Abstract

Funders are increasingly requiring that only evidenced-based nutrition education approaches are used to promote health behavior change. The intent of this approach is to optimize nutrition education program effectiveness by integrating the best available evidence from research and practice. However, this requirement can undermine efforts of culturally unique areas to create their own practice-based nutrition education programs using real-world experience with local populations. Public health professionals working with SNAP Ed in Hawaii, home to a population with a rich cultural background, know this all too well. In light of recent SNAP Ed requirements mandating all states use evidence-based approaches for nutrition education, this paper seeks to explore the experiences of SNAP Ed in Hawaii with using evidence-based nutrition education programs for Native Hawaiian and Other Pacific Island populations. Using literature reviews, secondary data sources, and key informant interviews, this paper describes key ways in which Native Hawaiian and Other Pacific Island population differences should inform the development of practice-based nutrition education programs and the challenges and opportunities related to using Mainland evidence-based nutrition education programs for Hawaii SNAP Ed.
I. Background

An estimated 1.4 million Native Hawaiians and Other Pacific Islanders (NHOPI) currently live in the US, and this population is projected to grow to more than 2.6 million by 2050\textsuperscript{1}. The 2010 Census race category for NHOPI, including those of mixed race, refers to people of Native Hawaiian, Guamanian or Chamorro, Samoan, Polynesian, Micronesian, and Melanesian descent\textsuperscript{1}. Most NHOPI in the US live in Hawaii and California\textsuperscript{1}. Many racial and ethnic minorities lag behind whites in multiple indicators of poverty and health, and NHOPI are no exception. 2010 data from the Hawaii Community Health and Needs Assessment (CHNA) reveal that while Hawaii has, on average, a lower poverty rate than the US (9.6\% vs. 13.8\%), 18.2\% of NHOPI in Hawaii live in poverty\textsuperscript{2}. Though federal poverty levels (FPL) in Hawaii are 15\% higher compared to the standard FPL, this likely underestimates the total amount of persons in poverty, given the elevated cost of living in Hawaii and respectively lower average wages\textsuperscript{3,4,5}. In 2013, Hawaii’s average annual wage was only 88\% of the average annual wage for the entire US (see Figure 1)\textsuperscript{3}. Furthermore, second quarter data from 2014 show that the state of Hawaii currently has the highest cost of living with an adjusted consumer composite index (CPI) of 158.9\textsuperscript{4}. Groceries have an index of 157.4 and housing is more than double the “100.0” reference point with an index of 206.0\textsuperscript{4}. Data from the US Bureau of Labor statistics indicate that the unadjusted average CPI in Hawaii continues to climb at an elevated rate compared with the US average (see Figure 2)\textsuperscript{5}.

![Average Annual Wages, 2000-2011](image1.png)

Figure 1: Trends in average annual wages, Hawaii and US, 2000-2011\textsuperscript{3}.

![Average CPI Index, 2000-2011](image2.png)

Figure 2: Average Consumer Price Index, Hawaii vs. US, 2000-2011\textsuperscript{5}.
In 2013, the Economic Research Service reported that 17.5 million households were food insecure in the US, meaning 14.5% of Americans lacked consistent access to food due to having limited resources. The estimated food insecurity rate in Hawaii from 2013 was 12.9%. While only 10% of white households are classified as food insecure in Hawaii, 31% of mixed race households, and 48.5% of NHOPI households hold this classification. A recent study using data from the Behavior Risk Factor Surveillance System found that food insecure adults were 32% more likely to be obese than food secure adults (95% CI 1.17-1.50). The authors propose several explanations for this relationship including the possibility that food insecure individuals overeat when food becomes available, have mechanisms of more efficient energy storage in response to weight cycling, and tend to consume highly available and affordable high fat and high sugar foods.

The proportion of obese adults in Hawaii increased by nearly 40% from 2003 to 2010 (16.7% to 23.1%), with 28.3% of Native Hawaiians and 23.8% of Other Pacific Islanders falling into this category. Being obese increases the risk of developing chronic diseases such as type II diabetes, hypertension, heart disease, stroke, several kinds of cancer, and early death. Food insecurity in low-income adults has also been directly linked with increased risk of diabetes and hypertension, likely related to poor diet quality.

In Hawaii’s 2013 CHNA, heart disease, stroke, diabetes, and cancer were among the top 10 pressing health issues in the state, with NHOPI most often carrying the largest share of chronic disease burden compared to other ethnicities. Data from the CHNA reveal that NHOPI have substantially higher death rates from chronic disease compared to the state average (see Figure 3). Of the five major ethnic groups in Hawaii, Native Hawaiians have the highest incidence and mortality rate of cancer (see Figure 4). Researchers attribute this to Native Hawaiians’ increased likelihood to smoke tobacco and adhere to unhealthy diet patterns. Studying health disparities between NHOPI and other ethnic groups presents a challenge for two major reasons. Until 1997, there was no separate race category for NHOPI as they were included in the Asian and Pacific Island racial group in the majority of national data sets, a problem that still persists in some databases to this day. Secondly, there are often not enough Pacific Islanders relative to other major ethnicities, even in Hawaii, to generate comparable health estimates.

![Disease Specific Death Rates, 2009-2011](image)

Figure 3: Population death rates, per 100,000 persons for selected chronic diseases, Hawaii state average vs. NHOPI.
The major impact of lifestyle-related chronic disease in NHOPIs, paired with their increased likelihood to be food insecure, highlights the need for high quality and culturally appropriate obesity prevention and nutrition education targeting low-income members of this population. However, before tackling chronic disease burden in low-income NHOPIs, the high levels of food insecurity faced by this group must be addressed. In order to improve food access nationwide, the Supplemental Nutrition Assistance Program (SNAP) was created to partially subsidize the cost of food for low-income US residents. SNAP promotes food security in the nation’s most impoverished populations, while providing communities with increased revenue by improving low-income populations’ food purchasing power. SNAP provides millions of low-income families and individuals every year with billions of dollars in economic assistance to purchase food. In FY 2011, 21.1 million households received SNAP benefits, with 95% of households served living at 130% or less of the FPL.

Increasing the ability of low-income populations to purchase food is the important first step in addressing devastating rates of chronic disease, considering that obesity and increased risk of poor health often accompanies food insecurity. The second step is providing quality nutrition education that addresses modifiable risk factors for chronic disease, including poor diet and lack of physical activity. Comprehensive nutrition education includes direct opportunities for participants to build relevant skills as well as social and environmental supports for positive dietary and health behaviors. Nutrition education that is thoughtfully designed and implemented can encourage positive dietary behavior change.

The Food and Nutrition Service (FNS) of the USDA collaborates with state agencies, nutrition professionals, and other organizations to deliver nutrition education (SNAP Ed). SNAP Ed is designed specifically for US low-income populations, defined as those who have incomes below 185% of the FPL. SNAP Ed seeks to provide participants with the knowledge and skills to make healthy food choices within a budget, and to incorporate regular physical activity into their lives. By modifying lifestyle-related chronic disease risk factors through sustained behavior change, the ultimate goal of SNAP Ed is to reduce the disproportionate burden of nutrition-related diseases.
related chronic disease in low-income populations, most often racial/ethnic minority groups in the US\textsuperscript{13,16}.

Significant changes have recently been made to the national SNAP Ed program. Amendments to the Food and Nutrition Act (FNA) of 2008 according to the Healthy Hunger Free Kids Act of 2010 (HHFKA) and the \textit{SNAP: Nutrition Education and Obesity Prevention Grant Program} Interim Rule require that all state SNAP Ed plans include nutrition education as well as obesity prevention programs\textsuperscript{17}. This represents a shift away from the previous model of SNAP Ed solely providing individual and group level direct nutrition education. Now, states must also include policy, systems, environment and/or community-based interventions that focus on obesity prevention\textsuperscript{17}. Furthermore, all interventions and nutrition education must be evidence-based with a focus on behavior change; requirements that are becoming more common place among grants and other funding sources\textsuperscript{17}. The fiscal year 2015 SNAP Ed guidance describes an evidence-based approach as one in which high quality research and available evidence from practice are meaningfully combined\textsuperscript{17}. Evidence-based programs include both rigorously tested research-based interventions and practice based interventions, with evidence of effect from the field. Several databases are maintained that contain research-based and practice-based nutrition education programs appropriate for states to select for their SNAP Ed Plans\textsuperscript{17}. However, the effectiveness of these programs are often demonstrated in Mainland US, in states over 2,000 miles from Hawaii in both physical location and island culture.

Given the many differences between NHOPI in Hawaii and Mainland populations, evidence-based nutrition education programs (EBNEP) developed without consideration of these differences can result in programs that are not well-accepted or impactful in Hawaii SNAP Ed populations. This paper seeks to describe the challenges and opportunities related to the implementation of EBNEP for SNAP Ed with NHOPI low-income populations in Hawaii and to explore how NHOPI population differences should inform nutrition education program development. To explore this topic, interviews were conducted with 4 members of SNAP Ed implementing agencies in Hawaii, after they were given informed consent and made aware that information they provided would remain confidential. Relevant published literature was obtained from searches of PubMed and Google Scholar with key words such as “Pacific Islander”, “nutrition”, “diet”, “acculturation”, “evidence-based”, “implementation”, and “food culture”. Pertinent secondary data was obtained from Census reports, the Hawaii Community Needs and Health Assessment, SNAP Ed reports from the national website, and Research and Economic Analysis data from Hawaii.gov.

The first main section of this paper outlines some of the key ways in which NHOPI populations differ from Mainland populations. Interviewees expressed these differences as necessary components they felt were often missing from Mainland EBNEP. Literature and secondary data provide further insight into unique cultural aspects of NHOPI populations and supports the argument that locally developed, practice-based nutrition education programs (PBNEP) should be designed with these cultural aspects in mind to increase the likelihood of positive health behavior change in this population. The second major section of the paper describes SNAP Ed Hawaii’s experiences, informed by interviews, of adopting and adapting Mainland EBNEP in Hawaii. Finally, an example of a successful PBNEP developed in Hawaii is presented, followed by the discussion and main conclusions.
II. NHOPI Cultural Aspects Missing From Mainland Nutrition Education Programs

One interviewee describes Hawaii’s multicultural population as one that is “Not a melting pot...but forced to coexist”. The most ethnically and racially diverse state, Hawaii has no ethnic or racial majority group and nearly two-thirds of the population identifies as non-white (see Figure 5)\textsuperscript{3,18}.

![Hawaii Race Demographics, 2013](image)

Figure 5: Population racial breakdown for Hawaii, 2013 estimate\textsuperscript{18}.

The NHOPI population in Hawaii, in addition to Native Hawaiians, can refer to immigrants and descendants from innumerable cultural backgrounds as the Pacific Islands include thousands of island nations. 2000 Census Data revealed that nearly 20% of NHOPI were foreign born, compared with 11% of the total US Population. For several Pacific Island subgroups, over half of members were born outside the US (see Figure 6)\textsuperscript{19}.

![Nativity Status, 2000](image)

Figure 6: Native Status of selected Pacific Islander subgroups vs. total US population, and total US Pacific Island population, 2000\textsuperscript{19}.
Furthermore, the high proportion of mixed race NHOPI results an extensive blending of race, ethnicity, and culture. Nearly three quarters (72.4%) of the 491,238 NHOPI residing in Hawaii in 2010 identified as multiracial. This diverse background of NHOPI sets the stage for a multitude of food preferences, eating patterns, health beliefs, and health behaviors that differ from nutrition program target populations in the Mainland in ways that cannot always be entirely quantified. The sub-sections below highlight and describe some of these population differences identified by interviewees and suggest, based on available literature, why these differences should be considered in PBNEP development for NHOPI.

**Food Culture**

One interviewee described how Mainland EBNEP tend to conflict with Pacific Islander food culture by saying simply:

“The materials...use different recipes and foods than people eat here.”

Historically, meals in the Pacific Islands contained important starchy staples and accompaniments, including vegetables, meat, and/or seafood. In fact, language throughout the Pacific Islands reflects this division with words describing starchy staples as “real food” and the accompaniments as “foods to be eaten with the real food.” The traditional Hawaiian diet was rich in complex carbohydrates such as poi (fermented paste made from taro corm), taro, sweet potato, banana, and breadfruit. Their diet was supplemented with vegetables obtained from both the ocean and land, including sweet potato and taro leaves, ferns, and seaweed. Small amounts of lean meat, mainly fish or shellfish with some chicken and pork on special occasions, rounded out their diet. Most foods were traditionally eaten raw or steamed. Though colonization by the US has forever altered food habits throughout the Pacific Islands, Hawaii included, many NHOPI still regularly consume these traditional foods.

One recent study examined the correlation between type II diabetes, diet pattern, and ethnicity in participants living in a rural area on Hawaii Island. They found that Native Hawaiians consumed traditional Hawaiian dishes, often mixed with processed canned meats introduced to Hawaii by Western food commodity programs. The authors concluded that the animal fats added to foods or during meal preparation could contribute to higher rates of type II diabetes in Native Hawaiians. Another study in a multiethnic cohort of participants from California and Hawaii found that poi made up 5% of Native Hawaiians’ total vegetable intake.

Though only findings in Native Hawaiians are reported here, authors of both studies suggest that dietary change interventions should be developed to suit the unique food culture of diverse populations living in Hawaii. Due to the extensive blending of race and ethnicity in Hawaii, many NHOPI identify with multicultural backgrounds and therefore consume foods from a variety of cultures. This unique food environment includes not only Western influence on NHOPI diet patterns, but also influence from Japanese, Portuguese, Chinese, Filipino culture among others. This complex cultural influence results in a plethora of common foods and dishes completely unique to Hawaii. Therefore, it is necessary to incorporate specific food preferences and eating habits of ethnic populations in nutrition education programs in order to improve DGA compliance. The incorporation of both cultural group identity and specific food customs in health messaging for fruit and vegetable consumption is also necessary to promote pertinent and sustained health behavior change.
Though data on current food consumption patterns of other Pacific Islander groups living in Hawaii is limited, it is likely that these same key considerations for effective nutrition education programming in Native Hawaiians apply to other Pacific Islanders. The unique food culture in Hawaii, paired with the state’s highest proportion of NHOPI residents in the US, suggest that nutrition education program materials, messages, and objectives must be developed to suit food preferences and customs of NHOPI in order to promote improved compliance with DGAs and to improve health.

Social Connections to Food and Familial Decision Making

The role of family in determining food choices, the value of social learning, and collective decision-making were themes reflected in interviews and literature. A recent study exploring the cultural perceptions of Asians and Pacific Islanders with diabetes related to diet and exercise further explored some of these concepts. Participants in this study recalled internalization of childhood lessons related to the importance of never wasting food and having an abundance of food available in order to not bring shame on the family. Highlighting the effect of multicultural familial genealogy on food choices, participants mentioned the wide variety of carbohydrate-heavy ethnic dishes often eaten communally during familial and holiday celebrations. Pacific Islanders also share food to maintain and bolster familial connection and as a means to practice reciprocity with loved ones. The relationship between familial values and food consumption is a necessary consideration when developing nutrition education programs for Pacific Island populations.

NHOPI also tend to value social learning and program structures that allow for the attendance of multiple family members. One interviewee spoke of how participants’ grandchildren are welcome to attend her senior nutrition education classes to help out their non-English speaking grandparents,

“It’s usually with the older generation, they usually have their child or their grandchildren with them that’s translating. So the kids are in school here and then by the time they get home, we have the senior class and the grandchildren are there translating. So it’s helpful...”

Several studies have demonstrated that health interventions tend to achieve a larger benefit in NHOPI populations when family or close friends are also involved. One study compared the effects of a weight-loss maintenance program that included family members, and one that did not. The family intervention group could invite one friend or family member to each educational session, which focused on key areas such as family healthy goal setting, family meal planning, and familial trouble shooting of social situations involving food. The standard intervention included the same topics, but without familial inclusion. At the end of 6 months, participants in the family intervention were over 5 times more likely to maintain weight loss.

While Western culture tends to place more emphasis on individual decision-making, Pacific Island culture tends to favor collective decision-making. This emphasis on the group psyche is revealed in the tendency of group members to suffer silently and not reveal their true
desires at the risk of causing disharmony in the group. Traditionally, Hawaiian culture also tended to view Western medicine as dictatorial and conflicting with their more universal views of wellness, intertwined with spiritual and social customs. For both Hawaiians and Samoans, it is expected that sick family members will be taken care of by the family and this expectation can result in what may be perceived by outsiders as apathy toward preventative health care.28

Research and discussions with interviewees highlight that effective nutrition education programs for NHOPI need to be designed with both the participant and participants’ family in mind. Participants are much more likely to attend classes if they can bring along friends, family members, and/or small children27. The evidence also suggests a larger positive health impact from interventions can be achieved when the Pacific Island value of family involvement in health and decision making is incorporated into program design. Therefore, successful nutrition education programs serving NHOP should be designed with the entire family in mind.

**Acculturation**

Another theme brought up in interviews is that Mainland EBNERP sometimes attempt to reinforce behaviors and messages that are not readily accepted by NHOPI. One interviewee, with professional experience in Mainland US and in Hawaii, described the Mainland population as “more acculturated to Western culture.” She further explained how, in her experience, SNAP Ed on the Mainland often serves residents who have been in the US for several generations versus more recent Pacific Island immigrants. SNAP Ed in Hawaii also serves Native Hawaiian clients who may have or may have not assimilated to Western culture. Recent research has revealed that varying degrees of assimilation persist among Native Hawaiians (See Table 1)29.

<table>
<thead>
<tr>
<th>Acculturation Modes</th>
<th>% of Native Hawaiians in Each Mode</th>
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<tbody>
<tr>
<td>Integrated</td>
<td>Describes a high attachment to both ethnic and mainstream cultures</td>
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<tr>
<td>Separatist/Traditional</td>
<td>Retains a high attachment to ethnic culture only</td>
</tr>
<tr>
<td>Marginalized</td>
<td>Describes a low attachment to both ethnic and mainstream culture</td>
</tr>
<tr>
<td>Assimilated</td>
<td>Refers to high attachment with mainstream culture only</td>
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Table 1: Data from a study examining link between acculturation mode and type II diabetes in NH.29

The authors of the above study found that Native Hawaiians in the traditional mode of acculturation had the highest prevalence of type II diabetes20. The authors cite research with other racial and ethnic minorities suggesting that being in traditional and marginalized modes of acculturation can lead to higher degrees of “acculturative stress”. The feelings of depression associated with this stress might be related to type II diabetes risk30,31. Research suggests that Native Hawaiians experiences varying modes of assimilation to Western culture and assimilation status can influence health. Therefore, the degree of assimilation to Western culture should be considered when developing effective nutrition education programs for Native Hawaiians.
Other research has revealed that assimilation to Western culture is associated with weight gain and higher BMIs among many Pacific Island immigrants to Hawaii\(^2\). One recent study explored the relationship between obesity and acculturation among 4,455 hotel workers in Oahu, Hawaii\(^3\). Researchers found that a higher degree of acculturation to the US was associated with having a heavier BMI\(^3\). The authors suggested that the relationship between time in the US and BMI could be explained, at least partially, by changes in diet\(^3\). This research might suggest that identifying with Pacific Island culture could be more protective of health than identifying with Western culture.

Despite the strong Western influence in Hawaii, literature reveals that many NHOPi and Pacific Islanders maintain their own cultural health beliefs. One of these beliefs is related to cultural views about an appropriate healthy body weight. One study with low income NHOPi found that participants tended to think Caucasians and Europeans were supposed to be thin, while Pacific Islanders were meant to be larger\(^4\). Other research has revealed a similar belief persists in Native Hawaiians\(^5\).

Literature supports that the degree of assimilation to Western culture can influence body weight, diet patterns, and health perceptions\(^2\)-\(^5\). Therefore, developing comprehensive nutrition education programs highlighting healthy aspects of NHOPi food culture for those who identify more with their Pacific Island heritage might have real health benefit. Literature and interviews also support that the incorporation of NHOPi food preferences, customs, and health beliefs into nutrition education program design could lead to wider acceptance of health messages and yield a potentially greater impact on positive health behavior change.

**Nature Mediates the Connection Between People, Food, and Health**

For many cultures throughout the Pacific Islands, knowledge of when and how to plant traditionally relied on ancestral knowledge related to moon phases, tide, and time divisions within the year\(^2\). For Native Hawaiians, the health of the land is centrally connected to the health of the people. It is through this connection to land that Hawaiians obtained the knowledge of appropriate times to obtain and produce food, such as when to plant and fish. Many plants also serve not only as sustenance, but also as medicine to treat numerous health ailments, from diarrhea to stalled milk production in new mothers\(^6\). One contemporary study examining this practice of *la’au lapa’au*, traditional Hawaiian medicinal practices, created a list of over 150 plants used by Hawaiians for healing\(^7\). Many Pacific Island cultures look to nature to inform decisions about food production. Interviewees highlighted that nutrition education programs from the Mainland overlook the connection between the land (*āina*), the people, and their health. Connecting health to action within the belief system of NHOPi should be a necessary component of any nutrition program designed for this population.
IV. Implementing Evidence Based Nutrition Education Programs with SNAP Ed

The SNAP Ed guidance emphasizes that states are only required to use an evidence-based approach in all nutrition education programs, and are not required to select EBNEPs from available databases. The guidance describes evidence-based programs as being on a continuum. On one end are the systematically tested, peer-reviewed research-based interventions and on the other are the practice-based interventions with evidence of success from the field. Therefore, an allowable evidence-based approach can contain a combination of research-based and practice-based nutrition education programs. However, interviewees lamented that they lack staff and resources to develop new programs and to evaluate existing programs to the extent required to receive funding for allowable locally-developed PBNEPs. They also cite the lack of available research-tested interventions conducted with NHOPI. Limited resources, paired with increasing pressure to use only EBNEPs, is increasingly forcing SNAP Ed and other agencies in Hawaii to select EBNEPs that have only been tested in non-NHOPI populations for use in Hawaii, or risk losing funding altogether.

When interviewees were asked about their experiences with implementing EBNEP developed in the Mainland with NHOPI in Hawaii, they described a lot of barriers to doing so. These included lack of resources, lack of fit, and limited capacity to both implement programs as intended and to adapt them as needed. A recent report from the National Research Council describes common challenges to implementing evidence-based health programs in several non-mutually exclusive ways and highlights some of the same challenges Hawaii SNAP Ed experiences with Mainland EBNEP implementation. The three models of evidence based program implementation the authors discuss include adopting the evidence-based program as is, adapting the program to better suit the community, or having the community lead the implementation of health programs altogether, including involvement program development.

Adopting Evidence Based Programs As is

When EBNEPs are implemented in a different setting than where they were originally developed, challenges can arise. Though implementing the evidence-based program as is ensures a high level of program fidelity and increases the likelihood that the intended health outcomes will be met, the program may be a poor fit for both community resources and assets, might fail to address the same health outcomes desired by the community, and community ownership of the program could be missing, all of which can hamper program sustainability. In order to implement the evidence based program successfully as intended, basic requirements include both resources and capacity at the implementing agency, ongoing support from those who created the program, and/or training from those with necessary certification to promote program “fidelity, monitoring, supervision, and sustainability.”

Hawaii SNAP Ed has had challenges with finding and implementing EBNEP that are an appropriate fit for available community strengths and resources, including having enough qualified staff. One interviewee stated:

“...[W]hen someone is developing a full cost evidence based program, it’s done with highly skilled advisors, it’s monitored very closely, they have all the...
resources and that kind of thing. By the time you get it down to the community, you don’t have those same kinds of skill sets and professionals to actually implement it. You’re doing it with people who really don’t know anything about the background, these theories, and are just kind of reading it off the top of their head. They don’t do it to the same degree that a professional person implementing those kinds of curriculums would.”

This statement emphasis how in their experience with EBNEP implementation, Hawaii SNAP Ed sometimes struggles to implement with fidelity due to lack of sufficient qualified staff who understand the strategies and theories behind the program. This is an example of an EBNEP being a poor fit for community resources and strengths. Further highlighting this point, as one interviewee described, challenges can arise with maintaining evidence based program fidelity due to requirements for evaluation and monitoring.

“And even more so in the areas of evaluation, we’re finding that all programs want an evaluation but it’s expensive and there’s not enough resources to pay for all that evaluation. Or to implement that evaluation on a continual basis. To make sure there is fidelity in the program, continuously... and we kind of feel like we need to have something in place all the time to keep the program on track, because they kind of fall out of it when they try to do it themselves.”

Several interviewees cited “lack of resources compared to the Mainland” as a reason for the historical lack of success with implementing EBNEP with Hawaii SNAP Ed. Interviewees mentioned that some of the EBNEP require resources and infrastructures that are not in place in Hawaii. As a result, the same intervention that may cost less in terms of resources, staff, and start up in some places in the Mainland would cost more in Hawaii. One interviewee stated:

“... if we do use an evidence based curriculum, if we tweak it in any way, it’s not considered evidence based and we have to get approval or work with the agency that developed the curriculum, and that’s not possible for every single situation. For every single community. Especially us, cause we don’t have those resources. We don’t have whole staff or even a whole person dedicated to [implementing] one strategy. It’s like one person doing ten different things.”

Adapting Evidence Based Programs

Due to the emphasis on program fidelity, implementing the evidence-based program as is can neglect often-necessary adaption of the materials to better suit the cultural needs and interests of the community. Though adapting the EBNEP program to meet community needs is beneficial because it may better fit both the communities’ capacity and desires, it can also result in reduced impact due to core intervention component modifications. At present, limited evidence is available on how to successfully maintain the balance between keeping the core elements that make the evidence based program successful and adapting the program to meet community needs. Extensive program adaption can also be very expensive and require a lot of time and resources many community organizations do not have. Several interviewees cited a lack
of resources to adapt EBNEP to the extent that would be needed for Hawaii’s SNAP Ed eligible population. One interviewee, speaking on an attempt to adapt a specific EBNEP said:

“It’s very different in Hawaii, because the crops are different, and even like, essentially any curriculum that comes from the Mainland, in order for it to be effective in Hawaii, we have to redo the whole thing, the pictures and everything. When our population looks at people with shoes, [different kind of] clothing, even racial differences, they don’t relate to it. And the foods are really different, available crops are real different...we didn’t have the staff to redo the whole thing.”

While adapting an EBNEP for just one community can be cost prohibitive, there would be a need to tailor the curriculum for numerous multicultural communities across and within the habitable Hawaiian islands.

“It doesn’t fit for every single community cause you can see that the community of Kalihi is very different from the community of the Big Island and very different from like Waianae and Waimanalo. So that’s part of the problem.”

Adapting an EBNEP to fit community needs requires extensive time and resources. Furthermore, USDA SNAP Ed funds do not directly support the extensive adaption of EBNEP to meet community needs because once a program is adapted; it is no longer considered evidence based, but practice-based. USDA does not fund the development or evaluation of programs not currently being used under the approved SNAP Ed Plan, as this is considered research. Interviews reveal that Hawaii SNAP Ed staff lack time and resources to devote to adapting EBNEP while simultaneously running the programs that are currently approved.

Community Led Program Implementation

Community led program implementation and development can lead to increased community ownership of the program, contribute to better collaboration across community sectors, result in program evaluation that is more acceptable to the community, and increase likelihood of program sustainability. The challenges associated with this method include more time required to develop the program, possibility of poor impact on health outcomes, and difficulty with the acquisition of funding to support community developed programs. Described below is an example of a locally developed PBNEP from Hawaii. It serves as an example of how community input into the development of the program increased community acceptance and ownership of the initiative. This PBNEP also demonstrates preliminary evidence of success toward achieving intended health outcomes.

Example: Project Zest

In 2007, Kalihi-Palama Health Care Center (KPHC), located in the Farrington neighborhood in Honolulu, implemented a community led PBNEP designed with Hawaii’s multiethnic and multicultural low-income population in mind. Farrington is one of the most diverse neighborhoods in Oahu, with 15.6% of residents in this neighborhood having immigrated
to Hawaii from another country in or after 1990 and 95.4% of the residents identifying as nonwhite (vs. Hawaii state average of 6%, 73.4%, respectively)\(^{18,27,40}\). The second-highest population of NHOPI in Hawaii resides in this neighborhood and over half of residents (54.6%) report speaking a non-English language in their households\(^{40}\). Compared to the rest of the state, residents in this neighborhood have lower per capita incomes, higher unemployment rates, own fewer homes, and receive more federal benefits, including SNAP and welfare\(^{40}\). Farrington contains a neighborhood that is one of two priority areas in Hawaii’s SNAP Ed Plan\(^{41}\).

KPHC’s Project Zest was designed specifically for multiethnic populations who qualified for federal food benefit programs\(^{27}\), and streamlined nutrition education and core messages in all of KPHC’s programs and activities in health promotion and disease prevention. The goals of Project Zest were to make participants more accustomed to local fruits and vegetables, improve their KSA and self-efficacy to make healthier meals, and to ultimately increase their F/V intake\(^{27}\).

KPHC developed the program using input from community members, which led to the creation of the key message “Eat the Rainbow”, which, formative research revealed, was received successfully by target population. Further formative research conducted with the target population suggested most people were in early stages of behavior change, and the program sought to move participants from pre-contemplation to contemplation or action stages for dietary behaviors. KPHC developed the curriculum to target specific constructs of the Transtheoretical Model and Social Cognitive Theory (self-efficacy, KSA, social support), as they determined these theories best fit their goals for behavior change in the target population\(^{27}\).

The first component of Project Zest was a cohesive set of lessons designed to be integrated into existing KPHC health promotion programs, called nutrition education modules (NEMs). The next component was the Community Food and Fitness Modules (CFFM) that were designed to be used in community outreach at other health centers, agencies, and housing projects. CFFM were also designed for use with elementary age children. Project Zest also established both a community advisory board and a provider stakeholder board to inform project development, implementation, and evaluation\(^{27}\).

Project Zest was well designed to address multiple barriers and challenges that often arose when attempts were made to implement Mainland EBNEP. In order to effectively convey key nutrition education messages to a target population with varying levels of literacy and English proficiency, highly visual and hands-on methods of learning were used. PowerPoint presentations contained key messages paired with pictures of typical meals for NHOPI and common produce found in Hawaii. All classes had cooking demonstrations in which participants could taste test healthy adaptions of familiar foods. These healthy recipes were also taste tasted by the community advisory board established for the project and eventually developed into professionally designed and easy-to-follow recipe cards\(^{27}\).

Social learning was prioritized, and the nature of program made it easy for social groups to attend. For example, if one friend or family member was referred to the program, then this person could bring several individuals with them (young children, grandparents, friends, etc.). The program design also allowed for rapport building through opportunities for individualized
education/conversation with dietitian, which many participants felt was tantamount to their program participation. To address language barriers to nutrition education, staff translators attended classes and program materials were translated into multiple languages. To reach those in very early stages of behavior change that were not quite ready to commit to nutrition education, key messages were provided in brochure form and widely distributed in clinics and community outreach events.

Project Zest also addressed key barriers to nutrition education program attendance often faced by low-income participants (i.e., lack of transportation, limited time due to family/work duties) by allowing flexibility in program attendance. Classes were designed as a “repeating series of connected units” which incentivized total attendance instead of the attendance of all classes in a particular sequence. Qualitative evaluations, suitable to the community being evaluated, suggested that the program was successful in achieving program objectives and was very well received by the community.

Although the project did an excellent job of addressing key barriers and serving a unique population effectively, there was room for improvement. Results from the qualitative evaluation suggested program restructuring might be needed to increase contact hours. As staff became busy with preparing food for demonstrations, they had less time to mingle with participants, which was very important for participant satisfaction and reinforcement of key messages. More training was needed so that staff could effectively and appropriately deliver the program to multiethnic low literacy populations; when students tried to deliver the main PowerPoint presentations, clients tended to appear confused and uninterested. Slowly the three staff that pioneered the creation of the program have dwindled to one, and shrinking financial resources currently challenge program sustainability.

Project Zest highlights the ability of Hawaii’s public health leaders to work with a diverse community to develop an effective PBNEP for SNAP Ed. Unfortunately, limited funding and staff to support the continued development and evaluation of this program presently hamper its future growth and potential for success as an effective PBNEP. Though Project Zest development was partially funded by SNAP Ed, this was before the new evidence-based requirements became mandatory and current funding does not support further project development. Unfortunately, this limits Hawaii SNAP Ed’s ability to deliver a culturally appropriate nutrition education program with demonstrated success in a NHOPI population in a neighborhood of high need. SNAP Ed currently funds the community outreach aspects of Project Zest, but not the direct nutrition education components provided by the NEMs. In order for Project Zest to receive full approval as a PBNEP, and to use their locally developed curriculum, more evaluation, documentation, and changes in program structure are needed, but these changes are presently not possible with available resources. This tension between limited resources and strict requirements for SNAP Ed puts the implementing agencies in a difficult place. This pressure increases the likelihood that agencies are forced to select mainland EBNEPs to cut costs, and limit plans to develop their own PBNEPs, which though they are likely more effective in their population, are also not funded. One interviewee stated simply,

“To be honest I am a little stuck at this point.”
Leveraging Existing Resources: Freedom within Constraints

The new SNAP Ed requirements call for states to use an evidence based approach and/or EBNEPs as much as possible while also pairing direct nutrition education with environmental level supports to healthy eating and physical activity \(^1\). Though Hawaii SNAP Ed has faced challenges with implementing and adapting Mainland EBNEPs, and with receiving adequate funding to use their own locally developed PBNEPs, they have managed to be successful in other ways. For example, one SNAP Ed implementing agency has been able to use data from another federal nutrition education program, the Expanded Food and Nutrition Education Program (EFNEP), to demonstrate success with locally developed PBNEP in low income populations. This has allowed them to receive approval for all of their nutrition education programs, based on evidence that their programs are locally effective. In another triumphant example of success, after the USDA refused to fund one locally developed and widely accepted PBNEP, because the curriculum was not “evidence-based”, a community organization stepped up and paid for the program to continue.

Coalitions have also been formed with community agencies and organizations to leverage available resources and spend increasingly limited funds in ways that are both impactful and important to the community. Describing a specific coalition, one interviewee stated:

“ That group is highly is highly vested and they do have a lot of interest. And they pull whatever resources they have to make more things happen. Even when you see [one particular community agency], I mean, they can’t add anymore because they’re stretched thin, but you know when we meet, that little bit of synergy propels the work a little bit further. ”

V. Discussion & Summary

Nutrition education can be an effective way to provide low-income populations with knowledge and skills to improve healthy behaviors within the constraints of limited resources. There are three key requirements for the effectiveness of nutrition education and promotion that work within the social ecological model (see Figure 7)\(^1,42,43\). The first step in effective nutrition education is relevant skill building to promote positive changes in dietary behavior. Environmental and policy changes that support healthy eating are critical for encouraging the use of these behaviors. Finally, both “integrated initiatives” and social marketing are needed to increase community acceptance and support of healthy dietary behaviors\(^15\). 2015 FY Guidance for SNAP Ed requires states to incorporate these components into the development of comprehensive state SNAP Ed plans\(^17\). Databases have been developed that contain many research- and practice-based EBNEPs for states to use in their SNAP Ed Plans. However, Hawaii SNAP Ed has had limited success with selecting EBNEPs from these databases due to limited availability of research-based and practice-based interventions developed in NHOPI populations.
In an example of unsuccessful EBNEP implementation found in the literature, *Hip Hop to Health Jr*, a research-based health program, was proven to be effective at reducing weight gain in a population of black children, but not Latino children. Reasons authors cited for the null results was the lack of attention paid to parental involvement with “less-acculturated” Latino Parents and lack of consideration of Latino body image preferences and food preferences. These are also key population differences between NHOPI and whites as revealed by interviews with SNAP Ed implementing agency staff in Hawaii and secondary data. Failure to account for and develop EBNEP to suit culturally distinct NHOPI populations could result in an inability to achieve desired health outcomes, at a time when they need them the most. NHOPI are one of the most disadvantaged groups in Hawaii, with poorer health outcomes and increased chronic disease mortality. Furthermore, program adaption of existing EBNEP can be cost and time prohibitive to resource-poor agencies serving diverse populations in Hawaii.

Examples exist in Hawaii highlighting the possibility of relying on local knowledge and experiences to develop EBNEP that are more appropriate for NHOPI needs. However, current funding for many grants and SNAP Ed is contingent on the use of an evidence-based approach, which means limited resource and culturally unique areas like Hawaii must select EBNEPs from the Mainland. These requirements can hamper local development of PBNEPs in Hawaii and the risk of losing funding undermines existing community efforts that could potentially be more effective. Hawaii’s programs support and encourage the population differences that make NHOPI so unique and support the achievement of health outcomes important to the communities they serve. One nutrition educator spoke about how she knows what she teaches is affecting change in her community:

“They always come up to me if I see them, in the grocery store. They’re like “look at my wagon, look at my wagon, I’m eating healthy!”...so you can see it,
whenever I see them they’re face lights up. They’re happy to see me, not dodging me in the aisle like, “I have all this junk food in my cart”. So I know that it’s hitting them and that they’re observing everything so it’s good.”

This paper has several strengths and limitations to be considered. One strength of this work is the fresh approach to integrating challenges to implementing EBNEP as gleaned from interviews with SNAP Ed staff in Hawaii, secondary data and existing literature. Limitations include the limited timeline for writing this paper that prevented conducting both more interviews and more in-depth interviews with the selected interviewees. The assertions in this paper are based on interviews with 4 staff members in SNAP Ed implementing agencies in Hawaii. This, combined with limited published research available on Pacific Islanders in Hawaii makes it difficult to develop specific evidence-based recommendations for NHOP (North Pacific) nutrition education programs within this paper.

More research related to acculturation and food customs and preferences in Pacific Island populations is needed as well as more research in understanding the experience of NHOP (North Pacific) who participate in SNAP Ed programs in Hawaii and their suggestions for improvement. More research is also needed in the area of EBNEP cultural adaption. At present, limited evidence exists to determine the key ways in which the EBNEP must be adapted to fit a population’s needs while maintaining the key components that are necessary for effectiveness. Also, more collaboration is needed with national agencies and local organizations to increase the availability of PBENP developed in NHOP (North Pacific) and other ethnic groups for dissemination in nationwide databases.

NHOP (North Pacific) populations in Hawaii have some of the highest chronic disease related mortality’s in Hawaii and are more likely than most to live in poverty and be food insecure. Health promotion and disease prevention through highly tailored nutrition education programs is absolutely necessary. Though Hawaii has been successful in leveraging existing (and often limited resources) to reach this population, support of local knowledge in developing effective nutrition education programs is a necessary step in the road to achieving health equity in the Hawaii.
References


