

# Health Beliefs of Marshallese Regarding Type 2 Diabetes

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**Objectives:** The Marshallese population suffers from disproportionate rates of type 2 diabetes. This study identifies the underlying beliefs and perceptions that affect diabetes self-management behavior in the US Marshallese population living in Arkansas. **Methods:** The study employs focus groups with a semi-structured interview guide developed using a community-based participatory research (CBPR) approach and the Health Belief Model. Data were collected from 41 participants; bilingual community co-investigators provided translation as needed. **Results:** The results show high-perceived threat, with most participants describing diabetes as inevitable and a death sentence. Participants are gener-

ally unaware of the benefits of diabetes self-management behaviors, and the Marshallese population faces significant policy, environmental, and systems barriers to diabetes self-management. The primary cue to action is a diagnosis of diabetes, and there are varying levels of self-efficacy. **Conclusions:** The research grounded in the Health Belief Model provides important contributions that can help advance diabetes self-management efforts within Pacific Islander communities.

**Key words:** community-based participatory research; minority health; Pacific Islanders; health disparities; diabetes

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The Marshall Islands is a group of low islands and atolls in Micronesia, which were used for the United States (US) Nuclear Testing Program. The Marshall Islands were a US Trust Territory from 1947 until 1986. In 1986, the Republic of the Marshall Islands (RMI) signed a Compact of Free Association (COFA) agreement with the US that recognized the RMI as an independent nation.<sup>1</sup> The COFA agreement permits Marshallese migrants to live and work in the US without a visa or permanent resident card.<sup>1,2</sup> The COFA also provides the US government with a strategic location for ongoing military activity from the Ronald Reagan Ballistic Missile Defense Test Site located on Kwajalein Atoll.<sup>3</sup> In the early 1990s, poultry pro-

cessing jobs drew Marshallese migrants to northwest Arkansas.<sup>4</sup> Currently, the largest population of Marshallese living in the continental US resides in Arkansas with ~10,000 residents.<sup>5</sup> As COFA migrants, the Marshallese cannot vote, nor can they access many health safety net programs such as Medicaid.<sup>6</sup>

Chronic and infectious diseases are extremely high among the Marshallese.<sup>7-13</sup> Of particular concern, the Marshallese population suffers from disproportionate rates of type 2 diabetes (diabetes), with rates 400% higher than the general US population.<sup>7,8,14</sup> In the Marshall Islands, diabetes rates between 20% and 31% have been found among adults on the 2 most populous islands.<sup>7,8</sup> Health assessments of Marshallese adults in the US found 44.2% in Hawaii and 46.5% in Arkansas had diabetes. An additional 25.3% in Hawaii and 21.4% in Arkansas had pre-diabetes.<sup>15</sup>

Diabetes self-management and prevention behavior is low among US Marshallese.<sup>16,17</sup> Health-care providers report that it is rare for Marshallese patients with diabetes to perform regular blood glucose checks and take medications as prescribed.<sup>18</sup> Few Marshallese have participated in diabetes self-management education (DSME).<sup>16,17</sup> Previous attempts to implement DSME among US

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Marshallese have not been successful.<sup>16</sup> There is no known documentation of Marshallese participating in diabetes prevention programs.

To understand the diabetes epidemic, it is important to understand how current and past social, cultural, and historical factors have affected the health of the Marshallese.<sup>6,18-20</sup> From 1946 through 1958, the US military tested nuclear weapons in the Marshall Islands. Cumulatively, these tests were equivalent in payload to 7200 Hiroshima-sized bombs.<sup>3,21-23</sup> The Atomic Energy Commission lists the Marshall Islands as one of the most contaminated places in the world.<sup>21</sup> The US nuclear testing program resulted in radiation contamination of the fish, vegetable, and fruit supply,<sup>3,22,23</sup> which altered the traditional, subsistence lifestyle of the Marshallese.<sup>3,16</sup> The US provided aid to Marshall Islanders that consisted mainly of highly processed canned and packaged foods.<sup>3</sup> The majority of the food consumed in the Marshall Islands today is imported processed food, such as canned meats and rice, and these foods continue to be the preferred diet of the Marshallese living in the US.<sup>18,24</sup>

### Health Belief Model

There is limited literature on Marshallese beliefs or behaviors related to diabetes.<sup>16,18,25</sup> The Health Belief Model (HBM) is an empirically supported conceptual framework for understanding health behavior.<sup>26,27</sup> The HBM can be useful for developing health behavior interventions.<sup>28,29</sup> The HBM also can be particularly effective with ethnic and racial minority groups, because it assesses a person's cultural beliefs, perceptions, and values that provides valuable information that can be used to inform culturally-appropriate interventions that produce behavior change. The 6 dimensions of the HBM are: (1) perceived susceptibility; (2) perceived severity; (3) perceived benefits; (4) perceived barriers; (5) cues to action; and (6) self-efficacy.<sup>26,27,30</sup> Perceived susceptibility refers to one's perception of the likelihood of getting a disease or health condition. Perceived severity refers to the perceived seriousness of a disease. Together, perceived susceptibility and perceived severity are referred to as perceived threat. However, perceived threat alone does not lead to behavior change. Behavior change is influenced by a person's beliefs regarding the benefits of actions to reduce the threat of the disease, and by the perceived and structural barriers to action. A person's perceptions of the benefits and barriers to taking a particular health action create an intrinsic cost-benefit analysis regarding the positive and negative consequences of taking the action.

In addition, cues to action can serve as instigators to action. Cues to action can be internal (ie, a cough) or external (ie, a media campaign) and wide-ranging. Self-efficacy is a more recent addition to the HBM.<sup>26</sup> Whereas the original 5 constructs explain changes in health behavior, particularly taking preventive health action,<sup>30</sup> the model is predicated on the concept that people must feel

capable of overcoming perceived barriers to take a health action, and therefore, self-efficacy has been added to the model.<sup>26</sup>

## METHODS

### Community-based Approach

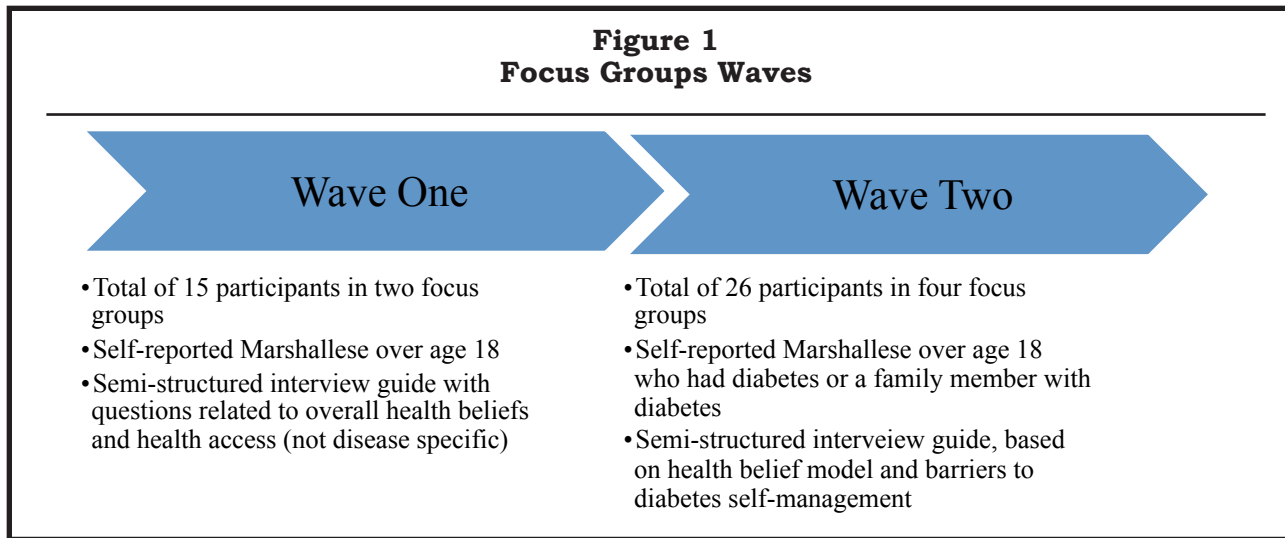
This study was conducted using a community-based participatory research (CBPR) approach that is grounded in Empowerment Theory.<sup>31</sup> The CBPR team began working with the Marshallese community in 2012. Over the past 3 years, the CBPR team has engaged a Community Advisory Board to conduct a needs assessment. Diabetes was chosen by the community as a top concern.<sup>32</sup> In addition, the CBPR team has trained 16 community co-investigators on research methods. The training has included interactive sessions on quantitative, qualitative, and mixed-methods research. In addition, training is provided in ethics and dissemination of results. This approach has helped the researchers and community co-investigators build deep trust in the community while building the community's capacity to conduct research. For this study, 2 of the community co-investigators most interested in the study joined the CBPR team. Other community members and community co-investigators assisted with recruitment as described below. CBPR capacity activities and lessons learned are outlined further in articles published and forthcoming.<sup>32,33</sup>

### Research Design

A sequential, exploratory, qualitative study design utilizing focus groups was implemented to examine the research question: *What health beliefs related to diabetes influence diabetes self-management behaviors?* The theoretical model gave rise to the choice of qualitative methods. The qualitative approach allowed for an examination of the beliefs and experiences of Marshallese participants when little was known on the topic. Thorough semi-structured interview guides ensured all participants were asked the same questions based upon the Health Belief Model, but also allowed participants the freedom to present their thoughts in their own words. In addition, the focus groups facilitated rich discourse between participants, which allowed researchers to observe and understand the social and cultural context of the perceptions and beliefs more completely.<sup>34-38</sup>

### Recruitment

The research team worked in collaboration with Marshallese community groups including the Arkansas Coalition of Marshallese, the Gaps in Services to Marshallese Task Force, Marshallese pastors, and the local Republic of the Marshall Islands Consulate to recruit participants. These community partners were provided with written information about the study and participation criteria. Partners distributed information throughout the Marshallese community. These diverse organizations allowed for broader recruitment. Study information



was also posted on Facebook. Marshallese community members are frequent users of Facebook, and it is an efficient way to spread information to a large segment of the Marshallese community. Our community partners provided us with contact information for potential participants, and they encouraged potential participants to contact members of the research team to learn more about the study.

**Consent Procedures**

The study information sheet and consent document, with investigator and IRB contact information, was provided to potential participants. Participants were given time to read the information, and then the documents was read aloud. Potential participants were asked if they had any questions about the study or consent process. All questions were answered by investigators. Potential participants affirmed their consent prior to participation.

Qualitative data were collected from 41 focus group participants.<sup>35</sup> As shown in Figure 1, two waves of focus groups were conducted using a sequential exploratory design. The sequential exploratory design was chosen because of the participatory nature of the research. The design allowed the first wave of interviews to inform the second wave of interviews. In the first wave, 2 focus groups were conducted with 15 Marshallese participants. The research question was: *What are the primary health concerns of your community?* The interview guide included broad questions about community health concerns and health access. In this first wave of focus groups, participants discussed the high rate of diabetes among community members. In addition, participants discussed health beliefs concerning diabetes, healthcare access barriers to diabetes care, and the lack of diabetes education, which they expressed as the top health concerns of the community.

Findings from the first focus groups informed

the second wave of focus groups. Along with input from CBPR stakeholders, the CBPR team developed a semi-structured interview guide based on the HBM for the second wave of focus groups. This interview guide was designed to improve understanding of US Marshallese’s beliefs and perceptions about diabetes and how these beliefs and perceptions promoted or impeded diabetes self-management behaviors.

In the second wave, 4 additional focus groups were conducted with 26 participants who either had diabetes or had a family member with diabetes. The guiding research question for the second wave of focus groups was: *For US Marshallese, what health beliefs related to diabetes influence diabetes self-management behaviors?*

The lead researcher and a research associate facilitated each focus group. At least one of the bilingual Marshallese community co-investigators was also present. The Marshallese community co-investigator provided interpretation as needed. Each focus group had between 4 and 9 people. The focus groups used a semi-structured interview guide with open-ended questions to allow participants to speak in-depth, yet ensure that all focus groups covered the same topics. The semi-structured guides were developed by the CBPR team, which included 2 Marshallese community co-investigators, and was discussed and edited with input from 6 additional Marshallese CBPR stakeholders.

The research team conducted all focus groups in private meeting rooms in Springdale, the city with the largest Marshallese population in Arkansas.<sup>39</sup> The duration of each focus group was about one hour. Each participant received a \$25 gift card as compensation for sharing their knowledge and experiences with the researchers.

**Data Analysis**

The data from each wave of focus groups were

**Table 1**  
**Final Codes**

Priori themes based on Health Belief Model constructs	Emergent themes within priori constructs
Perceived susceptibility to diabetes	a) Inevitability
	a) Death sentence
Perceived severity of diabetes	b) Limits lifestyle
	c) Medical challenges
	d) Social stigma
Perceived benefits of diabetes self-management behavior	a) Generally positive
	b) Limited knowledge of benefits
Perceived barriers to diabetes self-management behavior	a) Limited health care access
	1) Medicaid
	2) Providers who see those without insurance
	b) Social stigma
Cues to action	a) Diagnosis
Self-efficacy	a) Outside their control
	1) Genetic
	2) Nuclear testing
	b) Within their control
	1) Nutrition

transcribed verbatim. Any data in Marshallese was translated into English, and the translations were verified by a second translator, edited, certified, and approved prior to use. Prior to coding, the lead investigator provided qualitative coding training to the community co-investigators. The CBPR team coded transcripts for priori themes based on the constructs of the HBM and for emergent themes within those constructs. Codes were organized in a codebook<sup>40</sup> that described the priori and emergent themes. The CBPR team met 5 times to discuss codes and ensure coder agreement.<sup>41</sup> Greater than 94% agreement was achieved. After the data had their final consensus codes, the CBPR team compared the coded data to see if there were significant differences among the 6 focus groups, and found that the themes were consistent between the 2 waves and among the 6 focus groups. Table 1 shows the priori and emergent thematic codes.

Throughout the process, the Marshallese community co-investigators provided feedback on the interpretations to ensure that the nuanced meanings of participants' responses were understood. The Marshallese community co-investigators' input was particularly crucial to ensuring that the findings and discussion presented accurately reflected Marshallese beliefs and perceptions about diabetes. To extend our member-checking process and develop recommendations, the lead researcher shared findings with a broader group of 14 Marshallese CBPR stakeholders who discussed the interpretation of the findings and developed recommendations. Through a shared interpretation process, CBPR stakeholders explored what the

findings meant to the community, how the findings could best guide programs and practices to address diabetes, and assisted in the development of recommendations (see discussion and Table 2).

## RESULTS

Findings are organized based on each construct of the HBM: (1) perceived susceptibility; (2) perceived severity; (3) perceived benefits; (4) perceived barriers; (5) cues to action; and (6) self-efficacy. Emergent themes are provided within these constructs<sup>26,30,42</sup> (Table 1).

### Perceived Susceptibility

Perceived susceptibility relates to one's perception of the likelihood of getting a disease.<sup>27,30</sup> The Marshallese perceive a high level of susceptibility to diabetes within the community. Marshallese people discuss diabetes as an inevitable condition for many in their community, rather than a preventable disease. Participants describe diabetes as "our community's curse." "Most of my family has diabetes. I know I will get it too." "If you are Marshallese, you have it [diabetes] or you get it [diabetes] someday."

### Perceived Severity

Perceived severity refers to feelings about the seriousness of a disease, and includes both medical and social consequences.<sup>30</sup> Marshallese participants generally perceive diabetes to be a deadly disease. "I would say it's the most killer disease in our community." In the Marshallese community, a diabetes diagnosis is viewed as a death sentence,



**Table 2**  
**Recommendations for Health Educators and Healthcare Providers**

<b>Construct</b>	<b>Marshallese beliefs related to the construct</b>	<b>Implications for health educators and healthcare providers</b>
<b>Perceived susceptibility:</b> One’s perception of their chances of getting a condition	High perceived susceptibility. Participants see diabetes as inevitable.	<ul style="list-style-type: none"> <li>• Personalize risk based on a person’s behavior.</li> <li>• Clarify the etiology of diabetes as based on personal lifestyle rather than fate.</li> <li>• Take care not to perpetuate the stigma and shame.</li> </ul>
<b>Perceived severity:</b> One’s perception of the seriousness of a condition and its consequences	High perceived severity. Participants discuss diabetes as a death sentence. Medical consequences and social stigma perceived as very high.	<ul style="list-style-type: none"> <li>• Focus on areas of consequence/risk that are most important to the population without heightening the stigma and shame.</li> </ul>
<b>Perceived benefits:</b> One’s belief in the efficacy of the advised action to reduce risk or seriousness of impact	Generally positive, but uncertain and uninformed about benefits of diabetes self-management. While participants generally felt that self-management behavior was good, they did not discuss specific benefits.	<ul style="list-style-type: none"> <li>• Clarify the positive outcomes of self-management behavior and DSME for individuals, families, and the broader Marshallese Community.</li> </ul>
<b>Perceived barriers:</b> One’s opinion of the internal and structural barriers of the advised action	There are numerous and significant barriers including: limited health care access, social stigma, lack of transportation, cost of healthy food, and lack of culturally appropriate health education.	<ul style="list-style-type: none"> <li>• Restore Medicaid benefits for COFA migrants.</li> <li>• Increase the number of providers who see those without insurance.</li> <li>• Increase public transportation.</li> <li>• Increase access to healthy food choices.</li> <li>• Implement programs to address the social stigma.</li> <li>• Make positive changes in the foods that are served at cultural celebrations.</li> <li>• Use Community Health Workers to help patients navigate barriers</li> </ul>
<b>Cues to action:</b> Activate “readiness” to take action	The primary cue to action is a diagnosis of diabetes. This cue is often avoided because Marshallese frequently do not want to know if they have diabetes due to the stigma within the community. In addition, lack of health care access (barrier) often prevents the cue from emerging until the disease progresses to a more severe state.	<ul style="list-style-type: none"> <li>• Provide culturally appropriate information about early risk factor to increase preventive actions.</li> <li>• Promotion of diabetes screenings to allow for quicker diagnosis.</li> </ul>
<b>Self-efficacy:</b> Confidence in one’s ability to take action and overcome barriers	There is variation in self-efficacy because of the participants’ perceived inability to perform self-management behaviors. All participants discussed difficulty in performing self-management behaviors.	<ul style="list-style-type: none"> <li>• Promote successful role model cases to build confidence in individuals’ abilities to successfully manage diabetes.</li> <li>• Provide culturally tailored DSME to address misconceptions and encourage self-efficacy.</li> </ul>

rather than a manageable condition. When describing the typical response of a community member to a diabetes diagnosis, one participant stated: “You are dying.” Another participant shared: “When I first found out that I might have diabetes...First thing [that] came to my mind, I am going to die.”

Participants also discussed restrictions on their daily lives and ability to work. Diabetes “limited everything for us.” Family members discussed the difficult medical consequences of diabetes and seeing family members suffer from amputations, strokes, and dialysis. Some participants described the severe physical and emotional toll that diabetes has on a person’s body: “He was a really hand-

some man when he was younger, and then the having diabetes. I could see changes in people’s appearances when they have diabetes. They look more sickly and ... sometimes I, like see suicidal in their face.”

The social consequences of diabetes are also perceived as severe. The stigma of a diabetes diagnosis is high among community members and precludes many individuals from openly admitting they have diabetes and seeking care. One participant explained: “They are ashamed if other people find out they have diabetes.” Another added: “They think that if they are diabetes, they hide it from people. They don’t want people to know [they]

have diabetes. So they are mostly in denial.” These social consequences seem to be exacerbating the medical consequences of diabetes because it keeps many Marshallese from seeking diabetes education and care at an earlier stage.

### Perceived Benefits

A perceived benefit refers to a person’s belief in the effectiveness of a recommended health behavior to help them reduce risk or impact of the disease. Participants seemed to understand many of the self-management behaviors “Exercise, lose weight, eat more vegetables, reduce fat.” Participants generally felt positive about the potential benefits of diabetes self-management behavior; however, they did not articulate the benefits of those behaviors. Of all the dimensions of the HBM, perceived benefits were the most difficult to capture. Participants unanimously stated that diabetes self-management behavior and DSME would help their community, but they were not able to articulate how they would benefit. Many participants simply stated: “I don’t know.” Other participants quickly shifted to stating that they wanted DSME for themselves or their family, or began discussing barriers to DSME. Overall, when questions of benefit were asked, participants were far less verbose than when discussing any other aspect of health beliefs and perceptions. One of the reasons for the limited discussion on the benefits of diabetes self-management behavior may be a lack of understanding about self-management behaviors and the lack of culturally-appropriate DSME available to the Marshallese.

### Perceived Barriers

Perceived barriers refer to the negative aspects of a health action and the obstacles to undertaking a health behavior.<sup>30</sup> Participants identified numerous barriers that impede the Marshallese from practicing diabetes self-management behaviors. Participants discussed both structural and nonstructural barriers including limited healthcare access, lack of transportation, cost of healthy foods, cultural food practices, and social stigma. These barriers are explored in-depth in a separate article devoted solely to the barriers faced by the Marshallese community.<sup>18</sup>

Participants identified their primary barrier to self-management as lack of access to healthcare services and medication because they are ineligible for Medicaid. Those without insurance have few options to access healthcare services and medication. “They have no access to their insulin or their medicine, because they don’t have any insurance.”

Transportation to attend doctor appointments and to attend DSME classes was also a significant barrier. Participants described how families often share only one car between many members, and public transportation is limited in the area. As one participant summarized: “No insurance. No money to see a doctor. No ride to the doctor.”

Participants discussed several barriers to eating healthy, including the cost of food and the role that food plays in the community. “We have to feed a lot of people, and healthy food like vegetables and meat cost a lot of money. Rice and noodles don’t cost too much.” Food is central to the Marshallese culture and changing eating patterns is difficult when eating communal meals. “Food and family means there’s happiness; I mean it’s a big part of our custom.” “Everyone knows diabetes is bad, but to manage is really hard in our community because of the food we eat. . . And people cannot blame us because it’s our culture.” Participants described in-depth how meals are eaten together and eating separately from the group or eating a different diet is not acceptable. Another participant described: “I cannot have my own meal because that is offensive.” In addition to these external barriers, participants discussed social stigma and a sense of shame. “To say you have diabetes is to say you are no longer strong, and maybe you cannot support your family. So sometimes people don’t want to go to [DSME] classes or even check their blood to see if they have diabetes, because if they do [have diabetes], they feel bad.”

### Cues to Action

Cues to action are the factors that activate one’s likelihood to take action. The primary theme for cues to action, identified by focus group participants, was the diabetes diagnosis itself. Respondents explained that once a Marshallese person is officially diagnosed with diabetes, it often stimulates behavior change or at least the consideration of behavioral change. A Marshallese man stated: “After my aunt knows that she’s diabetes, she doesn’t drink any more soda. And she controls eating her rice. And my sister, she always (ate) candy and soda, and after she was diagnosed, she drinks only water and not eating any candy.” A Marshallese woman who translates at DSME classes explained: “The persons that . . . just found out recently that they have diabetes, they’re pretty much good; they’re controlling themselves. But I know a lot, a high percentage of our community [members] that are still in denial. They don’t do check-ups, they don’t go; they don’t do anything until it comes to a point where it’s really extreme, that they get admitted [to the hospital].” Whereas a diabetes diagnosis is the primary cue to action, the shame associated with diabetes keeps many Marshallese from having their blood sugar tested to determine if they have diabetes.

### Self-efficacy

Self-efficacy refers to confidence in one’s ability to perform an action.<sup>27,42</sup> Although participants’ responses regarding other constructs were fairly homogenous, the responses for self-efficacy varied widely. This variation was present within each of the focus groups, rather than across focus groups. Confidence in one’s ability to be successful in per-

forming self-management behavior is complicated by many participants' beliefs that the nuclear testing and their genetics are the primary factors that influence diabetes, making diabetes outside their control. "They know they're gonna get diabetes." "It was caused by the bomb . . . Before the bomb testing and the war there were no diabetes. It was after that we started getting more cases of diabetes. Then we started [having] people feet getting amputated because of diabetes." Others questioned: "Do you know if it was caused by the bomb? Is it because of genetic inheritance or from what we eat?" Among many in the Marshallese community, there is the belief that the nuclear testing caused, at least in part, the epidemic of diabetes.

Regardless of the cause, some participants felt like self-management behavior was outside their control. "Because it is something that they cannot control. It comes, it comes . . . even though sometimes they take their medications, they still cannot control it. Their body cannot control it." This lack of self-efficacy was cited as a reason why they did not practice self-management behaviors.

However, others voiced that self-management was possible and expressed high self-efficacy and their belief that their behavior determined outcomes. "And so for people to know that [they have] diabetes, some will try to help themselves. With enough knowledge, they can try to control." Even among those who believed that self-management was possible, self-efficacy was mitigated somewhat by the frustration that diabetes self-management is difficult. Whereas some respondents expressed that they could perform diabetes self-management behaviors, they explained that daily maintenance of diabetes is frustrating and laborious. "It's really hard [to] have diabetes because there is a lot of complicated things you have to do. First, you have to see what you are eating. Second, exercise. Third, is taking your insulin. If you don't take care of the insulin and the food you eat and exercise, it would be not good."

In addition, participants discussed the numerous structural barriers to diabetes care and prevention that reduce feelings of self-efficacy. When participants were asked what might improve self-efficacy, they stated that real-life examples and role models from within the Marshallese community were needed to increase their self-efficacy. "Yeah, you can educate people but there has to be an example . . . there has to be that one person that can say, yes, I did it. We haven't had that one person say yes, I was a diabetic and now [I can manage my diabetes]. Other participants agreed stating: "There's that one first example. Because . . . we don't like to listen and then we do it. We want to see it. We want to see action. We want to see a real result and then we're gonna do it." "That example would help people believe or have confidence that they could do it too."

## DISCUSSION

Marshallese suffer from high rates of type 2 di-

abetes.<sup>7-9,15</sup> Prior studies evaluating DSME have failed to show glycemic control among participants.<sup>16,17</sup> Cultural adaptation of DSME has been shown to be an effective strategy in other minority populations.<sup>43,44</sup> The HBM has been used as a tool to understand a population group's cultural beliefs, which serve as a foundation for developing or adapting health behavior interventions.<sup>30,45-47</sup> This is the first article using all of the constructs of the HBM to examine the beliefs and perceptions of the Marshallese related to diabetes self-management behavior, and provides an important foundation for interventions with the Marshallese community.<sup>18</sup>

## Perceived Threat

Perceived susceptibility and perceived severity together are conceptualized as perceived threat. Findings indicate that the perceived threat of diabetes is high for the Marshallese. Marshallese perceive diabetes as a deadly disease that most members of their community will develop. However, it appears as though many Marshallese regard diabetes as a "death sentence" specifically for their community. This suggests that the Marshallese people perceive themselves to be uniquely susceptible, due to genetics or nuclear exposure, which makes diabetes an especially deadly disease for their community. Based upon the high level of perceived threat, educators can clarify the etiology of diabetes to decrease the perception of inevitability. Educators also can help personalize risk based on a person's behavior, and focus on areas of consequences and risks that are most important to the population. However, it is important to balance the effort to personalize risk in a way that does not intensify the stigma and shame associated with diabetes in the community and does not blame patients.

## Benefits versus Barriers Ratio

Positive health behavior is more likely when there are higher perceived benefits and lower perceived barriers, which provides a positive benefits-to-barriers ratio. Currently, among the Marshallese, the benefits of diabetes self-management are not well understood and the barriers are numerous. These internal and external barriers prevent the Marshallese from achieving effective self-management of diabetes. It is important to note that many of these barriers, including limited healthcare access, lack of transportation, cost of healthy foods, and lack of culturally appropriate health education, are beyond the control of the person with diabetes and the Marshallese community. To address the current benefits-to-barriers ratio, educators will need to clarify the anticipated positive outcomes of self-management behavior and DSME for individuals, families, and the broader Marshallese community. In addition, policy and programmatic action are needed to address the external barriers identified by the Marshallese community, many of which are outside of their control. Educa-

tors will need to partner with others in policy and health care to work on efforts to restore Medicaid benefits for COFA migrants, increase the number of providers who see those without insurance, increase public transportation, and improve access to healthy food choices. In addition, programs are needed to address aspects of the cultural norms including the social stigma of diabetes and making positive changes in the food that is served in cultural celebrations.

### **Cues to Action and Self-efficacy**

It is concerning that the primary cue to action is the diabetes diagnosis. The diagnosis often comes after diabetes has become severe because of limited access to health care and social stigma. If the Marshallese expect to get diabetes, it may be difficult to encourage them to take action with preventive health behaviors before diabetes develops. It is imperative to cultivate earlier cues to action, perhaps through community programs that focus on diabetes prevention.

Self-efficacy was one area with significant variation in responses. Whereas some participants believed that their behaviors might have a small influence on their ability to prevent or manage diabetes, they were convinced that genetics and nuclear contamination are the primary cause of diabetes. A sense of inevitability about developing diabetes is prevalent among other marginalized populations, including American Indians,<sup>48-50</sup> African Americans,<sup>51,52</sup> and Hispanics.<sup>53,54</sup> The perception that diabetes is inevitable is influenced in part by family history and the belief that diabetes is hereditary,<sup>49-51</sup> as well as fatalistic beliefs that diabetes is beyond one's control and may be the will of God, nature, or the universe.<sup>48,53</sup> It is imperative to navigate ways to increase self-efficacy while respecting culturally-based fatalistic beliefs regarding developing diabetes.<sup>53</sup> Heuman et al<sup>53</sup> suggest combining dispelling beliefs about genetics as a primary cause of diabetes with a focus on what can be done to prevent diabetes.

To expand cues to action, educators can provide culturally-appropriate information and examples to promote awareness of actions that can be taken to prevent and manage diabetes earlier. Additionally, educators can promote diabetes screenings to allow for more rapid diagnosis prior to the onset of severe symptoms. To increase self-efficacy, educators can provide culturally-tailored DSME to address misconceptions and encourage activities that improve self-confidence in performing recommended diabetes self-management actions. Educators also can promote successful role models to build confidence in the individual's abilities to manage diabetes.

### **Limitations and Strengths**

The convenience sample of Marshallese adults living in Springdale, Arkansas, is a limitation of the study. The qualitative design is appropriate for this

exploratory study and allows the research team to explore the health beliefs of a Pacific Islander population that suffers from significant health disparities in the rate of diabetes. The qualitative design provides participants with the opportunity to share their beliefs, perceptions, and lived experiences in their own words. This study contributes to an area where there is currently a dearth of literature on Pacific Islander populations and subgroups of Pacific Islander populations, such as the Marshallese. The findings can be used to inform future research and diabetes education within the Marshallese community. The use of a CBPR approach, which included the involvement of community co-investigators and the broader Marshallese community in all phases of the research, helps increase the validity of the results by ensuring that they accurately represent the nuances of Marshallese culture.<sup>55-57</sup>

This CBPR study is action-oriented. From the start of preliminary fieldwork, Marshallese community members told the CBPR team that they do not want to be "guinea pigs" and only want research done in their community that has tangible benefits. This speaks to the ethical imperative inherent in CBPR to *contribute to*, rather than *take from*, health disparate communities when conducting research.<sup>55-57</sup> Given that the long-term goal of our CBPR partnership is to improve the health of the Marshallese community, the discussion focuses on how findings can inform culturally-appropriate healthcare practices, diabetes education, and other health promotion efforts. Based on CBPR stakeholders' recommendations, we offer recommendations for practices and programs in Table 2.

### **Conclusion**

The Marshallese community suffers from rates of type 2 diabetes that are 400% higher than the general US population. There are few studies or programmatic efforts to address these disparities. The research grounded in the HBM provides important information that can help advance diabetes self-management efforts within the Pacific Islander communities. The CBPR team is developing and testing a family model of diabetes self-management education based upon this exploratory research. In addition, the CBPR team is working to address the policy, environmental, and systems barriers that prevent self-management behavior.

### **Human Subjects Approval Statement**

The study was conducted according to all UAMS IRB policies and procedures under protocol #202720.

### **Conflict of Interest Disclosure Statement**

The authors have no conflicts of interest to disclose.

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