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Formative research to inform nutrition interventions in Chuuk and the U.S. Pacific

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Abstract

The type 2 diabetes epidemic is a global health issue, and it is especially severe in the U.S. Pacific. Although there are nutrition interventions in Hawai'i and the Pacific, success is limited due in part to the lack of tailoring for the Pacific context. The Pacific context is inclusive of environment, political and economic situation; historical (pre-contact, colonial and post-colonial) background; cultural practices; and spiritual orientation. This study used Grounded Theory and Community Based Participatory Research (CBPR) processes to identify influences that hinder or facilitate adherence to nutrition recommendations. Data were gathered through key informant interviews (faith leaders and health care providers) and focus group discussions (individual with diabetes and care takers). Results showed barriers to nutrition recommendations adherence that were similar to other minority populations in the U.S. such as cost of healthy foods, taste preference, low availability of healthy food choices, lack of ideas for healthy meals/cooking, and lack of culturally appropriate options for dietary modification. It also elucidated behaviors that influences adherence to nutrition recommendations such as preparing and consuming meals for and with extended family and church members; patient and group motivation; and access to healthy, affordable and palatable foods. Participants expressed the need for interventions that are tailored to the local culture and context and a holistic view of health with a focus on motivation (spiritual and emotional support). These findings could be used to develop culturally and contextually appropriate programs. For example, adapting Motivational Interviewing (MI) techniques and materials by adding family members to MI sessions versus patients only as Pacific Islanders have a collectivistic culture and family members play an important role in adherence; conducting MI in the community in addition to the clinical setting; utilizing church leaders as MI counselors in addition to healthcare providers; and changing MI narratives and tools (e.g., a confidence scale of 1 to 10 will be unfamiliar to many Pacific Islanders, therefore, counselors need to develop another method to indicate levels of confidence, such as the color of the lagoon/ocean that goes from turquoise [the color of shallow water] to navy blue [the color of deep water].

Keywords

Culturally-tailored interventions; Type 2 Diabetes Management; Chuukese; Pacific Islanders; Community Based Participatory Research

Introduction

The type 2 diabetes epidemic is a global health issue, and it is especially severe in the Pacific.[1] In 2007, the estimated prevalence of adult diabetes for the US population was 10.7%.[2] In the U.S Pacific diabetes rates range from 24.4% in the Federated States of Micronesia[3] to 47.3% in American Samoa.[4]

Nutrition plays a critical role in the therapeutic strategy to keep T2DM patients in glycemic control and to prevent complications.[5] However, many individuals with diabetes do not adhere to nutrition recommendations.[6] In 2009, the Pacific Chronic Disease Coalition (PCDC) recognized this as a problem and identified diabetes management and nutrition as a research focus; healthcare providers, faith leaders, individuals with diabetes and caregivers as study participants; and Chuukese in Chuuk and Hawaii as the target ethnic group and

research sites. Accordingly, the Faith in Action Research and Resource Alliance (FARRA) was formed to implement this on-going community-based participatory research (CBPR) project in the islands of Chuuk as they have a high prevalence of T2DM, extremely low consumption of fruits and vegetables and numerous social, economical, environmental factors that are similar to other U.S. Pacific jurisdictions;[7] and in Hawaii to which Chuukeses have migrated.

Chuuk is one of the four states of the Federated States of Micronesia (FSM), a sovereign island nation with a compact of free association (COFA) with the U.S. The majority of the population (estimated at 48,651 in 2010) resides in the 15 islands of the Chuuk Lagoon. The nation's economy is greatly dependent on government spending funded by the COFA agreement. Although 91.5% of households in Chuuk have income from employment, the average annual household income is $6,195.[8] Like other isolated developing countries, the economy is depressed mainly because it very isolated from the rest of the world so it is hard to increase exports, tourism and other economic development initiatives. These realities are not likely to change soon and neither are health care expenditures, therefore, working with churches is even more important because their infrastructure is far better than the health care system.[1]

Studies have shown the importance of cultural awareness and sensitivity to the success of health interventions in the Pacific including Chuuk.[1,9–11] The western health perspective follows the biomedical model, described as being individualistic, reductionist, physical, and secular.[12] In contrast, the Pacific's definition of health is broad, collective, holistic, spiritual and linked to cultural identity.[13–14] Health and wellbeing in the Pacific encompasses values and obligations centered around the family and community. Pacific Islanders' concepts of self also reflect this collectivistic orientation as it goes beyond the western notion of the bounded, autonomous individual to incorporate extended family, community, society and the environment.[15–16] Pacific Islanders follow a collectivistic culture where the groups' rights are given priority over rights of individuals. In respect to health decisions, family members (both immediate and extended) play a crucial role in deciding where and how to seek help (traditional or western). Religion and spirituality also play a significant role in the lives of Pacific Islanders and over 90% of Pacific Islanders belong to a church.[1,17] Attendance at religious services is generally high; churches are well supported by their congregations and play a significant role in civil society. Church affiliation plays an even greater role for Pacific Islanders living in the U.S where churches serve as a framework for organizing in the absence of the traditional village/clan structure found in their home islands.[18]

Researchers in other similar populations have identified numerous contributing factors including cost, taste preferences, forgetfulness, availability of healthy choices and lack of ideas for healthy meals/cooking.[19] This type of information is not available for the Chuukese population which underscores the need for this type formative research. Scholars and practitioners consistently recommend the consideration of culture and context in diabetes interventions to assist minority populations in their management of T2DM.[20] Due to the lack of information on barriers for adherence to nutrition recommendations in the Chuukese community, this CBPR formative study explored this issue from the perspectives

of four key community identified stakeholders: health care providers, faith-leaders, diabetes patients and diabetes patients' family members/caregivers. From past experiences,[21,22] saturation (discussions or interviews do not yield new themes) was usually reached after eight gender-specific focus groups (four groups of males and four groups of females) with an average size of seven participants per focus group and after 6 key informant interviews. Informed consent from each participant was obtained before each focus group session or interview.

Methods

CBPR principles call for research that is based on community-set priorities, engages community members as partners in all aspects of the project, provides tangible benefits, and does no harm.[23] Accordingly, FARRA selected the research topic, participants, sites and scientific research partner through various community meetings and consultation with the PCDC. FARRA also selected two representatives to be part of the research team, and these representatives assisted in the development of research tools, data collection and analysis. The University of Iowa Institutional Review Board approved the study protocol and all participants provided written informed consent. Two community organizational partners, Chuuk Women's Council (CWC) and Micronesians United (MU) assisted with recruitment (identified potential study participants and hosted study informational sessions) and data collection logistics (making arrangements for focus groups and interview sites).

The first set of data was acquired through faith leaders and health provider qualitative semi-structured interviews. The objectives were to consider participants' behaviors and feelings about nutrition and nutrition therapy for diabetes prevention and control; nutrition therapy adherence; faith-based nutrition interventions. The second data set was obtained from individuals with diabetes and caregivers through focus group discussions. The objectives were to obtain their perspectives, experiences and actions regarding nutrition therapy, and to determine their level of support for faith-based nutrition initiatives. Participants also completed a socio-demographic questionnaire.

In accordance with CBPR principles, CWC and MU identified faith and health care providers for the qualitative interviews. A total of 29 individuals (12 health care providers and 17 faith leaders) were identified and invited to participate (Spring 2011). All 12 health care providers (6 in Hawaii and 6 in Chuuk) and 17 faith leaders (8 in Hawaii and 9 in Chuuk) participated in key informant interviews (Table 1). Interviews were conducted in-person, recorded with the permission of the interviewees and lasted approximately 2–3 hours.

Focus group recruitment began with presentations during meetings, church events, and community gatherings. A total 120 individuals were interested in participating and were formally invited via email and telephone. A total of 102 individuals (85%) participated in focus groups. Eight groups were conducted in Chuuk with a total of 43 individuals and 8 groups were in Hawaii with a total of 59 individuals (Table 2). Per cultural protocols, a female staff facilitated the female focus groups and a male facilitated the male focus groups.

Focus group sessions were recorded and the audiotapes were reviewed after each session to guide probing questions for the next session.

Grounded theory principles guided the analysis of the interview and focus group transcripts. The first step was applying labels to portions of data with a code that concurrently categorizes, summarizes and accounts for each piece of data.[24] The data analysis team, comprised of FARRA members did this independently and met face-to-face two weeks later to do group coding. As the team progressed though the transcript they came upon similar types of responses so they implemented focused coding to synthesize and explain larger segments of data. While the initial coding process breaks the data into separate pieces the next step, the axial coding, process reunited these pieces to form major categories with subcategories, and showed the links between them.

Results

Key interview and focus group results are integrated into behaviors, personal factors and environmental influences associated with nutrition recommendations adherence. Although there were not many participants who followed nutrition therapy recommendations, they commented on how to improve adherence. Some suggestions are based on cultural practices and worldview. For example, given Pacific Islanders' holistic view of health, participants requested holistic nutrition education and motivational support.

Behaviors

Focus group discussions began with comments on overall diabetes self-management adherence, as all sixteen focus groups discussed not following doctor's advice including nutrition recommendations. For those who sought medical assistance for diabetes, they did so to manage pain or other complications and not seeking ways to manage diabetes (e.g., follow nutrition and physical activity recommendations).

A participant with diabetes stated:

> We go to the doctor to make us numb to the pain. We want our doctors to give us medicine to make the pain go away but we have no desire to follow all the other advice like eating right and exercise. We are not motivated to do any of that stuff.

Health care providers also reported similar behavior with patients as one of the physician reported:

> Many of my Chuukese patients come in with complications and I spend the most of my time dealing with complications and not enough time with nutrition education. I refer them to the nutritionist but they don't keep their appointment. The next time I see them is usually dealing with more complications.

Focus group participants also reported low fruits and vegetable consumption, high intake of unhealthy foods (salt, sugar and fat) and widespread unhealthy cooking practices (e.g., deep-frying and salty marinades). As one participant narrated:

> We live in a tropical island and a lot of people think that we shouldn't have a problem with fruits and vegetables but we do, I grew up after the war so by many

> of our foods were brought in by ships because the bombing destroyed a lot of the vegetation. Today, we are used to eating those canned foods and they are easy to get and prepare as all you need to do is go to the store, buy, open, cook and eat. For local foods there is a lot of work, farming is hard work and preparing local food also takes a lot of time, 2 to 3 hours compared to 1 hour with imported foods.

Another participant added:

> Yes, I also grew up after the war and that destroyed our vegetation but now our issues are natural disasters like typhoon, drought and rising ocean-water – all that salt water going into the soil is killing our plants.

Results from faith leaders and healthcare provider interviews were similar. A healthcare provider in Hawaii who works with Micronesians in Hawaii reported:

> A typical meal contains starch and protein. For a starch, they usually eat white rice because it's easy to get. Sometimes they eat taro, tapioca or breadfruit but very rare because they are more expensive and it takes extra time to prepare. For protein, they eat mostly canned or processed meat but sometimes they eat chicken. They also tend to add a lot of salt in their foods.

Personal Factors

Conversations in all focus groups included discussions of nutrition knowledge and motivational issues. They cited fruits, vegetables and foods with less fat, less sugar and less salt as healthy food. They also cited corned beef, sausages, turkey tails, donuts, and sodas as unhealthy foods. Focus group discussions suggested that participants recognized the importance of good nutrition in the prevention and control of diabetes as demonstrated by this comment from a caregiver:

> I know that the kind of food my family eats is important as it can help put off illnesses that are harming our people, like diabetes, heart attack and stroke.

Another participant added;

> There is a lot of public education on eating healthy and why we need to eat healthy. I know that eating more plant-based food is good for my diabetes. I even attended a class on all the different kinds of food that our ancestors ate and they did not have diabetes.

However, participants reported emotional and motivational issues as barriers in eating healthy. They stated that unhealthy foods are palatable and make them emotionally satisfied.

A participant elaborated on this and said;

> From a very young age I eat a lot of food like corned beef and sausages. They have a lot of fat and flavor – mostly salt – and we get addicted to that. Now that I'm trying to go back to our local food, I find them very bland and tasteless and I crave the salt and flavors.

Another participant added;

> Many of us are eating the kinds of food we ate when we were growing up – mostly imported foods. There is familiarity with those foods and they are our comfort foods. We know eating our traditional plant-based foods are good for us but many times we eat imported foods because they are easy-to-get, easy-to-cook, familiar and comforting food.

As one Hawaii male focus group participant summarized:

> Eating tasty food is the only pleasure we have in life. There is not much going for us, if you look around, life is not that great so eating these foods makes us happy and lifts our spirit.

Healthcare providers also agreed. A Chuukese healthcare provider stated,

> Patients have the hardest time changing their diet because unhealthy foods provide comfort. I can tell them to eat healthy but if they are not motivated then it's a waste of time. We need to address the motivation issue first and foremost.

To address nutrition education needs, participants suggested lessons with specific information (e.g., name of foods, portions and preparation) within the context of affordability, availability and taste preferences; skill training for family members who are responsible for the meals to (e.g., how to shop for healthy foods on a limited budget and making the most of community resources including food from the food bank); and food preparation classes with new recipes as many did not grow up preparing or eating foods that were recommended by health care providers. Participants also narrated the value of holistic nutrition education that addresses the needs of the mind (e.g., culturally and contextually appropriate nutrition education and skills training), body (e.g., ability to care for the physical body, cultivate strong relationship with family members and stewardship of resources), and spirit (e.g., faith, encouragement, motivation and accountability).

Environmental Factors

Participants reported that environmental factors do influence compliance to nutrition therapy and cited access to healthy foods (including issues related to poverty), deeply engrained cultural practices, and lack of support from health care providers, faith leaders, church and community.

Access—The discussions around access began with narratives around poverty. As mentioned earlier Chuukese are facing difficulties in obtaining and preparing local foods. There are local foods available in the stores but the costs in money and time are high and unaffordable. As one caregiver explained:

> I know doctors promote eating local food - our vegetable, fish and other seafood - but it takes a lot of work to catch and prepare and it is much easier to drive to the store, buy canned tuna and I don't even have to cook it. For local fruits and vegetable I have to grow them, pick them, cook them – a lot of work. I would rather buy a bag of rice. I can buy the local foods at the market but they are a lot more expensive compared to imported foods.

Hawaii participants also reported that the cost of healthy food, especially traditional healthy foods was unaffordable. A caregiver from Hawaii conveyed her personal experience with purchasing foods:

> I don't have a car so I have to catch the bus to the nearest supermarket. When I get to the market I don't want to buy fruits and vegetables because they are bulky and heavy, so I buy lighter foods like ramen and small canned meat.

To improve access to healthy foods in Hawaii, participants suggested legislative policies such as tax incentives to make healthy foods affordable; a program similar to the Women, Infants and Children (WIC) program that gives voucher specifically for food with high nutritional values; and healthy foods, especially fruits and vegetables available at the local food banks.

Cultural Practices—Chuukese and other Pacific Islanders follow a collectivistic culture and engage in activities together including dining that influence nutrition adherance. A faith leader from Hawaii stated:

> We eat a lot of meals together as a church because it is part of our culture. We are not living in our homeland so breaking bread together helps us remember that we are part of a whole and there is comfort in that because I know I am not alone here in this foreign place.

This collectivistic theme also plays an important role within families, as people with diabetes do not want to consume a meal that is different from the rest of family. A participant reported:

> Everybody around me are eating those things so if I am eating something different then I will feel odd, and I don't like that, I want to fit in, and I don't want to stand out.

Encouragement and Accountability—Focus group participants reported a lack of encouragement and accountability from health care providers. People with diabetes recalled their diabetes doctor or nurse telling them to "eat healthy," and some provided nutrition education. However, focus group participants reported tuning out the "eat healthy" advice as they felt that providers are required to say. One diabetes patient from Hawaii recalled his last visit to the doctor:

> I was only in there for less than 10 minutes. He went over my test results, spent most of the time explaining my medication and at the end he told me to watch what I eat, exercise and take care. If watching what I eat was that important, he should say more about it.

Health care providers agreed that they don't have the time to spend with their patients. For Hawaii providers, language was a major problem. Health care providers who participated in the interviews recognized these issues and expressed the need for interventions that are tailored to the need of this population. To address this, participants recommended motivational support such as collective prayers, words of encouragement from family,

friends and pastors, and most importantly family and church members eating the same types of foods. As one participant communicated:

> Like many of you, I know that I need to eat healthy foods, I know there are many reasons why I can't do that but at the core is my own attitude and mentality. I also need the support of my family and church. All kinds of support, I need your prayers to change my way of thinking and your words of encouragement to get me through. I wish my church can dedicate a time just to pray for strength, courage and resources.

Another participant summarized:

> Motivation needs to come first, I know there are other issues like the cost of food but if we are motivated to eat healthy food we as a group can do something to overcome those issues we can fight that type of social injustice but we need to be motivated first. On the other hand, we can have all the healthy foods available us but we will not cook or eat them because we are not motivated to do so.

In addition, participants prioritized the critical need to address the following emotions and attitudes related to a diabetes diagnosis and living with diabetes everyday and for the rest of their lives: denial, shame, anger, fear, hopelessness, passiveness and sadness.

Discussion

This was the first study that investigated environment, political, economic, historical and cultural practices that hinder or facilitate adherence to nutrition recommendations among Chuukese in Chuuk and Hawaii from the perspectives of care-provider and care-recipient. The two groups did not provide contradictory information however, care-recipients expounded reasons behind behaviors while care- providers were just reporting the behaviors. These care-recipient insights will help clinicians and public health practitioners understand their Chuukese patients and inform culturally and contextually interventions.

Participants' narratives of low consumption of fruits and vegetables were not surprising. According to surveillance data, 90.4% Chuukese consume less than five servings of fruits and/or vegetables on average per day.[7] This study results showed barriers that were similar to other minority populations in the continental U.S. such as cost of healthy foods, taste preference, and low availability of healthy food choices.[19,25–27] Moreover, participants related their decisions choose imported processed food versus plant-based local foods was due to aforementioned reasons plus positive emotions (such as comfort). Other researchers found emotions as the driving force behind consumers' decisions and actions.[28–30]

To comply with nutrition recommendations, participants expressed the need for interventions that are tailored to the local culture and context (historical, social and economic) and a holistic view of health. Participants prioritized the need for motivational support (spiritual and emotional) and this is also supported by the literature as health consequences of emotional problems include poorer metabolic outcomes, morbidity, mortality and poorer quality of life.[30–31] An example of a culturally appropriate motivation intervention is using an adapted version of Motivational Interviewing (MI).[32] Practitioners

can adapt techniques and materials in several ways. First, add family members to MI sessions instead of patients only as Pacific Islanders have a collectivistic culture and family members play an important role in adherence. Second, conduct MI in the community in addition to the clinical setting. Third, utilize, church leaders as MI counselors in addition to healthcare providers; incorporating prayers and encouraging scripture in MI sessions. Fourth, adapt MI narratives and tools (e.g., a confidence scale of 1 to 10 is unfamiliar to Pacific Islanders, therefore, counselors need to develop another method to indicate levels of confidence, such as the color of the lagoon/ocean that goes from turquoise [color of shallow water] to navy blue [color of deep water]. Finally, provide spiritual and emotional support through sermons, testimonies from patients and family members, home-fellowship gatherings, and prayer partners.

As mentioned earlier, involvement of family members and churches are crucial to adhering to nutrition recommendations. This is consistent with other studies that found the importance of family and churches in this population for other health issues like cancer.[21] Families are organized around an extended family system versus nuclear family. They are responsible for obtaining and preparing food for the entire clan of as many as fifty individuals. Therefore an appropriate nutrition education intervention would identify meals preparer to provide education on to how to access and prepare healthier meals for larger families versus targeting diabetes patients only. Furthermore, participants reported that an average of six meals per week are consumed at churches and families within the churches take turn in preparing the meals. A church policy of health meals and nutrition education on how to prepare healthy meals for large groups would be beneficial for this population. These and other similar interventions can potentially work well in providing group support and accountability and therefore maintain long-term adherence. Community members, faith leaders and health care providers agree that churches are more stable and have the resources for these types of community programs and therefore in the better position to implement a variety of community nutrition interventions.

Access to healthy food was also a concern and interventions that promote the availability of healthy food (e.g., facilitate the growing of local fruits and vegetables, decrease taxes on healthy foods, and provide incentives for food trucks and corner stores to sell fruits and vegetables) would benefit for this community. Another example of an appropriate project would be one that provides resources and training on how grow local foods in the community in addition to developing, testing, and disseminating palatable and easy-to-prepare recipes using local foods. Given the preference for congregant dining the ideal venue for testing and dissemination are local churches.

Conclusion

The significance of this study is that it elucidates needs that are specific to the Chuukese culture and context. Most of the information can be generalized to other Pacific Island communities with similar culture and context as other scholars found that although these jurisdictions have unique cultures and languages, they share similar traditional values and beliefs, including health beliefs.[33] Furthermore, findings can be generalized to other developing countries with similar context and are facing similar health and nutrition issues.

Limitation to this study is due to its formative nature with limited data collection. However, with the focus on the Chuukese perspective and the use of the CBPR approach and the research team felt confident that our findings could be used to develop culturally appropriate diabetes control intervention in the state of Hawaii and Chuuk. In addition, programs and research based on the Pacific values, beliefs and traditions may also appeal to other Pacific communities and isolated developing countries that facing similar situations. Finally, the participatory process using grounded theory principles could serve as a model for other researchers working with minority groups to reduce health disparities.

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Table 1

Demographics of a cohort of 12 Health Care Providers and 17 Faith Leaders participating in key informant interviews to inform nutrition intervention in Chuuk and Hawaii.

	Chuuk		Hawaii	
	Health Providers	**Faith Leaders**	**Health Providers**	**Faith Leaders**
Number of participants	6	8	6	9
Number of male/females	3/3	5/3	4/2	6/3
Ethnicity Chuukese/non-Chuukese	6/0	8/0	1/5	9/0
Average age (years)	45.7	52.2	51.7	50.8
Age range (years)	37–58	44–59	36–67	41–62
Catholics/Protestants	na	3/5	na	3/6

Table 2

Demographics of a cohort of 102 individuals with Type 2 Diabetes participating in focus group data collection to inform nutrition intervention in Chuuk and Hawaii.

	Chuuk	Hawaii	Total
Number of focus groups	8	8	16
Number of participants	43	59	102
Female participants	24	32	56
Male participants	19	27	46
Average age (years)	43	47	46
Age range (years)	19–64	19–78	19–78
Catholics/Protestants	17/26	26/33	43/59
Type 2 Diabetes status: Y/N/Unknown	25/14/4	29/30/0	54/44/4
Health care provider: Y/N	43/0	49/10	92/10