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The aim of the Hawai'i Journal of Health & Social Welfare is to advance knowledge about health and social welfare, with a focus on the diverse peoples and unique environments of Hawai'i and the Pacific region.

History:

In 1941, a journal then called The Hawai'i Medical Journal was founded by the Hawai'i Medical Association (HMA). The HMA had been incorporated in 1856 under the Hawaiian monarchy. In 2008, a separate journal called the Hawai'i Journal of Public Health was established by a collaborative effort between the Hawai'i State Department of Health and the University of Hawai'i at Mānoa Office of Public Health Studies. In 2012, these two journals merged to form the Hawai'i Journal of Medicine & Public Health, and this journal continued to be supported by the Hawai'i State Department of Health and the John A. Burns School of Medicine.

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HAWAII JOURNAL WATCH

KAREN ROWAN MS

Highlights of recent research from the University of Hawai'i and the Hawai'i State Department of Health

CHILDREN'S PAIN REDUCED WITH A VIBRATING COLD DEVICE

For hospitalized children, a vibrating cold device (VCD) may reduce the pain of an intravenous (IV) catheter insertion as well as topical lidocaine. Researchers including Katherine Finn Davis, PhD, RN, of the School of Nursing and Dental Hygiene, conducted a randomized controlled trial of 224 children. Topical lidocaine was applied at least 30 minutes before the insertion; for those randomized to receive the VCD, the device was activated 15 to 45 seconds prior to the needle puncture. Results showed no significant difference in pain scores using two standardized pain scales. The time needed to complete the procedure was significantly shorter for the VCD group (3 minutes vs 41 minutes). Further research using the VCD is needed, the researchers wrote. The study (PMID 28121978) is published in *Pediatric Emergency Care*.

NATIVE HAWAIIANS HAVE THE SHORTEST HEALTHY LIFE EXPECTANCY IN HAWAII

Among the major ethnic groups in Hawai'i, Native Hawaiians have the shortest healthy life expectancy (HALE). Researchers led by Yanyan Wu PhD and Kathryn Braun DrPH, of the Office of Public Health Studies constructed HALE tables which adjust total life expectancy based on a self-reported health status. The greatest gap in HALE was between Native Hawaiians and Chinese Americans at birth. At that age, Chinese Americans had a HALE of 75.9, compared with 62.2 for Native Hawaiians, a gap of 13.7 years. The HALEs for Japanese, Filipino, and white were 74.8, 73.3 and 72.1 years, respectively. The findings highlight ethnic disparities in Hawai'i, the researchers wrote. The study (Pubmed ID: 31537119) is published in the *Asia Pacific Journal of Public Health*.

THE ROLE OF ORGANIZATIONAL CULTURE AT CHILD WELFARE AGENCIES

Among workers at child welfare agencies, greater use of evidence-informed practices and interventions is needed. For example, family-centered practice (FCP), which involves building collaborative relationships with families, is an expanding evidence informed practice. Researchers including Francie J. Julien-Chinn PhD, of the Myron B. Thompson School of Social Work, surveyed staff members at child welfare provider agencies to investigate the relationship between supervisory processes, such as reflective supervision and group supervision, and the agencies' culture toward learning. Results showed that reflective supervision, which involves asking questions to promote critical thinking, and group supervision, which involves team members working together to improve their professional practice, are positively associated with increased perceptions of a learning culture. The study is published in *Children and Youth Services Review*.

A HIGH-QUALITY DIET CAN BE DETECTED IN THE BLOOD

Eating a high-quality diet has been linked to higher blood levels of certain micronutrients and lower levels of inflammation mark-

ers, and a new study shows this link holds true in an ethnically diverse population. Researchers led by Cherie Guillermo MS, of the UH Cancer Center, examined data from 1806 participants in the Multiethnic Cohort study, which primarily includes individuals of African American, Native Hawaiian, Japanese American, Latino, and white ancestry in Hawai'i and California. Results showed that higher diet quality was associated with higher levels of lipid-soluble micronutrients, lower levels of inflammation markers, and healthier lipid and glucose metabolism. The study (PMID: 31291155) is published in the *Journal of the American College of Nutrition*.

HYPERTENSION IN NATIVE HAWAIIANS

For Native Hawaiians, there is complex relationship between discrimination experiences, the strength of their cultural affiliation, and whether they have hypertension. Researchers led by Claire Townsend Ing DrPH, of the John A. Burns School of Medicine, sent surveys to 540 households on Hawaiian Homelands. Thirty-two percent (171 households) responded. The researchers hypothesized that more experiences with discrimination would be linked with higher odds of having hypertension. However, among those with lower cultural affiliation, discrimination was linked with a decreased likelihood of having hypertension. Individuals less affiliated with the Hawaiian culture may not ruminate on their experiences of discrimination, making these experiences less stressful. Further work is needed on hypertension and sociocultural variables, the researchers wrote. The study is published in the *Asian American Journal of Psychology*.

MEASURING KILAUEA'S EMISSIONS

When the Lower East Rift Zone of Kilauea began erupting in May 2018, the volcano produced toxic sulfur dioxide (SO₂), sulfate aerosol particulates, and volcanic ash. Researchers led by Alvin Bronstein, of the Hawai'i State Department of Health, used a system of 20 sensors to measure SO₂ and respirable particulate matter (PM_{2.5}) across the region. They then analyzed the data to provide recommendations for advisories including "shelter in place" and "evacuation." Among all the sensors, the Leilani Estates lower sensor reported the highest SO₂ levels, reporting its maximum, 20ppm, for 17 868 of the 132 065 samples gathered before it was incinerated by lava. Overall, the air concentrations of the gases and aerosols fluctuated widely with wind shifts, which made making recommendations difficult. The results are published in *Clinical Toxicology*.

ANGIOSTRONGYLUS LARVAE CAN CROSS SOME RAINWATER CATCHMENT SEDIMENT FILTERS

The larvae of the nematode *Angiostrongylus cantonensis*, which causes rat lungworm disease, can traverse some of the filters designed to keep particles in rainwater catchment systems from entering household water supplies. Researchers including senior author Susan Jarvi PhD, of the Daniel K. Inouye College of Pharmacy set up a laboratory replica of a catchment system. Five commercially available sediment filters were tested. Larvae were obtained by drowning slugs collected from the lower Puna District of Hawai'i Island. Results show infectious-stage larvae were able to cross polypropylene sediment filters of 20- μ m, 10- μ m, 5- μ m, and 1- μ m filtration ratings. While larvae did not cross a 5- μ m carbon block filter, the authors caution homeowners to not assume any carbon block filter will provide 100% protection. The study (PMID: 31022202) is published in PLoS ONE.

A Community-Based Participatory Approach to Promote Healthy Eating Among Marshallese

Pearl Anna McElfish PhD, MBA, MS; Lisa Smith MBA; Karra Sparks RD, BS; Williamina Ioanna Bing BS; Sharlynn Lang; Amber Estes BS; and Michael Stephens MS

Abstract

This article describes changes made to the menu served during the 2015 Marshallese May Day celebration in Northwest Arkansas, an annual Marshallese community event. The menu changes were part of a community-based participatory collaborative to improve nutrition and health in the Marshallese community. The 2015 May Day menu significantly reduced the 2014 May Day menu amount of calories, fat, carbohydrates, sodium, and cholesterol of foods offered by incorporating healthier ingredients and reducing portion sizes. Compared to the 2014 May Day menu, the total caloric value of the revised menu was reduced by more than 63%, declining from 1369 calories to 499 calories. The menu change affected an estimated 1,800 Marshallese in attendance for the 2015 May Day celebration. The successful implementation of the menu changes, which resulted in reductions in calories, fat, carbohydrates, sodium, and cholesterol offered to participants demonstrates the effectiveness of community-based participatory approaches in the implementation of policy, systems, and environmental strategies to promote health.

Keywords

Community-based participatory research; Health disparities; Marshallese; Minority health; Nutrition; Pacific Islanders

Abbreviations

CBPR = community-based participatory research
COFA = Compact of Free Association
PSE = policy, systems, and environmental
RMI = Republic of the Marshall Islands
UAMS = University of Arkansas for Medical Sciences

Introduction

Marshallese, both in the Republic of the Marshall Islands (RMI) and in the United States (US), experience significant health disparities. In particular, type 2 diabetes is high among the Marshallese population.¹⁻⁷ Rates of type 2 diabetes are documented at 20% to 50% among Marshallese adults, compared to 8% in the general US population.¹ Prior studies have discussed the role of food, family, and cultural celebration in the Marshallese community, and how they may influence diabetes risk, management, and nutritional choices.^{6,8-10} This article describes changes made to the menu served during the 2015 Marshallese May Day in Northwest Arkansas. The menu changes were part of a community-based participatory collaborative to improve health in the Marshallese community, which is described in other articles.¹¹⁻²⁰

To understand and address disparities related to type 2 diabetes, it is important to understand the historical and cultural context of the relationship between the RMI and the United States. The RMI is comprised of low-lying atolls spread over 750,000 square miles in the Micronesian region of the Pacific Ocean.^{1,21} After World War II, the US military began conducting nuclear tests in the Marshall Islands.²¹ From 1946 to 1958, 67 nuclear tests were conducted on Bikini Atoll and Eniwetok Atoll in addition to tests detonated in the atmosphere and ocean.^{1,21-23} BRAVO, a 15 megaton test conducted in 1954, was 1000 times the power of the Hiroshima bomb.^{23,24} Heavy nuclear fallout resulted²²⁻²⁷ and significant amounts of radiation contaminated the ecological resources in the testing location and nearby atolls.^{21,28-30}

Prior to nuclear testing, the Marshallese diet consisted of lean fish, locally grown taro, and breadfruit.⁸ The nuclear testing, subsequent contamination of the Marshall Islands, and the relocation of Marshall Islanders, altered the traditional, subsistence lifestyle of the Marshallese people.^{2,31} The alteration of Marshallese subsistence lifestyles resulted in food insecurity, which forced the Marshallese community to rely on US food aid consisting primarily of processed carbohydrates and high-fat canned meats.²⁶ These types of foods, especially white rice and Spam, endure as favorites among Marshallese both in the Marshall Islands and the US.³¹ However, this drastic change to the Marshallese diet resulted in serious and negative health effects.^{8,31,32}

Following the nuclear testing, the US maintained administrative control of the Marshall Islands until 1986.^{23,33,34} To gain self-governance, the nation's first constitution was adopted on May 1, 1978.²¹ This date is recognized as Marshallese Constitution Day, and is celebrated annually as "May Day." May Day is considered as one of the most important holidays to the Marshallese people. It is the most widely celebrated holiday. In Northwest Arkansas upwards of 4,000 Marshallese attend this annual celebration.⁴

Marshallese migrants residing in the US have grown rapidly. Between 2000 and 2010, the number of Marshallese living in the US tripled.^{4,35} Due to frequent migration, it is difficult to determine the exact number of Marshallese living in the US; however, it is estimated that approximately 40,000 Marshallese reside in the US.^{36,37} Arkansas is home to the largest Marshallese population in the continental US with about 10,000 residents.^{36,37}

May Day is celebrated in the RMI and in locations across the US. Each year, thousands of Marshallese across the US and the RMI travel to Northwest Arkansas to commemorate May Day.⁴ May Day celebrations organized by a planning committee bring together Marshallese from different islands, tribes, and clans in recognition of RMI sovereignty. The week-long event includes community meals, social gatherings, and volleyball and softball tournaments. Each year, a May Day planning committee organizes the celebration.

The Marshallese community judges the success of a May Day celebration by the food that is prepared and served.³⁸ There is significant ceremony related to the preparation and serving of the meal. Marshallese cultural customs require that the prepared food be first served to the Marshallese leadership - royalty, church leaders, and government leaders. The leadership's approval of the meal is very important. Food is highly valued and serving a plentiful and varied meal is seen as a way of demonstrating honor and respect.^{8,38} The meals are prepared and served in the manner that resembles and honors the way the meal would be prepared in the Marshall Islands conforming strictly to cultural protocols.^{1,6,8,38} Each year, the May Day planning committee designates members to serve on a food sub-committee, which selects various churches and organizations to prepare and host food for three primary May Day events. In 2015, approximately 1,800 Marshallese were served during these celebratory events.

Since 2013, the University of Arkansas for Medical Sciences (UAMS) collaborated with the Marshallese community in Northwest Arkansas to address diabetes, using a community-based participatory approach. UAMS is a Racial and Ethnic Approaches to Community Health (REACH) awardee of the Centers for Disease Control and Prevention (CDC). In particular, UAMS coordinated with local churches to develop a community-based action plan focused on implementing policy, systems, and environmental (PSE) improvements. To implement PSE improvements, UAMS collaborated with Marshallese church leadership to increase access to, and consumption of, healthy food and increase culturally appropriate access to chronic disease prevention and management services.^{13,39-42}

Methods

Addressing Menu Changes

The May Day food sub-committee expressed interest in learning about healthier food options to incorporate in their celebratory meal and sought UAMS guidance to incorporate healthy changes into the menu. UAMS staff, including a registered dietitian, registered nurse, diabetes educators, and public health experts, gathered input from Marshallese stakeholders on prior May Day event menus and goals for the 2015 menu. The May Day food sub-committee and UAMS staff met several times to discuss healthier substitutions of favorite foods, portion sizes, and alternative beverage choices.

Given the prominence of rice in the Marshallese diet, discussions of portions for this specific food were noteworthy. In 2014, two cups of white rice were served per plate. UAMS staff explained that large portions of white rice could adversely affect blood sugar and introduced the idea of using measuring cups for serving the rice. UAMS staff also offered information about the nutritional content of white rice compared to brown rice. The sub-committee displayed interest and excitement about the healthier changes and began discussing additional healthy alternatives for the menu. Specifically, the May Day food sub-committee asked how to reduce the overall sugar content of the meal. In 2014, soda was the primary beverage served and fried sweet bread was served for dessert. UAMS staff offered a demonstration to display the amount of sugar in soda and described the relationship between added sugar, blood sugar levels, and diabetes, and made recommendations to help reduce the amount of sugar in the menu.

As a result of the discussions, the May Day food sub-committee collaborated with site hosts for each of the three events to make small, yet nutritionally significant changes to the menu while maintaining traditional, cultural food preferences. Table 1 outlines the four major alterations to the menu that the food sub-committee made: portion sizes, substituting brown rice for white rice, reducing sugar content, and incorporating more fruits and vegetables. Food for the 2014 and 2015 May Day celebrations was prepared by members of the May Day food sub-committee and other volunteers from local Marshallese churches.

Analyzing Menu Changes

A registered dietician and dietetics intern calculated nutritional value changes in nutritional content, food items and portion sizes for the 2014 and 2015 menus were documented using the USDA Food Composition Databases software, which documented calories, macronutrients, and micronutrients.⁴³ The 2014 and 2015 menus are compared by total grams, percent of total calories for each nutrient, and the percent change of each nutrient (see Table 2).

Controlling Portion Size	The amount of rice served per plate was reduced. When serving rice, a measuring cup was used to ensure correct portion sizes.
Substituting Brown Rice for White Rice	Brown rice was served as a substitution for half of the white rice.
Reducing Sugar	Soda was replaced with bottled water as a beverage. A fruit cup in water was offered in place of dessert.
Incorporating Fruits and Vegetables	A fruit cup was provided instead of dessert. Asalad was incorporated into each plate.

Results

Menu items and portion sizes for the 2014 and 2015 May Day celebrations are compared in Table 2. The nutritional content analysis of the 2014 May Day menu is compared to the 2015

May Day menu in Table 3. The nutritional content estimates were based on the agreed upon portion size and were confirmed by plate observation techniques.

2014 May Day Menu		2015 May Day Menu	
Food Item	Portion Size	Food Item	Portion Size
White rice	2 cups	Brown rice	1/3 cup
		White rice	1/3 cup
Chicken (fried)	1 piece (leg or thigh)	Chicken (broiled)	1 piece (leg or thigh)
Pork rib (boiled in soy sauce)	1 rib		
Soy sauce (rib)	1/2 teaspoon	Ranch dressing	1 tablespoon
Fish (broiled)	2 ounces	Fish (broiled)	3 ounces
Potato salad	1/2 cup	Green salad (iceberg lettuce)	1 cup
Doughnuts (fried bread)	1 doughnut	Mandarin orange cup/peach cup (fruit cup, pre-packaged, in water with no sugar added)	1 (4 ounces) fruit cup
Soda (cola)	12-ounce can	Water	N/A

Nutrients	2014 Menu	2015 Menu	% Change
Total Calories	1369 Calories	499 Calories	-63.6%
Protein (g)	56 g	40 g	-28.6%
Protein (% Calories)	16% Calories	29% Calories	+81.3%
Carbohydrates (g)	186 g	46 g	-75.3%
Carbohydrates (% Calories)	54% Calories	33% Calories	-38.9%
Dietary Fiber	3 g	7 g	+133.3%
Total Sugars	53 g	5 g	-90.5%
Added Sugars	47 g	1 g	-97.9%
Total Fat	29% Calories	37% Calories	+27.6%
Total Fat	44 g	20.5 g	-53.4%
Saturated Fat	9% Calories	8% Calories	-11.1%
Saturated Fat	14 g	4.5 g	-67.9%
Polyunsaturated Fat	7% Calories	12% Calories	+71.4%
Monounsaturated Fat	10% Calories	15% Calories	+50.0%
Linoleic Acid (g)	10 g	6 g	-40.0%
α -Linolenic Acid (g)	1.0 g	0.8 g	-20.0%
Omega 3 – EPA	14 mg	13 mg	-7.1%
Omega 3 – DHA	108 mg	143 mg	+32.4%
Cholesterol	176 mg	107 mg	-39.2%
Calcium	114 mg	45 mg	-60.5%
Sodium	1612 mg	742 mg	-54.0%

The 2014 Menu

The 2014 May Day menu is estimated to contain 1,369 calories. Based on a daily 2000-calorie diet,⁴⁴ this meal was more than half the daily recommended intake of calories, fat, protein, carbohydrates, sodium, and cholesterol. The 2014 menu provided an excess of simple carbohydrates, and offered two deep fried items that contributed to the excessive amount of unhealthy fats. Saturated fat contributed to 9% of total calories consumed in the 2014 menu. In addition, the added sugar from the dessert and the sweetened soda contributed significantly to caloric intake with little added nutritional value. While the average healthy adult should have a maximum of 25-37.5 grams of added sugar per day,⁴⁵ the 2014 menu greatly exceeded this recommendation, measuring 47 grams of added sugar in this single meal. Based on a daily 2000-calorie diet, the sodium content of the 2014 menu contributed to 67% of the daily maximum recommendation for a healthy adult. Also the 2014 May Day menu lacked fruits and vegetables.

The 2015 Menu

The 2015 May Day menu reduced the total amount of calories, fat, carbohydrates, sodium, and cholesterol offered to participants by incorporating healthier ingredients and smaller portion sizes. Compared to the 2014 May Day menu, the total caloric value of the revised menu was reduced by more than 63%, declining from 1369 calories to 499 calories. The 2015 menu significantly reduced the amount of simple carbohydrates. Furthermore, the reduction of white rice and the incorporation of brown rice increased the amount of fiber and overall nutritional content of the meal. The preparation methods used for the protein components of the 2015 menu were changed from frying to broiling, reducing the grams of fat, cholesterol, and sodium in the meal. The amount of saturated fat was reduced by 67.9% and the amount of sodium was reduced by 54%. Healthy fats, such as monounsaturated and polyunsaturated fats, increased in the 2015 menu. Furthermore, the added sugar content of the 2015 meal diminished significantly from 47 grams to one gram. The final improvement to the 2015 menu was the addition of vegetables and fruits, which included a four once fruit cup and one cup of green salad.

Discussion

The Marshallese population experiences significant health disparities and suffers a disproportionate burden of type 2 diabetes. The pattern of consuming high fat, highly processed, and starchy foods after the US nuclear testing continues. This food consumption pattern contributes to the high prevalence of

diabetes among the Marshallese.^{1,9} Marshallese food preferences and the high cultural value placed on preparing and serving a celebratory meal presents challenges and provides opportunities to address positive nutritional changes at a community level.

The changes from the 2014 May Day menu to the 2015 menu are notable with significantly reduced calories, sugar, fat, and sodium in addition to a significant increase in fiber and overall nutritional content. The menu changes directly affected an estimated 1,800 Marshallese in attendance for the 2015 May Day celebration. The successful implementation of the menu changes that resulted in reductions in calories, fat, carbohydrates, sodium, and cholesterol offered to participants demonstrates the effectiveness of community-based participatory approaches in the implementation of a PSE strategy promoting nutritional improvements in a community. This study is consistent with prior studies that indicate PSE strategies can be effective in improving the nutritional content of food offered; however, prior literature has focused on schools,⁴⁶⁻⁵⁰ food pantries,⁵¹ worksites,^{52,53} and other institutions.⁵⁴ This article fills a significant gap in the literature because it documents PSE changes implemented at a unique cultural event, and because it is the first study documenting such changes in a US-residing Marshallese community.

Strengths and Limitations

This intervention evaluation does have some limitations. The intervention was only implemented with Marshallese living in Arkansas; therefore, the methods described may not be successful with other Pacific Islanders who are not Marshallese or Marshallese communities residing outside Arkansas. The menu analysis did not evaluate participant's consumption at the event or throughout the day. Therefore, it is unknown if the menu change affected total nutritional intake for the day. Despite these limitations, the May Day menu changes resulted in an early success of the community-based participatory collaboration between UAMS, Marshallese staff, and the May Day food sub-committee and were the beginning of several nutritional interventions. The May Day menu changes was our first pilot intervention, and since the May Day intervention, UAMS has continued to work with the Marshallese community to address diabetes through nutritional interventions including the implementation of diabetes self-management education^{9,12,17,19,20,55} and diabetes prevention education.^{15,18} In addition, UAMS has continued to worked on PSE changes to improve nutrition in multiple settings including schools,⁵⁶ food pantries,^{39,40} and churches.^{57,58} Healthier nutritional practices have continued to be implemented at subsequent May Day events, but these changes have not been formally evaluated.

Conflict of Interest

None of the authors identify a conflict of interest.

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The First Confirmed Case of Breast Implant-Associated Anaplastic Large Cell Lymphoma in Hawai'i

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Abstract

A 78-year-old woman within 3 years of bilateral silicone gel breast implants for breast reconstruction due to breast cancer presented with heaviness and swelling in her right breast. Cytology of the aspirated fluid confirmed breast implant associated anaplastic large cell lymphoma (BIA-ALCL), and the patient underwent removal of implant and total capsulectomy. Breast implant-associated anaplastic large cell lymphoma is a rare entity, but if diagnosed early is a curable condition. This paper presents the first confirmed case of breast implant associated anaplastic large cell lymphoma in Hawai'i.

Keywords

surgery, breast augmentation, breast implants, breast implant-associated anaplastic large cell lymphoma

Abbreviations

ALK = anaplastic lymphoma kinase

BIA-ALCL = breast implant-associated anaplastic large cell lymphoma

BI-RADS = breast imaging reporting and data system

Introduction

Breast implant-associated anaplastic large cell lymphoma (BIA-ALCL) is a rare peripheral T cell non-Hodgkin's lymphoma, which typically arises in the capsule or fluid surrounding a breast implant. The etiology of BIA-ALCL is unknown, but BIA-ALCL cases have occurred more frequently in association with textured surface implants. It has been proposed that the texture surface induces a chronic inflammatory reaction.¹⁻⁴ The neoplastic cells of BIA-ALCL are CD30 positive and ALK negative. They have characteristic horseshoe-shaped, or kidney-shaped, nuclei and prominent nucleoli with abundant eosinophilic cytoplasm.⁴

Case Report

A 78-year-old woman underwent bilateral breast reconstruction following mastectomy for breast cancer. Textured silicone gel breast implants were inserted on March 2013. On November 2015, the patient presented to the emergency room with heaviness in her right breast for two days. On examination she showed right breast swelling with no sign of infection. An ultrasound guided aspiration revealed 650 mLs of cloudy, yellow fluid. Cultures were negative. The patient had both implants and the anterior implant capsule removed. Portions of the anterior implant capsule as well as pieces of the residual thin film in

the capsular space was submitted for cytologic studies. The cytology report indicated breast implant-associated anaplastic large cell lymphoma, CD30 positive and ALK negative (Figure 1). The patient subsequently underwent removal of the right breast implant and total capsulectomy. Histological studies of the removed capsules also showed breast implant-associated anaplastic large cell lymphoma that involved the capsule but not extending to the surrounding breast tissues. No masses could be identified grossly or microscopically.

The patient was followed regularly by an oncologist and she maintained a BI-RADS score of 2 with no evidence of malignancy on MRI through January, 2018. On July, 2018, a PET/CT showed a new nodule in the medial left upper lobe of the lungs. Biopsy of the lung confirmed non-small cell carcinoma, unrelated to the breast cancer, and the patient was treated with radiation therapy.

Discussion

Since the first breast augmentation in 1962,⁵ the number of breast augmentation procedures have increased tremendously becoming the most common cosmetic surgical procedure performed by plastic surgeons during the past decades. There were 313 735 procedures conducted in 2018, a 48% increase since 2000.⁶

The first reported case of breast implant associated anaplastic lymphoma was published by Keech and Creech in 1997.⁷ Increasing reports of BIA-ALCL have occurred since then, and as of September, 2018, the US Food and Drug Administration has received 457 reports of BIA-ALCL.⁸ Anaplastic lymphoma appears to vary based on type of implants: 310 (68%) reports involved textured implants, 24 (5%) were associated with smooth implants, and 123 (27%) reports did not specify. Of the 457 reported cases, 274 (60%) involved silicone gel-filled implants and 183 (40%) were due to saline-filled prostheses.⁸

In 2016, the World Health Organization recognized BIA-ALCL as a distinct form of anaplastic large cell lymphoma, and classified BIA-ALCL as a mature T and NK neoplasm.⁹ Doren and associates estimated a lifetime prevalence of BIA-ALCL in the United States of 1 in 30 000 patients with textured breast implants whether or not they are filled with silicone gel or normal saline.¹⁰ Worldwide, the current incidence and risk of BIA-ALCL is estimated at 1 in 2 832 patients with textured breast implants.¹¹

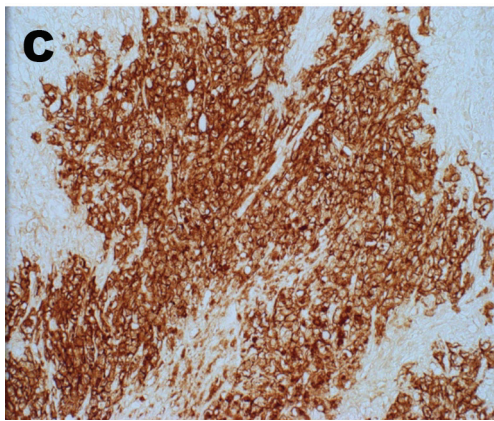
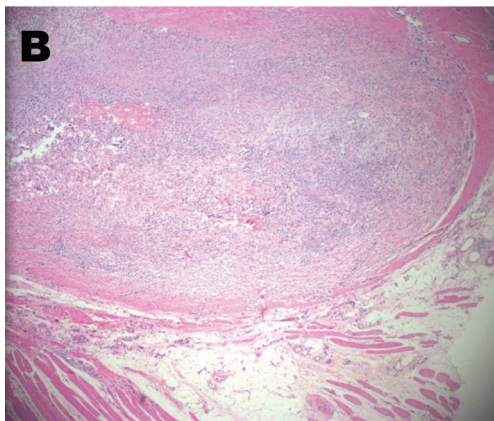
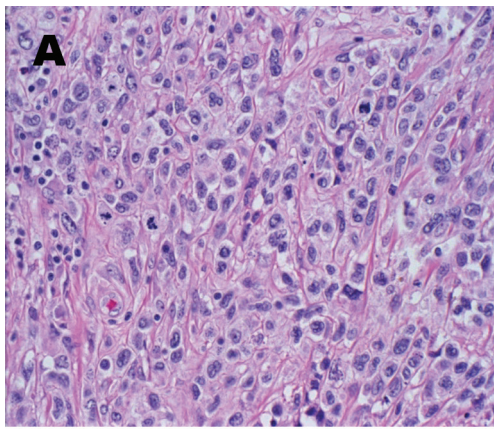


Figure 1. Large anaplastic lymphoma cells with abundant cytoplasm and pleomorphic nuclei at high power (A), low power (B), and an immunohistochemistry stain for CD30 diffusely positive (C).

Most cases of BIA-ALCL present approximately 10 years after breast implant placement and the median age of onset of BIA-ALCL in patients is about 50 years.^{12,13} BIA-ALCL commonly presents with seroma accumulation between the fibrous capsule and breast implant, and in the absence of other causes of seroma accumulation, such as infection, implant rupture, or trauma.⁴ The effusion may manifest as breast swelling, pain, and redness.^{4,14} Less common presentations include a palpable mass, skin lesions, and axillary lymphadenopathy.^{4,13,15}

The National Comprehensive Cancer Network (NCCN) recommends removal of the implant as well as the surrounding capsule and any suspicious associated masses. No adjunctive therapy is suggested in patients with localized disease that can be completely excised by total capsulectomy and removal of breast implant. However, adjunctive chemotherapy is suggested for cases of high risk patients with advanced disease BIA-ALCL that have not been completely resolved by surgery.¹⁶ Clemens, et al, (2016) showed higher event-free survival and overall survival in patients treated with complete surgery (breast implant removal and total capsulectomy with complete excision of any associated mass and negative margins on final pathologic evaluation) compared to limited surgery (partial capsulectomy and implant removal) or chemotherapy or radiation therapy.¹⁷

To our knowledge, this is the first confirmed case of BIA-ALCL in Hawai‘i. As awareness of BIA-ALCL spreads, and with a 1 in 30 000 prevalence of BIA-ALCL, more cases of this condition are likely to present to physicians in the future. It is recommended that this subtype of anaplastic lymphoma should be on physicians’ differential diagnosis when a patient presents with delayed onset of seroma (median onset is approximately 10 years after breast implantation), particularly if the patient had textured implants inserted. While these are the common presentations, there have been rare cases of BIA-ALCL presenting with earlier onset breast seroma and in association to smooth implants.

Conclusion

Breast implant-associated anaplastic large cell lymphoma (BIA-ALCL) is a rare subtype of anaplastic large cell lymphoma associated with textured breast implants. Despite its rarity, BIA-ALCL has become more widely recognized as a concerning surgical complication. This paper presented the first confirmed case of BIA-ALCL in Hawai‘i. More cases are likely to occur in Hawai‘i, and so patients who receive breast implants need to be educated about this condition and monitored for common presenting symptoms, such as late onset breast swelling and pain.

Conflict of Interest

None of the authors identify a conflict of interest.

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The Wahine Heart Wellness Program: A Community Approach to Reducing Women's Cardiovascular Disease Risk

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Abstract

Cardiovascular disease remains the leading cause of death for women in the United States. Although Hawai'i has relatively low rates of death from heart disease and stroke, Native Hawaiians and Other Pacific Islanders (NHOPI) are plagued with disproportionately higher rates of the chronic diseases that contribute to these deaths. This study follows a Practice Inquiry Project framework and aims to improve identification of cardiovascular disease (CVD) risk and promote health literacy of the disease in Asian, Native Hawaiians and Other Pacific Islander women on O'ahu. The study addresses: (a) assessment of current level of awareness of CVD as the leading cause of death for this population; (b) implementation of a CVD risk reduction program; and (c) an evaluation of that program's effectiveness in decreasing CVD risk. The study design used a mixed methods approach. The methods included a cardiovascular awareness questionnaire (pre-test and post-test), a screening process using the American Heart Association's Life's Simple 7 matrix, and 6 educational sessions. With these research methods, the participants' knowledge levels, health perceptions, and behaviors were evaluated. A convenience sample of 20 predominantly Asian, Native Hawaiian, and Pacific Islander women were recruited. At the conclusion of the project, participants showed increased awareness of CVD and improved behaviors to reduce the risk of CVD. The project also demonstrated that collaboration and partnerships between local schools of nursing and community organizations, community-based integrated approaches, incorporating health literacy, and infusing cultural knowledge into practice are important in creating successful and innovative solutions when working with Asian, Native Hawaiian, and Other Pacific Islander women.

Keywords

cardiovascular risk, community-based prevention program, lifestyle management, Native Hawaiian women, primary prevention

Abbreviations and Acronyms

AHA MCI ELT = American Heart Association Multicultural Initiatives and Executive Leadership Team
CAD = coronary artery disease
CVD = cardiovascular disease
PIP = Practice Inquiry Project
RAQ = Risk Awareness Questionnaire
WCCHC = Wai'anae Coast Comprehensive Health Center
WHWP = Wahine Heart Wellness Program

Introduction

Heart disease is the leading cause of death of American women. According to the Centers for Disease Control and Prevention, in the United States heart disease kills more women yearly than all forms of cancer. More than 1 in 3 women in the United States has heart disease. According to the American Heart Association (AHA), the number of cardiovascular disease (CVD) deaths in

females has surpassed that in males in every year since 1984. In 2013, CVD was the cause of death in 289,758 women in the United States (U.S.), and women represented 51% of all deaths from CVD. The rate of heart disease triples after menopause. Sixty-four percent of women who died suddenly of CVD had no previous symptoms. Recent data has revealed a gender-specific role of myocardial dysfunction as an early stage of CVD. Autopsy data has shown that women have more coronary plaque erosion and more embolization in their smaller, distal blood vessels, compared with men.

In Hawai'i, CVD is the leading cause of death. In 2014, 3 out of every 10 deaths in Hawai'i were caused by CVD, about 3,000 deaths each year. Although Hawai'i has relatively low rates of death from heart disease and stroke, Native Hawaiians are plagued with disproportionately higher rates of chronic conditions, such as obesity, diabetes, and high blood pressure, and higher rates of death from heart disease compared with the overall state population. Previous studies have documented ethnic disparities in CVD mortality and risk factors. Studies have shown that Native Hawaiians die at younger ages than Hawai'i residents in other ethnic groups. In 2010, Native Hawaiian female life expectancy at birth was 79.4 years as compared to the state average of 85.6 years. Compared to the state average, Native Hawaiians also have higher rates of smoking (21.3% vs 14.3%), high blood pressure (35.3% vs 27.5%), and obesity (43% vs 23.4%). These statistics show that increased engagement of disparate communities needs to be a priority. Future research is needed to improve cardiometabolic risk in this disproportionately affected population, and to look for effective interventions to reduce mortality and morbidity.

Women's awareness of CVD as the leading cause of death in women has almost doubled since 1997, but minority women's awareness still lags behind that of other women. Before the start of the current project, a survey was performed at the Makeke Market on the Leeward Coast of O'ahu. Ninety-eight women were asked an open-ended question, "What is the leading cause of death for women in the U.S.?" According to the survey performed at the Makeke Market, only 44% of the respondents stated heart disease was the leading cause of death for women. This is below the national average of 54% of women recognizing that heart disease is their No. 1 killer.¹ Several studies have shown that increasing awareness of heart disease risk can lead to decreased cardiovascular risk. Other studies have shown that being aware of the risks of CVD is

linked to taking preventative action in women. Following a Practice Inquiry Project framework, the purpose of this study is to identify CVD risk early, to improve health literacy about CVD, and to promote healthy lifestyle changes in Asian, Native Hawaiian, and Other Pacific Island women. Studies have shown by participating in a comprehensive prevention program, like a women's heart disease awareness program, high-risk women can improve their knowledge and awareness of cardiovascular risk, and then act to reduce their risk of CVD and improve the health of their families.¹⁴⁻¹⁵

Methods

Setting

The study participants were recruited from the Makeke Market on the Leeward Coast of O'ahu. Makeke Market is a farmer's and wellness market held in several locations and generally serves a population of lower socioeconomic, predominantly Native Hawaiian people. The market is supported by the Wai'anae Coast Comprehensive Health Center, and offers a gathering place where community members, local food producers, and Hawaiian cultural practitioners can meet to connect, learn, teach, entertain, and share values that lead to healthy and affordable habits. The Makeke Market accepts electronic benefit transfer (EBT) cards and gives users double the purchasing power when using the card. Women were recruited for the study at the Kapolei location, which is located across the street from a Hawaiian homeland property, and thus visited by many Native Hawaiian people. A nonprobability sampling method was used to approach Asian, Native Hawaiian, and Pacific Islander women in the Makeke Market.

Participants

The participants in this project included 20 predominantly Asian, Native Hawaiian, and Pacific Islander women, living on the Leeward Coast of O'ahu, Hawaii. The eligibility criteria included female, ages 24-69, English speaking, of lower socioeconomic status, of Asian, Native Hawaiian, or Other Pacific Islander ethnicity, and having at least 1 CVD risk factor. Another inclusion criterion was their willingness to discuss health status, current health practices, and knowledge levels of heart disease. Exclusion criteria included having diabetes, previous cardiac event, systolic blood pressure (SBP) > 180 mmHg, diastolic blood pressure (DBP) > 110 mmHg, total cholesterol > 400mg/dl, or pregnant, all based on self-report. A questionnaire and a demographic information sheet were used to screen women for inclusion and exclusion factors prior to enrolling them in the program.

Of the 40 women who initially expressed interest, 20 consented to participate and completed the study. The most common reasons for declining to participate in the study were perceived time constraints, and not being able to attend all 8 weeks of the

program. The participant selection process concluded with a convenience sample of 20 Native Hawaiian, Asian, and Other Pacific Islander women who gave informed consent and voluntarily participated in the study.

Data Collection Procedure and Timeline

The research timeline consisted of 3 phases, including Phase I (planning), II (implementation), and III (analysis). During the first week of phase II, the participants completed a cardiovascular risk awareness questionnaire (RAQ) to evaluate their knowledge about CVD risk. They completed the RAQ twice, first as pre-test to collect baseline data, and then as a post-test. In between these tests, the participants assessed their CVD risk using the AHA's Life's Simple 7 matrix, and completed the 6 educational sessions comprising the Wahine Heart Wellness Program (WHWP). During the eighth week (phase II), the participants completed an evaluation of the program. During Phase III, data were compiled and analyzed. Results were disseminated, and the feasibility of future implementation of the WHWP was determined.

Risk Awareness Questionnaire (RAQ) Pre- and Post-test

The RAQ was prepared by the project director. It consisted of knowledge-based questions aimed at assessing the participant's ability to correctly identify modifiable risk factors for CVD. The questionnaire consisted of 5 multiple-choice questions, each offering a choice of 4 answers, labeled "A" through "D." Questions on the RAQ included: What is the leading cause of death for women? How much exercise is recommended weekly? What is considered a "good" total cholesterol score? What is a healthy target blood pressure? How many servings of fruits/vegetables should you have daily? The questions were formulated based on the AHA Life's Simple 7 Wellness Guide.

Life's Simple 7 Assessment Tool

After the participants completed the RAQ to assess their baseline knowledge of CVD risk factors, the participants assessed their CVD risk using the AHA Life's Simple 7 Assessment Tool. The assessment tool was created by AHA using the AHA guidelines and is part of the organization's Life's Simple 7 program, which identifies the 7 most significant predictors of heart health and shows users a pathway for achieving ideal cardiovascular health (Table 1). The AHA's 2020 Impact Goal of improving the cardiovascular health of all Americans by 20 percent and reducing deaths from cardiovascular disease and stroke by 20 percent emphasize the organization's focus on prevention. To complete the Life's Simple 7 assessment tool, participants answer questions about 4 behaviors (not smoking, maintaining a healthy weight, eating healthy, and being physically active) and 3 biometric measures (blood pressure, cholesterol, and blood sugar). This tool classifies their answers about each of these 7 factors into 3 categories of health: ideal, intermediate, and

poor. For example, for body mass index (BMI), adults with a BMI greater than 30 are classified as “poor,” those with a BMI of 25–29.9 are classified as “intermediate,” and those with a BMI of 18.5–25 are classified as “ideal” (Table 1). Individuals with ideal levels for all 7 metrics were considered to have ideal cardiovascular health. Life’s Simple 7 total scores are calculated by assigning each component points (2 points for ideal, 1 point for intermediate, or 0 points for poor), then summing all 7 components to yield a total score ranging from 0 (worst) to 14 points (best). Categories of Life’s Simple 7 score were poor (0–6 points), intermediate (7–8 points), and ideal (9–14 points).¹⁷

In the Wahine Heart Wellness Program (WHWP), participants were educated about modifiable and non-modifiable risk factors for CVD. Lifestyle intervention classes based on the AHA Life’s Simple 7 Wellness Guide were provided weekly. The participants were advised to get clearance from their health care provider before starting any exercise plan. The program included education on nutrition, exercise, hands-only CPR, and cardiovascular disease prevention. It also included behavioral support about barriers to lifestyle changes and problem-solving methods. The classes were taught in a small community-based environment. Local language was incorporated into the lessons, while culturally-relevant media were utilized that included local faces and information relevant to Hawaiian ethnic groups.

The diets discussed in the program included evidenced-based diets to prevent cardiovascular disease. The participants were encouraged to follow a healthy diet high in fruits, vegetables, and fiber, such as the Mediterranean or DASH diet, and they were provided with handouts on these diets. Participants were also given a booklet on a low-sodium diet called “Feel Better with Less Salt,” which was created by the Department of Native Hawaiian Health at the Queen’s Health Systems. This booklet also included culturally-specific disease management information, including concepts such as “*pa’akai*”, salt traditions in Native Hawaiian cultures. Meal preparation demonstrations were provided using AHA healthy recipes and incorporating local foods from the Makeke Market. A variety of local vendors, such as Mao Farms from Wai’anae, donated produce for the demonstrations.

The project director and nursing students used motivational interviewing techniques when communicating with the participants to help them achieve their lifestyle change goals. “Motivational interviewing” is a person-centered method for strengthening a person’s motivation for a commitment to change and has been used to predict a persons’ readiness to change. Motivational interviewing can build the intrinsic motivation that is needed to make difficult changes and offers an approach for managing behavioral challenges. Small giveaways such as a pedometer, AHAT-shirts, and healthy cooking recipe pamphlets were given to participants during weeks 3, 5, and 6 respectively. These giveaways were used as incentives to encourage participants to return to the weekly classes.

At the conclusion of the WHWP, a short evaluation questionnaire was provided to the participants. There were 7 questions, each with a 5-point Likert-scale to evaluate the program. The questions evaluated 3 domains: the quality of the program, the applicability of the program, and an overall assessment. There were also open-ended questions asking how the participants liked the community-based program, if the environment was conducive to learning, what they would like done differently, and what topics or activities would they like added to the program.

Statistical Analyses

Study participants’ characteristics were summarized using descriptive statistics. The pre- and post-program RAQ test results were compared by evaluating how many participants answered correctly for each item and overall mean score change. The participants’ pre and post Life’s Simple 7 scores were examined both in continuous scale and categorical scale (poor; intermediate; and ideal). Paired t-test and McNemar’s test were performed to determine whether the participants’ RAQ test scores and Life’s Simple 7 scores changed significantly before and after the program. A *P*-value of <.05 was considered significant for both paired t-test and McNemar’s test. All analyses were conducted in R version 3.6.0 (RCore Team: Vienna, Austria).

Components	Poor (0 Points)	Intermediate (1 Point)	Ideal (2 Points)
Physical Activity	No intense physical activity	Up to 149 minutes/week	150 or more minutes/week
Cholesterol	> 240 mg/dL	200-239 mg/dL	< 170 mg/dL
Healthy Diet Score	0-1 components	2-3 components	4-5 components
Blood Pressure	SBP > 140 or DBP > 90	SBP 120-130 or DBP 80-89 mmHg	SBP < 120 or DBP < 80
Body Mass Index	BMI > 30 kg/m ²	BMI of 25-29.9 kg/m ²	BMI < 25 kg/m ²
Blood Glucose	> 126 mg/dL	100-125 mg/dL or treated to goal	Less than 100 mg/dL
Smoking	Current	Former <1 year	Never or > 1 year ago

Collaboration

The key stakeholders who played a supportive role in the project included a Family Nurse Practitioner and Director of Nursing Education at the Wai‘anae Coast Comprehensive Health Center, the Multicultural Initiatives and Quality & Systems Improvement Regional Director for the AHA Hawai‘i Division, the Director of Native Hawaiian Health Program at The Queen’s Medical Center, and the Medical Director of the Center for Outcomes Research and Evaluation at The Queen’s Medical Center. The key stakeholders provided support and feedback for the planning and implementation of the project. The program also partnered with the AHA Hawai‘i Division, The Queen’s Medical Center, and the Wai‘anae Health Academy. The aim of this partnering with local organizations was to enrich the curriculum of the education program while providing greater value to the women who joined. The Makeke Market provided the venue for implementation of the program.

Protection of Human Subjects and Ethical Considerations

Protection of human subjects was addressed as well as any ethical concerns during the study. Application for Scientific Review Committee (SRC) and the Institutional Review Board (IRB) was obtained. Permission to conduct this study was obtained at the University of Hawai‘i at Mānoa Human Subjects Committee IRB before recruitment and data collection efforts (IRB Approval Number CHS #23947).

Results

Study participants ranged in age from 28 to 69 years, with a mean age of 48.5 years. More than one-third of the women identified themselves as Native Hawaiian (35%), with the other women stating their ethnicity as Filipino (25%), Japanese (15%), Korean (10%), Chinese (5%), other Asian (5%) or white (5%). Eighty-five percent of the women were employed (55% worked full time and 30% worked part-time), while 15% were retired. Income was assessed by a question that asked the women to describe their general financial status, rather than give a monetary range. Twenty percent reported making enough to feel comfortable, 55% reported having enough to make ends meet, and 25% did not make enough to make ends meet. All of the respondents

had completed high school, 30% had completed some college, and 55% had graduated from college (Table 2). All participants reported that they were literate and had adequate comprehension skills to complete the questionnaires without assistance.

The participants showed significantly improved awareness of CVD in the 4 items in RAQ except for the question “What is a healthy target blood pressure?”, for which 85% of the women already had correct answer from the beginning. The mean score on the RAQ post-test significantly increased from 2.4 to 4.5 (Table 3).

Variable	Mean ± SD or n (%)
Age (years)	48.5 ± 13.9
Ethnicity	
Native Hawaiian	7 (35%)
Filipino	5 (25%)
Japanese	3 (15%)
Korean	2 (10%)
Chinese	1 (5%)
Other Asian	1 (5%)
White	1 (5%)
Education Level	
Less than high school	0 (0%)
High school	3 (15%)
Some college	6 (30%)
College graduate or higher	11 (55%)
Employment Status	
Unemployed	0 (0%)
Employed Full-time	11 (55%)
Employed Part-time	6 (30%)
Home maker	0 (0%)
Retired	3 (15%)
Income	
Comfortable	4 (20%)
Enough to make ends meet	11 (55%)
Not enough to make ends meet	5 (25%)

Questions	Number Correct Pretest	Percent	Number Correct Post-test	Percent	P-value ^a
What is the leading cause of death for women?	11	55%	19	95%	.0077
How much exercise is recommended weekly?	12	60%	19	95%	.0133
What is considered a "good" total cholesterol score?	4	20%	14	70%	.0026
What is a healthy target blood pressure?	17	85%	18	90%	.9999
How many servings of fruits/vegetables should you have daily?	5	25%	14	70%	.0015
Total Score (Mean ± SD)	2.40 ± 1.05		4.45 ± 0.69		<.0001

^aP-values are based on the McNemar’s test for each questionnaire item, and the paired t-test for total score.

The participants showed significant improvements in their Life's Simple 7 scores. At the end of the program, the mean score for the Life's Simple 7 Metric was 10.5 with the standard deviation of 1.6, as compared to the average of 8.2 with the standard deviation of 2.0 at the beginning of the program ($P < .0001$). The post-program scores ranged from 8 to 13 points. None of the women scored in the poor range (0 to 6 points) after completing the program, as compared to 3 participants (15%) on their pre-program score; 2 (10%) of the women scored in the intermediate range (7-8 points) on their post-program score, as compared to 10 (50%) on their pre-program score; while 18 (90%) women scored in the ideal range (9-14 points) after completing the program, as compared to 7 (35%) on their pre-program score ($P = .0046$) (Figure 1).

At the conclusion of the program, a short evaluation questionnaire was provided to the participants. The majority of the participants (95%) scored the program a 5 out of 5 in all domains.

All of the women (100%) rated the quality of the program a 5 out of 5, and the applicability of the program a 5 out of 5. In the overall assessment, 100% of the participants evaluated the program as very good and would recommend this program to other women. For the final comments at the end of the program responses included, "I liked the information about watching my salt intake, and learned a lot about salt in local foods," "I learned how I can prevent heart disease," and "I attended the Makeke Market program weekly and found it helpful to have weekly follow-ups."

For outcome measures, the goal was to have all participants score 80% or above on the RAQ post-test and to see a 2-point improvement in the participants' Life's Simple 7 scores. At the conclusion of the program, 90% of the participants scored an 80% or above on the RAQ post-test, and 75% of the participants improved their Life's Simple 7 score by 2 points.

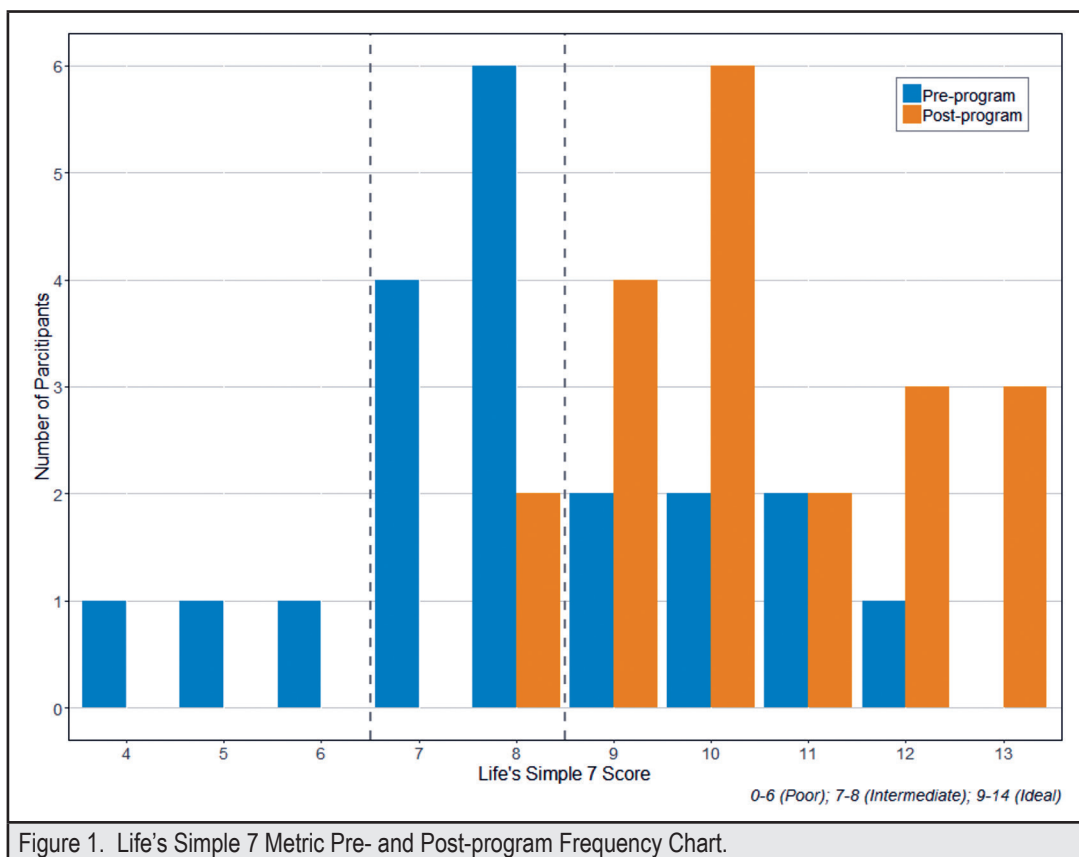


Figure 1. Life's Simple 7 Metric Pre- and Post-program Frequency Chart.

Discussion

Research confirms minority women are underserved and under-researched with inadequate resources, limited health literacy, and disadvantaged living conditions that lead to cardiovascular risk. In recent years, there has been more focus on studying cardiovascular disease in diverse racial-ethnic groups and in women. However, significant gaps remain in the understanding of cardiometabolic health disparities among Native Hawaiians and minority women. This practice inquiry project (PIP) extends what is known about cardiovascular health promotion and disease prevention in underserved women and minority populations and adds depth by incorporating Native Hawaiian cultural considerations, such as the concepts such as *pa'akai*, salt traditions, and practices to improve health literacy among women living on the Leeward Coast of O'ahu.

Women's awareness of cardiovascular disease as the leading cause of death in women has almost doubled since 1997, but minority women's awareness still lags behind that of all women. After the implementation of the WHWP, the post-test results of the RAQ showed that 95% of participants recognized that heart disease is the leading cause of death. Several studies have shown that by increasing awareness of heart disease risk, cardiovascular risk decreases.^{18,25} Studies have also shown that being aware of the risks of cardiovascular disease has been linked to taking preventative action in women.^{14,15,25} Public awareness campaigns, like the AHA's "Go Red for Women" and the WHWP, can help to increase awareness of the incidence of heart disease among women.

The purpose of using the Life's Simple 7 tool was to summarize several modifiable factors into a single score to promote and measure individual and population-level improvements in cardiovascular health. At the end of the program, the majority of the women in the current study (95%) scored in the ideal range of the Life's Simple 7 matrix, and none scored in the low range. Previous research has shown that better cardiovascular health, according to Life's Simple 7 factors, is associated with lower risk of heart disease and stroke.¹⁷ Moreover, the REGARDS study found a relationship between Life's Simple 7 scores and cognitive impairment: People with intermediate and high scores had a lower incidence of cognitive impairment. The REGARDS study did not observe a dose-response pattern; individuals with intermediate and high scores had a similar incidence of cognitive impairment.¹⁸ This result was encouraging for population health promotion, because scoring in the intermediate range in the Life's Simple 7 matrix is a more realistic target than scoring in the ideal range for many individuals.¹⁷

At the conclusion of the project, a meeting with staff and members of the Wai'anae Health Academy/Wai'anae Coast Comprehensive Health Center (WCCHC) was conducted to review results. A discussion took place about the feasibility of integrating changes to their standard of practice. Because of

the positive results and feedback from the participants, it was agreed upon to continue the WHWP at the Kapolei location. With the continuation of the program, its process and outcomes can continue to be monitored. The Makeke Market coordinators requested that the program also be offered at 2 other locations, Wai'anae Mall and the WCCHC.

A presentation of the evidence-based project was also given to the AHA Multicultural Initiatives and Executive Leadership Team (AHA MCI ELT) board members, and the board agreed to incorporate the WHWP into future initiatives and to continue support for the WHWP. An AHA MCI ELT meeting was held at the end of the fiscal year to discuss the progress to date and provide an update on healthier environments. Ongoing communication with the stakeholders is vital to the acceptance of change.

When designating limited resources to community health programs, public and private sector leaders need to consider both the health of the community and the economic value of a program that is aimed at CVD prevention. The ability to develop and prioritize policy measures is often impeded by significant gaps in health economics data. The Policy Research Implementation Group of the National Forum for Heart Disease and Stroke Prevention suggests that more focus needs to be directed towards expanded CVD surveillance, advances in evaluation, and economic modeling of primary prevention.²⁴ Enhanced policy, funding, and leadership support are essential to realizing these research goals. Research needs to be targeted towards the health impact and economic value of CVD prevention, to eliminate CVD disparities.

Recent considerations of the 2010 Affordable Care Act emphasize the need for population-wide change outside the health care system. It is estimated that only 10% to 15% of preventable deaths in the United States are affected by medical care. The CDC's Public Health Action Plan to Prevent Heart Disease and Stroke includes policy and environmental changes affecting the entire U.S. population as a way to change unhealthy behavioral patterns. The goal is to make a comprehensive public health strategy to prevent heart disease and stroke. The contribution to the recent advances in Preventive Cardiology and Lifestyle Medicine series focuses on behavioral interventions that facilitate population-wide cardiovascular health through public policy, environmental change, and legislation.²⁶ Health care needs to move beyond the walls of hospitals and clinics. Community-based programs like the WHWP, which encourages healthy lifestyles, are essential for underserved and understudied populations such as the study population.

The next step is to collaborate with the AHA and the University of Hawai'i at Hilo School of Nursing to discuss a plan to offer a program like the WHWP to communities on Hawai'i Island. Rural communities including Ka'u and Kalapana may benefit from a culturally-sensitive program to help high-risk women

improve their knowledge and awareness of cardiovascular disease, which may help them to engage in behaviors that reduce their risk of cardiovascular disease as well as improve the health of their families.

Currently, the WHWP continues in partnership with the Hawai'i Pacific University, the University of Hawai'i Hilo, and the Wai'anae Health Academy. The nursing students volunteer at the Makeke Market, a Kupuna Program in Wai'anae, and at the Wai'anae High School Health Academy, educating the community about lifestyle choices to prevent CVD. The goal of this project is to make the program portable so that it can be offered to communities on all the islands of Hawai'i. The collaboration with nursing schools and community stakeholders will play an integral role in the success of this program.

Studies about cardiovascular risk are needed involving women and minorities, in particular with Native Hawaiian women. Although racial and ethnic disparities in cardiovascular risk have been recognized, the growing literature has not sufficiently integrated data on the socioeconomic status of these populations into CVD research. More research is also needed to develop evidence-based methods to improve adherence to cardiovascular prevention interventions, especially in high-risk women. Research related to the identification of nontraditional risk factors is ongoing and much needed.

Study Limitations and Generalizability

The use of a convenience sample and the small sample size of the study may have been limiting factors. The participants were selected from a single community farmer's market. The participants included lower income predominantly Asian, Native Hawaiian, and Pacific Islander women, therefore the study is limited in its generalizability. Women who felt they were not at risk for CVD or, conversely, were at high risk may have self-selected not to participate. Also, the sample could have consisted of people interested in improving their health and may be different from those not interested in improving their health. This study targeted a group of women of certain ethnicities and socioeconomic status in order to address the specific factors that put them at risk for CVD and to offer culturally-sensitive interventions.

Conclusion

Women's awareness of CVD as the leading cause of death in women has improved, but minority women's awareness remains suboptimal.²¹ This study showed that educational sessions to increase awareness of CVD can encourage women to make behavioral changes to decrease cardiovascular risk. Women need hands-on solutions that are easy, quick, affordable, and accessible to incorporate into their busy lives. Tangible solutions need to be provided, along with a place that women can gather to learn about their CVD risk, primary prevention strategies,

and ways to promote a healthy lifestyle. Additional data are needed in diverse ethnic/socioeconomic population of women. Future CVD and prevention studies for women should focus on incorporating culturally-relevant interventions to reduce mortality and morbidity.

The next step for the WHWP is to focus on making the program portable so it can be implemented in other communities, such as rural communities on islands other than O'ahu. The AHA MCI Committee is interested in collaborating with other School of Nursing programs to implement a similar program to other desperate communities. The use of evidence-based initiatives, having a solid conceptual framework, and the goal of creating a sustainable program increased the success of the program. One contribution a Doctor of Nursing Practice provider can offer a community is to translate research findings into programs such as the WHWP. This study showed that collaboration between local schools of nursing and community organizations, as well as integrating community-based approaches, health literacy, and cultural knowledge into models of practice are key to successful, innovative, and sustainable solutions. It takes a community to build a village, and as exemplified by the Hawaiian language phrase, *'A'ohe hana nui ke alu 'ia*, which means, "No task is too big when done together by all."

Conflict of Interest

None of the authors identify a conflict of interest.

Disclosure

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SPOTLIGHT ON NURSING

Filling the Gap in the Primary Care Shortage: Issues and Solutions for Hawai'i's Healthy Future

Laura Reichhardt MS, APRN, NP-C and Joanne R. Loos PhD

The Spotlight on Nursing is a recurring column from the University of Hawai'i at Mānoa's School of Nursing and Dental Hygiene (UHM SONDH). It is edited by Mary G. Boland DrPH, RN, FAAN, Dean of UHM SONDH; Kristine Qureshi PhD, RN, CEN, PHNA-BC, FAAN, Associate Dean of Research for UHM SONDH and HJH&SW Contributing Editor; and Joanne R. Loos PhD, Science Writer for UHM SONDH.

Hawai'i is facing a primary care provider crisis. As the population age and size continues to rise and the distribution of people with complex chronic illnesses increases, the demands for primary care services will expand.^{1,2} In the current environment, there is a high demand but low supply of primary care providers. Therefore, identifying solutions for the shortage in primary care providers is of great priority. One solution may be the use of nurse practitioners (NPs), a rapidly growing segment of the primary care workforce. This group of healthcare professionals is well prepared to deliver primary care and has the ability to deliver high-quality and patient-preferred care.²

NPs are advanced practice registered nurses (APRNs) who are licensed, independent practitioners. They provide primary and specialty care in all practice settings, including ambulatory, acute, and long-term care. In Hawai'i, NPs have full scope of practice authority (they assess, diagnose, and treat patients, including prescribing both controlled and uncontrolled drugs).^{3,4} Practicing NPs have more than six years of academic and clinical preparation that includes graduate education, national board certification, and state APRN licensure in their specialty area of NP training.⁵ This training prepares NPs to offer a high level of quality care to their patients. Nationally, 89% of NPs are prepared in a primary care specialty.²

Primary care NPs (PCNPs) add significant value to patient care services. When evaluating the cost of primary care, PCNP-delivered care is 11%-29% lower in cost than that of primary care medical doctor (PCMD)-delivered care, even after controlling for the lower Medicare and Medicaid reimbursement rates for NPs for the same services.¹ When assessing quality, patients who receive primary care from a PCNP are less likely than those cared for by a PCMD to have preventable hospital admissions, 30 day all-cause hospital readmissions, inappropriate emergency room visits, or receive prescriptions for drugs commonly linked to overdose deaths.^{2,6} NPs are more likely to care for underserved populations, and their patients, particularly those who are vulnerable, have been shown to have expanded health care utilization.⁶ NPs are adept at working in a team

care environment. When PCNPs and PCMDs work together to deliver care, patients receive better care than when compared to those who receive primary care from a PCNP or PCMD alone.² Moreover, once team-based care is established, the vast majority of both PCNPs (88%) and PCMDs (74%) prefer this model of care delivery.⁷

All of Hawai'i, Maui, and Kaua'i Counties and pockets of the City and County of Honolulu are medically underserved.⁸ These areas are often rural, remote, or both. In the rural areas, population size is growing and access to care remains a major concern. NPs can help to fill this void, as the trends have shown that the NP workforce has increased dramatically and is projected to continue to grow.¹ In states like Hawai'i, which enable NPs to work with full scope-of-practice authority, PCNPs are more likely to practice in rural areas.¹ As a result, people in these communities gain access to well-coordinated, high quality, and timely healthcare.

In Hawai'i, the University of Hawai'i at Mānoa and University of Hawai'i at Hilo educate PCNPs at the doctoral level.⁹ In addition, Hawai'i Pacific University prepares NPs for acute and primary care roles at both the master's and doctoral levels of education.⁹ During the course of their education, students are supported by highly qualified NP and physician preceptors. Although clinical education is critical to creating well-prepared NP graduates, access to needed clinical preceptors is in short supply.¹⁰ To incentivize highly qualified providers to serve as preceptors for clinical experiences, the state legislature approved a preceptor tax credit bill in 2018.¹¹ Beginning in 2019, PCNPs, PCMDs, and pharmacists in Hawai'i who precept NP, MD, or pharmacy students may be eligible for the Healthcare Preceptor Tax Credits. For every 80 hours or more of uncompensated precepted time, the provider may receive a \$1,000 credit off his or her state personal income taxes, up to \$5,000, annually.¹¹

The National Academy of Medicine, formerly the Institute of Medicine, along with the National Council of State Boards of Nursing and 47 other national nursing associations recom-

mend the full-scope-of-practice model.¹² NPs in these states can legally evaluate patients, diagnose, order and interpret diagnostic tests, initiate or refer for treatment, prescribe legend and controlled drugs, and ensure continuity of care over time.³ Hawai‘i is one of 22 states where NPs have the full scope-of-practice authority.¹³ Challenges still exist. Although nearly 90% of NPs are prepared to deliver primary care, only 53% of NPs are employed in primary care, which indicates that the integration of NPs into these roles is an untapped opportunity.¹⁴ Root causes for underutilization of NPs in Hawai‘i include a lack of team-based care models, poor understanding of the APRN role, and low reimbursement rates for APRN services. Challenges begin with educating organizations on best practices for recruiting and hiring NPs. Once those issues are solved, opportunities can occur for organizations to develop interprofessional practice models and integrate NPs into the primary care workforce. These organizations should capitalize on the rapidly growing and readily available NP workforce to serve the communities in greatest need.

The Hawai‘i State Center for Nursing is convening an APRN Transition to Practice steering committee. Members include employers, insurance agencies, and APRNs, and they are working to identify best practices for APRN transition to practice in the state. Information is available by emailing HSCFN@hawaii.edu. Additionally, many health care organizations are actively recruiting APRNs. For example, the Hawai‘i/Pacific Basin Area Health Education Center is compiling active job recruitment efforts in the state at: <http://www.ahcc.hawaii.edu/health-care-jobs/>. NPs can help to answer the calls for increased primary care providers, but support is needed in order to tap into this potential.

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General Recommendations on Data Presentation and Statistical Reporting (Biostatistical Guideline for HJH&SW) [Adapted from Annals of Internal Medicine & American Journal of Public Health]

The following guidelines are developed based on many common errors we see in manuscripts submitted to HJH&SW. They are not meant to be all encompassing, or be restrictive to authors who feel that their data must be presented differently for legitimate reasons. We hope they are helpful to you; in turn, following these guidelines will reduce or eliminate the common errors we address with authors later in the publication process.

Percentages: Report percentages to one decimal place (eg, 26.7%) when sample size is ≥ 200 . For smaller samples (< 200), do not use decimal places (eg, 27%, not 26.7%), to avoid the appearance of a level of precision that is not present.

Standard deviations (SD)/standard errors (SE): Please specify the measures used: using “mean (SD)” for data summary and description; to show sampling variability, consider reporting confidence intervals, rather than standard errors, when possible to avoid confusion.

Population parameters versus sample statistics: Using Greek letters to represent population parameters and Roman letters to represent estimates of those parameters in tables and text. For example, when reporting regression analysis results, Greek symbol (β), or Beta (b) should only be used in the text when describing the equations or parameters being estimated, never in reference to the results based on sample data. Instead, one can use “b” or β for unstandardized regression parameter estimates, and “B” or β for standardized regression parameter estimates.

P values: Using *P* values to present statistical significance, the actual observed *P* value should be presented. For *P* values between .001 and .20, please report the value to the nearest thousandth (eg, $P = .123$). For *P* values greater than .20, please report the value to the nearest hundredth (eg, $P = .34$). If the observed *P* value is great than .999, it should be expressed as “ $P > .99$ ”. For a *P* value less than .001, report as “ $P < .001$ ”. Under no circumstance should the symbol “NS” or “ns” (for not significant) be used in place of actual *P* values.

“Trend”: Use the word trend when describing a test for trend or dose-response. Avoid using it to refer to *P* values near but not below .05. In such instances, simply report a difference and the confidence interval of the difference (if appropriate), with or without the *P* value.

One-sided tests: There are very rare circumstances where a “one-sided” significance test is appropriate, eg, non-inferiority trials. Therefore, “two-sided” significance tests are the rule, not the exception. Do not report one-sided significance test unless it can be justified and presented in the experimental design section.

Statistical software: Specify in the statistical analysis section the statistical software used for analysis (version, manufacturer, and manufacturer’s location), eg, SAS software, version 9.2 (SAS Institute Inc., Cary, NC).

Comparisons of interventions: Focus on between-group differences, with 95% confidence intervals of the differences, and not on within-group differences.

Post-hoc pairwise comparisons: It is important to first test the overall hypothesis. One should conduct *post-hoc* analysis if and only if the overall hypothesis is rejected.

Clinically meaningful estimates: Report results using meaningful metrics rather than reporting raw results. For example, instead of the log odds ratio from a logistic regression, authors should transform coefficients into the appropriate measure of effect size, eg, odds ratio. Avoid using an estimate, such as an odds ratio or relative risk, for a one unit change in the factor of interest when a 1-unit change lacks clinical meaning (age, mm Hg of blood pressure, or any other continuous or interval measurement with small units). Instead, reporting effort for a clinically meaningful change (eg, for every 10 years of increase of age, for an increase of one standard deviation (or interquartile range) of blood pressure), along with 95% confidence intervals.

Risk ratios: Describe the risk ratio accurately. For instance, an odds ratio of 3.94 indicates that the outcome is almost 4 times as likely to occur, compared with the reference group, and indicates a nearly 3-fold increase in risk, not a nearly 4-fold increase in risk.

Longitudinal data: Consider appropriate longitudinal data analyses if the outcome variables were measured at multiple time points, such as mixed-effects models or generalized estimating equation approaches, which can address the within-subject variability.

Sample size, response rate, attrition rate: Please clearly indicate in the methods section: the total number of participants, the time period of the study, response rate (if any), and attrition rate (if any).

Tables (general): Avoid the presentation of raw parameter estimates, if such parameters have no clear interpretation. For instance, the results from Cox proportional hazard models should be presented as the exponentiated parameter estimates, (ie, the hazard ratios) and their corresponding 95% confidence intervals, rather than the raw estimates. The inclusion of *P*-values in tables is unnecessary in the presence of 95% confidence intervals.

Descriptive tables: In tables that simply describe characteristics of 2 or more groups (eg, Table 1 of a clinical trial), report averages with standard deviations, not standard errors, when data are normally distributed. Report median (minimum, maximum) or median (25th, 75th percentile [interquartile range, or IQR]) when data are not normally distributed.

Figures (general): Avoid using pie charts; avoid using simple bar plots or histograms without measures of variability; provide raw data (numerators and denominators) in the margins of meta-analysis forest plots; provide numbers of subjects at risk at different times in survival plots.

Missing values: Always report the frequency of missing variables and how missing data was handled in the analysis. Consider adding a column to tables or a footnote that makes clear the amount of missing data.

Removal of data points: Unless fully justifiable, all subjects included in the study should be analyzed. Any exclusion of values or subjects should be reported and justified. When influential observations exist, it is suggested that the data is analyzed both with and without such influential observations, and the difference in results discussed.

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