Community Academic Partnerships to Address Obesity Disparities in Hawaii and the Pacific: Pacific Kids DASH for Health (PacDASH)

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Professor, University of Hawai‘i, Principal Investigator
OBJECTIVES

1. To develop & evaluate the impact of the PacDASH intervention (based on DASH eating pattern) for preventing weight gain (& improving blood pressure) in overweight or obese children of the Pacific Region
OBJECTIVES

2. To describe environmental, social, economic, & cultural factors associated with body size & composition of children of the Pacific Region, for whom there are few national data (uses electronic medical record data).
Objective 1
INTERVENTION CONCEPTUAL MODEL

Social
- Caregiver
- Physician

Physical
- Farmers’ Market
- Supermarkets
- School Cafeteria
- Home
- Clinic

Child
- Food & Physical Activity
- Recommendations
- Motivation
PacDASH Tool Development

Pacific Tracker 2 (PacTrac2) Food & Activity Assessment Tool with Local Food & Activity

• *Led by:* Rachel Novotny, Suzanne Murphy & Claudio Nigg

• *Capabilities include:* Analyzing diets, assessing dietary adequacy & excess, providing nutrition education

• *Features:*
  • UH Cancer center food composition database
    • 2400 foods & recipes
    • includes local foods & ethnic dishes
  • My Pyramid Physical Activity assessment
    • children’s activities and MET values added

• *Testing:* qualitative interviews of mothers & children & in surveys

• *PacTrac2 available at:* http://hawaiifoods.hawaii.edu
PacDASH Tool Development:
Computerized Expert System
to Assess Stage of Readiness to Change & Self Efficacy

• Led by: Claudio Nigg
• Capabilities include: assessment of self efficacy and stage of readiness to change for fruit & vegetable intake and for physical activity
PacTrac2 ES

PacTrac2 Behavioral Assessment of Child
Physical Activity
Dietary Intake

Expert System Assessment of Child
Stage of Readiness to Change &
Self Efficacy for Physical Activity
Fruit and Vegetables

Assessment data entered by
PacDASH staff

Decision Rules by Computer
(Expert System)

Printed Reports created by Computer
(Expert System)

PARENT
INFORMATION
ON CHILD
Behavior
Stage
Self Efficacy

CHILD
INFORMATION
ON CHILD
Behavior
Stage
Self Efficacy

PHYSICIAN
INFORMATION
ON CHILD
Stage-related
behavioral
prescription
INTERVENTION DESIGN

• Randomized, controlled intervention trial, with participatory input
  1) Intervention group (n = 44)
  2) Usual care group (n = 41)

• 5 visits over 15 months
• Completing data collection this month
INTERVENTION STUDY OVERVIEW

- Assessments in research clinic
- Intervention
  - delivered in well-child visits by physician:
    - Fruit, vegetable & “DASH” eating plan & physical activity targeted behaviors for
      child, based on assessment, self-efficacy & stage of change
  - Intervention Stage based activities (mailing) for target behaviors:
    - Fruit & vegetable & physical activity in child’s physical environment
- Usual Care group mailings supporting “usual” Health guidelines (e.g. Safety)
PacDASH Intervention
Sample & Measures

• Selection criteria
  – 5-8 years old
  – BMI: ≥ 50th to 99th percentile

• Key Measures
  – Pacific Tracker (PacTrac2): Average of two-days of diet records
  – Expert System Output: Stage of change (FV & PA), Self efficacy
  – Outcome Measures: Anthropometry, Blood pressure, DXA
Intervention
Initial Findings - Baseline

Sample:
- 85 multiethnic (Native Hawaiian, Pacific Islander, Asian and White) children
- 53 girls, 32 boys
- 44 control, 41 intervention

Age:
- $7.06 \pm 0.95 \text{ y (5.33 - 8.92y)}$

Presented at Society for Nutrition Education and Behavior 2012
Food Intake, 5-8y

- Intake of most vitamins & minerals meet the recommended level
- Low intake of vegetables
- High intake of sodium, solid fats & added sugars (SoFAS)
- Low intake of fiber & potassium
- High intake of all macronutrients (especially protein)
- High energy intake
## Stage of Readiness to Change, 5-8y

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<th>Physical Activity</th>
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</table>

Presented at Society for Nutrition Education and Behavior 2012
Objective 2. KPH EMR Data

Ethnic disparity in body mass index among 5 to 8 year old children in Hawai‘i

Rachel Novotny, Caryn Oshiro, Lynne Wilkens
University of Hawaii at Manoa & Kaiser Permanente Hawaii

presented at FASEB 2012
Methods

• Design: Cross-sectional analysis

• Sample:
  – Electronic medical records
    • Kaiser Permanente Hawaii (KPH)
  – N = 8732
  – 5 - 8 year olds, with parent member
Ethnic disparity in prevalence of overweight & obesity
5 – 8 year olds (n = 4608)*

- **Total**: 32%
- **White**: 20%
- **Asian**: 22%
- **Filipino**: 33%
- **Native Hawaiian**: 41%
- **Samoan**: 69%
- **Native Hawaiian - Asian**: 35%
- **Mixed**: 33%
- **Other**: 40%

* Those with ethnic information, adjusted for age distribution of census
(Age & Sex) Adjusted Odds Ratios for Risk of Overweight & Obesity by Ethnic Group, 5 – 8y (n = 4599)
(Age & Sex) Adjusted Mean Child BMI by Ethnic Group & Neighborhood Education Level (n = 4599)

Global F test, p<0.0001 across categories - ethnic group & neighborhood education level
Risk for Child Overweight & Obesity (n=2165)
Subsample with data on maternal age (y) & maternal education (y) from vital records

- Maternal age (y) protective (p = 0.04)
  - ≤ 20y OR = 1.0
  - 21y - 30y OR = 1.29
  - 31y - 40y OR = 1.06
  - > 40y OR = 0.60

- Maternal education (y) protective (p = 0.004)
  - < 12y OR = 1
  - 12y OR = 1.19
  - 13y OR = 0.92
  - > 14y OR = 0.69

- Maternal education (y) & neighborhood education level, r = 26%
Discussion

Mixed ethnicity

- Mixed ethnicity common in Hawaii (48% of children)
  - ‘Mixed’ ethnic children higher risk for overweight & obesity than expected mean of single ethnicities
  - Hawaiian - Asian mixed children more similar to Native Hawaiian than to Asian children in BMI
  - Mixed ethnicity associated with retaining favored cultural attributes from both ethnic backgrounds
    - such as ceremonial foods, which tend to be energy dense & which may increase risk for overweight & obesity

- Understanding role of mixed ethnicity in overweight & obesity an area for further study
Discussion

Ethnic disparity in overweight & obesity

• Samoan children very high prevalence & risk of overweight & obesity
  – relatively newly acculturated to Hawaii, which may increase risk

• Hawaiian, Hawaiian - Asian, Mixed, Filipino & Other ethnic groups higher risk of overweight & obesity compared to White & Asian
  • Environment & lifestyle in Hawaii has modernized, which may increase risk

• WHO / IOTF BMI cut points for overweight & obesity could be compared to CDC cut points
  • uniform cut point, considering the frequency of mixed Asian plus Pacific Islander ethnic groups (which have divergent IOTF cut points) aids in interpretation of data

• Further study examine relationship of child BMI with blood pressure & with acanthosis nigricans among these diverse ethnic groups
Discussion
Parental education & child overweight & obesity

• Interaction of ethnicity & neighborhood education level on child overweight & obesity
  – May be related to:
    – living & working conditions of parents
    – age of parents

• Lower maternal education (<13y) & younger maternal age (< 30y) associated with greater child overweight & obesity
  – Young women still obtaining education
    – may result in a more sedentary environment with more energy dense fast food for children
  – Area for further study
Conclusion

• Samoan, Hawaiian, Hawaiian – Asian, Mixed, Filipino & children of Other ethnicity more overweight & obese than White or Asian children
  – Higher neighborhood education level protective & interactive with ethnicity
  – Older maternal age & more maternal education protective
  – Populations of mixed Pacific ethnicity deserve further study related to acculturation of environment & lifestyle, & healthy body size
Academic - Health System Partnership
Students pursuing degrees with the PacDASH study

- Caryn Oshiro, MS RD
  - Degree objective: PhD Epidemiology (ABD)
  - Topic: Birth size, infant & preschool rapid growth and young childhood overweight
  - PacDASH Objective addressed: Objective 2 (Electronic medical record data)

- Joanne Avila, BS
  - Degree objective: MS Nutrition (candidate)
  - Topic: Added sugar intake and young child overweight & obesity
  - PacDASH Objective addressed: Objective 1 (Intervention)
Lessons Learned: Childhood Obesity Prevention

• Slow weight gain during childhood (grow into weight)
  • Modify food & physical activity environment of young children
  • Assist physician & parent to provide (staged) relevant information and action tips
  • Create an environment (home, school, health center, community) where children can play actively & eat healthy food
Public Health Policy Recommendations

• Child obesity prevention is primary prevention
• Partnership between health systems & academia can leverage strengths of the 2 systems
• Need a Pacific Data System to monitor core indicators of food, physical activity & obesity of children for program & policy planning
Mahalo!
Asian, Mixed & ‘Other’ Ethnic Group Descriptions

- ‘Asian’ ethnic group includes Chinese (68), Japanese (138), Korean (13), South Asian (Indian, Pakistani) (11), Vietnamese (11), Laotian (4), Other Asian (186)

- ‘Mixed’ ethnic group includes Asian - mixed (512), Filipino - mixed (140), Hawaiian – mixed (except Asian, 646), Other - mixed (202), Samoan - mixed (22)

- ‘Other’ ethnic group includes Black (35), American Indian / Aleutian / Eskimo (5), Pacific Islander (except Samoan, Hawaiian, 272), Other (144)