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Food Insecurity and Culture - A Study of Cambodian and Brazilian Immigrants

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FOOD INSECURITY AND CULTURE- A STUDY OF CAMBODIAN AND BRAZILIAN IMMIGRANTS

A thesis presented

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DEDICATION

I dedicate this thesis project to the loving memory of my father, Hassan Modarresi Ghavami and to the greatest mother, Eram Farsad.

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ABSTRACT

FOOD INSECURITY AND CULTURE- A STUDY OF CAMBODIAN AND BRAZILIAN IMMIGRANTS

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Vulnerable immigrant populations such as refugees and undocumented immigrants are at higher risk for food insecurity and its health consequences than other low- income populations. Acculturation and adaptation of certain coping strategies, as well as certain characteristics, make these populations vulnerable to food insecurity.

This thesis focuses on two of the understudied immigrant populations in Lowell, Massachusetts: Brazilian immigrants and Cambodian refugees and immigrants. To better understand food insecurity, acculturation, and coping strategies of these immigrant populations, we conducted a mixed-methods study with two Brazilian focus groups (n=16) and three Cambodian focus groups (n=21). We assessed 1) food security experiences, 2) the role of acculturation in the aspects of food security status, and 3) the role of coping strategies in the food insecurity and acculturation of these populations.

Participants were similar with respect to age, income, length of stay in the U.S. across both Brazilian and Cambodian groups. Native language was the preferred

language spoken at home. In quantitative survey analyses, Cambodians participants experienced higher rates of food insecurity compared to Brazilians (91% vs. 25%, $p<0.001$). Cambodians experienced greater food hardship in their home countries compared to the Brazilian immigrants (66.6% vs. 43.7%). Throughout the focus groups, Cambodians talked about a difficult food environment in which desired foods were not available or accessible to them. In contrast, the Brazilians seemed to enjoy a suitable food environment. Dietary acculturation was also evident in both groups. However, Cambodians expressed more indications of adapting to what they considered an American diet. Also, Cambodians seemed to engage in more risky strategies that could potentially exacerbate their food security status and health than Brazilians.

These results suggest that some of the possible contributing factors to the higher rates of food insecurity in the Cambodian groups are their employment of risky coping strategies, as well as the difficult food environment. The difficult food environment along with their past food experience might have played a role in the greater dietary acculturation in the Cambodian groups.

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LIST OF ABBREVIATIONS

CMAA= Cambodian Mutual Assistance Association of Greater Lowell, Inc.

DHS= Department of Homeland Security

ESOL= English as a Second or Other Language

EFNEP= Expanded Food and Nutrition Education Program

FSP= Food Stamp Program

LAEC= Lowell Adult Education Center

PI= Principal Investigator

PRWORA= Personal Responsibility and Work Opportunity Reconciliation Act of 1996

SNAP= Supplemental Nutrition Assistance Program

USDA= United States Department of Agriculture

CHAPTER 1

INTRODUCTION

Researchers define food insecurity as limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways (1-4). The U.S. Department of Agriculture (USDA) defines two categories of food insecurity: low and very low food insecurity.

Food insecurity starts when there is uncertainty and anxiety about food at the household level, and can in extreme conditions lead to child hunger when there is insufficient food (5, 6). According to the USDA, 14.9% of the U.S. households were food insecure in 2011, with 5.7% having very low food security (1).

Food insecurity is related to health complications such as obesity (2, 7-10), diabetes (8, 11-13), nutrient deficiency (14-16), stress and anxiety (17, 18). Researchers and educators have suggested that components of food insecurity such as availability, access, and utilization might contribute to behaviors that lead to poor health outcomes. Researchers also suggest that cyclic food depravation (19, 20) is another mechanism through which food insecurity can cause health problems. Some factors that can lead to food insecurity are low economic status (21-24), lack of access to foods (25-29), low educational attainment (30-32) and being a single parent household or households with high number of children (22, 30, 33, 34).

Food insecure individuals can employ different coping strategies to manage their food security status (35-38). Some coping strategies can pose food safety, nutritional and financial risks that can increase the overall food insecurity of individuals (39).

Households with single parents, Hispanics, Black non- Hispanics, and low-income households have high rates of food insecurity (1). Some immigrant populations also have high rates of food insecurity (40, 41).

According to the Department of Homeland Security (DHS), there were a total of 1,031,631 legal immigrants to the U.S. in 2012. Legal immigrants are granted lawful permanent residence in the United States (42). Unlike legal immigrants, undocumented immigrants do not have the right to reside in the United States. In 2007 there were approximately 12 million undocumented immigrants in the U.S. However, the number of the undocumented immigrants dropped to 11.1 million in 2011 (43).This drop is due to a decrease in the number of new immigrants from Mexico, the single largest source of U.S. migrants (43).

DHS categorizes a person as a refugee if the person is unable or unwilling to return to his or her country because of persecution or a fear of persecution based on race, religion, nationality, membership in a particular social group, or political opinion (42). In 2012, nearly 60,000 new legal immigrants were categorized as refugees (42), and between 40,000 and 70,000 are resettled in the U.S. annually (44).

Due to the increasing number of immigrants to the U.S. (42) and the high prevalence of food insecurity in these populations research on the prevalence, causes and outcomes of food insecurity among immigrants and specifically vulnerable immigrants is of great importance (40, 41).

Some immigrants to the U.S. are at greater risk for food insecurity than other low-income populations (40, 41). Many low-income immigrants have characteristics that likely contribute to increased food insecurity (30, 45, 46), including language barriers (4,

47) and ineligibility to participate in food assistance programs (41, 48). Dietary acculturation is another mechanism that can lead to food insecurity among immigrants. Different authors define acculturation as a process by which different ethnic or cultural groups adopt the attitudes, values, costumes and behaviors of a new culture (4, 11, 49-53). Dietary acculturation is the process that occurs when members of a minority group adopt the eating patterns/food choices of the host country (24, 27, 30). However, it is important to note that acculturation is more than just behavioral norm- swapping (54).Refugees and undocumented immigrants are particularly vulnerable to food insecurity because they have experiences and characteristics that are linked to food insecurity. Such experiences and characteristics include immigration status, ineligibility to participate in social safety networks, their socioeconomic background, limited English literacy, residential location, and stigma (55).

CHAPTER 2

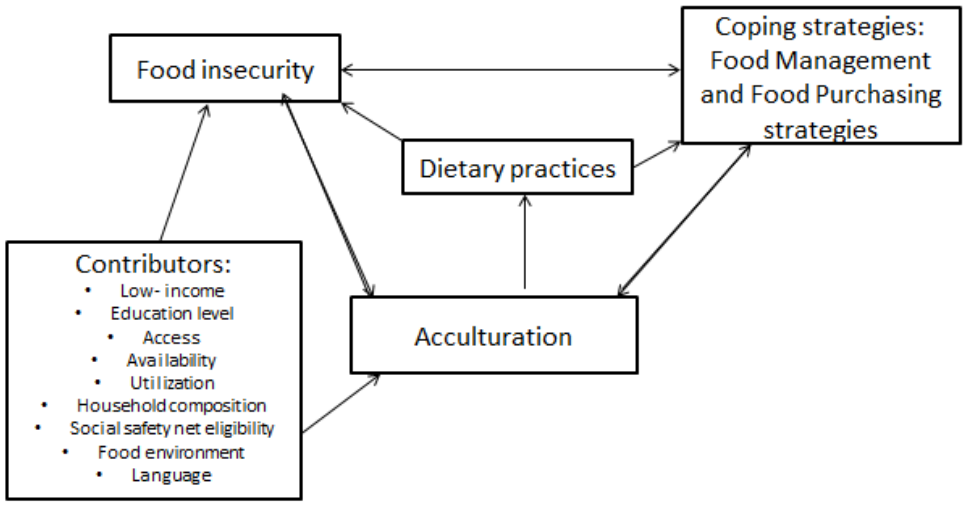
LITERATURE REVIEW

As discussed in the introduction, food insecurity can lead to many health complications. Availability, access, utilization, and cyclic food depravation are some of the mechanisms through which food insecurity might lead to these complications, particularly in vulnerable immigrant populations.

2.1. Conceptual Framework

This literature review describes the relationship between personal experiences and characteristics, acculturation, dietary practices, coping strategies, and food insecurity among vulnerable immigrants. The conceptual framework details the pathways through which personal characteristics and experiences may affect acculturation, dietary practices, coping strategies, and food security (Figure1). The literature review details the research to support this conceptual framework.

Figure1. Conceptual Framework



2.2. Food Insecurity

2.2.1. Food Insecurity and Contributors

Refugees and undocumented immigrants likely have high rates of food insecurity in part because of low income, which can put individuals and households at great risk for food insecurity (4, 6, 30, 56-58). In 2008, in a mixed- methods study of food insecure African refugees (n= 157), Patil et al. (47) demonstrated that half of the refugees had income levels of less than $1000/month and 40% of them were unemployed. Hadley et al. (59) also showed similar results in a quantitative analysis of African immigrants (n= 101). Half of the participants in this study also had mean household income of less than $1,000/month. In a study of U.S.–Mexico border migrants and seasonal farmworkers (n=100), Weigel et al. (60) determined that 82% of the participants were food insecure.

One of the possible mechanism through which vulnerable immigrants might become food insecure is the inability to cope with unexpected changes in their budget because of their financial constraints (21, 22). Just like any low- income populations, these individuals make consumption choices based on their expectations of future income, their current income, their stock of savings and their ability to borrow. Unexpected changes to budget can greatly influence consumption choices leading to food insufficiency (21).

Another factor that can lead to food insecurity of refugees and immigrants is lack of availability or inaccessibility of food (4, 25, 26, 57, 61). One factor that makes food inaccessible/unavailable is the perceived or actual high price of healthy foods (25, 26). Additionally, food deserts, areas where residents cannot buy affordable, healthy foods (61), may lead to food insecurity (27, 61). The lack of access to healthy foods in food

deserts is due to the absence of large supermarkets, farmers markets and other health food stores/markets in low- income neighborhoods (27, 28). Another contributing factor to the low access to food is lack of adequate transportation to undertake food shopping (29).

Researchers have documented that refugees face access constraints. In a mixed-methods study of food insecure African and Asian refugees (n= 175), Patil et al. (62) concluded that inaccessibility of international/specialty stores due to lack of transportation to such stores and perception of high prices contributed to the food insecurity status of these individuals. Hadley et al. (57) also addressed the issue of food access and food insecurity in a mixed-methods study with food insecure refugee populations from different races and countries of origin (n=281). The authors discussed how difficult food environments increase barriers to food accessibility, thus exacerbating food insecurity (57). They found what contributes to food insecurity includes an environment in which the participants had difficulty identifying items at stores, finding desired foods, cooking American food, and did not know all different food stores. In a mixed-methods study of undocumented Latino immigrants (n=317) Quandt et al. (63) observed that the lack of transportation limited participants access to food and influenced the food security status of this population.

Undocumented immigrants and refugees might have lower education levels due to the social conflicts that they faced in their home countries (58, 63). Although research in this area is mixed, the weight of evidence suggests that low levels of education contribute to food insecurity (31, 32, 60, 64). Researchers propose that low levels of literacy can make food purchasing and preparation challenging and therefore lead to food insecurity (65). Hadley et al. (57) reported that among refugees from West Africa, having more

than one year of education is associated with lower food insecurity ($p<0.05$). Quandt al. (63) also found an association between education level and food insecurity among undocumented Mexican farmworkers (n= 102). They reported that 70% of the food insecure individuals in this population had only a primary education.

Food security of vulnerable immigrant populations might also be affected by household composition (30). Larger households are more likely to be food insecure (citation). Increasing household size or number of children increases the risk of food insecurity by 1.3–1.4 times (22, 34). In a study of West African refugees, Hadley et al. (4) demonstrated that household size was positively related to the food insecurity ($p= 0.01$). A thorough literature review did not find any published research addressing household size and undocumented immigrants.

Language barriers can also contribute to food insecurity (4, 47). In a qualitative study of West African refuges (n= 101), Hadley et al. (4) determined that language comprehension (i.e. difficulty understanding other people in English) was associated with higher rates of food insecurity ($p=0.05$). In another mixed-methods study of Liberian refugees (n= 33), researchers concluded that mother's difficulty in understanding people in the host country was associated with child hunger ($p=0.013$) (66). A thorough literature review did not find any published research addressing language barrier and undocumented immigrants.

Ineligibility to participate in food assistance programs can also increase risk of food insecurity rates among some immigrant populations (41, 48). After the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA) was implemented in 1996, most legal immigrants became ineligible for Food Stamp Program (FSP) for a

period of 5 years beginning on their date of entry into the United States (67). Additionally, for households with eligible members, such as children, PRWORA specified that Food Stamp allotments had to be reduced in proportion to the number of non-citizens living in the household (67). This policy further constrains access to food assistance programs and increases food insecurity for both non-citizen parents and their children (41).

Federal food assistance programs are inaccessible to undocumented immigrants (48) because of laws and regulations that affect eligibility for such programs (48). Undocumented individuals may express reluctance to request food assistance due to confusion about the eligibility criteria and the fear that program use will hurt their own and their children's future opportunities (56). In a cross- sectional study of undocumented Mexicans (n=431), researchers found out that those who did not have access to public assistance programs were more likely to experience hunger than others (p=0.01) (48). A thorough literature review did not find any published research addressing access to public assistance programs and refugees.

2.2.2. Food Insecurity, Hunger, and Health

Hunger and food insecurity are very much prevalent in immigrant and refugee populations (66, 68, 69). Research on immigration and health has revealed links between food insecurity and immigrant hunger and health. In a study of 431 undocumented immigrants, Hadley et al. (48) demonstrated that food insecurity-induced hunger among immigrants was associated with poorer overall health (OR 1.69, 95% CI 0.95–3.02) and more days of poorer mental health (p=0.01). Researchers have also demonstrated associations between food insecurity and several undesirable health consequences in

some immigrant populations that are not traditionally associated with food shortage. These health outcomes include weight gain, diabetes, nutrient deficiency, and high levels of stress, anxiety, and depression (2, 7, 8, 68, 70). In a mixed-methods study of Cambodian refugees, Peterman et al. (70) demonstrated that depression was associated with increased likelihood of being food insecure ($p=0.014$). Likewise, in a longitudinal study of 5,150 Finnish men and women, Laitinen et al. (71) concluded that food insecurity and stress resulting from food insecurity may cause obesity in low-income immigrant families. An association between food insecurity, diabetes, and obesity was also demonstrated among the immigrant populations. In a study of Latinas (n=201), Fitzgerald et al. (72) concluded that Latinas with very low food security were 3.3 times more likely to have diabetes and be obese ($p<0.05$) in comparison to their counterparts who were food secure or experienced only low food security.

Adverse health outcomes of food insecurity among vulnerable immigrants might be due to lack of access to healthy foods that can lead to inadequate intake of certain nutrients (14-16), including energy, carbohydrates, milk products and fruits and vegetables (14). Children of food insecure immigrants might also be at increased risk for nutrient deficiency (15). Research with low- income legal immigrants and their children also demonstrated high prevalence of nutrient deficiency in these populations (16, 73). In a qualitative study of resettled refugees in San Diego (n=40), researchers reported themes related to undernutrition due to poor diets (73).

2.2.3. Mechanisms of Food Insecurity and Health Outcomes

As discussed above, food insecurity has many health implications among vulnerable immigrant populations. Lack of access to healthy foods and cyclic food

deprivation are two potential mechanisms through which food insecurity can contribute to poor health of low- income populations, including low-income immigrants.

One mechanism through which food insecurity might cause compromised health is the cyclic food depravation also known as the "food stamp cycle". This cycle refers to a 3-week period of potential overeating when food stamps and money are available, followed by a 1-week period of involuntary food restriction when resources have been depleted, followed by overeating when the monthly food stamp allotment has been restored (19). While undocumented immigrants cannot access SNAP, they might suffer from cyclic income and have periods of resource constraint (60). In a study of 100 migrant and seasonal workers, Weigel et al. (60) demonstrated that these individuals suffered from high rates of food insecurity (82% of the household) due to the cyclic nature of their income. These immigrant farmers were also more likely to suffer from depression, gastrointestinal infection and adult obesity.

2.3. Acculturation

2.3.1. Acculturation Measurement

Due to the complex nature of acculturation, researchers often base the measurement of acculturation on statistical proxy indicators such as language use, immigrant status and length of stay in the U.S. (11, 74, 75). These proxies are quick and convenient and correlate with measurement scales (74, 75).

2.3.2. Acculturation and Food Insecurity

As a multidimensional and complex process (49, 50), dietary acculturation can both lead to food insecurity and result from it (4). Many different demographic, social

and economic factors can influence dietary acculturation (51). Examples of such factors include income and purchasing power, food availability, and food accessibility (51).

Vulnerable immigrant populations might not have access to food/cultural foods; or cultural foods or food in general might not be available to them. Consequently, lower purchasing power, lack of availability and inaccessibility can lead to dietary acculturation in low-income immigrant populations (4, 47). Lack of availability/inaccessibility of traditional foods and ingredients as well as high prices of such foods compared to income levels, could potentially result in increased consumption of lower-cost foods of the host country (47, 50, 52).

Some other pathways through which dietary acculturation leads to food insecurity can include shifts in budget management (e.g. running out of money at the end of the month/food stamps use by eligible immigrants) and changes in food-related practices (e.g. shopping and preparation). In immigrants, these pathways can then be exacerbated by language barriers (4). A qualitative study of West African female refugees in the U.S (n=101) revealed that difficulty in the food shopping environment and language difficulty (measures of low dietary acculturation) are associated with occurrence of food insecurity and also with its severity ($p<0.05$) (4). A thorough literature review did not find any published research addressing language barrier, and difficult food environment in undocumented immigrants.

2.3.3. Acculturation and Dietary Practices

Dietary acculturation can be both helpful and harmful (58, 76). In a cross-sectional, mixed-methods study of Cambodian refugees, Peterman et al. (58) reported that more highly acculturated refugees had lower consumption of high-sodium Asian sauces

and higher consumption of brown rice and whole grains than lower-acculturated refugees. In a cross-sectional study of documented Mexican immigrants, Batis et al. (76) found that the more acculturated individuals had higher energy intake from saturated fat and sugar, while consuming more whole grain, fish, low-fat meat compared to the less acculturated individuals ($p<0.01$).

Some researchers of acculturation assume that immigrants enjoy healthier dietary practices prior to migration (9, 49, 77). According to these researchers, the negative changes of dietary practices in these populations occur due to the acculturation process. However, recently some researchers have suggested that some immigrants to the U.S have already developed unhealthy food habits in their home countries (78). This may be due to the modernization of food production, global experiences with the nutrition transition, as well as transnational transmission (78). A transnational theory describes how different cultures share and communicate mass- producing, purchasing, preparing and consuming foods (78).

In a qualitative research with 15 Latino immigrant families between 2008-2009, Martinez (78) reported that the dietary practices of Latino immigrants in the U.S. was shaped by their pre-immigration experiences such as presence of fast food, increased accessibility to processed and convenience food in their home countries, and not the time spent in the U.S. or language preference. The authors reported that the participants had very low English speaking skills and because of that they had very little exposure to the main stream culture. They then concluded that the immigrants would not have learned the negative dietary practices in the U.S.

2.3.4. Acculturation and Health

In addition to the health risks from food insecurity, acculturation may affect immigrant health (4, 50, 52). Different studies on acculturation and health status show that acculturation can have negative effects such as obesity (9, 10) and diabetes (77). In a cross-sectional study, Himmelgreen et al. (10) showed a strong association between the increased length of stay in the continental U.S. and increased BMI in Puerto Rican women ($p= 0.012$). Obesity prevalence was highest among women who had been in the U.S. for 10 years or more (40%), compared to those who had been in the U.S. less than 1 year. This study also demonstrated that those individuals who were fluent in speaking English (often used as a proxy for acculturation) weighed more (mean BMI= 26.8) than those who did not speak fluent English. In a study of immigrants from different countries Antecol et al. (9) shows similar results. They demonstrated that the BMI for the average female immigrant rose by approximately 6% between 0–4 years of U.S. residence and 15 or more years of U.S. residence. They also found some disparities between female and male immigrants in terms of weight gain. Antecol et al. (9) found that the average BMI difference between natives and recent immigrants is substantially larger for men than for women.

In this context it is also important to take note that not only acculturation but also discrimination can play a role as a potential pathway through which the health of immigrants and their descendants erode. In a qualitative study of 40 Mexican immigrants Viruell-Fuentes (54) concluded that the social and economic discrimination that this population was facing and not the acculturation levels led to undesirable health outcomes in this group.

2.4. Coping Strategies

In order to avoid food insecurity and/or food insufficiency, low-income individuals including vulnerable immigrants use many different types of coping strategies (35-38, 79-83). Employment of some coping strategies can contribute to the food insecurity and the consequent health issues in these populations.

When vulnerable populations such as undocumented immigrants and refugees use certain coping strategies, they can increase their risk of food insecurity (66, 84-86). Researchers believe that strategies such as eating less preferred meals and reducing portion sizes, do not pose a great risk on food-insecurity because of their reversible nature. However, if individuals take more desperate measures and start using risky strategies such as pawning assets, borrowing money and diluting foods, they put themselves into great financial or health risks that might be irreversible or hard to change (85-87). In a study of Liberian refugees, Hadley et al. (66) found that refugee mothers and children in households with child hunger were more likely to eat meals at other people's homes. The researchers concluded that employment of such strategy is a more helpful alternative to borrowing money to cope with child hunger.

Employment of risky coping strategies can also pose health risks on the immigrant populations. In a study of Cambodian refugees (n= 150), Peterman et al. (70) found out that some individuals in this the focus groups adjusted to the difficult food environment in the U.S by learning how to make what they defined as American foods like pizza and hot dogs. The researchers concluded that since these foods are high in sodium and fat, adaptation of such coping strategies can pose greater health risks on this population.

Most of the studies of coping strategies are done with Food Stamp, food pantry and emergency food providers participants as well as individuals who participate in nutrition education programs such as Expanded Food and Nutrition Education Program (EFNEP) (35, 37, 79, 80, 88-90). Many of these studies are qualitative (35, 37, 79, 80, 88-90), and there is limited quantitative research on coping strategies in the U.S. (87, 89). Only two of the studies focused on different coping strategies used by different races/ ethnicities in the U.S. (87, 90).

2.5. Summary of Literature Review

Overall, some immigrant populations in the U.S. are at greater risk for food insecurity and associated health consequences compared to other populations. Acculturation and certain coping strategies employed may increase the risk of food insecurity. However, current research on the food insecurity of immigrants lacks information on the actual food insecurity, and acculturation experience. Also, there is limited information on the role of acculturation in food insecurity, and the coping strategies employed by vulnerable immigrants, refugees and undocumented immigrants. There is also limited research on the role that the home country food experiences of immigrants play in the acculturation and food security experience in host countries. Overall, there is a lack of knowledge about the coping strategies employed by these populations and the role that coping strategies play in food insecurity and acculturation.

CHAPTER 3

Research Questions

This thesis encompasses issues of food insecurity, acculturation, and coping strategies in two immigrant populations in Lowell, Massachusetts: Brazilian immigrants from a largely undocumented community and Cambodians are a combination of refugees and immigrants to the U.S. Information about the food security experience and health implications of these populations is limited. This thesis provides details about their food security experiences that may be applicable to other refugee and undocumented immigrant communities.

The following three research questions focus on the issue of food insecurity, acculturation and coping strategies among Brazilian immigrants, and Cambodian immigrants/refugees in Lowell, Massachusetts:

Research Question 1 addresses the food security experience of the Brazilian immigrants and Cambodian refugees/immigrants.

RQ.1. What are the food in/security experience of Brazilian immigrants and Cambodian refugees/immigrants living in Massachusetts?

- **Specific Aim.1.1.**To describe the food insecurity level of focus group participants using the USDA measure
- **Specific Aim.1.2**.To describe the contributors to food insecurity

Research Question 2 addresses the role of acculturation on the food insecurity experiences of Brazilian and Cambodian immigrants.

RQ.2. What role does acculturation play in food security status?

- **Specific Aim. 2.1.** To describe acculturation levels among the focus group participants
- **Specific Aim. 2.2.** To describe how acculturation is related to overall food insecurity
- **Specific Aim. 2.3.** To describe the food experiences of individuals in their home countries

Research Question 3 focuses on the role of coping strategies in the food security experience of Brazilians and Cambodians living in Massachusetts.

RQ.3. What role do coping strategies play in food security status and how are they related to acculturation and food insecurity?

- **Specific Aim.3.1.** To describe the coping strategies of the focus group participants.
- **Specific Aim.3.2.** To describe the commonalities and differences between coping strategies used by the different individuals in the focus groups (cross-cultural comparison)
- **Specific Aim. 3.4.** To describe how the coping strategies differ between food insecure and food secure participants
- **Specific Aim. 3.5.** To describe how the coping strategies differ between less and more acculturated individuals

CHAPTER 4

METHODS

The objective of this thesis project was to study the food insecurity, coping strategies, and acculturation experiences of Brazilian immigrants and Cambodian immigrants and refugees in Lowell, Massachusetts. Participants were primary adult food purchasers and preparers enrolled in English as a Second or Other Language (ESOL) classes in Lowell, MA. Focus groups were held to explore food experiences, understand the role of acculturation in the food insecurity, and describe coping strategies in the context of acculturation (Table 1.). Additionally, a short survey was administered to the focus group participants to assess food security status, other food security-related behaviors, acculturation, and demographic characteristics (Table1.).

Table1. demonstrates the research questions, concepts, measurement methods, and the format in which data was gathered from the participants. All procedures were approved by the University of Massachusetts Amherst Institutional Board of Review.

4.1 Participants and Data Collection

4.1.1. Sample

For the purpose of this study Brazilian immigrants and Cambodian refugees and immigrants, three of the less studied immigrant populations in the U.S, were chosen. Due to the high number of undocumented Brazilians in Lowell, Ma, the immigrant Brazilians were assumed to represent undocumented members of this community for this study (91).

4.1.2. Brazilians

Brazil is by far the largest and the most populous country in South America (92). The population in Brazil consists of 53.7% white, 38.5% mixed white and black, 6.2% black, and 1.6% other (92). Brazil's economy began major economic growth in 2003 and has been growing steadily since then (92). Vast natural resources and a large labor pool have played an important role in turning Brazil into South America's leading economic power and leader (92). However, unequal income distribution and high crime rates are the biggest issues in this country (92). The low income and unequal income distribution affects women, black people, mixed races, and indigenous populations in Brazil (92). Since Brazil's economic downturn in the 1980s, immigration to the United States, Europe, and Japan has been rising. Since 1987, immigration of Brazilians to other countries has increased by an estimated rate of about 20% per year (91). According to U.S Census, there were 340,000 Brazilian immigrants in the U.S in 2010 which accounts for 1.6% of total immigrant population from Latin America in the U.S.(93). The U.S. Census undercounts low-income populations and immigrants, particularly the undocumented (91). The actual size of the Brazilian population is certainly larger than that reported by the Census Bureau (91).

The majority of Brazilian immigrants are well-educated and middle-class (92). More than 81% of immigrants to the United States have completed secondary or higher education, and 39% have university or equivalent technical studies (94).

Lowell is one of the destination cities for Brazilian immigrants in Massachusetts. According to the U.S. census nearly 1,800 Brazilians resided in Lowell, Massachusetts in 2010. However, because of the issue of undocumented Brazilian immigrants in this city it

is difficult to determine accurate population estimates (95). To our knowledge there is limited information about the food security of this population and its contributors.

4.1.3. Cambodians

Cambodia is located in Southeastern Asia, bordering the Gulf of Thailand, between Thailand, Vietnam, and Laos. The Cambodian society consists of 90% Khmer, 5% Vietnamese, 1% Chinese, and 4% other. Cambodia suffered years of hardship under the invasion by the Japanese during World War II, rule of Khmer Rouge regime between 1975-1978, and a 10-year occupation of Vietnam that followed the ruling of Khmer Rouge regime. The social hardship in Cambodia did not alleviate until 2004 when garments, construction, agriculture, and tourism stared to drive Cambodia's economic growth. However, Cambodia is still one of the poorest countries in Asia and corruption, limited educational opportunities, high income inequality, and poor job prospects create challenges for long-term economic development. Approximately 4 million people live on less than $1.25 per day and 37% of Cambodian children under the age of 5 suffer from chronic malnutrition. The population lacks education and productive skills, particularly in the rural areas (92).

Cambodian refugees were resettled in the United States in large numbers in1979. The biggest wave of immigrants came in the early 1980s. Many Cambodian immigrants came as refugees and asylees. The largest population of Cambodians settled in California, where approximately half of all Cambodian Americans currently reside (96).

There is a high rate of unemployment among Cambodians in the U.S. (96). Many of these immigrants do not have formal schooling because of the social conflicts that they

faced during the ruling of Khmer Rouge forces and Vietnam invasion, making it difficult for them to get jobs. Relatively recent Cambodian Americans are also affected by language barriers, as can be seen through the diminishing unemployment rates as they remain in the U.S. for longer time (96).

Lowell, Massachusetts has the second highest population of Cambodians in the U.S, about 25,000 people (96, 97). Previous research is indicative of low income levels and high food insecurity rates in this population (58, 70).

4.2. Recruitment

All participants were recruited through two community agencies in Lowell, MA. Cambodians were recruited from the Cambodian Mutual Assistance Association of Greater Lowell, Inc. (CMAA), and Brazilians were recruited from the Lowell Adult Education Center (LAEC). A CMAA staff member recruited participants from CMAA. LAEC staff and the project principal investigator (PI) recruited participants from LAEC.

All the participants in this study were food preparers and purchasers of their households. They were also English learners in ESOL classes.

4.3. Surveys

A survey was designed to gather information on the demographics of the focus group members, as well as their food security and acculturation status. This survey was administered to all participants.

The written surveys were translated into Portuguese and Khmer, and were administered in the preferred language of the participant. Surveys at CMAA were administered in Khmer. Surveys were administered in Portuguese at LAEC.

Demographic data included age, gender, marital status, number of people in the household, income, highest level of education, age at the time of immigration, and length of stay in the U.S.

Questions on the food experience/situation in the home countries of the participants were asked. The set of questions in this section were adapted from a survey designed by Peterman et al. (70) for a study examining past food experiences and current characteristics among Cambodian refugees. These questions asked about food quantity and quality and meals per day.

Language spoken at home (English, Portuguese, or Khmer), the length of stay in the U.S. and difficulty in the food environment were used as independent proxy measures of of acculturation. The length of stay in the U.S. and language preference were the most frequently used single-dimension measures of acculturation (69, 98, 99). According to Norman et al. (98), Himmelgreen et al. (10), and Dave et al. (100), longer years of living in the U.S. and speaking English at home represent higher acculturation levels (10, 98, 100). Appendix B features the questions asked in the surveys.

4.4. Focus Groups

A moderator guide was designed to gather information on the food insecurity, acculturation, and coping strategies of the participants. This moderator guide was administered to all the Brazilian focus groups (n=2), as well as all the Cambodian focus groups (n=3). The Brazilian focus groups were held in LAEC in Lowell, MA, and the Cambodian focus groups were held at CMAA in Lowell, MA.

The moderator guide was translated into written Portuguese by the UMass Amherst Translation Center. The written Khmer translation of the moderator guide was done by an experienced CMAA staff.

Before the commencement of each focus group, the consent forms were read to the participants by the Principal Investigator (PI) with concurrent translation by LAEC and CMAA staff. The consent forms were then signed by all the participants.

Focus groups with Cambodian participants were held in English with oral translation conducted by a CMAA staff. Focus groups with Brazilians were also held in English with oral translation by a LAEC staff. Each focus group lasted approximately one hour and thirty minutes.

The moderator guide questions were developed based on the research questions. These questions included three concepts: food insecurity, coping strategies, and acculturation. Within the food insecurity concept, questions on the perceptions of price (cultural and American), quality of food (cultural and American), time (time to cook and go shopping), cooking skills, and accessibility of stores (cultural and American) were asked. Within the coping strategies, concept questions about strategies to afford food/ cultural foods, strategies used to make time for cooking and shopping were included. Questions asked in the acculturation section were on the perception of American food versus cultural foods, overall diet change (important foods and foods consumed), environmental contributors to diet change(types of known food stores, shopping places, availability of food, and types of food cooked), and familiarity with food assistant programs. Appendix A features the moderator guide questions and concepts.

4.5. Data Management and Analysis

4.5.1. Surveys

The survey data were double entered into Microsoft Excel software for maximum accuracy. Descriptive statistics such as mean, standard deviation, minimum and maximum values were calculated for age, length of stay in the U.S. and household size variables using the Microsoft Excel software. For other variables such as gender, total household income in the past 12 months, highest level of education, food security status, and past food experience, the percentage of participants in each category was calculated.

Student's t-test and Pearson's chi-square tests were used to analyze whether there were differences between the Cambodian and the Brazilian samples for age, highest level of education, household size, length of stay, preferred language spoken at home, income, and food security status. The Student's t-test was used to analyze the continuous variables: age and household size. To analyze the categorical variables such as highest level of education, length of stay, preferred language spoken at home, food security status and income, Pearson's chi- square tests were used.

To perform a Pearson's chi- square analysis for the food security variable, two different classifications were chosen. In the first classification, individuals with high and marginal food security status were categorized as food secure and the rest were considered to be food insecure. In the second classification only the individuals with high food security status were considered to be food secure and the others (people with marginal, low and very low food security) were categorized as food insecure.

Length of stay was categorized into two categories of ≤1 year and 1 year and more. This categorization is based on research done by Hadley et al. (4), who reported

that most of the acculturation occurs in the first year of immigration among West African refugees. Language spoken at home was used as a proxy for acculturation. This decision was based on the findings of previous research done by Himmelgreen, Dave, and Norman (10, 98, 100). The other reason for choosing this question was to avoid the possible bias in the other language preference questions caused by the fact that all of the participants were English language learners.

For the ease of reporting the total household income, the responses to this variable are presented as percentages of the U.S. poverty line and have also divided the income levels into two categories of below and above 100% of the poverty line based on household size. This report is based on the 2013 Federal Poverty Guidelines (101). Education level is reported into two categories: no high school degree and high school degree and above. This categorization is based on research by Hadley et al. (4) in which they demonstrated that an education level of high school degree and above is associated with less food insecurity.

To assess food security status we used the 6-item USDA Food Security Module. The 6- item USDA tool measures three main categories of food insecurity: high food security, low food security and food very low food security (102). USDA guidelines were used to assign household food security status to survey participants. Categorization is based on the cumulative number of affirmative responses to the 6 questions in the survey. Zero (0) positive answers to the questions is indicative of high food security status. One or two (1-2) positive responses indicate marginal food security status, which USDA includes in the full food security category, but which is related to poor health outcomes, including overweight/obesity (8, 9, 68). Two to four (2-4) affirmative responses are

indicative of low food security status. Five to six (5-6) affirmative responses indicate very low food security status.

4.5.2. Focus Groups

All focus groups were recorded, and then transcribed verbatim in English. NVivo 10 software (QSR International, Doncaster, Victoria , Australia) was used for coding the focus group transcriptions, using directed content analysis to gain information about pre-identified themes and identify new themes relevant to the research questions (70).

Pre- identified themes regarding acculturation were based on responses to questions from the semi-structured moderator guide, and included low income, difficult food environment such as lack of availability/inaccessibility of cultural foods/ingredients, high cost of cultural foods/ingredients. Other pre- identified themes include shifts in budget management, changes in food related practices, language barriers and low access to social safety net programs. These pre-identified themes were derived from past literature on the food insecurity of refugees by Hadley et al. (4, 57, 62)

Pre-identified themes regarding coping strategies are eating foods that are less preferred, limiting portion sizes, borrowing food or money, maternal buffering, skipping meals, skipping eating for whole days, change in housing conditions, stretching food, stretching money for food, domestic food production, denying food to the family, participating in federal food programs, attending events to get food, exchanging resources, using support systems, purchasing food from low- cost sources and shopping for low- cost and value food. These pre identified themes were derived from past literature on the food insecurity and coping strategies of refugees by Hadley et al. (57, 66) and other food- insecure populations (36, 80, 86).

CHAPTER 5

RESULTS

5.1. Surveys

5.1.1. Demographics

5.1.1.1. Brazilian

The two Brazilian focus groups consisted of 16 people total (8 participants per group). There were three males and 13 females. Average age was 46.7 ± 13.2 years. Two households (12.5%) were below 100% of the federal poverty line and eight (50.0%) households were above the 100% of the federal poverty line. Data on six households were missing because participants reported that other household members controlled the finances and the participants did not have a clear perception of the total household income (Table 3.).

Responses to questions on the past food insecurity experience indicated that seven (43.7%) people had experienced some type of food hardship in Brazil (ranging from not having access to the foods that they wanted to not having enough food), 25.0% (4 people) had marginal food insecurity in the U.S and the remaining 75.0% were food secure in this country (Table 3.).

Mean household size was 3.0 ± 1.0 people. Thirteen participants (81.2%) had high school education and above. Participants had been in the U.S for an average of 6.7 $\pm$ 5.2 years. Twelve (75.0%) always spoke Portuguese at home and the rest spoke other languages (Table 2.).

5.1.1.2. Cambodian

The three Cambodian focus groups consisted of 21 people total (7 participants/group). Five participants were male and 16 were female. Average age was 47.0 $\pm$ 15.0 years. Nine (43.0%) lived in households with income levels below 100% of the poverty line and 11 (52.0%) lived in households with income levels above 100% of poverty line. Average household size was 4.0 ± 1.7. Thirteen participants (62.0%) had a high school degree or above. The average length of stay in the U.S was 9.8 ± 10.6 years. Sixteen (76.1%) people always spoke Khmer at home, while the rest spoke in other languages (Table2.).

Responses to the questions on the past food insecurity experience indicated that 14 people (66.6%) had experienced some type of food hardship in Cambodia (ranging from not having access to the foods that they wanted, to not having enough food), 9.5% (2 people) had marginal food insecurity in the U.S and 57.0% had low food insecurity, while 33.0% had very low food insecurity (Table 3).

5.1.1.3. Demographic Comparison

The Brazilian and Cambodian participants were similar in terms of age (Table 2.), income, length of stay, and preferred language spoken at home. Cambodians had larger households ($p=0.02$) (Table 2.) and were more food insecure ($p<0.001$). More Brazilians than Cambodians had graduated from high school ($p= 0.01$) (Table 3.).

5.2. Focus Groups

The focus group themes are presented in tables with quotes illustrative of emergent themes.

5.2.1. Food Access and Availability

Table4. represents general themes related to food access and availability for both the Brazilian and Cambodian focus groups with quotes related to the themes.

Brazilian participants reported that they had easy access to the stores and foods that they liked, and that food was easily available to them. This theme emerged from participants of genders, all incomes, length of time in the U.S., language preference at home, and all food security statuses.

When asked why they thought they had easy access to the stores, respondents stated that it is because they either had cars or lived close to the stores. Also, participants were still able to access and afford most of their cultural foods because of the similarity between the American and Brazilian ingredients. Brazilians also believed that the price of food is cheaper in the American stores and that they could avoid going to Brazilian stores because of the abundance of Brazilian ingredients in the Americans stores.

During the focus groups some Cambodians expressed that they have easy access to stores and food because they lived close to stores or had cars. However, this opinion was not shared by all participants.

Unlike some Cambodian participants who talked about easy access to food, others had difficulty accessing stores. These contrasting opinions on food access emerged from participants of both genders, all incomes, length of time in the U.S., language preference at home, and all food security statuses.

Most Cambodian participants talked about how living far away from certain stores, high gas prices, lack of availability of the traditional ingredients in most American

stores, lower quality of the Khmer ingredients and their higher prices in Cambodian stores, make food access and availability difficult for them.

Cambodians also stated that despite all the issues that they had with the low quality of the ingredients in the Cambodian stores and the high prices of the ingredients in those stores, they would still go to the Khmer stores to purchase the ingredients that they needed. The reason was the lack of the availability of the Khmer ingredients in the American stores and the preference of some family members for the traditional Cambodian foods.

5.2.2. Dietary Changes

Table 5 represents general themes related to the dietary changes of Cambodian and Brazilians with quotes of emergent themes in this context.

Most Brazilians did not perceive the Brazilian food to be very different from American food. But some Brazilians talked about how having an American spouse, grandchildren, relatives, and children at home was a reason for making and eating American food.

Also, most of the Brazilians preferred Brazilian food because they thought it was healthier and tried to avoid eating American food. This preference toward Brazilian food and the need to accommodate the preference of some of the family members for the American foods has led to creation of new dishes by combining the American ingredients and the Brazilian recipes.

During the focus groups some Cambodians talked about how the Khmer food was healthier and therefore it was more important to them and tried to avoid eating American food. However, this opinion was not shared by all the Cambodians.

Unlike the previous group some Cambodians believed that the American food was healthier because it is less salty or spicy and the cooking method allows them to do more of the grilling and broiling rather than frying.

Another theme in this context was the lack of availability of the traditional ingredients in the American stores and the higher prices of certain ingredients in the Khmer stores, and the lower quality of the foods in such stores.

Cambodians also talked about how the preference of some family members for American food had increased the consumption of American food instead of Cambodian foods in their households.

5.2.3. Coping Strategies

Table 6 represents general themes related to the dietary changes of Cambodian and Brazilians with quotes of emergent themes in this context.

All coping strategies reported by Brazilians were helpful to their current food security status. They include, sharing rent, living with other people, shopping at stores with cheaper food products such as Wal-Mart and Market Basket, shopping on certain days of the week for cheaper foods, shopping in American stores versus shopping in Brazilian stores, avoiding foods of Brazilian origin, comparing the price of foods at different stores to get the better deals, substituting cheaper food with more expensive ones, not eating out, not wasting food, shopping for food on certain days of the month/ week to assure cheaper foods and higher quality. More strategies include taking advantage of the sales at stores, using coupons and being economical in all aspects of life and avoiding unnecessary expenses.

Some of the coping strategies reported by the Cambodian participants were potentially helpful. These include substituting the Cambodian ingredients for American ingredients, substituting expensive food items with cheaper food items, buying larger quantities of food in American stores, shopping in American stores for cheaper foods, using coupons, cooking just enough to prevent food waste, taking advantage of food assistance programs such as SNAP and WIC, and trying to save on gas.

Cambodians also employed some risky strategies. These include cutting down on the amount of food that they purchased, eating less food, buying low quality food, and switching to American fast food because of time constraints.

CHAPTER 6

DISCUSSION

6.1. Food Insecurity Experiences and Contributors

The survey results from the 6-item food security measure suggest that the two ethnic groups were very different with respect to food security status. While almost all of the Brazilians (75.0%) had high food security, almost all (91.0%) of the Cambodians experienced some level of food insecurity, with 33.3% suffering from very low food security, which is the most severe category.

The results from the Cambodian surveys are consistent with the previous reports of high rates of food insecurity in this population, although the rates in this population were higher than previously reported (70). A comparison of the results from the Brazilian groups with any other study could not be performed since there is no previous research on Brazilian immigrants and food security status and its contributors. However, research with other immigrant groups suggest that this population might suffer from lower levels of food security (48, 103) compared to more stable populations, but the results imply that this might not be true of this Brazilian population. Additionally, the results are in contrast to the findings of Quandt et al. (63). In their study of 317 Latino immigrant families, with Mexicans making up the majority of the sample, they found high rates of food insecurity in this population (35.6% to 41.8%). This difference in findings might be due to the difference in the studied populations. Although Brazilians are also categorized as Latinos, their social and economic experience is different from Mexicans or any other Latin American countries. Also, all Brazilian participants in the study were Non- Hispanic Whites, whereas the studied population in the Quandt et al.(63) research were all

Hispanics. Such difference in race might have also affected the food security status of the participants. In a study of mixed races Adams et al. (6) found that Non- Hispanics Whites have higher rates of food security compared to Hispanics and other races. This finding is in accordance with Adams et al. (6) research in that Brazilians enjoyed higher food security rates than the Cambodians.

Analysis of focus group transcripts of both groups matched the quantitative results of the 6-item food security measurement tool. In the analysis of the Cambodian transcripts concerns about food hardship was evident, which is in accordance with high rates of food insecurity in this population shown by the 6-item food security measurement tool. Unlike the Cambodians, Brazilian focus group members expressed little concern about food, which was indicative of the high food security status evident in the survey.

The previous research with immigrants suggest that some of the contributing factors to the food insecurity include financial difficulty (4, 16, 57), difficult food environment such as high prices of food items, lack of availability of the cultural foods, transportation difficulty, unfamiliarity of food items in stores (4, 57), shift in budget management (e.g. shopping for food items commonly found and consumed in the home country despite the high prices)or dietary practices (104), time lived in the U.S.(4), language difficulty (4, 16). The analysis of the focus group results suggests that the Cambodian groups share many of these contributing factors to food insecurity. Although the responses to access to food stores were mixed in this group, it seems that the high price of cultural foods and their lower quality in Khmer stores, lack of availability of traditional ingredients in American stores, and not having access to the preferred stores

contribute to food insecurity in this population. Shifts in the budget management such as shopping in the Cambodian stores despite the high prices of food and lower quality seem to exacerbate the food insecurity of this population.

The analysis of the Brazilian groups suggested that they do not share the same difficulties as Cambodians. The participants in the Brazilian group reported easy access to the stores. They do not seem to have difficulty in locating their cultural foods in the American stores and they do not perceive American ingredients to be very much different from Brazilian ingredients. The fact that the Brazilian ingredients are available in the American stores provides the Brazilians with the chance to avoid shopping for expensive food items in the Brazilian stores. This finding is in contrast with another study of undocumented immigrants by Quandt et al. (63) In that study researchers indicated that undocumented Mexicans faced a difficult food environment in which they had difficulty accessing stores due to lack of transportation. This difference in findings might be due to the difference in the characteristics of the studied populations.

6.2. Acculturation and Food Insecurity

Dietary change in both the Cambodian and the Brazilian groups is evident in what people discussed during the focus groups. However, the dietary change seems to be greater for the Cambodians. Past food experience (78), length of stay in the U.S. (4), language preference/difficulty (4, 16), economic constraints (47), and the food environment (4, 62) are some of the factors that might contribute to the acculturation of these two immigrant populations. Other acculturation proxies such as the extent of social ties and contacts with friends of the same ethnic group might have also played a role in the acculturation of Brazilian and Cambodian immigrants and refugees (74). However, a

measurement of these social proxies was not done and therefore a conclusion on the role of such variables on the dietary changes of the participants could not be drawn.

While the Cambodians suffer from high rates of food insecurity in the U.S., the responses to the survey questions on the food experience in the home country indicates that many of them experienced greater hardship in relation to food in their home countries. This result is in contrast with other research that suggests that in general, immigrants enjoyed better food security status and had better diets before immigration (4, 77, 105).

As discussed previously, many of the Cambodian refugees have experienced trauma and food shortage during the rule of Khmer Rouge and the Vietnam invasion (92). Also, it is important to note that Cambodia is still one of the poorest countries in South East Asia. Therefore, it is possible that such trauma and economic disadvantage negatively influenced the dietary practices of these individuals in their home country.

Also, the idea that Cambodians may have not enjoyed healthier diets in Cambodia is in accordance with what Martinez (78) proposed about the acculturation of immigrants. He believes that the transnational transmission process leads to the unhealthy diets of immigrants. However, the analysis of the Cambodian focus group transcripts did not suggest any former familiarity with fast foods or the processed foods. The major theme in this context was the unfamiliarity of the Cambodians with the American food and their initial distaste for such foods. This contrast with the Martinez (78) findings might be due to the difference in the studied populations and their past food experience.

Unlike Cambodians, the Brazilian participants seemed to have experienced a better food situation in their home country. This is due to the fact that Brazil is

economically more advanced than Cambodia and the Brazilians might not have faced food restriction as much as the Cambodians did. Also, Brazilians were very familiar with the American food that can be suggestive of the occurrence of transnational transmission in this population (78). Such familiarity with American food might also be related to the fact that both America and Brazil have European based populations, where the foundational foods and recipes are similar.

According to the literature other contributing factors to the dietary change of the immigrants are length of stay and language preference (4, 57, 62). However, focus group transcripts revealed that Cambodians expressed concern with lack of food availability/inaccessibility, irrespective of the length of stay in the U.S. and language preference, due to their struggle with the food environment. According to the literature (4, 57) a difficult food environment can lead to higher dietary change/acculturation since the individuals who face such environments start adopting the dietary practices of the host country (4, 57).

Dietary change was also evident among the Brazilian participants irrespective of the length of stay in the U.S. and their language preference. In contrast to the Cambodian participants, it seems that what might have actually contributed to the Brazilians high food security rates are the suitable food environment, and the helpful coping strategies that they used (e.g. giving food priority in the budget, cooking food at home).

In the context of acculturation it is also important to note that acculturation can be both healthy and unhealthy (58, 76). The findings from the Cambodian focus groups indicate that acculturation of some of the participants has been healthy since they had started consuming less salt. However, acculturation of some other Cambodians was

unhealthy since they had started consuming more processed and fast foods in order to be able to save time and money. In contrast to Cambodians, acculturation in the Brazilian groups seemed to be healthier since they had started to transform American recipes into more healthy recipes by adding more fruits, vegetables, and condiments to food.

6.3. Coping Strategies, Food Insecurity, and Acculturation

Coping strategies used by the Brazilians seem to be more helpful in nature compared to some of the coping strategies used by the Cambodians. For example, sharing rents, giving food the priority in the budget, and avoiding unnecessary expenses do not pose potential problems for long-term resource allocation or health. Conversely, strategies shared by Cambodians such as not eating the foods that they really want, cutting down on the amount of food that they ate, buying less food, and shopping for more expensive food when money is available, buying cheaper foods at the time of financial constraint, and shopping at more expensive stores could potentially compromise health or increase risk of future insecurity. In a study of food pantry participants, Wood et al. (88) demonstrated that participants who used more drastic strategies such as limiting the portions sizes or cutting down on food were more likely to suffer from higher degrees of food insecurity. Another study of low- income populations in North Carolina by Ahluwalia et al. (81) demonstrated the same results. Just like Wood et al. (88) these researchers concluded that food insecure individuals are more likely to use more risky coping strategies compared to food secure individuals.

It is important to note that Cambodians coping strategies are not limited to risky tactics. Cambodians shared many of the helpful strategies employed by the Brazilians, except for one. During the Cambodian focus groups participants talked about the use of

food assistance programs to cope with food shortage while the Brazilians were unfamiliar with such programs. Using food assistance programs may benefit this population by protecting their food security status (106).

Another factor that might have influenced the use of food assistance programs by Brazilians is their immigration status because even legal adult immigrants (in contrast with refugees) are not eligible for such programs. Another reason is that unlike the Brazilians, Cambodians seeking food assistance programs might experience higher food insecurity. Also, the Brazilians may not adopt this strategy because of their higher income levels that make them ineligible for the use of food assistance programs.

Employing strategies such as substituting the more traditional foods for American foods, and substituting Khmer ingredients with American ingredients are indicative of the high dietary acculturation in this population (4, 57). As stated previously, Hadley et al. (4, 57) suggest that a difficult food environment, an acculturation proxy, leads to adaptation of the diet in the host country. The findings from the Cambodian focus groups on coping strategies, food availability, and access is in accordance with what these researchers suggested. Substituting traditional foods with the more processed foods in the American food environment might pose health challenges in this population since these foods are higher in fat and sodium compared to more traditional foods.

6.4. Strengths

The qualitative aspect of this research provided valuable insight to the issue of food insecurity among Brazilian and Cambodian immigrants. The information from the focus groups could not be gained from quantitative studies.

The addition of the survey as a data collection tool to focus groups helped provide valuable information about the ethnic groups that was further utilized to study the food insecurity of the participants. Using the qualitative methods in conjunction with quantitative method provided a better picture of the overall situation than either method could do alone.

6.5. Limitations

Concurrent translation of the focus group conversations contributed to a tight time frame that caused the omission of some moderator guide questions that could have yielded additional information about the focus group members. To address this issue, lack of saturation in the responses and or missing data on any of the research questions were used to include or omit moderator guide questions for the second and third focus groups.

The fact that both Brazilian and Cambodian focus group members were English learners in ESOL classes may prevent generalization of the results to any other Brazilian, Cambodian or any other ethnic immigrant populations due to the possible motivation to improve their economic and food security situation.

Lastly, the use of unidimensional proxy measures, length of stay in the U.S. and language preference, prevented a thorough investigation of the acculturation experience of the immigrant populations.

6.6. Summary of Findings

The Brazilians in this study seem enjoy higher food security in the U.S compared with the Cambodians. One of the possible contributing factors to the food security status of most Brazilians is a more suitable food environment. Some of the factors that make the food environment suitable for the Brazilians were easy access to food and stores,

familiarity with the ingredients in the U.S, and cheaper food in the U.S compared to Brazil. In addition to this suitable food environment, utilization of helpful coping strategies might play an important role in the food security status of the Brazilians. Unlike the Brazilians, the Cambodian food security status might be influenced by their past food experiences and the risky coping strategies that they use. The employment of such strategies might be due to the barriers that they face in a difficult food environment (79, 80).

6.7. Implications for Research and Practice

Future research should include larger samples which are representative of the undocumented Brazilian immigrants and Cambodian refugee and immigrant populations to give a clearer picture of the food security status and its contributors in these populations. Future research could also include examining these issues in other refugee and undocumented immigrant populations to understand how these findings translate.

Future research could involve investigating coping strategies used in the home country of these populations. This would help better understand the role of acculturation in the employment of copying strategies by these populations in the U.S. Also, a thorough investigation of the previous food security status of the Brazilian and Cambodian groups could provide us with a better understanding of their current status and its possible contributors.

Another factor that could be investigated is the acculturation level of the Brazilians and the Cambodians using multidimensional acculturation tools. The results of such study would provide valuable information on the acculturation experience of such populations and its relation to the food security status of Brazilians and Cambodians.

6.8. Conclusion

This study found that the food insecurity rates are high among the Cambodians. The risky coping strategies that they use and the difficult food environment could be the potential contributors to their food insecurity status. Long- term food insecurity rates and use of risky coping strategies might lead to health complications in this population. Unlike this group of immigrants, the Brazilians seem to be enjoying a better food security status because of a suitable food environment and the helpful coping strategies that they employ. The use of helpful coping strategies might be protective of their food security status and can also prevent the occurrence of health complications in this population in the future.

Table 1. Research Questions

Research Questions		Concepts	Measurements	Format
1. What is the food in/security experience of the cultural groups?	**Specific Aim.1.1**To describe the food insecurity level of the focus groups using the USDA measure **Specific Aim.1.2.**To describe the contributors to food insecurity	1- Food Security	USDA 6-item FSM	Questionnaire
		2-Experiences	Availability, access, utilization-Brazilian and Cambodians	Focus groups
2. What role does acculturation play in food in/security?	**Specific Aim. 2.1.** To describe acculturation level in the focus groups **Specific Aim. 2.2.** To describe how acculturation is related to overall food insecurity **Specific Aim. 2.3**. To describe food experience of individuals in their home countries	1-Acculturation	Language preference at home Length of stay in the U.S	Questionnaire
		2-Experience	Perception of American foods versus cultural foods, overall diet change since immigration, contributors to diet change, familiarity with food assistance	Focus groups

Table 1. Research Questions (Continued)

Research Questions		Concepts	Measurements	Format
3. What role do coping strategies play in food in/security, and how are they related to acculturation and food insecurity?	**Specific Aim.3.1.** To describe the coping strategies of the focus group participants. **Specific Aim.3.2**. To describe the commonalities and differences between coping strategies used by the different individuals in the focus groups (cross-cultural comparison) **Specific Aim. 3.4.** To describe how the coping strategies differ between food insecure and food secure participants **Specific Aim. 3.5.** To describe how the coping strategies differ between less and more acculturated participants.	Coping mechanisms	Coping strategies related to food purchasing, time management in relation to shopping and cooking, and food access	Focus groups
Other information		Demographics	Age, household composition, income, education, age at the time of immigration, length of stay in the U.S.	Questionnaire

Table 2. Continuous Demographic Data for Brazilian and Cambodian Groups

	Brazilian (n=16)			**Cambodian(n=21)**			**p-value**
	Mean±SD	**Min**	**Max**	**Mean±SD**	**Min**	**Max**	
Age	47.0 ± 13.1	20	66	47.0 ± 15.0	25	74	0.47*
Household size	3.0 ± 1.0	2	5	4.0 ± 1.7	1	8	0.02*

*t-test (p=0.05)

Table 3. Categorical Demographic Data for Brazilian and Cambodian Groups

	Brazilian (n=16)				Cambodian (n=21)				p-value
	Mean±SD	**Min**	**Max**	**N(%)**	**Mean±SD**	**Min**	**Max**	**N(%)**	
Gender									
Female				13(81%)				16(76%)	
Male				3(19%)				5(23%)	
Education									0.01*
No high school degree				1(6.25%)				8(38.10%)	
High school degree and above				15(93.75%)				13(61.90%)	
Length of stay in the U.S	6.79±5.2	8mo	14yrs		9.83±10.61	6mo	32yrs		0.38*
≤1 year				2(12.50%)				5(23.90%)	
1 year <				14(87.50%)				16(76.19%)	
Language spoken at home									0.93*
Always				12(75.0%)				16(76.19%)	
Portuguese/Khmer									
Other				4(25.00%)				5(23.80%)	

*Pearson Chi-Square (p=0.05)

Table 3. Categorical Demographic Data for Brazilian and Cambodian Groups (Continued)

	Brazilian (n=16)	**Cambodian (n=21)**	**p-value**
	N(%)	**N(%)**	
Total household income in the past 12 months			0.14*
Below %100 of poverty line	2(12.5%)	9 (43%)	
Above %100 of poverty line	8 (50%)	11 (52%)	
Undetermined	6(37.5%)	1(4.76%)	
Food security status			0.001*
High food security	12(75.0%)	0	
Marginal food security	4(25.00%)	2(9.52%)	
Low food security	0	12(57.14%)	
Very low food security	0	7 (33.33%)	

*Pearson Chi- Square (p=0.05)

Table 3. Categorical Demographic Data for Brazilian and Cambodian Groups (Continued)

	Brazilian (n=16)				Cambodian (n=21)			
	Mean±SD	**Min**	**Max**	**N(%)**	**Mean±SD**	**Min**	**Max**	**N(%)**
Food experience at home								
Often had enough food to eat				15(93.75%)				13(61.9%)
Sometimes had enough food to eat				1(6.25%)				7(33.33%)
Never had enough food to eat				0				1(4.76%)
Often had the kinds of food they wanted				9(56.25%)				15(71.4%)
Sometimes had the kinds of food they wanted				6(37.5%)				4(19.04%)
Never had the foods that they wanted				0				2(9.52%)
Number of meals	3.43±0.7	2	5		2.79±3.0	2	5.5	

Table 4. Food Access and Availability Themes

Response Themes	Selected Quotes	Question from the Moderator guide
Brazilian: In the U.S food access is easier and food is readily available **Cambodian:** In the U.S cultural food is easily available and accessible **Cambodian**: In the U.S cultural food is not easily available and accessible	**Brazilian: Easy Access and Availability** "These days they have all kinds of food that are in Brazil, they have here also. Before they only had United States foods but now they import all foods." "The quality of the food, easier access to the better things, like he said salmon, lobsters, it's more difficult in Brazil." " [W]e financially have the ability to go to the supermarket and buy everything that we need here, like you have the ability that you have here. That's the reality. That's us. That's why we are here and we don't go home, for that reason." **Cambodian: Easy Access and Availability** "I have easy access. I have transportation." "I don't have any difficulty. I live near the store." **Cambodian: Difficult Food Access and Availability** "The Cambodian vegetables are only available in the Cambodian stores, but they are more expensive" "Because of the food, the ingredient, the vegetable…they don't have them available in the American store and especially the Cambodian vegetable… and it's not available in the American store.. so they sell more expensive.. but they don't have available."	1. What foods you eat here? 2. What do you think about the price of foods in the U.S? Why do you think it is cheap? Why do you think it is expensive? 3. Is it easy to go to the stores that you want? Why?

Table 5. Dietary Change Themes

Response Themes	Selected Quotes	Question from the Moderator guide
Brazilian: We have to have American food because of children and relatives **Brazilian:** American recipes are altered to make American food more like Brazilian food	**Brazilian: Dietary Change Because of Relatives** "My problem is that my granddaughter is American, so in my house we have to have both of them." "I'm living with my niece. My nieces' husband is American. Sometimes I am cooking American food. Sometime mashed potato, green beans" **Brazilian: Alteration of American recipes** "Sometimes there is American food. I just change it and put my own condiments on it. I look up recipes on the internet." "I make my own. I buy the ground beef and I put some condiments on it. And then it's different because of the condiments."	1-What foods are important to you? 2- What foods do you eat here? 3-What do you think about the price of foods in the U.S? Why do you think it is cheap? Why do you think it is expensive?

Table 5. Dietary Change Themes (Continued)

Response Themes	Selected Quotes	Question from the Moderator guide
Cambodian: Cambodian food is more important **Cambodian:** Traditional ingredients are not easily available **Cambodian:** We need to accommodate the preference of family members for American food	**Cambodian: Cambodian food is important** "So we eat fish more than we eat chicken or beef. That's why we are more healthy than the American food." "I like Cambodian food over American food, the important choice why I like Cambodian food more is that I'm used to it, I ate Cambodian food all my life. But there are ways to prepare it to keep me healthy too." **Cambodian: Traditional ingredients are not available** "I go to the American store if I can substitute the vegetables, and substitute some of the meals. I have to do that. If there is no choice only to eat Cambodian food, the budget will not satisfy the need every month. So, I have to substitute. That's how I learned how to eat American food." **Cambodian: Family preference for American food** "It is important for me to make the adaptation here, because I depend on my kids, that came here first, so when they took me to American pizza or things like that I couldn't eat it. I thought I should go back to Cambodia; however after several times, I like it and I don't mind." "I prefer the American store because I do all the cooking for my kids. Because they're grown here, they prefer American food. They would not eat Khmer gourmet food.	1-What foods are important to you? 2- What foods do you eat here? 3-What do you think about the price of foods in the U.S? Why do you think it is cheap? Why do you think it is expensive?

Table 6. Coping Strategies

Response Themes	Selected Quotes	Question from the Moderator guide
Brazilian: Potentially helpful strategies	**Brazilian: Helpful strategies** "[And] if you buy a lot of things Wal-Mart ends up being cheaper." "I shop at the American stores because they are cheaper than the Brazilian stores and you can find everything that you need." "[And] then we have the options here for the sale. So many times can afford. I like to go shop. Sometimes they also have cheap things. I have to check, look for it. We all have to learn to research." "Usually I don't buy Brazilian products. I rarely buy them, because I find everything here easily." "First food. We always need it." "I love to cook, so I always plan. I can go to bed later, but have everything prepared."	1- How do you manage the time to cook? 2- What do you think about the prices of Brazilian foods in America? 3- How do you manage your money to save for foods that you want? 4- Do you know any food assistant programs? Do you find them helpful?

Table 6. Coping Strategies (Continued)

Response Themes	Selected Quotes	Question from the Moderator guide
Cambodian: Potentially helpful strategies **Cambodian:** Potentially risky Strategies	**Cambodian: Helpful strategies** "Market Basket, Costco, because I like to buy in bulk." "I learned how to substitute vegetables, going to the American stores. For dairy products I usually go to the American store because they have them in large quantities, so I have to go there." "But I usually go to American store to spend less and get more. Because the food that I get there is usually at a discount or sale." **Cambodian: Risky strategies** "I am used to the fast pace here, so at times because it's really hard to package Cambodian food, rice and some dried stuff, vegetable, I'm used to eating the precooked stuff. And whether it's hot dog or hamburger, just microwave. So, I'm used to doing that. It's a quick fix." "I need to think about the foods that I want to buy because I have a budget. I cut down the amount to save money. I buy what I need to buy, but I don't buy in large amount. "At the Cambodian store they have fruits by the season and the vegetables by the season, so when we buy we need to cut down on the amount. When we have to buy it we substitute somehow. If I don't do it, I will have a shortage the next month." "I look at not only the quantity but also the price. But I will also substitute. I take larger quantity, maybe lower quality, but I prefer the larger quantity.	1- How do you manage the time to cook? 2- What do you think about the prices of Brazilian foods in America? 3- How do you manage your money to save for foods that you want? 4- Do you know any food assistant programs? Do you find them helpful?

APPENDIX A

MODERATOR GUIDE

Focus Group Domains and Questions

Focus Group Brazilian

- Topic: Food insecurity and coping strategies: identifying barriers to accessing food/cultural foods and how individuals deal with food scarcity at home
    - Perception of prices
        - General perception of prices of foods in the U.S.
        - Perceptions of prices of cultural foods in the U.S
    - Perceptions of the quality
        - General perception of the quality of foods in the U.S.
        - Perceptions of quality of cultural foods in the U.S
    - Perceptions of time
        - Perception of the available time to cook
        - Perception of the time to shop food
    - Perceptions of cooking skills
    - Perceptions of accessibility of stores
        - General perception of accessibility of food stores
        - Perception of accessibility of cultural food stores
    - Coping mechanisms
        - Strategies used to afford food/cultural foods
        - Strategies used to purchase healthier foods (high quality)
        - Strategies used to make time for cooking
        - Strategies used to make time for shopping
        - Strategies used to access food stores/cultural stores
- Topic: Acculturation

- Perception of American food versus cultural foods
    - How American foods are defined
    - How cultural (Brazilian) foods are defined
- Overall diet change since immigration
    - Important foods
    - Foods consumed
- Contributors to diet change
    - Food environment perception
        - Types of known shopping stores
        - Shopping places
        - Perception of foods available
        - Types of food cooked
- Familiarity with food assistant programs

Guide for Moderator

Focus Group: Food insecurity (identifying barriers to accessing food/cultural foods and the coping mechanisms)

Let's start by talking about the foods that you eat, including what you think about Brazilian and American foods.

- What foods do you consider American?
- What foods do you consider Brazilian?
- What foods are important to you?
    - American?
    - Brazilian?
    - Why?
- What foods do you eat?

- American?
- Brazilian?
- Why?

Now, let's start talking about how you make choices about the foods that you buy.

- What do you think about the price of foods in the U.S?
  - (if cheap) what makes you think the food is cheap?
  - (if expensive) what makes you think that the food is expensive?
  - [prompt] For example,
    - If you can buy a lot of the food for a low cost (ramen noodles)
    - If the food fills you up for a low cost (even it is not a lot of food)
    - There is not much food wasted
    - The food does not spoil easily
- What do you think about the prices of your cultural foods (Brazilian)?
  - What makes you think that the food is expensive or cheap?
- Can you tell me how you manage your money to be able to afford food?
  - [prompt] For example,
    - Do you buy cheaper foods?
    - You do not buy non- food items such as clothes, make-up, etc. often
    - You do not eat out often
    - You live with friends, relatives
    - Do you share food with others?
    - Do not own a car, cell phone, etc.
- Is it easy for you to go to the stores that you like?
  - What makes it difficult?
  - [prompt] For example,

        - The stores are far and you don't have access to buses, cars, etc.
        - You can't leave the kids home and have to take them with you
        - You can't carry heavy bags
    - What makes it easy?
    - [prompt] For example,
        - Do you ask for a ride to stores from friends, relatives
        - You have access to public transport such as buses, etc
        - You do not take your kids shopping
- Do you have enough time to cook the foods you want to eat?
    - (If no) what causes the time constraint?
    - [prompt] For example,
        - You work long shifts
        - You are a student
    - (if yes) how do you manage your time to cook the foods you want to eat?
- Do you have enough time to do shopping for food during the week?
    - (If no) what causes the time constraint?
    - (if yes) how do you manage your time to shop?
- Do you think you have enough skills to cook?
    - What makes you think that?

Now let's talk about the foods you eat in the U.S.

- What stores do you normally shop at?
    - Why do you shop at those stores?
    - [prompt] for example,
        - Because you don't know any others
        - The foods in these stores are cheaper

        - These stores sell your cultural foods
        - These stores have healthier foods
        - The other stores (such as cultural food stores) are far
        - You are able to use your food benefits in those stores
- What kind of food do you usually cook?
    - You mentioned XX, XX and XX foods. Can you tell me why you cook these foods?

Last question, let's talk about different food assistance programs.

- Do you know any food assistance programs? [prompt: for example, SNAP, WIC, School Lunch]?
- Do you use any of them?
    - Why/why not?
- If you use them, do you find them helpful to feed your family?
    - Why/why not?

APPENDIX B

BRAZILIAN/CAMBODIAN FOOD INSECURITY AND ACCULTURATION SURVEY

DEMOGRAPHICS: SECTION A

In this section I will ask you some basic questions about yourself and your family.

1- How old are you? --------

2. Are you

[ ] Married or live with someone as a couple

[ ] Never married

[ ] Divorced or separated

[ ] Widowed

[ ] Don't know, Refused

3- How many people live in your house (including you)?

Adults ---- Children---- Don't know/Refused--------

4- About how much money did your family earn in the last 12 months?

1. Less than $5,000

2. 5,000 to 7,499

3. 7,500 to 9,999

4. 10,000 to 12,499

5. 12,500 to 14,999

6. 15,000 to 19,999

7. 20,000 to 24,999

8. 25,000 to 29,999

9. 30,000 to 34,999

10. 35,000 to 39,999

11. 40,000 to 49,999

12. 50,000 to 59,999

13. 60,000 to 74,999

14. $75,000 or more

15. Don’t know/Refused

5a. What is the highest level of education you have achieved, as of today?

[ ] Primary school only

[ ] High School, no degree

[ ] High School degree

[ ] Some University Courses

[ ] University Degree

[ ] Some Graduate Level Courses

[ ] Master Degree

[ ] Some Doctorate Level Courses

[ ] Doctorate Degree

[ ] Don't know/Refused

5b. You mentioned that your highest level of education was XX. Where did you finish that?

Was it in the U.S. or [Brazil/Cambodia]?

[ ] U.S. GO TO 5c

[ ] Brazil SKIP 5c; GO TO 6

[ ] Cambodia SKIP 5c; GO TO 6

5c. What was the highest level of education that you had in [Brazil/Cambodia]?

[ ] Primary school only

[ ] High School, no degree

[ ] High School degree

[ ] Some University Courses

[ ] University Degree

[ ] Some Graduate Level Courses

[ ] Master Degree

[ ] Some Doctorate Level Courses

[ ] Doctorate Degree

[ ] Don't know, Refused

6. How old were you when you immigrated to the U.S?

Age---------- Don't know/Refused

7. How long have you lived in the United States?

a. ---------

b. Don't Know/ Refused

FOOD EXPERIENCE: SECTION B

SECTION B.1

Now we are going to talk about your food situation here in the United States. These questions are about your food situation over the last year. I will read you some statements. I would like you to tell me if the statement was often true, sometimes true, or never true for you and your family in the last 12 months.

1. "(I/We) worried whether (my/our) food would run out before (I/we) got money to buy more." Was that often true, sometimes true, or never true for (you/your household) in the last 12 months?

[ ] Often true

[ ] Sometimes true

[ ] Never true

[ ] Don't know, Refused

2. The food that (I/we) bought just did not last, and (I/we) didn't have money to get more." Was that often, sometimes, or never true for (you/your household) in the last 12months?

[ ] Often true

[ ] Sometimes true

[ ] Never true

[ ] Don't know, Refused

3. I/we could not afford to eat balanced meals. Was that often, sometimes, or never true for (you/your household) in the last 12 months?

[ ] Often true

[ ] Sometimes true

[ ] Never true

[ ] Don't know, Refused

4. In the last 12 months, since (date 12 months ago) did (you/you or other adults in your household) ever cut the size of your meals or skip meals because there wasn't enough money for food?

[ ] Yes

[ ] No

[ ] Don't know, Refused

4.a. [Answer only if Q4 = YES] How often did this happen --almost every month, some months but not every month, or in only 1 or 2 months?

[ ] Almost every month

[ ] Some months but not every month

[ ] Only 1 or 2 months

[ ] Don't know, Refused

5. In the last 12 months, did you ever eat less than you felt you should because there was not enough money to buy food?

[ ] Yes

[ ] No

[ ] Don't know, Refused

6. In the last 12 months, were you ever hungry but didn't eat because you couldn't afford enough food?

[ ] Yes

[ ] No

[ ] Don't know, Refused

SECTION B.2

In this section I am going to ask you some questions about your food experience/situation in Brazil/Cambodia.

1- In [Brazil/Cambodia], did you have enough food to eat often, sometimes, or never?

[ ] Often

[ ] Sometimes

[ ] Never

[ ] Don't know, Refused

2- In [Brazil/Cambodia], did you have the kinds of food you wanted to eat often, sometimes, or never?

[ ] Often

[ ] Sometimes

[ ] Never

[ ] Don't know, Refused

3-In [Brazil/Cambodia], how many meals did you usually eat each day?

Number of meals ---------- Don't know/Refused-------

ACCULTURATION: SECTION C

LANGUAGE PREFERENCE

1. When you are at home with your family, how often do you speak [Portuguese/Khmer]: always, sometimes, seldom, or never?

1-Always 2-Sometime 3- Seldom 4- Never 5- Don't know/refused

2-Can you read and understand a book, letter, or newspaper written in English?

1- Easily 2- With difficulty 3- Almost not at all 4- Not at all 5- Don't know/refuse

3. In what language do you prefer to watch T.V?

a. A more Portuguese/Khmer than English

b. A more English than Portuguese/Khmer

c. Half Portuguese/ Khmer and half English

d. other (please specify)_____

e. Refused

4. In what language do you prefer to read books/newspapers/magazines?

a. more Portuguese/Khmer than English

b. more English/Khmer than Portuguese

c. Half Portuguese/Khmer and half English

d. other (please specify)_____

e. Refused

5. In what language do you prefer to listen to radio/music?

a. more Portuguese/Khmer than English

b. more English than Portuguese/Khmer

c. Half Portuguese/Khmer and English

d. other (please specify)_____

e. Refused

FOOD AFFORDABILITY: SECTION D

Next, I will ask you are about whether you or your family members are able to afford healthy foods. I am asking these questions a little differently than the last questions.

1. We could afford to buy healthy foods all month long. Was that <u>always</u>, <u>often</u>, <u>sometimes</u>, or <u>never</u> true for your household in the last 12 months?

[ ] Always

[ ] Often

[ ] Sometimes

[ ] Never

[ ] Don't know, Refused

2. We could afford to buy fruits and vegetables all month long. Was that always, often, sometimes, or never true for your household in the last 12 months?

[ ] Always

[ ] Often

[ ] Sometimes

[ ] Never

[ ] Don't know, Refused

3. We could afford to buy the same kinds of food all month long. Was that always, often, sometimes, or never true for your household in the last 12 months?

[ ] Always

[ ] Often

[ ] Sometimes

[ ] Never

[ ] Don't know, Refused

APPENDIX C

CERTIFICATION OF HUMAN SUBJECTS APPROVAL

Date: April 23, 2013

To: Jerusha Peterman, Nutrition

From: Anne Herrington, Chair, UMASS IRB

Protocol Title: The role of the Massachusetts Expanded Food and Nutrition Program in promoting food security among SNAP participants and SNAP-eligibles.

Protocol ID: 2010-0776

Review Type: EXPEDITED - REVISION

Paragraph ID: 5,6,7

Approval Date: 04/23/2013

Expiration Date:01/19/2014

OGCA #:None

This study has been reviewed and approved by the University of Massachusetts Amherst IRB, Federal Wide Assurance # 00003909. Approval is granted with the understanding that investigator(s) are responsible for:

Modifications - All changes to the study (e.g. protocol, recruitment materials, consent form, additional key personnel), must be submitted for approval in e-protocol before instituting the changes. New personnel must have completed CITI training.

Consent forms - A copy of the approved, validated, consent form (with the IRB stamp) must be used to consent each subject. Investigators must retain copies of signed consent documents for six (6) years after close of the grant, or three (3) years if unfunded.

Adverse Event Reporting - Adverse events occurring in the course of the protocol must be reported in e-protocol as soon as possible, but no later than five (5) working days.

Continuing Review - Studies that received Full Board or Expedited approval must be reviewed three weeks prior to expiration, or six weeks for Full

Board. Renewal Reports are submitted through e-protocol.

Completion Reports - Notify the IRB when your study is complete by submitting a Final Report Form in e-protocol.

Consent form (when applicable) will be stamped and sent in a separate e-mail. Use only IRB approved copies of the consent forms, questionnaires, letters, advertisements etc. in your research.

Please contact the Human Research Protection Office if you have any further questions. Best wishes for a successful project

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