

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

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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 dietitian 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).

Table 1. Changes to the 2015 May Day Menu	
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.

Table 2. May Day Menu Items			
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

Table 3. Estimated Nutritional Content Analysis			
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.

Financial Support

The CBPR partnership support is provided by the University of Arkansas for Medical Sciences Translational Research Institute grant UL1TR000039, which is funded through the NIH National Center for Research Resources and National Center for Advancing Translational Sciences. The content of this paper is solely the responsibility of the authors and does not necessarily represent the official views of the NIH.

Acknowledgments

The research is made possible because of our CBPR partnership with the Marshallese Consulate General in Springdale, Arkansas, the Arkansas Coalition of Marshallese, Marshallese Education Initiative, and the Gaps in Services to Marshallese Task Force.

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