

TYPE 2 DIABETES INFORMATIONAL POSTER

DEVELOPMENT, IMPLEMENTATION, AND EVALUATION OF A NATIVE HAWAIIAN  
CULTURALLY APPROPRIATE TYPE 2 DIABETES INFORMATIONAL POSTER

DOCTOR OF NURSING PRACTICE

APRIL 15, 2020

By

Saba Kam

This practice inquiry project has been approved for meeting partial requirements for the Doctor  
of Nursing Practice Degree at the University of Hawai'i at Hilo

Advisory Committee:

Diane Van Hoose, Chairperson  
Joyce Norris-Taylor

*Keywords:* Diabetes 2, culturally appropriate, poster

## TABLE OF CONTENTS

List of Abbreviations .....	3
List of Figures .....	4
Abstract .....	5
Acknowledgements .....	6
Chapter One .....	7
Problem Statement .....	7
Primary Research Question .....	8
Goal of the Project .....	8
Purpose of the Project .....	9
Significance of the Study .....	9
Overview of the Planning and Evaluation Framework .....	10
Aims and Objectives .....	11
Conclusion .....	11
Chapter Two .....	13
Literature Review .....	13
Methods of Literature Review .....	13
Results of Literature Review .....	13
Native Hawaiians as a Disparity Group .....	13
Waianae Coast Comprehensive Health Center FQHC .....	14
Utilizing a Culturally Appropriate Approach .....	14
Informational Poster Tools .....	15
Diabetes Guidelines .....	16
Theoretical Framework .....	16
Logic Model Planning and Evaluation Tool .....	18
Conclusion .....	19
Chapter Three .....	21
Project Design, Setting and Participants .....	21
Methodology .....	21
Project Budget .....	23
Project Timeline .....	23
Protection of Human Subjects .....	23
Data Analysis .....	24
Chapter Four .....	26
Data Collection Process .....	26
Results, Objective Presentation of Data .....	28
Chapter Five .....	37
Explanation of How The Framework Guided Outcomes Evaluation .....	37
Discussion of Data Linked to Specific Aim and Objectives .....	37
Outcomes Evaluation .....	40
Implications for Practice .....	40
Project Limitations .....	41
Conclusions and Recommendations .....	42
References .....	43
Appendix A .....	48
Appendix B .....	50
Appendix C .....	52
Appendix D .....	53
Appendix E .....	54
Appendix F .....	55

## LIST OF ABBREVIATIONS

CMS	Centers for Medicare & Medicaid Services
CVD	Cardiovascular Disease
FBG	Fasting Blood Glucose
FQHC	Federally Qualified Health Center
HHS	U.S. Department of Health and Human Services
IRB	Institutional Review Board
MOU	Memorandum of Understanding
PCP	Primary Care Provider
PIP	Practice Inquiry Project
SDKI	Short Diabetes Knowledge Instrument
SRC	Scientific Review Committee
WCCHC	Waianae Coast Comprehensive Health Care Center

## LIST OF FIGURES

Figure 1	Logic Model
Figure 2	Social Cognitive Learning Theory
Graph 1	Poster Viewing Time
Graph 2	Poster Culturally Appropriate / Visually Pleasing?
Graph 3	(Pre-Survey) Normal FBG
Graph 4	(Post-Survey) Normal FBG
Graph 5	(Pre-Survey) Correct Vegetable Portion
Graph 6	(Post-Survey) Correct Vegetable Portion
Graph 7	Exercise Level Intention (Pre- and Post-Survey Comparison)
Graph 8	Perceived Diabetes Complications
Graph 9	Previous Diabetes Diagnosis? (Pre)
Graph 10	Previously Screened for Diabetes? (Pre)
Graph 11	Plan to Make PCP Appt to Screen for Diabetes? (Pre)
Graph 12	Plan to Make PCP Appt to Screen for Diabetes? (Post)
Graph 13	Health Conversations (Pre)
Graph 14	Health Conversations (Post)

## ABSTRACT

Native Hawaiians are disproportionately diagnosed with diabetes and have higher rates of diabetes-related morbidity and mortality compared to the rest of Hawai'i and the United States at large. Waianae Coast Comprehensive Healthcare Center (WCCHC) is a Federally Qualified Healthcare Center (FQHC) in the largest predominantly native Hawaiian community in Hawaii. WCCHC also serves surrounding underserved communities such as Nanakuli, Waiola, Waipahu and Kapolei. Health literacy is low among native Hawaiians in the Waianae and surrounding communities. Previous studies have demonstrated the improved effectiveness of tailoring native Hawaiian and Pacific Islander health initiatives to be culturally relevant. Culturally relevant interventions include aspects such as native and traditional foods, imagery, and language. The purpose of this Practice Inquiry Project (PIP) was to develop a culturally appropriate diabetes informational tool, or poster. The poster was then evaluated to determine if it helped participants gain a better understanding of diabetes recommendations and goals, and to determine if it increased intention for improved diabetes self-care behaviors. The Social Cognitive Learning Theory was instrumental in shaping the expected outcomes of this intervention, because it describes the relationship an individual has with environmental and cognitive factors in predicting behavior. The Logic Model was used as a planning and evaluation tool for this project, and addressed the potential impacts that the results of this project could have. Ultimately, the poster tool was found to be effective in promoting diabetes self-care knowledge and intention towards behavior. Furthermore, participants expressed gratitude that an informational tool was tailored to their traditional foods, culture and language.

### **ACKNOWLEDGEMENTS**

I would acknowledge and thank Dr. Diane Van Hoose for serving as my committee chair and for her kindness, passion, timeliness and responsiveness along this process. Her creative suggestions and valuable feedback were instrumental in shaping the outline and direction of this project. Because of her active engagement I was able to adhere to the proposed timeline. I would like to thank Dr. Joyce-Norris Taylor as the second committee member for her prompt and unerring editing ability and for her valuable feedback that ultimately strengthened the backbone of this project. I would also like to thank Dr. Joan Pagan for giving me the idea for this project during our first doctoral institute. The outstanding doctoral faculty at UH Hilo such as Dr. Dula Pacquiao, Dr. Michelle Chino, Dr. Kay Daub and Dr. Jeanette Ayers-Kawakami also provided the students with invaluable knowledge and practice in regards to leadership, statistics, research and rural health. Melina Rajaei is a Hilo resident familiar with Hawaiian culture and graphic design, and she was instrumental in applying culturally tailored graphic design to the poster. Lastly, I would like to thank my loving husband Justin Kam who watched the children alone many days so that I could focus on completing this project. Mahalo nui loa to everyone who had a hand in this project.

## **Chapter One**

Native Hawaiians are disproportionately diagnosed with type 2 diabetes in relation to the rest of Hawaii, and have exponentially higher rates of obesity and diabetes-related preventable hospitalization (Sentell et al., 2014). In relation to the rest of Hawaii, native Hawaiians have 12.8% higher rates of diabetes overall (Hawai'i State Department of Health Behavioral Risk Factor Surveillance System, 2016). Native Hawaiians who live in the rural community of Waianae are particularly high-risk, as they are impoverished and geographically isolated, with unemployment rates among the highest in the nation (Okihiro et al., 2017). Access to healthy food is scarce and fast food restaurants riddle the main road in Waianae. In 2013, 41% percent of native Hawaiians were obese, and 34% were overweight (Office of Hawaiian Affairs, 2013). Fifty-nine percent of native Hawaiians in Hawaii live in the Waianae community (Hawai'i State Department of Health, 2012).

The WCCHC is a healthcare center that provides comprehensive medical care to the otherwise medically underserved community of Waianae. Forty-three thousand people live in Waianae, and the center has five satellite clinics in surrounding underserved areas. WCCHC qualifies as an FQHC, receiving money in part from grants and federal funding. Most of the clients of WCCHC are uninsured or underinsured (U.S. Department of Health and Human Services. Centers for Medicare & Medicaid Services, 2016). WCCHC has many resources for those diagnosed with diabetes. There are dietary workshops, diabetes counseling, exercise programs, and a free fitness area with fitness classes. The purpose of this project was to develop a culturally appropriate diabetes informational poster, which will be displayed in the exam rooms of a WCCHC clinic for viewing while clients wait to be seen by their providers.

### **Problem Statement**

Health literacy is low in the Waianae community. Residents know little about nutrition, nutritional requirements, and the risk factors for developing type 2 diabetes. They are also ill informed of the sequelae of diabetes if left untreated. Many of the residents of Waianae seek care at the WCCHC or have family members who do. A culturally appropriate diabetes informational

poster hung in exam rooms of WCCHC could help spread knowledge of type 2 diabetes prevention and/or maintenance throughout the community.

**Primary research question.** The question was, “Does viewing an informational type 2 diabetes poster while waiting to be seen in an exam room improve knowledge and motivation for diabetes self-care behaviors?” The poster was viewed while waiting to be seen by a provider, which can be a lengthy process. Would clients be motivated to adjust their lifestyle and follow up with a primary care provider if they had some knowledge of how to screen for diabetes and what the sequelae of the disease are? A pre- and post- survey given before entering the exam room and after the visit was completed determined the effectiveness of this intervention. See Appendices A and B for proposed pre- and post-surveys.

### **Goal of the Project**

The overall goal of this intervention was to increase knowledge and intentions for diabetes self-care behaviors in native Hawaiians living in Waianae, as diabetes is a major contributor of health disparities among this population. The target population is native Hawaiians who seek care at a WCCHC clinic. The intervention was a culturally appropriate diabetes informational poster, incorporating visual and linguistic representations of the culture, along with culturally appropriate interventions. A comparison of diabetes prevention knowledge and understanding was before entering the exam room and afterwards, with a survey. The expected outcome was to increase understanding of diabetes prevention, lifestyle recommendations and sequelae. Clients of WCCHC who viewed the poster would learn how to be screened for diabetes and what actions to take to help prevent type 2 diabetes. They would also have an understanding of what can happen if diabetes is left untreated. Studies show that health education and awareness of consequences is an effective motivator for improving health behavior (Mayén et al., 2016).

The poster would include a diagram depicting lifestyle recommendations, a sensible portion plate including an example of local and Hawaiian foods, healthier starch alternatives, and



resources that WCCHC provides such as primary care, dietary counseling for weight loss and a smoking cessation program. See Appendix D for the proposed poster.

### **Purpose of the Project**

Studies show that health education and awareness of consequences is an effective motivator for improving health behavior (Mayén et al., 2016). The purpose of this intervention was to provide a culturally appropriate informational diabetes poster hung in exam rooms of WCCHC to view while clients were waiting to be seen. A post-intervention survey may be an appropriate way to measure the impact of the intervention. Potential questions to pose in a post-intervention survey are:

After viewing the diabetes information poster in the exam room...

- \*Did the poster motivate you to make an appointment with your PCP to screen for diabetes?
- \*Do you have a better understanding of healthy food options?
- \*Do you have a better understanding of healthy food portions?
- \*Do you have a better understanding of healthy starch options?
- \*Do you have a better understanding of exercise recommendations to prevent diabetes?
- \*Did you gain knowledge about normal blood sugar levels?
- \*Do the consequences of not treating diabetes motivate you to prevent or treat diabetes?
- \*Do you plan to share the knowledge you gained from this poster with friends or family?

If the intervention was found to be effective in a sample size of at least 30, more posters could be printed and hung in more exam rooms across the WCCHC system. By evaluating the effectiveness of the informational poster, other culturally appropriate posters with different educational themes could potentially be developed as well. These posters could be used across the State of Hawaii in various clinics and hospitals, rather than only within the WCCHC system.

### **Significance of the Study**

As a rural area with a large native Hawaiian population, Waianae has many of the same issues as other impoverished areas throughout the country. Twenty-four percent of residents live below the poverty line, and 15% of adults are unemployed (U.S. Census Bureau, 2009-2013).

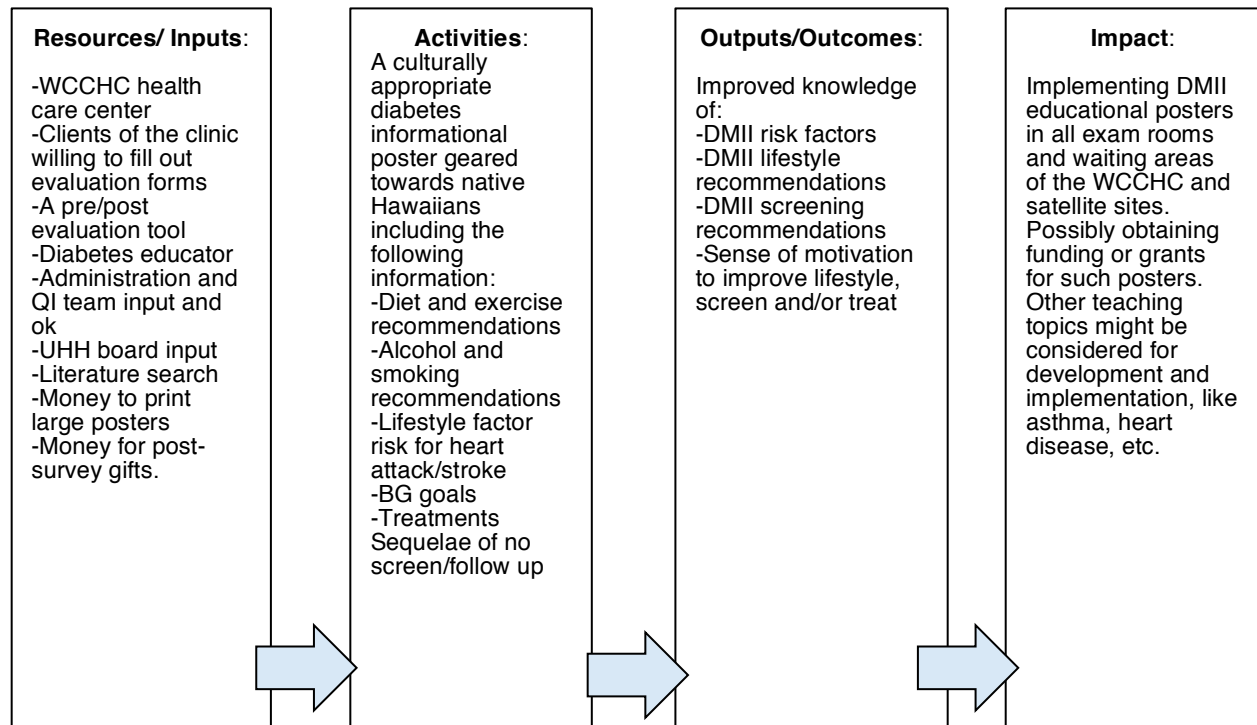
The chronic stress of living in poverty accumulates, causing epigenetic changes, which translate to higher morbidity and mortality over the lifespan (Kaholokula et al., 2018). Native Hawaiians are dealing with an ever-present historical trauma and discrimination from the higher economic classes in Hawaii (Liu & Alameda, 2011). Hawaiians state that access to fresh and affordable produce and lack of social and environmental support are barriers to healthy eating (Fujita, et al., 2004). Many struggle just to feed their families at all. Education in underserved areas is substandard (Boyd & Braun, 2007). Rates of childhood abuse and neglect are staggering, and childhood stress can lead to childhood obesity and other health problems, which can lead to obesity and diabetes in adulthood (Remigio-Baker et al., 2017).

Studies show that education alone can influence one to change health behavior (Sentell et al., 2015). Information provided in a culturally relevant context is more persuasive as residents of the community feel empowered by their culture rather than discriminated against (Oneha et al., 2016). Healthcare providers are in a unique position to be able to reach those seeking healthcare and health knowledge. A culturally appropriate informational type 2 diabetes poster hung in exam rooms of WCCHC would be a resource for all those who seek healthcare at WCCHC. They would be able to determine at-a-glance what they could do to prevent diabetes.

### **Overview of the Planning and Evaluation Framework (Logic Model)**

The Logic Model is a useful framework, which allows individuals to think through a project development and implementation conceptually at various phases (Kaplan & Garrett, 2005). These stages are discussed in more depth later in the paper. The Logic Model as it applies to this project is depicted in Figure 1 below:

Figure 1



### Aims and Objectives

The expected outcome of this informational intervention was to increase understanding of the risk factors for type 2 diabetes, lifestyle recommendations to prevent diabetes, culturally-appropriate healthy food choices, and the potential risks of diabetes. Clients of WCCHC would know how to screen for diabetes and what actions to take to help prevent diabetes. They would have the intention of seeking a primary care provider (PCP) to screen for and/or better manage diabetes, and would also have the intention of making healthier lifestyle choices.

### Conclusion

Native Hawaiians are at risk for diabetes-related health disparities. Those living in rural Waianae are more at risk because of their isolation and impoverished circumstances. Healthcare education is inadequate in primary school and this carries forward in adulthood. Access to healthy food is limited, while convenience foods can be found at every corner. WCCHC is an

FQHC, which provides residents of Waianae with comprehensive medical services, including diabetes-related counseling, dietary and exercise programs, smoking cessation programs, etc. The goal of this intervention was to make diabetes information culturally relevant, concise and easily viewable while clients of WCCHC are waiting to be seen in the exam room. Hopefully this tool would encourage those who haven't been screened for diabetes to make an appointment with a PCP, and those diagnosed with diabetes to adhere to treatment recommendations.

## Chapter Two

### Literature Review

In Hawaii, native Hawaiians have 12.8% higher rates of diabetes in relation to the rest of Hawaii's population (Hawai'i State Department of Health Behavioral Risk Factor Surveillance System, 2016). Diabetes is the fourth leading cause of death among native Hawaiians (King et al., 2012). One contributing factor is weight, as 41% of Hawaiians are obese, and 34% are overweight (Hawai'i State Department of Health, 2013). Native Hawaiians are also most likely to have complications of diabetes including end-stage renal disease and cardiovascular disease (King et al., 2012). A large percent of native Hawaiians in Hawaii live below the poverty line and depend on government-subsidized health insurance like Quest and Medicare (U.S. Department of Health and Human Services, 2017). Community health centers like the WCCHC provide services for the uninsured and underinsured in Hawaii. This health center is funded through grants and federal funds, and qualifies as an FQHC.

### Methods of Literature Review

A review of the literature was conducted through PubMed, with the keywords "native," "Hawaiian," "poverty," "Waianae Coast Comprehensive Health Center," "health literacy," "traditional Hawaiian foods," and "diabetes recommendations OR guidelines." CINAHL database was also searched for the keywords "logic model," "poster AND intervention," "culturally appropriate," "Hawaiian," and "diabetes."

### Results of Literature Review

**Native Hawaiians as a disparity group.** Native Hawaiians have lower per capita income and are more likely to be living below the poverty line than the rest of Hawaii's population (Office of Hawaiian Affairs, 2013). Predominantly native Hawaiian areas like Waianae are particularly impoverished (Okiihiro et al., 2017). We know from the literature that those living in impoverished communities tend to have more daily stress and a high allostatic load, leading to higher morbidity and mortality (Robinette et al., 2016). Additionally, impoverished native Hawaiians have poor health literacy.

Living in an unsafe environment with high crime rates deters physical exercise, and impoverished areas tend to have less access to healthy foods and more access to high-calorie and low-nutrient convenience foods (Cote-Lussier et al., 2015). Native Hawaiians tend to eat a high-calorie diet high in fat and meat, which has been linked to diabetes in minority populations (King et al., 2012). Those living in rural areas tend to be socially isolated, uninsured or underinsured, and have proportionately less access to good health care (Brundisini et al., 2013). Furthermore, native Hawaiians have been subjected to historical trauma (Browne et al., 2014) and may have a genetic predisposition to diabetes, especially those with mixed Asian race (Maskarinec et al., 2016).

**Waianae Coast Comprehensive Health Care FQHC.** Waianae is an impoverished and geographically isolated community. Twenty-four percent of residents live below the poverty line and 15% of adults are unemployed (U.S. Census Bureau, 2009-2013). WCCHC is an FQHC that provides numerous health and wellbeing services for the Waianae community (WCCHC, 2018). Services range from primary care to women's health, pediatrics, urgent care and emergency medicine. There is a gym and fitness program, dietary counseling, diabetes education and support, a smoking cessation program, substance abuse treatment and counseling, a dental clinic, vision care, massage, acupuncture, family planning, teen clinic, pharmacy and a laboratory to name a few ancillary services.

WCCHC accepts most insurances and the majority of clients are either uninsured or on government subsidized insurances like AlohaCare, Quest and Medicaid (Okiihiro et al., 2017). Additionally, the WCCHC system operates satellite clinics in surrounding and equally underserved and isolated communities like Nanakuli, Kapolei and Waipahu. By placing informational diabetes teaching posters in exam rooms of WCCHC, clients could view them while waiting to be seen by a provider and could learn ways to prevent diabetes.

**Utilizing a culturally appropriate approach.** Native Hawaiians are a proud people with a rich and vibrant culture. Recently there has been a resurgence in Hawaii of cultural dance, language, ways of life and values. This follows a history of colonialism and cultural suppression,

including the outlaw of hula and of speaking Hawaiian. Previous studies show the efficacy of approaching diabetes education in Hawaii using culturally appropriate interventions. One study demonstrated that a culturally adapted diabetes intervention was effective in improving glycemic control among native Hawaiians (Sinclair et al., 2013). Another study found that culturally appropriate efforts to promote breastfeeding among native Hawaiians were effective in initiating breastfeeding (Hayes et al., 2014). Interventions that are culturally relevant would be most effective to relay information to the native Hawaiian community.

According to Kaholokula et al. (2018), culturally appropriate interventions should aim at preserving the core elements of the intervention while incorporating culturally relevant elements. This can include poster design elements, and changing the name of the intervention and terms used within the intervention to appeal to the target population. This can also include food and eating examples that are culturally specific, using the native language and metaphors. The article mentioned hula dance as an appropriate form of exercise.

The traditional native Hawaiian diet consisted of mostly poi, which is made of taro root, with other foods seen as supplementary. Meat such as pig was eaten infrequently, and mostly consumed at special occasions. Foods commonly eaten were taro leaves, greens such as fern shoots, seaweed, breadfruit, sweet potato, bananas, fish, and chicken. The traditional way of food preparation was either steaming or serving food raw (Shintani et al., 1991).

**Informational poster tools.** Previous studies have shown posters to be effective and useful prompts for changing health behavior. One study found that a poster intervention promoted the use of stairs rather than the elevator (Kwak et al., 2007). Another study found that posters were effective in increasing hand-washing rates in a hospital (Filion et al., 2011). A third study by Zhu et al. demonstrated the effectiveness of information posters to prevent drowning in drowning hotspots among children of migrant workers (2017). Numerous other studies show that posters hung strategically can influence health behaviors.

Although no specific tool was found with the same questions desired for this pre- and post-survey, a tool called the “Short Diabetes Knowledge Instrument,” (SDKI) has been tested

and found to be effective. Questions from this tool are similar to the questions from this survey, and include knowledge questions such as what foods are mostly starch, which foods contain high levels of fat, and a target blood sugar range (Quandt et al., 2014).

**Diabetes guidelines.** According to Fox et al. (2015), the updated diabetes type 2 guidelines for prevention of cardiovascular disease (CVD) state that the A1C level should be less than 6.5 in people with diabetes to prevent CVD, although a normal A1C level is less than 5.7. An A1C level of 5.7 percent to 6.4 percent is considered pre-diabetes. Individuals within this range are at risk for developing diabetes with micro- and macro-vascular complications in the future. A normal fasting blood sugar is less than 100, and the pre-diabetes range is 100-125. Although A1C level is the new gold standard in diagnosing type 2 diabetes and pre-diabetes, health literacy is poor in impoverished Hawaiian communities such as Waianae (Sentell et al., 2015). Therefore, a fasting blood sugar may be easier to comprehend.

The updated diabetes guidelines by Fox et al. (2015) also addressed dietary recommendations, emphasizing the intake of fruits, vegetables, complex carbohydrates, the reduction of saturated fat, and low-fat dairy products. Calorie intake can range from 1,200 to 1,800 per day, depending on individual weight. The LDL cholesterol level should be aggressively managed in those with type 2 diabetes, initially managed with weight loss, then statin drug therapy. Smoking cessation is encouraged to prevent CVD, and alcohol should be limited to one drink per day for women, and two drinks per day for men. Exercise recommendations include 5-7 days a week for a total of 150 or more minutes total, according to a systematic review by Smith et al. (2016).

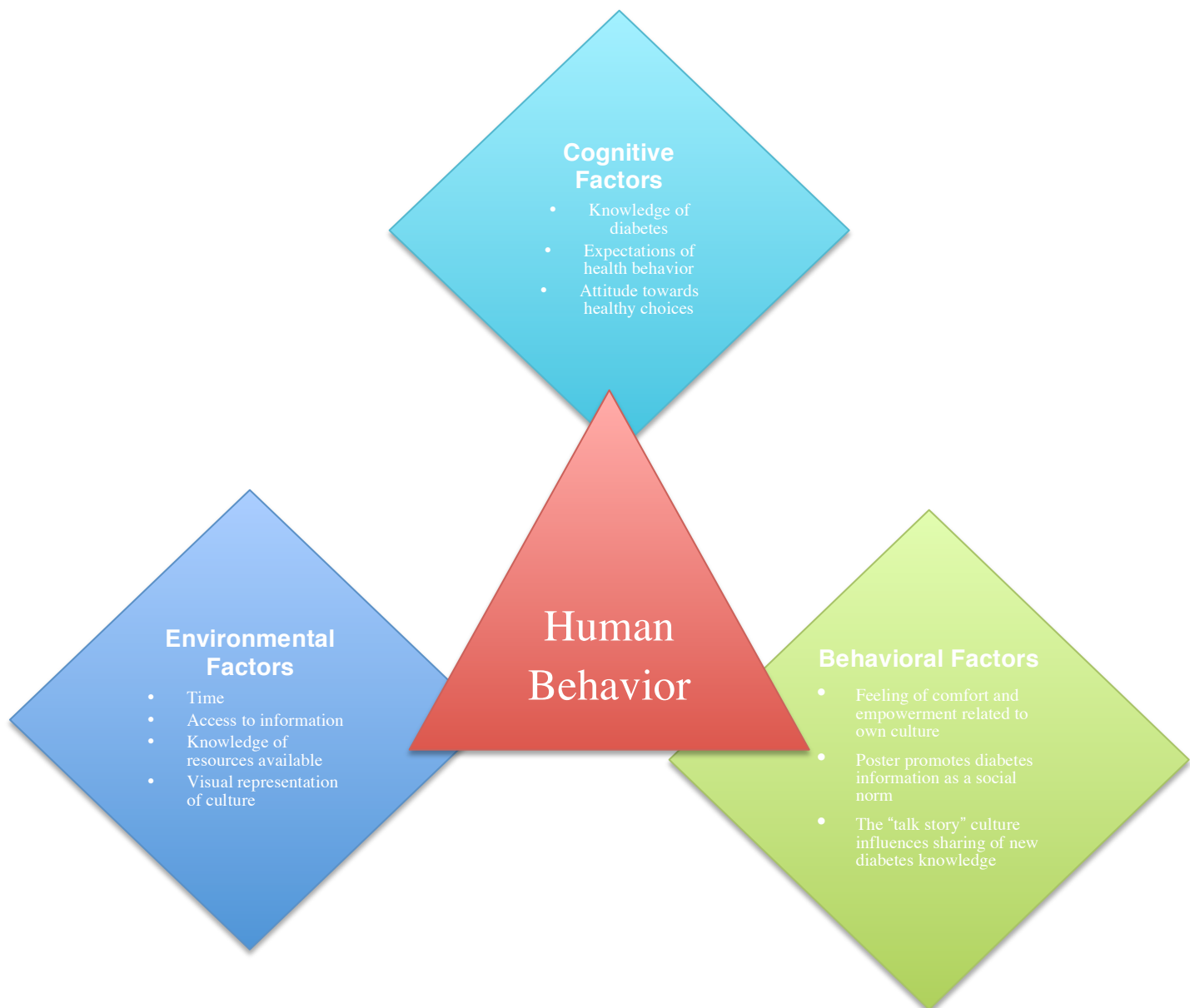
### **Theoretical Framework**

The Social Cognitive Learning Theory (Figure 2) states that individuals learn based on three factors: behavioral, environmental and personal (Sincero, 2019). These factors work together and influence each other. When the person and the environment interact, issues such as beliefs and values, ideas, cognitive competency, support system and stressors are affected. In personal and behavioral interactions, cognitive processes of an individual affect behavior. And



lastly, where the environment and behavior interact, extrinsic factors can influence behavior, such as an informational tool. As this theory is aimed at interactions of a person with the environment and subsequent behavioral changes, it can be applied to this project.

Figure 2



The environmental factors that may influence behavior are time to view pertinent information, access to information in the exam room, information on the poster regarding resources available at the clinic, and a visually pleasing representation of the native Hawaiian culture. Cognitive factors that may influence behavior are an increased knowledge and awareness of diabetes information, the expectations of health behavior listed on the poster, and culturally pleasing suggestions that may improve the attitude towards healthy behaviors. Behavioral factors that may shape future health decisions may include a feeling of comfort and empowerment related to the Hawaiian culture. Additionally, a visual can promote diabetes information as a social norm. Lastly, the “talk story” culture that Hawaiians engage in can influence the sharing and solidifying of newly learned diabetes information.

Therefore, hanging an informational diabetes poster in the exam room, and mentioning resources such as diabetes education classes, dietary counseling, free fitness classes and a smoking cessation program, could potentially motivate clients and lead to changes in behavior. When clients are reminded that they need to screen for diabetes annually and make healthy lifestyle choices, they will be more inclined to do so. When they exchange knowledge and ideas that they learned from the poster with their friends and family, they are all more likely to improve diabetes self-care behaviors.

### **Logic Model Planning and Evaluation Tool**

The Logic Model is a useful framework, which allows one to think through a project development and implementation conceptually at various phases (Kaplan & Garrett, 2005). This model has been successful in development and evaluation of numerous community initiatives (Ebenso et al., 2019). It describes four phases of a project, including resources and inputs needed to implement the project, the activities of the project, outcomes and goals of the project, and the expected impact of the project (Kaplan & Garrett, 2005). The resources and inputs to consider for this project were approval from WCCHC to implement the project there, University of Hawaii at Hilo committee input, IRB approval for the project, developing a measuring tool (e.g. a pre- post-questionnaire), native Hawaiian clients of WCCHC willing to fill out the

questionnaire, money to print large posters, and a focus group to plan the information and layout of the poster.

Activities, or project implementation, involved creating the culturally appropriate type 2 diabetes educational tool, in collaboration with three healthcare and native Hawaiian focus groups. Included were diet and exercise recommendations, lifestyle recommendations regarding smoking and alcohol, normal blood glucose levels, and potential sequelae of diabetes. The poster was presented in a culturally appropriate visual schematic, including an example plate of traditional foods with sensible portions and healthier starch options.

Outcomes and goals of the intervention included improved understanding of lifestyle recommendations, screening, and diabetes sequelae. Clients would hopefully find some motivation to make an appointment with their PCP to screen for diabetes and/or to improve lifestyle risk factors. They would also have an understanding of what can happen if diabetes was left untreated, which was heart attack and stroke.

The expected impact would be that clients who viewed the poster would gain a sense of urgency and motivation to prevent and/or to control their diabetes. If found to be effective, posters could be hung in several exam rooms of many clinics in the WCCHC system. This way those who came through WCCHC, their friends and family would benefit from the information provided. Additionally, other informational posters could be considered, such as those to prevent heart disease and to treat asthma, which are also disproportionate health problems among native Hawaiians.

### **Conclusion**

A review of the literature demonstrated native Hawaiians as a disparity group with disproportionately high rates of, and complications from, diabetes. Waianae is a rather health-illiterate community, so laymen's terms and simple language would be most effective to convey information on a poster. WCCHC is an FQHC that provides comprehensive health care services to the underserved, and largely native Hawaiian, Waianae and surrounding communities. An

intervention conducted at WCCHC would be an effective way to reach native Hawaiians and to provide basic type 2 diabetes information regarding lifestyle recommendations and sequelae. Those who follow up with a primary care provider would learn about an A1C level, whereas the fasting blood sugar is a better-known test for diabetes. Therefore, a normal fasting blood sugar level was a more appropriate information point for the purposes of this project. Culturally appropriate considerations included incorporating native or local terms to convey information, and proposing traditional Hawaiian lifestyle choices such as hula dance and native foods. The Social Cognitive Learning Theory states that individuals learn based on three factors that influence each other: behavioral, environmental and personal (Sincero, 2019). Subsequently, using informational posters as environmental interventions have been shown to influence health behavior. The Logic Model is a theoretical framework that is useful in planning and evaluating interventions, and is used as a guide for this project.

## **Chapter Three**

### **Project Design, Setting and Participants**

This project was conducted at a satellite clinic of WCCHC. An informational diabetes poster was hung in exam rooms for clients to view while waiting to be seen by a provider. The project was to develop this informational diabetes tool, and to determine its efficacy. The focus population was at least 30 native Hawaiian adults, and demographic questions on a survey and a cross-check with the demographic client chart would ensure the correct population was being studied. Sampling was performed by convenience, as those who walked into the clinic that day would be asked to participate based on eligibility. The study design was non-experimental as there is no control group, only the study participants. Inclusion criteria were individuals ages 18 and over, and of native Hawaiian descent. Exclusion criteria were individuals under the age of 18, or with no native Hawaiian descent.

### **Methodology**

According to the Social Cognitive Learning Theory, a person interacts with the environment and as a result, behaviors can be changed or adapted. In this project, the environmental element was the viewing of an informational diabetes poster. This poster would hopefully provide needed information and motivation to be screened for or to better manage existing type 2 diabetes and lifestyle recommendations. The WCCHC clinics provide ample resources for clients to follow up with, such as access to primary care providers, diabetes educators, a dietitian, a free fitness center, and smoking cessation counseling. Although utilization of these additional resources will not be evaluated, the environment at WCCHC provides accessibility, and therefore a favorable environment for changes in behavior to occur.

The information included on the poster was created by this author based on the results of the literature review, suggestions from focus groups including individuals such as the director of the walk-in clinic, a WCCHC diabetes educator, and several native Hawaiian acquaintances. The best graphic flow and design of the poster would be determined by the author, the author's

doctoral chairperson, a focus group comprised of the author, a graphic designer, native Hawaiians with or without diabetes, and a diabetes educator.

**Aim one.** The first aim of this project was to determine if native Hawaiians could relate to the poster.

**Objective one.** One objective was to find out if the poster was culturally appropriate.

**Objective two.** A second objective was to determine if it was visually pleasing.

**Aim two.** The second aim of this project was to determine if native Hawaiians gained knowledge about how to prevent and/or better manage diabetes.

**Objective one.** The first objective was to determine if they gained an understanding what a normal blood sugar level is.

**Objective two.** The second objective was to determine if they gained an understanding of how much their plate should consist of vegetables.

**Objective three.** The third objective was to determine if they gained an understanding of exercise recommendations to avoid heart disease.

**Objective four.** The fourth objective was to determine if they gained an understanding of potential diabetes-related complications.

**Aim three.** The third aim of this project was to determine if the informational poster motivates native Hawaiians to change health behavior.

**Objective one.** One objective was to motivate them to make an appointment with a PCP for diabetes screenings.

**Objective two.** A second objective was to motivate change for healthier lifestyle choices.

A pre- and post-viewing survey would be distributed to participants by this author to measure success of the aims of the project. The surveys would be distributed over a two- to four-week period or until the goal sample size of 30 participants is reached. The approximate timeline for completion of the project was March, 2020. Objectives measured would include understanding of how to screen for diabetes, motivation to screen for diabetes, motivation to better manage existing diabetes, understanding of a normal blood sugar level, and understanding

of diet and exercise recommendations. See Appendices A and B, Diabetes Poster Pre- and Post-Survey. Pre- and post-survey responses would be compared and analyzed to determine the efficacy of the informational poster to meet the aims of the study.

### **Project Budget**

The informational diabetes poster was 16 x 24 inches and cost approximately \$6 for one. Five posters total would be printed at the author's expense for a total of \$30, to be hung in five of the most utilized exam rooms of the clinic. A gift of healthy foods was to be distributed to participants after the survey. This author was to attempt to partner with a Waianae grocery store such as Tamura Super Market, the Waianae Store or Sack N Save and ask them to donate produce and attractive logo bags for each participant. The total cost of travel was around forty dollars. The project was implemented at the clinic in which the researcher works. Therefore, the budget for this project is approximately \$400.

### **Project Timeline**

The researcher got approval for the proposal from committee members in January 2020 and then sought SRC approval. Once SRC approval was obtained, an oral defense of the proposal took place. IRB approval was sought in February of 2020. Once IRB approval was obtained, the posters were developed and printed by the end of March of 2020. During March 2020, the project was implemented. A post-viewing survey was distributed to participants by this author to measure success of the aims of the project. The survey was distributed over a two-month period or until the goal sample size of 30 participants was reached. Data analysis and evaluation of the project took place in March-April of 2020. The oral defense took place in April of 2020. The approximate timeline for completion was April 2020.

### **Protection of Human Subjects**

This project involved minimal risk, with probability and magnitude of physical or psychological harm that is normally encountered in the daily lives, or in the routine medical, dental or psychological examination of healthy persons. Potential harm may have come in the form of increased psychological stress of clients or family members over a possible diagnosis of

diabetes. A vulnerable but appropriate group of participants would be studied and would be representative of those who would benefit from this project. The study population was also representative of the population of the Waianae community at large.

The subjects would not be identified in any way, including name or demographic information. A code would be assigned to each pre- and post-survey in order to keep the surveys coupled. An informed consent would be obtained prior to distributing surveys. This consent would ask participants if they are age 18 or older, are of Hawaiian ancestry, and if they were willing to take a post-visit survey after viewing the informational diabetes poster in the exam room. See Appendix C for the informed consent form. A memorandum of understanding (MOU) from WCCHC has been obtained with UH Hilo prior to proceeding with the implementation of the project. Additionally, an exempt IRB approval for exempt status and a letter of support from the clinic director was sought prior to proceeding.

Some issues with validity may have been that the informed consent coerced clients to view the poster, therefore inaccurately measuring efficacy of the tool. Also, subjects who knew they would be surveyed may have paid more attention or exaggerated answers to fit whatever result they think the surveyor expects. Once the survey was complete, the participants would receive a gift of a healthy foods package, costing about ten dollars each.

### **Data Analysis**

The methods of data analysis were determined upon completion of the surveys. A combination of quantitative and qualitative methods was used to compile the information gathered. At least 30 participants ages 18 and over and of native Hawaiian descent were sought. There was a mix of open-ended, multiple choice and yes/no questions. Open-ended responses were aggregated and grouped together, then coded on an Excel spreadsheet, located on a secure computer. Pre- and post-surveys were numbered in order to keep them coupled together, although no patient identifiers would be used. The surveys were completed following the visit, so that participants could remember what they viewed and their thoughts and attitudes after viewing the poster. Due to the limited sample size of 30, percentages were used in graph format for each



multiple-choice and yes/no question. Qualitative data was grouped according to common themes, in addition to the use of representative quotes.

## **Chapter Four**

### **Data Collection Process**

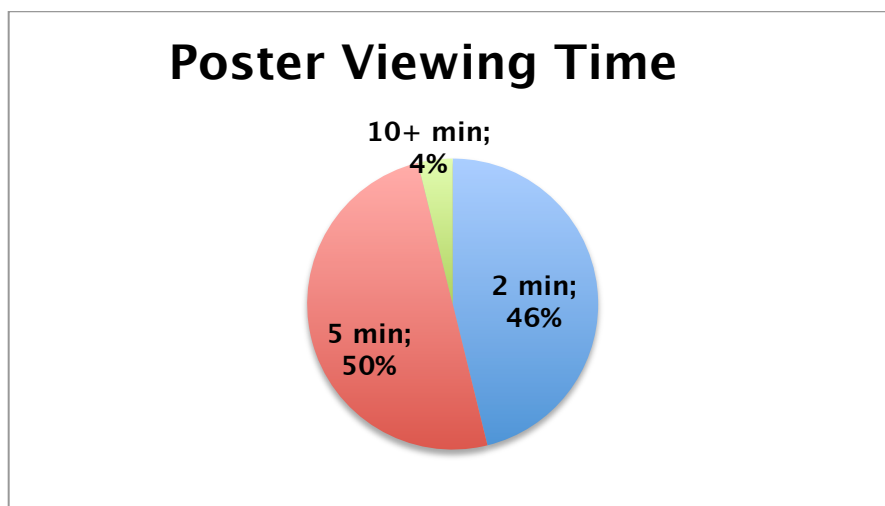
IRB approval for exempt status was granted on March 16, 2020. The researcher ordered five posters total, three for the West Oahu Community Health clinic, and two for the Waiola clinic. Posters were not available to the researcher until March 26, because of shipping delays. Also due to the COVID-19 pandemic, fresh vegetables were in short supply at the grocery store, so in consultation with the committee chairperson, a decision was made to buy grocery store gift cards in the amount of \$10 instead. Sampling was initiated on March 28 and was completed on April 4.

Clients who did not present for ill symptoms amidst the COVID-19 outbreak were asked if they were of native Hawaiian descent and if they were interested in participating in the study while in the triage area. If they responded yes, the demographic information on the chart was verified for confirmation of eligibility to participate. Only native Hawaiian adults were asked to fill out informed consents and pre-surveys in the triage area. Once the consent and pre-survey was complete, the client was taken to the exam room with the diabetes poster to wait for the provider. The provider waited at least a few minutes before entering the room to give the client an opportunity to view the poster. After the visit, the participant was guided into another exam room without the diabetes poster present. The participant was given ample time to finish the post-survey and was informed not to leave without a copy of their informed consent and a gift card to Foodland for participating in the study.

This project was initiated just as the COVID-19 stay-at-home orders for the State of Hawaii was being implemented, so sampling was an issue. Clients were reluctant to leave their homes for a doctor's visit other than to screen for COVID-19. At the time, outpatient clinics

across the State of Hawaii were operating at half-staff. This greatly reduced the amount of native Hawaiian adults that could qualify for the study. Persons Under Investigation for COVID-19 were not given physical survey forms because of the risk of contamination of the researcher's home and personal belongings, and also because these clients were too ill and distracted to participate in a diabetes study. Results of the survey responses were compiled after a total of 26 results were obtained, with guidance on when to stop and compile the data from the committee chairperson.

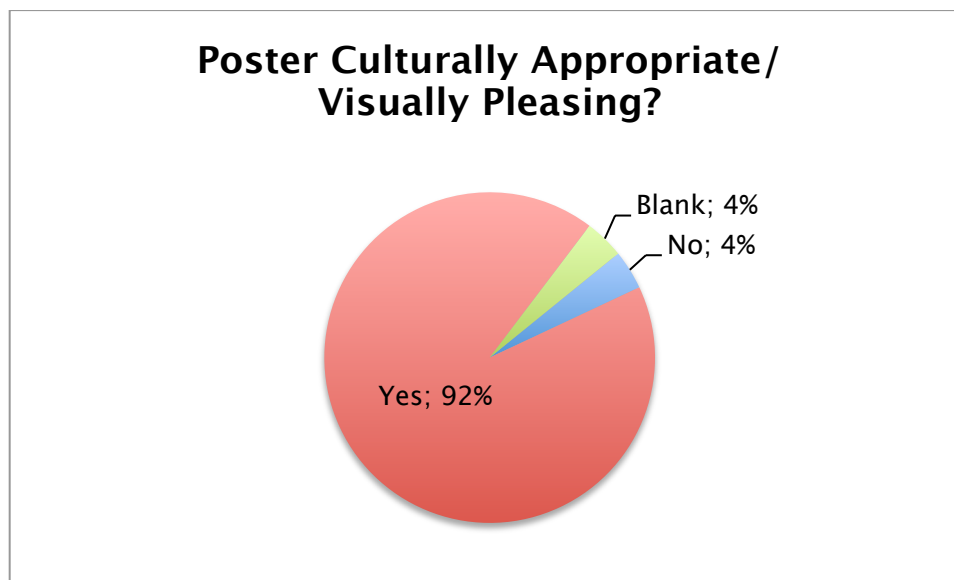
The first question on the post-survey was "How long were you able to view the diabetes poster in the exam room?" The choices were "0 minutes," "2 minutes," "5 minutes," or "10 minutes or more." Fifty percent of participants were able to view the poster for five minutes, forty-six percent for 2 minutes, and one person for ten minutes or more. This particular clinic was a walk-in clinic, and fast-paced. Most participants did not have upwards of ten minutes to view the poster before being seen. However, they were asked if they had sufficient time before being asked to fill out the post-survey. Therefore, the researcher determined that participants had ample viewing time. See Graph 1 below.



Graph 1

### Results, Objective Presentation of Data

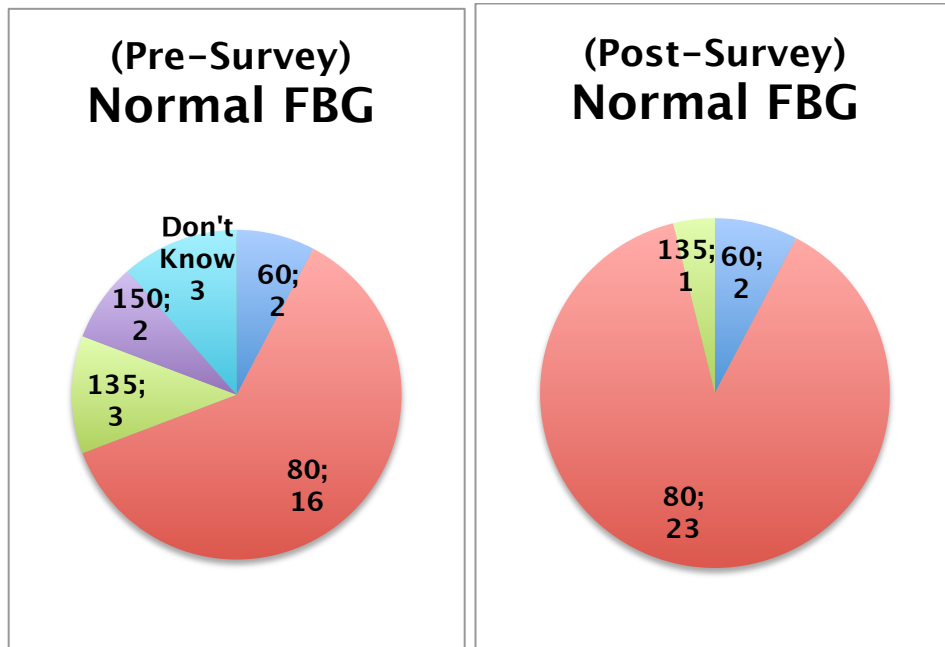
The first aim of this project was to determine if native Hawaiians could relate to the poster. The two objectives of this aim were to establish whether or not the poster was culturally appropriate and if it was visually pleasing. The question in the post-survey was open ended, and asked “Was the poster culturally relevant and/or visually pleasing.” The overwhelming response was “yes,” with the exception of one “no, not visually pleasing.” See Graph 2:



Graph 2

The second aim of the project was to determine if native Hawaiians gained knowledge about how to prevent and/or better manage diabetes after viewing the poster. The first of four objectives of this aim was to ascertain whether or not native Hawaiians gained an understanding what a normal blood sugar level is. The corresponding pre-survey question for this objective was “What is an example of a normal fasting blood sugar level?” The choices were “60,” “80,” “135,” and “150,” with the correct answer being “80.” The same question was asked on the post-survey. Prior to viewing the poster, 62% of participants were able to answer this question

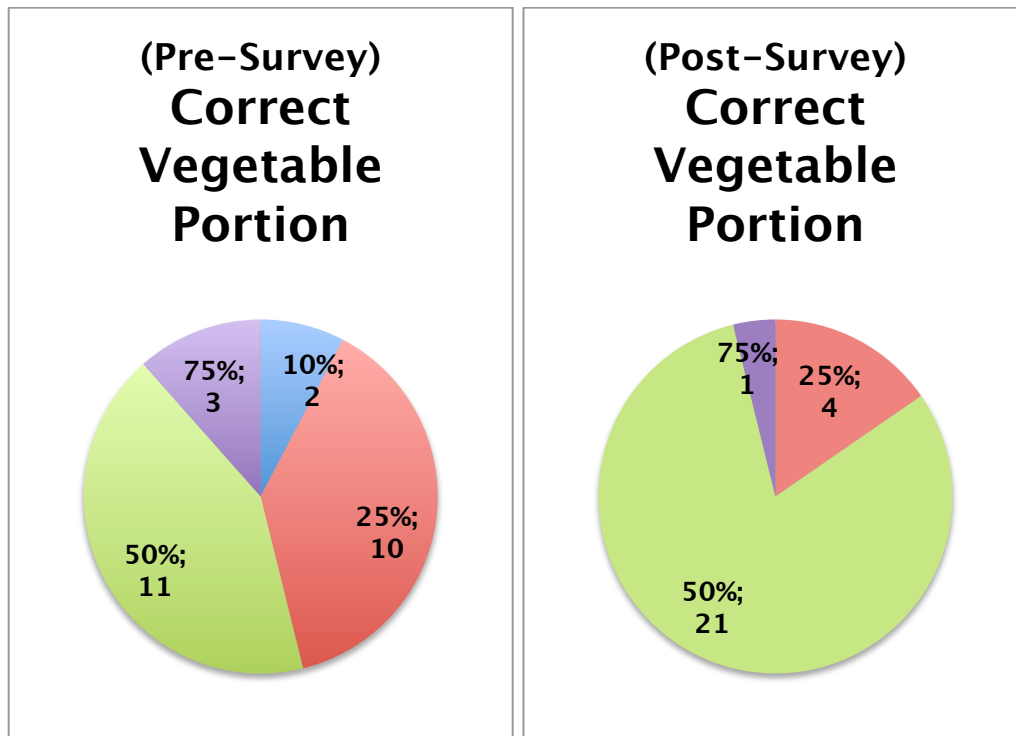
correctly. After viewing the poster, 88% of participants were able to answer correctly. See Graphs 3 and 4 below.



Graph 3

Graph 4

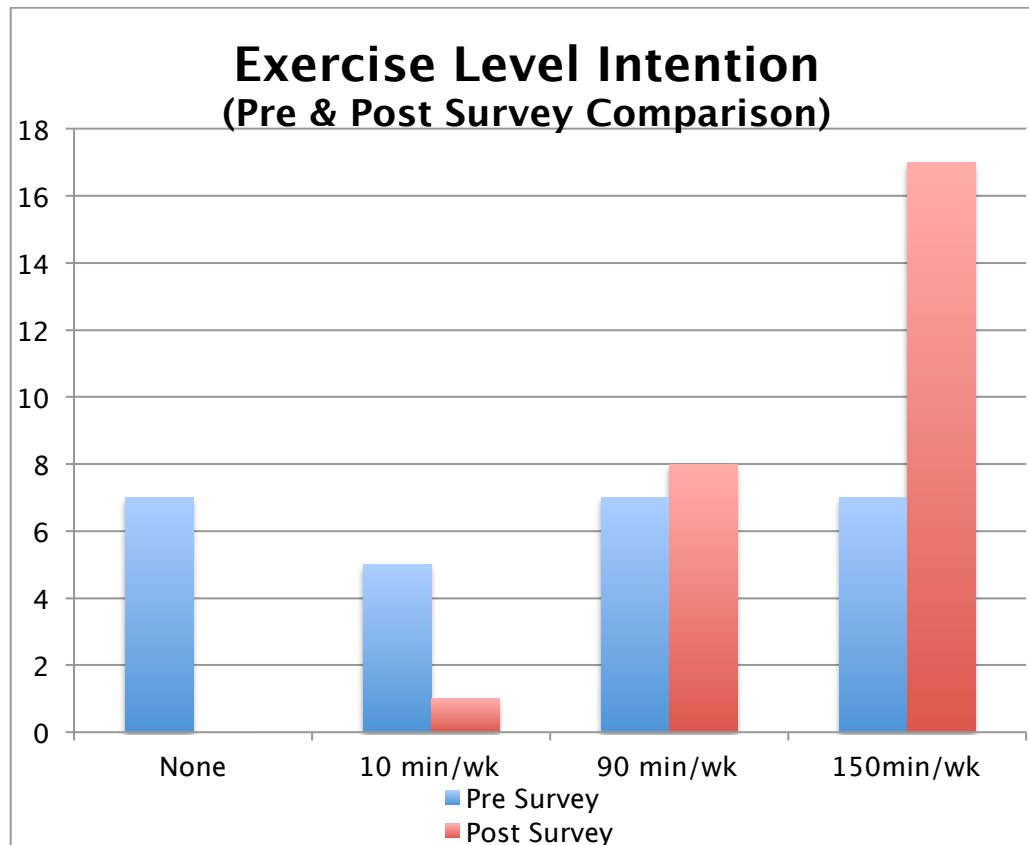
The second objective of this aim was to determine if participants gained an understanding of how much their plate should consist of vegetables. The question on both the pre- and post-surveys for this item was “How much of your food plate should consist of vegetables?” The choices were “10%,” “25%,” “50%,” and “75%,” with “50%” being the correct answer. Before viewing the survey, 42% of participants answered correctly. Afterwards, 81% of participants answered correctly. See Graphs 5 and 6.



Graph 5

Graph 6

The third objective of this aim was to ascertain if native Hawaiians gained an understanding of exercise recommendations in order to avoid heart disease. The pre-survey question that pertained to this objective was “How long do you exercise?” and the post-survey question was “How long do you plan to exercise after viewing the poster?” The answer choices were “None,” “10 minutes once a week,” “30 minutes three times a week,” and “30 minutes 5-7 times a week.” The recommendation from the poster was “30 minutes 5-7 times a week,” because the guidelines state 150 minutes a week is optimal. See Graph 7, showing that only 27% of participants answered correctly and had the intention of exercising per the current guidelines before viewing the poster, whereas 65% answered correctly after viewing the poster. Also of significance the respondents who answered “none” or “10 minutes per week” in the pre-survey were 19%, but only one participant answered “10 minutes per week” in the post-survey (4%). See Graph 7 below, Exercise Level Intention.

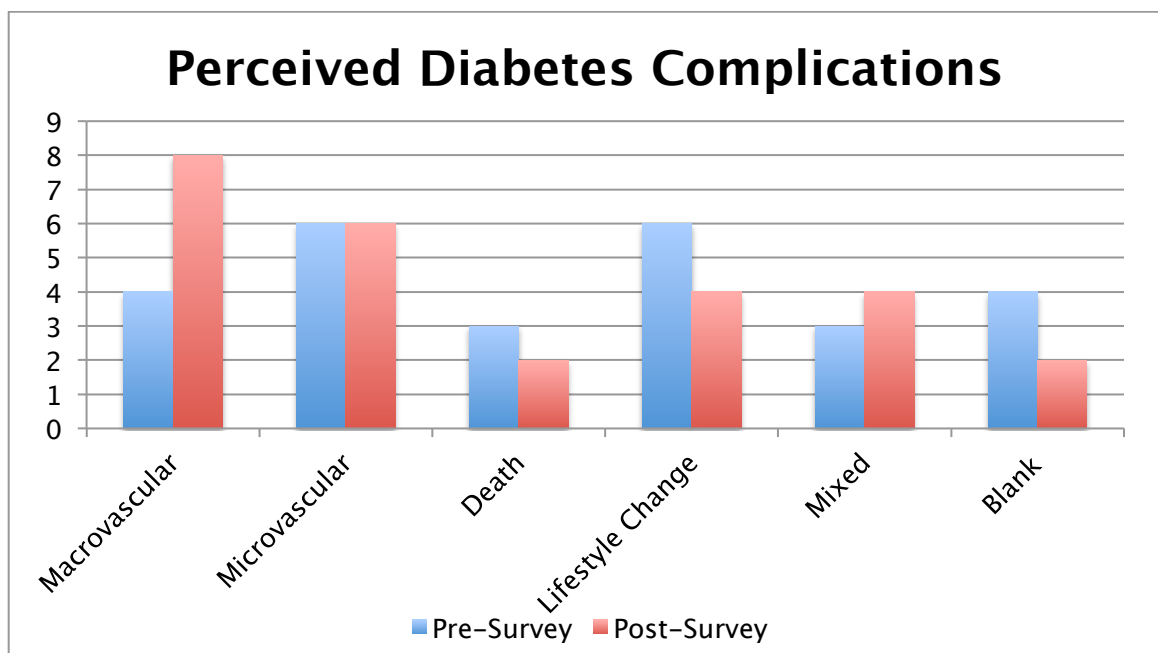


Graph 7

The fourth objective is to determine if they gained an understanding of potential diabetes-related complications. This objective can be evaluated by the pre- and post-survey question “What can happen to you if you have diabetes?” This was an open-ended response rather than multiple choice, and answers were grouped as macrovascular complications, microvascular complications, alteration in lifestyle, death, mixed complications, and don’t know/blank. Examples of the macrovascular complications group were heart problems, heart attack, and stroke. Examples of the microvascular complications group were diabetic neuropathy, bad eyesight/vision problems, kidney problems, blood problems, amputate, hypo/hyperglycemia, “can mess up your organs,” etc. Examples of alterations in lifestyle were changes in diet and exercise, “no candy or soda, no junk food,” referral to a nutritionist, need to monitor blood sugars, need to be on medications, “I probably be in bad shape,” etc. Answers categorized in the

mixed group had any combination of these groups in their answer such as “Worsens if you’re a smoker, drink alcohol. It can lead to multiple health issues stroke, circulation problems, obesity.”

In the pre-survey, 15% were able to list macrovascular complications of diabetes, as opposed to 31% in the post-survey group. Twenty-three percent were able to name microvascular complications as opposed to 26% in the post-survey group. Twenty-three percent listed lifestyle adjustments that would need to be made, as opposed to 15% in the post-survey group. The mixed complications groups were comparable, at 12% for the pre-survey and 15% for the post-survey groups. Twelve percent listed death as a complication as opposed to 4% in the post-survey group. Significantly, 19% did not know or left that question blank in the pre-survey group, as opposed to 4% in the post-survey group. See graph 8 for comparisons.



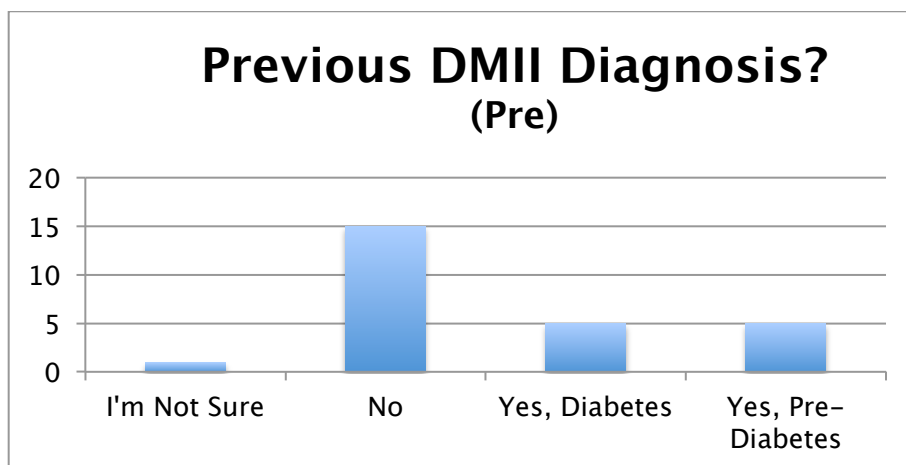
Graph 8

The third aim of this project was to determine if the informational poster motivated native Hawaiians to change health behavior. This aim was specifically targeted at health maintenance through regular doctor visits with a PCP and at lifestyle choices. The correlating pre-survey

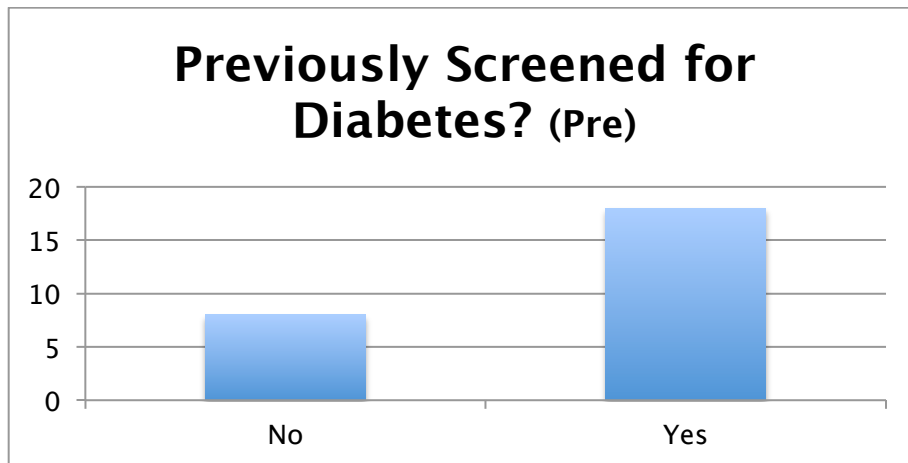


questions for the first objective were “Has a doctor ever told you that you have diabetes?” “Have you ever screened for diabetes with a fasting blood sugar test?” and “Do you have a plan to make a doctor’s appointment to screen for diabetes?” The post-survey question relating to this objective was “Do you plan to make a doctor’s appointment to screen for diabetes after viewing the poster?”

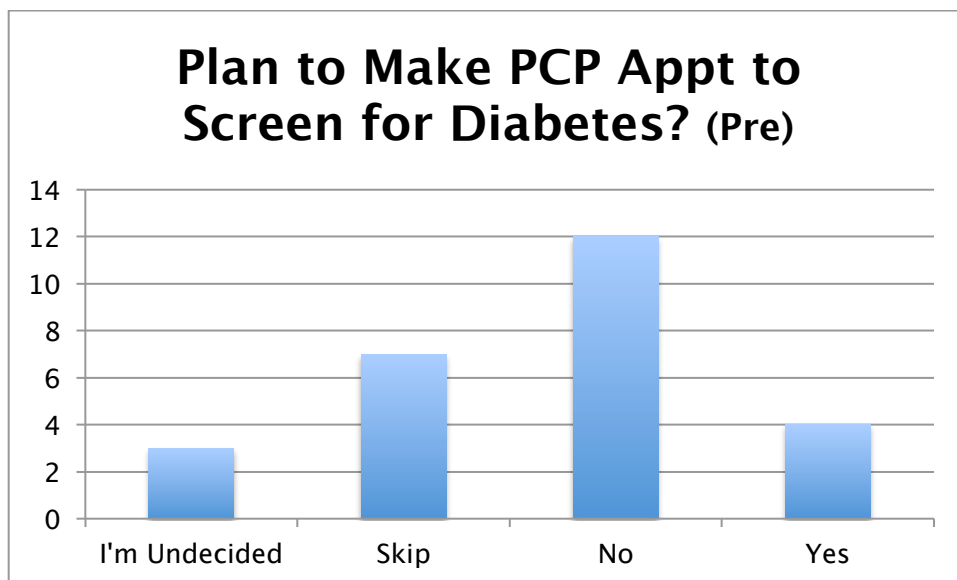
Prior to viewing the poster, 54% of participants were not formally diagnosed with diabetes. Thirty-eight percent stated they were diagnosed with either diabetes or pre-diabetes. One person wasn’t sure. Also in the pre-survey, 69% of participants stated they have been screened for diabetes whereas 31% said they haven’t been screened. Forty-six percent of participants did not have a plan to screen for diabetes prior to viewing the poster, and only 15% did have a plan to screen with a PCP. The remaining 38% were undecided. After viewing the poster, 42% of participants stated they had a plan to make a doctor’s appointment to screen for diabetes (up from 15%), and only 8% still had no intention of making an appointment with a PCP (down from 46%). The other 50% were undecided or left the answer blank. See Graphs 9, 10, 11 and 12 below.



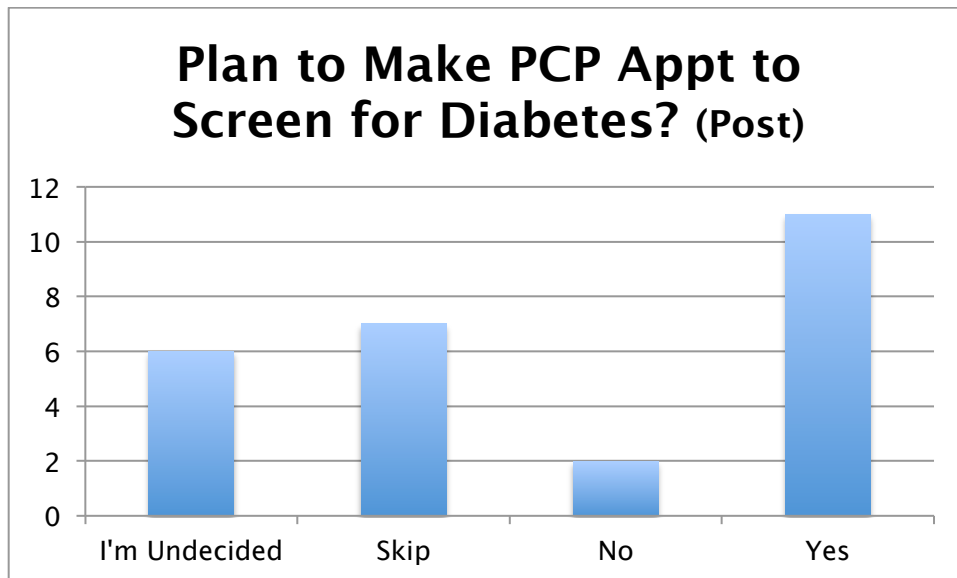
Graph 9



Graph 10



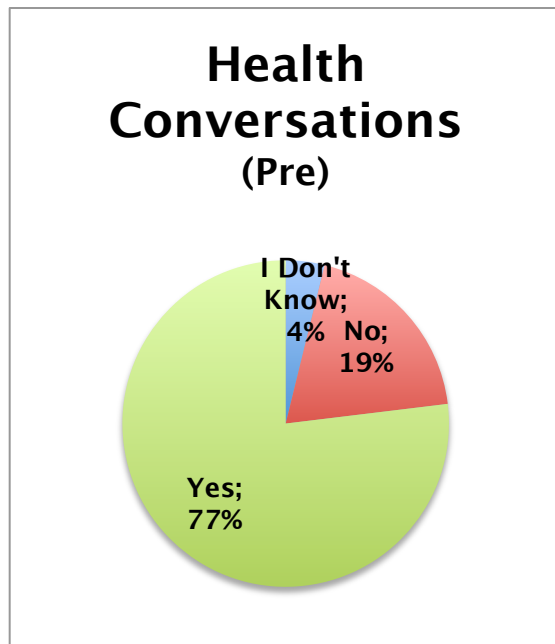
Graph 11



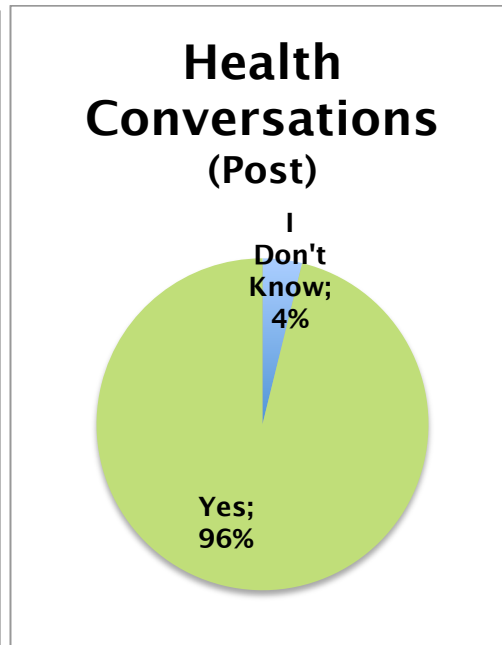
Graph 12

The second objective of this aim is to determine motivation to change towards healthier lifestyle choices. This objective can be measured in comparing several questions in the pre- and post-surveys, including the exercise question and plan to make an appointment with a PCP mentioned previously. Additionally, the pre-survey question “Do you talk to your friends or family about health-related topics” and the post-survey question “Do you plan to share the knowledge you gained from this poster with friends or family?” are pertinent. These aspects of daily life are important in determining motivation to change, because the Social Cognitive Learning Theory states that individuals learn based on behavioral, environmental and personal factors, and these factors influence each other. Talking to loved ones about major health issues is a social and environmental factor that can serve as motivation for behavior change.

Graphs 13 and 14 below demonstrate that prior to viewing the poster, 77% of participants had health conversations with friends or family. After viewing the poster, 96% had the intention of speaking to their friends and family about the contents of the poster, and only one person still wasn't sure.



Graph 13



Graph 14

## **Chapter Five**

### **Explanation of How The Framework Guided Outcomes Evaluation**

The Logic Model framework was used to guide the evaluation of this project. The Logic Model incorporates resources or inputs needed to implement the project, activities that the researcher will carry out to implement the project, outcomes and outputs of the project, and potential impacts after analysis of the project (Kaplan & Garrett, 2005). This chapter will discuss the outcomes and analysis of data compiled, based on previously specified aims and objectives. Impacts of the study will also be discussed.

Outcomes and goals of this intervention included improved understanding of lifestyle recommendations, screening, and sequelae in regards to diabetes in the native Hawaiian population. Clients would hopefully be motivated to make an appointment with their PCP to screen for diabetes and/or to improve lifestyle risk factors. They would also have an understanding of potential consequences of leaving diabetes untreated.

### **Discussion of Data Linked to Specific Aim and Objectives**

The first aim of this project was to determine if native Hawaiians could relate to the poster. The two objectives of this aim were to establish whether or not the poster was culturally appropriate and if it was visually pleasing. The overwhelming response to this question was yes; the poster was culturally appropriate and visually pleasing. Therefore the first aim was met. The one participant who said “no” specified that the poster wasn’t visually pleasing. It is unclear if that participant thought it was culturally relevant or why it wasn’t visually pleasing to that person. These were the individual responses:

“Great poster, I like how it shows percentage of veg, protein, starch, etc.”

“Yes, it was culturally relevant because Hawaiian/Samoan descendants are at higher risk”

“I found the poster very interesting. I didn’t know you could eat those type of food when you’re a diabetic.”

“Yes, culturally appropriate because of the sweet potato”

“Yes, look ono and it good to see Hawaiian food in there”

“Yes. Very clean layout. Straight to the point and highly relatable and easy to understand.”

“Yes, very informational”

“Yes, on relevant about diabetes”

“Yes culturally relevant and yes visually pleasing”

“I loved the poster it was very educational and pleasing”

“Yes, used language of native Hawaiian”

“Yes, I enjoy eating those food recommendations pictured on the poster”

“VERY”

“Yes very good info”

“No, not visually pleasing.”

The second aim of the project was to determine if native Hawaiians gained knowledge about how to prevent and/or better manage diabetes after viewing the poster. The first of four objectives of this aim was to ascertain whether or not native Hawaiians gained an understanding what a normal blood sugar level is. Only 3 people, or 12%, chose an incorrect value for normal blood sugar in the post-survey. This is a 26% improvement from 10 participants, or 38%, who previously did not know or got this item incorrect. The second objective of this aim was to determine if participants gained an understanding of how much their plate should consist of vegetables. The number of participants who answered correctly in the post-survey doubled from 11 to 21, an increase of 40%. The third objective of this aim was to ascertain if native Hawaiians gained an understanding of exercise recommendations in order to avoid heart disease. The

number of participants who answered correctly in the post-survey increased by 10 participants, or 38%.

The fourth objective of this aim was to determine if participants gained an understanding of potential diabetes-related complications. The question asking “What can happen to you if you get diabetes?” was ideal to determine diabetes knowledge before and after viewing the poster. The percentage of participants who understood which macrovascular complications can occur with diabetes doubled from 15% to 31% after viewing the poster, and those who did not know any complications decreased from 19% to only 4% after viewing. Therefore, the poster was effective in relaying this information and the conclusion can be made that the second aim of this project was met.

The third aim of this project was to determine if the informational poster motivated native Hawaiians to change health behavior. The first objective of this aim was to motivate them to make an appointment with a PCP for diabetes screenings. Before viewing the poster, 62% of participants did not have a formal diabetes or pre-diabetes diagnosis. In fact, 31% had never been screened for diabetes. An alarming 85% had no intention of making a PCP appointment to screen for diabetes. After viewing the poster, that number dropped to 58%, an improvement of 27%. This still seems like a small percentage of participants who are planning to get screened even after the intervention. However, the improvement after viewing the poster is comparable to the percentage of participants who had never been screened. Therefore, the conclusion can be made that this objective was successfully met.

The second objective was to motivate change for healthier lifestyle choices. This was evaluated by asking about intention towards exercise, intention to make a PCP appointment as previously discussed, and intention to discuss health topics with family and friends. After viewing the poster, intention to use the recommended exercise guideline of 150 minutes per week improved by 38%. Additionally, those who stated they didn’t exercise at all or exercised 10

minutes per week dropped from 46% to 4%, a significant improvement. Of note, 50% of participants already exercised 90-150 minutes per week according to the pre-survey. In previous discussions with Hawaiians, they tend to enjoy employment that involves the outdoors and hard work. This may be the exercise they are referring to, and if so it is adequate.

In regards to having health conversations with family and friends, native Hawaiians are known to enjoy “talking story.” They have a strong sense of community and strong family ties. The fact that 77% of participants stated they already talked about health issues with their loved ones was not surprising. However, the intention to discuss what they learned from the poster with friends and family was reported at 96%. This is astounding and speaks to the connection the participants felt towards a culturally based source of information. The fact that participants said they appreciated that it “used the language of native Hawaiians” and that the food “look ono and it good to see Hawaiian food in there” and “I enjoy eating those food recommendations pictured on the poster” is a testimony to the importance of culturally relevant interventions.

### **Outcomes Evaluation**

The researcher was able to speak with several participants after the study and gained anecdotal perspectives on the diabetes poster. Participants expressed that they appreciated having an intervention geared towards native Hawaiians, and that they wish there were more information sources that were culturally relevant to them. They also said that they did not know it was okay for diabetics to eat the cultural foods depicted on the poster, and that they were happy to have this knowledge and would share it with friends and family. Several participants mentioned that they have family members with diabetes and that health is a common topic of conversation for native Hawaiians.

### **Implications for Practice**

The impact of this intervention was that clients who viewed the poster gained a sense of urgency and motivation towards diabetes self-care behaviors. They felt empowered to be represented in a visually pleasing way that promoted their traditional foods and way of life, and



are likely to speak to others about diabetes self-care. Posters have been hung in five exam rooms within WCCHC system. Requests were made to make more posters and hang them in common areas for clients to view while in the waiting area or in other exam rooms across the WCCHC system. This way those who come through WCCHC, their friends and family will benefit from the information provided.

This researcher is in the process of making minor edits to the previous poster, such as replacing the word “sponge” with “bodyboard” as several participants did not know what “sponge” meant, even after three focus groups reviewed the poster and made edits. Other edits needed are bigger and darker font in some areas and a more central focus on important information such as lifestyle recommendations. The plan is to make the edits and ask providers across WCCHC health systems if they would like posters for their common areas or exam rooms. The researcher will provide the posters to those who request one.

Furthermore, we know that native Hawaiians are also disproportionately diagnosed with heart disease, cancer, asthma and obesity. These are other topics best conveyed in a culturally relevant manner. There is a need for the development of more informational posters that address these topics, using culturally appropriate angles. This poster can be used across the state and other culturally relevant posters can be created addressing other topics related to health disparity among native Hawaiians.

### **Project Limitations**

Because of the reduction in outpatient clientele due to the COVID-19 situation, other recruitment techniques were used to obtain a closer to optimal study sample size. The medical assistants at the clinic who qualified were asked to participate, as well their family members and native Hawaiians who were recruited from outside the clinic. This is a limitation of the study because one intention of this project was to determine if clients had time to view the poster while waiting to be seen by a provider. Additionally, medical assistants have at least baseline knowledge of healthcare in comparison to the outside community. However, many of the

medical assistants did not know the correct answers to the pre-surveys. Lastly, the sample size of 26 was not optimal, as the goal was 30. However, for the data analysis methods used, this sample size was sufficient to determine whether or not objectives were met.

### **Conclusions and Recommendations**

In comparing the results of the pre-surveys and post-surveys, the intervention was effective to teach and motivate native Hawaiian adults regarding diabetes self-care. Specifically, participants were better able to identify normal a blood sugar level, the current recommendations for exercise time and vegetable portions, and major complications associated with diabetes. They also had increased intention to screen for diabetes with a PCP, and to have conversations about the culturally relevant diabetes recommendations from the poster with their friends and family. Participants expressed appreciation for an intervention tailored to their culture, language and traditional foods. Culturally relevant interventions have been found to be effective in the native Hawaiian and Pacific Islander populations (Kaholohula et al., 2018). Therefore, health interventions for this population should always include cultural elements.

## References

- Boyd, J. K., & Braun, K. L. (2007). Supports for and barriers to healthy living for Native Hawaiian young adults enrolled in community colleges. *Preventing Chronic Disease*, 4(4), A88.
- Browne, C. V., Mokuau, N., Ka'opua, L. S., Kim, B. J., Higuchi, P., & Braun, K. L. (2014). Listening to the voices of Native Hawaiian elders and 'ohana caregivers: discussions on aging, health, and care preferences. *Journal of Cross-Cultural Gerontology*, 29(2), 131-51.
- Brundisini, F., Giacomini, M., DeJean, D., Vanstone, M., Winsor, S., & Smith, A. (2013). Chronic disease patients' experiences with accessing health care in rural and remote areas: a systematic review and qualitative meta-synthesis. *Ontario Health Technology Assessment Series*. 13(15), 1-33.
- Côté-Lussier, C., Fitzpatrick, C., Séguin, L., & Barnett, T. A. (2015). Poor, unsafe, and overweight: the role of feeling unsafe at school in mediating the association among poverty exposure, youth screen time, physical activity, and weight status. *American Journal of Epidemiology*. 182(1), 67-79.
- Ebenso, B., Manzano, A., Uzochukwu, B., Etiaba, E., Huss, R., Ensor, T., Newell, J., Onwujekwe, O., Ezumah, N., Hicks, J., Mirzoev, T. (2019). Dealing with context in logic model development: reflections from a realist evaluation of a community health worker programme in Nigeria. *Evaluation and Program Planning*. 73, 97-110.
- Filion, K., KuKanich, K. S., Chapman, B., Hardigree, M. K., & Powell, D. A. (2011). Observation-based evaluation of hand hygiene practices and the effects of an intervention at a public hospital cafeteria. *American Journal of Infection Control*, 39(6), 464-470.
- Fox, C. S., Golden, S. H., Anderson, C., Bray, G. A., Burke, L. E., de Boer, I. H., Deedwania, P.,

- Eckel, R. H., Ershow, A. G., Frandkin, J., Inzucchi, S. E., Kosiborod, M., Nelson, R. G., Patel, M. J., Pignone, M., Quinn, L., Schauer, P. R., Selvin, E., & Vafiadis, D.K. (2015). American Diabetes Association. Update on prevention of cardiovascular disease in adults with type 2 diabetes mellitus in light of recent evidence: a scientific statement from the American Heart Association and the American Diabetes Association. *Diabetes Care*, 38(9).
- Fujita, R., Braun, K. L., & Hughes, C. K. (2004). The traditional Hawaiian diet: A review of the literature. *Pacific Health Dialog*, 11(2), 250-259.
- Hawai`i State Department of Health. *State of Hawai`i Primary Care Needs Assessment Databook* (2012). Retrieved from <http://health.hawaii.gov/about/files/2013/06/pcna2012databook.pdf>.
- Hawai`i State Department of Health, Behavioral Risk Factor Surveillance System. *Coronary heart disease prevalence, for the State of Hawai`i, for the Year(s) –2011, 2012, 2013, 2014, 2016*. Honolulu, HI: 2016. Retrieved from: [http://hhdw.org/wp-content/uploads/BRFSS\\_Heart-Disease\\_IND\\_00001\\_20111.pdf](http://hhdw.org/wp-content/uploads/BRFSS_Heart-Disease_IND_00001_20111.pdf).
- Hayes, D., Mitchell, K., Donohoe-Mather, C., Zaha, R., Melcher, C., & Fuddy, L. (2014). Predictors of exclusive breastfeeding at least 8 weeks among Asian and Native Hawaiian or other Pacific Islander race subgroups in Hawaii, 2004-2008. *Maternal & Child Health Journal*, 18(5), 1215–1223.
- Kaholokula, J. K., Ing, C. T., Look, M. A., Delafield, R., & Sinclair, K. (2018). Culturally responsive approaches to health promotion for Native Hawaiians and Pacific Islanders. *Annals of Human Biology*, 45(3), 249–263.
- Kaplan, S. A., & Garrett, K. E. (2005). The use of logic models by community-based initiatives. *Evaluation and Program Planning*, 28(2), 167-172.
- King, G. L., McNeely, M. J., Thorpe, L. E., Mau, M. L., Ko, J., Liu, L. L., Sun, A., Hsu, W. C., & Chow, E. A. (2012). Understanding and addressing unique needs of diabetes in Asia

- Americans, native Hawaiians, and Pacific Islanders. *Diabetes care*, 35(5), 1181-8.
- Kwak L, Kremers SPJ, van Baak MA, & Brug J. (2007). A poster-based intervention to promote stair use in blue- and white-collar worksites. *Preventive Medicine*, 45(2/3), 177–181.
- Liu, D. M., & Alameda, C. K. (2011). Social determinants of health for Native Hawaiian children and adolescents. *Hawaii Medical Journal*, 70(11 Suppl 2), 9–14.
- Maskarinec, G., Morimoto, Y., Jacobs, S., Grandinetti, A., Mau, M. K., & Kolonel, L. N. (2016). Ethnic admixture affects diabetes risk in native Hawaiians: the Multiethnic Cohort. *European Journal of Clinical Nutrition*. 70(9), 1022-7.
- Mayén, A.-L., de Mestral, C., Zamora, G., Paccaud, F., Marques-Vidal, P., Bovet, P., & Stringhini, S. (2016). Interventions promoting healthy eating as a tool for reducing social inequalities in diet in low- and middle-income countries: a systematic review. *International Journal for Equity in Health*, 15, 205.
- Office of Hawaiian Affairs (2013). Native Hawaiian Data Book 2013. Retrieved from <http://www.ohadatabook.com>.
- Okihiro, M., Duke, L., Goebert, D., Ampolos, L., Camacho, C., Shanahan, N., Hishinuma, E., & Kaholokula, J.K. (2017). Promoting Optimal Native Outcomes (PONO) by understanding women's stress experiences. *The Journal of Primary Prevention*, 38(1-2), 159–173.
- Oneha, M. F., Dodgson, J. E., DeCambra, M. H., Titcomb, C., Enos, R., & Morimoto-Ching, S. (2016). Connecting culturally and spiritually to healthy eating: A community assessment with Native Hawaiians. *Asian/Pacific Island Nursing Journal*, 1(3), 116–126. <http://doi.org/10.9741/23736658.1023>
- Quandt, S. A., Ip, E. H., Kirk, J. K., Saldana, S., Chen, S., Nguyen, H., & Arcury, T. A. (2014). Assessment of a short diabetes knowledge instrument for older and minority adults. *Diabetes Education*. 40(1), 68-76.
- Remigio-Baker, R. A., Hayes, D. K., & Reyes-Salvail, F. (2017). The relationship of adverse childhood events to smoking, overweight, obesity and binge drinking among women in Hawaii. *Maternal and Child Health Journal*, 21(2), 315–325.

- Robinette, J. W., Charles, S. T., Almeida, D. M., & Gruenewald, T. L. (2016). Neighborhood features and physiological risk: An examination of allostatic load. *Health & Place, 41*, 110-118.
- Sentell, T. L., Juarez, D. T., Ahn, H. J., Tseng, C.-W., Chen, J. J., Salvail, F. R., Miyamura, J., & Mau, M. K. (2014). Disparities in diabetes-related preventable hospitalizations among working-age Native Hawaiians and Asians in Hawai'i. *Hawai'i Journal of Medicine & Public Health, 73*(12 Suppl 3), 8-13.
- Sentell, T., Zhang, W., & Ching, L. K. (2015). Insights in public health: the importance of considering educational inequity and health literacy to understand racial/ethnic health disparities. *Hawai'i Journal of Medicine & Public Health, 74*(7), 244-247.
- Shintani, T. T., Hughes, C. K., Beckham, S., & O'Connor, H. K. (1991). Obesity and cardiovascular risk intervention through the ad libitum feeding of traditional Hawaiian diet. *American Journal of Clinical Nutrition, 53*, 1647S-1651S.
- Sincero, S. M. (2019). Cognitive Learning Theory. Retrieved from <https://explorable.com/cognitive-learning-theory>
- Sinclair, K.I., Makahi, E.K., Shea-Solatorio, C., Yoshimura, S.R., Townsend, C.K., & Kaholokula, J.K. (2013). Outcomes from a diabetes self-management intervention for Native Hawaiians and Pacific People: partners in care. *Annals of Behavioral Medicine, 45*(1), 24-32.
- United States Census Bureau. 5-Year American Community Survey. 2009-2013 Retrieved from [http://factfinder.census.gov/faces/nav/jsf/pages/community\\_facts.xhtml#none](http://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml#none)
- Smith, A. D., Crippa, A., Woodcock, J., & Brage, S. (2016). Physical activity and incident type 2 diabetes mellitus: a systematic review and dose-response meta-analysis of prospective cohort studies. *Diabetologia, 59*(12), 2527-2545.
- United States Census Bureau. 5-Year American Community Survey. 2009-2013 Retrieved from

[http://factfinder.census.gov/faces/nav/jsf/pages/community\\_facts.xhtml#none](http://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml#none)

U.S. Department of Health and Human Services. Centers for Medicare & Medicaid Services,

(2016). *Research, statistics, data & systems*. Retrieved from

<https://www.cms.gov/Research-Statistics-Data-and-Systems/Research-Statistics-Data-and-Systems.html>

U.S. Department of Health and Human Services (2017). *Profile: Native*

*Hawaiians/Pacific Islanders*. Office of Minority Health. Retrieved from

<https://www.minorityhealth.hhs.gov/omh/browse.aspx?lvl=3&lvlid=65>

Waianae Coast Comprehensive Health Center (WCCHC) (2018). Retrieved from

<http://www.wcchc.com/Services>.

Zhu, Y., Feng, X., Li, H., Huang, Y., Chen, J., & Xu, G. (2017). A randomized controlled trial to evaluate the impact of a geo-specific poster compared to a general poster for effecting change in perceived threat and intention to avoid drowning “hotspots” among children of migrant workers: evidence from Ningbo, China. *BMC Public Health*, 17, 1–9.

**Appendix A**

## Informational Diabetes Poster PRE-Survey

Aloha ka kou! Mahalo for agreeing to fill this short pre- and post-visit survey. The purpose of this survey is to determine how to best convey diabetes information to Native Hawaiians. You can stop at any time. Let us know if you have questions. There are many diabetes resources at WCCHC. Please feel free to ask the provider today or your PCP for more information. Thank you for sharing your mana'o!

1. Are you of Native Hawaiian descent? (circle)
  - a. Yes
  - b. No
2. Are 18 years old or older? (circle)
  - a. Yes
  - b. No
3. Has a doctor ever told you that you have diabetes? (circle)
  - a. Yes, Diabetes
  - b. Yes, Pre-diabetes
  - c. No
  - d. I'm not sure

Comments:

4. Have you ever screened for diabetes with a fasting blood sugar test? (circle)
  - a. Yes
  - b. No

Comments:

5. What is a normal fasting blood sugar level? (circle)
  - a. 60
  - b. 80
  - c. 135
  - d. 150

Comments:

6. How much of your food plate should consist of vegetables? (circle)
  - a. 10%
  - b. 25%
  - c. 50%
  - d. 75%
7. How long do you exercise? (circle)
  - a. None
  - b. 10 minutes once a week



- c. 30 minutes three times a week
- d. 30 minutes 5-7 times a week

Comments:

8. What can happen to you if you have diabetes?

Comments:

9. Do you have a plan to make a doctor's appointment to screen for diabetes?  
(SKIP if you have already been diagnosed) (circle):

- a. Yes
- b. No
- c. I'm undecided

Comments:

10. Do you talk to your friends or family about health-related topics? (circle)

- a. Yes
- b. No
- c. I don't know

Comments:

\*\*Ask our walk-in provider or your regular doctor for diabetes resources including diabetes screenings, diet counseling, access to the fitness center, and referral to the smoking cessation program. Or you can make a PCP appointment at the front desk. Mahalo nui loa!

**Appendix B**

## Informational Diabetes Poster POST-Survey

Aloha ka kou! Mahalo for agreeing to fill this short pre- and post-visit survey. The purpose of this survey is to determine how to best convey diabetes information to Native Hawaiians. You can stop at any time. Let us know if you have questions. There are many diabetes resources at WCCHC. Please feel free to ask the provider today or your PCP for more information. Thank you for sharing your mana'o!

1. How long were you able to view the diabetes poster in the exam room? (circle)

- a. 0 minutes
- b. 2 minutes
- c. 5 minutes
- d. 10 minutes or more

Comments:

2. Was the poster culturally relevant and/or visually pleasing?

Comments:

3. What is an example of a normal fasting blood sugar level? (circle)

- a. 60
- b. 80
- c. 135
- d. 150

Comments:

4. How much of your food plate should consist of vegetables? (circle)

- a. 10%
- b. 25%
- c. 50%
- d. 75%

5. How long do you plan to exercise after viewing the poster? (circle)

- a. None
- b. 10 minutes once a week
- c. 30 minutes three times a week
- d. 30 minutes 5-7 times a week

Comments:

6. What can happen to you if you have diabetes?

Comments:

7. Do you plan to make a doctor's appointment to screen for diabetes after viewing the poster? (SKIP if you have already been diagnosed) (circle):

- a. Yes
- b. No
- c. I'm undecided

Comments:

8. Do you plan to share the knowledge you gained from this poster with friends or family? (circle)

- a. Yes
- b. No
- c. I don't know

Comments:

\*\*Ask our walk-in provider or your regular doctor for diabetes resources including diabetes screenings, diet counseling, access to the fitness center, and referral to the smoking cessation program. Or you can make a PCP appointment at the front desk. Mahalo nui loa!

## Appendix C

### University of Hawai'i at Hilo

#### Consent to Participate in Research Project:

Aloha! My name is Saba Kam and I am a doctoral student testing how to best convey diabetes information to Native Hawaiians. The benefit of this project may be to prevent diabetes or to diagnose diabetes early in those who view the poster. I believe there is little risk to you in participating in this research project. You may become stressed or uncomfortable answering any of the pre- or post-survey questions. If you do become stressed or uncomfortable, you can skip the question or stop participating in the project. I will keep all information in a secure place, and the surveys are completely anonymous. Your participation is completely voluntary. You may stop participating at any time. If you stop participating in the study, there will be no penalty or loss to you. You will receive a grocery bag with healthy foods for your time and effort in participating in this research project. Other agencies that have legal permission have the right to review research records. The University of Hawai'i Human Studies Program has the right to review research records for this study. The materials from each participant will not be revealed or shared with anyone except members of the doctoral committee or whoever is deemed appropriate. If you agree to participate, please sign and date this signature page.

#### Signature:

I have read and understand the information provided to me about being in the research project, Culturally Appropriate Diabetes Information Poster.

My signature below indicates that I agree to participate in this research project.

Printed name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

You will be given a copy of this consent form for your records.

\*If you have any questions about this study, please call or email me at (808) 697-3800 or saba@hawaii.edu. You may also contact my faculty advisor, Dr. Diane Van Hoose, at (808) 932-7071 or dianev@hawaii.edu. You may contact the UH Human Studies Program at (808) 956-5007 or uhirb@hawaii.edu to discuss problems, concerns and questions, obtain information, or offer input with an informed individual who is unaffiliated with the specific practice inquiry project protocol. Please visit <http://go.hawaii.edu/jRd> for more information on your rights as a project participant.

## Appendix D

## Letter of Endorsement



Saba Kam, MSN; APRN, has described her proposed research to me, titled “Culturally Appropriate Type 2 Diabetes Information Poster.” As director of WCCHC walk-in clinics at West Oahu Community Health and Waiola Clinic, I approve of this research to occur with our patients.

Audrey Taleff, APRN-Rx  
Director KWIC and WKIC  
Waianae Coast Comprehensive Health Care Center

## Appendix E

## How Do I Avoid Diabetes?

- **See your doctor every year for fasting blood sugar screening**
  - Normal blood sugar is 70-100
  - Don't have a regular doctor? Ask your provider to hook you up with one today!
- **Exercise five times a week for 30 minutes each time**
  - Go for a hike or walk
  - Swim, surf or sponge in the ocean
  - Dance hula
- **Too much sugar, salt and fat can plug up blood vessels, and make more risks for heart attack and stroke.**
  - Eat plenty of fresh foods that are naturally low in sugar, salt and fat
  - Stay a healthy weight... We get diet programs!
- **Quit smoking**
  - Ask us how... We have a smoking cessation program!
- **Limit alcohol**
  - Wāhine - no more than 1 a day
  - Kāne - no more than 2 a day



## Da Hawaiian Plate.... Make 'em look la' dis!

**25% Good Kine Starch**  
 'uala, kalo/poi, 'ulu, quinoa,  
 cassava, brown rice, whole grain  
 bread, whole grain pasta

**25% Lean Meat**  
 Beef lū'au, grilled fish,  
 grilled chicken,  
 lean pork, lean beef



**50% Any Kine Veggies You Like!**  
 Hō'i'o salad, lomi salmon salad,  
 lū'au leaves, soup, etc.  
 \*Jus no add *too much*  
 buttah, mayo, salt, oil, dressing

So, what's mo' bettah than white rice and mac salad...?

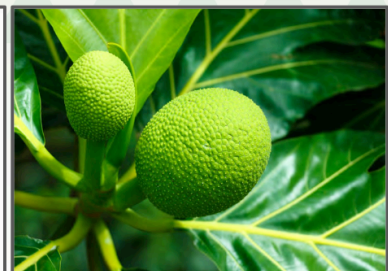
'Uala (Sweet Potato)



Kalo (Taro)



'Ulu (Breadfruit)



## Appendix F



UNIVERSITY  
of HAWAII®  
MĀNOA

Office of Research Compliance  
Human Studies Program

**DATE:** March 16, 2020  
**TO:** Van Hoose, Diane, PhD, University of Hawaii at Hilo, School of Nursing  
Norris-Taylor, Joyce, DNP, University of Hawaii at Hilo, School of Nursing, Kam, Saba,  
MSN, University of Hawaii at Hilo, School of Nursing  
**FROM:** Rivera, Victoria, Dir, Ofc of Rsch Compliance, Social&Behav Exempt  
**PROTOCOL TITLE:** Development, Implementation, and Evaluation of a Native Hawaiian Culturally  
Appropriate Type 2 Diabetes Informational Poster  
**FUNDING SOURCE:**  
**PROTOCOL NUMBER:** 2020-00017  
**APPROVAL DATE:** March 16, 2020

### NOTICE OF APPROVAL FOR HUMAN RESEARCH

This letter is your record of the Human Studies Program approval of this study as exempt.

On March 16, 2020, the University of Hawaii (UH) Human Studies Program approved this study as exempt from federal regulations pertaining to the protection of human research participants. The authority for the exemption applicable to your study is documented in the Code of Federal Regulations at 45 CFR 46.101(b) 3.

Exempt studies are subject to the ethical principles articulated in The Belmont Report, found at the OHRP Website [www.hhs.gov/ohrp/humansubjects/guidance/belmont.html](http://www.hhs.gov/ohrp/humansubjects/guidance/belmont.html).

Exempt studies do not require regular continuing review by the Human Studies Program. However, if you propose to modify your study, you must receive approval from the Human Studies Program prior to implementing any changes. You can submit your proposed changes via the UH eProtocol application. The Human Studies Program may review the exempt status at that time and request an application for approval as non-exempt research.

In order to protect the confidentiality of research participants, we encourage you to destroy private information which can be linked to the identities of individuals as soon as it is reasonable to do so. Signed consent forms, as applicable to your study, should be maintained for at least the duration of your project.

This approval does not expire. However, please notify the Human Studies Program when your study is complete. Upon notification, we will close our files pertaining to your study.

If you have any questions relating to the protection of human research participants, please contact the Human Studies Program by phone at 956-5007 or email [uhirb@hawaii.edu](mailto:uhirb@hawaii.edu). We wish you success in carrying out your research project.

UH Human Studies Program, Office of Research Compliance  
Office of the Vice President for Research and Innovation, University of Hawai'i, System  
2425 Campus Road, Sinclair 10, Honolulu HI 96822  
Phone: 808.956.5007 • Email: [uhirb@hawaii.edu](mailto:uhirb@hawaii.edu)  
<https://www.hawaii.edu/researchcompliance/human-studies>  
An Equal Opportunity & Affirmative Action Institution

