The PILI ‘Ohana Project
12 Years of Addressing Obesity and Diabetes Disparities in Native Hawaiian and Pacific Islander Communities

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Objectives

• Overview of the PILI ‘Ohana Project
• Describe the interventions developed and tested
  • Translation of the Diabetes Prevention Program (DPP)
  • Novel family and community focused component
• Present the results of the translated DPP
• Present the results of long-term weight loss maintenance
• Overview of current dissemination and implementation efforts
• Lessons learned over 12 years
The PILI ‘Ohana Project

• **Vision:** A healthy, vibrant, and robust Native Hawaiian and Pacific Islander population.

• **Mission:**
  To integrate community wisdom and scientific enquiry to develop effective community-based health promotion programs to achieve health equity in Hawai‘i and the larger Pacific.

• **Description:**
  Over the past 12 years, the Project developed a community-based lifestyle program and diabetes self-care program for Native Hawaiians and Pacific Islanders, using a community-based participatory research (CBPR) approach.
The Partners and Investigators

Kōkua Kalihi Valley
Sheryl Raneses-Yoshimura

Kula No Nā Poʻe Hawaiʻi
Puni Kekauoha
Adrienne Dillard
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Ke Ola Mamo
Donna-Marie Palakiko
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Hawaiʻi Maoli
Claire Hughes
Shari Gamiao

Native Hawaiian Health
Keawe Kaholokula
Claire Townsend Ing
Becky Delafield
Shelley Soong
Obesity and Diabetes Disparities

- Obesity in Native Hawaiians/Pacific Islanders
  - 4x more higher than Asian American population.
  - 30% higher than non-Hispanic Whites.
- Diabetes in Native Hawaiians/Pacific Islanders
  - 2.4x to 4x higher than white population.

Challenges with Prevailing Strategies to Address Obesity

- Neglects the social determinants of obesity
- Absence of any socio-cultural context
- Too intense; based on ideals rather than reality
- Programs not easily accessible those at-risk
- Programs not easily sustainable across settings
- Policies not in place to support programmatic efforts
Factors Affecting Weight Loss Efforts

- 112 focus group participants
- 206 survey respondents
- 15 community key-informant interviews
- "Windshield Tours"

<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to PILI Lifestyle</td>
<td>1A: Welcome to the Lifestyle Balance Program, 12: The Slippery Slope of Lifestyle Change, 16: Ways to Stay Motivated</td>
</tr>
<tr>
<td>2</td>
<td>Getting Started</td>
<td>1B: Getting Started Being Active, 3: Being Active: A Way of Life, 5: Three Ways to Eat Less Fat</td>
</tr>
<tr>
<td>3</td>
<td>Get Moving</td>
<td>1B: Get Started Being Active &amp; Losing Weight, 4: Be A Fat Detective, 2: Move Those Muscles</td>
</tr>
<tr>
<td>4</td>
<td>Make it Fun</td>
<td>6: Healthy Eating, 10: Four Keys To Healthy Eating Out, 13: Jump Start Your Activity Plan</td>
</tr>
<tr>
<td>5</td>
<td>Keep it Going</td>
<td>8: Tip the Calorie Balance, <em>Economics of Healthy Eating (Meal Planning)</em></td>
</tr>
<tr>
<td>6</td>
<td>Taking Charge</td>
<td>7: Take Charge of What’s Around You, 14: Make Social Cues Work for You.</td>
</tr>
<tr>
<td>7</td>
<td>Talking it Out</td>
<td>9: Problem Solving, <em>Talking with your Doctor</em></td>
</tr>
<tr>
<td>8</td>
<td>Wrapping it Up</td>
<td>11: Talk Back To Negative Thoughts, 15: You Can Manage Stress</td>
</tr>
</tbody>
</table>
# Results of DPP Translation

## Change in Clinical and Behavioral Measures from Baseline to Three-Month Follow-Up

<table>
<thead>
<tr>
<th>Measures</th>
<th>Pilot Study(^c) (N = 169)</th>
<th>Intervention Study(^d) (N = 242)</th>
<th>Worksite Study(^e) (N = 217)</th>
<th>OHA Study(^f) (N = 343)</th>
<th>Average Across Studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (kg)</td>
<td>-1.5 ± 3.5***</td>
<td>-1.7 ± 3.5***</td>
<td>-1.2 ± 2.6**</td>
<td>-1.4 ± 3.4***</td>
<td>-1.5 ± 3.3</td>
</tr>
<tr>
<td>BMI</td>
<td>-0.58 ± 1.4***</td>
<td>-0.6 ± 1.3***</td>
<td>-0.5 ± 1.0**</td>
<td>-0.5 ± 1.2***</td>
<td>-0.55 ± 1.2</td>
</tr>
<tr>
<td>Systolic BP (mmHg)</td>
<td>-6.0 ± 18***</td>
<td>-2.8 ± 12.5**</td>
<td>-2.4 ± 11.2</td>
<td>-3.9 ± 17.2***</td>
<td>-3.8 ± 14.7</td>
</tr>
<tr>
<td>Diastolic BP (mmHg)</td>
<td>-2.8 ± 11**</td>
<td>-2.0 ± 8.1***</td>
<td>-2.5 ± 7.2*</td>
<td>-2.4 ± 11.4***</td>
<td>-2.4 ± 9.4</td>
</tr>
<tr>
<td>6 min. Walk Test (ft)</td>
<td>42 ± 124***</td>
<td>74.7 ± 154.7***</td>
<td>113.0 ± 121.1***</td>
<td>111.5 ± 278***</td>
<td>85.3 ± 169.5</td>
</tr>
<tr>
<td>Dietary Fat Intake(^a)</td>
<td>-0.27 ± 0.4***</td>
<td>-0.20 ± 0.3***</td>
<td>-0.2 ± 0.3*</td>
<td>-0.2 ± 0.5***</td>
<td>-0.22 ± 0.4</td>
</tr>
<tr>
<td>Physical Activity Level(^b)</td>
<td>-0.46 ± 1.2***</td>
<td>-0.6 ± 1.1***</td>
<td>-.05 ± 1.0***</td>
<td>-.6 ± 1.2***</td>
<td>-0.43 ± 1.1</td>
</tr>
</tbody>
</table>

\(^*p < .05; **p \leq .001; ***p < .0001\)

\(^a\) Dietary fat score ≥ 2.5 indicates greater than 30% of calories from fat.

\(^b\) Frequency of moderate-vigorous physical activity; range: 1 = 4 times/week to 5 = rarely or never.

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\(^f\) Delafield, R., et al. Dissemination and implementation of an evidence-based, healthy lifestyle intervention using community-based participatory research. Manuscript in review by *Translational Behavioral Medicine*
# Family & Community Component

<table>
<thead>
<tr>
<th>Month</th>
<th>PILI Lifestyle Intervention (PLP)</th>
</tr>
</thead>
</table>
| 1     | Identify healthy lifestyle values shared by all family members  
      | Family goal setting exercise  
      | Schedule family free time for activities |
| 2     | Family eating history exercise  
      | Family meal planning exercise  
      | Identify community resources to support healthy lifestyle plan |
| 3     | Identify physical/recreational activities for the family  
      | Family activity planning exercise  
      | Identify community resources to support family activities |
| 4     | Identify ways the family can deal with difficult social events involving food  
      | Identify family’s cultural beliefs that relate to healthy living  
      | Identify ways to increase social support in the home and in the community |
| 5     | Managing negative thoughts/emotions exercise  
      | Increase family’s understanding of how negative thoughts/emotions can affect healthy living goals  
      | Identify community resources to help manage negative thoughts/emotions |
| 6     | Review of lessons, family action plans, and goals  
      | Plan next steps in maintaining a healthy lifestyle |
Pilot Study
(2005 to 2008)

- Native Hawaiian, Filipino, or other Pacific Islander
  - Age 18 years or older
  - BMI ≥25 kg/m² or ≥23 kg/m² (Filipino)
Results of 9-Month Weight Loss

Percent of Participants Who Achieved ≥ 3% Weight Lost at 9 Months by Intervention Group

<table>
<thead>
<tr>
<th>Intervention Group</th>
<th>M (SD)</th>
<th>95% CI</th>
<th>Test for Equivalent Pre–Post Weight Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>PILI lifestyle program (PLP)</td>
<td>0.075 kg (4.7 kg)</td>
<td>-1.0, 1.2</td>
<td>Equivalent (p ≤ .05)</td>
</tr>
<tr>
<td>Standard behavioral weight loss</td>
<td>0.581 kg (2.7 kg)</td>
<td>-0.06, 1.2</td>
<td>Equivalent (p ≤ .05)</td>
</tr>
<tr>
<td>maintenance program (SBP)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

χ²(7, N = 100) = 45.50, P < .0001

0.45 kg (9.79) PILI 'Ohana Program
2.54 kg (7.01) Standard Behavioral Program

Mean Weight Regain between 3-Month and 6-Month Follow-Up by Intervention Group

Note. M = mean; SD = standard deviation; CI = confidence interval.
a. Dropouts are assumed to have regained 0.3 kg per month.
b. Indifference region (3% mean baseline weight), Δ_{PLP} = -3.20 to +3.20 kg, Δ_{SBP} = -2.98 to +2.98 kg.


Physical Functioning Results

Change in physical functioning based on 6 min. walk test
Blood Pressure Results

Change in systolic blood pressure

Change in diastolic blood pressure

* Indicates statistical significance ($p \leq .05$) compared to baseline
Lessons Learned from Pilot

• Anecdotal
  • Difficult to obtain family support for weight loss efforts
  • Facilitator characteristics influence participants’ outcomes
  • Participant engagement and group cohesion influence outcomes
  • Fixed intervention schedules get in the way of fully participating

• Empirical
  • Initial weight loss predicts longer-term weight loss
  • Bulk of weight loss achieved in 3 months
  • Chuukese more likely to achieve $\geq 3\%$ weight loss goal at 9 months than Native Hawaiian participants

Intervention Study (2008 to 2013)

DPP 3-Month Lessons (n=242)

Randomization (n=239)

Allocated to PLP Face-to-Face (n=81)

Lost to follow-up (n=19)

Lost to follow-up (n=7)

Completed Intervention (n=55)

Allocated to PLP DVD (n=75)

Lost to follow-up (n=19)

Lost to follow-up (n=7)

Completed Intervention (n=49)

Allocated to Control (n=84)

Lost to follow-up (n=13)

18-Month Follow-up

Lost to follow-up (n=13)

Completed Intervention (n=58)
# 3-Month Weight Loss Predicts Weight loss at 12 Months

<table>
<thead>
<tr>
<th>Initial 3-Month Weight Loss by Study Group</th>
<th>12-Month Weight Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Face-to-face</td>
<td></td>
</tr>
<tr>
<td>≥ 3%</td>
<td>16</td>
</tr>
<tr>
<td>&lt; 3%</td>
<td>46</td>
</tr>
<tr>
<td>DVD</td>
<td></td>
</tr>
<tr>
<td>≥ 3%</td>
<td>16</td>
</tr>
<tr>
<td>&lt; 3%</td>
<td>40</td>
</tr>
<tr>
<td>Control</td>
<td></td>
</tr>
<tr>
<td>≥ 3%</td>
<td>32</td>
</tr>
<tr>
<td>&lt; 3%</td>
<td>39</td>
</tr>
</tbody>
</table>

Note. OR = Odd ratio; CI = confidence intervals. Analyses are adjusted for ethnicity (Hawaiian vs. Others). Reference group is < 3%.
### 3-Month Weight Loss Predicts Weight loss at 18 Months

<table>
<thead>
<tr>
<th>Initial 3-Month Weight Loss by Study Group</th>
<th>18-Month Weight Loss</th>
</tr>
</thead>
</table>
|                                           | n | Mean % Weight Loss (SD) | ≥ 5 % Weight Loss |%
|                                           |   |                         |                  |
| Face-to-face*                              | 55| -6.17 (6.69)             | 57.1%            |
|  ≥ 3%                                     | 14|                          | 5.51             | 1.48 – 20.49    |
| < 3%                                      | 41| 0.27 (5.6)               | 19.5%            |
| DVD*                                      | 49|                          | 1.0              |
|  ≥ 3%                                     | 14| -4.69 (2.84)             | 42.9%            |
| < 3%                                      | 35| 0.39 (5.87)              | 11.4%            |
| Control                                   | 58|                          |                  |
|  ≥ 3%                                     | 29| -3.46 (8.42)             | 37.9%            |
| < 3%                                      | 29| -0.23 (5.26)             | 17.2%            |

Note. OR = Odd ratio; CI = confidence intervals. Analyses are adjusted for ethnicity (Hawaiian vs. Others). Reference group is < 3%.
Partners in Care (2011-2012)

- Culturally-adapted diabetes self-care program for Native Hawaiians and Pacific Islanders
- 12 lessons delivered over 12 weeks.
  - Based on ADA guidelines
  - Basic information about diabetes care
  - Encourages working with their diabetes team and ask questions
  - Emphasizes goals for blood sugar levels, blood pressure, and lipids.
Partners in Care: Results

<table>
<thead>
<tr>
<th>Study Group</th>
<th>N</th>
<th>Baseline M (SD)</th>
<th>3-Month M (SD)</th>
<th>Change ± SE</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PIC</td>
<td>34</td>
<td>9.7 (2.1)</td>
<td>8.2 (1.1)</td>
<td>-1.6 ± 0.2</td>
<td>&lt;.0001</td>
</tr>
<tr>
<td>Control</td>
<td>31</td>
<td>9.8 (2.3)</td>
<td>9.4 (2.2)</td>
<td>-.03 ± 0.2</td>
<td></td>
</tr>
</tbody>
</table>

- PIC participants also significantly improved their:
  - Diabetes self-care activities
  - Diabetes care profile
  - Problem areas in diabetes
  - Diabetes-related distress

Lessons Learned from 5-Year Study

• Facilitators matter
  • Not education level but commitment
  • Intimate knowledge of community
  • Active involvement
• One size does not fit all
  • Differences in acculturation-related factors, motivation, and community resources
• Participant engagement
  • Increased through group interaction, games, activities, immediate positive reinforcements
  • May contribute to enhanced weight loss

• Greater initial weight loss leads to greater weight loss at 12 and 18 months
  • Face-to-face superior to DVD and control for those who lost ≥ 3% in 1st three months
  • For those who achieve <3% weight loss in 1st three months, continuing on with the intervention helped very little.
• Another strategy is needed for those who do no lose weight early on

- Disseminate 9-month version of the PILI Lifestyle Program and Partners in Care across Hawai‘i, Continental U.S., and the Pacific
- Assist CBOs with implementation and evaluation of the interventions
  - Over 20 new CBOs have implemented the interventions
- Develop capacity within CBOs for health promotion and CBPR
  - Over 12 capacity-building workshops conducted that focused on:
    - CBPR approaches and research methods
    - Grant seeking and writing
    - Qualitative data collection strategies
    - Program evaluation
    - Community organizing and advocacy
  - 170 participants from 64 CBOs across 5 islands
- Study the factors that influence dissemination and implementation of evidence-based interventions in real-world settings.
Acknowledgements

• PILI ‘Ohana Project Founders:
  • Dr. Marjorie Mau, Native Hawaiian Health
  • Dr. Claire Hughes, Charlie Rose, and Henry Gomes, Hawai‘i Maoli
  • Donna-Marie Palakiko, Ke Ola Mamo
  • Puni Kekauoha, Kula no na Po‘e Hawai‘i
  • Sheryl Raneses, Kōkua Kalihi Valley
  • Dr. Anne Leake, Queen’s Medical Center

• All intervention materials can be obtained from: http://www2.jabsom.hawaii.edu/pili/index.html

• The projects described were supported by...
  • The National Institute on Minority Health and Health Disparities (R24MD001660, U54MD007584)
  • The National Cancer Institute through ʻImi Hale Native Hawaiian Cancer Network (U54CA153459)
  • Office of Hawaiian Affairs and Hawaiʻi Medical Service Association (HMSA) Foundation

• The content is solely the responsibility of the authors and does not necessarily represent the official views of our funders.
Mahalo Nui