



## Original Research

# “We didn’t know”: An Examination of Health and Nutrition Knowledge, Behaviors and Clinical Risk Factors to Guide a Pilot Health Education Intervention for Refugees from Burma

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DOI: 10.18297/rgh/vol2/iss2/2

Submitted Date: January 26, 2018

Accepted Date: April 18, 2019

Website: <https://ir.library.louisville.edu/rgh>

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### Recommended Citation:

Smith, Elizabeth B. and Sastre, Lauren R. (2019) “We didn’t know”: An Examination of Health and Nutrition Knowledge, Behaviors and Clinical Risk Factors to Guide a Pilot Health Education Intervention for Refugees from Burma.” *Journal of Refugee & Global Health*: Vol. 2 : Iss. 2 , Article 2.

## Introduction

Between 2008 and 2014, approximately 109,000 Burmese refugees arrived in the United States (US) making them the largest recently resettled refugee group in the US (Centers for Disease Control and Prevention, Division of Global Migration and Quarantine 2016). Burmese refugees are a diverse group with ethnic groups from various regions, with the largest subgroup the Karen (Centers for Disease Control and Prevention, Division of Global Migration and Quarantine 2016) and others including Chin and Mon, amongst others (Centers for Disease Control & Prevention 2010). The majority of Burmese refugees in the United States are ethnic minorities (non-ethnic Burmese) fleeing military violence and torture or persecution for religious beliefs (Shannon et al. 2015). Despite recent political transition to democracy, ethnic minorities in Myanmar (previously Burma) continue to suffer widespread human rights abuses (Shannon et al. 2015; Parmar et al. 2015).

Previous studies on the health and wellbeing of Burmese refugees have primarily focused on mental health, communicable diseases and pediatric malnutrition. Burmese refugees experience high rates of mental health issues due to past traumatic experiences (Shannon et al. 2015; Van Wyk et al. 2012; Cook et al. 2015) and Hepatitis B and enteric parasites have been commonly reported (Hoffman & Robertson 2017). Examination of nutritional status has revealed many Burmese children arrive with nutrient deficiencies and signs of malnutrition, for example, Denburg et al., found 78% of children were below the 25th percentile in weight and 93% of children were below the 25th percentile for height upon arrival to the US (Denburg et al. 2007).

Although infectious disease, mental health and initial under-nutrition in children have been reported health concerns, less research has examined chronic disease, related lifestyle behaviors and health literacy despite risks newcomers often face

(refugee and immigrant). Newcomers are at increased risk of developing chronic health problems such as hypertension and heart disease the longer they reside in the US; moreover, many barriers to management of chronic conditions may also co-exist (Currie 2012; Mulasi-Pokhriyal, Smith, and Franzen-Castle 2012; Franzen-Castle & Smith 2014; Rondinelli et al. 2011; Smith & Franzen-Castle 2012; Martin & Yankay 2012). Research specifically with Burmese refugees has identified a variety of possible barriers to identifying and managing chronic disease conditions. McHenry et al., found Burmese adults waited until a health issue occurs, resulting in visits to the emergency department, suggesting poor access, and/or understanding of preventative care and management of conditions (McHenry et al. 2016). Cultural perceptions may also serve as a barrier, for example in a study by Oleson et al., Karen refugees practicing traditional medicine reported that western medications were perceived as ineffective and contaminated with harmful chemicals (Oleson et al. 2012). However, in another study, Burmese refugees have reported trust in the Western healthcare system, yet are hesitant to visit healthcare providers due to long wait times and the difficulty obtaining an interpreter to assist with visits (Haley et al. 2014). In summary, there may be several potential barriers to identifying or managing chronic disease conditions with Burmese refugees and in addition, the prevalence of chronic disease conditions is not well established.

Previously described studies have demonstrated potential barriers to navigating and using preventative, primary care services where chronic disease conditions would most commonly be identified and managed. In addition, research regarding prevalence of chronic disease and health literacy (especially of prevention and management of chronic diseases) with this and other refugee groups remains limited. Lifestyle behaviors such as poor diet, lack of physical activity and

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smoking are top risk factors associated with the development of chronic disease reported by the Centers for Disease Control and Prevention (CDC) and efforts to address chronic disease risks must examine these risk factors (Centers for Disease Control and Prevention 2017a). Moreover, any health and nutrition promotion and education efforts to address chronic diseases should be tailored and targeted to the specific audience, as this has been demonstrated to be the most successful in supporting sustained lifestyle changes necessary to prevent or manage chronic disease (Skinner et al. 1999, Eyles & Mhurchu 2009; Kreuter et al. 2002). Lastly, community based health and nutrition promotion and education efforts may be more accepted by newcomer groups as they do not require navigation of the US Healthcare system, allowing more time and flexibility to deliver culturally tailored and targeted messages. In order to develop and deliver tailored, targeted health and nutrition education, assessment of knowledge and behaviors is necessary.

Photovoice is a qualitative research tool that can be used to examine dietary and lifestyle behaviors in the home. The use of photography reduces potential cultural, language, or literacy barriers (common in groups new to the US) to data collection and/or participation in research (Martin, Garcia and Leipert 2010). Photovoice has been used to examine the diets of immigrants to the United States, low-income families, and obese individuals varying in age (Van Oss et al. 2014; Heidelberger & Smith 2015; Murray et al. 2015; Turk, Fapohunda, and Zoucha 2014; Watts et al. 2015). Its use across a variety of age groups and populations has reduced barriers and allowed researchers to collect lifestyle-related data. While several studies have explored Burmese refugees' mental health and infectious disease risk upon arrival to the United States, there is a lack of research on the knowledge, behaviors and clinical risk factors with Burmese refugees- particularly within the context of chronic disease. Furthermore, because of the large amount of change refugee's experience upon arrival to the United States, prior research has suggested that community-based education and intervention would be useful in refugee populations- but data regarding risks and needs must first be identified (Tiedje et al. 2014; Pereira, Larder, and Somerset 2010). Thus, the objective of this study was to examine the health and nutrition knowledge, behaviors, and interests associated with chronic disease with Burmese refugees to develop and deliver a tailored health and nutrition education pilot intervention.

## Methods

### STUDY DESIGN

Two health and nutrition programs were delivered during March (4 weeks) and June (3 weeks) 2017 in Charlotte, North Carolina. Sessions were conducted on Saturday mornings for approximately 90 minutes in classrooms at a community site. A facilitated discussion guide was developed specifically for this program and was content validated by colleagues in the field (n=4) with expertise in refugee, immigrant, and minority health. A Burmese interpreter was available at all sessions and study materials (consent forms) were translated into Burmese. Most educational materials were available in Burmese (e.g. and were obtained from the United States Committee for Refugees and Immigrants. This study was reviewed and approved by the Institutional Review Board at Winthrop University and consent was obtained prior to all data collection. No identifying information was collected and data collected was coded using non-identifiable codes (e.g. BPO1).

### PARTICIPANT RECRUITMENT AND INCLUSION

Participants were recruited through collaboration with a community partner that provides services to newcomer groups (e.g. Healthcare, English as a Second Language Classes, etc). Flyers were distributed within the Burmese community through the community partner. Inclusion criteria were based on age (18+ years) and nationality (resettled refugee from Burma/ Myanmar). A total of n=9 participants attended the March program and n=4 participants during the June program. Some participants self-identified as Chin (ethnic group) from Burma during discussions, however, individual ethnicity data were not collected.

### DATA COLLECTION

#### *March Program*

Digital cameras were provided to participants to photograph foods consumed during the day to further assess dietary patterns. Facilitated discussion was used to reveal educational topics of interest and evidence of dietary risks from photographs, as well as anthropometric and clinical measurements to guide delivery of health and nutrition education.

#### *June Program*

To guide the delivery of the second program, educational topics were based on a survey (translated to Burmese) developed from an oral survey provided during the March program. The survey was distributed within the community by the community partner and results (n=10 completed surveys) indicated greatest interest in: heart disease prevention and development, shopping and reading food labels, oral health and general nutrition for healthy diet and promoting health. The surveys were completed by community members from the local Burmese community to guide the program, however, these community members were not necessarily participants in the June program. The survey results were reviewed with the June participants who agreed that these were important topics and topics of high interest, therefore they were used to guide the June program. Anthropometric (height, weight) and clinical (blood pressure) measurements were also obtained and were discussed/explained with regards to level of potential risk and behaviors that reduced risks. One session included a trip to the local international grocery store to review common foods and provide education.

### MEASURES

Data were collected during sessions (March, June) via handwritten notes by the primary investigator and two research assistants during facilitated discussions. Blood pressure measurements were obtained utilizing sphygmomanometer at the start of the first session for each program. Anthropometric measurements included height and weight. Participants were asked to remove any hats or shoes prior to measurements. A calibrated digital scale was used to obtain weight to the nearest 0.1 kilogram and a stadiometer was used to obtain height to the nearest 0.1 centimeter. Digital cameras were provided during the first program to identify commonly consumed foods. Participants kept cameras for 1-2 weeks and were instructed to photograph all food consumed. A total of (n=100) photographs were collected from (n=8) participants.

**Table 1** March Program Session

<b>Session Focus</b>	<b>Facilitated Discussion Responses</b>
<u>Assessment Part I</u> <ul style="list-style-type: none"> <li>Height, weight, blood pressure measurements</li> <li>Topic Interests from Oral Survey for future lessons</li> </ul>	<ul style="list-style-type: none"> <li>Highest interest: chronic disease management/prevention (Specific concerns with diabetes, weight gain and blood pressure)</li> <li>Interest in American recipes, cooking and taste testing.</li> <li>Children no longer wanted Burmese food. Frustration, US foods are “more expensive” than Burmese foods.</li> <li>Physical activity was reported to be the same or less that before arrival to US.</li> <li>Reported dietary changes (more fast and convenience foods).</li> </ul>
<u>Assessment Part II</u> <ul style="list-style-type: none"> <li>Knowledge and health related perceptions</li> <li>Provision of digital camera tracking of meals/foods</li> </ul>	<ul style="list-style-type: none"> <li>Defined health as “healthy is for future” and is associated with: “fresh food”, “right food”, “drinking water”, “exercise”</li> <li>“Being happy” and “the mind” is important for health</li> <li>Desire to be healthy associated with family duties and need to provide for children and the family</li> <li>Healthy foods: fruits, vegetables, water, meat, milk with an emphasis on vegetables. Foods that were described as “unhealthy”: beef, oil, sweets, expired foods, foods with gas, energy drinks, alcohol. Spices and seasonings were described as remedies and promoting health and favorites included ginger, curry, turmeric, and lemon.</li> <li>General meal patterns were described as coffee and a snack like bread or cake for breakfast, rice and meat (usually fish or pork) and a vegetable for a midday meal, then a similar evening meal.</li> <li>Primary oils commonly used included: soybean, peanut, vegetable. Frying was reported to be common but not daily.</li> <li>Reported growing food at their house or apartment, however, reported they grew “more” food prior to arriving to the US</li> <li>Physical activity was reported to be 20 minutes or less a day.</li> <li>Portion sizes and label reading new (participants very surprised by portion sizes)</li> <li>Prevention or management of chronic disease (e.g. diabetes, hypertension) through diet and lifestyle was new information. The risk of high blood pressure to the heart was new information and was very surprising.</li> <li>Label reading – was new and unknown (how, why to use food labels to identify ingredients)</li> </ul>
<u>Hypertension and Heart Disease</u> <ul style="list-style-type: none"> <li>Handouts: USCRI blood pressure/ heart disease and food label handout, DASH diet (visual), Portion sizes (using your hand visual)</li> </ul>	<ul style="list-style-type: none"> <li>Portion sizes and label reading new (participants very surprised by portion sizes)</li> <li>Prevention or management of chronic disease (e.g. diabetes, hypertension) through diet and lifestyle was new information. The risk of high blood pressure to the heart was new information and was very surprising.</li> <li>Label reading – was new and unknown (how, why to use food labels to identify ingredients)</li> </ul>
<u>Healthy Cooking and General Nutrition</u> <ul style="list-style-type: none"> <li>Pizza Dough Recipe Demonstration</li> </ul>	<ul style="list-style-type: none"> <li>High interest in making more healthful, tasty pizza for children</li> <li>Female participants (n=2) initiated questions and discussion of diabetes management. Female participant (n=1) initiated discussion of weight loss (described wanting to lose weight and not knowing what to do about it “but now she does”)</li> <li>Participants explained during the last session that the information about chronic disease management was “new”.</li> </ul>

**Table 2** Photovoice Results (Themes per Participant)

<b>Theme</b>	<b>Per Total Sample (n=8)</b>
Vegetables cooked in large amounts of oil	n=6
Fried Meats	n=6
White rice (large portion)	n=5
Red meat	n=5
Limited vegetables (small portion)	n=4
High fat/sugar breakfast breads (Croissants, Danishes)	n=4
High sugar, energy-dense instant coffee or tea	n=4



Figure 1



Figure 2



Figure 3



Figure 4

Figures 1-4 Samples of photographs demonstrating main identified themes from participants.

## DATA ANALYSIS

Handwritten notes from facilitated discussions were reviewed after sessions between all researchers and consensus was reached regarding responses. Photographs collected during the first program in March were analyzed independently by three researchers and consensus was reached regarding the themes. Photovoice data were analyzed for themes per participant vs. total pictures. Behaviors that were present in multiple photographs from one digital camera were only counted one time (e.g. if a participant photographed coffee multiple times coffee was counted once for that individuals file).

## Results

### MARCH PROGRAM

March sessions were attended by n=9 (n=2 male, n=7 female) Burmese community members. Participants described health, dietary and lifestyle practices, and frustration with children's dietary changes (**Table 1**). Participants reported never having received information about diabetes, blood pressure and heart disease- especially prevention and management. On the last day, a homemade healthier pizza recipe (a favorite of their children reported by the parents since arriving in the US) was demonstrated.

### MARCH PROGRAM PHOTOVOICE RESULTS

Of the (n=100) photographs collected, emerging primary themes

included vegetables cooked in large amounts of oil, fried meat, large servings of white rice, red meat, bread, the consumption of pasta or bread in addition to rice, consumption of high sugar, energy-dense instant coffee and tea, and small amounts of vegetables on the plate (**Table 2**). Samples of photographs demonstrating main identified themes from participants are shown in **Figures 1-4**.

### JUNE PROGRAM

The June sessions were attended by n=4 refugees (n=2 male, n=2 female). Participants reported never having received information about diabetes, blood pressure and heart disease- especially prevention and management and were very attentive regarding lifestyle changes that can reduce risks (**Table 3**). During the grocery store tour, participants showed researchers commonly used ingredients and discussed eating patterns including: sugar sweetened teas and coffees, white rice, vegetable oil as well as very high sodium sauces and seasonings (e.g. one popular sauce had 1800mg/serving), limited fruit consumption and limited use or understanding of the food label.

### ANTHROPOMETRIC AND CLINICAL DATA FROM JUNE AND MARCH SESSIONS

Body mass index and blood pressure demonstrated high rates of overweight and obesity as well as hypertension risks (results summarized in **Table 4**). More than two thirds of participants were overweight or obese based off the CDC's outlined BMI formula for adults (e.g. Formula: weight (kg) / [height (m)]<sup>2</sup>)

**Table 3** June Program Session

Session Focus	Facilitated Discussion Responses
<u>Assessment/Heart Disease</u> <ul style="list-style-type: none"> <li>height, weight and blood pressure measurements were taken</li> <li>Lifestyle &amp; diet risk factors blood pressure/heart disease risk</li> <li>Handouts with visuals for preventative behaviors</li> </ul>	<ul style="list-style-type: none"> <li>Discussion of anthropometric and blood pressure results</li> <li>Participants reported never having received information about prevention and management of chronic disease conditions.</li> </ul>
<u>Grocery Store Tour</u> <ul style="list-style-type: none"> <li>Participants showed researchers commonly used ingredients and foods</li> <li>Ingredients and foods were discussed for nutrition and health benefits and risks</li> </ul>	<ul style="list-style-type: none"> <li>Very high sodium sauces (e.g. 1800 mg/serving) and seasonings</li> <li>High sugar, energy dense instant tea and coffee with creamer and sugar pre-mixed. Use of condensed milk in coffee</li> <li>Vegetable oil primary fat for cooking</li> <li>Wide range of produce and fresh spices and herbs (e.g. turmeric). An older female participant described mixing fresh turmeric in honey and allowing the “capsules” to dry.</li> <li>White rice primary staple and purchased in bulk</li> <li>Food labels and serving sizes- not used or familiar</li> </ul>
<u>General Healthy Lifestyle Guidelines, Child/Adolescent and Oral Health</u>	<ul style="list-style-type: none"> <li>Participants complained their children did not want to eat Burmese food anymore.</li> <li>Participants had not seen/used dental floss or mouthwash before and many of the dental care instructions were new. Kits were provided for the entire family, which include toothbrushes, mouthwash, floss and toothpaste.</li> </ul>

**Table 4** Clinical Measures: BMI and Blood Pressure

	Category	Clinical Criteria	Frequency	Mean ± SD
<b>BMI</b>	Underweight	<18.5	n=1	27.2 ± 4.16
	Normal	18.5-25	n=2	
	Overweight	25-30	n=5	
	Obese I	30-35	n=5	
<b>Blood Pressure</b>	Normal	Less than 120/80 mm Hg	n=0	134.1 ± 14.3 89.6 ± 7.7
	Elevated	Systolic between 120-129 and diastolic less than 80	n=0	
	Hypertension I	Systolic between 130-139 or diastolic between 80-89	n=6	
	Hypertension II	Systolic at least 140 or diastolic at least 90 mm Hg	n=7	

and corresponding risk categories. Based off the newly released 2017 Guidelines for High Blood Pressure in Adults from the American College of Cardiology (ACC) and American Heart Association (AHA), all participants’ blood pressures fell within the Stage 1 or Stage 2 hypertension categories (Centers for Disease Control and Prevention 2017b; American College of Cardiology 2017).

## Discussion

The objective of this study was to examine the health and nutrition knowledge, behaviors, and interests associated with chronic disease with Burmese refugees to develop and deliver a tailored health and nutrition education pilot intervention. Participants reported no prior knowledge of the adverse effects of high blood pressure on the heart as well as the impact of lifestyle, dietary choices, and weight loss on chronic disease prevention and management. A study by Haley et al. (2013) with Burmese refugees also identified self-reported lack of nutrition knowledge as well as desire to learn more about chronic disease prevention (Haley et al. 2014). Burmese refugees are one of the more established recent groups, however, findings in this study and by Haley et al., suggest that time in the US does not necessarily translate into improved health and nutrition knowledge.

In addition to limitations to health and nutrition knowledge adverse dietary and lifestyle behaviors relating to chronic

disease risk were identified (e.g. large portions of white rice and meat, excessive vegetable oil, high sugar instant tea and coffee beverages and use of very high sodium seasonings and sauces). Other studies have found diets of refugees to include increases in energy dense foods, meats, saturated fat, sugars, convenience foods along with a decrease in physical activity, increase the incidence of chronic diseases such as obesity, type II diabetes, and cardiovascular disease (Holmboe-Ottesen & Wandel 2012; Montesi, Caletti, and Marchesini 2016). Photographs of meals taken by program participants, evidence from discussions and grocery store tours, and reported low physical activity provide further evidence of dietary and lifestyle concerns with relationship to chronic disease risk as defined by the CDC (Centers for Disease Control and Prevention 2017a).

In addition to dietary changes, acculturation - the process by which newcomers adjust to living somewhere with “culturally dissimilar people, groups, and social influences” is another risk that may affect the health of Burmese families as they acculturate to a Western diet and lifestyle (Schwartz et al. 2010). Participants reported low daily physical activity and several reported they had become less active since moving to the US. Participants in both sessions mentioned their children no longer want to consume Burmese food but prefer American foods. This is in line with several previous studies, which have shown that newcomer children’s diets rapidly change upon arrival to the US (Mulasi-Pokhriyal, Smith, and Franzen-Castle 2012; Franzen-Castle & Smith 2014; Diaz et al. 2009). Renzaho et al., however,



found a discrepancy between newcomer caregiver and youth-with caregivers observing changes to their children's diets with great concern and children and youth believing their diets to have changed very little, as they are consuming traditional foods at home and westernized foods at school, minimizing their perception of change (Renzaho, McCabe, and Swinburn 2012). Reported perceptions of dietary changes may potentially therefore be exaggerated by caregivers, never the less, there is strong evidence that younger generations diets change more rapidly. For these reasons, participants in the first program initiated an interest in learning healthy versions of their children's favorite foods (e.g. pizza) and enjoyed the "healthful" pizza demonstration offered during the program. With rapid and usually less healthful dietary acculturation as well as pressures of Western lifestyle (e.g. less time, women often working outside the home) that occur during acculturation in the US it may be beneficial to incorporate healthy, easy to prepare alternatives to "new" favorites (e.g. pizza) and/or development of "fusion" recipes between traditional foods and new favorites (Vue, Wolff, and Goto 2011; Wilson & Renzaho 2015; Franzen & Smith 2009; Garnweidner et al. 2012).

Furthermore, the identified dietary (e.g. large portions rice, meat, limited fruits and vegetables, use of oil, high sodium intake) and lifestyle (low physical activity) changes and risks, limited nutrition and health knowledge provided further insight into the nutrition risks relating to prevalent hypertension risk as well as identified overweight and obesity with this group. At the time of the study, all participants' blood pressure measurements fell within Stage I and II hypertension categories based off the new ACC/AHA guidelines released in 2017 (American College of Cardiology 2017). According to the CDC, one third of Americans are pre-hypertensive and 29% have hypertension (Centers for Disease Control and Prevention). The risk of hypertension in the study participants was higher than reported rates for the general adult population in the US. Other studies have also found elevated levels of hypertension among refugees to the US from Southeast Asia. (Yun et al. 2012, Munger et al. 1991). Several factors could be contributing to the high rate of hypertension in participants with high rates of overweight and obesity (n=10 out of n=13 total sample were overweight and/or obese) and adverse dietary trends.

While this study has several implications, it is not without limitations. The sample size was small and included primarily Chin Burmese - a smaller resettled subpopulation and results may not be generalizable to other larger groups (e.g. Karen). All data during sessions were collected by handwritten notes; researchers chose not to audio-record the sessions in order to improve the level of comfort in participants, however, this leaves room for unintentional bias or error, however, multiple researchers took notes and consensus was reached regarding responses during discussions. Additionally, photovoice analysis was limited as participants did not photograph all meals during the data collection period as instructed. In addition, blood pressure should be measured on two separate occasions to confirm hypertension as specified by the ACC/AHA and blood pressure was only taken once during this study. Lastly, although there were limitations with this pilot study, findings did correlate with larger, previous studies with Burmese refugees.

## Conclusions

This pilot study identified limited health and nutrition knowledge, specific adverse dietary (large portion sizes, high

sodium and vegetable oil use as well as consumption sugar sweetened beverages with limited fruits and vegetables) and lifestyle (low physical activity) behaviors in combination high rates of overweight, obesity and hypertension risk with Burmese refugees. These elevated risks suggest further examination of health literacy, lifestyle risk factors, clinical risk factors and prevalence of chronic disease within the Burmese refugee group is warranted. Findings presented here can guide future assessment of potential dietary and lifestyle risks associated with the development and management of chronic disease with this group to develop and deliver tailored health and nutrition education and promotion. Lastly, the authors suggest further assessment and interventions with this group is likely warranted to reduce long-term chronic disease risks (e.g. obesity, hypertension) and reduce likely health disparities.

## Acknowledgements

The authors would like to thank their research assistants Alina Pittman and Jessica McCarton for their work collecting the data. They would also like to thank their community partner and members of the Burmese community who participated in this study.

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**Funding Source:** The study was not funded.

**Conflict of Interest:** No authors have conflicts of interest to report.

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