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Implementation and Evaluation of a Healthy Eating Curriculum for NHPI

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Abstract

Native Hawaiians and Pacific Islanders (NHPI) suffer from disproportionate rates of obesity and other related chronic diseases. Pacific Islander Community Health (PIC Health) is a project in San Diego County that is actively investigating how to improve the health of NHPI, using a mixed methods Community Based Participatory Research (CBPR) approach. This project provided a culturally tailored nutrition curriculum for 12 weeks to participants of the PIC Health program, followed by investigating how this influenced their eating behaviors. After the analysis of the focus group, three main themes were determined to inform future work. These themes were: (1) Intervention Strategies for NHPI Health (2) Impact of Curriculum and (3) Cultural Relevance. The survey data revealed a significant difference from week 0 to week 12 for both fruit consumption per month and vegetable consumption per month ($p < .05$). These findings indicate that a culturally tailored nutrition curriculum did positively influence the eating behaviors of NHPI participants. The strong prevalence of chronic disease, along with an observed change from the intervention demonstrate the need for more programs to be developed for NHPI health.

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Soli Deo Gloria.

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Introduction

Native Hawaiian and Pacific Islanders (NHPI) who live in the United States face various health disparities related to obesity. The Center for Disease Control reports 36.5% of the American population to be obese. Obesity rates among NHPI in the United States are especially concerning. The US Department of Health and Human Services Office of Minority Health states that the NHPI population is three times as likely to be obese than the overall Asian American population in 2015, and 20% more likely to be obese than non-Hispanic whites. Obesity is defined as having a BMI of 30 or higher or can also be defined as having a body fat percentage of 32% or higher for women and 25% or higher for men. For reference, a healthy BMI range for adults is 18.5- 24.9 and a healthy body fat percentage is 6%-24% for men and 14%-31% for women.

Obesity is considered to be a chronic disease and is mainly caused by poor eating habits and lack of physical activity over a long period time. Chronic diseases that are associated with obesity and commonly occur simultaneously include type 2 diabetes, cardiovascular disease, and hypertension. A study focused on health indicators of NHPI population found its participants to report a higher prevalence of obesity and chronic conditions (hypertension, high cholesterol, diabetes, and angina). Participants also reported lower levels of physical activity, fruit and vegetable consumption and cancer screening rates (Moy, et al. 2012) This information reveals the severity of the health disparity within this population. Poor lifestyle habits including smoking tobacco products and high consumption of alcohol also contribute to many of the chronic diseases that the NHPI population face. Other common behaviors include a lack of physical activity and low fruit and vegetable intake. Many cultural foods popular for NHPI are high in

refined carbohydrates, saturated fat, and/or calories overall. The constant consumption of these types of foods results in gaining weight.

A tendency toward lower socioeconomic status also is a considerable factor. A 2006-2010 American Community Survey (U.S. Census Bureau) found only 18% of NHPI had earned a bachelor's degree or higher, revealing a low rate of education past high school. It is clear that there are many factors that contribute to the health disparities of this population, and a great need for intervention to aid in improvement of overall health.

Chronic Disease

Due to the fact that NHPI suffer disproportionately from higher rates of obesity, it should also be noted that NHPI experience higher rates of other types of chronic diseases. These include diabetes, heart disease, and cancer. All these diseases include obesity as a risk factor for their occurrence. The health behaviors that NHPI engage in not only influence their weight and waistline, but also their risk for many chronic diseases. This further pushes the point that NHPI face many health disparities, and that action needs to be taken to promote a healthier lifestyle.

Diabetes

One of the most common chronic diseases that the US population faces is diabetes, and the NHPI population is no exception. They face a higher risk of diabetes, due to the higher rate of obesity within the population. Diabetes is a metabolic condition where the body has a decreased ability to process carbohydrates, causing blood sugar levels to rise into an unhealthy high rate. Prolonged uncontrolled blood sugar has lasting negative effects on the body, including damage to the kidneys, nerves, and an increased risk for heart attack or stroke. Over time, a person with diabetes may lose feeling in their toes and feet due to nerve damage, or have

decreased kidney function, and eventually may require dialysis to compensate for the bodies inability to filter blood.

Diabetes has also been found to increase length of hospital stay in NHPI patients who have suffered an ischemic stroke. (Nakagawa, et al. 2014) The study aimed to compare minority populations and length of stay in a hospital after suffering a stroke. In relation to NHPI, patients who suffered a stroke were significantly younger compared to those who were white (59 ± 14 years vs 72 ± 13 years). Rates of diabetes in these patients for NHPI vs white were (53% vs 18%) and obesity prevalence was found to be (55% vs 20%).

Cardiovascular Disease

Cardiovascular Disease is another chronic disease found to be comorbid with obesity, especially within the NHPI population. The American Heart Association defines cardiovascular disease as a diseased state of the heart and blood vessels, including atherosclerosis, characterized by a buildup of plaque and hardening in the arteries (American Heart Association, 2017). Increased plaque in the arteries is caused by high cholesterol levels in the blood. High cholesterol is caused by a diet high in saturated and trans fats, and low in dietary fiber. Low intake of fruits and vegetables, as well as low activity levels, contribute to higher risk of heart disease within this population. (Tung & Barnes, 2014) NHPI have higher rates of cardiovascular disease. Specifically, this populations is 70% more likely to die from heart disease than whites. (USDHHS, 2018) In 2014, NHPI were 10% more likely to be diagnosed with coronary heart disease than non-Hispanic whites. Greatest contributing risk factors are overweight, obesity and hypertension.

Hypertension

Hypertension is another condition that NHPI experience at higher levels, due to the previously mentioned chronic diseases that occur simultaneously. A recent study found 36.7% of NHPI participants to be hypertensive. (Moy, et al. 2010) Hypertension is a constant state of high blood pressure, which raises a person's risk for heart attack and stroke. Hypertension is a risk factor for cardiovascular disease, and the conditions commonly occur simultaneously.

Cancer

Studies have found a strong relationship between consumption of fruits and vegetables and cancer. One study found a decreased risk of multiple types of cancer associated with an increased intake of fruits and vegetables (Riboli & Norat, 2003). A low intake of fruits and vegetables has also been found to be associated with higher rates of cancer in NHPI (Moy, et al. 2010). Another study aimed at investigating health behaviors of NHPI found a much lower rate of NHPI participating in cancer screenings. Cancer screening rates for NHPI within this study were found to be 0%- 57%, meaning some had participated in some forms of screening, and values ranged all the way down to no screening participation behaviors. Females demonstrated higher cancer screenings rates (41–57%) than males (4–9%). (Moy, et al. 2010) Participation in smoking behaviors by NHPI also contribute to cancer rates. These factors of poor dietary choices and lack of health screening tests can contribute greatly to cancer risk and incidence in NHPI.

Another lifestyle factor found to be higher in the NHPI population is smoking. A study focusing on health indicators of NHPI found that of their participants, 49% of them were current smokers. (Moy, et al. 2010) The Centers for Disease Control reports smoking to increase the risk of coronary heart disease and stroke of an individual 2 - 4 times. It also reports for men and

women, an increased risk for lung cancer by 25 times the risk of those who do not smoke. Smoking, combined with other risk behaviors including poor diet quality, low activity levels, or already occurring chronic diseases will only shorten lifespan and increase likelihood of preventable death.

Traditional Diet and Acculturation

Acculturation to western diet and lifestyle is a major contributor towards the impact of obesity among the NHPI. The traditional diet of NHPI originally consisted of foods native to their islands. These included fresh fish, local meats, fresh fruits and vegetables, taro and yams. As NHPI people adopted western traditions when they moved to countries like the United States, their diets changed. In 2006, it was found that the diets of Micronesians living in California had a much higher proportion of calories coming from saturated fat than Micronesians living a traditional way in Palau. (Cassels, 2006) As European influence continued to grow, many nontraditional foods were introduced into their diets. These nontraditional foods were much less nutritious and higher in calories. Foods that were imported include things such as rice, sugar, flour, and canned goods. High calorie beverages such as beer and soda were also introduced. As these different foods were introduced and adopted into their lifestyle, the need to be physically active also decreased. Instead of having to go out to fish or work outside to harvest produce, foods are simply imported in and conveniently found in can.

This shift from a traditional diet towards more convenient and higher calorie foods instigated new habits that would eventually lead to an obese population. (Cen 2010) Living in the United States creates access to processed foods unlike ever before. NHPI is a continually growing population in the United States. San Diego has the second largest population of NHPIs in California. (Moy et. al 2012) In fact, the NHPI population has grown

25% in the past decade. (Hixon, Hepler, & Kim, 2012) Processed foods being highly accessible combined with low prices for these items makes unhealthy foods an easy choice. Obesity is a universal health issue in the United States, regardless of ethnic background. As the NHPI population continues to grow in the US, they grow in an environment that is ideal for becoming obese. Poor diet and lack of exercise may be a lifelong behavior for NHPI children born in the United States. This combination intervention of physical activity and nutrition education may be effective in helping the NHPI community in San Diego lose weight and live healthier lifestyles. (Moy et. al 2012)

Another study conducted in Southern California targeted the eating behaviors of NHPI population. The study investigated diet, BMI, and health behaviors. The study found that 90% of its NHPI participants were overweight or obese. Of these participants, less than 20% met the dietary recommendations for daily consumption of fruits, vegetables, whole grains, and fiber. The study ended by drawing the conclusion that a culturally tailored education program aimed at improving diet and reducing obesity is critical for NHPI in Southern California. (McEligot et. al 2012)

Research Goal

The goal of this research is to determine whether a culturally tailored nutrition education program will influence the dietary behaviors of NHPI participants.

The high rates of obesity within the NHPI community along with other chronic diseases make a compelling argument that nutrition education is needed within this population. Although instigating behavior change is not easy to accomplish, success is possible when the right resources are used. Using a community-based participatory research approach along with culturally tailored nutrition lessons will help in accomplishing this project goal. Success has been

found in this model with the Pili ‘Ohana project. The Pili ‘Ohana Project was an intervention that began in Hawaii focused on improving the health of their population. Using the community based participatory research model, the study aimed at weight loss and included a nutrition curriculum (Kaholokula et. al 2014). Using this project as a resource will inform education materials to make them as effective as possible.

Research Question

What are the effects of a culturally tailored nutrition curriculum on attitudes toward and practices of eating behaviors for NHPI participants?

Project Objectives

Objective 1. Adapt and develop nutrition education materials from a previous “Healthy Eating for NHPI” capstone for the Pacific Islander Community Health (PIC Health) pilot study.

Objective 2. Implement a nutrition curriculum within a Pacific Islander physical activity pilot study. Nutrition curriculum will include 12 lessons and a healthy snack.

Objective 3. Analyze qualitative and quantitative data from focus group and PIC health survey responses to determine if the nutrition curriculum impacted eating behaviors of PIC Health participants. Focus group will be conducted after 12 weeks of the nutrition lessons have been completed.

Methods

The purpose of this study is to investigate the effectiveness of a culturally tailored nutrition education program on the dietary behaviors of PIC Health participants. This capstone takes into consideration the insight and knowledge gained from a first “Healthy Eating for NHPI” capstone completed in Fall 2017 at CSUSM. This knowledge, along with working with a

student with a bachelor's degree in nutrition was combined in this capstone to build an effective nutrition program.

Participants

Eleven NHPI participants enrolled in the PIC Health program held at Rawmana Fitness. Participants were both male and female adults, ranging from 19 - 65 years old. Recruitment to start the program was done through handing out flyers, social media promotion, and word of mouth within their community. The PIC Health pilot study included workout classes twice a week, three anthropometric measurements, nutrition lessons each week, and, for incentives, gift cards after completing each measurement period.

Materials and Design

Materials needed for this study included the gym Rawmana Fitness, and all the workout equipment that is included at that location. The gym provided a place of meeting for the participants, as well as workout equipment to be used for their exercise classes. The measurement tools used for the study included the PIC Health surveys given to participants at week 0 (baseline) and week 12. SPSS software was used to analyze the data. A microphone with recording capabilities was used to record the focus group. Transcription of data was done by downloading the audio file of the focus group onto a student laptop and playing it back while the student typed a verbatim transcript of what was said.

This type of study is a non-experimental pre-posttest design. The study did not include randomization of the sample, and participants who chose to join the study joined by their own motivation and desire to be in a health-related study. Measurements of the food frequency variables were taken before and after the intervention was given.

This study is also included in the category of community based participatory research, as the study worked closely with the community partner, Rawmana Fitness, a native-owned fitness gym. The population of NHPI that suffer from obesity and other related health disparities are frequently asked for their input on the research and what they want to gain from it. The research team and the NHPI community informants worked together to design the Pacific Islander Community Health program.

Procedure

Nutrition Curriculum

Nutrition lessons for each of the twelve were written, developed, and presented by the MPH student. Due to unknown health literacy levels of participants, lessons were written with the goal of being informative at a level that is easily understood. Twelve nutrition lessons were presented, once a week after a workout class. Workout and nutrition classes were located at Rawmana Fitness, a gym owned by a Tongan family and located in San Diego County. Each week, a healthy snack was provided during the lesson to supplement the nutrition information being presented. The healthy snack created a tangible example of foods that can be enjoyed and are part of a nutritious diet. Where possible, snacks were tailored to be culturally relevant.

Focus Group

A focus group was conducted with 5 NHPI participants of both genders, in order to gather information about thoughts, beliefs, and attitudes in relationship to behavior change in their culture. The focus group was conducted after the 12 weeks of nutrition lessons were given. The goal of the focus group is to gain a more comprehensive understanding of how the nutrition curriculum affected participants. Knowledge, beliefs, and attitudes are not seen through the food frequency variables being assessed from PIC Health survey data. Questions were open ended,

and centered around cultural practices, perceived NHPI health concerns, and attitudes towards the nutrition curriculum.

Data Collection

After the recruitment stages of the study, participants have joined PIC Health and have filled out a baseline survey (week 0) that asks many questions about health behaviors, including food frequency. These surveys are given out again to participants at weeks 12 and 24 of the PIC Health program. For the purposes of this capstone, data from week 0 was used to reveal the need for dietary improvements in the population. Where possible, week 12 data were used to determine whether food frequency variables changed. Five specific variables related to food frequency were chosen to be analyzed from the PIC Health survey.

The five food frequency variables chosen were: fruit intake per month, vegetable intake per month, fast food intake per week, coffee or tea sweetened with sugar per month, and dessert foods per month. Questions were asked in the format “How many times in the past month have you had (specific food item)?” and a blank was left for participants to write in a numerical value. The focus group consisted of asking participants questions and allowing time for multiple responses for each question. Questions asked during the focus group were open ended and related to addressing NHPI health disparities, as well as addressing the effects of the nutrition curriculum.

Data Analysis

The focus group was recorded using a microphone in order to obtain an audio tape, to be later analyzed by transcription and coding. The audio was transcribed verbatim into a written document, to able to be coded for themes by hand. Coding was done by reading through the document and noting consistent or repeated concepts.

Once data was collected it was separated by variable, and averages of each response will be calculated. The average responses from Week 0 and Week 12 for each variable were compared using a t-test for statistical significance. Data was analyzed using SPSS software. The resulting p-value indicated whether the nutrition education provided was associated with dietary behaviors changing at a statistically significant level.

Results

Data for this research includes both quantitative and qualitative work. A focus group of PIC Health participants was conducted, and participant survey data was collected.

Focus Group

Three prominent themes emerged from the focus group conducted with NHPI participants of the PIC Health study. These main themes had some underlying subcategories that were evident enough to also note in results. The three main themes found were (1) Intervention Strategies (2) Impact of the Curriculum, and (3) Cultural Relevance.

Theme 1: Intervention Strategies

Questions at the beginning of the focus group were centered around the appropriate way to approach the NHPI people about their health, and what interventions may be most effective. Subthemes included a family-based approach, as well as the importance of establishing trust.

Family Based Approach. A “family based” approach was strongly recommended from the focus group participants. It was explained that family is of extreme importance to people of the NHPI culture and that inclusion of the entire family would encourage participation. Loved ones such as family or friends create accountability when attendance is a group effort instead of individual.

“Probably would have to be through like, like family or friends. With friends, someone’s gonna have to push you that knows you to get you to. Or like how you talked about last time, how your family started coming, ya know, so you started coming and get everyone to be accountable.” (Participant, male, 41)

When discussing the family dynamic in relationship to health, it was also mentioned that starting healthy habits during youth was thought to be most successful. NHPI participants stated that exposure of healthy foods and exercise to their children would make more of a lasting impact on their lives, as their habits for life are less developed. They explained that the older generation is “stubborn” and “set in their ways”, making the changing of health behaviors much more difficult for the older generation.

“...but I think that’s where it would have to start in order to reach, like the younger generation, because I feel like the older generation, they are very stuck in their ways, and it’s harder to get them to see, kind of I guess, I don’t know, stuff they didn’t really worry about in their days or that it wasn’t as important to them.” (Participant, female, 26)

Establishing Trust. Participants discussed establishing trust within their community as an important aspect when approaching them about health. It is important to build relationships and gain trust within this group before approaching them about their behaviors and choices related to their health.

“There always has to be one person that everybody trusts, and then they’ll kinda jump in too.” (Participant, female, 40)

Theme 2: Impact of Curriculum

Participants were asked questions about whether the curriculum influenced their lives and what aspects they found helpful. Responses indicated that the curriculum influenced their mindset about food and caused them to change the eating habits. Subthemes included feedback on the impact of the curriculum on participants, as well as change in eating habits of participants.

Curriculum Feedback. Participants stated that certain nutrition lessons were most helpful for gaining nutrition knowledge and enabling them to make changes for their health. Portion control was said to be one of the most helpful topics. Participants mentioned it was important to the NHPI culture as they eat together frequently, and large quantities of food are available and large portions are typically eaten. Participants stated as well as explaining balancing basic nutrient groups (such as fats, proteins, and carbohydrates) at meal times.

“The printouts with the um, serving sizes of all the like, pretty much everything, you know you had the fats and the proteins, like the size of your hand and stuff like that, that was helpful for me. Because usually I just pile it all on one plate and eat it.” (Participant, female, 26)

It was consistently stated that the participants had positive feelings about the setup of the PIC Health program overall, and the specifics of the nutrition lessons setup. Participants felt that the lessons were best when kept short and to the point, to keep their attention. They stated they preferred the lessons to be right after the workout, and that topics were broken down into simple and clearly understood points. Explaining why certain foods or practices are better for health was found to be favorable. It was also frequently mentioned that participants enjoyed the snacks that were provided during the nutrition lesson.

“Yea and I think also you just broke it down, you kinda just did it in a way of not just oh this is a healthy snack to have instead of chips. You really explained the why and you know the importance of it, and how we can slowly change our diet, and how it can be beneficial to us on a daily basis so, yea just being detailed and really explaining to us why this snack may be important or what it can contribute to our health, I think that was really helpful.” (Participant, female, 23)

“And also too, like how you brought the snacks too, like the granola and yogurt one you made and everything. I wouldn't go to the store and try that myself. I'd walk right past that aisle, but being that it was here, I tried it out and it was good. So it's something that's new to your taste buds and you're like, oh yea I can handle that. You wouldn't try it unless someone hands it to you so, the way you did that, these little snacks and stuff like that, I think that was great.” (Participant, male, 41)

“Oh, I liked it, it was short, straight to the point, like after a workout, like OK I'm dying from a workout so we didn't have to like stick around forever, and I think, I think

that not like less information, but the short spurts that you did, I think that's good instead of like jam packed full of stuff. Especially if it's new information for someone. I think once a week is good, and that its short and straight to the point." (Participant, female, 26)

Change in Eating Habits. Participants reported that the curriculum influenced their eating behaviors. It was stated that the nutrition lessons, along with participating in PIC Health exercise classes caused them to be more mindful of their eating choices, as well as implementing new eating habits. Participants noted that they understood changing their eating habits was integral to their progress in the PIC Health program. It was clear that the workouts would be most successful if paired with healthy eating habits.

"It influenced my diet, because I noticed early on when I was coming, I think the first workout, I had like hot Cheetos and coffee right before I went, and I was dying. I remember that first workout, it was inside and it was me, and I think it was XX and XY's first workout too, and they were just going at it like nothing and I was dying, and I could just like, taste the hot Cheetos, it was just a mess, but I was trying to keep it all in, so that influenced me to eat light, eat healthy, because I will feel it later on, and I'm kinda glad, it was like a blessing in disguise that I experienced that first hand because I can't imagine doing like an outside workout or if we would have flipped a tire that day, so um, just eating healthier, not only before the workout but just overall, that was something I learned firsthand." (Participant, female, 23)

Theme 3: Cultural Relevance

The final main theme recurred throughout the entire focus group. Cultural relevance was touched on consistently, as it is an integral part of creating a program that will be effective and helpful for any community that suffers from health disparities. Participants mentioned they felt that the atmosphere of the gym and simplicity of workout equipment was culturally tailored to their lifestyle and preferences. Simplicity overall was explained to be one of the best aspects of the program that was culturally relevant. Participants also stated that the multigenerational and family-based approach of the program was ideal for a culturally tailored program.

"You can do a lot more with less and I think a lot of the Hawaiian families are like that. They do a lot of that. I should say Polynesian families, not just Hawaiians. They get out there and they can do it, and they can do a lot with what they have. It's not

all about the fancy things with them. So, this kind of stuff will open their eyes to doing it, and again if you have someone pushing them, or the family out there doing it with them, then they'll get into it. You can pick a rock up and run around your backyard. You can do a pull up in a tree, whatever it is, you can find a spare tire and push it around, as much as it sucks, but you can do that stuff. Learning from their family, you know, it can open up their eyes, that it doesn't have to be all this fancy stuff." (Participant, male, 41)

Survey Data

A paired samples t test was used to determine whether there was a significant change in food frequency variables from week 0 to week 12. The analysis of survey data found that participants had a significant change in their frequency of eating two of the five food frequency variables. Fruit intake and vegetable intake were the variables found to have a significant difference from week 0 to week 12. Fruit intake had the mean value increase from 16.8 to 26.0, with a significance of $p < .032$. Vegetable intake had the mean value increase from 12.4 to 20.4, with a significance of $p < .032$. The variables that did not see significant change were frequencies of fast food, coffee or tea sweetened with sugar, and dessert foods.

Discussion

NHPI as a group suffer from many health disparities related to obesity. Obesity is a result of poor eating habits and low physical activity levels. NHPI have generally poor lifestyle behaviors and more chronic health conditions when compared to the overall population of the United States (Moy, Sallis, and David, 2010). This study aimed at improving eating behaviors of NHPI living in San Diego and participating in the PIC Health program.

The first objective of this project was completed by adapting and completing a nutrition curriculum. Once this curriculum was completed, it was implemented for 12 weeks during the PIC Health pilot study, thereby completing the second objective of the project. After 12 weeks of nutrition education, a focus group was conducted to be analyzed, along with the assessment of

PIC Health food frequency survey data. The analysis of the focus group and survey data completed the third and final objective of the project.

PIC Health participants reported a statistically significant higher frequency of fruit intake and vegetable intake (both, $p < .05$) after the 12 weeks of nutrition education. The other three food frequency variables did not show statistically significant change, but the mean values of these variables did show a decrease. The decrease of these frequencies is a desired outcome, due to the fact that these variables were considered to be foods that are less beneficial to health.

Feedback from the focus group indicated that NHPI participants found multiple aspects of the nutrition curriculum helpful. Participants made it clear that the curriculum taught them new information about nutrition and healthy eating and enabled them to make dietary choices that were better for their health. Understanding portion control was mentioned often as a lesson that was influential, especially due to the fact that NHPI participants reported portion control as a struggle for the NHPI community, as eating together is a part of their culture.

The family-based approach and island atmosphere found at Rawmana Fitness contributed to a comfortable setting that was culturally tailored towards participants. The nutrition curriculum was culturally tailored by teaching specific topics that are needed to address the health disparities of the NHPI community.

Strengths

This study showed desirable change in dietary behaviors of NHPI participants after a nutrition curriculum was implemented. The evaluation of the effects of the curriculum indicated that NHPI participants did change their eating behaviors, and shifts occurred towards healthier choices.

Cultural relevance was important to the success of this research. The location of Rawmana Fitness and the atmosphere it provided created a place for this specific population to feel welcome and comfortable. Many NHPI community members from San Diego were frequently at the gym while PIC Health participants were there for workouts and measurements. Establishing trust was a suggested intervention strategy from focus group participants. Having community members present gives the ability for other NHPI participants to feel they can trust the familiarity of the people around them.

The multi-generational aspect of this study, along with the use of CBPR is a strength of the research. Including the input of the population being studied creates a stronger likelihood of providing a program that is relevant and influential to a specific cultural group. NHPI place an unparalleled importance on family, which was a prominent theme from the focus group. The multi-generational approach was set with the goal of the whole family coming together to work on health goals, rather than individuals. Consistency of attendance of the program and accountability from loved ones were more likely by using a family-based approach.

It is important to note the significance of the product of a nutrition curriculum. A product of this project is a 12-week nutrition curriculum that was developed for the PIC Health program and will continue to be used in the future of that program. Strengths of the nutrition curriculum itself were the topics that informed participants about topics such as portion control and balanced meals. Participants also reported that providing snacks as examples was helpful and enjoyable. They reported enjoying the combination of familiar foods and new ones they may have not otherwise tried on their own.

Limitations

This research included a small sample size of participants overall, as well as a poor retention rate. Participation decreased from 11 participants at week 0, to 5 fully active participants at week 12. Small sample size limits data, as well as what conclusions can be drawn from such a sample. The structure of the food frequency questions may have allowed for food recall bias, so a different formatting such as food diary may produce more accurate results.

Also, while the focus on NHPI is positive for that specific population, the program was very much targeted towards their specific culture. For this reason, results may be less applicable to other minorities or other groups suffering from health disparities. The nature of this work is preliminary, and more research in the future is necessary to draw stronger conclusions about how to address NHPI health.

Implications

There are few health programs that target the specific needs and health disparities of NHPI living in the United States. The NHPI population is steadily growing, especially in California (Moy, Sallis, and David, 2010). This increasing rate of NHPI living in California, along with their convincingly high rates of obesity and other related health disparities make the definitive argument that health programs for this population are essential.

There is little available research surrounding NHPI health and diet, specifically in San Diego. The completion of this research contributes to the need for more information about NHPI health programs. The nutrition curriculum also provides a resource available for use to future programs for NHPI health. This program includes many aspects that will inform successful projects in the future.

The information and insights gained overall from this research is able to inform future programs for NHPI living in the United States. NHPI suffer from health disparities related to obesity, such as diabetes, cardiovascular disease, and cancer. Sharing information and results from this project may be able to create more resources to improve the dietary behaviors and overall health of NHPI living in San Diego.

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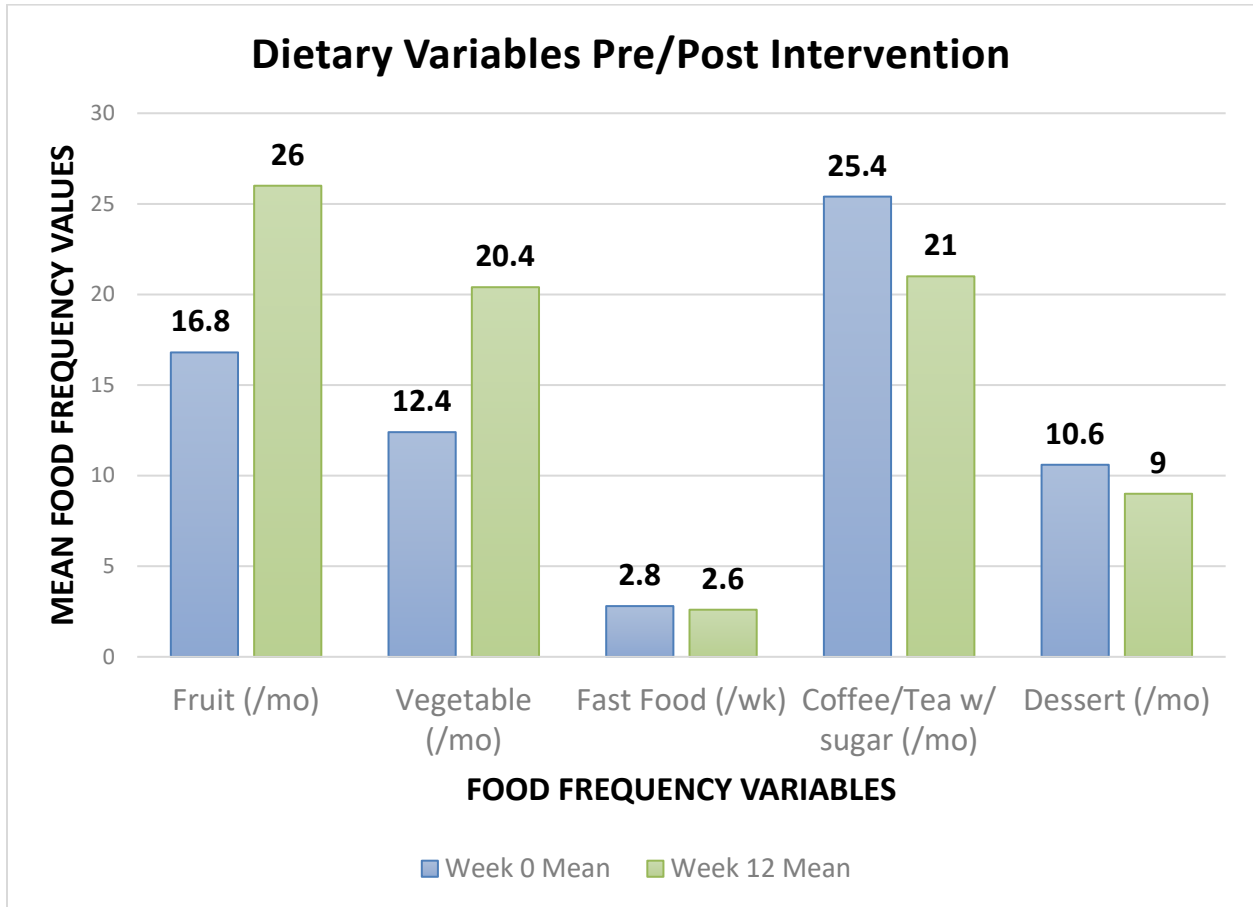
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Table 1. Food Frequency Mean Values and Paired Samples Significance

n = 5	Week 0 Mean	Week 12 Mean	significance
Fruit (/mo)	16.8	26.0	p < .032
Vegetable (/mo)	12.4	12.4	p < .032
Fast Food (/wk)	2.80	2.60	p < .511
Coffee/Tea w/ sugar (/mo)	25.4	21.0	p < .749
Dessert (/mo)	10.6	9.00	p < .666

Note. A value of p < .05 or smaller indicates significant difference.

Figure 1. Dietary Variables Pre-Post Intervention



Appendix A: Focus Group Questions

Focus Group Questions

1. What is the best way to reach the Pacific Islander Community?
2. What health concerns/behaviors do you think most affect the Pacific Islander Community?
3. What are some potential intervention strategies to combat the health concerns and promote health?
4. What did you find most helpful about the nutrition program?
5. In what ways do you think the program influenced you or influenced your habits?
6. Do you feel the program could have been more tailored to the NHPI culture? And if so, how?
7. In relationship to the nutrition program and information you've been given, is there anything else you can think of that would be helpful or make it better? Or, do you have any final comments about it?

Appendix B: Nutrition Curriculum

Lesson 1: Beverage Guide

- Items we can drink can often be very high in calories that don't keep us full and satisfied.
- Drinks are often loaded with sugar, which can cause diabetes or make diabetes worse.
- Here are some high calorie and/or high sugar drinks with a healthier alternative.

Goals to strive for:

- Drink more water!
- choose drinks with less or no sugar!
- caffeinated beverages don't keep you hydrated!

Commonly Picked Drinks and Healthy SubstitutionsStarbucks

Mocha Frappuccino (Venti)

- 500 calories -79 grams of sugar

Java Chip Frappuccino- (Venti)

580 calories -21 grams of fat and 95 grams of carbohydrates

Substitutions

-Caramel Macchiato (w/ skim milk) - 140 calories

-Vanilla Latte (w/ skim milk) - 120 - calories

Gatorade

32-ounce Orange, -214 calories -56 grams of sugar

Substitution

G2- 20-ounce bottle -50 calories, -12 grams of sugar

Sodas

Coca Cola (12 oz can) - 140 calories - 39 grams of sugar

Sprite (12 oz can) - 140 calories - 38 grams of sugar

Alternatives

Diet Soda or Flavored Sparkling Waters

Lesson 2: Carbohydrates

Carbohydrates are our bodies main source of energy! Our bodies use them to move our muscles, to power our brains, and so much more.

What foods have carbohydrates?

Carbohydrates are found in many types of foods such as: breads, cereals, grains, rice, pasta, fruits, vegetables, dairy, juice, french fries, chips, desserts, soda, and candy.

Certain foods containing carbohydrates are more nutritious and beneficial to health than others.

Increase carbohydrate foods that include fiber, vitamins and minerals. These would include fruits, vegetables, and whole grains.

Decrease foods such as white bread, white rice, chips, candy, fast foods.....

Choose the more nutritious option:

White bread OR Whole grain bread
Flour Tortilla OR Corn Tortilla
Brown Rice OR White Rice
Whole Fruit OR Juice
Whole Wheat Pasta OR White Pasta
Fresh OR Canned fruits and veggies

Lesson 3: Fats

Why do we need to eat fats?

- Fats are an important source of energy
- Fats are used by our bodies to build cells, create hormones, and have a healthy brain and nervous system
- Keep our bodies protected and insulated
- Foods that contain fat often also have sources of vitamins and minerals- avo example

Sources

Fish, Meats, Dairy products, avocado, nuts, nut butters, seeds, oils, butter, margarine, fried foods, and pre-packaged foods.

Saturated vs Unsaturated: What's the Difference?

Unsaturated fat is found in fish, avocado, nuts, seeds, and oils. They are considered to be heart healthy and positively affect cholesterol levels in our blood. These sources are also rich in vitamins.

Saturated fat is less beneficial to our health, and it is important to have in moderation. Too much saturated fat in a person's diet can cause cholesterol levels to rise, which increases risk for heart disease.

Lesson 4: Proteins

Why do we need proteins?

- Proteins are used for building and repairing all the tissues in our bodies, from muscles to skin and hair!
- Eating enough protein keeps our muscles strong.
- Including protein sources in our meals keeps us fuller longer.

Plant vs Animal SourcesAnimal Sources

- Meats
- Poultry
- Fish and other Seafoods
- Dairy Products
- Eggs

Plant Sources

- Whole grains
- Soy
- Legumes
- Nuts and Seeds

How much? And How Often?

-Protein should be between 15-25% of our daily calorie intake. This is about 46 grams for women and 64 grams for men per day.

-Aim to eat all different types of proteins during the week. It is best to try to eat fish at least 2 times per week, poultry a few times, and red meat 2 times or less.

-Eating different sources of proteins gives us different vitamins and minerals as well as keep us from eating too much saturated fat.

-Can you identify the protein sources that are higher in saturated fat? _____

Try the Hawaiian Chicken Recipe on the back!

HAWAIIAN CHICKEN AND PINEAPPLE

Ingredients:**1/4 cup reduced sodium soy sauce**

- 1/4 cup pineapple juice
- 1/4 cup brown sugar, packed
 - 2 tablespoons ketchup
 - 3 cloves garlic, minced
- 1 tablespoon freshly grated ginger
 - 1 teaspoon sesame oil
 - 1 teaspoon Sriracha, optional
- 4 boneless, skinless chicken breasts
- 2 tablespoons chopped fresh cilantro leaves
 - For the pineapple:
 - 1 large pineapple, peeled, cored and cut into 8 to 10 wedges
 - 1/4 cup brown sugar

DIRECTIONS:

1. In a medium bowl, whisk together soy sauce, pineapple juice, brown sugar, ketchup, garlic, ginger, sesame oil and Sriracha. Reserve 1/4 cup and set aside.
2. In a gallon size Ziploc bag or large bowl, combine soy sauce mixture and chicken; marinate for at least 1 hour to overnight, turning the bag occasionally. Drain the chicken from the marinade.
3. In another gallon size Ziploc bag or large bowl, combine pineapple and brown sugar.
4. Preheat grill to medium high heat. Add chicken and pineapple to grill and cook, flipping once and basting chicken with reserved 1/4 cup marinade until cooked through, about 5-6 minutes on each side.
5. Serve immediately, garnished with cilantro, if desired.

Lesson 5: Post Workout Nutrition

Woohoo! You just finished another challenging workout!

Your body is tired, and you've burned a lot of energy. You hop in the car to head home. Are you hungry? What will you choose to feed yourself when you get home? Here are a few tips to refuel your body after a workout.

Drink enough water!!!

- Being dehydrated can make you feel sick, and possibly even faint.

Make sure your snack or meal is balanced!

- Make sure you're eating both carbohydrates and protein after a workout.

Why?

- Protein helps our bodies repair our muscles and build them stronger.
- Carbohydrates replenish our energy stores and give our body energy to rebuild muscle.

Listen to your body.

-If you're really hungry, make sure you give yourself a filling and nutritious meal. If you're not very hungry, fuel up with a balanced snack!

Lesson 6: Balancing Your Plate

What does a balanced plate look like?

When choosing a balanced meal, aim to eat from many different food groups. Make sure you are eating protein, carbohydrates, and fats.

Why?

Your body benefits from eating a balanced meal. When you eat a balanced meal, you feel fuller longer, which may prevent weight gain. You are also providing yourself with a variety of sources of nutrients.

So, what is a Serving Size?

Protein	Carbohydrates	Fats
3 ounces of meat or fish (palm of your hand) 1 egg Yogurt - 1 cup	Beans and Grains - $\frac{1}{2}$ Cup (size of your fist) 1 slice of bread Rice - $\frac{1}{2}$ cup Pasta - $\frac{1}{2}$ cup	Nut butters - 2 tablespoons Avocado - $\frac{1}{2}$ of the avocado Oils - 1 Tablespoon Nuts - 1 oz (varies by size of nut)

Lesson 7: Positivity and Eating Intuitively

Here are few thoughts and principles for you to consider as you participate in PIC Health and work towards your health goals!

- Have a positive attitude. Your food choices won't always be perfect. You may not meet goals as quickly as you'd like, but that's OK!
- Don't give up! With time and persistence, you can and will meet your health goals.
- Changing your behavior takes time, and creating new habits can sometimes be a challenge. Start small and set realistic goals for yourself.

Intuitive Eating - The Basics

- Create a positive relationship with food.
- Listen to your body when you feel hungry and full.
- Don't penalize yourself for eating foods you enjoy!
- Respect your body and your health by staying active and choosing nutritious foods.

Progress, not perfection!

Lesson 8: Grocery Shopping Tips

The way we grocery shop can set the stage for success and help us meet our health goals!
Here are a few tips to guide healthy shopping.

1. Don't go when you are hungry!
-This can lead us buy more and make more impulsive decisions.
2. Go with a list and/or a plan.
-This helps you stay on track with nutritious foods.
-Apply your knowledge about healthy eating to make your list and choices at the store.
3. Read labels and the ingredients list.
-Generally speaking, the less ingredients, the better.
4. Shop for in-season produce.
-In season fruits and veggies are usually more flavorful and cost less.
5. Not everything in the frozen section is junk!
-Frozen fruits and vegetables can be stored for much and ready quickly when you are pressed for time.
6. Know yourself.
-If there are certain foods that trigger you to overeat, avoid that aisle.
7. Explore!
-Try new grocery stores, new items in the produce section, or check out your local farmers market. Eating healthy foods can still be a fun and enjoyable experience.

Lesson 9: Eating Out, The Smart Way

Here are a few recommendations for making healthy choices while eating out.

1. Choose where you go wisely.
 - Going to a fast food restaurant may not be the best choice in setting yourself up for success. Be intentional about where you go and choose places that have healthier options.
2. Order balanced meals.
 - Aim to have a meal that includes multiple food groups.
3. Consider a substitution
 - Substitute for a side of fruit or vegetables instead of something heavy.
 - Sides that are baked may have less saturated fat than sides that are fried.
4. Portion size... you don't have to eat the whole plate!
 - Restaurants often have large portions that are more than you need to eat in one sitting.
 - Eat half or until you are satisfied, then take the rest home for the next day!
5. Try reinventing your favorite restaurant meal at home!
 - You will be saving yourself calories and will likely spend less money than if you were to eat out.

Lesson 10: Snacking...Friend or Foe?

SNACKS! We all love them, and the good news is, it is good for us to have them! Snacking keeps us full, keeps our metabolism going, and is opportunity to nourish our bodies.

Snacking Tips

1. Plan ahead and portion out.
 - If you know you're going to have a busy day, pack snacks for yourself. Also, instead of eating a snack out of the whole bag, give yourself an appropriate portion, then put the rest away.
2. Choose a balanced snack.
 - Giving yourself a snack that includes carbohydrates, protein, and fat will nourish your body best and keep you fuller longer.
3. Eat your fiber!
 - Fiber is found in fruits, vegetables, and whole grains. Fiber keeps us full by slowing down digestion, and is found in nutritious whole foods.
4. Don't forget your liquids!
 - It is important to stay hydrated. Instead of high sugar drinks, enjoy things like flavored water or tea.
5. Snack mindfully.
 - Listen to your body, and snack at a level appropriate for your hunger.
6. Don't deprive yourself.
 - Constant restriction will lead you to overeat. Eat regularly throughout the day and allow yourself to have to foods you enjoy. For example, if you would like a cookie, have one, and
7. Avoid stress eating.
 - When under stress we are likely to eat easy foods that are processed and higher in calories. Try to find other ways to cope with stress that are better for your health.

Lesson 11: Type 2 Diabetes and Nutrition

The goal of this lesson is to educate and empower you to understand diabetes and give you the ability to communicate with your family and community about taking control of their health.

What is diabetes?

When someone has diabetes, their bodies have less ability to control blood sugar. This means that when eating carbohydrate containing foods, blood sugars may rise into a range that is considered unhealthy. Long term effects of uncontrolled blood sugar are: nerve damage in feet and hands, and damage to the kidneys and eyes.

Why does nutrition and exercise matter?

The effects of type 2 diabetes can be controlled by nutrition and exercise! You have the power to decide how you take care of your body. Exercising lowers blood sugar levels and decreases risk of diabetes. By eating balanced meals and snacks, blood sugar levels can remain at healthy levels. Talk to your healthcare provider for individualized advice for you or your family.

Balanced Snack examples!

Apple and Peanut Butter
Cheese and crackers
Tuna salad with fruit or crackers
Vegetables and Hummus
Cottage Cheese
Yogurt
Eggs
Avocado
Popcorn

Lesson 12: Maintaining a Healthy Weight

Whatever your goals for your health and weight may be, here are a few tips for maintaining a healthy weight.

1. Commit to movement.
 - Find things that you enjoy and keep moving! Walk on the beach or play a sport with friends and family.
2. Sleep!
 - Lack of sleep can lead to weight gain for a variety of reasons.
3. Take some time to manage your stress.
 - Stress can cause us to overeat and produces hormones that make it harder to lose weight.
4. Eat often, and eat breakfast!
 - Eating often and consistently having breakfast boosts our metabolism. Skipping meals slows it down.
5. Get in those fruits and vegetables!
 - People who eat the recommended amount of fruits and vegetables tend to weight less.