Young Male and Female Perceptions and Experiences of Physical Activity in Apia, Samoa

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ABSTRACT

The purpose of the study was to investigate young people's perceptions and experiences of physical activity in Apia, Samoa. Physical inactivity is one of the main risk factors contributing to the prevalence of obesity in Samoa. Obesity and its health-related diseases are now the major causes of death in Samoa.

Focus group interviews and a survey were adopted for this study and the findings were based on the data collected from young people between 16 and 24 years of age. The findings indicated that a majority of young people have a positive attitude towards physical activity and recognize the link between physical activity and health. A high percentage of young people indicated that physical activity is important to improve health including getting fit and losing weight. However, there appears to be a significant portion of the respondents in the survey who think they are physically active while the reality is that they do not achieve the recommended national physical activity guidelines of 30 minutes a day over 5 or more days a week. A key aspect that emerged in the study was the importance of daily living tasks in young people's physical activity. Although not addressed in the survey, because it was based on a Western understanding of physical activity and daily life, the focus groups revealed that young people are regularly physically active through duties at home such as feeding the pigs, cooking meals on an earth oven and plantation work. This finding suggests the importance of conducting research focused on a Pacific perspective and taking into account the specific national contexts in which young people live.

The study identified constraints on the ability of young people to be physically active. A majority of the respondents cited cultural, environmental and discomfort factors related to physical activity as the main barriers. For instance, the respondents indicated that family duties, lack of footpaths, troublesome dogs and boredom were barriers to physical activity.

The evidence suggests that many young Samoans want to be more active and lose weight but they need help. The findings show that young people could be more active if their sources of encouragement such as friends, school, church and village are involved in physical activity promotion campaigns. A coordinated response engaging all health sector partners to establish and support youth physical activity and health initiatives is recommended. More importantly, the Government of Samoa could play a key leadership role in coordinating the sector to ensure that everyone accepts the responsibility of preventing and controlling the prevalence of obesity and lifestyle diseases by encouraging more people to be active.

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CHAPTER 1: INTRODUCTION

I am the eldest of four children, born in New Zealand to my father who is from Savaii, Lefaga in Upolu and my mother who was born and raised in Falelima, Savaii. They both immigrated to New Zealand in the late 1960s to work and subsequently provide their children with a better way of life for which I am grateful. For this reason, I wanted to give something back to my community by undertaking this project in the hope that it may benefit all Samoan peoples in New Zealand and Samoa, particularly in the area of physical activity and obesity.

Lifestyle diseases are not only prevalent in the Pacific region, they are also the leading cause of morbidity and mortality (Dorovolomo & Hammond, 2005). This debilitating health problem is placing a huge financial burden on Pacific Island nations as more people become predisposed to obesity and health-related problems. In Samoa in 2000, health care costs related to overweight and obesity problems accounted for nearly half of the annual health budget and this figure is likely to rise as the prevalence rate increases (Secretariat of the Pacific Community [SPC], 2000). This level of health expenditure is simply unsustainable. What was once a disease related to wealthy countries is now spreading into poor and middle income countries (WHO, 2005). Four in five chronic disease deaths occurred in developing countries according to a Global Report on Chronic Diseases in 2005 (WHO, 2005). Samoa is currently ranked the sixth most obese country (84%) in the world for people aged 15 years and over, behind five other Pacific countries.

Obesity-related diseases not only affect adults; obesity is now prevalent among young people, particularly in Pacific countries. Globally, cardiovascular diseases (CVDs) are the leading cause of death (WHO, 2007b). In fact more people die annually from CVDs than any other cause (WHO, 2007b). Coronary heart disease and stroke are the leading cause of early adult death in the Pacific region (SPC, 2000). In Samoa, 14% of the total population died from either heart disease or stroke in 2002 compared with 14% in Tonga and Argentina, and 23% in both USA and New Zealand (World Health Organization [WHO], 2009c). Over 80% of CVDs apparently occurred in low to middle income countries (WHO, 2007b). According to WHO (2009a), the rate appears to have declined in developed countries due to better prevention, diagnosis and treatment. However, WHO projects that 82% of increases in CVDs will occur in developing countries, of which Samoa is one. Cardiovascular disease is attributed to an unhealthy diet and

physical inactivity, and these are preventable or modifiable risk factors. Modifiable risk factors such as physical inactivity are responsible for 80% of CVD (WHO, 2005).

The causes of obesity are linked to modernization and urbanisation. The research clearly indicates that people living in urban areas are more likely to become obese (Curtis, 2004; Mavoa & McCabe, 2008; SPC, 2000; Unwin & Alberti, 2006; WHO, 2008d) and develop physical health problems such as Type 2 diabetes and cardiovascular disease (Szmedra, Sharma & Rozmus, 2007; Tukuitonga, 2007; WHO, 2002a). People in urban settings are more likely to eat more imported foods than local foods (Evans et al., 2001; Hughes & Lawrence, 2005) and develop a sedentary lifestyle (Aiavao, 2006; WHO, 2005).

It is widely accepted that the main cause of obesity is related to people not expending enough stored food energy in relation to the rate that food energy is being consumed. As was mentioned earlier, obesity is strongly linked to poor dietary habits and physical inactivity (Dorovolomo & Hammond, 2005). The decrease in physical activity levels in Samoa appears to be related to a change in the work environment particularly in urban places. Farming and fishing jobs have been replaced by more sedentary types of work (Rawlings, 1999; Szmedra et al., 2007; Tukuitonga, 2007; WHO, 2002a). In addition, people traditionally used to walk everywhere as the main mode of travel but less people walk because it is more convenient to use a bus (Dawn Rasmussen, personal communication, September 11 September, 2008).

The research also suggests that Pacific people have the knowledge to change their poor dietary habits and sedentary lifestyles but choose not to, despite knowing the risk linked to premature death, pain and suffering (Szmedra et al., 2007).

Samoan attitudes to eating and overeating may be linked to an inherent cultural belief in some Pacific countries that it is normal to be overweight or obese (Mavoa & McCabe, 2008). Some countries deliberately fatten up their women because it is unacceptable to be thin and a large body size is seen as a sign of beauty in Pacific countries (Curtis, 2004; Pollock, 2001; Ulijaszek, 2007). Furthermore, being overweight is associated with wealth and high social status in the village (Mavoa & McCabe, 2008).

Also, it appears that Pacific Island nations have been forced to yield to global economic pressure to accept the importation of poor quality foods in order to

continue receiving foreign aid. There is compelling evidence to show that Pacific Island countries lack the capacity to stop the importation of poor quality foods because of the constraints placed on them by their trading partners (Evans et al., 2001; Hughes & Lawrence, 2005). For example, it is clearly evident that mutton flaps are linked to obesity but the Food and Agriculture Organization (FAO) and World Trade Organization (WTO) require scientific evidence to prove that the product is in fact a risk to people's health before allowing Pacific countries to stop importing it. However, most Pacific Island countries do not have the resources to conduct the research.

Reducing or eliminating the causes of obesity requires structural or regulatory changes to food and health policy to have an immediate effect as well as active prevention measures like health promotion campaigns.

Obesity is prevalent in Samoa. Certainly, the evidence shows that if people continue to eat poorly and do not exercise then they are more likely to develop chronic diseases and die early or suffer a reduced quality of life. For these reasons, my main research questions are:

a. What are young men's and women's perceptions and experiences of physical activity and health?
b. What opportunities will make it more likely that Samoan people aged 16 to 24 years, residing in urban settings, will participate in physical activity to reduce or prevent the health problems related to being overweight or obese?
c. What barriers make it less likely that they will participate in physical activity?

CHAPTER 2: LITERATURE REVIEW

Introduction

In this chapter, the research reviewed is based on physical activity and lifestyle diseases in Pacific countries, in particular Samoan populations. Although there is a great need for such research, there remains a dearth of research with regards to considering levels of physical activity and obesity in Samoa (Tukuitonga, 2007).

According to Dr Jan Pryor, Professor and Director of Research at the Fiji School of Medicine, health research in the Pacific is chronically underdeveloped (Pryor, 2007). Pryor conducted a study in 15 countries, including Samoa, to determine the current situation of health research in the Pacific. The results revealed that some countries lacked a clear policy on health research and some countries were challenged to provide tangible evidence that the research outputs addressed priority health issues, informed and were being applied to policy, and were being implemented into health care practices (WHO, 2008a). Research capacity in the Pacific island countries needs strengthening to include a dedicated unit responsible for health research, legislation addressing health research, policy to define health research priorities, more mentors and role models, and career paths (Pryor, 2007; WHO, 2008a).

This review draws on a wide range of sources including media press releases, government and WHO reports, and conference papers as well as published research. In addition, the literature review has been expanded to consider published research in countries such as New Zealand, Australia, American Samoa and the United States (focused on Hawaii) which have significant Samoan populations. I also draw upon research related to Pacific peoples in Tonga, Fiji, Kiribati, Guam, Wallis and Futuna, Marshall Islands, Vanuatu and Nauru which may help us to understand the impact of obesity and physical activity in Samoa. Equally important, I also draw on this research to identify effective prevention and control programmes that have been adopted by other countries with high Pacific populations such as New Zealand and the United States. These ideas could help us to support obesity prevention and control programmes that currently exist or could be implemented in Samoa to reduce the burgeoning growth of obesity and other lifestyle diseases.

Global Health Status: Lifestyle Diseases

'*Obesity poses one of the greatest threats in human health and wellbeing in the 21st Century*' (World Health Organization, 2002b, p. 5)

On a global scale, lifestyle diseases, such as type 2 diabetes, hypertension and stroke, are among the leading causes of death in the world (WHO, 2005). Sixty percent of all deaths (58 million) in 2005 were due to such diseases (WHO, 2005; WHO, 2007a). In 2005 an estimated 1.6 billion people were overweight and at least 400 million people over 15 years of age were obese (WHO, 2006). By 2015, WHO has projected that over 2.3 billion people will be overweight, at least 700 million will be obese (WHO, 2006) and deaths from chronic diseases will increase by 17% (WHO, 2005). Cardiovascular diseases will still be the leading cause of deaths (WHO, 2005). Obesity and sedentary lifestyles were once a problem associated with wealthy nations but the same plight is expanding into developing countries, with lifestyle diseases now affecting low and middle income nations (WHO, 2005). In fact, 80% of chronic diseases occur in developing countries (WHO, 2005; WHO, 2007a). Consequently these problems are now expanding into the South Pacific region. Obesity is caused by two main factors: increased consumption of foods saturated in fat and sugars and lack of physical activity (Dorovolomo & Hammond, 2005; Hohepa, Schofield & Kolt, 2004; SPC, 2002). Physical inactivity appears to be compounding the obesity problem; over 60% of the global population fails to meet the recommended guidelines for physical activity to improve health (WHO, 2009b; WHO, 2008b). In 2002, physical inactivity accounted for approximately 1.9 million deaths globally and it is projected to get worse (WHO, 2002b). Furthermore, physical inactivity is estimated to cause about 10-16% of cases related to cancer such as colon cancer, diabetes, and about 22% of coronary heart disease (WHO, 2009b; WHO 2008b). In 2005, physical inactivity was linked to more than 35 million deaths caused by non-communicable diseases (WHO, 2008b). Physical inactivity was considered one of the main risk factors contributing to the prolonged effects of obesity and related diseases in the developed and developing world (Dorovolomo & Hammond, 2005). The trend in decreased physical activity levels is caused by an increase in less active forms of recreation, alternative modes of transport and an increase in urbanisation; in short, lifestyle factors. Physical inactivity is prevalent in both developed and developing countries. Combined with non-communicable diseases it

has become the greatest health problem in most countries in the world (WHO, 2008b). The next section is focused on investigating the health status of Pacific peoples in New Zealand, Pacific Island nations and Samoa.

Health Status of Pacific Island Countries

Pacific peoples are increasingly overweight and/or obese

The obesity epidemic appears to be increasing in the Pacific and the evidence indicates that more Pacific people will die from obesity-related diseases in the future. More women appear to be obese than men although more males are overweight than women (SPC, 2002; WHO, 2002a; WHO, 2001). Lifestyle risk factors appear to be causing obesity in the Pacific, such as imported foods and physical inactivity. Compounding the obesity problem is that chronic lifestyle diseases such as heart disease and cancer are the two leading causes of deaths in the Pacific. Furthermore, obesity levels in the Pacific appear to exceed levels in some developed countries. The prevalence of overweight and/or obesity is high in Pacific countries and it is becoming more noticeable among young people. For instance, Pacific youth in New Zealand and Tonga were more overweight and obese compared with their Pacific peers in Australia and Fiji according to the results of the Obesity Prevention in the Pacific study which was conducted in 2004 across four Pacific countries: Australia, Fiji, New Zealand and Tonga (Utter, Faeamani, Malakellis, Vanualailai, Kremer, Scragg & Swinburn, 2008). Pacific Island nations are the most overweight or obese in the world (WHO, 2005). The highest rates of obesity appear to be in the South Pacific (Burslem, 2004) which includes eight of the world's most overweight countries (see *Table 1*). Samoans are ranked fifth for men and sixth for women.

Pacific peoples are increasingly dying from lifestyle diseases, many of which are linked to obesity

Of even greater concern is that more Pacific people are likely to die from lifestyle diseases associated with obesity (Szmedra, Sharma & Rozmus, 2006). Lifestyle diseases such as diabetes and cardiovascular disease are widespread and increasing throughout the Pacific (Dorovolomo & Hammond, 2005; Ezeamama, Viali, Tuitele & McGarvey, 2006; Tukuitonga, 2007). Lifestyle diseases appear to be attributed to a growth in urbanisation, increasing changes in dietary habits, decrease in physical activity, increased use of motorized vehicles, importation of fatty foods, machines that have replaced human activities, and the abandonment of fishing,

Table 1. ***Top 10 Countries in the World with the Highest Obesity Prevalence Rate for Men and Women Aged 15 Years and Over, 2005 (WHO Infobase, 2005)***

Men		Women	
Nauru	83.2%	Nauru	78.8%
Cook Islands	69.5%	Tonga	76.1%
Federated States Micronesia	66.2%	Federated States of Micronesia	72.9%
Tonga	60.7%	Cook Islands	70.8%
Samoa	38.4%	Niue	61.0%
Niue	36.8%	Samoa	57.3%
United States	36.5%	Palau	55.0%
Argentina	31.4%	Kuwait	52.9%
Palau	31.2%	Barbados	50.8%
Kiribati	29.8%	Trinidad & Tobago	46.1%

hunting and traditional food preparation, processing and production practices (Szmedra et al., 2007; Tukuitonga, 2007; WHO, 2002a). According to a Western Pacific Region Health meeting in 2007 (Port Vila, Vanuatu), lifestyle diseases were the leading cause of death in all Pacific Island countries. Lifestyle diseases caused 70-75% of all deaths in each country except in Papua New Guinea (Tukuitonga, 2007). Cardiovascular diseases and cancer were the two leading causes of death within the lifestyle diseases group. These diseases accounted for 5-15% of all lifestyle-related deaths (Tukuitonga, 2007).

New Zealand is a developed country which is home to many Pacific immigrants, particularly from Samoa, Tonga and the Cook Islands. The next section is focused on exploring health trends in New Zealand, particularly related to obesity and physical activity which may help us to understand the obesity problems in Pacific countries, particularly Samoa.

Health Status of New Zealand Pacific Populations

This section is focused on reviewing existing research studies that make claims about the health status of Pacific peoples in New Zealand, particularly about obesity. Where possible, results related to Pacific peoples are highlighted to draw attention to obesity issues that may affect other Pacific nations, particularly Samoa.

Pacific population demographic profile in New Zealand

In 2006, Pacific peoples accounted for 6.9% (265,974) of the total population in New Zealand. Samoa has the biggest community (49%) followed by Cook Islands (22%), Tongan (19%), Niuean (8%), Fijian (4%), Tokelauan (3%), and Tuvaluan (1%) peoples (Ministry of Health, 2007). In 2006, 37.7% of the Pacific population was under 15 years compared to 21.3% of the total population and the median age was 21 compared to the national average of 35 years. The majority (67%) of the Pacific population was living in Auckland (as was 66% of the Samoan population), and 60% of the population was born in New Zealand, the same percentage as 60% the Samoan population (Ministry of Health, 2007).

Obesity trends in New Zealand and the Pacific region

The prevalence of obesity appears to affect all Pacific populations in the Pacific region, which indicates that the problem is not unique to Samoa. In fact, the high rate of obesity in New Zealand across all Pacific populations is similar to trends in the Pacific region. Thus, there is value in including research on other Pacific nations in the review, particularly in exploring the risk factors that cause obesity and identifying prevention and control strategies that could reduce obesity levels.

The New Zealand Ministry of Social Development Social Report (Ministry of Social Development [MSD], 2008) revealed that there is a large disparity between obesity rates by ethnicity. Obesity levels among Pacific adults and young people are disproportionate with other ethnic groups (MSD, 2008). Pacific peoples aged 15 years and over had higher obesity rates (65%) than the total population in this age group compared with European/other (23%) ethnic groups in 2006/2007 (Jeffs, 2006; Ministry of Social Development, 2008). Pacific children aged 5-14 years (26%) in 2006/2007 were more obese than European/other (5%) ethnic groups. Moreover, the obesity prevalence rate among Pacific peoples has increased by over 10% since 1997 (Ministry of Social Development, 2008).

Based on a study by Hohepa, Schofield and Kolt in 2004 about obesity and physical inactivity among youth in New Zealand aged 13-17 years, obesity is a health threat to young people and the future of the adult population. Their study indicated that young people were at risk of becoming overweight or obese and physically inactive (Hohepa et al., 2004). Indeed, a recent study by Teevale, Thomas and Scragg (2007) about obesity in Pacific adolescents aged 13-17 years revealed that a high proportion of young people were obese compared to other

ethnic groups. Three in 10 Pacific young people were obese compared to two in 10 Maori, one in 10 European followed by one in 11 Asian ethnic groups (Teevale et al., 2007).

Coronary heart disease and diabetes trends in New Zealand and the Pacific region

More Pacific populations, particularly males, die from coronary heart disease. Similarly, the prevalence of diabetes affects more Pacific peoples than the total population, particularly females. Heart disease and diabetes are linked to modifiable risk factors including being overweight and obese, physical inactivity and inadequate fruit and vegetable consumption (Jeffs, 2006; Ministry of Health, 2004). It appears that the prevalence of coronary heart disease and diabetes across all Pacific populations in New Zealand is similar to the trends in the Pacific region.

According to the results of the Ministry of Health New Zealand Health Survey 2002/03, lifestyle diseases such as coronary heart disease are one of the leading causes of deaths among Pacific populations (MOH, 2004). Coronary heart disease is the leading cause of mortality in New Zealand, accounting for about 25% of all deaths (MOH, 2004). Heart disease is commonly caused by the narrowing of the coronary arteries that supply blood and oxygen to the heart (Ministry of Health, 2004). More Pacific peoples die from cardiovascular disease (i.e., angina, heart attack, heart failure or abnormal heart rhythm) than those of the total population, particularly males (Ministry of Health, 2005).

It appears that diabetes is a leading cause of morbidity and mortality among Pacific populations (Ministry of Health, 2004). Diabetes was more prevalent in Pacific ethnic groups (20%) compared with European/other (5%), Maori (15%), and Asian (16.5%) ethnic groups (Jeffs, 2006; Ministry of Health, 2004). Pacific peoples were more likely to be diagnosed with diabetes and receive medical treatment compared with the total population. According to the 2002/03 New Zealand Health Survey, one in 8 (12%) Pacific females were diagnosed with diabetes compared with one in 12 (8%) males (Ministry of Health, 2004). Around 80% of Pacific peoples diagnosed (79% males; 72% females) received medical treatment (i.e., insulin injections, tablets or pills) (Ministry of Health, 2004).

Health Status of Samoans Living in Samoa

The prevalence of obesity and other lifestyle-related health diseases among Pacific populations in New Zealand, including the large urban Samoan population, appear

to be similar to trends in Samoa. It appears that obesity has increased over time in Samoa and it is more prevalent in urban and peri-urban areas as a result of internal rural urban migration, poor nutrition and physical inactivity. More females appear to be physically inactive and obese compared with males. For example, in Table 1 while 57.3% of females were estimated to be obese, the percentage was much lower for males at 38.4%. This trend is similar to other Pacific populations in the Pacific region. Also, there appear to be more undiagnosed cases of people with diabetes and hypertension than known cases, particularly in young people (WHO, 2008d). The prevalence of lifestyle diseases is increasingly becoming a significant social and financial burden in Pacific countries as more and more people become exposed to obesity risk factors, which requires a coordinated approach to prevent and control obesity and other health-related diseases.

Demographic profile

In 2007, the population of Samoa was estimated at 184,650 (WHO, 2008d). The World Health Organization (2005) projected that young people under 24 years will make up over 60% of the total population (193, 000) in 2009. Samoa is divided into four regions: Apia Urban Area (AUA), North West Upolu, Rest of Upolu (including Manono and Apolima Islands) and Savaii (WHO, 2008d). The AUA is the urban area and the other regions comprise the rural population (WHO, 2008d). Two in 10 (22.5%) people live in the AUA including peri-urban villages (Ministry of Health, Samoa, 2006).

Increase in lifestyle diseases

According to the Ministry of Health 2005/06 report, the 10 leading causes of death between 1999 and 2002 were linked to diabetes, cancer, hypertension, chronic low respiratory diseases and ischaemic heart diseases (see also Aiavao, 2006). Of these lifestyle diseases, circulatory and respiratory diseases were the two leading causes of death in Samoa (Aiavao, 2006). In addition, diabetes mellitus, and chronic lower respiratory diseases were two of the top 10 causes of hospitalization (Ministry of Health, 2007). The following figures portray a grim picture of how prevalent lifestyle diseases have been in Samoa. The rate of diabetes increased from 9.8% in 1987 to 23% in 2001 and the obesity rates nearly tripled from 25.5% in 1978 to 50.3% in 1991 and 67.5% in 2001 (Ministry of Finance, 2008). These results suggest that the prevalence of diseases related to unhealthy diets and sedentary lifestyles appears to have increased or worsened.

The worst statistics are for urban Samoans and women. According to The Samoa Human Development Report (Aiavao, 2006) and WHO (2008d), between 52.7% and 57% of the Samoan population was obese. These results are based on the percentage of people out of the total population who were obese compared with the percentage of total males and females who were obese (as was reported in Table 1). Obesity was more common in Apia (61.2%) compared with Rural Upolu (56.9%) and Savaii (52.8%), with the rate higher for women than men (WHO, 2008d). Six in 10 (67.4%) females were estimated to be obese compared with four in 10 (48.4%) males (Aiavao, 2006).

High rates of undiagnosed diseases

Interestingly, for every known case of diabetes there were more undiagnosed cases particularly in younger people (WHO, 2008d). Hypertension was another lifestyle disease that was more common in Apia (23.5%) compared with Rural Upolu (18.6%) and Savaii (21.2%). High blood pressure was more prevalent in males, of whom one in four (24.2%) had this disease compared with almost two in 10 (18.2%) females (WHO, 2008d). Interestingly, more than 90% of those who have high blood pressure do not know they have it and the rate of known cases to undiagnosed cases was higher in younger people; 1:22 (WHO, 2008d).

Increasing rates of physical inactivity and poor nutrition

An increase in physical inactivity and poor nutrition associated with a Western lifestyle are well documented risk factors in obesity studies worldwide that also appear to be linked to the increase in lifestyle diseases, particularly in Samoa (WHO, 2008d). For instance, three in 10 (35.6%) Samoans did not eat any fruit, two in 10 (21%) did very little or no physical activity, almost three in 10 (28%) people in Apia were inactive compared with one in 10 (15%) people in rural areas, and two in 10 (27.3%) females were less active compared with one in 10 (14.8%) males (WHO, 2008d).

Causes and Impact of Lifestyle Diseases in the Pacific Region

This section is focused on highlighting the risk factors that appear to cause obesity in the Pacific region. Based on published research, international workshops and proceedings of meetings about obesity in the Pacific, the researchers generally agree that the following factors are strongly linked to obesity: colonization, urbanization, globalization, physical inactivity, and cultural beliefs about body shape or size. Each will be discussed in this section to help us understand the

impact it is having on Pacific peoples' lifestyles today and in the future with a view to identifying aspects of effective prevention and control programmes that could reduce the prevalence of obesity in the Pacific region, particularly Samoa.

Colonization

Colonialism has had a significant impact on eating and physical activity patterns of Pacific peoples (Mavoa & McCabe, 2008). Prior to colonial contact, Pacific cultures involved mainly subsistence farming and people worked together to meet each other's needs, particularly for survival (Finau et al., 2004). Pacific peoples ate traditional foods such as fruit, vegetables and fish, all rich in nutritional value (Szmedra et al., 2006). Pacific peoples were described as fit when Europeans began arriving (Curtis, 2004; Dorovolomo & Hammond, 2005; Hughes & Lawrence, 2005) and prior to World War II a survey revealed that there was very little evidence of lifestyle diseases (Szmedra et al., 2006). The early settlers helped engineer a change in the traditional way of life and introduced foods high in fat and sugar (Szmedra et al., 2006). Since 1963 the level of imported foods has increased and has replaced traditional sources of fat and energy in the Pacific Islands (Evans et al., 2001; Hughes and Lawrence, 2005). Dietary changes have created nutrition problems that were not clearly evident before colonization (Dorovolomo & Hammond, 2005; Hughes & Lawrence, 2005; Peteru, 1996; Yari & Duncan, 2004) As Ringrose and Zimmet (cited in Curtis, 2004) point out:

> The traditional foods of the Islands such as fresh fruit, meat, and local fruit and vegetables have been replaced by rice, sugar, flour, canned meats, canned fruit and vegetables, soft drink and beer. The diet is high in calories and with little nutritional value. (p. 38; see also SPC, 2000)

Based on a study of globalization, diet and health in Tonga, Evans, Sinclair, Fusimalohi and Liava'a (2001) agree that Pacific Island countries have become increasingly dependent on food imports since the 1960s. For instance, Tonga imported 2941 tonnes of mutton flaps in 1996, two times more than the 1435 tonnes of mutton flaps that were consumed in 1976. In 1989, 789 tonnes of chicken parts were imported and the volume increased threefold in 1999 to 2569 tonnes. In the same period, 59 tonnes of sausages were imported compared with a massive increase to 505 tonnes of sausages that were imported in 1999 (Evans et al., 2001). That is, imported meat consumption increased from 35 to 56 kilos per person between 1989 and 1999 (Evans et al., 2001). Consequently, food imports have reduced the capacity of Pacific Island nations to develop growth in traditional food

supply production (Evans et al., 2001; Hughes & Lawrence, 2005). Evans et al.'s results showed that the Tongans not only preferred eating imported foods, in spite of being aware that traditional foods had more nutritional value, but food imports were cheaper to buy than locally produced low fat food sources, particularly for Pacific peoples living in urban areas on low incomes: "…fish generally cost between 15% and 50% more than mutton flaps or imported chicken parts" (Evans et al., 2001, p. 859; see also Pollock, 2001). As a result fewer people were willing to work the land and people were leaving their plantations (Hughes & Lawrence, 2005; Peteru, 1996). Evans et al. argue that the most effective way of reversing the obesity epidemic appears to be related to restricting the flow of less healthy foods by changing food trade policies between Pacific countries and their trading partners. However, this is not as straightforward a process as it looks. According to Article XX of the General Agreement on Trade and Tariffs (GATT), member countries of the World Trade Organization (WTO) are guaranteed the right to restrict imports of products when those measures are required to protect the health of humans (Evans et al., 2001; Hughes & Lawrence, 2005; World Trade Organization/World Health Organization [WTO/WHO], 2002). Imports were classified into four categories; legal and beneficial; legal and doubtful benefit; legal and harmful; illegal and harmful (Evans et al., 2001). More recently, WTO agreements relevant to health (WTO/WHO, 2002) stipulate that the exception only covers measures that are taken to protect human life from plant- or animal-carried diseases. Surprisingly, food imports such as mutton flaps, chicken parts and turkey tails do not qualify as hazardous commodities unless they are contaminated (Evans et al., 2001). Furthermore, countries that intend to restrict trade to protect human life may be required to provide scientific evidence to show that there is in fact a risk to health and that the measures, particularly in regards to health, are not used to restrict trade (Hughes & Lawrence, 2005; WTO/WHO, 2002). Meeting the WTO scientific justification agreement could be problematic for Pacific countries that lack the capability skills and resources to carry out scientific studies to construct a case to restrict the trade of unhealthy foods, particularly when the exception clause does not cover unhealthy foods (Hughes & Lawrence, 2005). In spite of these barriers, Evans et al. indicate that nutrition education programmes (and other intervention programmes such as public campaigns) cannot solve diet-related non-communicable diseases alone while it appears that changing economic trade policies can help solve the problem. In 2007, Samoa imposed a ban on turkey tail

food imports from the United States which it believes will help reduce the rate of obesity and their health related diseases (Radio New Zealand International, 2007).

Urbanization

People being overweight and/or obese appears to be more prevalent in urban areas (Curtis, 2004; Mavoa & McCabe, 2008; SPC, 2000; Unwin and Alberti, 2006; WHO, 2008d). The prevalence of overweight people in urban areas has become a common occurrence throughout the Pacific region (Szmedra et al., 2006). In Samoa, people who live in urban areas are more likely to adopt poor eating habits and develop a sedentary lifestyle which is consistent with Aiavao's (2006) comment that,

> Samoa is beginning to experience the worst of both worlds: traditional risks associated with 'vulnerable groups' resulting in poverty and the new and emerging risks associated with more people moving from rural areas to the urban region, adopting urban lifestyles of fast food…and physical inactivity which are making Samoans less healthy. (p. 76)

A study by Heine (1984) entitled 'Urbanization and Social Change in the Marshall Islands' appears to reflect the urban transition trend in Samoa. Heine reported that what was once a self reliant community has now become economically dependent on their donor partners for their survival. For example, the Marshall Islands are totally dependent on imported food for their survival while the traditional economy has largely disappeared, particularly fishing (Heine, 1984). Residents have taken to commuting in taxis instead of canoes and women have abandoned traditional weaving to play bingo for profit and fun in their leisure time (Heine, 1984). Rawlings' (1999) study of urbanisation in Vanuatu draws attention to similar trends that appear to be affecting peri-urban villages in Samoa such as Lufilufi whose livelihoods are dependent on Apia (the main hub of commerce and administration in Samoa). For instance in Vanuatu, social change occurred rapidly in urban and peri-urban settlements. Access to Port Vila (the main urban center), opened up trade in foreign goods (imported foods) and provided opportunities for the peri-urban villagers to sell locally produced fruit and vegetables at the markets in town, find employment and send their children to schools. During World II, American troops stationed in Vanuatu introduced rice and tinned meat to the local people and as Rawlings (1999) points out,

> It was the first time that people ate such food on a widespread scale. It became a dividing line between *bifo* (the past) and *noia* (the present or the

> recent past, a past which has continuity with the immediate present), *bifo* when people ate only roasted garden produce (yams, taro, manioc and plantain with fish and pork) and *naoia* when people eat rice, tinned fish and tinned beef. (p. 84)

Life after the war changed for good. According to Rawlings (1999), peri-urban villages were almost totally dependent on Port Vila for their livelihoods (employment, education, health services and entertainment, and other goods and services such as food), particularly with very few families participating in traditional food security systems such as fishing and gardening. Szmedra et al. argue: "This economic sea change caused a 'mortality transition' whereby people began to sicken and die from non-communicable diseases rather than infectious diseases" (Szmedra et al., 2006, p. 2).

Globalization

Finau, Wainiquolo and Cuboni (2004) argue that health changes in the Pacific are attributed to power imbalances associated with globalization. During the 19th century, the Europeans began arriving, believing that their work was going to benefit Pacific people. On the contrary, Finau et al. (2004) argue that globalization forced many villages to change from the economies that sustained them for many years to a cash and export economy. Before colonization, the accumulation of wealth was discouraged and equitable sharing and reciprocity of goods and services were encouraged (Finau et al., 2004). Interestingly, globalization was meant to make Pacific countries prosperous but it did not, as Finau et al. (2004) point out: "The opposite has been happening in that there has been no convergence between rich and poor nations" (p. 114). For instance, the World Bank (WB) and the International Monetary Fund (IMF) are two entities that basically operate and rule the global economy and dictate to the rest of the world, particularly developing countries, how they should be run and how they should live their lives according to imperialist paradigms (Finau et al., 2004). IMF and WB Structural Adjustments Programs (SAPs) have increased poverty in developing countries (Finau et al., 2004). For example, IMF and the WB cut social spending to developing countries in health, education and social services, which meant that higher medical fees for treatment increased morbidity and needless mortality. Furthermore, a reduction in social spending forced women to take on additional responsibilities of providing healthcare for their children and families (Finau et al., 2004). Another SAPs programme that has had an impact on Pacific countries was the liberalization of

trade policies that has forced developing countries to reduce bans and restrictions on import products including food. Interestingly, countries such as the European Union, United States and Japan do not offer significant trade concessions in the agriculture sector which limits and harms trade in the Pacific. For instance, the European Union subsidized their farmers $680 per hectare of agricultural land and imposed a 30% tax on agricultural imports in 2002 (United Nations, 2003). These measures reduce access or eliminate access for Pacific countries to these markets and the subsidies drive down world market prices, which put poor farmers out of business (United Nations, 2003). The agricultural sectors' contribution or share of GDP in Samoa dropped from 23% in 1990 to 13.7% in 2003 as a direct result of limited markets for copra, coconut cream, cocoa and kava (United Nations Development Programme, 2005). Furthermore, "while exports grew by 16.8% compared with 2000, imports increased by 28% in 2001" (WHO, 2008d, p. 365). Consequently, local people have been forced to depend on a cash economy to sustain their western lifestyles, and purchase foreign goods and services that are cheaper to buy than locally produced products including food (Finau et al., 2004). This has meant that fewer people engage in traditional food production which has led to more people adopting sedentary lifestyles and poor dietary habits (Rawlings, 1999).

Burden of lifestyle diseases

The cost of treating lifestyle diseases is a financial burden in all Pacific Island countries (SPC, 2000). According to a World Bank and the Secretariat of the Pacific Community study, an estimated 40% to 60% of all health care expenditure is spent on the treatment of lifestyle diseases (WHO, 2002a). Pacific people seriously affected by obesity-related illnesses equates to a loss of income and productivity to their families and the national economy (Mavoa & McCabe, 2008; Szmedra & Sharma, 2007; Unwin & Alberti, 2006). The cost of managing lifestyle-related diseases such as diabetes, eye disease, kidney disease and heart disease accounts for half of health care expenditures in some Pacific countries (Szmedra & Sharma, 2007). In 2000, Samoa spent 43% of its national health care budget on managing lifestyle diseases such as diabetes, hypertension and heart disease (SPC, 2000). It appears that more money is being absorbed in treating lifestyle diseases than preventing them, which is costly and unsustainable. For example, between 2005/06, $1,614,293 was spent on health promotion and prevention programmes compared with $3,000,000 that was spent on the Samoa

Kidney Foundation who are responsible for preventing and treating people with kidney diseases (Ministry of Health, Samoa, 2006). In the first 20 months of opening, there was a 600% increase in registrations and a further 400 people were waiting to be diagnosed or treated for kidney diseases in 2005 (Ministry of Health, Samoa, 2007). This degree of expenditure cannot be sustained as Szmedra et al. (2000) point out:

> As the prevalence of non-communicable diseases has become more widespread within Pacific Island nations and throughout the Pacific region the cost of treatment has become a financial burden that is no longer sustainable in many island nations. (p. 2)

Values and beliefs about food

Obesity appears to be related to the meanings that Pacific peoples attach to food. In fact, Pacific peoples love food and eating food particularly at social events or big feasts with most of the family or at big social gatherings (Bell, Swinburn, Amosa, & Scragg, 2001; Pollock, 2001). Unfortunately, feasts do not disappear with industrialization and modernization. For example, the increase in obesity trends and non activity among urban Samoans was attributed to a devotion to regular traditional cultural feasting (Ulijaszek, 2007). In Samoa, Mother's day, Father's day, birthdays, weddings, funerals, Children's day, Christmas, New Year's Day and Independence Day are several events in which food is central. Food is commonly used as a medium of exchange to show expression of love and gratitude. A study by Yamada (1999) pointed out a need within the Samoan culture to de-emphasize food as a medium of exchange to decrease obesity health-related diseases. This might be difficult to achieve because food and feasting is a core value of Pacific cultures, particularly for Samoans. Pacific peoples appear to be aware of the risks associated with overeating, especially food of poor quality, but the knowledge does not seem to be leading to action or changes in behavior as Ringrose and Zimmet (cited in Curtis, 2004) point out: "Despite the success of education programs in increasing awareness of what nutritional foods contribute to a healthy diet, Pacific Islanders nonetheless choose to eat foods with 'dubious' nutritional value…" (p. 39).

Values and beliefs about body size

A large body size is positively associated with traditional and collective world views. The notion of collectivity defines people's eating habits and perceptions of

body size (Mavoa & McCabe, 2008). Some Pacific countries consider being overweight is acceptable. For instance, in Tonga, Nauru, Wallis and Fiji a large body size for women is considered normal (Curtis, 2004; Pollock, 2001; Ulijaszek, 2007). A Pacific idea of big is associated with being healthy; for instance, fat children are perceived as healthy children (WHO, 2002a). A large body size is a sign of power. For instance, people of high rank are expected to be big (Mavoa & McCabe, 2008). Community leaders and high ranking chiefs are fed first or given the best foods on all official occasions (Mavoa & McCabe, 2008; WHO, 2002). Also, a large body size is associated with wealth, particularly in some parts of Fiji and Tonga (Mavoa & McCabe, 2008). Similarly, Samoans appear to be more tolerant of obesity. As a 58-year-old Samoan woman points out: "People look down on you if you're slim. They think that you are malnourished or diseased, that you have TB. They think that you have too much stress, like jealousy or being poor. People look down on you if you eat vegetables" (Yamada, 1999, p. 67). Interestingly, Ulijaszek (2007) suggested a change in this view:

> A number of societies in which the prevalence rate of obesity has risen in recent decades and that previously were shown to desire and/or accept larger bodies and obesity now show a preference for thinner bodies….including Pacific Islanders. (p. 185)

However, most of the other studies strongly indicate that a large body size is still seen as acceptable in Pacific countries. If Pacific peoples continue to defend their beliefs about body size, these beliefs make it difficult to introduce Western ideas that associate body fatness with ill health, poverty, and loss in productivity. Pacific peoples need to be educated that there is a difference between being big and muscular as opposed to being big as a result of over fatness (SPC, 2000). However, changing Pacific people's traditional world view about preferred body size has the potential to reduce the prevalence of obesity (Mavoa & McCabe, 2008). In addition, a person's status is defined by kinship, sex, seniority and a person's achievements (Mavoa & McCabe, 2008). In countries like Tonga where the organizational structure is hierarchical, low ranking commoners are expected to serve people with high ranking and status. High status chiefs are more likely to be overweight or obese as a result of their easy access to high status foods such as pork and other foods high in protein and less physically active lifestyles (Mavoa & McCabe, 2008).

Physical activity trends of Pacific peoples in New Zealand and the Pacific region

There appears to be a lack of literature or data on physical activity patterns for Pacific adults, particularly in the Pacific (Mavoa & McCabe, 2008; WHO, 2002a), compared with the data that has emerged within the last 10 years on Pacific adolescents. Nevertheless, there is still a dearth of research related to young people (Kahn et al., 2006). This section is focused on identifying physical activity trends based on existing literature focused on Pacific peoples that may help us to understand physical activity behaviours in Samoa. The review is based on the following studies by Utter et al. (New Zealand, Australia, Fiji & Tonga), Teevale, Thomas and Scragg (New Zealand), Mavoa and McCabe (literature review), Khan et al. (Fiji) and Smith, Phongsavan, Havea, Halavatau and Chey (Tonga), and Lako and Nguyen (Fiji study). Furthermore, the review will draw on the results a range of national physical activity surveys in New Zealand that include Pacific peoples (Sport and Recreation New Zealand [SPARC] 2003; SPARC, 2008; Sullivan, Oakden, Young, Butcher & Lawson, 2003). The surveys involved a nationwide response and where possible this review will be based only on the results for Pacific people who participated.

In New Zealand, the combined results of the surveys indicate that physical activity levels among adults have decreased over time (SPARC, 2003). This is also true for Pacific adults whose physical activity levels have decreased from 68% in 2000/01 to 52% in 2007/08 (SPARC, 2003; SPARC, 2008). Pacific adults' participation in at least one sport or active leisure or recreation activity over a month fell from 91.5% in 2001 (similar to the national average, 92.5%) to 80% in 2007/2008, (significantly lower than the national average of 90%). Pacific adults' participation in sport and active leisure appears to have decreased over time for particular activities such as walking (71%, 2001; 48.3%, 2007/08) and touch rugby (48%, 2001; 22.4%, 2007/08). The combined results of the surveys also indicate that physical activity levels for young people have decreased over time. Pacific young people's participation in physical activity (i.e., sport and active leisure) appears to have fallen from 82% in 1997 to 73% in 2001 for both boys and girls across the age groups (SPARC, 2003). Further, only 52% of young Pacific people were active between 5-6 hours per week compared with a national average of almost 7 hours per week (SPARC, 2003). More significantly, the evidence indicates that sedentary levels among young people have increased over time

(SPARC, 2003). For instance, three in 10 (30%) Pacific girls were inactive in 1997 compared with six in 10 (60%) in 1999 and 2001 (SPARC, 2003).

Also, the evidence clearly indicates that more young people tend to be active during school than outside of school and that socially oriented team sport activities appear to be the most popular form of physical activity (Kahn et al., 2006, SPARC, 2003). For instance, in Fiji, volleyball was the most popular sport across three schools studied (Kahn et al., 2006) compared with swimming, soccer, rugby and touch rugby which were the most popular activities among Pacific young people in New Zealand (SPARC, 2003).

Perceptions of physical activity benefits

The research throughout the Pacific indicates that both Pacific adults and young people are most likely to participate in physical activity for fun and social reasons (Kahn et al., 2006; Sullivan et al., 2003). As well, they participate to get fitter (Mavoa & McCabe, 2008) and improve their personal health (Kahn et al., 2006, Sullivan et al., 2003). Interestingly, Pacific adults were most likely to believe that there were no perceived benefits related to physical activity (Sullivan et al., 2003). Another interesting result, based on the Kahn et al. study, revealed that boredom and the lack of changing/shower facilities were the main reasons why young people did not look forward to physical education classes.

Perceptions of safety

The research suggests that creating safe neighbourhood environments, particularly in New Zealand, and removing physical activity risk factors such as troublesome dogs, particularly in Pacific countries such as Tonga and Fiji, is most likely to improve physical activity levels for Pacific youth. Pacific students in Tonga felt safer in their neighbourhoods compared with Australian, Fijian and New Zealand youth (Utter et al., 2007). However, more Tongan and Fijian people were bothered by dogs compared with Australian and New Zealand students. Utter et al. (2008) revealed that 60% of Tongan students (57% females; 63% males) and 40% of Fijian students (36% females; 44% males) reported that they were bothered by dogs compared with 30% of New Zealand students and fewer than 20% of Australian students.

Gender beliefs

Cultural beliefs about rank influence physical activity behaviour, particularly for females (Mavoa & McCabe, 2008). For instance, based on a study by Pollock

(2001) on obesity in Wallis and Futuna found that gender roles are distinctly different between males and females. Women were expected to maintain the home, take care of the children, feed the pigs, and weave mats (women were often required to sit for at least five hours per day for a week; food and eating broke up the monotony of the day). Furthermore, the women were not allowed to move too far beyond their homes unless they were going to a community event or church (Pollock, 2001). Also, young females in Tonga and Fiji were discouraged from participating in unsupervised physical activities away from home (Mavoa & McCabe, 2008). Interestingly, based on Khan et al.'s pilot study, almost seven in 10 (69%) females engaged in school duties and domestic chores which they considered their most common form of regular physical activity (Mavoa & McCabe, 2008). According to a 24 hour lifestyle activity recall diary by Lako and Nguyen (2001) in Fiji, a majority of the female respondents spent most of their time sitting, sleeping and lying rather than standing, and between 85% and 93.5% rarely participated in sports/aerobics or a brisk walk. In contrast, a typical day for a male in Tonga, Fiji, and Wallis and Futuna may involve plantation work, as Pollock (2001) points out:

> …men must walk some five or eight miles to climb the slopes of the interior mountain ranges on which most plantations are cleared. Then they dig plantations to plant root crops such as taro, and harvest such crops from those plantations, carrying their produce home either on their backs or on a bicycle they have borrowed. Such activity goes on five or six days a week, rain or shine, and in high humidity, men also do the cooking in the earth oven, and assist feeding the pigs as well as contributing to work in the community (Pollock, 2001, p.122).

The prevalence of obesity affects more women than men worldwide (WHO, 2001). The evidence indicates that there may be a strong link to traditional values in the Pacific and beliefs about rank that affect a woman's physical activity patterns, which are mainly sedentary and passive in nature.

Supportive school environments

Utter et al.'s (2008) study indicates that school environments (e.g., teacher role models), particularly during school breaks and organized sport, are most likely to encourage Pacific youth to be active. For instance, more males than females at school were actively engaged in informal types of physical activity during morning and lunch breaks. Interestingly, more Pacific Island youth particularly in New

Zealand and Tonga (females 36%; 43% males) were more active during school breaks compared with European youth (14% females; 25% males) by gender and ethnicity (Utter et al., 2008). Based on New Zealand surveys, almost seven in 10 (68%) Pacific young people participated in sport and active leisure activities during school; which was similar to the national average (69%), (SPARC, 2003). Utter et al. (2008) revealed that 60% of students in New Zealand, Fiji and Tonga believed school provided very good support for all students to be active, particularly in organized sport. Approximately two-thirds of Pacific students (61% females; 58% males) reported that school supported young people being active compared with less than 40% of European students (30% females; 38% males) (Utter et al., 2008). The study also indicated that approximately two thirds of Fijian (72% females; 65% males) and Tongan students (72% females; 68% males) and Pacific youth in New Zealand (59% females; 57% males) believed that their teachers were good or excellent role models for physical activity; a much higher percentage than Australian students (45% females; 35% males). Thus, school environments appear to provide appropriate opportunities for Pacific young people to engage in physical activity. Pacific young people are active during school breaks and they are most likely to participate in an organized sport at school.

Supportive family environments

Creating supportive family environments appears more likely to encourage Pacific youth to improve their physical activity levels. According to Utter et al. (2008) more Pacific students (53% females; 56% males) believed that parental and family support played an influential role in helping them to become more active than European students (32% females; 38% males). In a similar study by Teevale, Thomas and Scragg (2007) that was conducted across six secondary schools in the South Auckland region, Pacific students reported that they received some or a lot of support from their parents to be physically active and eat healthy. Parents play a significant role in increasing their child's or children's knowledge and beliefs about physical activity. For instance, Kahn et al. (2006) reported that 75% of children across 3 schools exercised for health and 56% reported that their parents exercised for health. The family and home environment play a vital role in young people being physically active (Doak, Visscher, Renders & Seidell, 2006; Dorovolomo & Hammond, 2005; Health Research Council, 2007). The findings clearly show that more Pacific young people could be active if their family environments, particularly parents, are supportive. The parents play a significant role in promoting positive

behaviours about physical activity as their children are more likely to respond to them than outside organisations. Also, parents could play a vital role in removing environmental risk factors (e.g., watching TV) that are associated with sedentary behaviour. For instance, based on Utter et al., (2008) New Zealand youth (40%) watched more television compared with youth in Fiji (25%), Australia (25%) and Tonga (15%). More Pacific youth (42% females; 45% males) watched television than Maori (35% females; 42% males), Asian (37% females; 45% males) and European students (39% females; 37% males). Furthermore, the New Zealand Physical Activity Guidelines for Children and Young People (5-18 years) suggest that young people should spend less than two hours per day (outside of school) watching television, playing video games and using a computer (Ministry of Education, 2007), implying that young people are more likely to become obese and sedentary if they spend more than two hours a day engaged in these types of activities, when they could be engaged in a physical activity, particularly after school (Utter et al., 2008).

Supportive community environments

Based on the results of the New Zealand 'Obstacles to Action' study, Pacific peoples are interested in learning about staying healthy, physical activity/exercise and weight control (Sullivan et al., 2003). Also, they are most likely to trust their church, doctors, health care providers, family or whanau and established health organisations for support and dissemination of health and physical activity information (Sullivan et al., 2003). The findings indicate that an integrated community response that includes health professionals, church, consumer groups, and other health-related government agencies is required to provide creative and effective ways of promoting health and physical activity in Pacific communities. For instance, the results of the 'Obstacles to Action' study suggest that more Pacific people are likely to participate in physical activities if the facilities are geographically accessible. Pacific people believed that a lack of access and price to neighbourhood facilities were barriers to physical activity, but 4 in 10 Pacific adults were more likely to use the local facilities such as the school gym or pool if they were open to the community on the weekends (Sullivan et al., 2003).

Successful Prevention and Control of Lifestyle Diseases

This section explores existing obesity prevention and control programmes for Pacific people, particularly Samoans. The database and Internet search unearthed

only a handful of relevant academic articles related to Pacific people which highlights the dearth of research in this area. The following review is based on a variety of studies between 1995 and 2008, including international workshop reports, Government reports and national health strategic plans, community prevention and control programme reports, a literature review on childhood obesity prevention programmes (including online radio broadcasts and newspaper media releases about Pacific food imports and trade policies) that were undertaken in New Zealand, Fiji, Tonga, Kiribati, Nauru, Micronesia and Samoa. This review is focused on identifying aspects of these prevention programmes and the existing literature that could be utilized by Pacific countries to enhance or improve their own programmes to reduce the burgeoning growth of obesity related diseases.

Conventional programmes show only modest results

Based on a study about chronic non-communicable diseases, Unwin and Alberti (2006) argue that lifestyle diseases are avoidable. Current knowledge indicates that up to 80% of cases of people diagnosed with cardiovascular disease and diabetes are avoidable (Unwin & Alberti, 2006).

It is widely accepted that physical activity and a healthy diet are two key factors in preventing lifestyle diseases, but there is not one country that has successfully reversed the increasing trend of obesity (Curtis, 2004; Doak et al., 2006; Hughes & Lawrence, 2005; Komsaroff & Thomas, 2007; Unwin & Alberti, 2007). For instance, based on a study about combating the obesity epidemic, Komsaroff and Thomas (2007) reported that only 5% of people who participate in a weight loss program maintain the loss for more than three years. In addition, increasing urbanisation and changes from traditional dietary habits to modern processed foods appear to be acting against any positive impact obesity prevention and control programs may be having in Pacific countries (Szmedra et al., 2007; Unwin & Alberti, 2007). Unwin and Alberti argue that it is going to take more than raising awareness and providing more information to reverse the increasing trend of obesity. For instance, a study by Szmedra et al. (2007), in Fiji, Nauru and Kiribati about improving healthy lifestyle behaviours of chronically ill people reported that Pacific countries need to identify the types of information and the dissemination channels that would have more appeal to the community, particularly for chronically ill people who have low motivation in terms of personal health. The study indicated that posters and brochures have very little impact on improving nutrition and physical activity, particularly for chronically ill people.

Prevention is cheaper than treatment

However, prevention is more cost effective and efficient than treatment alone in addressing the obesity epidemic, according to a study by Doak et al. (2006) on the prevention of childhood obesity. However, there is a lack of evidence about what approaches or health prevention and control programmes work in improving population-wide diet and physical activity behaviours, particularly in developing countries (Unwin & Alberti, 2007). As Unwin and Alberti (2007) point out, there is a need for Pacific countries to conduct research

> on what types of policy change are effective in promoting healthier diets and increasing levels of physical activity. Once collected, this evidence will be used to advocate for change, and to help countries to develop frameworks for action that are appropriate to their own circumstances. (p. 460)

As a result of a workshop on obesity prevention and control strategies in the Pacific facilitated by the World Health Organization in Apia in 2000, 22 countries agreed to provide prevention and control programmes that are evidence-based and reflect best practice models, and to monitor and evaluate programmes regularly to ensure that the desired behaviour change is being achieved or decide whether the programme needs modifying. The results could also inform policy (WHO, 2002a). Similarly, in the Ministry of Health, Samoa, (MOHS) Health Sector Plan (HSP) 2008-2018, about Samoa's current and future health priorities, evaluating the effectiveness of an existing prevention and control programme is a key strategy in the approach to reducing the prevalence of obesity (MOHS, 2007). As a result of a comprehensive review of over 100 intervention programmes for childhood obesity, Doak et al. (2006) argue that programmes should be evaluated frequently to see what is working and what is not, such as monitoring the programme to determine whether it is having adverse affects on children. Doak et al. (2006) argue that managing environmental factors, such as transportation, urban design and food prices, provides the most potential to prevent and control the obesity epidemic (see also Komsaroff & Thomas, 2007; Unwin & Alberti, 2007). For instance, OPIC is a research initiative that was conducted between 2005 and 2008 to find ways to prevent and reduce childhood obesity in New Zealand, Australia, Tonga and Fiji. OPIC is a unique study which not only described the obesity problem; it was focused on doing something about it (Health Research Council, 2007). Associate Professor Robert Scragg at the University of Auckland, who was leading the

project, indicated that to arrest the prevalence of obesity, environmental factors need to be eliminated (Health Research Council, 2007). For instance, based on the New Zealand OPIC study related to structural barriers, a third of the participants believed that dogs were a deterrent to being physically active (Teevale et al., 2008), which suggests that stray dogs need to be secured or removed from neighbourhoods to encourage more young people to be physically active. Other effective population-wide approaches focused on removing environment factors could include implementing laws to control advertising of certain food types to children (Komsaroff & Thomas, 2007) providing access to spaces for physical activity (Bauman, Schoeppe & Lewicka, 2008) and regulating prices on food imports. For instance, according to Radio New Zealand International (2009) Papua New Guinea threatened to ban the importation of mutton flaps if New Zealand does not improve the quality of the meat it currently exports to the country. As discussed earlier by other researchers (Curtis, 2004; Szmedra & Sharma, 2007), the high fat content in mutton flaps has been blamed for the increase in obesity and diabetes trends, particularly in Samoa, Tonga and Fiji (Hughes & Lawrence, 2005; MacLeod, 2002; Walsh & Hoby, 2002). In 2000, Fiji banned the importation of mutton flaps from New Zealand (Curtis, 2004). However, further research is required to investigate whether the ban had any effect on reducing the prevalence of overweight or obesity.

Another approach could include building environments that encourage physical activity. In Tonga, as a result of the Tongan healthy weight loss program (Englberger, Halavatau, Yasuda & Yamazaki, 1999), sidewalks were built along the roads to increase safety and to encourage more people to walk as well, although this has not been evaluated (Curtis, 2004). Addressing socio-cultural, environmental and economic obesity risk factors by creating enabling environments to promote healthy eating and physical activity was also a strategy that was endorsed by all the Pacific countries that attended the workshop on obesity prevention and control strategies in the Pacific (WHO, 2002a). For instance, all the Pacific countries agreed to establish health policies that allow people to have more access to a variety of low fat, high fibre foods and create safe places and opportunities for exercise. In Samoa, the MOH aims to reduce social and environmental obesity factors by encouraging households to cultivate their own fruit and vegetable gardens and also intends to work with school canteens to provide a variety of healthier food options for young people (MOHS, 2007).

A coordinated response, drawing on people and institutions that Samoan people trust, is needed

Several studies clearly indicate that a coordinated approach is the most effective way of preventing and controlling the prevalence of obesity (Doak et al., 2007; Englberger et al., 1999; Health Research Council, 2007; Unwin & Alberti, 2006), particularly in Pacific countries. A coordinated approach involving all health sector partners could promote positive attitudes and behaviours about physical activity, nutrition and health (Singh, 2007), create supportive and safe environments for physical activity, and remove sedentary risk factors such as TV (Doak et al., 2006; Utter et al., 2008) in order to improve physical activity and reverse the prevalence of obesity and lifestyle diseases. Lifestyle diseases are preventable and while there are many effective programmes, worldwide studies show that conventional programmes have had modest results in changing dietary and physical inactivity behaviours, particularly for Pacific women and chronically ill people (Szmedra et al., 2006). No doubt, in Samoa, a multisectoral approach is probably the most cost-effective approach to prevent and control the impact of lifestyle diseases (MOHS, 2007; WHO, 2002a). In response to the obesity problem, the MOHS identified several key strategies to reduce the prevalence of obesity and other health related diseases by 2018:

1. To collaborate with all sector partners to enhance people's life skills and teach them to make better health choices.
2. To ensure that the responsibility of health care provision is shared across all sector partners.
3. To collaborate with all healthcare institutions and academic institutions to provide health care training to increase the supply of skilled and competent health professionals and support staff.
4. To provide publicly funded or affordable and accessible health care services for all Samoans.
5. To strengthen communication and collaboration with all sector partners; for instance, to ensure that all sector partners are widely consulted about strategic sector policies (MOHS, 2007).

For instance, church settings appear to be ideal environments for promoting health intervention programmes for Samoans (Aitoto, Braun, Dang & So'a, 2007; Bell, Swinburn, Amosa & Scragg, 2001), as well as for Pacific peoples in urban settings (Simmons, Fleming, Voyle, Fou, Feo & Gatland, 1998). The following studies

draw attention to the church as an important site for reaching Pacific communities, especially for Samoan peoples who live in other countries. For example, Aitoto et al. (2007) point out that "The church serves as a framework for organizing Samoan society in the absence of the traditional village structure found in Samoa" (p. 384). Simmons et al. (1998) suggested that the church is more than a religious centre; it has become a focus of life and a social centre for many Pacific peoples who live in other countries. Aitoto et al. (2007), Dorovolomo and Hammond (2005) and Unwin and Alberti (2006) reinforce a Pacific-wide view that any prevention and control approaches that are adopted must accommodate local beliefs on diet, physical activity and body shape. Also, as already discussed Samoan culture is based on a system of hierarchy, particularly Samoan church communities. Decision-making is commonly hierarchical for the good of the community rather than the individual, with high ranking members making decisions (Aitoto et al., 2007). Congregants are more likely to support health-related intervention programmes if they are recommended by church leaders and delivered by outsiders who speak Samoan or people within the church who are trained to facilitate the programmes (Aitoto et al., 2007). Campaigns that appeal to Samoans' emotions are more likely to increase their participation in health-related intervention programmes, particularly testimonies from Samoans who have survived lifestyle diseases such as cancer (Aitoto et al., 2007). More importantly, Pacific peoples are more likely to improve their physical activity and nutrition behaviour if church communities are encouraged to run their own health intervention programmes (Braun et al., 2007; HEHA, 2008a, 2008b; Simmons et al., 1998).

Summary: Physical activity, prevention and control trends in the Pacific

In New Zealand, the research indicates that physical inactivity levels for Pacific adults and young people have increased over time, particularly for females. Although the physical inactivity trend appears to be similar in other Pacific countries, the evidence is not conclusive because there is a lack of physical activity research in these countries. However, the literature does indicate that more Pacific peoples across all Pacific countries are consuming more foods high in energy than they are expending. Also, more Pacific peoples do not appear to be as physically active as they used to be, compounded by the increasing prevalence of obesity and lifestyle diseases, particularly in urban areas. Clearly, the research shows that there is a need for a coordinated approach to provide effective intervention programmes to address physical activity risk factors, particularly environmental factors (Smith et

al., 2007). Therefore, it is vital to understand what young Samoans are doing, what their beliefs are about physical activity, and what barriers they perceive and enablers they think would help improve their physical activity levels.

CHAPTER 3: METHODOLOGY

Introduction

To undertake this project, I have chosen to adopt a Pacific way of knowing, which is an alternative and culturally appropriate way of thinking about conducting research (Bishop, 1996; Health Research Council, 2004; Porsanger, 2004).

A Pacific way of knowing has shaped and affirmed how I see the world. For this reason, my research paradigm is grounded in Pacific values and beliefs and, in particular, Samoan ways of knowing. A Pacific methodology has compelled me to examine aspects of my own study in terms of whether the research process was appropriately carried out. Pacific ways of knowing have challenged me to think about how I could improve my work in the future. The discussion is focused on presenting a Pacific research framework that is appropriate for research involving Pacific peoples.

I explain the origins of Pacific research that was borne out of a need for Pacific scholars to break away from Eurocentric research systems to establish a research system unique to Pacific peoples. My intention is not to compete with or replace traditional research practices but to advocate alternative ways of conducting research in a Pacific context that include conventional research processes (Bishop, 1996; Porsanger, 2004). This section examines the rationale for Pacific research and explores how Pacific peoples construct knowledge. These include literature written by a range of Indigenous and Pacific scholars from all parts of the world that have helped inform my own research practice. To conclude this chapter, I have identified 10 significant ethical principles that researchers should consider in undertaking Pacific research that includes a description of how I applied the principles in my own research project. The content, particularly the 10 ethical principles, is drawn from two main sources: The Health Research Council of New Zealand (2004) 'Guidelines on Pacific health research' and the Ministry of Education New Zealand (2001) 'Pasifika education research guidelines'.

Colonial Research Legacy

The first key point is that Western research approaches are not necessarily appropriate for studying Pacific peoples. The following accounts show that Pacific peoples were exploited by Western research practices that were foreign to them (Porsanger, 2004), embedded in Anglo-European values (Gegeo, 2001) and did not

acknowledge and recognize Pacific people's ways of knowing (Smith, 2004). As Vaioleti (2006) argues, "research methodologies that were designed to identify issues in a dominant culture and provide solutions are not necessarily suitable in searching for solutions for Pacific peoples, whose knowledge and way of being have unique epistemologies" (p. 22).

The second key point is that Pacific peoples' values and knowledge were historically marginalized and misrepresented. For over 200 years Western education institutions have not acknowledged Pacific ways of knowing as legitimate practice. Pacific knowledge and wisdom was not valued by academia because it did not meet institutional and conventional research practices and it contradicted Anglo-European views of the world (Gegeo, 2001; Smith, 2003; Tamasese, Peteru, Waldegrave & Bush, 2005). Pacific peoples' experience of research was also scarred by colonial research practices that ignored Pacific perspectives of research (Smith, 2004).

In addition, research is a social construction that was created in connection with social relations of power which have favored Western academic institutions and disadvantaged Indigenous people. Power and control were reinforced by academic structures that determined how research should be organized, conducted and disseminated. These structures prevail today (Smith, 2004). As a result, deconstructing traditional research practices requires Pacific and Indigenous scholars to decolonize themselves and the research process. Pacific research challenges echo similar concerns that Maori have expressed about traditional research practices that do not focus on benefits to Maori, as Bishop (1996) points out:

> Traditionally research has established an approach where the research has served to advance the interests, concerns and methods of the researcher and to locate the benefits of the research at least in part, with the researcher, other benefits being of lesser concern. (p. 15)

Another key point is that Pacific peoples were not benefitting from the research. Much recent research on Pacific peoples has not benefited the participants (Smith, 1999). In fact, Pacific peoples have become more distrusting of Western researchers and disillusioned about a research process that has continued to undermine their knowledge and values (Smith, 1999; Steinhauer, 2002; Vaioleti, 2006). There are numerous examples of cultural dominance and marginalization affecting Pacific peoples. The following accounts show how

Pacific people's views were not considered worthwhile or important, particularly in the education sector. For instance, Helu Thaman (2003) recounts the following experience: "I recall how an article of mine was considered unfit for publication in a book because there was too much of me in it; it was too different, too personal, and too Tongan" (p. 10). In another example, in 1984 in Fiji, Vilsoni Hereniko, who introduced Pacific literature in the English Department at a Methodist School, was told not to teach Pacific stories and stick to teaching English. The next case shows how difficult it was for Samoan migrants to adapt to a foreign and daunting way of life in Aotearoa over four decades ago. New Zealand was Eurocentric and monocultural 44 years ago when Samoan immigrants were first exposed to the education system: "The curriculum valued the English language and European knowledge more highly than other languages and knowledges" (Macpherson, Bedford & Spoonley, 2000, p. 74). In addition, Macpherson et al. (2000) highlight the legacy of colonial dominance and the marginalization of Pacific peoples that prevailed then:

> Throughout the 1960s and 70s there is little doubt that many Samoan children were alienated by their experiences in a system that did not value their knowledge and skills, and whose gatekeepers held low expectations of their achieving educational success. Many left school early, with minimal or no formal qualification. (p. 74)

Cultural dominance and marginalization that affected Pacific people still exists today, particularly in the research sector.

Emerging Pacific Ways of Knowing

The worldwide Indigenous political research movement emerged in the 1970s when, as Smith (2004) points out, "research started to be critically examined by Western academies" (p. 4). Concurrently, in the Southern hemisphere, Australian Aboriginal and Torres Strait Islanders waged a campaign to establish their own ways of conducting research which were not controlled by Western academic institutions. These campaigns, as Humphrey (2001) points out, involved:

> Demand for Aboriginal control of research activities or guidelines on research that insisted on Aboriginal control of, and participation in, research, the adoption of non-invasive and culturally sensitive methodologies, the pursuit of research of needs and benefits to communities, and full Aboriginal control over the dissemination of findings. (p. 198)

In 2007, Fredericks wrote an article about an indigenous research model that was working well at the time in Queensland. The Queensland Aboriginal and Islander Health Council (QAIHC), the body that supported the Aboriginal and Torres Strait Islander community-controlled health sector, was most certainly placing Australian Aboriginal and Torres Strait Islander people and the sector it served first (Fredericks, 2007). For instance, the Aboriginal and Torres Strait Islander people were directly involved in a research project about preventing circulatory and associated diseases in the communities. As Fredericks (2007) stated:

> This include[d] the conceptualizing, development, implementation and evaluation of projects. Aboriginal and Torres Strait Islanders use our knowledge, research training, abilities and skills, access to resources, and the environment in which we work towards a vision for better health for our people in Australia. (pp. 43-44)

Closer to home, and for the same reasons that other peoples all over the world began to advocate for equality in research, Maori scholars, such as Russell Bishop and Linda Tuhiwai Smith, emerged to assert their right to legitimize Maori research ways of knowing. As Bishop (1996) states: "In the late 1980's and the early 1990's, this consciousness has featured the revitalization of Maori cultural aspirations, preferences and practices as a philosophical and productive educational stance and resistance to the hegemony of the dominant discourse" (p. 11).

Professor Stephen Filipo, who completed his thesis on New Zealand Samoans' perspectives on Catholic education in New Zealand (Filipo, 2004), was influenced by Kaupapa Maori theory and applied it to his research practice at the time. This inspired him to think about the possibilities for Pacific peoples. As Filipo (2004) discovered: "Kaupapa Maori theory, experience and practice has made me think about a similar approach for Samoans based on fa'a'aloalo (respect) in research practice" (p. 179). Filipo (2004) called this concept "O auala i le faa Samoa (Samoan pathways)" (p.179).

Why Pacific Research?

There are four key reasons why research with Pacific peoples should use Pacific methods. First, Pacific research is an alternative way of thinking about how research could be conducted within a culturally appropriately framework. As Fredericks (2007) points out:

> The enacting of our rights within the realms of research includes visioning and voicing what we think, what we need and what we want. It is through

> our visions that we can develop research processes that are about us. (p. 42)

It also empowers people, reinforces a strong sense of identity, builds confidence and encourages independence. Promoting a Pacific way of knowing is not only about reclaiming our identity, it is also about finding out how we gather and understand knowledge for Pacific people.

Second, Pacific research is empowering. Self determination is a process that involves regaining power and control to design, conduct, and disseminate research in a culturally appropriate way. This implies that outside researchers (Porsanger, 2004) will not be able to exploit and devalue Pacific world views. As Smith (1999) argues:

> Communities and indigenous activists have openly challenged the research community about such things as racist practices and attitudes, ethnocentric assumptions and exploitative research, sounding warning bells that research can no longer be conducted with Indigenous communities as if their view did not count or their lives did not matter. (p. 9)

Furthermore, Pacific researchers today no longer see themselves as victims of research but as activists challenging research inequality (Smith, 2004).

Thirdly, Pacific peoples believe that research is a collective process (Steinhauer, 2002), grounded in the fundamental belief that people are connected to each other and their environment. This belief also underpins other Indigenous studies such as Kaupapa Maori research (Bishop, 1996).

More importantly, it is vital that Pacific research is grounded in Pacific ways of planning, designing and conducting research to protect and validate the views of Pacific peoples (Vaioleti, 2006). Vaioleti (2006) offers the following Pacific protocols that researchers should embrace in the way they conduct work in Pacific communities:

a. Fakaapaapa (respectful, humble and considerate)
b. Angalelei (tolerant, generous, kind, helpful, calm and dignified)
c. Mateuteu (well prepared, hardworking, culturally versed, professional and responsive)
d. Poto he anga (knowing what to do and doing it well, cultured), and
e. Ofa feunga (showing appropriate compassion, empathy, aroha, love for the context).

Samoan Ways of Knowing

Very little published research exists on Samoan ways of knowing, which draws attention to the need to encourage more Samoan scholars to explore Samoan epistemology. Nevertheless, the research that does exist in Samoan epistemology highlights three principles that appear to be consistent across other Pacific cultures: (a) Samoans are strongly connected to their community or collective; (b) Samoans are strongly connected to their spiritual, mental, physical and emotional worlds, values and beliefs; and (c) knowledge is collectively owned. These principles should form the basis of research involving Samoan peoples.

To understand Samoan perspectives about physical activity and health, researchers must understand the Samoan concept of self. A Samoan concept of self only has meaning in a collective context because there is no such thing as a Samoan who is independent (Tamasese et al., 2004). A Samoan is a total being connected to his or her place of existence that includes all things spiritual and physical, mental and emotional (Cardinal, 2002; Steinhauer, 2002; Tamasese et al., 2004; Tavana, 2002). Effective research approaches related to Samoan people should incorporate the core values that define their world views and guide every aspect of their lives such as their respect for the elders and matai system, communal collaboration and deep care for one another, and embrace the Samoan view of a person as an individual who is strongly connected to his or her community (Tavana, 2002). Tavana believes that research practices that include Samoan ways of knowing could increase Western researchers' understanding of particular processes involved in constructing knowledge that are commonly misunderstood or difficult to describe in Samoan culture. As Tavana (2002) points out, "many of the core contributions that Samoan culture has to offer to the world are in the form of tacit knowledge" (p. 20). Tacit Indigenous knowledge refers to knowledge that cannot be easily described to outsiders "such as the deep respect Samoans have for the elderly or the process of achieving consensus within a village fono [meeting]" (Tavana, 2002, p. 20). Furthermore, Pacific ways of knowing, particularly Samoan, are built on the premise that knowledge is not owned or discovered by any one person because research is a collective process (Anae, Coxon, Mara, Wendt-Samu & Finau, 2004; Wilson, 2001). The evidence clearly suggests that an effective research approach involving Samoan peoples must reflect their core values and should incorporate traditional knowledge about Samoan ways of knowing.

Pacific Research Methodology

Pacific research methodology refers to the process of designing, conducting, evaluating and disseminating research that is culturally appropriate for Pacific peoples (Porsanger, 2004). The Health Research Council (2004) and Anae et al. (2001) produced two informative sets of guidelines about conducting Pacific research in New Zealand on which I have drawn to form the basis of my research methodology. The key principles of conducting Pacific research will be discussed in the next section. The ways in which these principles were incorporated into my own research design and implementation are discussed later. These guidelines and other Samoan and Indigenous research discussions suggest that the foundation for all Pacific research practice begins with relationships (Anae et al., 2001; Bishop, 1996; HRC, 2004; Tamasese et al., 2004) based on respect, cultural competency, meaningful engagement, reciprocity, utility, rights, balance, protection, capability building and participation (HRC, 2004). Relationships are the overarching standard that binds all these principles in Pacific research and these principles can serve as a useful guide for researchers involved in Pacific research (HRC, 2004).

Show respect

Respect and humility refers to recognizing that Pacific peoples are part of a collective and that means respect expressed towards an individual corresponds with the group to which the individual belongs (HRC, 2004). It also means that individuals are expected to put aside their own needs (Anae et al., 2001), particularly people of higher rank such as researchers, so that the group will be able to reach a consensus (HRC, 2004). Nevertheless, individuals should be able to feel that they have been able to express their thoughts. HRC (2004) points out: "If respect and humility are not demonstrated by both Palangi and Pacific researchers, Pacific people will often disengage (p. 15). Therefore, a researcher must be able to demonstrate respect such as showing appropriate behaviour and language specific to the ethnic group, explaining the purpose of the research clearly and transparently with Pacific peoples, and disseminating the results of the research back to the community in a culturally appropriate way (HRC, 2004).

Cultural competency

Pacific research must embrace the practices and beliefs of Pacific people. HRC (2004) states: "Even when a person has limited cultural knowledge, if they work with an attitude of respect, they are often able to operate in a culturally safe

manner" (p. 19). For instance, it is inappropriate and disrespectful to talk down to people in positions of authority or place demands on people. As Filipo (2004) states:

> Knowing one's place with elders, showing humility and respect in terms of rank was expected at all times. The act of tautua [service] and offering one's service was a sign of showing how thankful and appreciative I was to my participants, acknowledging who they are and what they had given me. (p. 180)

Meaningful engagement

Research with Pacific peoples is not a short term exercise as HRC (2004) points out: "Meaningful engagement goes beyond consultation, to forming a relationship that is sustained and maintained, ongoing and deepening" (p. 21). For Pacific peoples, an initial meeting is based on developing relationships on an emotional level, particularly with researchers about whom they know very little (HRC, 2004). This may require researchers to put their professionalism to one side to interact with Pacific people on a personal level (HRC, 2004). This process provides an opportunity for researchers to understand how Pacific people are connected to other people and how they are bound within their relationships. HRC (2004) points out: "Through appreciating the context and location of a person, one can enhance their understanding of that person's individual competencies" (p. 21). Therefore, researchers must understand the consultation process in order to establish meaningful relationships with Pacific peoples (HRC, 2004).

Reciprocity

Researchers must ensure that the research process should be equal and balanced in the exchange and interaction of gifts, goods and services (HRC, 2004). For instance, researchers could provide opportunities for the participants to increase their knowledge about a subject being researched. Reimbursing the costs of participation in research is another example of demonstrating reciprocity, such as a monetary offering or gift in kind (Filipo, 2004). Another gesture of goodwill could include returning the results of the research to the participants (Anae et al., 2001; Ofa et al., 2008; Sanga, 2004; Steinhauer, 2002). As HRC (2004) states: "Dissemination should involve the same degree of attention and care that has been taken to extract the information from participants" (p. 27).

Utility

Pacific research must be useful. The researcher should work closely with key stakeholders, such as health professionals, health policy makers, end-users and patient advocates and clinicians, to ensure the research is going to benefit and improve the health outcomes of Pacific peoples (HRC, 2004). For instance, researchers need to be able to explain the potential of the research study to improve health outcomes. Alternatively, researchers could explain how the research is going to address priority health issues or demonstrate how the research could inform policy (HRC, 2004).

Rights

The rights of Pacific people must be respected so that the research does not harm the participants. Researchers must clearly explain the purpose of the research and provide participants with sufficient notice and information about the research in order to gain appropriate consent (HRC, 2004). As HRC (2004) point out:

> It is not appropriate to assume that the consent of the leadership [community leaders] extends to each and every participant. Each individual has the right to receive information that affects themselves and their families, in order to make a decision regarding participation to a research study. (pp. 33-34)

The participants must be provided with the opportunity to be able to make an informed choice about whether they would like to take part or withdraw from participating in the research project. This part of the process is a standard Western practice but all Pacific peoples must be properly informed and a researcher must uphold the right of participants to withdraw with dignity and respect (HRC, 2004).

Balance

Respect in Pacific research must be balanced in regards to who benefits from the research (HRC, 2004). Researchers must clearly explain how the research is going to benefit Pacific people in regards to the potential knowledge and findings that could emerge from the research, determine who will benefit from the training opportunities that the research could provide and identify who will benefit from the research publications (HRC, 2004). These questions determine whether there is balance in who benefits from the research (HRC, 2004). As HRC (2004) points out: "To achieve balance in a research relationship researchers should share information and responsibility for the research" (p. 36).

Protection

Pacific research or knowledge is not owned by anyone including researchers. As HRC (2004) states: "Ownership of knowledge is both familial and collective" (p. 37). In Pacific culture, knowledge must be used with respect for the good of the community (HRC, 2004). Researchers should also be aware that Pacific peoples may not share their knowledge with researchers whom they do not know or trust with the knowledge (HRC, 2004; Ofa et al., 2008; Vaioleti, 2006). As HRC (2004) argues, "This prevailing attitude may mean that some researchers face barriers that they might not experience if working with different populations" (p. 38). Hence, this is why relationships are central to the continuation of reciprocal relationships. As HRC (2004) point out, just as with respect and humility, "If the relationship is not ethically sound, Pacific participants and communities will often disengage" (p. 38). In Pacific research, Pacific peoples own the primary knowledge and the outputs of the accumulated knowledge belong to both participants and researchers, including their communities (HRC, 2004).

Capacity building

Developing a Pacific health research workforce is critical for the delivery of Pacific health research outcomes. However, the current workforce is limited in numbers, experience and seniority (HRC, 2004). The health sector needs more Pacific researchers to conduct research to gain knowledge and understanding about problems and challenges that face Pacific peoples, particularly in the Pacific region (HRC, 2004). As HRC (2004) point out: "It is only when Pacific peoples achieve the highest level of qualifications that they are in a position to supervise the next generation of Pacific researchers" (p. 42). In my research, although, I did not help build capacity or increase the participants' capacity to do research, I believe that increasing my own knowledge and experience in conducting research will enable me to mentor young Pacific research students in both New Zealand and the Pacific region.

Participation

Participation in Pacific research should include advisors and stakeholders (HRC, 2004). The research process must involve participants in planning the research project wherever possible. Most importantly the research process must allow Pacific voices to be heard. Ofa et al.'s (2008) study about cross-cultural research in Pacific psychology argues that preserving the voice of the participants is critical in

conducting Pacific research (Ofa et al., 2008; Sanga, 2004). Also, Ofa et al. argues that the research process must be participant driven and that everything must be negotiated, sanctioned and checked by them and then returned to them either orally or in written form.

Conclusion

A Pacific research process is grounded in relationships based on respect and humility. Most importantly, the research process must allow for Pacific voices to be heard. Researchers must practice respect by involving participants in designing, conducting, evaluating and dissemination of a study. The research process must be culturally appropriate to Pacific ways of knowing and this includes selecting methodologies that are better suited to Pacific peoples. It also means that Pacific researchers must be culturally competent in facilitating methods such as face-to-face individual or group interviews and communicate effectively across cultures using language that is appropriate to the place and people. Researchers must be accessible and approachable to the participants and this means ensuring that the knowledge that has been given by the researched must be used to benefit them. Lastly, the research findings must be disseminated back to the community in an appropriate and accessible way (HRC, 2004).

The next section focuses on the research process that was used to plan, collect and analyze the data for this study. Where possible, I refer to the relationship principles to demonstrate where they were applied during the research process. Relationships are the foundation in which Pacific research is built (HRC, 2004; Vaioleti, 2006). Relationships were the overarching principle that made it possible to undertake this study in Samoa.

This study was born from an urge to contribute my knowledge and skills to improve the health outcomes of Pacific people, particularly Samoans. In 2006, I travelled to Apia, Samoa to explore opportunities to do some research with a colleague, Dr Juliette Boone who was then working at the Centre for Samoan Studies at NUS. During my two week visit in Samoa, I had the opportunity to meet with staff at the Samoa Association of Sport National Olympic Committee, National University of Samoa and Ministry of Education, Sport and Culture (MESC) and I was privileged to attend some of their meetings and social functions where I met significant people in the sport, education and political sectors. As a result of the trip, I came away enthused about going back to conduct a formal study with NUS which I brokered with Dr Boone. The experience highlighted the

importance of developing and sustaining relationships, being respectful of other people's values and beliefs, and giving back to the community. For instance, as part of the principle of reciprocity, I assisted staff at SASNOC to facilitate a cricket programme at a local high school and I helped facilitate several ball skills sessions for a local village rugby seven-aside men's squad. Dr Boone also introduced me to Dawn Rasmussen, who became my local contact and provided significant assistance throughout the project. The experience also reinforced the need to return the benefits of the research to the participants including their communities. On completion of this project I intend to present the results of the study to the respective organisations who participated in the survey; a vital component in developing and sustaining relationships.

Methods

A mixed method approach involving a survey, two focus group interviews, supplemented by personal observations, was selected to gather the data for this study. The mixed method approach provided the most appropriate vehicle to obtain informative answers (Andrew & Halcomb, 2006; Johnson & Onwuegbuzie, 2004). The process involved analysing and comparing survey, focus group and observational data to determine whether the results supported or contradicted each other (Chen, 2006; Creswell, 2002; Creswell, Shope, Plano-Clark & Green, 2006; Johnson & Onwuegbuzie, 2004; Rocco, Bliss, Gallagher & Perez-Prado, 2003). This process is also known as triangulation. Triangulation accommodates a Pacific style of research that is creative, inclusive, flexible, and pluralistic. A mixed methods approach enabled me to adopt a two-stage sequential design. That is, I used the results from the survey to inform the purpose and design of two ensuing focus group interviews.

Observations

As was discussed earlier, very little published research exists on physical activity in Samoa. For this reason, in addition to the formal methods of focus interviews and survey analysis, references to personal observations from my visits to Samoa are drawn on as they relate to the issues raised in the survey and focus group results. Part of the process of observation included taking photographs, some of which appear later in the thesis, of physical activity and health-related images in Apia. Also, I draw on voluntary activities that I initiated to give back to the community that helped me conduct my research. For example, I facilitated several sports

coaching sessions at a local high school (AusAid cricket programme), and the National University of Samoa (rugby skills session).

Equally important, I also draw on conversations with a Samoan colleague, Dawn Rasmussen, students who participated in the survey, and staff in the Sports Department at the National University of Samoa (NUS). At the time of the research Dawn Rasmussen was the Head of Department for Expressive Arts in the Faculty of Education at NUS. Dawn was enrolled in the Masters in Education degree at the University of Canterbury. Her topic was called 'Implementing the Physical Activity and Health Education Curriculum: A Peg in the Ground' which focused on examining how well the health and physical activity curriculum was being delivered at secondary schools throughout Samoa. Dawn co-authored the Health and Physical Activity Teaching Manual for Year 9 to 13 teachers to supplement the National Education Curriculum in Health and Physical Activity. The curriculum was launched in 2004. Like me, she is genuinely concerned at the high prevalence of heart disease and diabetes affecting the people in Samoa. Dawn hopes that the results of our respective research projects will provide stakeholders in the health sector with a substantial body of knowledge to enhance and support intervention programmes to reduce obesity and related diseases.

Quantitative method: Survey

I first chose to use a survey, which is a quantitative approach, to obtain representative data about physical activity patterns of young people in Samoa (Nardi, 2004). A survey was also suitable for collecting data from a large sample that could be measured and generalized to the population from which the sample was drawn.

Pre 2008: Bay of Plenty Polytechnic

Planning phase, November 2006

This survey was part of a collaborative study with a colleague, Dawn Rasmussen, which grew out of my earlier visit at the National University of Samoa (NUS). The survey method was formally approved by the Bay of Plenty Polytechnic Ethics Approval Committee in November 2006 (see Appendix A for a copy of the research application approval letter). Based on the "Obstacles to Action" survey undertaken by ACNielsen on behalf of Sport and Recreation New Zealand (SPARC) in 2003, I conducted a similar survey as a pilot study in Auckland, January 2007, with a small cohort of Pacific employees working for a public

service organisation, arranged through a family contact who also worked there. This happened after several unsuccessful attempts to pilot the survey in Tauranga with the local Samoan community; the timing was not convenient. The decision to use this survey reflected the lack of existing knowledge and it was designed to produce baseline data. The focus was on those elements most directly related to physical attitudes and behaviours and barriers and enablers to participation in physical activity. As a result of the feedback, I eliminated the open questions to reduce the time that it took the respondents to deliberate over the questions and write the answers. Furthermore, I was concerned about the English literacy level in Samoa and the barriers that open questions may have created for respondents with limited literacy. The revised version of the survey did not include open questions as a result of the feedback. Furthermore, the survey was modified to reflect the Samoan context, so which parts were added or eliminated, which I address in the following section. I asked Dawn via email to comment on the survey, to ensure that the content did not contain language that may have been difficult to understand or was inappropriate to ask local people. On the basis of Dawn's feedback no further changes were made to the survey.

Samoa, February 2007

In order to gather survey information in Samoa, I spent two weeks conducting a pilot study, selecting and recruiting the participants, conducting the surveys and inputting the data. I carried out a pilot study of the survey with 14 tertiary students at NUS, arranged by Dawn. As a result of the pilot study, Dawn and I modified the survey. To acknowledge and validate the contribution of the students in the pilot study, data related to questions that were maintained or modified only slightly from the original survey were also included in the final data analysis. At the time, I considered that the decision was in keeping with the principles of respect, reciprocity and participation. The original survey content was modified slightly by removing and combining particular sections based on the feedback from NUS pilot group indicating that the survey took too long to complete. A small portion of the content was reformatted to eliminate confusion and improve clarity. For instance, the respondents were confused by the code numbers next to the response boxes (see Table 2) and thought they were asked to rate their responses based on the coding system. So, the size of the symbols were reduced to the smallest type face size that Microsoft Word would allow and a note was added on the cover page to inform the students to ignore the code numbers next to the tick boxes. This seemed to

eliminate the confusion. Based on discussions with Dawn, questions were also added to particular sections that were more relevant and familiar to the participants' environment. For example, questions related to the church were included in the barriers and enablers section to determine whether religious beliefs were a barrier to physical activity. Dawn arranged a translator to write a Samoan version of the survey (see Appendix C for a copy of the Samoan translation of the survey). The translator endeavoured to ensure that the integrity of the English version was not lost in translation. The Samoan version was checked and approved by Dawn. This was subsequently made available to those students who preferred to fill out the survey in this format although no students chose this format/all chose to complete the survey in English.

Table 2. ***Example of an ordinal question used in the survey***

Section B: Your Health					
How would you describe your health? (Mark ☒ one box)	Poor	Fair	Good	Very Good	Excellent
	□1	□2	☒3	□4	□5

Selecting and recruiting the participants

Four high schools and a tertiary institution in Apia participated in the survey (see Table 3). The schools were selected by using a probability sampling method that involved assigning all the high schools in Apia with a number, followed by using the simple random sample formula function on a statistics calculator to select four schools. I restricted the number to four because I had only 14 days to access the schools, conduct and collate the surveys. Dawn was instrumental in brokering the meetings with the schools that we selected to participate in the study. This highlighted the importance of being culturally aware of the process involved in seeking approval to carry out research and developing a meaningful relationship with key stakeholders. For instance, Dawn arranged the initial meeting with the school principals and she introduced me to them and spoke on my behalf about the survey. Dawn is well respected in the education sector and this was demonstrated by a high response rate to the survey.

In addition, seven groups at NUS participated in the survey. The participants were selected by using a non probability sample approach called convenience sampling. My colleague arranged the groups through the programme coordinators or lecturers and I attended the classes to conduct the survey. Samoan

versions of the questionnaire were provided to the NUS students who preferred this option but over 95% of the students completed the English version.

Consent, confidentiality and right of withdrawal

The respondents were firstly asked to read the information on the front page of the survey (see Appendix B for a copy of the revised survey). This explained the project and it outlined their rights to withdraw from the survey at any time. It also confirmed that the information provided, particularly private details, would be kept confidential and that the surveys would be stored in a secure place. They were informed that the answers would be used by the researchers to write a report about the findings.

Table 3 ***Total Number in the Sample***

Sample	***n***	**%**
NUS (A)	14	1.7
NUS (B)	16	1.9
NUS (C)	14	1.7
NUS (D)	22	2.6
NUS (E)	106	12.8
NUS (F)	14	1.7
NUS (G)	8	1.0
Private High School (mixed)	69	8.3
Private High School (mixed)	132	15.9
Private High School (single sex)	192	23.1
Public High School (mixed)	244	29.4
N	831	100.0

Note. *n* = number in subsample. *N* = Total number in a sample.

Conducting the survey

The surveys were completed by the participants at four schools and a tertiary institution. They took approximately 20-30 minutes to complete. The school principals distributed the surveys amongst their teachers who gave them to their students to complete. I did not attend the schools to introduce the survey because the principals offered to manage the survey themselves including collection once finished. However, I dropped off the surveys and collected them when the schools were ready. I did not stipulate a day when the survey had to be completed because

I believed it was inappropriate to impose a deadline, so I asked the principals to suggest a convenient time. As was mentioned earlier, Dawn arranged the groups at NUS to participate in the survey. In six cases, I went to the timetabled sessions before the lectures commenced to conduct the survey, and in one case I facilitated the survey after the lecture. I introduced myself to the group and explained the purpose of the project and the respondents were provided an opportunity to ask questions and decide whether they wanted to withdraw from the study. I do not recall a respondent who did not give consent to participate in the survey. I was also available to assist students if they required me to explain a question that they did not understand. On completion of the survey, I thanked the respondents and collected the surveys. Subsequently, all the surveys were completed and collected by the time I returned to New Zealand. The survey consisted of 105 questions in four sections on five A4 pages. Copies of the survey were provided courtesy of my colleague's research fund of which a portion was allocated to printing as NUS's contribution to our project. One school volunteered to print their own set and this offer was accepted as a way of minimising costs for which I was very grateful. The survey included ordinal, categorical or nominal questions that explored perceptions about physical activity, health, barriers to physical activity, sources of encouragement and demographic trends. The participants were asked to select the most appropriate response to a question and mark the box with an "☒"by using a pen or pencil (see Table 2). A total of 831 respondents completed the survey (see Table 4).

Table 4. ***Total Number in the Sample and the Age Groupings***

Age	***n***	**%**
13-15	300	36.1
16-17	314	37.8
18-24	125	15.0
25-34	29	3.5
35-49	18	2.2
50+	6	0.7
Missing	39	4.7
N	831	100

Note. n = number in subsample. N = Total number in a sample.

Post data collection, 2007

I processed over a quarter of the surveys in Samoa and the originals were stored in Samoa. The rest were contracted to a data entry operator (DEO) in New Zealand to input. However, due to incompatibility in the recording of information between the batches I completed in Samoa and the data inputted in New Zealand, and because the original data was stored in Samoa, the data from the original 300 surveys was unable to be combined and analysed with those the DEO completed. I completed a general analysis of the data using Excel but I was not able to analyse the data in any depth, in part because of a lack of access to staff with the required statistical expertise that could assist me in learning how to analyse the data in this way. Subsequently the project was shelved.

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I was dissatisfied with the analysis and for this reason I applied to University of Waikato, School of Education Ethics Committee requesting ethical approval to complete a robust statistical analysis and use it to inform the qualitative research planned for my thesis. I was granted ethical approval to use the survey data and draw from it to inform the qualitative research.

I retrieved the remaining surveys when I revisited Samoa in May 2008 and, using a programme called Statistical Package for Social Scientists (SPSS), I was able to re-input the data.

I chose to do a descriptive statistical analysis based on the literature review suggesting that gender and age might be key variables: The purpose of the analysis was to explore young males' and females' perceptions about physical activity and health, perspectives about barriers that stopped them from being active and sources of encouragement for being active. Although 831 respondents aged 13-50 years and over participated in the survey, only a portion of the data was used for the purpose of this study. I focused on people between middle adolescence and over. As was discussed in the literature review, Smith et al. (2007) suggests that young people between early and middle adolescence should be the focus of physical activity promotion programmes Thus results from 439 of these respondents, those aged between 16-24 years were analysed for the following three reasons: (a) The ideas and beliefs about physical activity for the older groups, including the older high school age group (16-17 years), are likely to be more fully formed than younger participants and (b) they are on the cusp of leaving school, which is also known as a potentially risky time because people aged between 16-24 years are

most at risk of stopping physical activity and at risk of becoming overweight and obese, particularly girls and women. As WHO (2003 ¶3) points out: "Physical activity declines with age, falling off from adolescence ... and in schools worldwide [particularly] girls and women". In addition, the analysis was limited to these two key age groups because of time considerations and size considerations for a three paper thesis.

I analyzed the data to see whether physical activity behavior differed by gender and between school-aged people (aged 16-17 years) and older youth (between 18 and 24 years). These choices produced a sample of between 426 and 439 respondents although the total varied for each question depending on how many participants answered that question.

Descriptive analysis

A descriptive analysis of the data was performed to describe the physical activity levels of the whole sample aged 16-24 years old (see Appendix D for a copy of the sample demographic profile). The analysis was focused on determining key trends and issues that could be explored in the focus group interviews with a view to explaining particular trends or exploring them in more depth (Vaus, 1995). Descriptive analysis is based on the notion that to explain why something has happened, you must first find out what has happened and, according to Vaus (1995), "Good description is important. It is the basis for sound theory. Unless we have described something accurately and thoroughly, attempts to explain it will be misplaced" (p. 24).

Independent-two sample t-test

An independent two-sample *t*-Test was performed to determine whether the means of the two groups were statistically different from each other (Trochim, 2006). The *t*-Test looks at the difference between the scores for two groups. If their means relative to the spread of scores overlap, the difference is not significant. In contrast, if their means relative to the spread of scores do not overlap, the difference between the means of two groups is significant (Dancy & Reidy, 2004; Trochim, 2006). To perform the *t*-Test the samples must be unrelated or should appear in only one group (e.g., male or female) and the samples should come from populations with equal variances (Coakes, Steed & Dzidic, 2006). The results of the respective tests were rejected if the p-value was less than .05 (i.e., $p < .05$) (Elliot & Woodward (2007).

A key assumption that was also required in order to perform the *t*-Tests, according to Elliot and Woodward (2007), was "that the population from which the sample is selected is normal" (p. 48). A sample that has a mean of zero and a standard deviation of one is known as a standard normal distribution. I was concerned about the non-normality (i.e., the 16-17 year old sample was larger than the 18-24 year old sample and more females participated in the survey than males) of my data and whether the *t*-Test was the appropriate test to use. However, Elliot and Woodward argue: "if the sample size is large (at least 40), then the… [two-sample *t*-Test]…can be safely used without regard to skewness or outliers" (2007, p. 49). Furthermore, Elliot and Woodward point out: "This rule is based on the central limit theorem which says when the sample size is large, then the sample scores should be normally distributed" (2007, p. 49). Thus, based on these arguments and the scope of this study I used the *t*-Test.

Qualitative Method: Focus group

Focus group interviews (see Appendix E for a copy of the focus group information) were used to collect data to explain particular physical activity and health trends that were revealed in the analysis of the survey. The protocols and methods received ethical approval from University of Waikato in 2008.

Methods

I used a Talanoa approach to guide the focus group interviews. According to Vaioleti (2007) "Talanoa...means talking...and interacting without a rigid framework" (p. 23). Unlike traditional research approaches, Talanoa appealed to me because it is natural to Pacific peoples, the process is less rigid and it provides opportunities for people to share, challenge and validate each other's ideas in order to reach a group consensus. Talanoa is respectful, interactive and responsive, where participants listen to each other and respond appropriately (Vaioleti, 2006). Furthermore, although the purpose of the Talanoa should be stated at the beginning, an open technique should be employed and the nature of the questions should be based on the way the conversation develops. As Vaioleti (2006) points out: "The Talanoa and interview will end when it loses its malie [participants lose interest] or starts to revisit areas covered already" (p. 26). More importantly, as Vaioleti (2006) states, "Talanoa removes the distance between the researcher and participant, and provides research participants with a human face they can relate to" (p. 25). This approach related to the focus on relationships as the overarching

binding principle in Pacific cultures, particularly in Pacific research practices (HRC, 2004). A qualitative topic guide that included a list of interview questions was used to guide the interviews (see Appendix E for a copy of the interview questions). The questions were generally focused on determining the enablers and barriers that influenced young people's physical activity patterns. However, as the Talanoa progressed, the topics developed naturally, some of which corresponded with the topic guide and thus particular questions did not need to be asked. Dawn acted as my advisor at both focus group meetings and rephrased English questions in Samoan for the students where needed, and generally contributed ideas and comments for the participants to consider for further discussion. Dawn was also instrumental in arranging an expert to translate the information sheet and consent forms into Samoan. The translation was proof read and its accuracy was checked and approved by Dawn.

Initial meeting in May 2008

Whilst on a trip to Samoa in early May 2008, permission to conduct the interviews with students from NUS was discussed with Dawn. We talked about the possibility of interviewing a sample of at least 10 students who participated in the survey that was carried out in 2007 at NUS. The intention was to interview both female and male students in the class in two separate focus groups, each consisting of five people. Dawn suggested the end of June was the best time to interview the students when they returned from their work experience. An introductory letter, information sheet and a consent form about the study were sent to Dawn to give to the students. However, due to Dawn's commitments and schedule I was not able to return until September to conduct the focus group interviews.

Conducting focus group interviews in Samoa, September 2008

The data gathering was carried out over a three week period in Apia that involved recruiting the participants, conducting the focus groups, and transcribing the interviews.

Meeting the participants

The interviews were held on campus, a familiar setting for the students. Two focus group interviews were conducted that involved 12 students. The respondents were all Samoan, 18-19 years of age and studying full time at NUS in the Faculty of Education department. I met the first group in the morning between 8:00am and 9:30am in a classroom on campus where the students were timetabled to be that

day. In the afternoon, I met the second group in the Gymnasium on campus at NUS between 1:00pm and 2:00pm. The focus group interviews lasted 45 to 90 minutes, and finished when the Talanoa naturally ended or the exchange of ideas had completely stopped (Vaioleti, 2006).

Consent, confidentiality and right of withdrawal

The participants were given the right to decline an invitation to be interviewed or to withdraw from the interview at any stage. Participation was completely voluntary and the interviews were scheduled to accommodate the needs of the students and when they preferred to meet so that this project did not disrupt their classes or other commitments. Participants were given time to withdraw from the study at any time up until they approved their transcripts as an accurate rendering of their participation.

Focus group interviews

The participants were required to read the information sheet about the study and complete the consent form prior to the start of the focus group. During the introduction, a brief overview was presented about the study and the format of the interview was explained. Participants were asked to answer a series of open-ended questions that were recorded on a digital voice recorder. The participants could decline to answer particular questions. Participants could request to have the questions communicated in Samoan (see Appendix F for a copy of the Samoan translation of the focus group information). However, the interviews were undertaken in English which was approved by both groups. They were also invited to respond to the questions in either or both languages. All but two male participants elected to converse in English. The male participants expressed their ideas mainly in Samoan sprinkled with some dialogue in English. At the conclusion of the interview, the participants were reminded of the confidentiality agreement and an opportunity was provided to ask questions about the post interview process but no one asked. They were also informed about their rights to access any data that was collected from or about them.

Written feedback, corrections, requests for sections to be deleted or expanded comments on specific aspects of the interview

The interviews were recorded and transcribed verbatim over five days using Microsoft word. The transcripts were given to Dawn to proof read and edit for grammatical errors specifically related to the Samoan dialogue. I scheduled another

session with the respondents so I could give the transcripts back to them to edit. This was an important exercise because the students were given the opportunity to withdraw and/or edit their comments. I did this over a two to three day period because not all the students attended the sessions at one time. After three days, I had successfully managed to get everyone to check the transcripts except for one student who did not attend the timetabled class sessions. All the students did edit their text such as adding more comments or making corrections to words I had misspelt. Furthermore, there were gaps in the dialogue or text that showed parts of the recording that I could not discern clearly, so the participants were able to fill in some of the gaps. However, there were still gaps in the transcripts after this process was completed. The process was transparent and I sensed (e.g., by the students' relaxed attitudes, body language, friendly reception, positive mood) that the participants felt valued that I cared enough to provide an opportunity for them to edit, add, correct or retract their comments.

Intellectual property rights and disseminating results

The participants were informed that the results of the study were to be used for the production of research presentations and publications and that key results were going to be shared with Government departments, agencies or organisations whose work relates to the health and physical activity issues addressed in the research. More importantly, the participants were assured that the information was not going to be used in any way to discredit or misrepresent them.

Reciprocity

To show my gratitude to Dawn and the students who participated in the focus group interviews, I offered to facilitate a sports coaching skills session with the students. I facilitated a rugby skills coaching session for two of Dawn's classes. Furthermore, I had the pleasure of taking the National Women's Rugby Squad for a warm up that Dawn was managing. On another occasion, I provided further information over coffee with a participant from the focus group interviews who asked me to explain how I structured the coaching session that I facilitated with his class.

Analysis

Both sets of focus group data were analysed separately by using a thematic model that involved organising the written responses into themes. The results from both sets of data were merged to determine common trends. The overall results from the

focus group analysis were also used to explain or expand upon the trends that were revealed as a result of the survey analysis. The results of the survey and focus group studies are presented in the next two chapters, supplemented by personal observations and literature research where appropriate.

CHAPTER 4: SURVEY RESULTS

Introduction

This chapter presents the key results of survey data collected in 2007 for young people in the Apia Urban Area between the ages of 16-24 years old. These results are drawn from three sections of the survey, which relate directly to the focus of my research and the later focus group interviews. The first section of the survey was related to young peoples' perceptions about physical activity. It included seven statements; (see Appendix B)

The second section included three questions which were focused on the respondents' perceptions about their personal health and weight; (see Appendix B)

The third section focused on the respondents' views about physical activity patterns, barriers and enablers to participation in physical activity. It comprised seven questions; (see Appendix B)

The majority of the respondents were in the younger age group (72% of the total sample were 16-17 years old) and female (64.5% of the total). In some cases, this made it difficult to establish any statistical significance in differences between the groups because the differences may have been due to chance. As a result, these inconclusive results are used in the discussion to highlight key points only. Details of all *t*-Test results can be found in Appendix G. The analysis of the data collected regarding the perceptions of health, physical activity, barriers and enablers to physical activity questions revealed the following results by age (16-17 and 18-24 years), and gender (male and female). The number of responses (*n*) by age and gender may differ (or do vary for most questions) depending upon how many respondents answered that question. There is no apparent reason to explain why the respondents did not answer certain questions, in particular demographic questions about age and gender.

Perceptions about health

The respondents clearly believed they were healthy (see Table 5). Overall, 91% of the sample rated their health as good, very good or excellent. Almost one quarter rated their health as excellent in comparison to less than 2% who saw their health as poor. There were no significant differences by age or gender (see Appendix G *t*-Test results).

Table 5. ***Health rating scores by percentage***

Group	*n*	Excellent	Very Good	Good	Fair	Poor
16-17	304	23.7	28.6	39.1	7.2	1.3
18-24	122	27.0	33.6	29.5	6.6	3.3
Total	426	24.6	30.0	36.4	7.0	1.9
Male	148	30.4	28.4	33.1	6.8	1.4
Female	275	21.8	30.9	37.8	7.3	2.2

Respondents' perceptions about their weight

Overall, 48.7% of the respondents believed that their weight was about right compared with 34.1% and 17.3% who rated their body size as overweight or underweight, respectively (see Table 6). There were no significant differences by age or gender.

Table 6. ***Ratings by Percentage of the Respondents' Perceptions About their Weight***

Group	*n*	Very Underweight	A Little Underweight	About the Right Weight	A Little Overweight	Very Overweight
16-17	310	1.0	13.5	49.7	31.9	3.9
18-24	124	3.2	16.9	47.6	29.0	3.2
Total	434	2.1	15.2	48.7	30.5	3.6
Male	150	1.3	14.0	46.7	31.3	6.7
Female	281	1.8	14.9	50.9	30.2	2.1

Respondents who wanted to gain or lose weight

Over half the respondents wanted to lose weight compared with almost 16% who wanted to gain weight (see Table 7). There were no significant differences by age or gender.

Table 7. ***Ratings by Percentage of Respondents Who Wanted to Gain or Lose Weight***

Group	*n*	Gain Weight	Lose Weight	No Change
16-17	310	12.9	57.1	30.0
18-24	124	18.5	50.8	30.6
Total	434	15.7	54.0	30.3
Male	150	19.3	50.0	30.7
Female	281	12.1	58.0	29.9

Perceptions about Physical Activity

I get enough physical activity to keep me healthy

The respondents clearly believed they were getting enough physical activity to keep healthy (see Table 8). Overall, 72.2% of the sample strongly agreed or agreed that they were getting enough physical activity to keep healthy compared to 25.1% who were undecided or did not agree. There were no significant differences by age or gender.

Table 8. ***Rating by Percentage for Whether Respondents are Getting Enough Physical Activity to Keep Healthy***

Group	*n*	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
16-17	305	26.9	46.6	11.8	12.8	2.0
18-24	122	29.5	46.7	11.5	8.2	4.1
Total	427	26.9	45.3	11.4	11.2	2.5
Male	146	31.5	41.8	12.3	12.3	2.1
Female	278	25.9	48.6	11.5	11.2	2.9

I like to be physically active on my own rather than in a group

The respondents did not have a clear preference for group-based or individual-based activities (see Table 9). Overall, 55.5% of the sample preferred to be active on their own compared to 34.5% that reported a preference for group-based activities and 10% were undecided. The results were not significant by age or gender.

Table 9. ***Ratings by Percentage for Whether Respondents Prefer to be Active on their Own***

Group	*n*	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
16-17	308	19.8	35.1	9.4	27.6	8.1
18-24	124	21.0	36.3	11.3	21.8	9.7
Total	432	20.1	35.4	10.0	25.9	8.6
Male	148	18.9	30.4	9.5	33.8	7.4
Female	281	20.6	38.1	10.3	22.1	8.9

Note. The results of the pilot study group were included in this question although the question was worded slightly differently.

I'm more physically active than other people my age

The respondents do not appear to believe they were more active than other people their age (see Table 10). Overall, 25.8% strongly agreed or agreed, compared to 41.3% who disagreed or strongly disagreed that they were more active than other people their age. Almost one third were undecided. There were no significant differences by age or gender.

Table 10. ***Ratings by Percentage for Whether Respondents Were More Physically Active than Other People their Age***

Group	*n*	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
16-17	305	7.2	18.0	33.1	33.1	8.5
18-24	121	9.9	17.4	32.2	31.4	9.1
Total	426	8.0	17.8	32.9	32.6	8.7
Male	147	8.2	19.7	36.1	27.2	8.8
Female	276	8.0	16.7	31.2	35.5	8.7

I'm so busy at work/school that I'm too tired to be physically active when I get home

Over half appear to be so busy at work or school that they are too tired to be physically active at home (see Table 11). Overall, 56.1% of the sample strongly agreed or agreed that they were too tired to be physically active at home compared with 32.2% who disagreed and 11.7% who were undecided. There was a significant difference by age, $t(433) = 2.19$, $p = .029$, with the group aged 16-17

years more strongly affected by work or school compared with the older group (aged 18-24 years) who were less affected by work or school.

Table 11. ***Ratings by Percentage for Whether Respondents Were Too Busy and Tired from Work and/or School to be Physically Active at Home***

Group	*n*	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
16-17	310	28.7	30.3	11.3	20.0	9.7
18-24	125	16.8	32.0	12.8	28.8	9.6
Total	435	25.3	30.8	11.7	22.5	9.7
Male	149	21.5	27.5	16.8	24.8	9.4
Female	282	27.3	33.0	9.2	20.9	9.6

I get enough physical activity according to the recommended guidelines of 30 minutes a day

Less than half agreed that they were getting enough physical activity according to recommended guidelines (see Table 12). Overall, 46.1% of the respondents strongly agreed or agreed that they were getting sufficient physical activity compared with 32.2% who disagreed or strongly disagreed and 21.8% who were undecided. There were no significant differences by age or gender.

Table 12. ***Ratings by Percentage for Whether the Respondents Were Getting Enough Physical Activity According to the Recommended Guidelines of 30 Minutes a Day***

Group	*n*	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
16-17	307	10.1	35.2	24.1	26.1	4.6
18-24	125	13.6	34.4	16.0	29.6	6.4
Total	432	11.1	35.0	21.8	27.1	5.1
Male	149	14.1	32.9	21.5	26.2	5.4
Female	282	9.6	35.7	22.1	27.9	4.6

People who are not physically active are at risk of health problems

The respondents believed that non active people are at risk of health problems. Overall, 79.5% of the respondents strongly agreed or agreed compared to 20.5% who were undecided, disagreed or strongly disagreed (see Table 13). There was a significant difference by age, $t(433) = -2.20$, $p = .029$. Both age groups believed

that non active people were at risk of health problems but the older group aged 18-24 years had a slightly higher rating.

Table 13. ***Ratings by Percentage for Whether Non Active People Were at Risk of Health Problems***

Group	*n*	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
16-17	310	51.3	25.2	8.1	8.1	7.4
18-24	125	56.0	31.2	6.4	6.4	3.2
Total	435	52.6	26.9	6.7	7.6	6.2
Male	150	52.0	22.7	10.0	10.0	8.7
Female	282	52.5	29.4	6.4	6.4	5.0

Being physically active is important in my life

The respondents believed that physical activity was important in their lives (see Table 14). Overall, 94% of the sample strongly agreed or agreed that being physically active was important compared with 3.9% who strongly disagreed or disagreed. There were no significant differences by age or gender.

Table 14. ***Ratings by Percentage for Whether Physical Activity was Important in their Lives***

Group	*n*	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
16-17	310	63.2	30.0	2.6	1.6	2.6
18-24	124	70.2	25.8	0.8	1.6	1.6
Total	434	65.2	28.8	2.1	1.6	2.3
Male	151	64.9	27.2	2.0	2.0	4.0
Female	180	65.4	29.6	2.1	1.4	1.4

Physical Activity Patterns

To meet the physical activity guidelines, the respondents would need to be physically active for at least 30 minutes for five days over seven days. This guideline emerged from the Workshop on Implementation of the Global Strategy on Diet, Physical Activity and Health in the Pacific, Suva, Fiji in 2006 (WHO, 2008c).

How much walking at a quick pace have you done in the past 7 days

Overall, 46.1% of the respondents reported that they had walked quickly for at least 5 to 7 days over the past 7 days compared with 46.5% who had walked for between 1 and 4 days (see Table 15). There was a significant difference by gender t (430) = 2.51, p = .012. Over half the males (53.3%) walked regularly for between 5 and 7 days, over 7 days, compared with 41.1% of the females.

Table 15. ***Ratings by Percentage for Walking at a Quick Pace in the Past 7 Days***

Group	*n*	Zero days	1 day	2 days	3 days	4 days	5 days	6 days	7 days
16-17	311	8.0	7.1	11.6	16.7	12.2	17.4	10.6	16.4
18-24	124	7.3	6.5	13.7	6.5	18.5	17.7	8.9	21.0
Total	435	7.7	6.8	12.7	11.6	15.4	17.6	9.8	18.7
Male	150	6.7	5.3	7.3	10.0	17.3	22.7	11.3	19.3
Female	282	8.5	7.8	14.9	16.0	11.7	14.9	9.2	17.0

Participation patterns in hard physical activity in past 7 days

Overall, 23.6% of the respondents participated in hard physical activity for at least 5 to 7 days out of the past 7 days compared with 53.2% who participated in hard physical activity for 1-4 days (see Table 16). Hard physical activity was defined as a noticeable increase in breathing and heart rate. Interestingly, 23.3% did not participate in hard physical activity on any day out of the past 7 days. There was a significant difference by gender t (430) = 7.27, p = .001. Over a third of the males participated in hard physical activity for at least 5 to 7 days out of 7 compared with 14.9% of the females. Interestingly, almost a third of the females reported that they did not participate in hard physical activity on any day over the past 7 days.

Table 16. ***Ratings by Percentage of Hard Physical Activity Participation Patterns in Past 7 Days***

Group	*n*	Zero days	1 day	2 days	3 days	4 days	5 days	6 days	7 days
16-17	310	24.2	14.2	17.4	11.9	10.0	11.9	6.1	4.2
18-24	125	22.4	12.0	23.2	8.8	8.8	8.0	10.4	6.4
Total	435	23.3	13.1	20.3	10.4	9.4	10.0	8.3	5.3
Male	151	8.6	9.9	18.5	9.9	16.6	16.6	14.6	5.3
Female	281	32.0	15.7	19.6	11.7	6.0	7.1	3.2	4.6

Percentage of people who met the recommended physical activity guidelines

Overall, 27.6% of the respondents reported that they participated in 30 minutes of physical activity regularly for at least 5 to 7 days out of the past 7 days compared with 27% who were active for at least 3 to 4 days out of 7, 31.7% who were less active for at least 1 to 2 days out of 7 and 13.8% who reported that they did not engage in physical activity on any day out of the past 7 days (see Table 17). There were no significant differences by age or gender.

Table 17. ***Ratings by Percentage of the Respondents Who Engaged in 30 Minutes of Easy to Hard Physical Activity a Day out of the Last 7 Days***

Group	*n*	Zero days	1 day	2 days	3 days	4 days	5 days	6 days	7 days
16-17	313	15.3	13.7	14.4	15.0	11.2	10.2	7.7	12.5
18-24	122	12.3	18.0	17.2	16.4	11.5	12.3	5.7	6.6
Total	435	13.8	15.9	15.8	15.7	11.4	11.3	6.7	9.6
Male	150	14.7	15.3	14.0	13.3	13.3	15.3	5.3	8.7
Female	282	14.5	14.9	15.6	16.7	9.9	8.5	8.2	11.7

How physically active the respondents think they are

In general, 33.2% of the respondents reported that they were regularly physically active for at least 30 minutes a day compared with 55.6% who were sometimes physically active and 8.2% who were less active or did not participate in physical activity on any day of the week (see Table 18). There were no significant differences by age or gender.

Table 18. ***Ratings by Percentage of How Physically Active the Respondents think they Are***

Group	*n*	Not Physically Active e.g. 0-1 Day a Week	Sometimes Physically Active e.g. 2-3 Days a Week	Regularly Physically Active e.g. Every Day
16-17	312	8.3	61.5	30.1
18-24	125	8.0	49.6	42.4
Total	437	8.2	55.6	36.3
Male	151	7.9	51.0	41.1
Female	283	8.5	62.5	29.0

Respondents who intended to be more or less active in 6 months time

More than half of the respondents indicated that they intended to be more physically active in 6 months time compared with 38.2% who were going to maintain their current level of physical activity (see Table 19). There were no significant differences by age or gender.

Table 19. ***Ratings by Percentage of How Many Respondents Intend to be More or Less Physically Active in 6 Months Time***

Group	*n*	More Physically Active	About the Same	Less Physically Active
16-17	307	49.8	41.7	8.5
18-24	124	58.1	34.7	7.3
Total	431	54.0	38.2	7.9
Male	151	57.0	35.1	7.9
Female	277	49.5	42.2	8.3

Why physical activity is important to young people

In Figure 1, all the responses were identified and sorted in order from the largest to the smallest scores. Because of time and space constraints, the following section focuses on the five most common reasons why physical activity was important to the respondents. However, it is important to note that the next two most common responses – to look better and because physical activity was enjoyable, also rated highly.

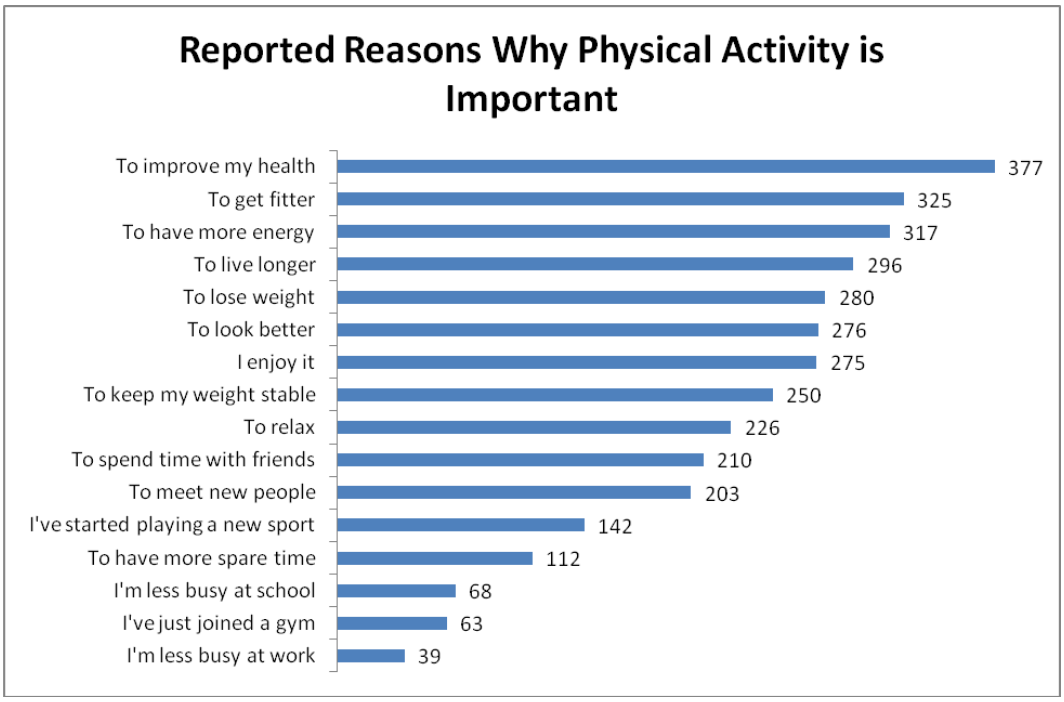


Figure 1. Respondents' reporting of reasons why physical activity is important

Physical activity is important to improve health

An overwhelming 87.3% of the respondents reported that physical activity was important to them to improve health (see Table 20). There were no significant differences by age or gender.

Table 20. ***Rating by Percentage of Physical Activity is Important to Improve Health***

Group	*n*	To Improve My Health
16-17	264	84.1
18-24	113	90.4
Total	377	87.3
Male	124	81.6
Female	251	88.7

Physical activity is important to get fitter

Seven in 10 respondents believed that physical activity was important to them to get fitter (see Table 21). There were no significant differences by age or gender.

Table 21. ***Rating by Percentage of Physical Activity is Important to Get Fitter***

Group	*n*	To Get Fitter
16-17	228	72.6
18-24	97	77.6
Total	325	75.1
Male	101	66.4
Female	221	78.1

Physical activity is important to have more energy

Almost three quarters of the respondents reported that physical activity was important to them to have more energy (see Table 22). There was a significant difference by age t (437) = -2.18, p = .030. Almost 80% of the older age group believed that physical activity was important to improve energy compared with less than 70% of the younger age group.

Table 22. ***Rating by Percentage of Physical Activity is Important to Have More Energy***

Group	*n*	To Have More Energy
16-17	218	69.4
18-24	99	79.2
Total	317	74.3
Male	105	69.1
Female	210	74.2

Physical activity is important to live longer

Almost 70% of the respondents believed that physical activity was important to them to live longer (see Table 23). There was a significant difference by gender *t* (433) = -2.05, p = .041. More females believed that physical activity was important to live longer compared with the males.

Table 23. ***Rating by Percentage of Physical Activity is Important to Live Longer***

Group	*n*	To Live Longer
16-17	204	65.0
18-24	92	73.6
Total	296	69.3
Male	93	61.2
Female	201	71.0

Physical activity is important to lose weight

Almost two thirds of the respondents believed that physical activity was important to them to lose weight (see Table 24). There was a significant difference by gender $t(432) = -2.97$, $p = .003$. Almost 70% of the females reported that physical activity was important to them to lose weight compared with just over half of the males.

Table 24. ***Rating by Percentage of Physical Activity is Important to Lose Weight***

Group	*n*	To Lose Weight
16-17	200	63.9
18-24	80	64.0
Total	280	64.0
Male	82	54.3
Female	195	68.9

Perceptions of physical activity barriers

In the next section I present the results of all the reported barriers to physical activity (see Figure 2). In Figure 2, the 'influences me' scores were calculated by adding together the number of respondents who chose 'influences me a lot' and 'sometimes influences me'. In the remainder of this section I address each barrier separately, beginning with the barrier which received the most 'influences me' responses.

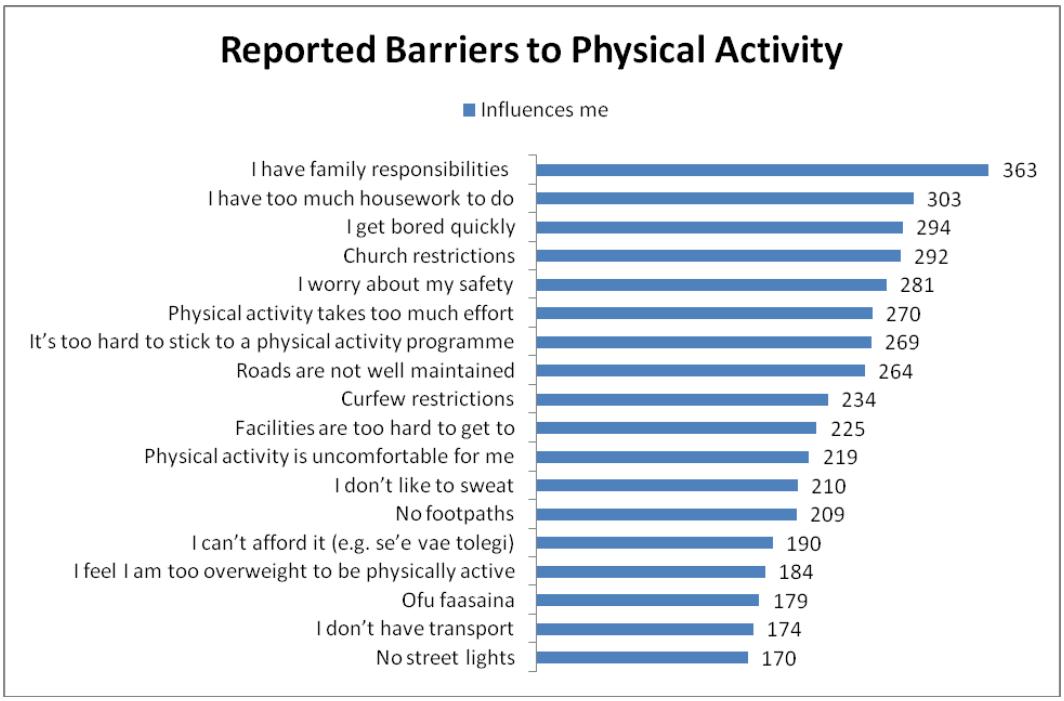


Figure 2. Respondents' reporting of barriers

I have family responsibilities

Overall, family responsibilities were by far the most common barrier. More than three quarters (83.6%) of respondents believed that family responsibilities were a barrier to physical activity in comparison to only 16.4% who were not influenced by it (see Table 25). There were no significant differences by age or gender.

Table 25. ***Ratings by Percentage for Whether Family Responsibilities Were a Barrier to Physical Activity***

Group	*n*	Influences Me	Does Not Influence Me
16-17	309	83.1	16.8
18-24	125	84.8	15.2
Total	434	83.6	16.4
Male	150	85.3	14.7
Female	282	82.6	17.4

I have too much housework to do

Another major barrier was housework. More than two thirds (70.6%) of respondents believed that having too much housework to do was a barrier to

physical activity in comparison to under one third (29.4%) who were not influenced by it (see Table 26). There were no significant differences by age or gender.

Table 26. ***Ratings by Percentage for Whether Having too Much Housework to do was a Barrier to Physical Activity.***

Group	*n*	Influences Me	Does Not Influence Me
16-17	306	69.0	31.0
18-24	123	74.8	25.2
Total	439	70.6	29.4
Male	149	67.8	32.2
Female	278	72.0	28.1

I get bored quickly

Boredom was a third major barrier. More than two thirds (68.5%) of the respondents believed that physical activities bored them quickly compared with almost a third who were not influenced by boredom (see Table 27). There were no significant differences by age or gender.

Table 27. ***Ratings by Percentage for Whether Boredom was a Barrier to Participation***

Group	*n*	Influences Me	Does Not Influence Me
16-17	305	69.0	31.0
18-24	124	66.9	33.1
Total	429	68.5	31.5
Male	148	70.3	29.7
Female	280	67.5	32.5

Church restrictions (e.g., Aso sapati* [Sabbath day]*)

Overall, just over two thirds (67.8%) of respondents believed that church restrictions were a barrier to physical activity participation while under one third (32.3%) did not regard it as an influence (see Table 28). There were no significant differences by age or gender.

Table 28. ***A Comparison Table of Group Scores for Whether Church Restrictions were a Barrier to Physical Activity Participation***

Group	*n*	Influences Me	Does Not Influence Me
16-17	308	66.0	34.1
18-24	123	72.4	27.6
Total	431	67.8	32.3
Male	149	69.8	30.2
Female	281	66.6	33.5

I worry about my safety (e.g., dogs that bite)

Overall, almost two thirds (65%) of respondents believed that a concern for personal safety (e.g., dogs that bite) was a barrier to physical activity in comparison to just over one third (35%) who did not regard it as a barrier (see Table 29). There was a significant difference by gender, t (429) = -4.16, p = < .001. More than two thirds (70.8%) of females were concerned about personal safety while 45.7% of males were not influenced by it.

Table 29. ***Ratings by Percentage for Whether Worries about Safety were a Barrier to Physical Activity***

Group	*n*	Influences Me	Does Not Influence Me
16-17	308	65.3	34.7
18-24	124	64.5	35.5
Total	439	65.0	35.0
Male	151	54.3	45.7
Female	280	70.8	29.3

Physical activity takes too much effort

Overall, almost two thirds (62.8%) of the respondents believed that physical activity involved too much effort while just over one third (37.2%) did not regard it this way (see Table 30). There were no significant differences by age or gender.

Table 30. ***Ratings by Percentage for Whether Physical Activity that Involved too Much Effort was a Barrier to Participation***

Group	*n*	Influences Me	Does Not Influence Me
16-17	307	63.1	36.8
18-24	123	61.8	38.2
Total	430	62.8	37.2
Male	148	60.1	39.9
Female	280	64.3	35.7

It's too hard to stick to a physical activity programme

Overall, almost two thirds (62.7%) of respondents believed that physical activity programmes were too hard to stick with. Over one third (37.3%) were not influenced by this barrier (see Table 31). There was a significant difference by age t (427) = -2.8, p = 006 and gender t (425) = -2.2, p = .029. More than two thirds of the older age group (70.7%) believed that physical activity programmes were too hard to stick with in comparison with 59.5% of the younger group. More females (67.1%) than males believed that physical activity programmes were too hard to stick to. However, for each group more than half agreed that this was a barrier (see Appendix G *t*-Test results).

Table 31. ***Ratings by Percentage for Whether Physical Activity Programmes that were too Hard to Stick with were a Barrier to Participation***

Group	*n*	Influences Me	Does Not Influence Me
16-17	306	59.5	40.5
18-24	123	70.7	29.3
Total	429	62.7	37.3
Male	147	53.7	46.3
Female	280	67.1	32.9

Roads are not well maintained

Overall, 60.8% of respondents believed that roads that are not well maintained were a barrier to physical activity in comparison to more than one third (39.2%) who did not regard them as a barrier (see Table 32). There was a significant difference by

gender t (429) = -2.48, p = .015. Just over two thirds (66.2%) of females believed that roads that were not well maintained were a barrier to physical activity while just under half (48.7%) of males were not influenced by it.

Table 32. ***Ratings by Percentage for Whether Roads that were not Well Maintained were a Barrier to Physical Activity***

Group	*n*	Influences Me	Does Not Influence Me
16-17	310	61.3	38.7
18-24	124	59.6	40.3
Total	434	60.8	39.2
Male	150	51.4	48.7
Female	281	66.2	33.8

Curfew restrictions (e.g., Sa o le nu'u* [village restrictions]*)

Overall, more than half (54.4%) of respondents believed that curfew restrictions were a barrier to physical activity (see Table 33). There were no significant differences by age or gender.

Table 33. ***Ratings by Percentage for Whether Curfew Restrictions were a Barrier to Physical Activity***

Group	*n*	Influences Me	Does Not Influence Me
16-17	307	54.4	45.6
18-24	123	54.5	45.5
Total	430	54.4	45.6
Male	148	51.3	48.6
Female	280	56.1	43.9

Facilities are too hard to get to

Overall, respondents were divided over whether facilities were too hard to get to although slightly more than half (52.3%) saw it as a barrier (see Table 34). There were no significant differences by age or gender.

Table 34. ***Ratings by Percentage for Whether Facilities that were too Hard to Access were a Barrier to Physical Activity Participation***

Group	*n*	Influences Me	Does Not Influence Me
16-17	306	52.6	47.4
18-24	124	51.6	48.4
Total	430	52.3	47.7
Male	149	52.4	47.7
Female	279	52.3	47.7

Physical activity is too uncomfortable for me

Overall, slightly over half (51.4%) of respondents thought physical activity was too uncomfortable compared with just under half (48.6%) did not see this as a barrier (see Table 35). There were no significant differences by age or gender.

Table 35. ***Ratings by Percentage for Whether Physical Activity that was too Uncomfortable was a Barrier to Participation***

Group	*n*	Influences Me	Does Not Influence Me
16-17	303	51.8	48.2
18-24	123	50.4	49.6
Total	426	51.4	48.6
Male	148	50.0	50.0
Female	277	52.3	47.7

I don't like to sweat

Sweating was the first barrier in which less than half the respondents did not see it as a barrier. Overall, slightly less than half (49.5%) of respondents believed that physical activity that induced sweat was a barrier compared with half (50.6%) who did not regard it as a barrier (see Table 36). There were no significant differences by age or gender.

Table 36. ***Ratings by Percentage for Whether Sweating Induced by Physical Activity was a Barrier to Participation***

Group	*n*	Influences Me	Does Not Influence Me
16-17	302	49.0	51.0
18-24	123	50.4	49.6
Total	425	49.5	50.6
Male	145	51.1	49.0
Female	278	48.9	51.1

No footpaths

Respondents were divided over whether a lack of footpaths was a barrier. Overall, just under half (49%) of respondents believed that a lack of footpaths were a barrier to physical activity (see Table 37). However, there was a significant difference by gender t (422) = -4.05, $p < .001$. More than half (54.3%) of females believed that no footpaths were a barrier to physical activity while close to two thirds (61.8%) of males did not consider it a barrier.

Table 37. Rating by Percentage for Whether a Lack of Footpaths was a Barrier to Physical Activity

Group	*n*	Influences Me	Does Not Influence Me
16-17	302	47.6	52.3
18-24	124	52.4	47.6
Total	426	49.0	50.9
Male	144	38.2	61.8
Female	280	54.3	45.7

Affordability (e.g., se'e vae tolegi **[exercise shoes]*)***

Less than half of the respondents reported that affordability was a barrier to physical activity (see Table 38). However, there was a significant difference by gender t (423) = 2.59, $p < .010$. Over half of the males reported that affordability was a barrier to physical activity.

Table 38. ***Ratings by Percentage of Respondents Who Couldn't Afford it to be Physically Active***

Group	n	Influences Me	Doesn't Influence Me
16-17	303	43.9	56.1
18-24	124	45.9	54.0
Total	420	45.0	55.1
Male	149	53.0	47.0
Female	276	39.5	60.5

Ofu faasaina **[clothing restrictions]**

Almost 40% of the respondents reported that ofu faasaina was a barrier to physical activity (see Table 39). There was a significant difference by gender t (427) = -2.30, $p < .022$. Almost half of the females believed that ofu faasaina was a barrier to participation.

Table 39. ***Rates by Percentage of Ofu Faasaina was a Barrier to Physical Activity***

Group	n	Influences Me	Does Not Influence Me
16-17	307	44.3	55.7
18-24	124	34.7	65.3
Total	431	39.6	60.5
Male	150	34.7	65.3
Female	279	45.5	54.5

Being overweight

Less than 40% of the respondents believed that they were too overweight to be physically active (see Table 40). There were no significant differences by age or gender.

Table 40. Ratings by Percentage of How Many Respondents Believed that they Were too Overweight to be Physically Active

Group	*n*	Influences Me	Does Not Influence Me
16-17	303	41.9	58.1
18-24	123	46.3	53.7
Total	426	44.1	55.9
Male	147	40.8	59.2
Female	277	44.4	55.6

Lack of transport

Although less than half of the respondents reported that a lack of transport was a barrier to physical activity, it was still an influence for 44.1% of respondents (see Table 41). There were no significant differences by age or gender.

Table 41. ***Ratings by Percentage of Transport as a Barrier to Physical Activity***

Group	*n*	Influences Me	Does Not Influence Me
16-17	307	39.4	60.6
18-24	117	45.3	54.7
Total	422	42.4	57.7
Male	147	36.1	63.9
Female	275	43.3	56.7

No street lights

Almost 41% of the respondents indicated that a lack of street lighting was a barrier to physical activity (see Table 42). There was a significant difference by gender $t(422) = -3.18$, $p < .002$. Almost half of the females believed that a lack of street lighting was a barrier to physical activity while 68.5% of the males did not.

Table 42. ***Rates by Percentage of the Respondents Who Reported That No Street Lights was a Barrier to Physical Activity***

Group	n	Influences Me	Does Not Influence Me
16-17	304	38.9	61.2
18-24	122	42.7	57.4
Total	426	40.9	59.3
Male	146	31.5	68.5
Female	278	44.6	55.4

Sources of Encouragement to be Physically Active

Friends mostly encouraged young people to be physically active, followed by school, church and village. In no case, were there significant differences by age or gender.

Encouragement from friends

Almost 90% received a lot (48.6%) or some (41.4%) encouragement from their friends to be physically active (see Table 43). There were no significant differences by age or gender.

Table 43. ***Rating by Percentages of Encouragement from Friends to be Physically Active***

Group	*n*	A Lot of Encouragement	Some Encouragement	No Encouragement	Does Not Apply
16-17	307	44.6	45.0	6.8	3.6
18-24	122	52.5	37.7	5.7	4.1
Total	429	48.6	41.4	6.3	3.9
Male	147	48.3	37.4	10.2	4.1
Female	280	46.1	45.7	4.6	3.6

Encouragement from school

Almost 85% received a lot (39.2%) or some (45.1%) encouragement from school to be physically active (see Table 44). There were no significant differences by age or gender.

Table 44. ***Rating by Percentage of Encouragement from a School to be Physically Active***

Group	*n*	A Lot of Encouragement	Some Encouragement	No Encouragement	Does Not Apply
16-17	302	35.8	48.3	8.6	7.3
18-24	122	42.6	41.8	11.5	4.1
Total	424	39.2	45.1	10.1	5.7
Male	143	42.7	39.2	10.5	7.7
Female	279	35.1	50.2	9.0	5.7

Encouragement from the Church to be physically active

Almost 80% received a lot (35.8%) or some (37.1%) encouragement from the church to be physically active (see Table 45). There were no significant differences by age or gender.

Table 45. ***Rating by Percentage of Encouragement from the Church to be Physically Active***

Group	*n*	A Lot of Encouragement	Some Encouragement	No Encouragement	Does Not Apply
16-17	304	33.9	33.9	16.8	15.5
18-24	122	37.7	40.2	12.3	9.8
Total	426	35.8	37.1	14.6	12.7
Male	144	35.4	33.3	18.1	13.2
Female	280	35.0	36.8	13.9	14.3

Encouragement from the village to be physically active

Almost two thirds received a lot (27.6%) or some (37.9%) encouragement from the village to be physically active (see Table 46). There were no significant differences by age or gender.

Table 46. ***Rating by Percentage of Encouragement from the Village to be Physically Active***

Group	*n*	A Lot of Encouragement	Some Encouragement	No Encouragement	Does Not Apply
16-17	305	28.5	37.4	21.6	12.5
18-24	120	26.7	38.3	19.2	15.8
Total	425	27.6	37.9	20.4	14.2
Male	146	33.6	40.4	13.7	12.3
Female	276	25.4	36.2	24.3	14.1

Summary of Quantitative Results

An overwhelming number of respondents valued physical activity and they believed that they were physically active enough to keep healthy. For example, 92% of the respondents rated their health between good and excellent. Further, a majority of respondents agreed that non active people were more likely to develop health problems.

When asked why physical activity was important, the survey respondents reported that they wanted to improve their health, get fitter, live longer, have more energy and lose weight. Also, a significant portion of the respondents believed that they were a little overweight and over a half indicated they wanted to lose weight and increase their physical activity levels over the next six months.

Yet the results suggest that most young people are not physically active enough although they think they are. Surprisingly, over three quarters of the respondents believed that they were getting enough physical activity to keep healthy. Yet, only 28% achieved 30 minutes of physical activity over five or more days, out of seven, in total. In spite of knowing the risks associated with inactivity, over half may be at risk in the future of becoming overweight or obese because they are not doing enough physical activity. The trend appears to reflect concerns in New Zealand and elsewhere in the Pacific (SPARC, 2003) compounded by an increase in overweight and obesity rates (Smith et al., 2007; SPC, 2002; Utter et al., 2007).

In addition, there was a mix of barriers which included family, religious and environmental factors, as well as views of physical activity as boring or uncomfortable. As Figure 2 indicates, many areas stood out as being important.

The findings suggest that cultural, environmental and discomfort factors were barriers to physical activity, particularly with older youth and females.

More than two thirds of the respondents believed that cultural barriers such as family, housework and church were the main barriers that affected their participation in physical activity, particularly older youth and males. Environmental factors such as a lack of footpaths including safety and facilities were barriers to participation, particularly for females. For instance, almost half of respondents, particularly over half of the females, believed that a lack of footpaths were barriers to physical activity. Lastly, an assortment of discomfort issues such as boredom including being overweight, was a barrier to participation. For instance, most of the respondents appeared to get bored easily with physical activity programmes, which was also a reported barrier among Fijian students in Kahn et al.'s (2006) study. Just under two thirds thought it was too hard to stick with a physical activity programme, particularly for females, about two thirds had an aversion to physical activities that involved too much effort, and about half found physical activity too uncomfortable, and just under half did not like to sweat. Although the survey results were not statistically significant, discomfort barriers related to physical activity appear to affect the females. The assortment of factors that inhibit physical activity clearly points to the need to consider interventions on a variety of fronts.

Lastly, young people are likely to engage in physical activity if they are encouraged by their friends, school, church and village. Almost two thirds of the respondents on average indicated that friends, school, church and village encouraged them to be physically active. The trends were similar by age and gender. For instance, almost 85% of young people and older youth on average reported that their school encouraged them to participate in physical activity. Likewise, the trend was similar by gender, whereby 82% and 85% of males and females respectively, believed that school encouraged them to be physically active. As was mentioned previously, school including friends could be useful sites to get more young people active.

The next chapter explores some of these key issues via focus group interviews.

CHAPTER 5: FOCUS GROUP INTERVIEW RESULTS

Introduction

This chapter presents the analysis of the data collected regarding the perceptions and experiences of physical activity and health of 12 NUS students via two focus group interviews. To support the findings, verbatim quotes are used from the participants including quotes from Dawn, as an informal participant/facilitator in the interviews. That is, where relevant, her questions or comments are included. Each participant is identified by gender and a number (e.g., M1 = male #1) and Dawn is identified as A1 (Assistant #1). Some of the quotes were recorded in the Samoan language and where there is a direct English equivalent I have included a translation (see Table 47). However, some Samoan words are virtually impossible to translate and they have been left in the text, although the closest meaning for some has been included where possible.

Table 47. ***Samoan Terms and their English Definitions (derived from Milner, 1992)***

Samoan	English
aso uma	each day or every day
fesootaiga	relationship
gaoioi	move
gaoioi le tino	move the body
gaoioiga	movement
malosi	strong or strength
inu pia	drink beer
sela	asthma
soifua maloloina	a respectful reference to good health and wellbeing
tagata	people
tino	body
ulaula	smoking

The Meaning of Faagaoioiga Ole Tino [Moving the Body]

The focus groups described the term 'physical activity' in a number of ways that included movement and a task that had to be done. Further, physical activity was regarded as movement that produced a range of health benefits. Overall, the participants identified eight different elements (see Table 48) that they believed underpinned faagaoioiga ole tino [moving the body or physical activity].

Table 48. ***Perceptions of Physical Activity***

Themes	Evidence											
	Focus group one						Focus group two					
What is physical activity?	M1	M2	M3	F1	F2	F3	M4	M5	F4	F5	F6	F7
1. task	✓	✓										
2. energy					✓	✓		✓		✓		
3. strength	✓	✓			✓	✓		✓	✓		✓	
4. soifua maloloina			✓		✓	✓	✓					
5. faagaoioiga	✓	✓			✓							
6. fitness - physical, mental and emotional			✓	✓								
7. fat/weight loss			✓									
8. individuality					✓					✓		

Two participants believed that physical activity was a task or an obligation that had to be done and they cited activities like house chores and walking as examples. This belief is reinforced in the following extract

> **(M1)** "Ou te talitonu o le physical activity…po ni… tusa o se… o sau feau lea… po lou…po le gaoioiga o le tino e tupu aso uma ma aso uma…tusa pei e mau tu o lou tino ma lea aso ma lea aso…i oe faataitaiina o le gaoioiga o lou ia tino i aso uma aso uma o le faiga o le feau pe a o le faiga o le saka…" [I believe that physical activity or movement is the same as a task or thing that has to be done every day to strengthen your body, today and the next day. The practice of movement in regards to my body each day is doing tasks that need doing, like preparing the things I need to boil food].

One third of the participants supported the idea that people who engaged in physical activity were more likely to have more energy. Further, there was an overwhelming response from the participants that supported the idea that physical activity promoted strength. This idea is expressed in the next example:

> **(F2)** "O le physical activity in my own opinion pe a tatou fua lea ai i le gaoioiga le tino ia…a tatou talanoa loa i ai le physical activity…e amata mai

ai faagaoioi tatou tino i aso uma…like running, walking ia maua ai le malosi ae mai se le soifuaga o lou tagata. Ia o le physical activity foi e increase pe faagaoioi le pulse rate o le heart. It can increase the energy ia e tele gaoioiga o le tino o tagata e mafai ona fai ina e ga ia increase ai le malosi ole tino ia fuafua ai le intake o le tagata ina ia maua ai o lou malosi." [Physical activity in my own opinion, if we measure movement of the body, that is, if we talk about body movement, it begins with moving our body every day, like running, walking…will provide strength especially to improve people's health and wellbeing. Also physical activity can increase or move the pulse rate of the heart. It can increase the energy in the body. There are many types of body movement that people may be able to do to increase body strength that suit their needs in order to get stronger].

Six participants provided a broader view of physical activity; two participants described it as a way of promoting physical, mental and emotional fitness and four others believed that physical activity promoted soifua maloloina [health and wellbeing]. One participant believed that physical activity was an effective way of losing weight and another participant argued that anyone could participate in a physical activity programme because there are a variety of programmes that suit a diverse range of people's needs.

The Meaning of Health

The focus groups described the term health as a particular state of well being and used the concept of 'soifua maloloina' that embraces a Samoan notion of wellbeing. Furthermore, the participants associated health with someone who was free from diseases.

Overall, the participants identified 13 elements (see Table 49) that they understood as being healthy. Three participants described health as a state of mental, physical and emotional wellbeing. Another participant had a broad view of health that included the elements above and also included social and spiritual wellbeing. This participant's view is expressed in the following example:

> **(F1)** "I can say health is the physical wellbeing of your body, your brain and also your psychological or emotions…. It is because your brain can actively control the whole body. That includes the physical, social, emotional and spiritual sides of an individual."

Table 49. ***Perceptions of Health***

Themes	Evidence											
	Focus group one						Focus group two					
What is health?	M1	M2	M3	F1	F2	F3	M4	M5	F4	F5	F6	F7
1. physical wellbeing				✓						✓	✓	
2. mental wellbeing				✓						✓	✓	
3. emotional wellbeing				✓						✓	✓	
4. social wellbeing				✓								
5. spiritual wellbeing				✓								
6. soifua maloloina		✓								✓		
7. good conditioned body	✓											
8. well balanced body						✓						
9. fitness - physically, mentally, emotionally					✓	✓						
10. free from disease					✓	✓						
11. outcome		✓	✓									
12. eating right			✓									
13. increased strength		✓										

Two participants believed that health was synonymous with the term 'soifua maloloina' [health and wellbeing] which is also a polite reference in the Samoan language that is used to wish someone good health. One participant considered someone who had a body that was well balanced and in good condition was healthy and one participant said a healthy person was someone who was physically, mentally and emotionally fit. The next example supports this idea:

> **(F2)** "I can say that health is totally fit in terms of physically, mentally, emotionally and not in terms of sickness or diseases."

Further, two participants believed that a healthy person was less likely to suffer from health-related diseases caused by inactivity and not eating correctly. Lastly, one participant expressed the idea that health was an outcome or result of regular participation in a physical activity:

> **(M2)** "Health is like an outcome or… is the result of the activities that you call the physical activities, the movements you done, and I can say that health is the benefit that you/or the outcome that you find out when you move your body…it's like…o le example…tagata e tino puta ia a fai…e faamaoni ia fai ai o ga activities faagaoi le tino ia pei… is like an outcome…healthy le la mulimuli mai ua le la malosi tino pe a e leai se mea e toe afia o lo na soifua maloloina ia…toaga e fai ai…physical activities." [Health is like an outcome or is the result that you receive from

participating in a physical activity. For example, if overweight people commit seriously to moving their bodies then they will develop strong bodies and they will not have to worry about good health and well being if they are seriously committed to doing physical activities].

The same participant stated that physical activity increased a person's strength which was also considered an element of health.

O le Fesootaiga O le Soifua Maloloina ma le Faagaoioiga O le Tino [The Relationship between Physical Activity and Health]

In general the focus groups had a clear understanding of the relationship between physical activity and health. Most participants related physical activity positively to health. They focused on aspects such as diet including health and wellbeing (see Table 50).

Table 50. ***Perceptions Physical Activity and Health***

Themes	Evidence											
	Focus group one						Focus group two					
What relationship do you see between physical activity & health?	M1	M2	M3	F1	F2	F3	M4	M5	F4	F5	F6	F7
1. active people are more healthy					✓					✓		
2. active people are strong and fit	✓											
3. active people have stronger immune systems	✓											
4. active people eat right						✓						
5. active people have soifua maloloina		✓										
6. active people have physical wellbeing												
7. active people don't drink to excess and eat right											✓	
8. active people are strong and healthy									✓			

Three participants believed that people who were actively involved in physical activity were more likely to have better health, as illustrated in the next example.

(F2) "I can say that the more you do, like in terms of activities, the more healthy, or physical wellbeing or achieve soifua maloloina."

Another participant reinforced the notion proposed earlier that physically active people were less likely to suffer from diseases than non active people and the next example supports this view.

(M1) "…physical activities gains you more stronger and increase fitness and makes your body and makes your immune system become well...your immune system helps you to/protect(s) your body from diseases… so... more activities you have done means you more healthy..."

Two respondents proposed that active people were more likely to be stronger and fitter than non active people. Two respondents suggested that people who were physically active were more likely to have a better diet and one said that active people don't drink to excess compared to non active people.

Physical Activity Levels

The respondents indicated a range of levels of activity, from 1 to 2 hours daily to 3 hours a week. They appeared to be most active at home where they engaged in general house-cleaning duties, cooking meals and plantation maintenance (see Table 51).

Table 51. ***Perceptions of Physical Activity Patterns***

Themes	Evidence											
	Focus group one						Focus group two					
How much physical activity do you do?	M1	M2	M3	F1	F2	F3	M4	M5	F4	F5	F6	F7
1. active at home	✓	✓	✓	✓					✓			
2. active between home and university					✓	✓						
3. active over 3 hours a week												✓
4. regularly active over an hour daily							✓				✓	
5. active on the plantation for over 90 minutes daily							✓					
6. active at university in the physical education paper												✓

Four participants were physically active every day of the week as illustrated by the following comments:

(**M1**) "There's no day that I… do nothing";

(**F4**) "everyday…";

(**F6**) "one hour daily";

(**M4**) "one and half daily."

The respondents appear to be more active at home because some of the tasks they were required to do involved moderate to high levels of physical movement, such as plantation work, sweeping, hand washing (laundry), cutting the grass and preparing the meals. For example, Figures 3 and 4 show a purpose-built cooking facility where meals are usually done on an open fire.

Figure 3. **The cook house includes earth oven materials and cast iron pots (Tuagalu, 2006)**

Figure 4. **Umu food (Tuagalu, 2006)**

The males were often required to gather materials like coconut husks, including firewood, to make a fire to boil water in heavy cast iron pots for cooking or to prepare an umu (see Figures 5 & 6). A stone oven consists of a shallow cavity lined with stones on which a fire is lit and cleared away before the food is laid on the hot stones (Gilmer, 1992).

Figure 5. **Umu (Tuagalu, 2006)**

Figure 6. **Taro plantation on top of a ridge in Aleipata (Tuagalu, 2006)**

This is illustrated in the following comment (see also Figure 6):

> **(M3)** "When I came to school I just walk and lot of time I spend time to sit. No activities. But at home I spend much time to do work like cutting the grass (using a tool called a sapelu or pelu) or play game with childrens…make a saka [boil food], umu [earth oven] and all the jobs and so, being my own conclusion, home … is a best things I do a lot of activities / paddling, climbing up the hills and mountains."

Plantations are often situated on the slopes of the hills or on the ridges outside the main residential area of the village. Plantation work is physically demanding and it includes cutting back the vines and weeds that grow amongst the crops with a sapelu [bush knife or machete] and harvesting the crops such as taro to carry back

to the village. One participant cited this type of activity as something he did regularly:

> **(M4)** "One and half daily**…**walking up to the plantation. In Savaii, every weekend I go to Savaii. I spend one hour going to the plantation, walking, bare feet…climbing the mountain and then the hills....now I'm fit. I always fit. I always stay fit."

The female respondents indicated that washing the laundry by hand was a common task at home that they believed was a physical activity. Similarly, sweeping the floor and front yard were other activities that females often had to do at home which require a moderate level of physical fitness (see Figure 7). Furthermore, washing the dishes and hip hop dancing were other activities that the respondents regarded as physical activities.

***Figure 7*. A groundsman sweeping up the lawn clippings that were freshly cut that day (Tuagalu, 2006).**

How Active Young People are in Relation to Other People they Know

Two thirds of the participants believed they were more active than other people they knew, including other siblings, parents, friends, sports team mates and older adults (see Table 52). More than three quarters of the participants compared themselves to other people in their families. Two of these participants expressed the belief that they were more active than their brothers, who were older and younger respectively, as the next comment points out:

> **(M2)**, "My older brother ia, e laititi ona tausaga aua lapoa tele le tino ona ua malosi ole ai…pe a le lima tausaga ma te va ai. He's five years older than me. Tino pei ole toeina matua foi ga le matua pei o se…matua atu le foliga o lau tama. Ia uo maua ia ile mai ole asthma, le sela…ia ai ole malosi ia ole ulaula male inu pia." [My older brother is little in years but he is large because he is a heavy eater and there are five years that separate us. He's five years older than me. He has a body like an old man and he

looks older than my father. He suffers from asthma caused by heavy smoking and drinking beer].

Table 52. ***Perceptions of Physical Activity Levels Compared with Other People***

Themes	Evidence											
	Focus group one						Focus group two					
How active are you in relation to other people you know?	M1	M2	M3	F1	F2	F3	M4	M5	F4	F5	F6	F7
1. more active than my sibling	✓	✓										
2. more active than my parents or family			✓						✓		✓	✓
3. less active than my grandparents or aunty				✓	✓	✓						
4. more active than my classmate							✓					
5. active like my team mates in sport										✓		

Four participants believed that they were more active than their parents who they considered to be physically inactive, as the next participant argued:

> **(M3)** "… I do lot of movements rather than my parents. They just stay home, look after childrens and eat more food and no movement. They so in myself I so totally fit than my parents because they just eat and stay home, no exercise. Eating more calories… less… release."

Three participants compared themselves to either their grandmother or aunty whom they considered to be more physically active, as the next example points out:

> **(F2)** "I just like to…compare myself to my aunty. Now she is 72 and…I'm 20 but I see the difference between us because she's staying at home…and she is like weeding grass all…day. Yeah, I'm serious. When the tree shade this place and then she comes here, weed this…place and when the shade [moves] over there…she goes over there. When we get home after school, yeah, we saw her…weeding this stuff or…scraping taro, or preparing food for the umu. Ia, she's…active. Yeah, she's like doing all those stuff everyday and me, when I compare to myself, I just walking all the day…like two times…from my home to school and from school to home. Even [though] I'm fit…I don't compare my fitness to her."

One participant compared himself to his classmate but he did not say whether he was more, less or no more or less active than his mate. Referring to his classmate **M4** said**:**

“But me and brother here…when we do weight lifting, I do much… rotations… He can only do five…set and I can do 10 sets. …He’s older than I am young. [I’m] much stronger than him. ”

How much physical activity young people do regularly

Unfortunately, I did not pose this question to the second focus group and therefore the data does not show how active they were. All but one of the participants in the first focus group believed that they were regularly active (see Table 53).

Table 53. ***Perceptions of How Physically Active the Participants Are***

Themes	Evidence											
	Focus group one						Focus group two					
How much physical activity do you do regularly?	M1	M2	M3	F1	F2	F3	M4	M5	F4	F5	F6	F7
1. at least 30 minutes a day	✓	✓	✓		✓	✓						
2. at least 20 to 30 minutes a day				✓								

Five participants were regularly active for at least 30 minutes a day and they participated in a range of activities that included playing volleyball and rugby with other young people in the village. This is referred to by **M2** who said:

“…ia o’o loa ile afiafi faapea ia tatou o e fai tatou faa afu. Pe la afiafi uma a la e fai ai taaloga. Ia e tele a la tupulaga e matou te ta a alo le voli ile lakapi. E pei e faa afu ai ga e gata le…ia o aso uma…le regular le activity…tolu sefulu minute ia toe…pe amata mai le afa le lima se oo le curfew time, taimi fai ga loto.” [In the evenings we go and make sweat. Every evening we have games. Many young people of all ages play volleyball and rugby. We stop when we get a sweat up. Every day we have regular activity lasting for at least 30 minutes starting at 4:30pm until curfew time when it is time for evening prayer].

Two male participants also participated in village games in the evenings but they also identified preparing the evening meal and feeding the animals as physical activities that they did daily, and this is illustrated in the following extracts:

(M1) “…every day I haven’t missed a physical activity…maybe over than 30 minutes I think…saka, 25 minutes, 30 minutes. I…play for 1 hour so that’s all I have every day.”

(**M3)** “I have a timetable for all my job[s] that I do at home after school. When I [get] back home I spend one hour to sleep, (he said i.e., 2-3 pm) and then I wake up. I make a saka, feed the pigs and collect the coconuts

and after that…that's only time that I do…activity. All…day from Monday to Friday".

Three female participants said they were regularly active every day by walking to and from home to school but they did not appear participate in physical activities when they were at home. This pattern is supported by the following examples from the interview:

> **(F3)** "I believe that I'm physically active every day because I walk to school every morning and evening… So if I mention my time walking from there, I probably went between 20 minutes and 30 minutes".
>
> **(F2)** "Yeah…physically active because when I refer to the distance from my house to school…I...spend only 15 to 20 minutes walking, morning and the afternoon. So when I go home, I'm just doing little activities just…stuff like washing the dishes….But when I spend the time walking from my house up to Lin's store, it's just about 20 minutes".

Finally, one female participant did not appear to be particularly active, as the following comment suggests:

> (**F1)** "…not that much…because I told you before I can do some [physical activity]…like sweeping the house, washing the dishes…depends on the time of…my classes in the school [university]. If I have eight o'clock classes so don't have…time to sweep the floor. So I can't woke up at that time, early in the morning about four o'clock to sweep the floor or the house. But if I have classes…about ten o'clock, so maybe I can sweep the floor about 20…30 minutes depend on the length of the house, how long or how huge it is and also the time after washing the dishes depend on how many stuff… that we used for the dinner, so I…maybe washing the dishes for just 20 minutes."

What young people dislike about participating in physical activity

One quarter believed that physical elements such as dogs, footpaths, and lifestyle changes were a barrier to being physically active. In addition, more than half of participants believed that social commitments were barriers to physical activity such as family responsibilities, village curfew restrictions and school homework (see Table 54).

Three participants including Dawn believed that there were a lack of footpaths for walking or running (see Figure 8) and where footpaths existed, people were using them regularly for exercise.

Table 54. ***Perceptions of Barriers to Physical Activity***

Themes	Evidence											
	Focus group one						Focus group two					
What are the barriers to physical activity?	M1	M2	M3	F1	F2	F3	M4	M5	F4	F5	F6	F7
1. dogs				✓			✓					
2. no footpaths		✓		✓								
3. motorized transport & communication technology		✓										
4. family commitments							✓	✓	✓	✓	✓	✓
5. village commitments							✓	✓	✓	✓	✓	✓
6. village curfew							✓	✓	✓	✓	✓	✓
7. homework							✓	✓	✓	✓	✓	✓
8. women's role									✓			
9. lack of transport home after evening sports training											✓	

The participants agreed that the roads were not safe for walking, as the next example points out:

> ***(M2)*** "More people would run…rather than using the road and [get] hit by the car."

***Figure 8*. Unsuitable footpaths (Tuagalu, 2006)**

***Figure 9*. Dawn time and the dogs are resting for the day (Tuagalu, 2006)**

Furthermore, one participant believed that people enjoyed walking, as the next comment points out:

> ***(F4)*** "Yeah…pei…e turf la matou; Tunaimato, Vaitalele, Vailoa. Aiga, ia fiafia e savavali i luga footpaths…afai taimi nei…o ā taimi i nei ai e savavali ai i luga le palāpalā" [Our turf where we live, Tunaimato, Vaitalele, Vailoa, families enjoy walking on the footpaths but today people still walk on the soil]

Two participants believed that dogs (see Figure 9) were a barrier to being physically active. For example, **F1** points out:

> "We have dogs. For example, Catholic Church they have those early masses in the morning at 5 o'clock….I didn't made [make it] up to…church every morning because I was afraid of dogs. We have dogs in our village. In fact…I can't see most of the people in our village running. I can see some youths in the evening they are doing…small activities but not…much in the morning because of those…animals."

This appears to be a common problem in Samoa and most of the participants shared the same opinion. Furthermore, the participants agreed that people were afraid of dogs and most people avoided dusk and dawn periods of the day because dogs often roam the streets in packs at those times.

One participant believed that lifestyle changes, such as changes to traditional modes of transport and communication were a barrier to physical activity. Most of the participants shared the same opinion and agreed that more people were becoming less active as a result. For example, **M2** argued:

> "O le example taua…mafaufau i vaitaimi ni aso la i totonu o Samoa. Tagata ga sa leai gi auala femalagaina sa tele faaoga le savali e feoai i lea nuu ma lea nuu. E ave feau e lo iai foi gi telefoni taimi nei. Faoga foi le savali e o mai le aoga. O isi fonotaga o latou faapotopotoga. Tatou mai le taimi nei ua o tagata le taxi. Ua tele ga o le pasi. Ua leai se tasi se tele o taimi e faaoga ai lo latou activities e faagaioi o latou tino. Ao tele a ga le nofonofo i tonu taavale ma alu le mea e manao ai. A o le mea ole sootaiga ole health ma le physical activity's a le faagaooiga o lou tino e le loa o sou soifua maloloina" [The example that I consider important is related to the old period of Samoa; people didn't have roads to travel about, many walked from this village to this village. Messages were delivered because there were no telephones then. Walking to school or village meetings and gatherings was common. When we come to our present period, people travel by taxi, many go by bus, many don't use the time to do activities that move the body. Many sit inside their car and go anywhere they want. The relationship between health and physical activity is that if you don't move your body, then you will not have good health and wellbeing].

Family and school study commitments appeared to be barriers to physical activity. In fact, all the participants overwhelmingly agreed that family responsibilities,

particularly jobs at home (see Figures 10 & 11), and studies appeared to be the main barriers that affected their physical activity patterns, as a range of responses below from the group show. (The respondents spoke in such quick succession that I was not able to identify all the participants' voices on the audio recording for the following comments). However, the comments were from focus group two and I have identified the comments by gender where the actual speaker could not be identified.

(***F***) "Family feaū's [jobs]."

(***M1***) "Family chores."

(***F***) "It's always the family."

(***F***) "Plant it right back home."

(***F***) "Mea aōga [school work]."

(***M1***) "Family chores."

(***M1***) "School work."

(***F***) "Oi, yeah…the curfew."

***Figure 10*. Domestic home chores include feeding the pua'a [pig(s)] (Tuagalu, 2006)**

***Figure 11*. Pua'a (Tuagalu, 2006)**

When I posed the question about whether there were any barriers that affected females or males specifically, a participant said that cooking the food was one of the barriers that affected women:

(F4) "We have to cook the food…those feaū's…that's one of the barriers."

However, we did not discuss what the other barriers could have been because the conversation changed to another topic.

Finally, another barrier that affects some young people's participation in extracurricular activities after school or work is an apparent lack of public transport to take them back home in the evenings after an event or sports training session. Public bus services seem to stop for the day after 5pm and they do not operate on Sunday. The participants recoiled at my suggestion to use a taxi as an alternative way to get home, arguing that it was too "expensive."

Actions that could be taken to improve physical activity among young people in Samoa

There were a range of suggestions that the participants believed the government could do to get more people active. The participants argued that the government could provide free or low cost activities, more spaces (i.e., footpaths) and facilities that were accessible to the community, involve the community, particularly the village chiefs in the initial stages of planning a community physical activity and health programme, establish robust and financially sustainable programmes, and provide physical activity environments that were safe from dogs. The participants believed that government should minimize financial barriers, particularly for people in deprived neighborhoods that stop people using a facility, as the next example shows:

> (***F1***) "The government should let the people free, like let them free inside the gym. Because many of them… [cannot] afford money to get inside those buildings for exercise because the main problem I've seen here in our country is the financial problem."

Furthermore, the participants believed that the government needed to make physical activity compulsory in primary schools [at the time of print, physical activity is currently delivered ad hoc in the schools until the formal curriculum document has been completed] to increase young children's physical activity levels and raise awareness of the health problems related to inactivity and poor eating habits, as the following example from Dawn points out:

> (***A1***) "I think what the government needs to do is to enforce physical education to be compulsory in…schools. So that the young children…that they'll grow up right from the beginning, that they will keep fit because researchers have shown that if you are active right from the beginning you will always stay active. See like your grandmother [referring to a comment made by another group member] and myself, we were active from little ones and we are now in this stage and we are still active."

The participants agreed with Dawn and they also believed that village chiefs along with the Ministry of Health should be involved in planning a strategy to get more people active. Equally important, the participants agreed that village councils must support and encourage their people to attend government-funded physical activity and health programmes as in the following comment:

(**M3**) "…the government should look at the pulega nuu ma fai pule. They must involve pule nuu and…komiti and to learn them about physical activities too… and particular special time to do it, in the morning, jazz. This is important for them to involve all villages in Samoa, Savaii. That is a issue…for government to look to improve our physical activities in our country to learn from matai [chief], au aluma [committees], particularly."

More importantly, the participants believed that the government must be able to financially sustain the physical activity programmes to ensure that they run regularly in communities for a long period of time if the Government is going to have any chance of getting more people active or stop people from developing health problems. This view is reflected in the following example:

(***F6***) "They should give you more money to support what the Ministry of Health is doing, giving out in the villages like exercising in the evenings and plus there's a thing faataūa le ola is doing tomorrow…about walking for life."

The participants suggested that the government could invest more money in health promotion to encourage more people to get active and eat correctly by using the media to change public behavior about overeating and physical inactivity. For example, as **F6** argued:

"I think the government should ask the TV station to give more advertisement on health…I think everyone has TV…for people to look at it and know the bad of smoking, and drinking alcohol…"

Furthermore, the participants believed that the government should build more footpaths, and encourage more people to use bikes than cars, as the following comment illustrates:

(***A1***) "Footpaths, bicycle paths…encourage people to ride on bicycles instead of going by taxi or by bus."

Lastly, the participants believed that the government should establish a bylaw that requires dog owners to keep their dogs behind a fence and not allow them to run free in public areas:

(***F6***) "You can ask families to build fences for their dogs."

(***F5***) "Keep their dogs inside".

(***F8***) "Yeah. Put them…there"

Summary

The findings show that the participants in general had a broad understanding about the meaning of physical activity and health. The results revealed that a number of meanings between physical activity and health overlapped. For instance, most of the participants believed that physical activity and health increased people's energy levels, strength and physical, mental, spiritual and emotional well being which underpin the notion of 'soifua maloloina'. Further, the participants believed that people who are healthy are more likely to have a well-balanced diet and are less likely to suffer from the health problems related to inactivity and a poor diet.

It appears that most of the participants are regularly active for at least 30 minutes a day. In addition the data showed that most of the participants appeared to be more active than other people they knew. Household chores like sweeping the floor, hand washing the laundry, washing the dishes, preparing the family meal, feeding the animals and plantation work were the most common form of physical activities that young people did in their spare time. It appears that males were more active than the females in the group. The interviews revealed that males seemed to find more time to play games and the females appeared to be more confined to household duties.

The data revealed that family commitments, chores, dogs and a lack of footpaths were the main barriers that stopped people from being physically active, particularly females.

Lastly, the participants overwhelmingly believed that the government should provide free or low cost activities and more safe and appropriate spaces including facilities for physical activity.

In the next chapter, I discuss the key trends that emerged from this study and consider the implications for national physical activity and health policy formulation in the future to combat obesity and their health related diseases.

CHAPTER 6: CONCLUSIONS

In this chapter, I weave together the major findings from the survey, focus groups and my own observations in order to present the major themes that emerged in relation to the physical activity patterns and perceptions of young people in Samoa. I recommend a multisectoral approach as the most relevant way to improve physical activity among young people, and conclude by suggesting avenues for future research.

Physical activity is important to the young Samoans in this study

Based on the results of the focus groups, young people appear to have a good basic understanding of the term physical activity. For example, many of the participants described physical activity as a movement of the body that occurs when it is used to perform a task such as household chores or an activity like walking or running. Next, a majority of young Samoans residing in the Apia Urban Area have a positive attitude about physical activity and recognize the link to health. In fact, an overwhelming percentage of the survey respondents (95%) believed that physical activity was important in their lives, particularly to improve health, to get fitter, to have more energy, to live longer, and to lose weight. Physical activity and health was important to the young people in this study for four main reasons. The first reason is that they believed physical activity produces a range of health benefits such as increased energy, strength and growth in physical, mental, social and emotional wellbeing. In fact, most saw themselves as healthy. The survey showed that a majority of the respondents rated themselves positively for health and almost half the respondents believed that their weight was about right. The second is that they believed that non active people are more at risk of developing health problems and the respondents appeared to understand the correlation between disease avoidance and physical activity. Many of the survey respondents (80%) and focus group interviewees believed that people who are not active enough face the risk of developing health problems, and this belief was particularly strong for older youth. For instance, many of the focus group participants agreed that active people are most likely to have good health including good immune systems and better dietary habits. Thirdly, a majority of the young people believed that they were active enough to be healthy, a key factor in obesity prevention, and most people in the focus groups believed that they were more active than other people they knew, who

were described as overweight, inactive and/or unhealthy. The fourth reason is that almost three quarters of the respondents in the survey reported that physical activity was important to improve health, to get fitter, to have more energy, to live longer and lose weight. The factors of getting fitter and having more energy were more important to older youth than the younger age group. Losing weight was a factor that was more significant for females. Overall, all the focus group participants and a very high percentage of the survey respondents believed that physical activity was important to them to improve health.

In conclusion, the initial findings suggest that young Samoan people have a positive attitude to physical activity and health. The evidence from both studies suggests that they believe they are getting enough physical activity to prevent the risks related to obesity and inactivity. Also, the evidence appears to indicate that young people understand the association between physical activity and health benefits.

However, the following section suggests that young people's perceptions of how much physical activity that they believe they do compared with how much they actually do is different.

Young Samoans do not appear to be active enough although they believe that they are

The evidence clearly supports the notion that young Samoans value the importance of physical activity to improve health and yet they do not appear to be active enough to achieve this aim. A majority of the survey respondents clearly believed that they were physically active enough to keep healthy. Yet, the evidence clearly shows that a majority failed to achieve the recommended guidelines of 30 minutes of physical activity for five or more days a week. The survey results as a whole suggest there is a significant gap between what young people believe is enough physical activity to be healthy and what they actually do.

In terms of beliefs, the survey indicated that almost three quarters of the respondents believed that they were active enough to keep healthy. Almost half (46%) believed that they were getting enough physical activity according to the recommended guidelines. Yet, when asked to report on their activity during the past week, only 27.6% of them reported doing five or more days of 30 minutes of easy to hard physical activity. This percentage is similar to the over one third who reported that they were regularly physically active. Walking was a common

activity, with almost half reporting quick walking on five or more days a week, although significantly fewer females achieved this target. Walking was more popular for both male and female groups than hard physical activity that involved a noticeable increase in breathing or heart rate. Indeed, the numbers engaging in hard physical activity were much lower with only 23.6% meeting the recommended five days a week. The gender difference was marked, with very few females regularly engaging in hard physical activity. When comparing their physical activity levels to others their age, only a quarter of the survey respondents believed that they were more active than other people their age, while a third reported that they were no more or no less physically active. This leads to the inference that their reference group (i.e., other young urban Samoans) is also inactive according to the recommended guidelines.

Overall, the survey results suggest that only about one third of young Samoans are meeting the recommended physical activity guidelines; a finding which is markedly different from young Pacific people in New Zealand who were almost twice as active (52%) (SPARC, 2003).

In contrast, however, the focus group stated that they were active almost every day. Most reported that they achieved 30 minutes of physical activity a day through a range of physical activity areas, such as domestic duties at home. In fact, half the participants appeared to achieve the recommended physical activity target through walking and household chores (e.g., collecting coconuts, making the umu, and planting and cultivating root crops on the plantation).

Lastly, a small but significant number of young people appear to be overweight; a pattern that was more common in the 16-17 age group. Although this statistic is based on self-reporting and might be influenced by cultural body ideals (see Mavoa & McCabe, 2008; Yamada, 1999), it appears to be similar to trends in other Pacific countries (Kahn et al., 2006) including New Zealand (Teevale et al., 2008) that suggest being overweight is increasingly emerging at a younger age in Pacific populations.

Although young Samoans intend to increase their physical activity levels, there are barriers that could affect their plans

According to the survey and focus group results, over half of the respondents intend to increase their level of physical activity in six months time or over time. However, although young people would like to be more active, the evidence from

both studies indicates that a mix of cultural, environmental and discomfort barriers related to physical activity could affect participation in the future. The evidence suggests that young people's physical activity levels may not change over time unless some of the barriers are addressed, particularly the more common barriers.

Cultural barriers that affected young people's participation were related to family, housework, church, school/work, curfew restrictions and ofu faasaina. The survey and focus group results suggest that a majority of young people appear to be affected by domestic duties, church and school/work commitments. For both survey respondents and the focus group participants, family responsibilities were the most important barrier, affecting almost 84% of the survey respondents. Housework was the second most common barrier, followed by church-related practices, both of which affected more than two thirds of survey respondents. School or work had the most effect on the younger age group (60%) although it was still a barrier for half the older youth. Similarly, the focus group respondents stated that family, village and school duties were a barrier to participation, particularly for females. Cultural aspects that had less influence included curfew restrictions and ofu faasaina (clothing).

Environmental barriers also affected young people's participation in physical activity, particularly safety, roads, footpaths and facilities. Of less importance were affordability, transport and street lighting. Several environmental factors had a greater influence on females than males. These factors included safety related to troublesome dogs, lack of footpaths and poorly maintained roads, which were identified as barriers in both the survey and focus groups. Lack of facilities also emerged as a barrier for more than half the survey respondents. The focus groups also discussed the problems with sports facilities which they identified as being too far away from the centre of town, as well as the cost of using facilities like fitness centres.

Discomfort factors related to physical activity such as boredom, effort, commitment, comfort, sweat and body weight were also barriers to participation. A majority of the respondents surveyed found it difficult to stick with a physical activity programme, particularly females. Also, the survey revealed that most people got bored quickly with physical activity programmes, and two thirds appeared to dislike physical activities that were uncomfortable and involved too much exertion.

While not statistically significant, discomfort barriers appeared to affect females more than males. In fact, females were over-represented in all but one barrier which was boredom.

Interestingly, almost half the respondents reported that sweating related to physical activity was a barrier to participation, and just under half the respondents indicated that they were too overweight to be physically active.

In conclusion, it appears that a wide range of factors may act as barriers to physical activity for young people. One clear trend was the importance of environmental factors for females, who appeared to be much more affected than males by issues related to safety in the physical environment such as fear of dogs, and lack of safe places to walk.

Young people are encouraged to be physically active

The survey results suggest that there is a lot of encouragement for young people to by physically active. The most important groups that encouraged young people to be active were friends, school, Church and village. Friends and school were particularly encouraging with 90% of respondents being encouraged by friends and over 84% being encouraged at school. The church was also clearly influential in that almost 73% of respondents reported that the Church gave some or a lot of encouragement. Although the village was the least influential of these four groups, nearly two thirds of participants reported that their village encouraged them to be active. The focus groups considered that village leaders and committees were important in encouraging physical activity.

The findings suggest that social institutions such as schools and the Church have a strong influence in the lives of young people and they could play an active role in getting more young people active. This finding is supported by research with Samoan populations in other countries that found that the Church is an important site for reaching Pacific populations particularly in the absence of the traditional village structure (Aitoto et al., 2007; Simmons et al., 1998).

Types of physical activity that might be effective with Samoan youth

Defining physical activity differently

Interestingly, in Samoa, young people appear to have a different understanding of what physical activity is. For example, the focus groups defined physical activity quite broadly to include feeding the pigs, washing the dishes and planting and cultivating root crops. The focus group results indicate that young people may be

meeting the recommended physical activity guidelines through everyday tasks and traditional forms of transport which include walking to school and university. This Samoan viewpoint was not adequately captured in the survey because it was based on a western model of physical activity. This difference could explain inconsistencies in the survey data around reported levels of walking, hard physical activity and whether the respondents were achieving 30 minutes of physical activity a day. Both the survey and focus group results suggest that physical activity could be conceptualised quite differently in a Samoan context, with an emphasis on the kinds of physical activities that young people are already doing – such as those household chores that require physical exertion. Thus, a traditional western model of how to develop physical fitness (e.g., through organised fitness classes, gyms and organised sport) may not be a particularly useful cultural fit.

A preference for solo rather than group activity

Surprisingly, more survey respondents preferred to be active on their own than in a group which is completely different to physical activity trends in other Pacific countries that indicate group-oriented activities are more popular than individual focused activities among young Pacific people (Kahn et al., 2006; SPARC, 2003). However, in this study, the participants do not appear to regularly engage in organized or formal types of sports. Instead, in discussions with the focus groups it became clear that that they achieved their physical activity needs during everyday living activities that were home and family related including transport (walking to school/work/university). Therefore it is not surprising that their activity preference was for individually-based activities.

Low impact, low intensity exercise might be most effective

The survey results and my own observations also suggest that low impact, low intensity forms of physical activity such as walking might be most appealing or appropriate in the Samoan context, particularly for females. For example, while almost half the survey sample reported walking at a quick pace on at least five days during the past week, far fewer reported engaging in hard physical activity that involved a noticeable increase in breathing and heart rate. In addition, a high percentage reported that activities that involved sweating (49.5%), effort (62.8%) or were physically uncomfortable (51.4%) were barriers to doing physical activity. The reported dislike of sweating or effort (which might imply sweating) might be explained by the fact that there were few facilities available where young people

could shower and change their clothes after intense physical activity. For example, during my visits in 2006 and 2008, the lack of shower and changing facilities was noticeable. In 2006 and 2007 I observed a high school boys' physical education class where the boys changed into their cricket gear on the field and then changed immediately back into their uniforms to return to class. A local male rugby club faced a similar situation, with no changing or shower facilities available to players after training. At NUS in 2008, there were days when students were not even allowed to use the toilet facilities in the gymnasium (or on campus) because of restricted water supply. During my visit in 2008, because there were no shower facilities at NUS, the only reason I biked each day was because it was all downhill and I could travel without building up a sweat. I noted that my bicycle was often the only one in the rack.

Thus, given the lack of facilities in which young people could shower and change clothes, it may not be surprising that they do not embrace activities that involve sweating or hard physical effort. This conclusion is supported by Kahn et al. (2006) who found that not having access to showers was a barrier for young people in Fiji.

Although the issue of how these barriers could be addressed was not examined in the survey, the focus group interviews involved discussion of what the government could do to improve physical activity opportunities. Based on these discussions, several key survey results, my observations and the existing research literature, the final section discusses the importance of a multisectoral approach to promoting physical activity.

The value of a multisectoral approach to promoting physical activity

Overall, the results of my research suggest that a multisectoral approach has strong potential to reduce and manage many of the barriers to physical activity. A collaborative approach that is embraced by all the organisations that are directly and indirectly related to the health sector including government, schools, village, Church and other informal social institutions (e.g., friends) could encourage more young people to participate in physical activity. A multisectoral approach could provide culturally appropriate and relevant programmes that support young people to improve their health, get fit, lose weight and have more energy.

A coordinated health sector response involving the government, private sector and the community could play an active role in promoting physical activity.

For example, there was a general consensus among the focus group participants that a government-led response could provide more footpaths, make physical education compulsory in primary schools and encourage people to use alternative forms of transport such as cycling and walking to improve physical activity. Also the female participants in particular argued that the government could control troublesome dogs to promote a safer environment for physical activity. Interestingly, the focus groups supported the idea that publicly-funded physical activity programmes need to be financially sustainable over time to develop positive physical activity behaviour. More importantly, one participant expressed the need to ensure that the villages are consulted; in particular the council of chiefs and other committees about government or private sector physical activity initiatives to ensure that they are culturally appropriate and meet the needs of their people. In addition, they suggested that a coordinated response could provide free or low cost access to public and private facilities and equipment, particularly for people who cannot afford the user charges. The results from the focus groups clearly indicate that a coordinated response could provide better physical activity opportunities that are affordable, accessible, community-oriented and sustainable. The evidence from the focus groups and the themes that were drawn from the survey clearly show that a coordinated response that includes the school, church and village and social groups such as friends could improve physical activity behaviour.

Given the real mix of barriers (including cultural and environmental factors as well as specific discomfort factors related to particular kind of physical activity), it appears that a multisectoral approach is necessary. Interventions in some areas, however, are likely to be more straightforward than others. For example, interventions related to cultural barriers could be more problematic if they challenge core beliefs related to a Samoan view of the world. These might include beliefs about rank and status such as the tradition that older men receive more food than young males, females and children (Mavoa & McCabe, 2008). Well-established cultural attitudes that value larger size, especially among women, may also be difficult to change.

However, some key environmental and discomfort barriers appear to be connected and could be simultaneously resolved with direct government intervention. For example, a coordinated approach could provide adequate footpaths, roads and transport to accommodate young people's physical activity needs and, more importantly, promote a safe environment to encourage more

people to get active. As discussed earlier, some of the discomfort factors (such as a dislike of sweating or activities that require effort) may be related to the lack of facilities for showering after exercise. At the same time, the geographical location of facilities that are not within walking distance of the majority of the population, a bus service that does not operate in the evenings, fear of roaming packs of dogs and a lack of footpaths may all combine to act as a deterrent to engagement in both informal and organised forms of activity, particularly outside of work for older youth.

Given the current lack of facilities, it might be more effective for the government to enhance people's ability to walk safely (via provision of footpaths, lighting, controlling dogs, etc.) rather than focus on Western-style organised fitness classes or sporting opportunities. If this was the case, the educational emphasis could focus on encouraging young people to walk or engage in other low impact, low intensity activities for at least 30 minutes at least five times a week. The survey data, for example, suggests that while almost half of young people do appear to be active for at least five days a week, they may not be active for long enough to receive significant health or fitness benefits.

Conclusion

The findings clearly show that physical activity is important to young people. The majority of young Samoans believed that physical activity is important to improve health, to get fitter, have more energy, live longer and lose weight. However, a third of the respondents reported that they were overweight and over half wanted to lose weight. In addition, although a majority of young people believed that they are active enough to keep healthy, the evidence revealed that most of the respondents did not achieve the national physical activity guidelines; a trend that appears to be similar to physical activity patterns in other Pacific countries. The existing literature (e.g., Hohepa, Schofield & Kolk, 2004; SPC, 2002) suggests that people who are overweight or obese in their youth are more likely to be overweight or obese as adults. Thus, this study suggests that current patterns need to be addressed so that the rate of obesity does not increase in the future.

More research is needed to explore ways to determine a culturally appropriate Samoan model of physical activity, which is collective, collaborative and beneficial to all parties. In the first instance a coordinated response could address the environmental and discomfort barriers more effectively and provide

programmes that are relevant to young people and fit into the structure of their daily lives. Further exploration is needed in relation to the levels of physical activity that are involved in their daily contributions to the family and village via tasks such as sweeping, cooking and plantation work. In addition, it would be valuable to explore in more detail how frequently young people engage in various types of activities and whether there are differences between young people living in urban, peri urban or rural areas.

In closing, the survey and focus group interviews offer information that could be used to help decrease the rate of physical inactivity and obesity in Samoa. In addition, this study could provide the impetus to undertake more research to develop a pool of knowledge about physical activity that appears to be lacking in Samoa. More importantly, the results of the study could inform government health policies aimed at increasing the health and wellbeing of all Samoans and reduce the prevalence of obesity and health-related diseases in the future.

REFERENCES

Aiavao, F.P.-U. (2006). The health sector. In *Samoa national human development report 2006: Sustainable livelihoods in a changing Samoa* (pp. 69-79). Apia, Samoa: National University of Samoa; Centre for Samoan Studies.

Aitaoto, N., Braun, K., Dang, K., & So'a, T. (2007). Cultural considerations in developing church-based programs to reduce cancer health disparities among Samoans. *Ethnicity & Health, 12*(4), 381-400.

Anae, M., Coxon., M., Wendt-Samu, T., & Finau, C. (2001). *Pasifika education research guidelines final report*. New Zealand: Ministry of Education.

Andrew, S., & Halcomb, E. (2006). Mixed methods research is an effective method of enquiry for community health research. *Contemporary Nurse: A Journal for the Australian Nursing Profession, 23*(2), 145-153.

Bauman, A., Schoeppe, S., & Lewicka, M. (2008). *Review of best practice in interventions to promote physical activity in developing countries*. Geneva: World Health Organization.

Bell, A., Swinburn, B., Amosa, H., & Scragg, R. (2001). A nutrition and exercise intervention program for controlling weight in Samoan communities in New Zealand. *International Journal of Obesity & Related Metabolic Disorders, 25*(6), 920-927.

Bishop, R. (1996). *Collaborative research stories: Whakawhanaungatanga*. Palmerston North, New Zealand: The Dunmore Press Ltd.

Braun, K., Henry, I., Kuhaula, R., Aitaoto, N., Tsark, J., Spegal, R., & Lamb, B. (2003). Empowerment through community building: Diabetes today in the Pacific. *Journal of Public Health Management and Practice, 9*, S19-S25.

Burslem, C. (2004). *The changing face of malnutrition*. International Food Policy Research Institute Forum. Retrieved May 22, 2008, from http://www.ifpri.org/pubs/newsletters/ifpriforum/IF200410.htm

Cardinal, L. (2001). What is an indigenous perspective? *Canadian Journal of Native Education, 25*(2), 180-182.

Chen, H. T. (2006). A theory-driven evaluation perspective on mixed methods research. *Research in the Schools, 13*(1), 75-83.

Creswell, J. W. (2002). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research*. USA: Merrill Prentice Hall.

Creswell, J. W., Shope, R., Plano Clark, V. L., & Green, D. O. (2006). How interpretive qualitative research extends mixed methods research, *Research in the Schools, 13*(1), 1-11.

Curtis, M. (2004). The obesity epidemic in the Pacific Islands. *Journal of Development and Social Transformation, 1*, 37-42.

Dancy, C. P., & Reidy, J. (2004). *Statistics without maths for psychology*: *Using SPSS for windows* (3rd ed.). Essex, England: Pearson Education Limited.

Doak, C., Visscher, T., Renders, C., & Seidell, J. (2006). The prevention of overweight and obesity in children and adolescents: A review of interventions and programmes. *Obesity Reviews, 7*(1), 111-136.

Dorovolomo, J., & Hammond, J. (2005, August). *Regular physical activity: An urgent health need in the Pacific islands*. Paper presented at a Regional Conference on Continuing Education, Laucala Campus, University of the South Pacific, Suva, Fiji.

Elliot, C. A., & Woodward, A. W. (2007). *Statistical analysis quick reference guidebook with examples*. USA: Sage Publications, Inc.

Englberger, L., Halavatau, V., Yasuda, Y., & Yamazaki, R. (1999). The Tonga healthy weight loss program 1995–97. *Asia Pacific Journal of Clinical Nutrition, 8*(2), 142-148.

Evans, M., Sinclair, R., Fusimalohi, C., & Liava'a, V. (2001). Globalization, diet, and health: An example from Tonga. *Bulletin of the World Health Organization, 79*(9), 856-862.

Filipo, S. (2004). In search of a culturally appropriate approach to research: A Samoan case. In T. Baba, O. Mahina, N. Williams, & U. Nabobo-Baba, (Eds.), *Researching the Pacific and Indigenous peoples* (pp. 179-185). Auckland, New Zealand: The University of Auckland; Centre for Pacific Studies.

Finau, S., Wainiqolo, I., & Cuboni, G. (2004). Health transition and globalization in the Pacific: Vestiges of colonialism? *Perspectives on Global Development & Technology, 3*(1/2), 109-129.

Fredericks, B. (2007). Australian Indigenous visions and voices enacted through research (3rd ed.). *World Indigenous Nations Higher Education Consortium Journal*, (3), 42-49.

Gegeo, D. (2001). Cultural rupture and indigeneity: The challenge of (re)visioning "place" in the Pacific. *The Contemporary Pacific, 13*(2), 491-507.

Healthy Eating-Healthy Action. (2008a). Grow slowly for sustainable community projects. *HEHA On-line Network*. Retrieved 6 April, 2009, from http://www.heha.org.nz/index.php?id=384

Healthy Eating-Healthy Action. (2008b). Pacific community action plans. *HEHA On-line Network*. Retrieved 6 April, 2009, from http://www.heha.org.nz/index.php?id=133

Health Research Council of New Zealand. (2004). *Guidelines on Pacific health research* (2nd ed.). Auckland, New Zealand: Health Research Council of New Zealand.

Heine, A. (1984). Urbanization and social change in the Marshall Islands. *Ambio, 13*(5/6), 313-315.

Hereniko, V. (2000). Indigenous knowledge and academic imperialism. In R. Borofsky (Ed.), *Remembrance of Pacific pasts: An invitation to remake history* (pp. 78-91). Honolulu: University of Hawaii Press.

Hohepa, M., Schofield, G., & Kolk, G. (2004). Adolescent obesity and physical activity. *The New Zealand Medical Journal, 117*(1207), 1-13.

Hughes, R., & Lawrence, M. (2005). Globalisation, food and health in Pacific island countries. *Asia Pacific Journal of Clinical Nutrition, 14*(4), 298-306.

Humphery, K. (2001). Dirty questions: Indigenous health and Western research. *Australian and New Zealand Journal of Public Health*, *25*(3), 197-202.

International Obesity Taskforce. (2009). *Global prevalence of adult obesity, 2009* [Data file]. Retrieved June 11, 2009, from http://www.iotf.org/database/documents/GlobalPrevalenceofAdultObesityJune2009updateonweb.pdf

Jeffs, K. (2006, July/August). Diabeating ourselves to death. *Spasifik, 15*, 24-26.

Johnson, R., & Onwuegbuzie, A. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, *33*(7), 14-26.

Kendrick, J. R. (2000). *Social statistics: An introduction using SPSS for windows*. Mountain View, CA: Mayfield Publishing Company.

Kinnear, P. R., & Gray, C. D. (2009). *SPSS 16 made simple*. East Sussex: Psychology Press.

Khan, N., Cigljarevic, M., Schultz, T., & Dyer, E. (2006). Evidence for a curriculum review for secondary schools in Fiji. *Pacific Health Dialog, 13*(2), 97-101.

Komesaroff, P., & Thomas, S. (2007). Combating the obesity epidemic: Cultural problems demand cultural solutions. *Internal Medicine Journal, 37*, 287-289.

Lako, J., & Nguyen, V. (2001). Dietary patterns and risk factors of diabetes mellitus among urban indigenous women in Fiji. *Asia Pacific Journal of Clinical Nutrition, 10*(3), 188-193.

Macleod, S. (2002, January 11). NZ meat blamed for fat problem. *New Zealand Herald*. Retrieved April 4, 2009, from http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=586078

Macpherson, C., Bedford, R., & Spoonley, P. (2000). Fact or fable? The consequences of migration for educational achievement and labor market participation. *The Contemporary Pacific*, *12*(1), 57-82.

Mavoa, H., & McCabe, M. (2008). Sociocultural factors relating to Tongans' and Indigenous Fijians' patterns of eating, physical activity and body size. *Asia Pacific Journal of Clinical Nutrition, 17*(3), 375-384.

Menzies, R. C. (2001). Reflections on research with, for, and among Indigenous peoples. *Canadian Journal of Native Education*, *25*(1), 19-36.

Milner, B. G. (1992). *Samoan dictionary*. New Zealand: Pasifika Press.

Ministry of Education. (2007). *Physical activity for healthy confident kids: Guidelines for sustainable physical activity in school communities*. Wellington, New Zealand: Learning Media Limited.

Ministry of Finance. (2008). *Strategy for the development of Samoa, 2008-2012: Ensuring sustainable economic and social progress*, Retrieved June 6, 2008, from http://www.mof.gov.ws/uploads/sds_2008_-_2012_-_english.pdf

Ministry of Health. (2007). *Pacific health: Tagata Pasifika in New Zealand*. Retrieved February 17, 2009, from http://www.moh.govt.nz/moh.nsf/indexmh/pacifichealth-tagatapasifika

Ministry of Health. (2005). *The health of Pacific peoples*. Retrieved March 4, 2009, from http://www.moh.govt.nz/moh.nsf/0/16FD4E63EFA72477CC256FD9000FDC48/$File/thehealthofpacificpeoples.pdf

Ministry of Health. (2004). *A portrait of health: Key results of the 2002/03 New Zealand health survey*. Wellington, New Zealand: Ministry of Health.

Ministry of Health, Samoa. (2008). *Physical activity*. Retrieved March 5, 2009, from http://www.health.gov.ws/subpage.cfm?subid=3&pid=4&mid=16&rk=0

Ministry of Health, Samoa. (2007). *Health sector plan 2008-2018*. Retrieved 16 April, 2009, from http://www.health.gov.ws/UserFiles/File/Health_Sector_Plan_english.pdf

Ministry of Health, Samoa. (2006). *Annual report: 2005-2006*. Retrieved 16 April, 2009, from http://www.health.gov.ws/subpage.cfm?subid=13&pid=4&mid=9&rk=1

Ministry of Social Development. (2009). *The social report: Obesity*. Retrieved February 28, 2009, from http://www.socialreport.msd.govt.nz/health/obesity.html

Nabobo-Baba, U. (2004). Research and Pacific Indigenous peoples: Silenced pasts and challenged futures. In T. Baba, O. Mahina, N. Williams, & U. Nabobo-Baba, (Eds.), *Researching the Pacific and indigenous peoples*. (pp. 17-32). Auckland, University of Auckland: Centre for Pacific Studies.

Nardi, P. M. (2003). *Doing survey research: A guide to quantitative methods*. USA: Pearson Education Inc.

Neuman, L.W. (2003). *Social research methods: Qualitative and quantitative approaches* (5th ed.). USA: Pearson Education Inc.

Ofa Makasiale, C., Patterson, S., Silipa, N., Tupou, F., Agee, N., & Culbertson. (2008). *Voicing the unspoken: Breaking through the barriers of mainstream institutionalized deafness to Pacific therapeutic practices*. Hamilton: Maori and Psychology Research Unit.

Pawson, G., & Janes, C. (1981). Massive obesity in a migrant Samoan population. *American Journal of Public Health, 71*(5), 508-513.

Peteru, C. (1996). Food for thought. *Pacific Islands Monthly, 66*(7), p. 41.

Pollock, N. (2001). Obesity or large body size? A study in Wallis and Futuna. *Pacific Health Dialog, 8*(1), 119-123.

Porsanger, J. (2004). An essay about indigenous methodology, *Nordlit*, *15*, 105-120.

Pryor, J. (2007, April). *Approaches to research capacity building in low to medium resource countries: What works in the Pacific Islands?* Paper presented at the Forum on Building Research Capacity to Improve Global Health, Melbourne, Australia.

Radio New Zealand International. (2009). *PNG Government to try and tax New Zealand's mutton flaps off their market*. Retrieved April 8, 2009, from http://www.rnzi.com/pages/news.php?op=read&id=45170

Radio New Zealand International. (2007). *Samoa health officials says turkey tail ban should improve country's health.* Retrieved April 9, 2009, from http://www.rnzi.com/pages/news.php?op=read&id=34100

Rawlings, G. (1999). Foundations of urbanisation: Port Vila town and Pango village, Vanuatu. *Oceania, 70*(1), 72-86.

Rocco, T. S., Bliss, L. A., Gallagher, S., & Perez-Prado, A. (2003). Taking the next step: Mixed methods research in organizational systems. *Information Technology, Learning and Performance Journal, 21*(1), 19-29.

Sanga, K. (2004). Making philosophical sense of indigenous Pacific research. In T. Baba, O. Mahina, N. Williams & U. Nabobo-Baba (Eds.), *Researching the Pacific and indigenous peoples*. (pp. 41-52). Auckland, The University of Auckland: Centre for Pacific Studies.

Scragg, R. (2007). Preventing obesity in Pacific communities. Retrieved 18 February, 2009 from http://www.hrc.govt.nz/assets/pdfs/publications/HRC48%20(Scragg).S.pdf

Secretariat of the Pacific Community. (2002). *Obesity in the Pacific: Too big to ignore*. Manila: World Health Organization.

Singh, S. (2007). South Pacific island nations struggle with obesity epidemic. *Global Information Network,* 1. Retrieved August 12, 2008, from Academic Research Library database. (Document ID: 1245873771).

Simmons, D., Flemming, J., Voyle, F., Fou, F., Feo, S., & Gatland, B. (1998). A pilot urban church-based programme to reduce risk factors for diabetes among Western Samoans in New Zealand. *Diabetic Medicine, 15*, 136-142.

Smith, L. T. (2004). Building research capability in the Pacific, for the Pacific and by Pacific peoples. In T. Baba, O. Mahina, N. Williams & U. Nabobo-Baba (Eds.), *Researching the Pacific and indigenous peoples* (pp. 4-16). Auckland, The University of Auckland: Centre for Pacific Studies.

Smith, L. T. (1999). *Decolonizing methodologies: Research and indigenous peoples*. London: Zed Books.

Smith, B., Phongsavan, P., Havea, D., Halavatau, V., & Chey, T. (2007). Body mass index, physical activity and dietary behaviours among adolescents in the Kingdom of Tonga. *Public Health Nutrition, 10*(2), 137-144.

Sport and Recreation New Zealand. (2003). *Sport facts: Pacific people*. Retrieved April 16, 2009, from http://www.sparc.org.nz/filedownload?id=f1b9b926-d9c2-452f-8229-f3919fc803de

Sport and Recreation New Zealand. (2008). *Sport, recreation and physical activity participation among New Zealand adults*: *Key results of the 2007/08 active in New Zealand Survey*. Wellington: SPARC.

Stanger, C. (1998). *Research methods for the behavioral sciences*. Boston, USA: Houghton Mifflin Company.

Statistics New Zealand. (2005). *Samoan population.* Retrieved February 16, 2009, from http://www.stats.govt.nz/analytical-reports/pacific-profiles-2001/samoan/population.htm

Steinhauer, E. (2002). Thoughts on an indigenous research methodology. *Canadian Journal of Native Education*, *26*(2), 69-81.

Sullivan, C., Oakden, J., Young, J., Butcher, H., & Lawson, R. (2003). *Obstacles to action: A study of New Zealanders' physical activity and nutrition: Profiling others oriented* (Ref. No. 1401720.). Wellington, New Zealand: Sport and Recreation New Zealand.

Szmedra, P., Sharma, K., & Rozmus, C. (2007). Differences in health-promotion behaviour among the chronically ill in three South Pacific island countries. *Development in Practice*, *17*(2), 291-300.

Szmedra, P., & Sharma, K. (2007). Small island states in crisis: The impact of lifestyle diseases in the South Pacific. *Journal of Third World Studies, 24*(2), 45-61.

Szmedra, P., Sharma. K., & Rozmus, L. (2006). *Health status, health perceptions, and health risk among outpatients with non communicable diseases in three developing Pacific Island nations* (No. 2006/10). Suva, Fiji: University of the South Pacific, School of Economics.

Tamasese, K., Peteru, C., Waldegrave, C., & Bush, A. (2005). Ole taeao afua, the new morning: A qualitative investigation into Samoan perspectives on mental health and culturally appropriate services. *Australian and New Zealand Journal of Psychiatry, 39*, 300-309.

Tavana, N. (2002). *Traditional knowledge is the key to sustainable development in Samoa: Examples of ecological, botanical and taxonomical knowledge.* In proceedings of the national 2001 National Environment Forum, No. 3 (pp. 19-261). Apia Samoa: Ministry of Natural Resources and Environment.

Teevale, T. (2006, September). *Obesity in Pacific adolescents: A socio-cultural study*. Paper presented at New Zealand Satellite Meeting of the International Congress of Obesity & Australasian Society for the Study of Obesity (ASSO), Auckland University of Technology, Auckland.

Teevale, T., Thomas, D., & Scragg, R. (2008, November 13-16). *Obesity in Pacific adolescents: A social-cultural study: Physical activity key differences between healthy weight and obese Pacific adolescents*. Paper presented at the International Conference on Childhood Obesity: Evidence and Practice from Exercise Science (ICC02008), Department of Sports Science and Physical Education, Faculty of Education of the Chinese University of Hong Kong, Hong Kong SAR.

Thaman, K. H. (2003). Decolonizing Pacific studies: Indigenous perspectives, knowledge, and wisdom in higher education. *The Contemporary Pacific, 15*(1), 1-17.

Tukuitonga, C. (2007, March). *Population health and health care in the Pacific region: A situation analysis.* Background paper presented at the meeting of Ministers of Health for the Pacific Island Countries, Port Vila, Vanuatu.

Trochim, W. (2006). *The t-test*. Retrieved April 28, 2009, from http://www.socialresearchmethods.net/kb/stat_t.php

Ulijaszek, S. (2007). Obesity: A disorder of convenience. *Obesity Reviews, 8*(1), 183-187.

United Nations Development Programme. (2005). *Voices of the least developed countries of Asia and the Pacific: Achieving the millennium development goals through a global partnership*. New Delhi, India: Elsevier.

Unwin, N., & Alberti, K. (2006, July). Chronic non-communicable diseases. *Annals of Tropical Medicine & Parasitology, 100*(5/6), 455-464.

Utter. J., Faeamani, G., Malakellis, M., Vanualailai, N., Kremer, P., Scragg, R., & Swinburn, B. (2008). *Lifestyle and obesity in South Pacific youth: Baseline results from the Pacific Obesity Prevention in Communities (OPIC) project in New Zealand, Fiji, Tonga and Australia.* Auckland: University of Auckland.

Vaioleti, T. M. (2006). Talanoa research methodology: A developing position on Pacific research. In T. Bruce & R. De Luce (Eds.), *Waikato Journal of Education, 12*, 21-34.

Vaus, A. D. (1995). *Surveys in social research*. (4th ed.). Australia: Allen & Unwin.

Walsh, R., & Hoby, K. (2002, November 18). Avoidable epidemic takes toll. *New Zealand Herald*. Retrieved April 4, 2009, from http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=3004857

Wilson, S. (2001). What is indigenous research methodology? *Canadian Journal of Native Education, 25*(2), 175-179.

World Health Organization. (2009a). *Deaths from coronary heart disease*. Retrieved March 1, 2009, from http://www.who.int/cardiovascular_diseases/en/cvd_atlas_14_deathHD.pdf

World Health Organization. (2009b). *Global strategy on diet, physical activity and health: Physical activity*. Retrieved 16 April, 2009, from http://www.who.int/dietphysicalactivity/publications/facts/pa/en/

World Health Organization. (2009c). *World data table*. Retrieved March 1, 2009 from http://www.who.int/cardiovascular_diseases/en/cvd_atlas_29_world_data_table.pdf

World Health Organization. (2008a, October). *Consultation on strengthening health research capacity in the Pacific: Meeting report*. Paper presented at the 'Consultation of Strengthening Health Research Capacity in the Pacific', Nadi, Fiji.

World Health Organization. (2008b). *Myths about physical activity* [Fact Sheet]. Retrieved 19 March, 2008, from http://www.who.int/dietphysicalactivity/factsheet_myths/en/index.html

World Health Organization. (2008c). *Pacific physical activity guidelines: Framework for accelerating the communication of physical activity guidelines*. Geneva: World Health Organization.

World Health Organization (2008d). *Western Pacific country health information profile* (rev. ed.). Geneva: World Health Organization.

World Health Organization. (2007a) *A guide for population based approaches to increasing the level of physical activity: Implementation of the WHO global strategy on diet, physical activity and health*, Retrieved May 22, 2008 from http://www.who.int/dietphysicalactivity/PA-promotionguide-2007.pdf

World Health Organization. (2007b). *Cardiovascular diseases* [Fact sheet]. Retrieved November, 2008, from http://www.who.int/mediacentre/factsheets/fs317/en/index.html

World Health Organization. (2006). *Obesity and overweight* [Fact sheet]. Retrieved June 5, 2008, from http://www.who.int/mediacentre/factsheets/fs311/en/index.html

World Health Organization. (2005). *Preventing chronic diseases: A vital investment: WHO global report*. Geneva: World Health Organization.

World Health Organization (2003). Global strategy on diet, physical activity and health: Physical activity: Retrieved June 2, 2009 from http://www.who.int/dietphysicalactivity/publications/facts/pa/en/

World Health Organization. (2002a). World Health Organization: Regional Office for the Western Pacific: Report: Workshop on obesity prevention and control strategies in the Pacific. In World Health Organization: Regional Office for the Western Pacific. *Proceedings of the 2000 Workshop on Obesity Prevention and Control Strategies in the Pacific, 26-29 September, Apia, Samoa.* Manila, Philippines: World Health Organization.

World Health Organization. (2002b). *The world health report 2002: Reducing risks, promoting health*. Geneva: World Health Organization.

World Health Organization. (200l). Obesity an epidemic. Retrieved February 29, 2009, from http://www.emro.who.int/nutrition/PDF/Obestity_Epidemic.pdf

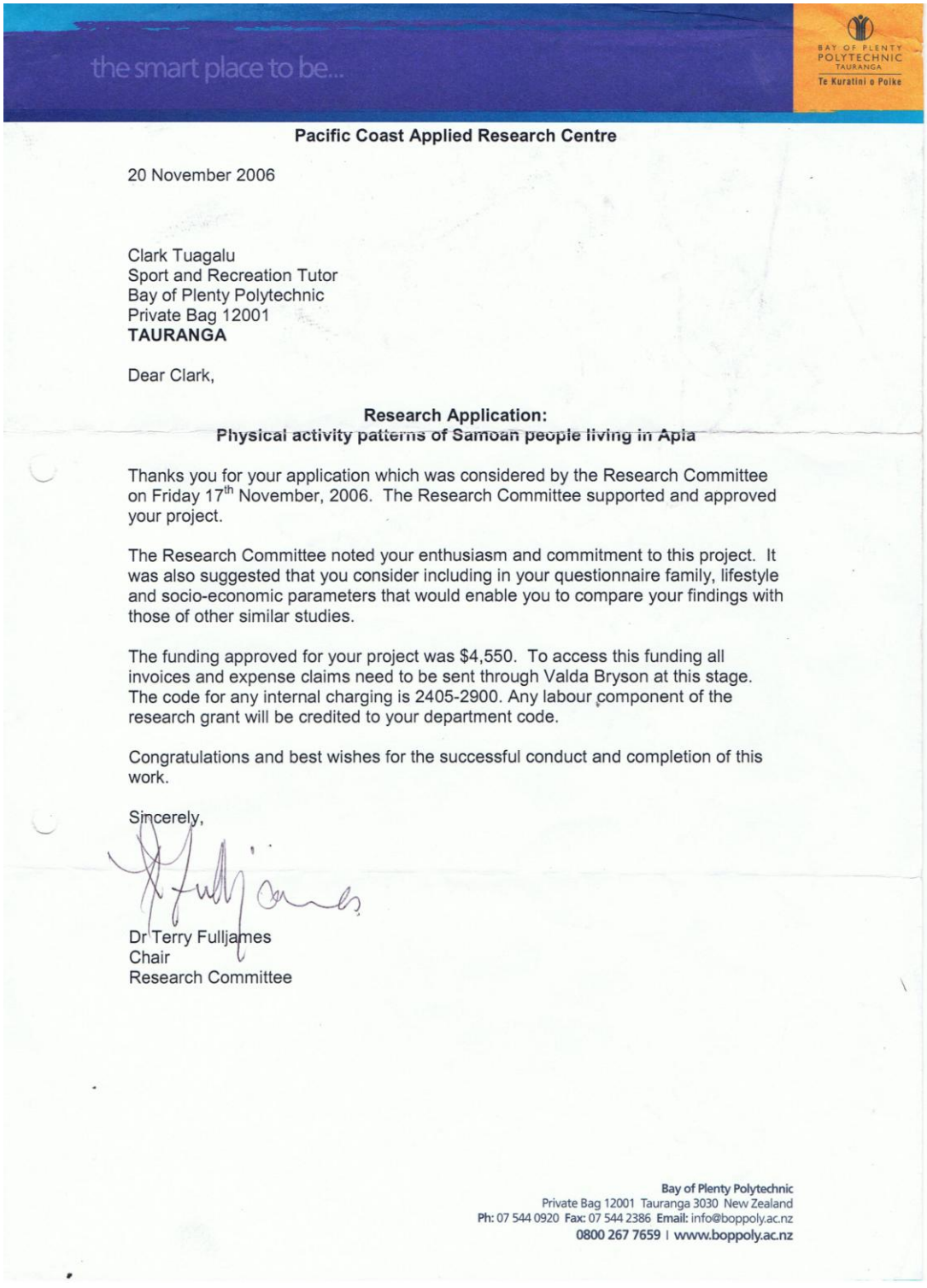
World Trade Organization/World Health Organization. (2002). *WTO agreements & public health: A joint study by the WHO and the WTO Secretariat*. Retrieved 16 April, 2009, from http://www.unescap.org/pdd/publications/bulletin04-05/bulletin04-05_full.pdf

Yamada, S. (1999). Obesity in Samoans: A practice based naturalistic inquiry. *Pacific Health Dialog, 6* (1), 65-66.

Yari, D. & Duncan, R. (2004). Food security: A development issue for Pacific island countries. In *Economic and Social Commission for Asia-Pacific: Bulletin on Asia-Pacific Perspectives 2004/05: Asia-Pacific economies: Living with high oil prices?* (pp. 97-111). NY: United Nations.

APPENDICES

Appendix A Bay of Plenty Polytechnic Research Application Approval



the smart place to be...

BAY OF PLENTY POLYTECHNIC TAURANGA
Te Kuratini o Poike

Pacific Coast Applied Research Centre

20 November 2006

Clark Tuagalu
Sport and Recreation Tutor
Bay of Plenty Polytechnic
Private Bag 12001
TAURANGA

Dear Clark,

Research Application:
Physical activity patterns of Samoan people living in Apia

Thanks you for your application which was considered by the Research Committee on Friday 17th November, 2006. The Research Committee supported and approved your project.

The Research Committee noted your enthusiasm and commitment to this project. It was also suggested that you consider including in your questionnaire family, lifestyle and socio-economic parameters that would enable you to compare your findings with those of other similar studies.

The funding approved for your project was $4,550. To access this funding all invoices and expense claims need to be sent through Valda Bryson at this stage. The code for any internal charging is 2405-2900. Any labour component of the research grant will be credited to your department code.

Congratulations and best wishes for the successful conduct and completion of this work.

Sincerely,

Dr Terry Fulljames
Chair
Research Committee

Bay of Plenty Polytechnic
Private Bag 12001 Tauranga 3030 New Zealand
Ph: 07 544 0920 Fax: 07 544 2386 Email: info@boppoly.ac.nz
0800 267 7659 | www.boppoly.ac.nz

Appendix B Revised Survey

Physical activity patterns of Samoan people living in Apia

BAY OF PLENTY POLYTECHNIC TAURANGA
Te Kuratini o Poike

National University of Samoa

Thank you for participating in this survey.

The aim of this study is to identify how active the Samoan people are living in Apia.

The survey involves answering questions mainly related to your attitude to physical activity. I expect the form to take approximately 15 to 20 minutes to complete. You may withdraw from the survey at any point.

Your answers will be kept confidential and used only by the researchers for the purpose of this study.

Yours Sincerely

How to answer

Use a black or blue pen (that does not soak through the paper) or a dark pencil put an × in the box provided. For example

☐1	☒2	☐3	☐4

If you change your mind or make a mistake scribble the whole box and mark the correct one as shown. For example

☐1	☒2	☒3	☐4

What does the word "physical activity mean"?

Physical activities" are things you do that increase your breathing and/or heart-rate. For example walking and dancing.

Special note: Please ignore the numbers next to the box e.g. ☐1

Section A: Attitudes and Opinions

1. For each statement below, please indicate how much you agree or disagree with it.						
		Strongly disagree	**Disagree**	**Neither disagree nor agree**	**Agree**	**Strongly agree**
a	I get enough "physical activity" to keep me healthy	☐1	☐2	☐3	☐4	☐5
b	I like to be physically active on my own rather than in a group	☐1	☐2	☐3	☐4	☐5
c	I am more physically active than other people my age	☐1	☐2	☐3	☐4	☐5
d	I am so busy at work/school that I am too tired to be physically active when I get home	☐1	☐2	☐3	☐4	☐5
e	I get enough "physical activity" according to recommended guidelines e.g. 30 minutes daily physical activity	☐1	☐2	☐3	☐4	☐5
f	People who are not physically active are at risk of health problems e.g. high blood pressure	☐1	☐2	☐3	☐4	☐5
g	Being physically active is very important in my life	☐1	☐2	☐3	☐4	☐5

Section B: Your Health					
How would you describe your health? (Mark ☒ one box)	**Poor**	**Fair**	**Good**	**Very Good**	**Excellent**
	☐1	☐2	☐3	☐4	☐5

1. How would you describe your weight?	Very underweight	A little underweight	About the right weight	A little overweight	Very overweight/obese
	☐1	☐2	☐3	☐4	☐5

2. Are you trying to …	Gain weight	Lose weight	None of these
	☐1	☐2	☐3

3. The following is a list of reasons that motivate people to improve their health					
	How important is it to YOU to …	Not important at all	Sometimes important	Important	Very important
a	Look better	☐1	☐2	☐3	☐4
b	Lose weight	☐1	☐2	☐3	☐4
c	Have more energy	☐1	☐2	☐3	☐4
d	Feel more relaxed	☐1	☐2	☐3	☐4
e	Set a good example for others	☐1	☐2	☐3	☐4
f	Live a longer life	☐1	☐2	☐3	☐4
g	Have fun	☐1	☐2	☐3	☐4
h	Sleep better	☐1	☐2	☐3	☐4
i	Feel good about yourself	☐1	☐2	☐3	☐4
j	To be with others	☐1	☐2	☐3	☐4
k	Improve your fitness level	☐1	☐2	☐3	☐4

Section C: Physical Activity							
1. How much walking, at a quick pace, have you done in the past 7 days? (Mark ☒ one box).							
0 days	1 day	2 days	3 days	4 days	5 days	6 days	7 days
☐1	☐2	☐3	☐4	☐5	☐6	☐7	☐8

2. How much hard physical activity have you done in the past 7 days? For example very heavy lifting.							
0 days	**1 day**	**2 days**	**3 days**	**4 days**	**5 days**	**6 days**	**7 days**
☐1	☐2	☐3	☐4	☐5	☐6	☐7	☐8

3. How many of the last 7 days did you do 30 minutes or more of physical activity? For example dancing.							
0 days	**1 day**	**2 days**	**3 days**	**4 days**	**5 days**	**6 days**	**7 days**
☐1	☐2	☐3	☐4	☐5	☐6	☐7	☐8

4. How physically active do you think you are?		
Not physically active e.g. 0 to 1 day a week	**Sometimes physically active** e.g. 2 to 3 days a week	**Regularly physically active** e.g. every day
☐1	☐2	☐3

5. How long have you been active at this level (Refer to Q4)?					
Less than 1 month	**Less than 3 months**	**4 to 6 months**	**7-9 months**	**10-12 months**	**More than 12 months**
☐1	☐2	☐3	☐4	☐5	☐6

6. Over the next 6 months do you think you will be…?		
Less physically active	**About the same**	**More physically active**
☐1	☐2	☐3

7. Do the things below stop you from being physically active?				
		Doesn't influence me	**Sometimes it influences me**	**Influences me a lot**
a.	I have family responsibilities	☐1	☐2	☐3
b.	Facilities are too hard to get to e.g. swimming pool)	☐1	☐2	☐3
c.	I get bored quickly	☐1	☐2	☐3
d.	Physical activity is uncomfortable for me	☐1	☐2	☐3
e.	I feel I am too overweight to be physically active	☐1	☐2	☐3
f.	I don't like to sweat	☐1	☐2	☐3
g.	I can't afford it e.g. se'e vae tolegi	☐1	☐2	☐3
h.	It's too hard to stick to a physical activity programme	☐1	☐2	☐3
i.	I worry about my safety e.g. fear of dogs biting me	☐1	☐2	☐3
j.	I have too much house work to do	☐1	☐2	☐3
k.	Physical activity takes too much effort	☐1	☐2	☐3

l.	I don't have transport	☐1	☐2	☐3
m.	No street lights	☐1	☐2	☐3
n.	Curfew restrictions e.g. Sa o le nu'u	☐1	☐2	☐3
o.	Church restrictions e.g. Aso Sapati	☐1	☐2	☐3
p.	Ofu faa saina e.g. ofuvae pu'upu'u	☐1	☐2	☐3
q.	No footpaths	☐1	☐2	☐3
r.	Roads are not well maintained	☐1	☐2	☐3

8. Why is physical activity important to you? (Mark ☒ only the boxes that apply to you)	
To improve my health	☐1
I enjoy it	☐2
I've started playing a new sport	☐3
I've just joined a gym	☐4
To meet new people	☐5
To spend time with my friends	☐6
To have more spare time	☐7
To lose weight	☐8
To control my weight	☐9
I'm less busy at work	☐10
To look better	☐11
To have more energy	☐12
To relax	☐13
To live longer	☐14
To get fitter	☐15
I'm less busy at school	☐16
None of the above	☐17

9. How much encouragement do you get from the following people to be physically active?					
		No encouragement	Some encouragement	A lot of encouragement	Does not apply
a	Your partner e.g. boyfriend or girlfriend	☐1	☐2	☐3	☐9
b	Your husband or wife	☐1	☐2	☐3	☐9
c	Your friends	☐1	☐2	☐3	☐9
d	People at your work	☐1	☐2	☐3	☐9
e	People at your school	☐1	☐2	☐3	☐9
f	People at your church	☐1	☐2	☐3	☐9
g	Your doctor	☐1	☐2	☐3	☐9
h	People at your village	☐1	☐2	☐3	☐9

Section D: About Yourself		
1. Are you?	Male ☐1	Female ☐2

2. Are you… (Mark ☒ the one box that best describes you now)			
Single	**Married/living with a partner**	**Separated/divorced**	**Widowed**
☐1	☐2	☐3	☐4

3. Which ethnic group do you belong to?	
Samoan	☐1
Non Samoan	☐2
(If non-Samoan please specify ethnic group)	

4. To which of these age groups do you belong?	
13 – 15 years	☐1
16 – 17 years	☐2
18 – 24 years	☐3
25 – 34 years	☐4
35 – 49 years	☐5
50 + years	☐6

5. Which of these areas best describe where you are currently living while you work and/or study in Apia? (Mark ☒ one box)			
Apia Urban Area (Vailele to Faleula & Apia to Vaoala)	☐1	Rest of Upolu (Laulii to Aleipata, Tiavea to Lefaga & Falelatai to Fuailoloo	☐2
North West Upolu (Toamua to Satapuala	☐3	Savaii	☐4

6. Which one of the following best describes you? (Mark ☒ one box)	
Working full-time	☐1
Working part-time	☐2
Unemployed/Actively seeking a job	☐3
At home with pre schoolers	☐4
At home with older children	☐5
At home with no children	☐6
Retired	☐7
Sick	☐8
Student	☐9

7. Which one of these best describes where you work or study? (Mark ☒ all boxes that apply)	
In an office	☐1
In a shop	☐2
In a factory	☐3
Outdoors	☐4
Home	☐5
Indoors	☐6
In a class room	☐7

8. When you are at work or studying, which one of the following best describes what you do? (Mark ☒ one box)	
Mainly sit	☐1
Mainly stand	☐2
Mainly walk or perform light labour	☐3
Mainly do heavy labour or physically demanding work	☐4
Not of the above	☐5

9. At a later stage, we would like to contact a few people for some follow-up research. If you are happy to be contacted, please write your telephone number here:	
Work:	**Home:**

Have you answered all the pages of this questionnaire? Thank you very much for your time and effort.

Appendix C Survey Samoan Translation

TULAGA O GALUEGA FAAMALOSITINO A TAGATA SAMOA E ALALA I APIA

BAY OF PLENTY POLYTECHNIC TAURANGA
Te Kuratini o Poike

National University of Samoa

E momoli atu le faafetai ona o lou auai i lenei sailiiga.

O le faamoemoe o lenei suesuega, o le fia maua oe se malamalamaga po o le a le tulaga soifua gaoioi o tagata Samoa o loo alala i Apia.

O lenei galuega suesue e aofia ai le tali mai i ni fesili pe a male 20 i le 30 minute e faatino ai.
E mafai ona e faamaamulu mai i lenei suesuega i soo se mafuaaga.

O le a matua malu puipuia au tali ma o le a faaaoga mo le pogai o lenei suesuega e i latou o loo faafoeina.

Ma le faaalcalo lava,

Dawn Rasmussen ma Clark Tuagalu.

Faiga e tali ai fesili:

Faaaoga se peni uliuli poo se peni lanumoana (e le o le ituaiga ai nini/sosolo) po o se penitala e olaola lelei, tuu se ekisi (x) i le pusa ua saunia. Mo le faataitaiga:

☐1	x 2	☐3	☐4

Afai ua toe sui lou mafaufau po ua sese lau tali ona osiosi lea o le pusa ma faailoga le tali fou e pei ona faaalia i le ata

☐1	2	x 3	☐4

O le a le uiga o le upu "gaoioiga faamalositino?

O gaoioiga faamalositino o ni galuega ia e te faia ina ia faaleleia ai lau manava ma le tata o lou fatu. Faataitaiga: O le savali ma le siva.

Vaega A: O Lagona ma Manatu

1 Mo faamatalaga uma o i lalo, faamolemole faailoa mai po o le a le tele o lou lagolagoina pe teena foi.

		Matua Teena	Teena	Le Mautonu	Lagolago	Matua Lagolago
a	E lava ma totoe a'u gaoioiga faamalositino e faatumauina ai lo'u ola maloloina	☐1	☐2	☐3	☐4	☐5
e	E sili ia te au lo'u gaoioi faamalositino na o a'u na i lo le faamalositino faatasi ma isi	☐1	☐2	☐3	☐4	☐5
i	E sili atu lo'u tiotio ma le malosi o lo'u tino na i lo isi matou te tupulaga	☐1	☐2	☐3	☐4	☐5
o	Ou te pisi tele i la'u galuega / aoga ma ua faigata ai ona maua se avanoa e faamalositino ai pe a ou foi i le fale	☐1	☐2	☐3	☐4	☐5
u	E lava a'u gaoioiga faamalositino e tusa ai ma fautuaga taiala. Ft: Ia 30 minute e fai ai gaoioiga faamalositino i le aso	☐1	☐2	☐3	☐4	☐5
f	O i latou e leai ni gaoioiga faamalositino, ua tulaga lamatia lo latou soifua ona o faafitauli tau le soifua maloloina. Ft: toto maualuga	☐1	☐2	☐3	☐4	☐5
g	O le tino malosi e ala mai i gaoioiga faamalositino, e matua taua i lo'u olaga	☐1	☐2	☐3	☐4	☐5

Vaega E: Lou Ola Maloloina

	Leaga	Feoloolo	Lelei	Lelei tele	Matua lelei
1 O le a lou silafia i lou soifua maloloina. (Faailoga le pusa ☒ e tasi)	☐1	☐2	☐3	☐4	☐5

2 O le a lou silafia i lou mamafa?	Matua mama	Mama feoloolo	Talafeagai	Mamafa laitiiti	Matua mamafa
	☐1	☐2	☐3	☐4	☐5

3 O e taumafai e...	Faaopoopo lou mamafa	Faaitiitia lou mamafa	Le o se tasi o ia mea
	☐1	☐2	☐3

4	O le lisi o i lalo, o ni manatu ua uunaiina ai tagata ina ia faaleleia lo latou soifua maloloina				
	O le a le taua ia te oe o le	**Matua le taua lava**	**E taua i isi taimi**	**E taua**	**Taua tele**
a	Foliga lelei ma malosi	☐1	☐2	☐3	☐4
e	Tino pa'e'e	☐1	☐2	☐3	☐4
i	Sili atu le malosi	☐1	☐2	☐3	☐4
o	Lagona le saoloto	☐1	☐2	☐3	☐4
u	Fai ma faataitaiga lelei mo isi	☐1	☐2	☐3	☐4
f	Umi le ola	☐1	☐2	☐3	☐4
g	Ola fiafia	☐1	☐2	☐3	☐4
l	Moe lelei	☐1	☐2	☐3	☐4
m	Lelei la'u faalogo ia te a'u lava	☐1	☐2	☐3	☐4
n	Fiafia e aufaatasi ma isi	☐1	☐2	☐3	☐4
p	Faaleleia le malosi o lo'u tino	☐1	☐2	☐3	☐4

Vaega I : Galuega Faamalositino

1 : E faafia ona e savali televave i le 7 aso talu ai? Faailoga le pusa ☒ e talafeagai.

0 aso	1 aso	2 aso	3 aso	4 aso	5 aso	6 aso	7 aso

2 : E fia ni galuega faamalositino mamafa na e faia i le 7 aso talu ai ?
Faataitaiga: O le siiga o ni mea mamafa

0 aso	1 aso	2 aso	4 aso	5 aso	6 aso	7 aso	8 aso

3: E fia ni aso o le 7 aso talu ai na e faamalositino ai mo le 30 minute po o le sili atu foi?
Faataitaiga : siva

0 aso	1 aso	2 aso	3 aso	4 aso	5 aso	6 aso	7 aso

4 : O le a lou silafia i le malosi o lou tino o iai nei?

E le malosi. Ft: 0 i le 1 le aso i le vaiaso.	E malosi i ni isi taimi. Ft: 2 i le 3 vaiaso	E malosi i taimi uma. Ft: O aso uma

5 : O le a le umi talu ona e silafia ua malosi lou tino (Silasila i le fesili e 4)?

Itiiti ifo i le 1 masina	Itiiti ifo i le 3 masina	4 i le 6 masina	7 i le 9 masina	10 i le 12 masina	Sili atu i le 12 masina

6 : E sili atu i le 6 masina o lumanai e te manatu o le a.....?

Faaitiitia le malosi o lou tino	Faatumauina pea	Sili atu le malosi o lou tino

7: E mafai e mafuaaga o i lalo ona taofia oe mai le malosi o lou tino?

		Ou te le aafia ai	Ou te aafia ai i ni isi taimi	Ou te matua aafia ai
a	E iai ou tuatuagia faaleaiga			
e	E le maua gofie ni mea e faatino ai, Ft: Leai se vai taele e aau ai			
i	E vave ona ou fiu			
o	E manuia la'u faalogo pe a faamalositino			
u	Ou te lagona ua mamafa tele lo'u tino mo le faia o faamalositino			
f	Ou te le fia afu			
g	Ou te le maua mea faitino e faaaoga Ft: seevae toleni			
l	E faigata ona tumau ma faaauau se polokalame faamalositino			
m	Ou te popole i lo'u saogalemu. Ft: Fefe i maile			
n	E tele a'u feau e fai i le fale			
p	E tele le malosi e manaomia i gaoioiga faamalositino			
s	E leai sa'u taavale			
t	E leai ni moli o le auala			
v	E fai vavao a nuu. Ft: Sa a nuu			
k	Tulafono a ekalesia. Ft: Aso Sapati			
r	O ofu e faasaina. Ft: ofuvae vae pupuu			
h	E leai ni auala savali i tafa ala.			
x	E le o tausia lelei auala			

8 : Aisea e taua ai gaioiga faamalositino ia te oe? Faailoga na o le pusa [X] e talafeagai ia te oe	
Mo le faaleleia o lou ola maloloina	
Ou te fiafia i ai	
Ua amata ona ou taalo i se taaloga fou	
Faatoa ou auai i se polokalame i se fale taalo	
Ou te feiloai ai i ni tagata fou	
E maua ai so matou taimi ma a'u uo	
Ia tele ai ni ou taimi avanoa	
Ia faaitiitia ai lo'u mamafa	
Ia faatumauina le mamafa o lo'u tino	
E faalepisi la'u galuega	
Ia foliga lelei lo'u tino	
Ia tele ai lo'u malosi	
E mapu ma malolo i ai	
Ia ou ola umi	
Ia mama lo'u tino ma ou malosi	
Ou te faalepisi i le aoga	
E le o se tasi o mea uma ua taua	

9 : O le a se tele o se faamalosi'au mai ia i latou nei ina ia faamalosi lou tino?					
		Leai se faala'ei'au	Sina faala'ei'au	Tele le faala'ei'au	E le talafeagai
a	Lau paaga. Ft: Lau ta'a po o lau teine				
e	Lau tane po o lau avā				
i	O au uō				
o	Tagata tou te faigaluega				
u	Tagata o lau aoga				
f	Tagata o la tou aulotu				
g	O lau foma'i				
l	Tagata o lou nuu				

Vaega O : O le tulaga o oe		
1 O le a oe?	Alii	Tamaitai

2 Ua e.....? (Faailoga [X] le pusa e sili ona talafeagai e faamatala ai oe)			
E le i faiaiga	Faaipoipo / Nonofo faapouliuli	Nonofo eseese/ Tatala lē faaipoipoga	Ua maliu le toalua

3 O le a le ituaiga tagata e iai oe?	
Tagata Samoa	
E le o se tagata Samoa	
Afai e le o oe o se Samoa, ta'u mai lou ituaiga tagata	

4 : O le fea o nei vaega e iai lou matua?	
13 - 15 tausaga	
16 - 17 tausaga	
18 - 24 tausaga	
25 - 34 tausaga	
25 - 49 tausaga	
50 ma sili atu tausaga	

5 : O le fea o nei nofoaga o loo e mau ai nei i Apia a o e feagai ai mo galuega poo aoga? Faailoga le pusa [X] e tasi.			
O le li'o o le taulaga o Apia (Vailele i Faleula ma Apia i Vaoala)		Le vaega o totoe o Upolu (Laulii i Aleipata, Tiavea i Lefaga, Falelatai i Fuailoloo	
Matu Sisifo o Upolu Toamua i Satapuala		SAVAII	

6 : O le fea o nei faamatalaga e talafeagai ma oe? (Faailoga [X] le pusa e tasi)	
Faigaluega tumau	
Faigaluega faavaitaimi	
E le faigaluega / O loo saili se galuega	
Nonofo i le fale ma tamaiti laiti	
Nonofo i le fale ma tamaiti matutua	
Nofo i le fale ae leai ni tamaiti	
Malolo litaea	
Ma'i	
Ou te aoga	

7 : O le fea o nei faamatalaga o loo ta'u mai ai le nofoaga e te faigaluega pe aoga ai ? Faailoga [X] uma pusa e talafeagai.	
Faigaluega i le ofisa	
Faigaluega i le faleoloa	
Faigaluega i le fale gaosimea	
Faigaluega i fafo i le fanua	
Faigaluega i le aiga	
Faigaluega i totonu o le fale	
Faigaluega i le potu aoga	

8 : A o e iai i galuega poo aoga, o le fea o fuaiupu nei e sili ona faamatala ai au mea e fai? Faailoga [X] le pusa e tasi.	
E tele i le nofo	
E tele i le tu	
E tele i le savalivali solo ma faatino nai galuega mama	
E tele i galuega mamafa e manaomia ai le malosi o le tino	
E le talafeagai uma	

9 : O le lumanai, matou te fia faafesootaia ni isi mo ni isi faamatalaga mo lenei suesuega. Afai e te finagalo e faafesootai lau susuga, faamolemole tusi mai le numera o lau telefoni i avanoa ia:			
Galuega		Aiga	

Appendix D Survey Sample Group Demographic Profile

Demographic profile for 16-24 years sample

Age: 72% of 439 respondents were aged 16-17 (n = 314) and 28% of respondents were aged 18-24 (n = 125).

Gender: 64.5% of respondents were female (n = 283) and 34.6% were male (n = 152). The gender imbalance was greater in the younger group aged 16-17 (67.5% of female; n = 212, 31.5% of male; n = 99) than in the older group aged 18-24 (56.8% of female, n = 71; 42.4% male, n = 53). Three respondents out of a total of 439 did not complete this question in the survey which amounts to 1% of the sample.

Ethnicity: 93.2% (n = 409) of respondents identified themselves as Samoans and 6.4% (n = 28) of respondents out a total of 437 did not identify themselves as Samoan. Two participants (0.5%) did not complete this question.

Residence: 75.4% of respondents were either living, working, or studying in the Apia Urban Area and 23.2% of respondents were from outside the region. Two out of a total of 439 did not provide a response.

Status: 95.2% of the respondents identified themselves as single. The remaining participants were either married or living with a partner (1.6%, n=7), divorced or separated (.09%, n=4) or widowed (.05%, n=2) or did not answer this question (1.8%, n=8).

Occupation: An overwhelming majority of respondents were students at the time of the survey (91%, n=399). The remaining 9% (n=35) were divided between; working full time (2.7%, n=12), working part time (2.5%, n=11), unemployed/actively seeking a job (0.05%, n=2), at home with pre schoolers (0.07%, n=3), at home with older children (1.1%, n=5), retired (0.02%, n=1), sick/invalid (0.02%, n=1) and 1.1% (n=5) participants did not provide a response.

Appendix E Focus Group Information

Information sheet: Physical Activity and Health Focus Group Interview

To complete my Master's thesis at the University of Waikato, I have been approved to carry out a follow up study to the Physical Activity Survey I conducted in January 2007. I would like to interview you as one of the Faculty of Education students at NUS who took part in the pilot study last year. The purpose of the study is to explore your experiences and perceptions of physical activity and health, including the motivators and barriers that affect your physical activity and health patterns. It is expected that the results of the research will:

- Help identify how Samoan people define the terms "physical activity and health"
- Help identify the barriers that affect whether or not Samoan people participate in a physical activity
- Help improve the provision of physical activity and health services to Samoan people in the Apia Urban Area.

The current Ministry of Health strategy places strong emphasis on the health, education and sport organisations working with their local communities to increase physical activity and health levels.

The researcher will respect the confidentiality of the information provided. Individuals will not be identified in the study without prior approval.

Questions regarding the study may be directed to:

Clark Tuagalu
320 Snodgrass Road, RD2
Te Puna
Tauranga
New Zealand 3120

E-mail clark@pasifikaresearch.co.nz
Toni Bruce (Supervisor)
Department of Sport and Leisure Studies,
The University of Waikato,
Private Bag 3105,
Hamilton, NEW ZEALAND.
Email tbruce@waikato.ac.nz

Consent Form: Physical Activity and Health Focus Group Interview

I have read the attached information sheet about the study and understand what it is about. All my questions concerning the study and my participation in it have been answered to my satisfaction.

I am aware that:

- I may request further information about the study any time.
- My participation in the study is entirely voluntary.
- Any information I provide will be stored securely and accessed only by the researcher or members of his Masters Thesis supervisory team.
- All information collected will be dealt with in such a way as to ensure that individual participants will remain anonymous.
- The results of the project will be published as part of the researcher's thesis, and may appear in research publications and presentations. The thesis will be distributed to the University of Waikato and National University of Samoa, Ministry of Health Samoa and Ministry of Education, Sport & Culture. Other organizations that are focused on health and physical activity issues may receive copies on request.
- The findings of this report will only be used for the purpose of this study and will not be used for commercial gain or personal financial gain.
- Participants will be offered the opportunity to review or edit their contribution on a written transcript of the recording.
- The tape recordings of the interviews will be stored securely for 5 years, after which they will be destroyed.
- If you have any concerns during this study please contact the researcher or the supervisor

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New Zealand 3120
E-mail clark@pasifikaresearch.co.nz

Toni Bruce (Supervisor)
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The University of Waikato,
Private Bag 3105,
Hamilton, NEW ZEALAND.

Email tbruce@waikato.ac.nz

On the basis of the above undertakings, I agree to take part in the study.

Signature: _____

Date: _____

Interview Guidelines and Questions

a. Introduce myself, briefly outline the objectives of the study, and explain how the focus group fits into it.
b. Explain the confidentiality precautions and give the participants an opportunity to ask questions and to withdraw at this stage.
c. Distribute the consent forms
d. Explain that the session will be audio taped and turn on the tape.
e. Issue name tags
f. Begin the session with the first question

Focus group questions

1. What does physical activity (PA) mean to you?
    a. How do you define PA?
2. What does health mean to you?
3. What relationship do you see between PA and health?
4. How much PA do you do?
5. How active are you in relation to other people you know?
6. What makes you think that you are less or more PA than others you know?
7. How much PA do you do regularly?
    a. Do you get the recommended amount per day [do you know what the recommended amount is?]
    b. Most people in the survey thought they got enough PA. Do you think this is the case for most young people?
8. What kind of PA do you do?
9. What activity do you do at University and outside University that is PA?
    a. Is this different from what you did when you were at school?
10. What kinds of activities do you consider as a PA?
11. What kind of chores do you do every day that involves moving your body?
12. What have you learned about PA and health at school?
13. Who has the biggest influence on the level of PA that you do?
14. What PA experience do you remember the most?
15. What things have influenced your participation in PA?
    a. What about people who have influenced you?
16. What excites you about participating in PA?
17. What things do you dislike about participating in PA?

18. What things are stopping you from doing PA?
    a. e.g. in the survey, some people mentioned that wild dogs made them scared to exercise outside. Is this a problem for you?
    b. follow up with other issues discussed in the survey results
19. What kinds of things make it easier for you to PA?
    a. e.g. facilities, encouragement from friends, etc.
20. If you could ask the Government to do one thing to make it easier for you to do PA, what would it be?

Possible additional questions:

21. How healthy are you in relation to other people you know?
22. What makes you think that you are healthier than other people you know?
23. What do you consider as healthy?
24. What do you consider is not healthy?
25. Who has the biggest influence on the things that affect your health?

Appendix F Focus Group Information Samoan Translation

PEPA E FAALAUILOAI AI LE FAAMOEMOE O GAOIOIGA O LE TINO MA LE SOIFUA MALOLOINA

Mo le faamaeaina ole tikeri o le Master i le Iunivesite o Waikato ua talia ai se sailiiliga e autu i Gaoioiga o le tino na amata ia Ianuari 2007. E manaomia ai se faatalatalanoaga ma se tasi mai le Vaega o Aoaoga i le NUS sa auai i se suesuega i le tausaga ua mavae. O le faanaunauga autu o lenei sailiiliga ia aoao mai tomai ma ni agavaa ma le vaai mamao i gaoioiga o le tino ma le soifua maloloina e aofia ai le faaosofia o lagona fiafia po'o ni pa puipui foi e aafia ai gaoioiga o le tino ma le soifua maloloina. E iai le taofi o lenei taumafaiga o le a alia'e ai ni faaiuga o le a:

- Fesoasoani e auiliili ai e tagata Samoa le uiga moni o fuaitau ia Gaoioiga o le tino ma le Soifua Maloloina.
- Fesoasoaini e auiliili ai ia ni faafitauli e aafia ai le fiafia po'o le le fiafia o tatou tagata e auai i ni faamalositino.
- Fesoasoani e faalelei ai le faasoasoaina atu o tulaga faamalosi tino ma faatinoga o auaunaga faalesoifua maloloina ile talafatai o Apia ma alalafaga tulata i le taulaga.

O le Matagaluega o le soifua Maloloina i le taimi nei o lo'o tulimatai ma faamalosia aoaoga tau le soifua maloloina atoa ai ma vaega o taaloga e galulue faatasi ma alalafaga e faamalosi ai faamalositino ma le soifua maloloina o tagata.

E tatau i le fai-suesuega ona faaaloalogia ma amanaia faamatalaga uma o le a maua ina ia aua nei faailoaina faalauaitele ma ia malupuipuia.

E lē tatau foi ona faailoaina tagata taitoatasi i lenei iloiloga e aunoa ma sa latou ioega.

O fesili e uiga i lenei iloiloga e tatau ona agai lea ia:

Clark Tuagalu
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Te Puna
Tauranga
New Zealand 3120
Imeli clark@pasifikaresearch.co.nz

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MALIEGA: GAOIOIGA FAATINO MA FAATALANOAAGA TOATELE E AUGA I LE MALOLOINA.

Ua maea ona ou faitauina le pepa o faamatalaga faapipi'i e uiga I le iloiloga ma ou malamalama i lona uiga. O a'u fesili uma e uiga i lenei iloiloga aemaise o so'u sao, ua ma'ea tali'ina ma lo'u malie atoatoa i ai.

Ou te iloa e:

- E mafai on ou talosagaina nisi faamatalaga e uiga i lenei iloiloga i so'o se taimi.
- O lo'u sao i lenei iloiloga ua tuuina atu ma lou loto malie atoatoa i ai.
- O so'o se fa'a matalaga o le a ou tuuina atu ma lou loto malie atoatoa i ai.
- O So'o se fa'amatalaga o le a ou tu'uina ma ofoina atu o lea teumaluina ma na ole fai-su'esu'ega lava faatasi ai ma sui o le vasega o supavaisa taitai o lo o latou vaaia lenei tusitusiga.
- O fa'amatalaga uma o le a aoina o le a faia lava i se tulaga ina ia mautinoa le natiaina o tagata taitoatasi.
- O taunuuga uma o lenei poloketi o le a lomia ma avea ma vaega o le autu o lenei tusitusiga, ma e ono mafai ona atagia mai ini lomiga o le sailiga po o ni folasaga faalauiloa foi. O lenei tusiga o le a tufatufaina atu lea i le Iunivesite o Waikato, Iunivesite Aoao o Samoa, Matagaluega o Soifua Maloloina i Samoa faatasi ma le Matagaluega o Aoaoga, Taaloga ma Aganuu.

E ono mafai foi e nisi faalapotopotoga e patino lava i mataupu tau-le-soifua maloloina ma gaoioga o le tino, ona latou maua ni kopi pe afai e talosagaina.

- O taunuuga foi o lenei ripoti o le a faaaogaina tau lava o le auga o lenei iloiloga ae lē o ni ala su'e tupe pe faapisinisi foi.
- O le a tuuina atu lava foi le avanoa i le aufaisao e toe siaki ma iloilo ai faamaumauga tusia o le a pueina e uiga i lo latou sao.
- O le lipine uma o faatalanoaga o le a pueina o le a teumaluina mo le 5 tausaga, a maea ona faaleagaina loa lea.
- Afai lava o le a iai pea se popolega o le a tulai mai ona faafesootai mai lea faamolemole o le fai suesuega po o le supavaisa/taitai.

Clark Tuagalu

Toni Bruce

E tusa ai ma faavae o taofi o lo o taua i luga, ua ou malie atoatoa out te auai i lenei iloiloga

Saini_____

Aso_____

TAIALA O FAATALATALANOAGA MA FESILI

Gasologa o le Sailiga

a) Faailoa lou tagata, faailoa autu o le iloiloga ma faamatala pe faapefea ua fetaui lelei ma le kulupu autu.
b) Faamatala le taatiaga o faamatalaga natia po o le lē faailoaina ma tuuavanoa I le aufaisao e fai ai a latou fesili ma tulai ese loa i lea taimi pe afai ua lē fia auai.
c) Tufa pepa o Maliega
d) Faamatala tulaga o le faatalatalanoaga o le a pueina ma faaola ki loa le laau
e) Faaaoga ni faailo o suafa.
f) Amata loa le faatalatalanoaga i le fesili muamua.

Auga o Fesili

1. O le a le uiga o lenei mea o le gaoioiga o le tino ia te oe?
    a. O le a sa oe lava faamatalaina o lenei mea ole gaioiga o le tino?
2. O le a sou iloa i lenei mea o le soifua maloloina?
3. E i ai se sootaga o le gaoioiga o le tino ma le soifua maloloina?
4. O le a se tele /aofaiga o gaoioiga o le tino e te faatinoina?
5. O le a se malosi o lau gaoioi pe a fua i isi tagata e te iloiaina?
6. Aisea e te taofi ai o oe e le vaivai pe malosi atu foil au gaoioi i isi tagata e te iloa?
7. O le a se tele po o le malosi o le gaioi o lou tino i aso fai soo?
8. (a) E te ausia le malosi faatulagaina i le aso? (E te iloa e fia le malosi faatulagaina?)
   (b) O le tele o tagata i lenei suesuega latou te manatu ua lava ma totoe gaoioiga o o latou tino. E te silafia e sa'o le a tulaga pe a faatusa i tupulaga?
9. O a ituaiga galuega e te faatinoina i totonu o le Iunivesite po o fafo atu foi e te manatu o gaoioiga o le tino?
   (a) E i ai se eseesega mai mea ia na e faia ao e i ai i Aoga maulalo?
10. O a ituaiga galuega e te manatu o gaoioiga ia o le tino?
11. o a ituaiga feau e te faia i aso taitasi e manaomia ai le gaoioi o lou tino?
12. Sa e maua se aoaoga e uiga i gaoioiga o le tino ma le soifua malolina i aoga?
13. O ai na aupito sili ona aafia ai le maualuga o gaoioiga o lou tino e te faatinoina?
14. O lea se gaoioiga o lou tino e sili ona e manatua?
15. O a ni mea na a'a fia ai gaoioiga o lou taumafai e faagaioi lou tino?
   (a) Ae a tagata na mafua ai ona e sui?
16. O le a se mea na e fiafia ai e faagaoioioi lou tino?
17. O lea se mea s e le fiafia ai e faagaoioioi o lou tino?
18. O a ni mea o loo taofia oe mai le gaoioi o lou tino?
   (a) faataitaiga i le suesuga o le o taua ai e nisi tagata, o taifau feai na mafua ai ona fefefe e gaoioi i fafo. O se faafitauli lea mea ia te oe?
   (b) (Faaauau i nisi vaega anoa na lagā i taunuuga o le suesuega)
19. O a ituaiga mea ua faafaigofie ai ia te oe ona gaoioi lou tino?
   (a) O mea faamalositino/meafaigaluega; fautuaga a au uo
   (b) (Manatunatu i mea ua uma ona talanoaina i lenei suesuega)

20. Fa’amata a e talosagaina le Malo mo le faia o se mea se tasi ina ia faafaigofie ai ona faagaoioi lou tino, o le ā lea mea?

Fesili e ono fa’aopopo:

21. A fua i isi tagata e te iloa, o le ā sou maloloina o iai?
22. Aisea e te manatu ai e te maloloina atu nai lo isi tagata?
23. O a mea ete manatu e maloloina ma talafeagai?
24. O a mea e te manatu e lē maloloina ma lē talafeagai?
25. O ai na aupito sili ona tele lona sao i vaega e aafia ai lou soifua maloloina?

*Appendix G t-*Test *Results*

Perceptions about health

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
Health	**16-17 years**	304	3.6612	.96147	.05514
	18-24 years	122	3.7459	1.03302	.09353

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Health	**Equal variances assumed**	.146	.702	-.805	424	.421	-.08472	.10529	-.29167	.12224
	Equal variances not assumed			-.780	209.637	.436	-.08472	.10857	-.29875	.12932

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Health	**Male**	148	3.7973	.99632	.08190
	Female	275	3.6291	.97443	.05876

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Health	**Equal variances assumed**	.130	.719	1.680	421	.094	.16821	.10012	-.02860	.36501
	Equal variances not assumed			1.669	295.319	.096	.16821	.10080	-.03016	.36658

I get enough physical activity to keep me healthy

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
I get enough	**16-17 years**	305	3.8361	1.02566	.05873
	18-24 years	122	3.8934	1.05083	.09514

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
I get enough	**Equal variances assumed**	.124	.725	-.519	425	.604	-.05738	.11065	-.27486	.16011
	Equal variances not assumed			-.513	218.178	.608	-.05738	.11181	-.27773	.16298

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
I get enough	**Male**	146	3.8836	1.05380	.08721
	Female	278	3.8345	1.02740	.06162

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
I get enough	**Equal variances assumed**	.271	.603	.463	422	.644	.04903	.10594	-.15921	.25727
	Equal variances not assumed			.459	288.295	.646	.04903	.10678	-.16115	.25921

I like to be physically active on my own rather than in a group

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
On my own	16-17 years	308	3.3084	1.28598	.07328
	18-24 years	124	3.3710	1.29707	.11648

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
On my own	Equal variances assumed	.063	.803	-.456	430	.649	-.06253	.13711	-.33201	.20696
	Equal variances not assumed			-.454	225.467	.650	-.06253	.13761	-.33370	.20864

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
On my own	Male	148	3.1959	1.29183	.10619
	Female	281	3.3950	1.27777	.07623

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
On my own	Equal variances assumed	.666	.415	-1.528	427	.127	-.19907	.13027	-.45512	.05698
	Equal variances not assumed			-1.523	296.231	.129	-.19907	.13071	-.45632	.05817

I'm more physically active than other people my age

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
More active	**16-17 years**	305	2.8230	1.05512	.06042
	18-24 years	121	2.8760	1.11483	.10135

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
More active	**Equal variances assumed**	.275	.600	-.461	424	.645	-.05308	.11521	-.27954	.17338
	Equal variances not assumed			-.450	209.975	.653	-.05308	.11799	-.28568	.17951

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
More active	**Male**	147	2.9116	1.07222	.08844
	Female	276	2.7971	1.07304	.06459

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
More active	**Equal variances assumed**	.471	.493	1.045	421	.297	.11446	.10954	-.10084	.32977
	Equal variances not assumed			1.045	298.247	.297	.11446	.10951	-.10105	.32997

I'm so busy at work/school that I'm too tired to be physically active when I get home

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
Busy	**16-17 years**	310	3.4839	1.34552	.07642
	18-24 years	125	3.1760	1.28304	.11476

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Busy	**Equal variances assumed**	.434	.510	2.188	433	.029	.30787	.14070	.03134	.58440
	Equal variances not assumed			2.233	239.463	.026	.30787	.13788	.03627	.57947

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Busy	**Male**	149	3.2685	1.30296	.10674
	Female	282	3.4752	1.33968	.07978

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Busy	**Equal variances assumed**	.263	.608	-1.538	429	.125	-.20672	.13441	-.47091	.05747
	Equal variances not assumed			-1.551	308.773	.122	-.20672	.13326	-.46894	.05549

I get enough physical activity according to the recommended guidelines of 30 minutes a day

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
30 minutes daily	**16-17 years**	307	3.2020	1.07782	.06151
	18-24 years	125	3.1920	1.18931	.10637

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
30 minutes daily	**Equal variances assumed**	4.409	.036	.084	430	.933	.00995	.11789	-.22176	.24167
	Equal variances not assumed			.081	211.228	.936	.00995	.12288	-.23227	.25218

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
30 minutes daily	**Male**	149	3.2416	1.14874	.09411
	Female	280	3.1786	1.08603	.06490

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
30 minutes daily	**Equal variances assumed**	1.013	.315	.561	427	.575	.06304	.11237	-.15783	.28391
	Equal variances not assumed			.551	287.738	.582	.06304	.11432	-.16197	.28805

People who are not physically active are at risk of health problems

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
Risk	**16-17 years**	310	4.0484	1.25962	.07154
	18-24 years	125	4.3040	1.02567	.09174

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Risk	**Equal variances assumed**	5.982	.015	-2.015	433	.045	-.25561	.12686	-.50494	-.00628
	Equal variances not assumed			-2.197	279.239	.029	-.25561	.11634	-.48462	-.02660

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Risk	**Male**	150	3.9933	1.33360	.10889
	Female	282	4.1809	1.12522	.06701

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Risk	**Equal variances assumed**	6.164	.013	-1.544	430	.123	-.18752	.12142	-.42618	.05114
	Equal variances not assumed			-1.467	263.198	.144	-.18752	.12785	-.43926	.06423

Being physically active is important in my life

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
Important	**16-17 years**	310	4.4968	.84282	.04787
	18-24 years	124	4.6129	.74035	.06649

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Important	**Equal variances assumed**	2.660	.104	-1.341	432	.181	-.11613	.08659	-.28633	.05407
	Equal variances not assumed			-1.417	256.173	.158	-.11613	.08193	-.27746	.04520

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Important	**Male**	151	4.4702	.94381	.07681
	Female	280	4.5607	.74045	.04425

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Important	**Equal variances assumed**	4.411	.036	-1.097	429	.273	-.09052	.08252	-.25271	.07168
	Equal variances not assumed			-1.021	251.225	.308	-.09052	.08864	-.26509	.08406

Weight ratings

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
Weight	**16-17 years**	310	3.2419	.76926	.04369
	18-24 years	124	3.1210	.84192	.07561

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Weight	**Equal variances assumed**	.049	.826	1.440	432	.151	.12097	.08401	-.04415	.28608
	Equal variances not assumed			1.385	209.563	.167	.12097	.08732	-.05118	.29311

Are you trying to gain or lose weight?

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
Weight	**16-17 years**	310	2.1710	.63332	.03597
	18-24 years	124	2.1210	.69367	.06229

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Weight	**Equal variances assumed**	.929	.336	.723	432	.470	.05000	.06918	-.08597	.18597
	Equal variances not assumed			.695	209.429	.488	.05000	.07193	-.09181	.19181

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Weight	**Male**	236	2.1314	.67455	.04391
	Female	543	2.2007	.62115	.02666

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Weight	Equal variances assumed	.545	.461	-1.395	777	.163	-.06938	.04973	-.16699	.02823
	Equal variances not assumed			-1.351	415.654	.178	-.06938	.05137	-.17035	.03159

Walking at a quick pace

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
Walking	**16-17 years**	311	4.9453	2.15382	.12213
	18-24 years	124	5.1613	2.18787	.19648

Independent Samples Test

		Levene's Test for Equality of Variances		**t-test for Equality of Means**						
									95% Confidence Interval of the Difference	
		F	**Sig.**	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**Upper**	**Lower**
Walking	**Equal variances assumed**	.001	.979	-.940	433	.348	-.21595	.22978	-.66758	.23568
	Equal variances not assumed			-.933	223.196	.352	-.21595	.23134	-.67185	.23994

Group Statistics

	Gender	**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**
Walking	**Male**	150	5.3600	2.06368	.16850
	Female	282	4.8121	2.20242	.13115

Independent Samples Test

		Levene's Test for Equality of Variances		**t-test for Equality of Means**						
									95% Confidence Interval of the Difference	
		F	**Sig.**	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**Upper**	**Lower**
Walking	**Equal variances assumed**	3.075	.080	2.516	430	.012	.54794	.21782	.11982	.97606
	Equal variances not assumed			2.566	321.632	.011	.54794	.21352	.12786	.96803

Hard physical Activity

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
Hard physical activity	**16-17 years**	310	3.5065	2.11902	.12035
	18-24 years	125	3.6720	2.24246	.20057

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Hard physical activity	**Equal variances assumed**	.631	.427	-.725	433	.469	-.16555	.22834	-.61433	.28324
	Equal variances not assumed			-.708	218.026	.480	-.16555	.23391	-.62656	.29547

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Hard physical activity	**Male**	151	4.5033	2.02936	.16515
	Female	281	3.0142	2.03008	.12110

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Hard physical activity	**Equal variances assumed**	1.540	.215	7.270	430	.000	1.48908	.20481	1.08651	1.89164
	Equal variances not assumed			7.271	307.122	.000	1.48908	.20479	1.08610	1.89205

Thirty minutes of easy to hard exercise

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
30 minutes	**16-17 years**	313	4.1661	2.29503	.12972
	18-24 years	122	3.8934	2.04821	.18544

Independent Samples Test

	Levene's Test for Equality of Variances		t-test for Equality of Means					
								95% Confidence Interval of the Difference
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	

									Upper	Lower
30 minutes	Equal variances assumed	3.907	.049	1.146	433	.252	.27269	.23788	-.19486	.74024
	Equal variances not assumed			1.205	245.597	.229	.27269	.22631	-.17306	.71844

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
30 minutes	Male	150	4.0600	2.17129	.17729
	Female	282	4.0922	2.26186	.13469

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
30 minutes	Equal variances assumed	.182	.670	-.143	430	.887	-.03220	.22545	-.47532	.41092
	Equal variances not assumed			-.145	315.003	.885	-.03220	.22265	-.47026	.40587

Less, same or more physically active

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
Less, same or more physically active	16-17 years	307	2.4137	.64287	.03669
	18-24 years	124	2.5081	.63112	.05668

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Less, same or more physically active	Equal variances assumed	.217	.642	-1.387	429	.166	-.09438	.06805	-.22813	.03936
	Equal variances not assumed			-1.398	231.365	.163	-.09438	.06752	-.22741	.03864

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Less, same or more physically active	Male	237	2.4768	.66103	.04294
	Female	535	2.4430	.63602	.02750

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Less, same or physically active	Equal variances assumed	.531	.467	.673	770	.501	.03380	.05023	-.06481	.13241
	Equal variances not assumed			.663	436.792	.508	.03380	.05099	-.06641	

I have family responsibilities

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
Family	16-17 years	309	2.1650	.68987	.03925
	18-24 years	125	2.1360	.65185	.05830

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Family	Equal variances assumed	1.842	.175	.403	432	.687	.02905	.07199	-.11245	.17055
	Equal variances not assumed			.413	241.837	.680	.02905	.07028	-.10939	.16749

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Family	Male	150	2.1933	.67254	.05491
	Female	282	2.1383	.68436	.04075

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Family	Equal variances assumed	.067	.796	.801	430	.424	.05504	.06875	-.08009	.19016

	Equal variances not assumed	.805	308.681	.422	.05504	.06838	-.07952	.18959

I have too much housework to do

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
Housework	**16-17 years**	306	1.9739	.77203	.04413
	18-24 years	123	2.0081	.71856	.06479

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Housework	**Equal variances assumed**	2.936	.087	-.424	427	.672	-.03427	.08083	-.19316	.12461
	Equal variances not assumed			-.437	240.753	.662	-.03427	.07839	-.18870	.12015

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Housework	**Male**	149	1.9396	.76431	.06261
	Female	278	2.0072	.75521	.04529

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
House work	**Equal variances assumed**	.480	.489	-.878	425	.381	-.06760	.07700	-.21895	.08375
	Equal variances not assumed			-.875	299.589	.382	-.06760	.07728	-.21968	.08448

I get bored quickly

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
Bored	**16-17 years**	305	1.9672	.76449	.04377
	18-24 years	124	1.9516	.78455	.07046

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Bored	**Equal variances assumed**	.430	.512	.190	427	.849	.01560	.08204	-.14566	.17686
	Equal variances not assumed			.188	222.856	.851	.01560	.08295	-.14786	.17906

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Bored	**Male**	148	1.9662	.75065	.06170
	Female	280	1.9607	.78189	.04673

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Bored	**Equal variances assumed**	1.079	.299	.070	426	.944	.00550	.07838	-.14856	.15956
	Equal variances not assumed			.071	310.198	.943	.00550	.07740	-.14679	.15780

Church restrictions

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
Church	**16-17 years**	308	2.1006	.88026	.05016
	18-24 years	123	2.2114	.85173	.07680

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Church	**Equal variances assumed**	.393	.531	-1.190	429	.235	-.11073	.09304	-.29359	.07213
	Equal variances not assumed			-1.207	231.535	.229	-.11073	.09173	-.29146	.06999

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Church	**Male**	149	2.1745	.86783	.07110
	Female	281	2.1103	.87746	.05234

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Church	**Equal variances assumed**	.016	.898	.724	428	.469	.06418	.08859	-.10994	.23830
	Equal variances not assumed			.727	304.629	.468	.06418	.08829	-.10955	.23791

I worry about my safety

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
Safety	**16-17 years**	308	1.9805	.82289	.04689
	18-24 years	124	1.9355	.80387	.07219

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Safety	**Equal variances assumed**	.128	.721	.518	430	.605	.04504	.08694	-.12585	.21592
	Equal variances not assumed			.523	232.119	.601	.04504	.08608	-.12456	.21464

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Safety	**Male**	151	1.7483	.77648	.06319
	Female	280	2.0857	.81637	.04879

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Safety	**Equal variances assumed**	.041	.840	-4.163	429	.000	-.33737	.08104	-.49665	-.17809
	Equal variances not assumed			-4.226	320.844	.000	-.33737	.07983	-.49443	-.18031

Physical activity takes too much effort

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
Too much effort	**16-17 years**	307	1.8404	.74355	.04244
	18-24 years	123	1.8211	.74693	.06735

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Too much effort	**Equal variances assumed**	.042	.839	.242	428	.809	.01925	.07945	-.13691	.17541
	Equal variances not assumed			.242	224.028	.809	.01925	.07960	-.13762	.17612

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Too much effort	**Male**	148	1.8243	.77122	.06339
	Female	280	1.8429	.73100	.04369

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Too much effort	**Equal variances assumed**	1.767	.184	-.245	426	.807	-.01853	.07573	-.16737	.13031
	Equal variances not assumed			-.241	285.805	.810	-.01853	.07699	-.17007	.13300

It's too hard to stick to a physical activity programme

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
Too hard	**16-17 years**	306	1.7549	.71200	.04070
	18-24 years	123	1.9675	.74586	.06725

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Too hard	**Equal variances assumed**	1.132	.288	-2.758	427	.006	-.21258	.07706	-.36405	-.06110
	Equal variances not assumed			-2.704	216.144	.007	-.21258	.07861	-.36752	-.05764

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Too hard	**Male**	147	1.7075	.74218	.06121
	Female	280	1.8714	.71685	.04284

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Too hard	**Equal variances assumed**	3.982	.047	-2.218	425	.027	-.16395	.07391	-.30922	-.01867
	Equal variances not assumed			-2.194	287.898	.029	-.16395	.07472	-.31100	-.01689

Roads are not well maintained

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
Roads	**16-17 years**	310	1.9516	.85194	.04839
	18-24 years	124	1.8871	.82845	.07440

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Roads	**Equal variances assumed**	.226	.635	.718	432	.473	.06452	.08982	-.11202	.24106
	Equal variances not assumed			.727	232.507	.468	.06452	.08875	-.11034	.23937

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Roads	**Male**	150	1.8000	.85922	.07015
	Female	281	2.0107	.83016	.04952

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Roads	**Equal variances assumed**	4.211	.041	-2.479	429	.014	-.21068	.08498	-.37770	-.04365
	Equal variances not assumed			-2.453	295.456	.015	-.21068	.08587	-.37968	-.04167

Curfew restrictions

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
Curfew restrictions	**16-17 years**	307	1.8078	.82775	.04724
	18-24 years	123	1.7886	.81232	.07324

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Curfew restrictions	**Equal variances assumed**	.218	.641	.219	428	.827	.01920	.08786	-.15350	.19190
	Equal variances not assumed			.220	228.831	.826	.01920	.08716	-.15254	.19094

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Curfew restrictions	**Male**	148	1.7297	.79620	.06545
	Female	280	1.8429	.83620	.04997

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Curfew restrictions	**Equal variances assumed**	.638	.425	-1.353	426	.177	-.11313	.08360	-.27745	.05119
	Equal variances not assumed			-1.374	312.420	.170	-.11313	.08234	-.27515	.04889

Facilities are too hard to get to

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
Facilities	**16-17 years**	306	1.7320	.78097	.04465
	18-24 years	124	1.6855	.74754	.06713

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Upper	Lower
Facilities	**Equal variances assumed**	.659	.417	.567	428	.571	.04654	.08213	-.11489	.20797
	Equal variances not assumed			.577	237.156	.564	.04654	.08062	-.11228	.20537

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Facilities	**Male**	149	1.7114	.76490	.06266
	Female	279	1.7204	.77319	.04629

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Upper	Lower
Facilities	**Equal variances assumed**	.062	.804	-.115	426	.908	-.00902	.07816	-.16265	.14461
	Equal variances not assumed			-.116	305.209	.908	-.00902	.07791	-.16232	.14428

Physical activity is too uncomfortable for me

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
Do you find physical activity too uncomfortable?	**16-17 years**	303	1.6436	.69412	.03988
	18-24 years	123	1.6504	.72410	.06529

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Uncomfortable	**Equal variances assumed**	.552	.458	-.091	424	.927	-.00684	.07515	-.15455	.14086
	Equal variances not assumed			-.089	217.753	.929	-.00684	.07650	-.15763	.14394

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Uncomfortable	**Male**	148	1.6419	.71913	.05911
	Female	277	1.6498	.69426	.04171

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Uncomfortable	**Equal variances assumed**	.497	.481	-.111	423	.912	-.00793	.07158	-.14862	.13277
	Equal variances not assumed			-.110	291.377	.913	-.00793	.07235	-.15032	.13446

I dislike sweating

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
Sweating	**16-17 years**	302	1.6523	.74373	.04280
	18-24 years	123	1.7398	.81821	.07378

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Sweating	**Equal variances assumed**	3.599	.059	-1.068	423	.286	-.08752	.08193	-.24856	.07352
	Equal variances not assumed			-1.026	208.361	.306	-.08752	.08529	-.25566	.08062

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Sweating	**Male**	145	1.6690	.73650	.06116
	Female	278	1.6871	.78288	.04695

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Sweating	**Equal variances assumed**	1.801	.180	-.230	421	.818	-.01808	.07860	-.17259	.13642
	Equal variances not assumed			-.235	308.113	.815	-.01808	.07711	-.16981	.13364

Lack of footpaths

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
Footpaths	**16-17 years**	302	1.7152	.82629	.04755
	18-24 years	124	1.7823	.83189	.07471

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Footpaths	**Equal variances assumed**	.011	.916	-.759	424	.448	-.06703	.08830	-.24059	.10654
	Equal variances not assumed			-.757	227.575	.450	-.06703	.08855	-.24152	.10746

Group Statistics

	Gender	N	Mean	Std. Deviation	Std. Error Mean
Footpaths	**Male**	144	1.5208	.72872	.06073
	Female	280	1.8429	.85736	.05124

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
Footpaths	**Equal variances assumed**	11.719	.001	-3.848	422	.000	-.32202	.08368	-.48651	-.15754
	Equal variances not assumed			-4.053	332.663	.000	-.32202	.07945	-.47832	-.16573

Physical activity is important

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
I'm less busy at school	**16-17 years**	314	.1433	.35095	.01981
	18-24 years	125	.1840	.38904	.03480
I'm less busy at work	**16-17 years**	314	.0637	.24460	.01380
	18-24 years	125	.1520	.36047	.03224
I've just joined a gym	**16-17 years**	313	.1246	.33079	.01870
	18-24 years	125	.1920	.39546	.03537
I've started playing a new sport	**16-17 years**	314	.3280	.47024	.02654
	18-24 years	125	.3120	.46517	.04161
I enjoy it	**16-17 years**	313	.6070	.48919	.02765
	18-24 years	125	.6800	.46835	.04189
To control my weight	**16-17 years**	314	.5573	.49750	.02808
	18-24 years	125	.6000	.49187	.04399
To get fitter	**16-17 years**	314	.7261	.44666	.02521
	18-24 years	125	.7760	.41860	.03744
To have more energy	**16-17 years**	314	.6943	.46145	.02604
	18-24 years	125	.7920	.40751	.03645
To have more spare time	**16-17 years**	313	.2524	.43508	.02459
	18-24 years	125	.2640	.44257	.03958
To improve my health	**16-17 years**	314	.8408	.36648	.02068
	18-24 years	125	.9040	.29578	.02646
To live longer	**16-17 years**	314	.6497	.47783	.02697
	18-24 years	125	.7360	.44257	.03958
To lose weight	**16-17 years**	313	.6390	.48107	.02719
	18-24 years	125	.6400	.48193	.04311
To meet new people	**16-17 years**	314	.4490	.49819	.02811
	18-24 years	125	.4960	.50200	.04490
To relax	**16-17 years**	313	.4888	.50068	.02830
	18-24 years	125	.5840	.49488	.04426
To spend time with friends	**16-17 years**	313	.4601	.49920	.02822
	18-24 years	125	.5280	.50122	.04483
To look better	**16-17 years**	312	.6218	.48572	.02750
	18-24 years	125	.6560	.47695	.04266
I do not know	**16-17 years**	314	.0223	.14787	.00834
	18-24 years	125	.0000	.00000	.00000

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Upper	Lower
I'm less busy at school	**Equal variances assumed**	4.318	.038	-1.062	437	.289	-.04069	.03830	-.11597	.03459
	Equal variances not assumed			-1.016	208.676	.311	-.04069	.04004	-.11962	.03824
I'm less	**Equal**	33.977	.000	-2.957	437	.003	-.08831	.02986	-.14699	-.02962

busy at work	**variances assumed**									
	Equal variances not assumed			-2.518	171.343	.013	-.08831	.03507	-.15753	-.01908
I've just joined a gym	**Equal variances assumed**	12.424	.000	-1.818	436	.070	-.06740	.03707	-.14027	.00547
	Equal variances not assumed			-1.685	196.873	.094	-.06740	.04001	-.14630	.01150
I've started playing a new sport	**Equal variances assumed**	.434	.510	.323	437	.747	.01603	.04958	-.08142	.11347
	Equal variances not assumed			.325	230.311	.746	.01603	.04935	-.08121	.11326
I enjoy it	**Equal variances assumed**	9.838	.002	-1.427	436	.154	-.07297	.05114	-.17349	.02754
	Equal variances not assumed			-1.454	237.660	.147	-.07297	.05019	-.17185	.02591
To control my weight	**Equal variances assumed**	3.176	.075	-.814	437	.416	-.04268	.05245	-.14575	.06040
	Equal variances not assumed			-.818	230.423	.414	-.04268	.05219	-.14550	.06015
To get fitter	**Equal variances assumed**	5.057	.025	-1.075	437	.283	-.04989	.04642	-.14111	.04134
	Equal variances not assumed			-1.105	242.172	.270	-.04989	.04514	-.13879	.03902
To have more energy	**Equal variances assumed**	20.661	.000	-2.068	437	.039	-.09773	.04725	-.19060	-.00486
	Equal variances not assumed			-2.182	256.432	.030	-.09773	.04480	-.18595	-.00952
Have more spare time	**Equal variances assumed**	.247	.620	-.251	436	.802	-.01160	.04626	-.10253	.07932
	Equal variances not assumed			-.249	224.876	.804	-.01160	.04660	-.10344	.08023
To improve my health	**Equal variances assumed**	13.028	.000	-1.719	437	.086	-.06324	.03679	-.13555	.00907
	Equal variances not assumed			-1.883	280.392	.061	-.06324	.03358	-.12934	.00286
To live longer	**Equal variances assumed**	14.660	.000	-1.744	437	.082	-.08632	.04950	-.18362	.01098
	Equal variances not assumed			-1.802	244.893	.073	-.08632	.04790	-.18066	.00802

To lose weight	**Equal variances assumed**	.002	.968	-.020	436	.984	-.00102	.05093	-.10111	.09907
	Equal variances not assumed			-.020	227.974	.984	-.00102	.05097	-.10145	.09940
To meet new people	**Equal variances assumed**	1.287	.257	-.889	437	.374	-.04696	.05280	-.15073	.05682
	Equal variances not assumed			-.886	226.503	.376	-.04696	.05298	-.15134	.05743
To relax	**Equal variances assumed**	8.350	.004	-1.803	436	.072	-.09518	.05280	-.19896	.00859
	Equal variances not assumed			-1.812	230.771	.071	-.09518	.05254	-.19870	.00833
To spend time with friends	**Equal variances assumed**	.173	.678	-1.285	436	.200	-.06794	.05288	-.17187	.03599
	Equal variances not assumed			-1.283	227.513	.201	-.06794	.05297	-.17231	.03644
To look better	**Equal variances assumed**	1.975	.161	-.669	435	.504	-.03421	.05115	-.13474	.06633
	Equal variances not assumed			-.674	232.451	.501	-.03421	.05075	-.13420	.06579
I do not know	**Equal variances assumed**	11.884	.001	1.684	437	.093	.02229	.01324	-.00372	.04831
	Equal variances not assumed			2.671	313.000	.008	.02229	.00834	.00587	.03871

Group Statistics

	Gender	**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**
I'm less busy at school	**Male**	152	.2171	.41364	.03355
	Female	283	.1201	.32570	.01936
I'm less busy at work	**Male**	152	.1382	.34621	.02808
	Female	283	.0636	.24448	.01453
I've just joined a gym	**Male**	152	.2171	.41364	.03355
	Female	282	.1064	.30888	.01839
I've started playing a new sport	**Male**	152	.3618	.48212	.03911
	Female	283	.3074	.46224	.02748
I enjoy it	**Male**	152	.5855	.49426	.04009
	Female	282	.6560	.47588	.02834
To control my weight	**Male**	152	.5592	.49812	.04040
	Female	283	.5760	.49507	.02943
To get fitter	**Male**	152	.6645	.47374	.03842
	Female	283	.7809	.41436	.02463
To have more energy	**Male**	152	.6908	.46370	.03761
	Female	283	.7420	.43828	.02605
Have more spare time	**Male**	152	.2171	.41364	.03355

	Female	282	.2766	.44811	.02668
To improve my health	**Male**	152	.8158	.38894	.03155
	Female	283	.8869	.31724	.01886
To live longer	**Male**	152	.6118	.48894	.03966
	Female	283	.7102	.45445	.02701
To lose weight	**Male**	151	.5430	.49980	.04067
	Female	283	.6890	.46370	.02756
To meet new people	**Male**	152	.4474	.49887	.04046
	Female	283	.4770	.50036	.02974
To relax	**Male**	152	.5000	.50165	.04069
	Female	282	.5248	.50027	.02979
To spend time with friends	**Male**	152	.4408	.49812	.04040
	Female	282	.5035	.50088	.02983
To look better	**Male**	152	.5724	.49637	.04026
	Female	281	.6655	.47266	.02820
I do not know	**Male**	152	.0329	.17895	.01451
	Female	283	.0071	.08392	.00499

Independent Samples Test

		Levene's Test for Equality of Variances		**t-test for Equality of Means**						
									95% Confidence Interval of the Difference	
		F	**Sig.**	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**Upper**	**Lower**
I'm less busy at school	**Equal variances assumed**	27.698	.000	2.687	433	.007	.09696	.03608	.02604	.16788
	Equal variances not assumed			2.503	253.275	.013	.09696	.03874	.02068	.17325
I'm less busy at work	**Equal variances assumed**	27.179	.000	2.609	433	.009	.07455	.02857	.01840	.13071
	Equal variances not assumed			2.358	233.740	.019	.07455	.03162	.01226	.13685
I've just joined a gym	**Equal variances assumed**	38.480	.000	3.152	432	.002	.11072	.03513	.04168	.17976
	Equal variances not assumed			2.894	243.583	.004	.11072	.03826	.03536	.18609
I've started playing a new sport	**Equal variances assumed**	4.776	.029	1.153	433	.249	.05442	.04719	-.03833	.14717
	Equal variances not assumed			1.139	298.014	.256	.05442	.04779	-.03963	.14848
I enjoy it	**Equal variances assumed**	6.803	.009	-1.452	432	.147	-.07050	.04854	-.16590	.02490
	Equal variances not assumed			-1.436	299.425	.152	-.07050	.04909	-.16712	.02611
To control	**Equal**	.415	.520	-.336	433	.737	-.01676	.04989	-.11482	.08130

my weight	**variances assumed**									
	Equal variances not assumed			-.335	307.395	.738	-.01676	.04998	-.11512	.08159
To get fitter	**Equal variances assumed**	24.311	.000	-2.656	433	.008	-.11645	.04384	-.20262	-.03027
	Equal variances not assumed			-2.551	275.664	.011	-.11645	.04564	-.20630	-.02659
To have more energy	**Equal variances assumed**	4.839	.028	-1.140	433	.255	-.05126	.04498	-.13967	.03715
	Equal variances not assumed			-1.120	294.385	.263	-.05126	.04575	-.14130	.03878
To have more spare time	**Equal variances assumed**	7.926	.005	-1.355	432	.176	-.05949	.04391	-.14579	.02681
	Equal variances not assumed			-1.388	331.239	.166	-.05949	.04287	-.14382	.02484
To improve my health	**Equal variances assumed**	16.393	.000	-2.057	433	.040	-.07114	.03459	-.13912	-.00316
	Equal variances not assumed			-1.935	260.395	.054	-.07114	.03675	-.14351	.00124
To live longer	**Equal variances assumed**	14.215	.000	-2.096	433	.037	-.09841	.04694	-.19066	-.00615
	Equal variances not assumed			-2.051	290.184	.041	-.09841	.04799	-.19285	-.00396
To lose weight	**Equal variances assumed**	21.838	.000	-3.040	432	.003	-.14600	.04803	-.24039	-.05161
	Equal variances not assumed			-2.971	287.200	.003	-.14600	.04913	-.24271	-.04929
To meet new people	**Equal variances assumed**	1.523	.218	-.590	433	.555	-.02966	.05026	-.12846	.06913
	Equal variances not assumed			-.591	309.826	.555	-.02966	.05022	-.12848	.06915
To relax	**Equal variances assumed**	.374	.541	-.493	432	.623	-.02482	.05039	-.12386	.07421
	Equal variances not assumed			-.492	308.620	.623	-.02482	.05043	-.12405	.07441
To spend time with friends	**Equal variances assumed**	3.937	.048	-1.248	432	.213	-.06276	.05030	-.16163	.03611
	Equal variances not assumed			-1.250	310.825	.212	-.06276	.05022	-.16157	.03606

To look better	**Equal variances assumed**	10.930	.001	-1.922	431	.055	-.09311	.04844	-.18832	.00210
	Equal variances not assumed			-1.894	296.931	.059	-.09311	.04915	-.18984	.00362
I do not know	**Equal variances assumed**	17.121	.000	2.046	433	.041	.02583	.01262	.00102	.05064
	Equal variances not assumed			1.683	187.376	.094	.02583	.01535	-.00445	.05610

Encouragement to be physically active

Group Statistics

	To which of these age groups do you belong?	N	Mean	Std. Deviation	Std. Error Mean
Church	**16-17 years**	304	2.4803	.94726	.05433
	18-24 years	122	2.4508	.83421	.07553
School	**16-17 years**	302	2.4172	.75026	.04317
	18-24 years	122	2.3934	.74476	.06743
Village	**16-17 years**	305	2.3180	.94964	.05438
	18-24 years	120	2.3917	.97270	.08880
Work	**16-17 years**	247	3.1741	1.14323	.07274
	18-24 years	93	2.8925	1.13695	.11790
Doctor	**16-17 years**	284	2.7042	.89985	.05340
	18-24 years	114	2.7368	.91257	.08547
Friends	**16-17 years**	307	2.4495	.67632	.03860
	18-24 years	122	2.5492	.66931	.06060
Husband/Wife	**16-17 years**	238	3.2521	1.23054	.07976
	18-24 years	81	3.3704	1.08909	.12101
Partner	**16-17 years**	298	2.5772	.93694	.05428
	18-24 years	123	2.6585	.92177	.08311

Independent Samples Test

		Levene's Test for Equality of Variances		**t-test for Equality of Means**						
									95% Confidence Interval of the Difference	
		F	**Sig.**	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**Upper**	**Lower**
Church	**Equal variances assumed**	4.491	.035	.300	424	.764	.02944	.09822	-.16361	.22249
	Equal variances not assumed			.316	251.708	.752	.02944	.09304	-.15379	.21267
School	**Equal variances assumed**	.001	.974	.296	422	.767	.02378	.08032	-.13409	.18164
	Equal variances not assumed			.297	225.324	.767	.02378	.08006	-.13400	.18155
Village	**Equal variances assumed**	.229	.633	-.715	423	.475	-.07363	.10304	-.27616	.12890
	Equal variances			-.707	213.247	.480	-.07363	.10412	-.27887	.13161

	not assumed									
Work	**Equal variances assumed**	.057	.812	2.028	338	.043	.28162	.13888	.00844	.55479
	Equal variances not assumed			2.033	166.362	.044	.28162	.13853	.00811	.55512
Doctor	**Equal variances assumed**	.120	.729	-.326	396	.745	-.03262	.10017	-.22956	.16432
	Equal variances not assumed			-.324	205.897	.747	-.03262	.10078	-.23131	.16607
Friends	**Equal variances assumed**	.103	.748	-1.381	427	.168	-.09967	.07217	-.24152	.04218
	Equal variances not assumed			-1.387	224.501	.167	-.09967	.07185	-.24125	.04191
Husband /Wife	**Equal variances assumed**	4.420	.036	-.768	317	.443	-.11827	.15390	-.42107	.18453
	Equal variances not assumed			-.816	154.758	.416	-.11827	.14493	-.40457	.16803
Partner	**Equal variances assumed**	.160	.689	-.814	419	.416	-.08136	.09994	-.27781	.11510
	Equal variances not assumed			-.820	230.986	.413	-.08136	.09927	-.27694	.11423

Group Statistics

	Gender	**N**	**Mean**	**Std. Deviation**	**Std. Error Mean**
Church	**Male**	144	2.4375	.93658	.07805
	Female	280	2.4964	.90399	.05402
School	**Male**	143	2.4755	.78572	.06571
	Female	279	2.3763	.72837	.04361
Village	**Male**	146	2.4452	.87911	.07276
	Female	276	2.2935	.98945	.05956
Work	**Male**	122	2.9590	1.13106	.10240
	Female	216	3.1667	1.15336	.07848
Doctor	**Male**	135	2.6815	.94357	.08121
	Female	261	2.7356	.88309	.05466
Friends	**Male**	147	2.4626	.73347	.06050
	Female	280	2.4857	.64464	.03852
Husband/Wife	**Male**	112	3.1696	1.22208	.11548
	Female	205	3.3415	1.18425	.08271
Partner	**Male**	145	2.6138	.98732	.08199
	Female	273	2.5861	.90389	.05471

Independent Samples Test

	Levene's Test for Equality of Variances		**t-test for Equality of Means**						
								95% Confidence Interval of the Difference	
	F	**Sig.**	**t**	**df**	**Sig. (2-tailed)**	**Mean Difference**	**Std. Error Difference**	**Upper**	**Lower**

Church	**Equal variances assumed**	.377	.540	-.628	422	.530	-.05893	.09385	-.24339	.12554
	Equal variances not assumed			-.621	279.918	.535	-.05893	.09492	-.24578	.12792
School	**Equal variances assumed**	2.203	.138	1.289	420	.198	.09918	.07695	-.05208	.25044
	Equal variances not assumed			1.258	268.072	.210	.09918	.07886	-.05608	.25444
Village	**Equal variances assumed**	2.810	.094	1.556	420	.120	.15173	.09751	-.03993	.34339
	Equal variances not assumed			1.614	327.015	.108	.15173	.09402	-.03324	.33670
Work	**Equal variances assumed**	.021	.884	-1.601	336	.110	-.20765	.12972	-.46281	.04751
	Equal variances not assumed			-1.610	255.303	.109	-.20765	.12901	-.46172	.04642
Doctor	**Equal variances assumed**	1.280	.259	-.565	394	.572	-.05415	.09585	-.24259	.13429
	Equal variances not assumed			-.553	255.857	.581	-.05415	.09789	-.24693	.13863
Friends	**Equal variances assumed**	4.165	.042	-.336	425	.737	-.02313	.06890	-.15856	.11230
	Equal variances not assumed			-.322	265.574	.747	-.02313	.07172	-.16434	.11808
Husband /Wife	**Equal variances assumed**	1.469	.226	-1.221	315	.223	-.17182	.14073	-.44872	.10508
	Equal variances not assumed			-1.210	222.276	.228	-.17182	.14204	-.45174	.10810
Partner	**Equal variances assumed**	2.094	.149	.289	416	.773	.02771	.09594	-.16087	.21630
	Equal variances not assumed			.281	272.186	.779	.02771	.09857	-.16634	.22176