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Translating Diabetes Prevention into Native Hawaiian and Pacific Islander Communities: The PILI ‘Ohana Pilot Project

Marjorie K. Mau[1], **Joseph Keawe‘aimoku Kaholokula**[1], **Margaret R. West**[1], **Anne Leake**[2], **James T. Efird**[1,3], **Charles Rose**[7], **Donna-Marie Palakiko**[4], **Sheryl Yoshimura**[5], **Puni B. Kekauoha**[6], and **Henry Gomes**[7]

[(1)]University of Hawai‘i, Center for Native and Pacific Health Disparities Research, Department of Native Hawaiian Health, John A. Burns School of Medicine

[(2)]Kalihi-Pālama Community Health Center

[(3)]Center for Health of Vulnerable Populations, Office of the Dean, School of Nursing, University of North Carolina at Greensboro

[(4)]Ke Ola Mamo, Native Hawaiian Health Care System of O‘ahu

[(5)]Kōkua Kalihi Valley Comprehensive Family Services

[(6)]Kula no nā Po‘e Hawai‘i, Papakolea Homestead Community

[(7)]Hawai‘i Maoli, Association of Hawaiian Civic Clubs

Abstract

Objectives—Native Hawaiians (NHs) and Other Pacific Islanders (OPIs) bear an excess burden of diabetes health disparities. To address this, Community-based Participatory Research (CBPR) approaches were used to: 1) culturally-adapt the Diabetes Prevention Program Lifestyle Intervention (DPP-LI) for NHOPI communities; and 2) implement and examine the effectiveness of the culturally-adapted program to promote weight loss in 5 NHOPI communities. .

Methods—Informant interviews (n=15) and focus groups (n=15, 112 NHOPI participants) were completed to inform the cultural adaptation of the DPP-LI program. A team of 5 community investigators and 1 academic research team collaboratively developed and implemented the 12-week pilot study to assess the effectiveness of the culturally-adapted program.

Results—A total of 127 NHOPIs participated in focus groups and informant interviews that resulted in the creation of a significantly modified version of the DPP-LI, entitled the PILI ‘Ohana Lifestyle Intervention (POLI). In the pilot study, 239 NHOPIs were enrolled and after 12 weeks (post-program), mean weight loss was −1.5 kg (95%CI −2.0,−1.0) with 26% of participants losing ≥3% of their baseline weight. Mean weight loss among participants who completed all 8 lessons at 12 weeks was significantly higher (−1.8 kg, 95%CI −2.3, −1.3) than participants who completed less than 8 lessons (−0.70 kg, 95%CI −1.1, −0.29).

Conclusion—A fully engaged CBPR approach was successful in translating an evidence based diabetes prevention program into a culturally relevant intervention for NHOPI communities. This pilot study demonstrates that weight loss in high risk minority populations can be achieved over a short period of time using CBPR approaches.

Keywords

Native Hawaiian; diabetes mellitus; other Pacific Islander; diabetes prevention; obesity

Native Hawaiians (NHs), the indigenous people of Hawai‘i, comprise the largest proportion of individuals (46%) federally-designated as “Native Hawaiians and Other Pacific Islanders” (NHOPI) in the US. (1) Although NHOPIs comprise less than 1% of the US population, they have a greater burden of diabetes, pre-diabetes and other associated diseases than Whites. (2-4) Grandinetti et al reported the age-adjusted prevalence of diabetes mellitus and impaired glucose tolerance in NHs as 22.7% and 15%, respectively. (3) NHs have a diabetes mortality rate that is 3-times higher than Whites. (5) The prevalence of overweight/obesity is 82% for NHs, which is considerably higher than the national prevalence of 53%. (2,6) Thus, there is strong scientific evidence that NHOPIs are a high risk population with substantial obesity-related health disparities, such as diabetes.

The Diabetes Prevention Program (DPP) was the first clinical trial in the US to demonstrate that modest weight loss (5-7% of weight) in a lifestyle program could prevent or postpone the onset of Type 2 diabetes mellitus (T2DM). (7,8) The DPP Lifestyle Intervention (DPP-LI) curriculum is one of the few clinical trial interventions that have been translated into a number of diverse settings (9-16). Although the DPP clinical trial included 45% racial/ethnic minority individuals and was found to be efficacious across all racial/ethnic groups, no results were reported for NHOPIs, disaggregated from Asian participants. (7) Thus, the process of how best to translate the DPP-LI from clinical trial (efficacy study) into public health practice, especially among high risk minority populations, remains a topic of considerable interest to the research community, the lay public community, public health advocates and policy makers. (17-21)

Few studies have evaluated the use of CBPR approaches to facilitate the translation of empirically tested programs from clinical trial to community practice. The model of CBPR approach utilized in this pilot project fully embraced the concept and practice of CBPR by involving the community partners in all aspects of the research process from conceptualizing the research question, to conducting the study, to collecting and interpreting the data and to publishing and presenting the results. (22-25) In this paper, we describe the process undertaken by community and academic researchers of the PILI (**P**artnerships for **I**mproving **L**ifestyle **I**nterventions) ‘Ohana Project to use CBPR approaches to culturally-adapt the DPP-LI and conduct a pilot study to examine the effectiveness of the modified DPP-LI, called the PILI ‘Ohana Lifestyle Intervention (POLI), in NHOPIs communities. The purpose of this paper is to: 1) describe the community-based participatory research (CBPR) process used to culturally-adapt the DPP-LI for NHOPIs; and 2) present results of a pilot study examining the feasibility and effectiveness of the POLI to promote weight loss in NHOPIs.

METHODS

Our CBPR Partners and Process

The community partnering organizations represented 3 types of community-based organizations: 1) Community health centers (CHC): Kokua Kalihi Valley Family Comprehensive Services and Kalihi-Pālama Health Center, 2) A Native Hawaiian health care system: Ke Ola Mamo, and 3) Grassroots organizations: Kula no nā Poʻe Hawaiʻi, a Hawaiian Homestead organization, and Hawai‘i Maoli of the Association of Hawaiian Civic Clubs. The academic partners were researchers from the Department of Native Hawaiian Health at the John A. Burns School of Medicine of the University of Hawai‘i.

The CBPR process that was implemented in this study involved 5 community partners who had worked collaboratively with the academic organization for several years but, never previously partnered with an academic entity to conduct research using a fully engaged CBPR process.(26) Briefly, a key feature of the CBPR process used in this study was the establishment of a co-equal partnership of Community Investigators (CIs) and Academic Investigators (AIs) involved from the inception of the study to integrate the best combination of community

wisdom and scientific knowledge. (26) Challenges to maintaining scientific rigor while engaging NHOPI communities were balanced with the opportunities to build capacity for research in these communities and to capitalize on each other's strengths and assets.

Cultural Adaptation of the DPP-LI Program for NHOPI Communities

Three sequential research activities were completed to inform the modification of the DPP-LI for use in NHOPI communities: 1) Focus Groups and Informant Interviews; 2) Cultural adaptation of the DPP-LI for applicability across NHOPI communities, and 3) Pilot testing of the POLI (culturally-adapted DPP-LI). The partnering organizations (5 communities and 1 academic department) formed the Intervention Steering Committee (ISC) of the PILI 'Ohana Project which oversaw the process of translating the DPP-LI and the implementation of the pilot study. Training on research methodology for all phases of the study (focus groups, interviews and lifestyle intervention) were conducted by the AIs to assist CIs in standardizing data collection across all 5 sites. Refresher training sessions also were held at each community site by an AI to ensure consistency and fidelity of the intervention

Activity 1: Focus Groups and Informant Interviews

Each CI conducted 3 focus groups (total 15 focus groups) and 3 informant interviews (total of 15 interviews) to obtain information from community residents, leaders (e.g. respected elders) and health professionals (e.g., physicians and nurses) that would inform the adaptation of the DPP-LI. Using group seminars, didactic instructions and mock focus groups, AIs provided standardized training for the CIs on appropriate strategies to lead focus groups and interview key informants.

Focus Groups—The purpose of the focus groups was to gather qualitative data about the ideas, concerns, and perspectives of community members regarding obesity-related issues in the respective communities. The ISC formulated the focus group questions that targeted: 1) Motivation to participate in a weight loss maintenance program; 2) Influences of family, friends, and community on individual weight loss maintenance behavior; and 3) Ideas about how to address the problem of overweight/obesity in their community. Focus group participants were recruited using community flyers and newsletters. The focus groups were conducted in language for the Chuukese (a Pacific Islander ethnicity), Filipino and Samoan groups. Responses to the focus group questions were audio recorded and summarized in session by a recorder using a flip chart. Guided by the social action theory of behavior change (27) and using a thematic data analysis approach (28), the ISC analyzed the focus group data jointly.

Informant Interviews—Community Investigators (CIs) also conducted 15, 1-hour semi-structured informant interviews with community leaders across the 5 different NH/OPI communities. The community leaders interviewed were from social and civic organizations within their community and were persons with intimate knowledge about their community's health-related concerns and included teachers, physicians and other health care providers, religious and spiritual leaders, and community advocates. These audio recorded interviews were conducted by pairs of CIs, with extensive note taking and sharing of observations immediately after the interviews. Key informants were asked their thoughts about the impact overweight/obesity was having in their community, the obesity-related needs of, and available resources in, their community, and their ideas on what should be done to address the problem of overweight/obesity. (29)

Activity 2: Community and Cultural Adaptation of the Diabetes Prevention Program's Lifestyle Intervention (DPP-LI)

Consistent with CBPR philosophy, all members from the 5 community partners and the academic partner were involved in the analysis and interpretation of the qualitative data (focus groups and interviews) to inform the cultural and community adaptations of the DPP-LI. The ISC met regularly (weekly or bi-weekly) to review the original DPP-LI Program. Each of the sessions' material from the DPP-LI was rewritten to simplify the language, incorporate local examples and reformat for group learning and interaction. The ISC also incorporated themes and strategies from the qualitative data from their communities into the core features of the DPP-LI. (30)

Activity 3: Pilot Study of the PILI 'Ohana Lifestyle Intervention (POLI)

A series of eligibility screenings were conducted by the CIs over a 3-month period to identify potential volunteers for enrollment. Intervention participants were recruited at each site using flyers posted at the community sites, articles in newsletters, word-of-mouth and flyers handed out to clients/community members as they came into the community organizations for services or activities.

Eligibility was defined as: a) self-identified Native Hawaiian, Filipino or other Pacific Islander ethnic background (e.g., Chuukese, a Pacific Islander ethnicity; Samoan); b) ≥18 years or older; c) overweight/ obese defined as BMI ≥ 25 kg/m2 (for NHOPIs) or ≥ 23 kg/m2 (for Filipinos); (31) d) willing and able to follow a behavioral weight loss program that may involve 150 minutes of brisk walking per week (or equivalent) and a dietary regimen to induce weight loss of 1-2 lbs per week; and e) Identify at least 1 family member, friend, or co-worker to provide support throughout the study duration. Participants with co-morbid conditions (i.e. diabetes, hypertension, etc.) were advised to obtain approval from their primary care provider prior to participating in this study. All sites enrolled 6-12 participants at a time prior to starting each 8-lesson, group intervention program.

Pilot Testing of the POLI: Clinical Assessments and Procedures—Baseline assessments were performed by CIs using standardized protocols for data collection on demographics, medical history, clinical measurements, physical functioning, dietary and physical activity behaviors. Blood pressures were obtained in duplicate using an automatic blood pressure device (HEM-907XL IntelliSense). Body weight and height was measured in duplicate using an electronic scale (Tanita BWB800AS scale) and a stadiometer (Seca 222) according to protocol. All repeated measures were computed as the average of two recorded values. Body mass index (BMI) was computed as body weight in kilograms divided by height in meters squared. Self-reported medical history (high blood pressure, arthritis, diabetes, heart problem, kidney problem, and eating disorder) was recorded on the eligibility screening form and validated against medical charts for a random sample of participants. Participants with pre-existing or newly diagnosed co-morbid conditions were referred to their primary care provider for medical follow up as needed.

Physical functioning was assessed using the 6-Minute Walk Test (6MWT) that measures the distance a person is able to walk in 6 minutes. (32) At each community site, participants were asked to perform the 6MWT using a fixed lap distance of either 60 or 100 ft. Participants were asked to walk as briskly as possible (without running) for the allotted period of 6 minutes and told that s/he could pause to rest if needed but to resume walking as soon as they were able. The brief Physical Activity Questionnaire (PAQ), a previously validated 3-item self-report questionnaire, was used to assess the frequency and change in moderate and vigorous physical activity during the past month. (33) Frequency for moderate and vigorous activities are rated on a scale from 1 (>4 times per week, more active) to 4 (rarely or never, less active). Eating

behavior was assessed using an 18-item modified version of the Eating Habit Questionnaire (EHQ). (34,35) The EHQ assesses the frequency and types of foods a participant consumed in the past month and is scored according to a 4-point Likert scale ranging from 1 (Always) to 4 (Never).

Within 2 weeks of completing the baseline assessment, participants received the POLI delivered by trained community peer educators. The first 4 lessons were offered weekly and the 4 remaining lessons delivered every 2 weeks for 2 months for a total of 12 weeks. Within 2 weeks of completing the POLI, participants underwent post-program assessments (i.e., 12-week follow-up) on the same measures taken at baseline (except measured height).

Statistical Analysis

All data collected was entered into a database by CIs at each site and transferred to the AIs as a de-identified file into SAS (version 9.1) where data cleaning and statistical analyses were performed. Physical activity was computed as the average PAQ response of moderate and vigorous physical activity with 1 indicating more active and 4 indicating less active. A dietary fat intake value was computed using a composite scoring algorithm for the Eating Habits Questionnaire in which a score of ≥ 2.5 indicated a daily caloric intake of dietary fat of >30% of total calories (above target goal). (34) Mean differences in clinical and behavior measures at 12 weeks (post-program) minus baseline (pre-program) were assessed for statistical significance using paired t-tests. Normal theory 95% confidence intervals also were computed for parameter estimates.

This study was approved by the Committee on Human Studies at the University of Hawai'i and the Native Hawaiian Health Care Systems Institutional Review Board. All participants gave signed informed consent prior to enrollment.

RESULTS

Focus Groups and Informant Interviews

A total of 15 focus groups were completed that included 112 NHOPIs comprised of NHs (44%), Chuukese, (17%), Filipinos (15%), Samoans (14%) and other PIs (10%). Four major themes and several associated strategies per theme were identified: 1) Food-Related Issues (i.e. portion and stimulus control, using economical meal planning), 2) Physical Activity-Related Issues (i.e. exercising in groups), 3) Social Support Issues (i.e. changes in eating made by the entire family, eating together more often, time and stress management, targeting self-efficacy in making healthy lifestyle changes), and 4) Community Assets (i.e. using existing community resources such as farmer's market).

Further grouping of the qualitative data resulted in the following domains: 1) Social/Community Influences, 2) Family Influences, 3) Individual Influences, and 4) Weight Loss Strategies. Because of the strong endorsement of family values and group orientation of NHOPIs across all 5 sites, we were particularly interested in identifying social/community and family factors that influenced individual behaviors, a key focus area of the DPP-LI and thus the POLI. Therefore, the first 3 domains and the relevant themes were used to formulate an empirically derived conceptual model of weight loss specific to NHOPIs to guide the transformation of the DPP-LI into the PILI 'Ohana Lifestyle Intervention (POLI) (see Figure 1). This conceptual model is also consistent with existing ecological models of health behavior and reinforces the qualitative data findings reported in this phase of the study. (36)

Cultural Adaptation of the Diabetes Prevention Program Lifestyle Intervention (DPP-LI)

Several members of the ISC had past experiences and insights regarding lifestyle programs provided in their respective communities and recognized that a balance was needed between the frequency of the sessions (i.e. time commitment) and the ability of the intervention to achieve its ideal weight loss goals. A compromise was established in which the adapted version would include 8 lessons (vs. 16 sessions in the DPP) lasting 1-1/2 hrs or less and the entire intervention would be delivered over 12 weeks (vs. 24 weeks in the DPP).

Guided by the new conceptual model of weight loss derived from the focus groups and informant interviews, the ISC decided on a delivery model using community-peer educators in small groups of 6-12 individuals located in a community setting as the most feasible mode of delivery. (37,38) As suggested by Gilliland et al, the success of any program adaptation is dependent on similarities between cultural perspective and community needs. (39) The original DPP-LI curriculum underwent significant modifications to ensure that the materials were both culturally and linguistically appropriate for the NHOPI communities and delivered in a manner that would maximize participation.

Finally, based on the ISC discussions of the qualitative data, a consensus of CIs identified the following additional topic areas across all 5 community sites: 1) economics of eating healthy and 2) communicating more effectively with your doctor. (40,41) The lower socioeconomic status of the communities involved and the idea that NHOPIs' find it difficult to discuss personal matters with their doctor in a brief time-restricted medical visit were the reasons for including the additional lessons.

The final modified curriculum product was then graphically-enhanced to depict the ethnic diversity of the communities in a culturally-acceptable format and design (See Table 1: Summary of Adaptations). For translational purposes, 5 additional modifications were made related to delivery methods that contrasted with the original DPP-LI delivery method. The modifications included (DPP-LI vs. POLI): 1) individual vs. group delivery; 2) health professional delivered vs. community peer educator delivered; 3) 16 sessions delivered over 24 weeks vs. 8 lessons delivered over 12 weeks; 4) No additional topic areas vs. 2 additional topic areas; 5) Wording as provided in DPP-LI vs. wording changed to "plain language" with cultural/linguistic relevance to NHOPIs. In summary, we utilized a CBPR approach to significantly modify the DPP-LI curriculum and delivery protocol through a heuristic process, to create a modified version of the intervention entitled the POLI which was designed specifically for use in NHOPI communities.

Pilot Study Results of the PILI 'Ohana Lifestyle Intervention (POLI)

A total of 468 NHs/OPIs were screened for the POLI study, of which 372 (79% of the 468) were found eligible and 239 (64% of the 372) participants were enrolled. The mean age of participants was 49 years (SD=14) and the majority of participants were women (83%) and self identified as either Native Hawaiian (52%) or Chuukese (27%). Half of all participants (51%) had at least some college or technical training and 52% were currently married. The most frequently self-reported medical condition was high blood pressure (38%) followed by diabetes (26%), with 14% (n=33) of participants reporting a history of both.

A statistically significant improvement was observed in all of the clinical and behavioral measures at baseline (pre-program) versus 12-week follow-up visit (post-program). The mean change in weight (−1.5 kg, 95%CI −2.0, −1.0) from baseline for the entire group was modest (~1.5%). Mean systolic (−6.0 mmHg, 95% CI −8.5, 3.5) and mean diastolic blood pressure (−2.8 mmHg, 95% CI −4.4, −1.3) measures also were lower at 12 weeks. Similarly, mean physical functioning improved as measured by an increase in distance traveled (42 ft, 95%CI

25, 58) during the 6 minute walk test. Lifestyle behaviors of mean dietary fat intake (−0.27 points, 95% CI −0.32, −0.22) and mean physical activity (−0.46 units, more active, 95% CI −0.63, −0.29) also were improved compared with baseline (Table 3). In all, 26% and 11% of the participants lost ≥3% and ≥5% of their baseline weight, respectively, at the end of 12 weeks. For the 128 (76% of the 239) participants who attended all 8 POLI lessons, they achieved a significantly higher mean weight loss of −1.8 kg (95% CI −2.3, −1.3) than participants who completed less than 8 lessons (−0.70 kg, 95% CI −1.1, −0.29).

DISCUSSION

In the PILI ‘Ohana Pilot Project, a co-learning community-academic partnership was instrumental in translating an evidenced-based clinical trial (the DPP-LI) into community practice among a high risk population of NHOPIs. The key elements of this pilot project that adds to the existing literature on CBPR approaches in translational research were: 1) The use of a fully engaged CBPR partnership model that facilitated the completion of the scientific goals; 2) The role of CIs to collect and analyze the qualitative data that informed the cultural and community adaptations by, and for, NHOPI communities. 3) The feasibility of implementing a culturally adapted intervention via community peer educators and 4) Research oversight by community-based researchers to conduct a research protocol that achieved clinically significant improvements in weight loss, the primary outcome of the study.

The accomplishments of the POLI pilot study, however was enabled not merely by community involvement but more importantly by the collective partnership of both academic and community partners. That is, each partner brought resources and skills to the partnership which would not have been possible individually and this strengthened our ability to complete the scientific aims of the pilot study. For example, involvement of the community research teams from study inception facilitated awareness and recruitment of participants. (42,43) Delivery of the intervention, in a competent manner, by peer educators helped to breakdown perceived mistrust of research and of researchers. (40,42,43)

The main outcome of the intervention, mean weight loss was modest (−1.5 kg) compared to other studies in the literature. (9,11,14,16,44) However, few studies have used fully engaged CBPR approaches to translate the DPP-LI or were conducted in community settings with high risk populations, such as NHOPIs. Thus, our study adds to the existing literature of approaches to translating research into minority communities through the use of CBPR approaches as a viable option.

In particular, CBPR approaches offer the added benefit of building capacity within these difficult to reach communities for future translational studies. (25) Forming partnerships that provide direct benefits to racial/ethnic minority populations, such as NHOPIs, also addresses another public health imperative the elimination of health and health care disparities. (46) Thus, our preliminary results suggests that CBPR may be a promising way of both reducing the development of health disparities but also offers the promise of assisting communities to confront health disparities by becoming actively involved in research. (22,45)

Broad interpretation of our findings however, must remain cautious. Our study was limited by the types of communities who were involved in this study (i.e. NHOPI, Micronesian, etc.) which may not be generalizable to other at risk populations. Also the design of our study (non-randomized, pre-post design) does not allow for comparison with a control group. (18,20,46, 47) However, efficacy of the original DPP-LI is already established. (8) Moreover, the model of CBPR involvement that was used in this study may not be comparable to all forms of CBPR used in other settings and thus may not be generalizable to other community populations or settings. Finally, the enrolled population was not uniformly pre-diabetic individuals as was the

case in the DPP study and thus the effect size of the intervention may not be applicable across a more diverse population. Nonetheless, these preliminary results suggest that CBPR approaches of this type may be a promising option to conducting scientifically rigorous translational research in high risk minority populations. Furthermore, our preliminary study suggests that by engaging communities, we may also be addressing a more urgent public health mandate, the elimination of health disparities and promoting health equity for all.

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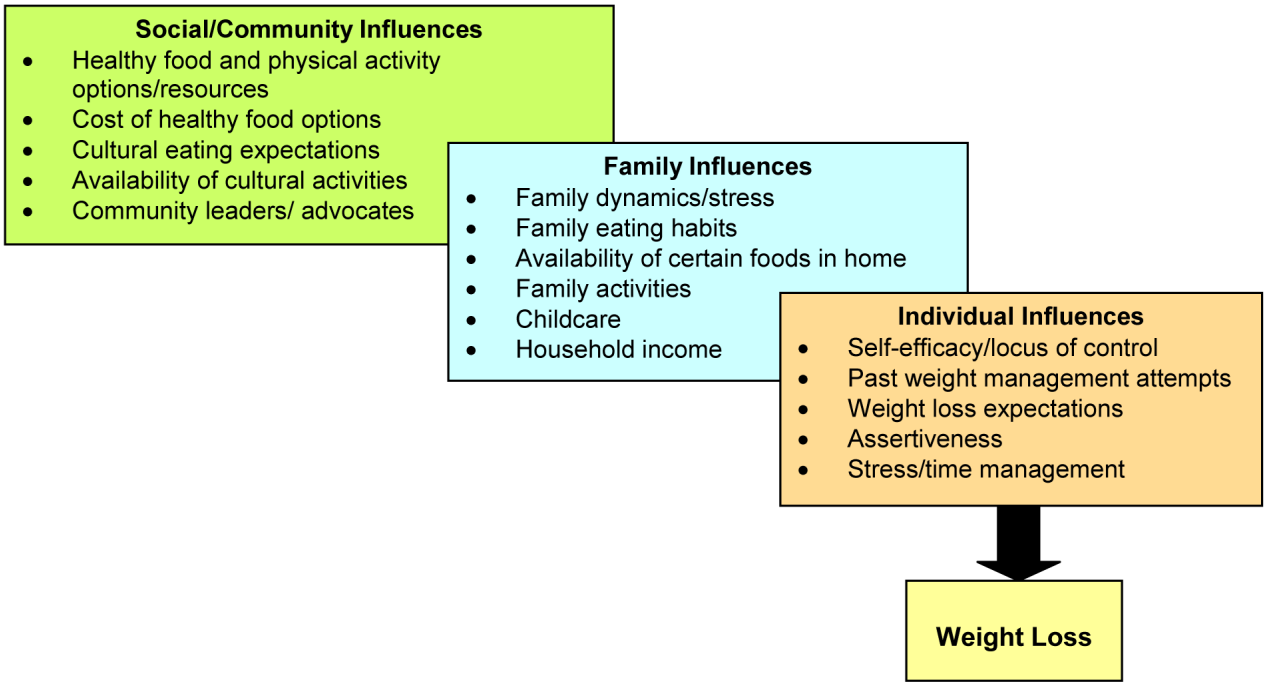

Figure 1.
Proposed Conceptual Model of Weight Loss for Native Hawaiians and Other Pacific Islanders

Table 1

Summary of Adaptations from the DPP Lifestyle Intervention matched to the PILI ‘Ohana Lifestyle Intervention (POLI)

POLI Lesson and Topic (Translated Curriculum)	DPP-LI Session and Topic (Original Curriculum)
Lesson 1: Introduction to PILI Lifestyle Intervention: Change? It’s no big thing. • The Benefits of Lifestyle Change • Setting Goals • Ways to Stay Motivated	• Session 1A: Welcome to the Lifestyle Balance Program • Session 12: The Slippery Slope of Lifestyle Change • Session 16: Ways to Stay Motivated
Lesson 2: Getting Started: • Being Active • Exercising Safely • Three Ways to Eat Less Fat	• Session 1B: Getting Started Being Active • Session 3: Being Active: A Way of Life • Session 5: Three Ways to Eat Less Fat
Lesson 3: Get Moving: • Tracking Progress • Being A Fat Detective (Finding Hidden Fats) • Move Those Muscles (Long Term Benefits)	• Session 1B: Getting Started Being Active & Getting Started Losing Weight • Session 4: Be A Fat Detective • Session 2: Move Those Muscles
Lesson 4: Making It Fun: • Healthy Eating with the Plate Method • The 3 Right Ways to Healthy Eating Out • Heart Strengthening Activities	• Session 6: Healthy Eating • Session 10: Four Keys To Healthy Eating Out* • Session 13: Jump Start Your Activity Plan
Lesson 5: Keeping It Going: • Tip the Calorie Balance • Economics of Healthy Eating (Meal Planning)§	• Session 8: Tip the Calorie Balance
Lesson 6: Taking Charge: • Of What’s Around You (Battling Temptation) • Make Social Cues Work for You	• Session 7: Take Charge of What’s Around You • Session 14: Make Social Cues Work for You.
Lesson 7: Talking It Out: • Problem Solving Skills (Exploring Options) • Talking with Doc (General Skills for Effective Communication)*	• Session 9: Problem Solving
Lesson 8: Wrapping It Up: • Managing Negative Thoughts & Emotions • Controlling Stress • Review of All Lessons	• Session 11: Talk Back To Negative Thoughts • Session 15: You Can Manage Stress

*Supplemented with materials from the “Sugar WATCH” lifestyle curriculum.

§Specifically developed to address issue of the high cost of eating healthy (per focus groups and previous education sessions to similar populations).

Table 2

Baseline Characteristics of PILI ‘Ohana Lifestyle Intervention Participants (N=239)

Baseline Characteristics	N (%)‡
Age, years (mean±SD)	49 ±14
Women	198 (83%)
Ethnicity	
Chuukese	64 (27)
Filipino	13 (5)
Native Hawaiian	125 (52)
Samoan	29 (12)
Other Pacific Islander	3 (1)
Non-Pacific Islander	5 (2)
Education	
Less than H.S.	57 (24)
H.S diploma/GED	60 (25)
Some college/Tech	68 (29)
College degree	53 (22)
Martial Status	
Never married	64 (27)
Currently married	125 (52)
Disrupted marriage*	50 (21)
High blood pressure†	
Yes	91 (38)
No	148 (62)
Arthritis†	
Yes	32 (13)
No	207 (87)
Diabetes†	
Yes	62 (26)
No	177 (74)
Heart problem†	
Yes	13 (5)
No	226 (95)
Kidney Problem†	
Yes	5 (2)
No	234 (98)

Baseline Characteristics	N (%)‡
Eating disorder†	
Yes	1 (<1)
No	238 (100)

*Disrupted marriage defined as divorced, separated or widowed.

‡Percentages may not add up to 100% due to missing values and/or rounding.

†Self reported at eligibility screening.

Table 3

Change in Clinical Measures of Participants Post-PILI ‘Ohana Lifestyle Program (N=169)

Measures [a]	Baseline (Pre-Program)	At 12 weeks (Post-Program)	Change in Clinical Measures (Post – Pre)	95% CI
Weight (kg)	103 ± 30	101 ± 30	−1.5 ± 3.5	−2.0, −1.0
Body Mass Index (kg/m^2)	39.1 ± 9.4	38.5 ± 9.2	−0.58 ± 1.4	−0.78, −0.38
Systolic Blood Pressure (mmHg)	134 ± 23	128 ± 20	−6.0 ± 18	−8.8, −3.5
Diastolic Blood Pressure (mmHg)	82 ± 13	79 ±12	−2.8 ± 11	−4.4, −1.3
6 minute Walk Test (feet)	644 ± 144	681 ±161	42 ±124	25, 58
Dietary Fat Intake Score [b]	2.8 ± 0.42	2.5 ± 0.37	−0.27 ± 0.39	−0.32, −0.22
Physical Activity Level [c]	3.4 ± 1.1	2.9 ± 1.0	−0.46 ± 1.2	−0.63, −0.29

[a] = all measures reported as mean ± SD

[b] = dietary fat score ≥ 2.5 indicates greater than 30% of calories from fat.

[c] = frequency of moderate-vigorous physical activity, range: 1= ≥4 times/wk (more active) to 4=rarely or never (less active). Thus, lower scores are more active and a negative change means more physical activity.