amount of sugar consumed per week(g)	Score on the Yale Food addiction
1	25, F	$40,000 - $70,000	Stay at home mother	627	0 No food addition
2	27, F	$40,000 - $70,000	Employed part time	125	1 No Food addition
3	28, M	$70,000 - $100,000	Unemployed not looking for work	501.5	0 No Food addiction
4	43, M	$20,000 – $40,000	Other	377	0 No Food addiction
5	53, F	$100,000+	Unemployed not looking for work	380	0 No Food addiction
6	69, F	$70,000 - $100,000	Unemployed looking for part time work	197	0 No Food addiction
7	53, M	$100,000+	Employed full time	268	0 No Food addiction
8	52, F	$70,000 – $100,000	Employed full time	215	1 No Food addiction
9	23, F	Less than $20,000	Unemployed looking for part time work	160	0 No Food addiction
10	19, M	Less than $20,000	Employed part time	1263	2 Mild Food addiction
11	34, F	$40,000 – $70,000	Employed full time	133	0 No Food addiction
12	39, F	$20,000 – $40,000	Unemployed not looking for work	659	0 No Food addiction
13	54, F	$70,000 - $100,00	Employed full time	205	0 No Food addiction
14	30, F	$40,000 - $70,000	Employed full time	477	1 No Food addiction
15	41, M	$20,000 - $40,000	Other	386	4 Moderate Food addiction
16	62, F	Less than $20,000	Employed full time	203	0 No Food addiction
17	53, F	$100,000+	Employed full time	114	4 Moderate Food addiction
18	55, F	$100,000+	Employed full time	254	0 No Food addiction
19	28, F	$70,000 - $100,000	Unemployed looking for part time work	5	0 No Food addiction
20	54, M	$100,000+	Employed full time	298	8 Severe Food addiction
21	53, F	$100,000+	Employed full time	92	1 No Food addiction
22	45, F	$40,000 - $70,000	Employed full time	251	0 No Food addiction
23	54, F	$100,000+	Employed full time	113	1 No Food addiction
24	48, F	$100,000+	Employed full time	351	3 Mild Food addition

5.4.1 Participants embraced the programme as a prevention approach for their illness

The majority of participants liked the material information of the program. The prevention approach of sugar reduction help some of the participants' illness. For example, participants stated that this study helped them to control their blood sugar level. Below are some of their responses:

> *I learnt from this program that I can live without sugar or food with added sugar. This gives me a clear indication of what food I should be eating when looking at the sugar content in the products. The whole experience in this study helped me with my diabetes, to control my blood sugar level (Participant 18).*

> *In the past 28 days, I set myself to constantly checking sugar content in processed food. I also avoided food that makes me add sugar, but add substitutes for example, add lemon leaves or orange leaves for a cuppa instead of adding sugar (Participant 6).*

5.4.2 New skills increase awareness of sugar intake

Many participants reported that not only they were being educated about sugar consumption, they were also able to learn new skills such as planning over the 28 days research. Most participants said they have increased their awareness of the amount of sugar they consume daily. They also generally learn about the sugar content of different types of food products. Some said that the skills of planning, setting goals and tracking of sugar consumption were important learning achieved through the program. Other said they learned to quench sugar carvings by engaging in other activities reducing sugar intake by reduce buying sugary food. Following are examples of skills learned by the participants:

> *I have learnt a lot in the past 28 day program. I started my consumption planning by making a daily and weekly plan of my sugar free meals. I also try and limit buying sugary food when shopping (Participant 14).*

> *I am grateful for this program, which taught me the skills of setting my goals in whatever I do. This is a huge motivational factor with dietary changes (Participant 16).*

5.4.3 The reduction of sugar consumption was the most important factor

Most participants said that the reduction of their sugar consumption is the most important factor because it gives them purpose and motivation to participate in the project. The participants below indicated that their understanding of their own reasons and purpose for trying to reduce their sugar intake and important:

> *To have a very positive mindset to overcome the temptations of getting back to old habits of taking sugar to a different level (Participant 22).*

> *Avoiding sugary food and cleaning up environment and mindful of eating indicators. I also manage underlying issues (Participant 17).*

5.4.4 Need to do it for loves ones

Some participants said that their involvement in this study was not only for themselves, but for their families and loves ones. The majority of the participants stated that their families were their supporter. For example:

> *I will constantly reminding myself that I am not only doing this for myself, but also for my loved ones. I want to be a role model for my family (Participant 12).*

> *My mum and dad were very supportive at home, by preparing and serving sugar free food for dinner (Participant 10).*

5.4.5 Barriers and Solutions

During the program evaluation at follow-up session 2, the participants were asked in a group exercise to identify some of the barriers that they experienced during the 28 day program. The participants were also asked to identify solutions to the barriers they identified.

Barrier:	*Too many family and church events to attend (Participant 15).*
Solutions:	*Plan ahead, limit events and church functions to attend.*
	Avoid sugary food by eating at home first before you go.

Self-discipline and eat non-sugary food. Be committed and keep reminding yourself

Barrier: *Family and visitors bringing treats home (Participant 4).*

Solutions: *Kindly inform visitors that you are practising sugar free gatherings.*
Accept and give them away.
Give back the food to take them home, saying it will be a waste, no one will eat the food.
Let them know that you are doing and involve in a sugar free program.

Barrier: *Availability of sugary foods (Participant 24).*

Solutions: *Get rid of sugary food in your house.*
Keep on reminding yourself about your goals.
Give them away to your friends and family.

Barrier: *Healthy foods too expensive (Participant 7).*

Solutions: *Look for cheaper healthy menus and options.*
Create and manage food budget daily.
Go to Mangere or Otara markets and buy cheaper vegetables.
Plan your meals and prepack them for the week.

Barrier: *Working long hours, tired and less motivated to cook (Participant 1).*

Solutions: *Plan and prepare healthy food and freeze them for later.*
Take healthy snacks to work and have a few while working.
Have healthy snacks available at home, so that you can still able to cook when get home from working long hours.
Stock healthy salad and fruits to eat when get home hungry.
Keep eating schedules and write down a food diary.

Barrier: *Bored and tempted to binge eat (Participant 20).*

Solutions: *Be involved in community and voluntary work.*
Go for a walk or exercise.
Have healthier substitute available for these moments.

Visit family and friends for a chat.
Do some part time studies or play some sports.

5.4.6 Online peer support – Facebook group forum

A closed Facebook group forum was set up during the program to support participants. The facilitator posted one question each day to encourage group engagement and discussions. This forum encouraged and motivated the participants to share their 28 day journey. On Day 1, the facilitator posted: "Welcome to the 28 day Sugar Challenge: The Pacific Way. This page is for you to check in with each other and share your progress. We want to hear about what has been going well for you, any challenges you have been facing, or any tips and advice you have for the others. Feel free to post statuses, photos or comment on other people's post. We are all in this sugar reduction journey together". Here are some of the postings from the participants after session one:

> *Well done to our facilitators this morning. Lovely to be part of this new family/group at the beginning of 2020! Good luck for the next 28 days as we tackle this sugar reduction goal. I'm thinking of approaching it as a fast and better care of God's temple. It will be harder for me to cheat and we can do all things through Christ who gives us strength (Participant 23).*

> *Thank you all, I really enjoyed today's session. I think the project is a good way of forcing us to realise our excessive sugar consumption. I am looking forward to changes (Participant 5).*

Day 3, the facilitator posted the following "What do you think are your biggest temptations to eat sugary foods? What would you do if you feel these temptation?" A participant responded:

> *So my daughter wanted to check out the strawberry ice cream in Mangere last Saturday, a regular activity in summer. If it wasn't for the study, I would have enjoyed one. It was a challenge on a hot day (Participant 23).*

On Day 4 the facilitator raised the following question: “Remember there are many other things you can choose to replace sugar, which will make you feel just as good. You could refocus your attention towards activities such as exercise or spending quality time with your family. What’s one thing you’re grateful for today?” Participants responded:

> *I’m grateful that this morning my kids stopped me from putting more than 1 tea spoon of sugar into my tea. They have caught on to what my husband has been telling me in the past few weeks. No more than 1 or it’s no sugar (Participant 1).*

> *Hi team, to be honest the first 3 days have absolutely rubbish – all of which I have recorded. So today I have been more purposeful with my choices keeping my goals in mind. I had a meeting this morning and instead of ordering my usual hot chocolate with a sweet treat, I enjoyed a green tea. Yay to my wallet, which I am grateful for (Participant 9).*

Other participants shared what they were grateful about regarding the program.

> *Grateful for having taken the first step in the right direction of sugar intake reduction. It forces you to take a good look at your eating behaviour (Participant 15).*

> *Grateful to be doing this program with a group rather than on my own. Makes me feel more accountable when it comes to making decisions of what I put into my body (Participant 3).*

On Day 9, the facilitator posted the following: “Every accomplishment starts with the decision to try”.

> *Very hard to resist the otai (watermelon drink) this weekend – has lots of sugar. I will discipline myself to drink green tea for the next couple of days to off-set that watermelon drink (Participant 23).*

> *I managed to have 2 glasses only of otai instead of four and more, especially on a hot day like yesterday (Participant 6).*

Day 12, the facilitator posted this online: "Healthy lifestyle isn't about what you lose, but is about what you gain. What good things have you gained or experienced after starting your sugar challenge?"

> *I attended a wedding yesterday. May I brag about myself because part of the buffet menu were all these delicious water mouthing desserts! Cheese cakes, brownies, velvet cakes, choc cream filled Swiss rolls (my weakness) and more! I managed just to admire and filled my plate with fruits. Only because The 28 Days sugar reduction project was ringing in my ears. Thank you we can do it (Participant 5).*

Other participants noted that, the program helped them deal with the temptation of consuming food with high sugar level. For example:

> *Normally when I go Café I buy a slice or muffin but I have managed to avoid it during the study. The study is definitely helping me discipline myself (Participant 23).*

> *Started to crave for some Dunkin Donuts or Krispy Kreme, so instead we headed to our nearest Asian supermarket and bought some fruit and vegetables to make our healthy lunch/snack. Fruits are chilling in the fridge so we can have it later. Hope everyone is finding good different ways to deal with their temptations (Participant 1).*

Participants also faced challenges when they are trying to reduce their sugar consumptions. The facilitator triggered off the following discussion online: "It has been 10 days since you have started your challenge! What are the biggest obstacles and difficulties that you are facing with your sugar reduction?"

> *Biggest obstacle is having cravings and temptations to eat sweets during a tough week but overcame it by just running away from the sweets (Participant 1).*

On Day 17, the facilitator prompted the participants to share their journey with the program: "Remember your reasons for changing your sugar consumption. Think back to Day 1 when you wrote this down in your booklet. Use this as motivation to keep going." One participant responded:

Brekkie was whole meal toast, little butter and vegemite, cuppa tea with no sugar. Reduced sugar talked to grand-daughter so water and milk at the same time checking the sugar content on cereals for her brekkie. Thank you for constant reminder as it does keep us on line (Participant 6).

Another participant shared:

So we usually make an excuse to have keke isite for our fortnightly team meetings. Today we had cherries and two weeks ago we had cucumber, carrots and hummus with crackers (Participant 23).

On Day 21, the facilitator decided to post some useful tip to help participants with reducing their sugar: "If you are finding it hard to control your sugar consumption, you could try using smaller plates for desserts or smaller cups for drinks. You could also try filling the cup up with ice before pouring your sugary drink." A participant shared:

To be honest, I don't have huge problem in resisting sugary foods. My major struggle is with too much consumption of carbs. I have been mostly good with eating sweets. Other advice has been quite helpful, such as clean up your pantry and fridge and don't buy any sugary stuff. So this is what I am doing and making it difficult to access them (Participant 21).

So I am going to be honest here. It's been a challenging week for me. Someone gave me Hawaiian macadamia chocolate and I couldn't resist that (Participant 11).

On Day 23, the facilitator posted the following: "What have you been doing to reduce stress? It could be things like having a daily walk, sitting out in nature, or swimming." Participant responded:

As for stress, when I was studying two years ago, I couldn't stop eating while doing assignments but realised later, that must have been my way of coping with "stress". There was no time for a walk, relax and admire nature (Participant 23).

On Day 25, the facilitator posted about celebrating the participant's journeys: "Celebrate your progress! Notice how far you have already come, how many days or weeks you have done well. Even if it's just one day - it's still an achievement to be proud of." Participants responded:

> *Thank you for the daily encouragement, it helps me to refocus and happy to say sugar is completely off with cuppa tea, coffee and lemon leaves. A definite reduced sugar when it comes to certain food e.g. otai, topai and hot milo especially with hot fresh bread. This does not happen often so it's a little treat by very aware of sugar intake (Participant 6).*

> *Thank you for the encouragement and continuing the journey. Like what being shared last week that eating healthy should be a permanent lifestyle. I get sad when I see my loved ones scooping 2-3 spoons of sugar for their tea/coffee. All the best team and let's carry on encouraging each other through this page (Participant 21).*

> *Almost a week and today is fish day for lent as I am Catholic and for sugar reduction, am struggling to finish a bowl of porridge without sugar. Blessed Friday you all and keep up the good work (Participant 5).*

On Day 28, the facilitator posted about the final day of the program: "Congratulations on coming to the end of the 28 day sugar challenge." Participant responded:

> *A great journey and lots of challenges, but this Program has given me strength to reduce and say no to sugar when required (Participant 6).*

6 Chapter: Discussion

Excessive sugar consumption has been identified by many studies as an increasing health problem for the Pacific community. This chapter focuses on the feasibility of using a group-based intervention methodology with Pacific peoples to support reduction of sugar consumption. This section summarises key findings of the study and taking into account the information provided by the literature review for the study.

There were significant improvement in sugar consumption by the participants. The study also noted a huge improvement in the weight efficacy questionnaire. This intervention was modelled on another intervention developed for addictive behaviours. This was because in the current study sugar was conceived as potentially an addictive behaviour. In the current study, the majority of the participants did not have food addiction, and most of them scored zero on the YALE Food Addiction Scale. It was noted that three reported mild addiction and only one with severe problem. These findings indicate that the sample may not have serious problems with sugar per se. Future studies should investigate the use of the YALE Food Addiction Scale with different populations. We did find that the average score on the Brief Substance Carving Scale indicated that some participants had carvings. This indicated that perhaps there was some overlap with addictive behaviours and warrants further investigation.

At the beginning of the programme, participants set goals and developed action plans which were personalised and self-initiated. The findings indicated participants understood how, when and where they would reduce sugar consumption right from the start. The majority of participants were quite satisfied with the programme materials and they found them very useful. Most of participants, found the programme information provided to be comprehensively easy to follow. It was noted that about 46% of the participants were likely to refer back to their program materials for clarification or guidance during the programme. Given that the majority of participants found the plans very helpful, they managed to gain control over their sugar consumption during the study. These findings indicate the two main research questions were addressed and shows a group based intervention may be feasible and warrant further investigation.

Generally, the participants agreed to their action plans that were developed at the beginning of the programme. They also had an understanding on how, when, and where they would reduce sugar consumption. As a result, participants agreed with the programme information materials provided and found them useful and comprehensive to follow. While there were similar positive results for coping planning and self-monitoring, some participants indicated that they needed a better plan on what to do when barriers were encountered.

The engagement throughout the programme was high, with the majority of participants indicating they agreed or strongly agreed with the steps provided by the planning guide which were listed in the planning and self-regulation for the study. In addition, most participants identified that their rationale to participate in the program to reduce their sugar consumption is the most important factor. This provided them with a sense of purpose and motivation to participate in the programme. The unpopular part of the programme was when the participants was required to track their sugar daily. Participants also indicated that being aware of the healthy level of sugar consumption and knowing the amount of sugar content in various products were helpful with reducing of their sugar intake.

Participants showed a preference for a group-based approach which provided sugar reduction tools tailored for each participant's need. Several studies on the health of Pacific people described the impact of the group-based intervention which help increase knowledge and behaviour change in this population (Barwick, 2000). Most or 70.1% of the participants reported that setting their plans using the information materials were totally helpful towards achieving their goals. Many of the participants (83%) indicated that they found the peer support provided by the programme somewhat very helpful too. One third of the participants reported that they had total control over their sugar consumption. A further 13 participants reported that they were in control most of the time, and only three stated they had a little control over their sugar consumption. However, no participant was reported to have no control at all over their sugar consumption during the programme.

The Facebook support forum was a very popular group engagement tool. About 83% of participants found this forum, somewhat useful or very helpful. The participants used the Facebook forum to engage with each other regularly to share their journey and support each other to complete the 28 day programme. The daily posting of questions or tips on the

Facebook forum helped to empower and encourage the participants to refocus on their daily sugar reduction plan.

From the study, it was apparent that group-based brief intervention was feasible and it demonstrated the interest of the Pacific people to participate in the program to support reducing their sugar intake. The recruitment of participants was relatively easy. The study had access to the extensive Pacific networks of the facilitator and managed to recruit 44 participants within two months. It is hoped that future research on group-based study can build on this study and to develop recommended delivering action and coping planning within the Pasifika community in New Zealand. These findings reflect the feasibility of using the group-based study within the Pasifika community in Auckland.

This chapter also discusses the limitations of this study, and its implications for future research and conclusive finding for the study.

6.1 Strengths of the study

Several study strengths and learnings emerged from this feasibility group-based study. By using a mixed methods approach, the study was able to hear from participants as they completed a series of open questions in the client satisfaction questionnaire (adopted from Larsen et al., 1979). The findings from the information collected from the participants suggest that being educated equipped some participants with skills such as planning, setting goals and tracking their sugar intake. It was noted that participants who have increased their awareness of the amount of sugar consumed daily helped them to substitute consuming sugary drinks with other activities, and limit themselves from buying sugary food. It was also noted that the programme material information were most helpful which enable the participants to complete the 28 day programme. Group support tool such as Facebook was identified as positive forum for participants to share and encourage each other to follow their plans throughout the 28 day programme.

6.2 Limitation and future directions

Although, the current study has a number of strengths, it is not without weaknesses. The study highlighted that his was the first time that a brief group-based intervention is used to support Pacific people to reduce their sugar intake.in Auckland New Zealand. This was a feasibility study based on a small group (n=24), and there was no control group. Participants were recruited mainly through word of mouth and referral within established Pacific network of investigator. These recruitment methods did not cover all the Pacific ethnic groups. The study also recorded that the majority of participants were female (75%). The dominant ethnicity was Tongan (66.7%) and the remaining ethnicities were Samoans and Fijians. It is recommended that future effort should be made to recruit participants from Pacific churches to ensure it involves all the Pacific ethnic groups and wider Pacific community in New Zealand.

The other limitation for the study that was noted is that the peer support via a closed Facebook group was moderated by the facilitator. The facilitator posted daily questions or tips for group discussions and feedback. Even though it is important for the facilitator to empower and direct participants, the participants should have taken ownership of the Facebook discussion and posted their own questions, issues or concerns which arose from their daily experiences during the 28 day programme. This needs to be taken into account by future studies in this area.

6.3 Conclusion

Over all, these findings reflect the feasible to use group intervention support Pacific people to improve better health outcomes rather than people working individually. The 28 day programme discussion stated that Pacific people work well as a group-based environment, they are able to share information and positively encourage and support each other to achieve common goals. Importantly, finding from the study noted that social media such as Facebook can be used as a tool to support other material information provided by the programme to help Pacific people to learn new skills, encourage each other to keep healthy.

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Appendix A: Advertisement

Want to reduce your sugar consumption?

The Pasifika Way project looks at different strategies people use to reduce their sugar intake.

To participate, please visit www.changestrategies.ac.nz

Eligibility

- Willing to do a 28-day programme over 7 hours
- Ready to reduce your sugar consumption
- Must be 18+, of Pacific decent from the Auckland region.

What would you do?

- Fill in two short 10 minute surveys
- Attend two training sessions
    - Session 1 (3 hours) - to design programme designed to help you apply strategies to reduce your sugar consumption.
    - Session 2 (3 hours) – a follow-up evaluation session.
- Participate in a closed Facebook group discussion.

You will receive a $50 voucher for participating in the 28 day evaluation session.

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change strategies project

Approved by the University of Auckland Human Participants Ethics Committee on 15 August 2019 for three years.
Reference Number 022363

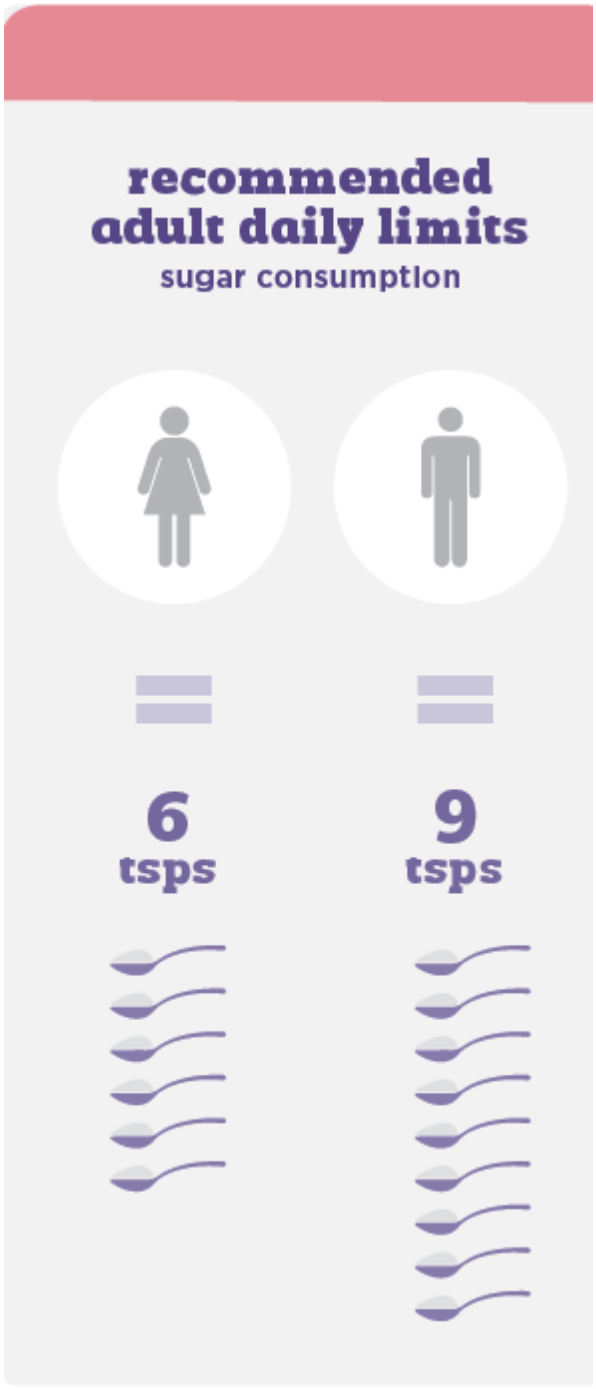
IF YOU ARE INTERESTED, PLEASE CONTACT US BELOW:

Change Strategies Project www.changestrategies.ac.nz

Appendix B: List of 12 Categories of Sugar Products (Screenshot)

Appendix C: Steps to support the Participants to set up for the 28 days (Screenshot)

Appendix D: WHO recommendation for adult daily limits sugar consumption



Appendix E: List of 16 Strategies for reducing sugar consumption (Screenshot)

Appendix F: RESET guidelines (Screenshot)

RESET

After beginning the journey with the Change Strategies project, some people wonder how to continue. The RESET booklet is the next step in the process. It draws on a wide range of views and expertise, including the experiences of other people who have reduced their sugar consumption. It also includes input from researchers, health promoters, and treatment providers.

This guideline has four parts:

1. Review the need to change
2. Strengthen your mindset
3. Re-establish goals & plans
4. Evaluate your progress

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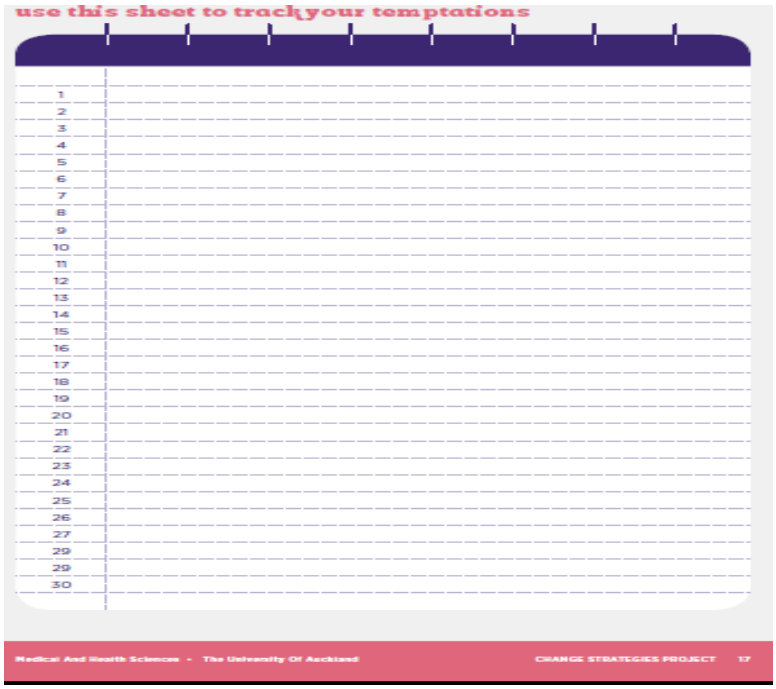
Appendix G: Sheet to track sugar consumption and temptations (Screenshot)



Appendix H: Participant Information Sheet

Social and Community Health
School of Population Health
The University of Auckland
Private Bag 92019
Auckland, New Zealand
TF 64 9 921 6573 ext.86573
Email: s.rodda@auckland.ac.nz

Participant Information Sheet

Project Title: 28-Day Sugar Challenge: The Pasifika Way

Principal Investigator: Dr Simone Rodda

Student Researcher: Telusila Vea

Introduction

This research is being conducted by Dr Simone Rodda (Senior Lecturer) from the School of Population Health, University of Auckland with Telusila Vea (Masters Student).

Project description and invitation to participate

You are invited to participate in a pilot study funded by the Health Research Council which investigates ways of supporting people so they can stick to their strategies to make changes in their life. The aim of this study is to help people better implement and maintain their strategies to reduce their sugar consumption. This pilot study is seeking 30 adults who are intending to make a change to the amount of sugar that they consume over the next 28-days. This study looks at how we can support you to do this better.

Project Procedures

To participate in this project, you must be wanting to reduce your sugar consumption over the next 28- days.
Participation will involve undertaking assessments and self-directed work including:

- A 10-minute online assessment at enrolment and at 28 days and 6-months.
- Height and weight are taken during **two visits** to Southern Cross Campus, Mangere by a member of our research team at the start of the intervention and at 28-days.
- Reading and completing of a set of materials over the intervention period.
- Participation in a closed Facebook group
- You will also be asked to participate in self-directed activities over the intervention period such as self-monitoring and self-evaluation.

We estimate that the intervention will in total take approximately 6 hours over the 28-day period.

Data storage and confidentiality

All responses provided by you will be treated confidentially and you will not be identified in any subsequent reporting. Access to the study data will be restricted. The online survey is encrypted. Data collected will be stored in a locked cabinet at the Grafton Campus of the University of Auckland, in the Department of Social and Community Health. Digital data will be stored on a protected University of Auckland server indefinite.

Right to withdraw from participation

Participation in this study is entirely voluntary. You can withdraw from the study at any time. Furthermore you can withdraw any data you have provided for this study up until the data collection phase is completed on 1st March 2020.

There is a slight chance that you may experience embarrassment or distress from participating in this study. This is because the study asks you to think about your behaviour and engage in a behavioural intervention. Through the course of the study you might also identify a more serious concern about your behaviour. If you do experience any significant embarrassment or stress or identify that you have a serious concern about your behaviour you should speak to the Principal Investigator Simone Rodda s.rodda@auckland.ac.nz +64 9 923 6573. If you believe you could benefit from counselling or further support please contact one of the services listed below:

Lifeline 0800 543 354
Healthline 0800 611 116

Contact details

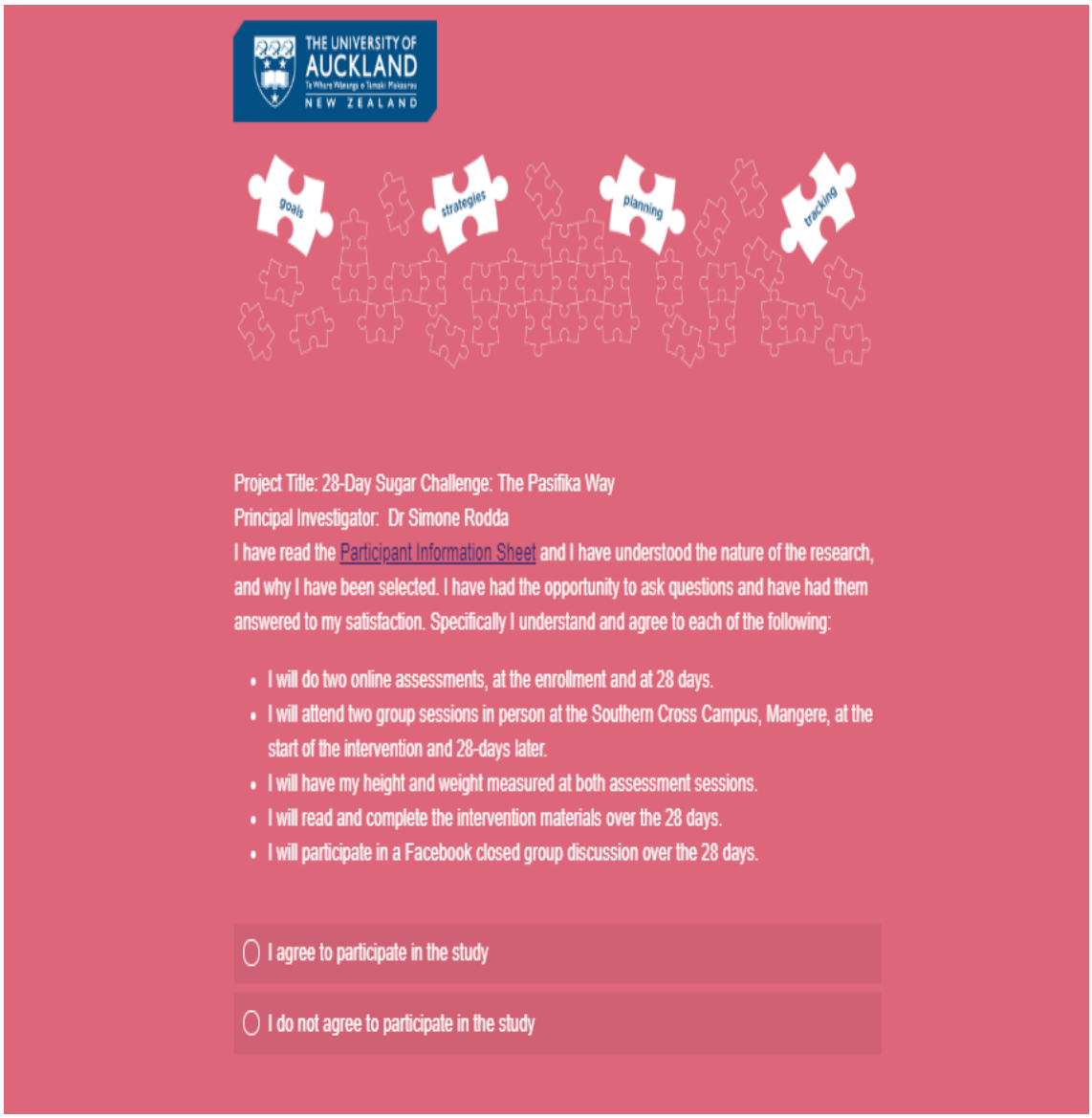
If you have any questions, concerns or complaints or for further information about the study please contact the Principal Investigator, Simone Rodda s.rodda@auckland.ac.nz +64 9 923 6573.

You can also contact the Head of Department, Social and Community Health: Dr David Newcombe, d.newcombe@auckland.ac.nz, 09-303 5932.

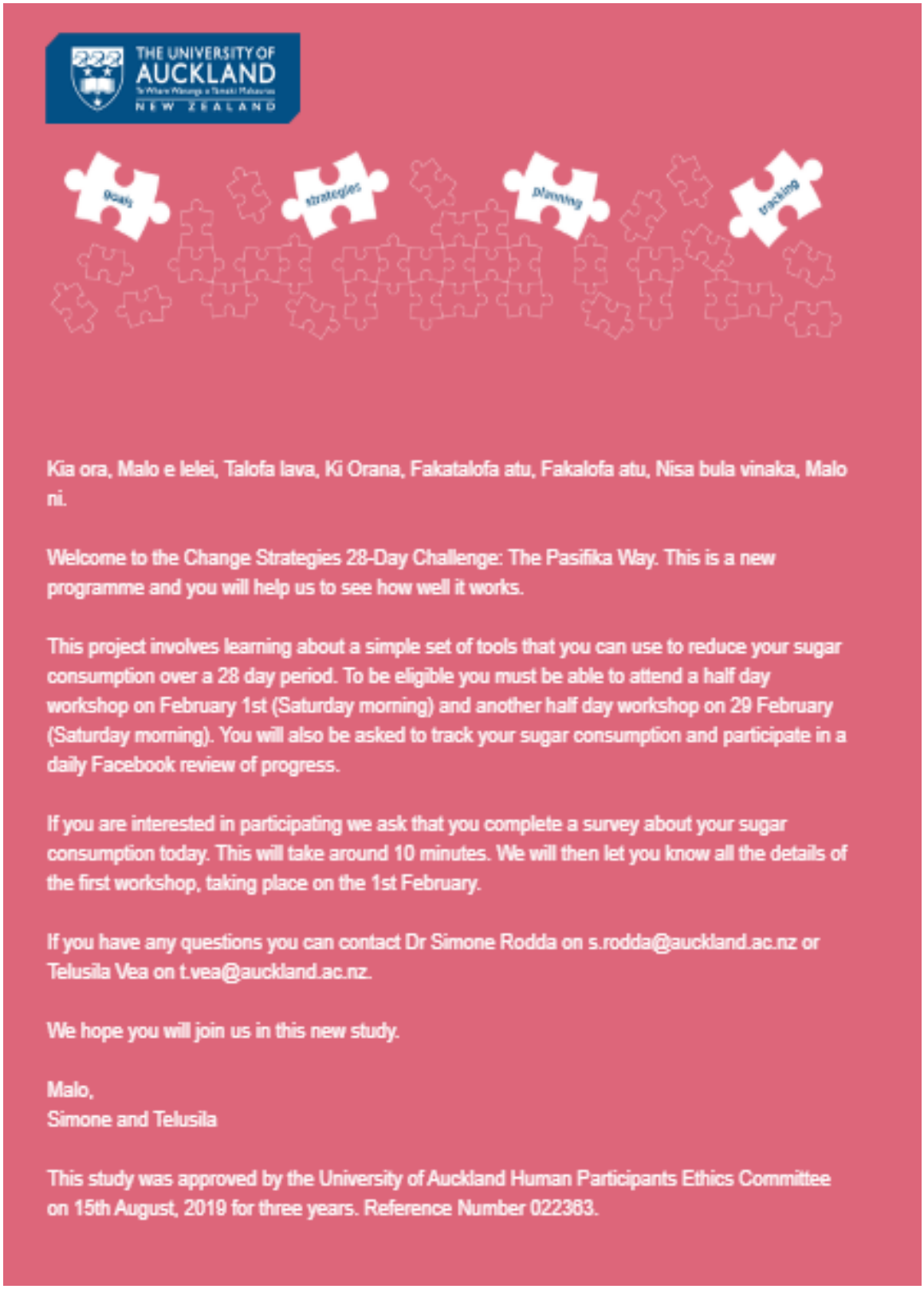
For any concerns regarding ethical issues you may contact the Chair, the University of Auckland Human Participants Ethics Committee, at the University of Auckland Research Office, Private Bag 92019, Auckland, 1142. Telephone 09 373-7599 ext. 843771. Email:ro-ethics@auckland.ac.nz.

Approved by the University of Auckland Human Participants Ethics Committee on 19 March 2019 for three years. Reference Number 022363.

Appendix I: Online Consent Form on Qualitrics (Screenshot)



Appendix J: Online Baseline Survey on Qualitrics (Screenshot)



Thanks for agreeing to participate in our study.

The first thing to do is go through the next few pages and answer the questions. It shouldn't take too long.

After that we'll email you the details about where and when to go for the group training sessions.

To get started please provide your contact details.

Your full name

Email address

Phone number

Let's see how much free sugar you've consumed over the past week. Free sugar is all sugar added to foods by the manufacturer, cook, or consumer, plus sugars naturally present in honey, syrups, and fruit juices.

Choose how often you have consumed foods from each group in the past week. Use serving size as a guide. If it's difficult to remember exactly how much and how often you have eaten the particular foods, please do your best to estimate.

So in the past week...

- Soft drinks (a can or a bottle about 300-500 ml) approx. 50 g of sugar
- Fruit juices (a glass 250 ml) approx. 30 g of sugar
- Energy and sport drinks (a can or a bottle about 300-500 ml)approx. 55 g of sugar
- Flavoured milkshake or smoothie (a glass 500 ml) approx. 35 g of sugar
- Flavoured hot drinks like hot chocolate (a cup about 350 ml) approx. 20 g of sugar
- Sugar, honey, natural syrups (one teaspoon) equivalent of 4 g of sugar
- Jams, marmalade,and sugary spreads (one tablespoon) approx. 8 g of sugar
- Sweets, chocolate and lollies (one portion 25 g) approx. 20 g of sugar
- Sweetened yogurt and ice cream (one portion 200 g) approx. 30 g of sugar
- Cake, muffins, cupcakes, deserts, pastries, slice, donuts & biscuits (one portion 150 g) approx. 60 g of sugar
- Breakfast cereals, muesli bar, fruit&nut bar (one portion 80 g of cereals or one bar) approx. 28 g of sugar
- Sauces, salad dressings, chutneys (one tablespoon) approx. 5 g of sugar

This question asks about any problems sugary products may have caused for you.

In the past 28 days:

	Never	Less than monthly	Once a month	2-3 times a month	Once a week	2-3 times a week	4-6 times a week	Every day
I consumed sugary foods or drinks to the point where I felt physically ill	○	○	○	○	○	○	○	○
I spent a lot of time feeling sluggish or tired from eating/drinking too many sugary products	○	○	○	○	○	○	○	○
I avoided work, school or social activities because I was afraid I would consume sugary products there	○	○	○	○	○	○	○	○
If I had emotional problems because I hadn't consumed certain sugary products, I would consume them to feel better	○	○	○	○	○	○	○	○
My sugar consumption behaviour caused me a lot of distress	○	○	○	○	○	○	○	○
I had significant problems in my life because of sugary foods and drinks. These may have been problems with my daily routine, work, school, friends, family, or health	○	○	○	○	○	○	○	○
My sugar consumption got in the way of me taking care of my family or doing household chores	○	○	○	○	○	○	○	○
I kept consuming sugary products in the same way even though it caused emotional problems	○	○	○	○	○	○	○	○
Consuming the same amount of sugary food or drink did not give me as much enjoyment as it used to	○	○	○	○	○	○	○	○
I had such strong urges to consume certain sugary foods or drinks that I couldn't think of anything else	○	○	○	○	○	○	○	○
I tried and failed to cut down or stop consuming certain sugary foods or drinks	○	○	○	○	○	○	○	○
I was so distracted by consuming sugary foods or drinks that I could have been hurt (e.g., when driving a car, crossing the street, operating machinery)	○	○	○	○	○	○	○	○
My friends or family were worried about how much sugar I consumed	○	○	○	○	○	○	○	○

Read each situation below and decide how confident (or certain) you are that you will be able to resist sugary products in each of the given difficult situations.

On a scale of 0 (not confident) to 10 (very confident), choose ONE number that reflects how confident you feel now about being able to successfully resist the desire to overeat.

I am confident that:

	0 Not at all confident	1	2	3	4	5	6	7	8	9	10 Very confident
I can resist sugary products when I am anxious (or nervous)	O	O	O	O	O	O	O	O	O	O	O
I can resist sugary products at the weekend	O	O	O	O	O	O	O	O	O	O	O
I can resist sugary products when I am tired	O	O	O	O	O	O	O	O	O	O	O
I can resist sugary products when I am watching TV (or using the computer)	O	O	O	O	O	O	O	O	O	O	O
I can resist sugary products when I am depressed (or down)	O	O	O	O	O	O	O	O	O	O	O
I can resist sugary products when I am in a social setting (or at a party)	O	O	O	O	O	O	O	O	O	O	O
I can resist sugary products when I am angry (or irritable)	O	O	O	O	O	O	O	O	O	O	O
I can resist sugary products when others are pressuring me to eat them	O	O	O	O	O	O	O	O	O	O	O

This set of questions will help us get an idea of the temptations and urges you have throughout the day. For each statement, please give us an appropriate measure of your sugar-related cravings.

The INTENSITY of my craving, that is, how much I desired sugar in the past 24 hours was

None at all	Slight	Moderate	Considerable	Extreme
○	○	○	○	○

The FREQUENCY of my craving, that is, how often I desired sugar in the past 24 hours was

Never	Almost never	Several times	Regularly	Constantly
○	○	○	○	○

The LENGTH of time I spent craving sugar in the past 24 hours was

None at all	Very short	Short	Somewhat long	Very long
○	○	○	○	○

Write in the NUMBER of times you think you had cravings during the past 24 hours

We are almost finished. Please let us know a little about who you are.

What is your age?

What is your gender?

Male	Female
○	○

What ethnic group do you most identify with?

- ☐ Maori
- ☐ Cook Islands Maori
- ☐ Samoan
- ☐ Tongan
- ☐ Niuean
- ☐ Tokelauan
- ☐ Fijian
- ☐ Other (please enter in text box)

What is your current employment status? Choose the option that best describes your situation

- ◯ Employed full time
- ◯ Employed part time
- ◯ Unemployed looking for full time work
- ◯ Unemployed looking for part time work
- ◯ Unemployed not looking for work
- ◯ Other

What is your family status?

- ◯ Single person household, no children and no other dependents (e.g. elderly parents living at home)
- ◯ Single with children still at home (including joint custody), or other dependents
- ◯ Single with children not living at home
- ◯ Couple with no children and no dependents
- ◯ Couple with children still at home, or other dependents
- ◯ Couple with children not living at home
- ◯ Group or shared household
- ◯ Some other arrangement

What is your total household income for the past 12 months?

- ◯ Less than $20,000
- ◯ $20,000 - $40,000
- ◯ $40,000 - $70,000
- ◯ $70,000 - $100,000
- ◯ $100,000+

That's the end of the survey. Congratulations on getting through it.

The next step is to attend the training session on 1st February 2020. This will take place at the following address, beginning at 8.45am:

Southern Cross Campus Auditorium
253 Buckland Road
Mangere East

You'll receive an email soon with information on the programme, how to get here on the training days and more.

Malo,
Simone and Telusila

Appendix K: Letter to Participants – Session 1

24th January 2020

Dear (Name)

Kia ora, Malo e lelei, Talofa lava, Ki Orana, Fakatalofa atu, Fakalofa atu, Nisa bula vinaka, Malo ni:

Thank you for completing the survey to enrol in the **"28 Day Sugar Program: The Pasifika Way project",** and well done for getting involved.

The aim of the programme is to give you some skills and strategies to cut down on sugar. Filling in the survey was the first step. The second step is to attend our half-day group training and planning session at the address below, on **Saturday the 1st February**, beginning at **8.45am**:

Southern Cross Campus Auditorium
253 Buckland Road
Mangere East

There is enough free parking at the venue for everyone – a map on how to get there is attached to this email (follow instruction below of where to go):

> **INSTRUCTION:** Please **do not use** the **Buckland Road entrance**. Turn into **Wickman Way from Buckland Road**, the access is about 150 metres from the **main gate/entrance** at Wickman Way. Please **drive pass** the **main gate** and after **150** metres, **turn right** into a drive way towards a **secured car park.** Right next to the parking area, is the auditorium. Please note someone will be there to further assist you.

Also attached to this email, is a booklet containing the Change Strategies we'll be talking about on Saturday the 1st February, 2020. There is a lot of information in here, don't read the whole book – just have a flick through to start getting ideas about what sort of things might work for you.
After this session you will track your sugar consumption over 28 days, get involved in a Facebook group with the other people involved, and attend the **second half-day group session**, beginning at **8:45am on Saturday 29th February, 2020.**

If you have any questions or concerns in the meantime, you can get in touch with me on this email address or by telephone.

Looking forward to being part of your journey.

Telusila Moala-Vea
Masters Student
Email: t.vea@auckland.ac.nz,, Mobile: 02102824507

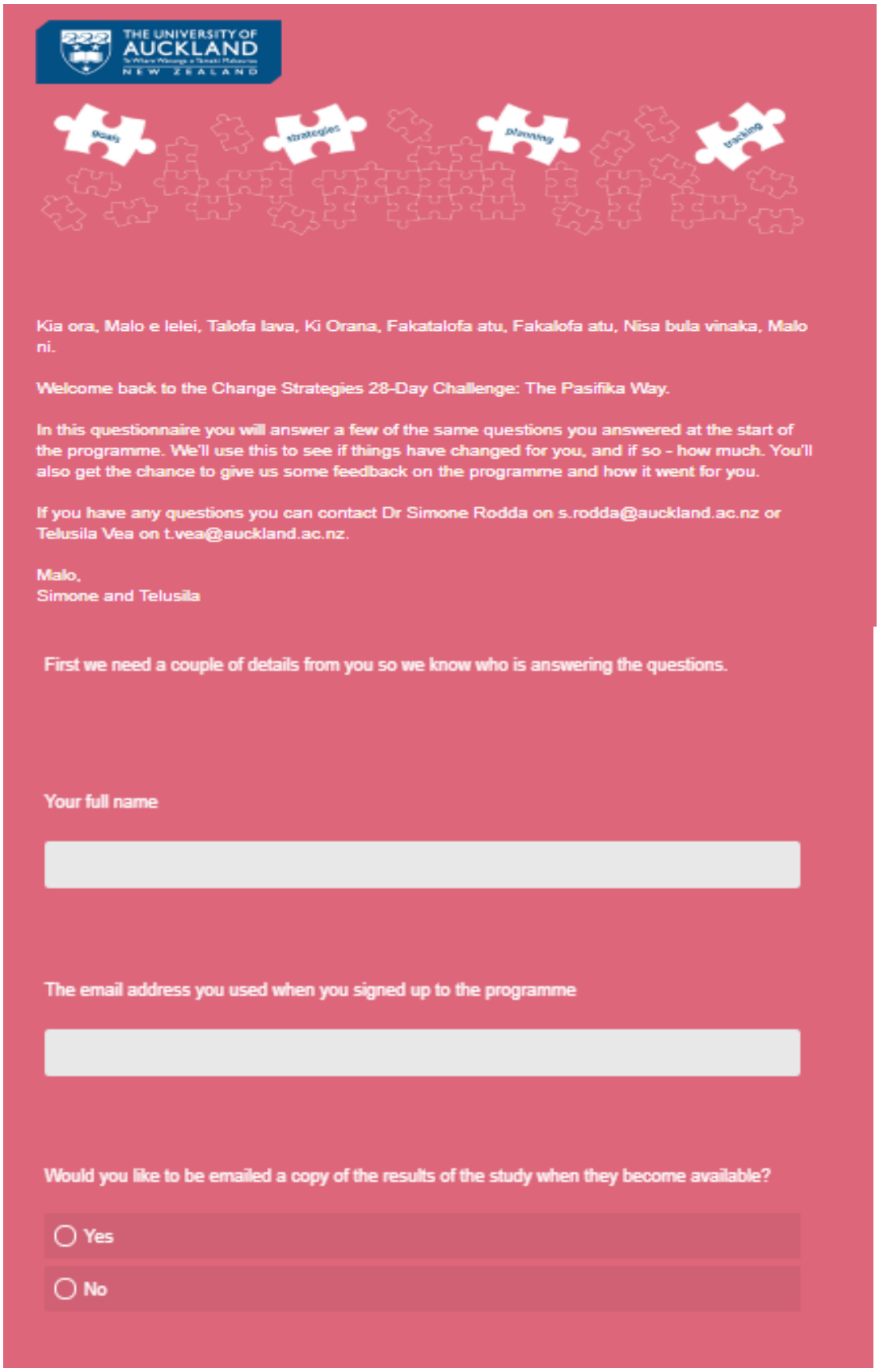
Appendix L: Timetable - Session 1

Timetable
"28 Day Sugar Program: A Pasifika Way"
1ST February 2020
8:30am – 12:00 noon

Facilitator: Telusila Vea
Co-facilitators: Natalia Booth, Matt Brittain, Jennifer Park, Paul Ware, Janine Kumar
Participants: Pacific Community Group

Time	Activity	Action By
8:45 – 9:00 am	Participants arrive Take measurements Sign up FB Group Tea and Coffee	Facilitators take height and weight- add Participants to FB Group
9:00 – 9:15 am	Opening Prayer Introduction of Facilitator/Co-Facilitators Brief overview/Timetable (PowerPoint Presentation)	Participants Facilitator and Co-Facilitators
9:15 – 9:30 am	Contract Introduce concept free sugar Icebreaker – **Group activity** Go over list of foods (PowerPoint Presentation)	Facilitators
9:30 – 10:00am	**Part 1** – Information on the intervention details – Overview of the intervention (PowerPoint Presentation)	Facilitators
10:00 -10:20 am	**Part 2** – Strategic Planning Session – Group Activity (PowerPoint Presentation)	Facilitators
10:20 – 10:40	**Break** – Refreshments	
10:40 – 11:40 am	**Part 3** Write Plans Work in small groups – Choose realistic strategies and plan (PowerPoint Presentation)	Participants Facilitator and Co-Facilitators to assist
11:40 – 12:00	Wrap-up – Sign up Facebook group Malo everyone Closing Prayer	Participants to sign up with the aid of Facilitators
Day 2	**Saturday 29 February** 2020 (check 28 days)	

Appendix M: Online Follow-up Survey on Qualitrics – Session 2 (Screenshot)



Let's see how much free sugar you've consumed over the past week. Free sugar is all sugar added to foods by the manufacturer, cook, or consumer, plus sugars naturally present in honey, syrups, and fruit juices.

Choose how often you have consumed foods from each group in the past week. Use serving size as a guide. If it's difficult to remember exactly how much and how often you have eaten the particular foods, please do your best to estimate.

So in the past week...

Soft drinks (a can or a bottle about 300-500 ml) approx. 50 g of sugar	
Fruit juices (a glass 250 ml) approx. 30 g of sugar	
Energy and sport drinks (a can or a bottle about 300-500 ml)approx. 55 g of sugar	
Flavoured milkshake or smoothie (a glass 500 ml) approx. 35 g of sugar	
Flavoured hot drinks like hot chocolate (a cup about 350 ml) approx. 20 g of sugar	
Sugar, honey, natural syrups (one teaspoon) equivalent of 4 g of sugar	
Jams, marmalade,and sugary spreads (one tablespoon) approx. 8 g of sugar	
Sweets, chocolate and lollies (one portion 25 g) approx. 20 g of sugar	
Sweetened yogurt and ice cream (one portion 200 g) approx. 30 g of sugar	
Cake, muffins, cupcakes, deserts, pastries, slice, donuts & biscuits (one portion 150 g) approx. 60 g of sugar	
Breakfast cereals, muesli bar, fruit&nut bar (one portion 80 g of cereals or one bar) approx. 28 g of sugar	
Sauces, salad dressings, chutneys (one tablespoon) approx. 5 g of sugar	

This question asks about any problems sugary products may have caused for you.

In the past 28 days:

	Never	Less than monthly	Once a month	2-3 times a month	Once a week	2-3 times a week	4-6 times a week	Every day
I consumed sugary foods or drinks to the point where I felt physically ill	○	○	○	○	○	○	○	○
I spent a lot of time feeling sluggish or tired from eating/drinking too many sugary products	○	○	○	○	○	○	○	○
I avoided work, school or social activities because I was afraid I would consume sugary products there	○	○	○	○	○	○	○	○
If I had emotional problems because I hadn't consumed certain sugary products, I would consume them to feel better	○	○	○	○	○	○	○	○
My sugar consumption behaviour caused me a lot of distress	○	○	○	○	○	○	○	○
I had significant problems in my life because of sugary foods and drinks. These may have been problems with my daily routine, work, school, friends, family, or health	○	○	○	○	○	○	○	○
My sugar consumption got in the way of me taking care of my family or doing household chores	○	○	○	○	○	○	○	○
I kept consuming sugary products in the same way even though it caused emotional problems	○	○	○	○	○	○	○	○
Consuming the same amount of sugary food or drink did not give me as much enjoyment as it used to	○	○	○	○	○	○	○	○
I had such strong urges to consume certain sugary foods or drinks that I couldn't think of anything else	○	○	○	○	○	○	○	○
I tried and failed to cut down or stop consuming certain sugary foods or drinks	○	○	○	○	○	○	○	○
I was so distracted by consuming sugary foods or drinks that I could have been hurt (e.g., when driving a car, crossing the street, operating machinery)	○	○	○	○	○	○	○	○
My friends or family were worried about how much sugar I consumed	○	○	○	○	○	○	○	○

Read each situation below and decide how confident (or certain) you are that you will be able to resist sugary products in each of the given difficult situations.

On a scale of 0 (not confident) to 10 (very confident), choose ONE number that reflects how confident you feel now about being able to successfully resist the desire to overeat.

I am confident that:

	0 Not at all confident	1	2	3	4	5	6	7	8	9	10 Very confident
I can resist sugary products when I am anxious (or nervous)	○	○	○	○	○	○	○	○	○	○	○
I can resist sugary products at the weekend	○	○	○	○	○	○	○	○	○	○	○
I can resist sugary products when I am tired	○	○	○	○	○	○	○	○	○	○	○
I can resist sugary products when I am watching TV (or using the computer)	○	○	○	○	○	○	○	○	○	○	○
I can resist sugary products when I am depressed (or down)	○	○	○	○	○	○	○	○	○	○	○
I can resist sugary products when I am in a social setting (or at a party)	○	○	○	○	○	○	○	○	○	○	○
I can resist sugary products when I am angry (or irritable)	○	○	○	○	○	○	○	○	○	○	○
I can resist sugary products when others are pressuring me to eat them	○	○	○	○	○	○	○	○	○	○	○

This set of questions will help us get an idea of the temptations and urges you have throughout the day. For each statement, please give us an appropriate measure of your sugar-related cravings.

The INTENSITY of my craving, that is, how much I desired sugar in the past 24 hours was

None at all	Slight	Moderate	Considerable	Extreme
○	○	○	○	○

The FREQUENCY of my craving, that is, how often I desired sugar in the past 24 hours was

Never	Almost never	Several times	Regularly	Constantly
○	○	○	○	○

The LENGTH of time I spent craving sugar in the past 24 hours was

None at all	Very short	Short	Somewhat long	Very long
○	○	○	○	○

Write in the NUMBER of times you think you had cravings during the past 24 hours

This set of statements will help us to understand how the planning and tracking elements of the program went for you.

Over the past 28 days I have...

	Strongly disagree	Disagree	Neither disagree nor agree	Agree	Strongly agree
Planned in detail HOW I would reduce my sugar consumption	○	○	○	○	○
Planned in detail WHEN I would reduce my sugar consumption	○	○	○	○	○
Planned in detail WHERE I would reduce my sugar consumption	○	○	○	○	○
I planned in advance WHAT to do if something got in the way of my plans	○	○	○	○	○
I planned in advance WHAT to do in difficult situations so that I stuck to my intention	○	○	○	○	○
I planned in advance WHAT to do if there were setbacks	○	○	○	○	○
I had a system in place on HOW I would track my sugar consumption every day	○	○	○	○	○
I had a system in place on WHEN I would track my sugar consumption every day	○	○	○	○	○
I had a system in place on WHERE I would track my sugar consumption every day	○	○	○	○	○

This question set will give us an idea of what you thought of the materials we used in the program and how helpful / unhelpful they were throughout.

Please answer each question on the program materials using the scale given.

	Not at all	Slightly	Somewhat	Mostly	Very	N/A
How satisfied were you with the program materials?	○	○	○	○	○	○
How useful did you find the information in the program materials?	○	○	○	○	○	○
How easy was the information to understand?	○	○	○	○	○	○
If difficulties continue or return, how likely would you be to come back to the program materials?	○	○	○	○	○	○

What was the most helpful part of the program materials?

What was the least helpful part of the program materials?

This is the last set of questions. They will ask you to think about your journey through the program, how it went, and how you might apply the things you've learned in the future.

How realistic was your overall sugar reduction goal?

How helpful were your plans for helping you to achieve your goal?

- ◯ Not at all helpful
- ◯ Somewhat helpful
- ◯ Mostly helpful
- ◯ Totally helpful

What skills in sugar reduction have you learned over the 28 days?

Who was in your support team? Did you find them supportive as you had hoped? Who else might be needed next time?

How helpful was the Facebook support group?

- ◯ Not at all helpful
- ◯ Somewhat helpful
- ◯ Very helpful

To what extent would you say you have regained control over your sugar consumption? (This is the power to choose when and if you consume sugar)

- ◯ I have no control over when I have sugar
- ◯ I have a little control over when I have sugar
- ◯ I have control most of the time over when I have sugar
- ◯ I have total control over when I have sugar

Based on your assessment of your goals and plans, what would you need to adjust for next time?

That's it! Thanks for filling in the survey and congratulations on completing the 28-day programme.

We will see you at the next group session this Saturday (29th February), where we will discuss how the programme went for all of you and what happens next.

See you at 0845am Saturday at Southern Cross Campus, Mangere - the same place we met for the first session.

Appendix N: Letter to Participants – Session 2

26 February, 2020

Dear (Name)

Kia ora, Malo e lelei, Talofa lava, Ki Orana, Fakatalofa atu, Fakalofa atu, Nisa bula vinaka, Malo ni:

You're nearing the end of the "28-day Sugar Program: The Pasifika Way". Congratulations! We hope you have been developing some useful skills and knowledge.

Please follow the below link to a survey and fill in your answers:
https://auckland.au1.qualtrics.com/jfe/form/SV_1RK2LiEBuRWJMvb
This is similar to the survey you completed when you first got involved in the programme, but also asks you some questions on your experiences through the programme. Filling in this survey earns you a $50 shopping voucher, which will be provided at this Saturday's group session.

The session this **Saturday, 29th February, 2020** and will begin at **8:45am** at the **Southern Cross Campus** – the same building as our last group meeting in DAY 1 (address below).

Southern Cross Campus Auditorium
253 Buckland Road
Mangere East

Don't forget to bring your workbooks!

We are all looking forward to seeing you there. If you have any questions or concerns in the meantime, you can get in touch with me by email or on the 'phone number given below.

Malo 'aupito

Telusila Vea
Masters Student
Email t.vea@auckland.ac.nz,Mobile: 02102824507

Appendix O: Timetable – Session 2

Timetable
"28 Day Sugar Program: A Pasifika Way"
29th February 2020, 8:30am – 12:00 noon
Southern Cross Campus, Mangere

Facilitator: Telusila Vea
Co-facilitators: Natalia Booth, Matt Brittain, Jennifer Park, Paul Ware, Janine Kumar
Participants: Pacific Community Group

Time	Activity	Action By
8:45 – 9:00 am	Participants arrive Take measurements Take copies of workbook Tea and Coffee	Facilitators take weight of Participants
9:00 – 9:15 am	Opening Prayer Introduction of Brief overview/Timetable (PowerPoint Presentation)	Participants Facilitator
9:15 – 10:30 am	**Part 1** • Review what worked well and not so well • Review Barriers and Solutions (Facilitators - Activities)	Facilitators
10:30 – 10:50 am	**Break** – Refreshments	
10:50 – 11:30am	**Part 2** • Skills Learnt • RESET Future Plans Strategic Planning Session – (Group Activity - PowerPoint Presentation)	Facilitators
11:30 – 11:45am	Wrap up - Malo everyone Closing Prayer Gift Vouchers	Facilitators Participants

Appendix P: Ethics Approval

Office of the Vice-Chancellor
Office of Research Strategy and Integrity (ORSI)

The University of Auckland
Private Bag 92019 Auckland, New Zealand

Level 11, 49 Symonds Street
Telephone: 64 9 373 7599
Extension: 83711 humanethics@auckland.ac.nz

UNIVERSITY OF AUCKLAND HUMAN PARTICIPANTS ETHICS COMMITTEE (UAHPEC)

15-Aug-2019

MEMORANDUM TO:
Dr Simone Rodda
Social and Community Health

Re: Request for amendment of Ethics Approval (Our Ref. 022363): Amendments Approved

The Committee considered the amendment(s) requested to your ethics approval for the project entitled Bridging the gap between intentions and behaviour for sugar reduction.

Approval was granted for the following amendments on 15-Aug-2019:
1. To deliver the intervention to participants in small groups (rather than individual delivery).
2. To remove the requirement for the taking of blood to measure sugar levels.
3. To remove the wait-list control.
4. Improvement of the advertising flyer.

The expiry date for your ethics approval is **19-Mar-2022.**

Completion of the project: In order that up-to-date records are maintained, you must notify the Committee once your project is completed.

Amendments to the project: Should you need to make any further changes to the project, please complete a new Amendment Request form giving full details along with revised documentation. If the project changes significantly, you are required to submit a new application to UAHPEC for approval.

The Chair and the members of the Committee would be happy to discuss general matters relating to ethics approvals. If you wish to do so, please contact the UAHPEC Ethics Administrators at humanethics@auckland.ac.nz in the first instance.

Please quote reference number **022363** on all communications with the UAHPEC regarding this application.

(This is a computer generated letter. No signature required.)

UAHPEC Administrators
University of Auckland Human Participants Ethics Committee

c.c. Head of Department / School, Social and Community Health, Mrs Natalia Kim, Prof. Nathan Consedine, Mr Matthew Brittain