EXAMINING HUNGER AND FOOD INSECURITY AMONG OLDER ADULTS OF MEXICAN HERITAGE IN TEXAS-MEXICO BORDER *COLONIAS:* A HOLISTIC APPROACH

A Dissertation

by

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ABSTRACT

This dissertation presents three studies designed to elucidate the phenomenon of hunger and food insecurity among older adults of Mexican heritage in Texas-Mexico border colonias. First, a comprehensive background of the problem is provided to include theoretical frameworks and delineations of the significance of this research. Second, a review of extant literature will be presented to include (a) definitions of hunger and food insecurity, (b) discussions on measurement of hunger and food insecurity, (c) nutritional and non-nutritional factors affecting food security, (d) nutrition curricula and food insecurity, and (e) limitations of current research and practice.

Senior focus groups illuminated the importance of centering interventions on the premises of coping strategies, resource management, and social capital. Many of the senior participants lacked adequate household resources, resource management skills, and coping strategies, and were disconnected from social networks that are evident in reducing barriers to food insecurity. These results spurred the development and implementation of our senior hunger curriculum, *No Más Hambre* [No More Hunger], which introduced novel methods of providing nutrition education and skill building in effort to reduce the risk of hunger and food insecurity through resource maximization. By way of extensive formative and process evaluations, the senior hunger curriculum emerged as a complex framework of *promotora*-led lessons and discussions, learner-based tactile activities, and culturally-sensitive resources and lesson materials—all delivered within the home of each participant. To test the feasibility and acceptability of

the *No Más Hambre* curriculum, we engaged the *promotoras* and participants in process discussions and in-depth interviews. This feasibility and acceptability study is the first of its kind in that we examined perspectives and experiences of MH seniors who endure acute hunger and food insecurity through the use of a home-based nutrition education curriculum. Though we did not assess empirical outcomes, we determined through interpretive analysis that secondary outcomes (i.e., self-reported impacts), such as social bonding, learned knowledge and skills, and improved health beliefs and behaviors, were valued and the lessons were enjoyable and indispensable to all participants.

This study represents the first of its kind to address hunger and food insecurity among seniors of Mexican heritage within a setting that has been under-utilized and under-studied. With an innovative, holistic, home-based approach, we addressed the burden of hunger and food insecurity within this population and created a sustainable solution to a global human rights issue.

DEDICATION

For my late grandparents, J.M. and Doris Mathews, who would be so very thrilled by this accomplishment. Ever-caring and always supportive of my efforts, they were lovely people and are greatly missed.

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NOMENCLATURE

AARP	American Association of Retired Persons
ADL	Activity of Daily Living
AoA	Administration on Aging
ALT	Adult Learning Theory
CFSM	Core Food Security Module
CHW	Community Health Worker
CITI	Collaborative Institutional Training Initiative
CLAS	National Standards for Culturally and Linguistically Appropriate Services in Health and Health Care
CNSTAT	Committee on National Statistics
CPS-FSS	Current Population Survey-Food Security Supplements
CRC	Community Resource Center
CSFII	Continuing Survey of Food Intakes by Individuals
DGA	Dietary Guidelines for Americans
DHHS	U.S. Department of Health and Human Services
ENP	Elderly Nutrition Program
ERS	Economic Research Service
FAO	Food and Agriculture Organization of the United Nations
FG	Focus Group
FNS	Food and Nutrition Service

FY	Fiscal Year
GHI	Global Hunger Index
HFS	High Food Security
HFSSM	U.S. Household Food Security Survey Module
HOTS	Higher Order Thinking Skills
HRB	Health-Related Behavior
IRB	Institutional Review Board
LFS	Low Food Security
LOTS	Lower Order Thinking Skills
LRGV	Lower Rio Grande Valley
MATCH	Multilevel Approaches Toward Community Health
MH	Mexican Heritage
MFS	Marginal Food Security
NFESH	National Foundation to End Senior Hunger
NHANES	National Health and Nutrition Examination Survey
OAA	Older Americans Act
OAANP	Older Americans Act Nutrition Program
SCT	Social Cognitive Theory
SFMNP	Senior Farmers' Market Nutrition Program
SMT	Social Marketing Theory
SNAP	Supplemental Nutrition Assistance Program
TTI	Theory of Triadic Influence

U.S.	United States
USDA	United States Department of Agriculture
VLFS	Very Low Food Security

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1. INTRODUCTION

1.1. Problem Statement

Good nutritional health coupled with adequate health maintenance and physical activity is essential to the prevention and management of chronic disease, physical and cognitive function, and quality of life for the growing population of older Americans.[1] For many older adults, food security and nutritional stability—conceptualized as the availability (i.e. existing or ready for use), affordability (i.e. reasonably priced), acceptability (i.e. suitable or agreeable), accessibility (i.e. obtainable), and consumption of nutritionally adequate foods—are affected by the adequacy of a variety of social, environmental, economic, and political resources.[2] As evidenced by recent literature, nutritional and non-nutritional health outcomes disproportionately affect disadvantaged populations.[3,4]

The fastest growing disadvantaged population in the U.S. are Mexican-heritage older adults in Texas-Mexico border *colonias.*[5] *Colonias* residents of Mexican heritage (MH, i.e., individuals who trace their origin or descent to Mexico) face physical, geographical, economic, and sociocultural contextual challenges to accessibility, affordability, adequacy, and appropriateness of food resources on multiple socio-ecological levels.[6] Ethnic minority older adults are considered an underserved population in regard to health and nutrition services and often face limited access to safe, nutritionally adequate, and culturally appropriate food compared to non-Hispanic whites.[7] Though we understand the magnitude of food insecurity in the U.S., only

modest quantities of research aimed at mitigating the problem of food insecurity and associated factors among MH seniors exist.

The prevalence of food insecurity among MH individuals residing in U.S. border counties is staggering. To end hunger and food insecurity in this priority population, we must first understand the root causes[3], then engage in the development of immediate and long-range interventions that promote and support the self-sufficiency of individuals and families.[3] Nutrition intervention and access to food assistance programs can address the problem of food insecurity that is prevalent in the Hispanic populations; resulting in increased quality of life, economic benefits, and improved health outcomes.[7] Furthermore, the need to develop innovative and sustainable interventions and food and nutrition assistance programs to reduce the risk and presence of hunger and food insecurity among MH seniors is evident and emergent.

1.2. Theoretical Framework of Influences on Hunger and Food Insecurity

Based on the widely utilized conceptual framework introduced by Lovendal and Knowles (2005), vulnerability to food insecurity is the result of a recurrent process; therefore, by reducing barriers, risks, and vulnerability in a population we can achieve both domestic and international food security targets.[8] This framework links an individual or household's present characteristics and asset ownership to food security and indicates the importance of risk management in achieving food security and optimal nutritional status by reducing vulnerability. My adaptation of the Lovendal and Knowles model (Figure 1.1) exchanges risk management events for coping strategies such as resource availability and utilization (e.g. economic, social, internal and external

management strategies). Per the literature, acute and long-term food security status may depend on a household's capacity to employ coping strategies,[9-12] therefore this model is progressive and dynamic. However, this model lacks key determinants and variables within the process of resource accumulation, maintenance, and exhaustion specific to older adults of Mexican-heritage; in other words, it is imperative that we also take into account all relevant social, cultural, and environmental contexts when assessing food insecurity.

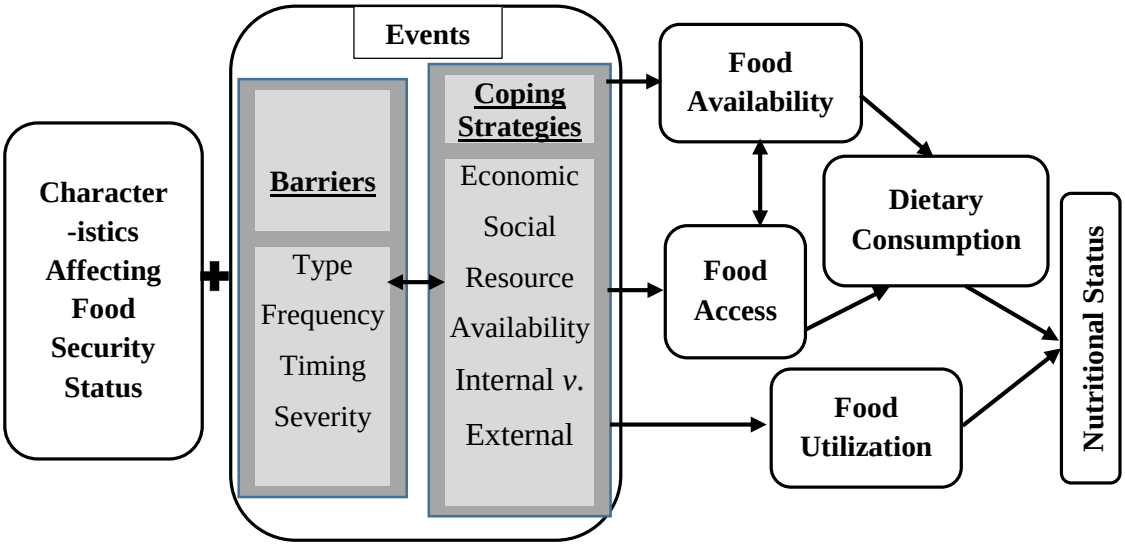

Figure 1.1. Adaptation of Lovendal and Knowles' framework (2005) for assessing vulnerability to food insecurity.

With dynamic and on-going indices of behavior in response to multiple ecological contexts and the demand for innovation, use of a singular static theory or framework may prove counter-productive. Nigg and colleagues (2002) maintain that application of multiple theories and/or models, "can help us learn more about the

processes by which people change and maintain health behaviors than does study of any single theory alone."[13] Adding to this argument is Flay and Petraitis' Theory of Triadic Influence (TTI). This health behavior

theory includes four levels of causation (i.e., ultimate causes, distal influences, proximal predictors, and immediate precursors) and three "streams of influence" that flow through the seven tiers. The three streams of influence are: 1) cultural-environmental influences on knowledge and values, influencing attitudes; 2) social situation-context influences on social bonding and social learning, influencing social normative beliefs; and 3) intrapersonal influences on self-determination/control and social skills leading to self-efficacy.[14] Significant to this theory is the inclusion of health-related behaviors (HRBs) as the action pieces that influenced the development of former theories and subsequently the TTI, or the meta-theoretical. The TTI is especially useful when negotiating influential factors that may affect food security in a population. As decisions and influences on eating are frequent, multi-faceted, situational, dynamic, and complex,[15] so are the inner dialogues that individuals must encounter.

Before practical and sustainable initiatives can be implemented, it is important to first link behavioral strategies of health promotion with efforts to strengthen environmental supports that are conducive to the collective well-being of MH seniors. The success of public health interventions is predicated on the use of integrative theoretical stratagems similar to that of the TTI and correspond with all five levels of socio-ecological influence.[16] The five levels of ecological influence (i.e. intrapersonal or individual factors, interpersonal factors, institutional or organizational factors,

community factors, and public policy factors) were identified by McLeroy and colleagues in 1988.[17] The e*cological perspective* or *model* essentially focuses on the depth and breadth of environmental influences from modifying individual behaviors (i.e. intrapersonal, interpersonal) to modifying the proximal and distal settings (i.e. institutional, community, public policy) of one's respective environment. The ecological perspective underlines the association between, within, and among all levels of a public health problem and addresses multiple levels of influence and reciprocal causation that occurs between an individual and their environment.[18]

In addition to approaching the stated problem through an ecological lens, contemporary pedagogical theory and various theoretical frameworks of pedagogy and human behavior (e.g. Adult Learning Theory (ALT)[19] and Social Cognitive Theory (SCT)[20]), will be integrated into an iterative and collaborative process of curriculum development.[21] Furthermore, when designing nutrition interventions for older adults, program planners must understand the underlying motivations and decision-making processes that influence food choices;[22] thus the theory of *action competence* will be applied. Action competence is defined by Albertsen and Anderson (2001) as a personal resource where the most important aspect is the individual's desire to take action and to believe in its benefit.[23] According to the theory of action competence: an individual must possess the skills, proficiency, and capacity to apply and transfer knowledge from one situation to another; the ecological setting must be conducive to the achievement of established goals; an individual must possess evident motivation that is influenced by their expectations, goals, and emotions; and an individual must have a positive self-

understanding, or belief in their own capacity to take action by referring to past experiences.

The challenge with traditional paradigms and theoretical frameworks is the necessity to develop culturally-sensitive and responsive programs that deliver evidence-based practices while pragmatically addressing individual and community concerns. Adaptation of efficacious programs that are "culturally blind" will not succeed in stimulating community engagement and participation in this population.[24] Given that contemporary public health interventions are likely to incorporate a multifactorial design and research methodology, the proposed study will integrate theoretical frameworks and methodologies that overlap with ecological levels of analysis. On the other hand, inductive logic may be applied through use of extant secondary data to generate inferences and establish grounded theory or abstract generalizations of study phenomena.

1.3. Population and Setting

In Hidalgo county, Texas, (along the Texas-Mexico border) individuals of Mexican descent who reside in areas known as *colonias* are one of the most under-represented, medically underserved, and hard-to-reach minority groups in the U.S.[25] *Colonias* are largely substandard, rural residential areas—often with inadequate infrastructure, variable housing conditions, and limited access to potable water and septic sources—that were developed from subdivided agricultural lands in response to a deficit in low-income housing.[26,27] Individuals living in *colonias* are subject to concentrated poverty, and due to their geographic and economic isolation, are less

visible than their urban counterparts. Research suggests that this level of "pervasive isolation—characterized by social, racial, linguistic, and economic separateness from the larger economy—underlies poverty concentration."[28] Given the socio-demographic composition of the rural, and oft-remote, South Texas *colonias* and the lack of access to and availability of resources, *colonias* residents have limited knowledge of, and are less likely to adhere to, nutrition-related health behaviors.[25] In terms of the *life course perspective,*[29] the complex accumulation of health-related outcomes within the life-span of an individual in the U.S. are likely the result of numerous environmental and structural inequities over time.

In the *colonias* of South Texas, inhabitants experience numerous nutritional health disparities and encounter many obstacles to adopting and maintaining healthy behaviors.[4] *Colonias* residents are primarily monolingual Spanish and have significant economic constraints, limited education, and few advantageous health resources such as access to healthful foods, affordable healthcare, health information, and health promotion programs.[25,26,30-32] Social determinants of health—the non-medical factors (both proximal and distal) that affect the health within populations—include socio-cultural contexts such as political, legal, institutional and cultural determinants as well as gender, sexual orientation, education, disability, socioeconomic status, race, ethnicity, immigration status, physical environment, living and working conditions, family and social networks, lifestyle or behavior and demographics.[33,34] For minority populations, health disparities are associated with lower life expectancy, decreased quality of life, lesser economic opportunities, and social injustice.[35] Health disparities related to one or

more of the social determinants of health are strongly tied to diet quality, nutritional health, nutrition-related disease states, and negative health outcomes.[34] Individuals and communities who are subject to health disparities that constrain and affect nutrition status and food security are at a severe disadvantage. This proposal introduces a holistic, culturally-driven, linguistically-centered, and innovative approach to reduce the risk of hunger and food insecurity in a vulnerable and at-risk population.

According to the U.S. Census Bureau (2010), people of *Hispanic, Latino or Spanish* origin comprise approximately 16% of the U.S. population (an increase of 43% between 2000-2010) making people of Hispanic origin the nation's largest ethnic or race minority; with nearly two-thirds (63%) of those identifying as *Mexican, Mexican American, or Chicano*.[36] Individuals who identify as being of Hispanic origin on U.S. Census surveys may also identify as a member of any race. This discrepancy results in a reporting overlap for Hispanic data and the data for race groups. With that in mind, the 2010 Census reports show the Hispanic population had a poverty rate of 23.2%, compared to American Indian and Alaska Natives (27%), Black or African Americans (25.8%), Whites (11.6%) and Asians (11.7%); contrasted with the overall national rate of 14.3%.[37] When we narrow our scope to focus on poverty in the priority setting, Hidalgo County, Texas had an overall poverty rate of 34% in 2013; surpassed only by two bordering counties, Starr (36.3%) and Willacy (43.1%), as the highest in the state (Texas overall rate of 17.5%, national rate of 14.5%).[38,39] According to the United States Department of Agriculture's (USDA) Economic Research Service (ERS), these particular locales are recognized as persistent poverty counties; meaning 20% or more of

their populations were living in poverty over the last 30 years. Rates of food insecurity were higher in households with incomes near or below the federal poverty line in 2012 according to the USDA ERS.[40] Additionally, enrollment in food assistance programs (e.g. Supplemental Nutrition Assistance Program or SNAP, formerly the Food Stamp Program; Senior Farmers' Market Nutrition Program; or Meals on Wheels), coincides with poverty rates suggesting that as poverty increases, food insecurity increases.[41]

The population of Hidalgo county is largely Hispanic (91% in 2013) and lies within a geographical area, known as the Lower Rio Grande Valley (LRGV), which is located along the Texas-Mexico border. Approximately 36% of Texas *colonias* residents are immigrants who are mostly from Mexico[42] and nearly 30% of Hidalgo county residents reported they are foreign-born (2009-2013).[43] These statistics are likely much lower than reported data due to significant underreporting or misrepresentation of immigration or legal status by respondents. Previous research has shown that individuals in this population generally are subject to significant financial constraints and limited resources to include access to healthful foods, affordable healthcare, and limited access to efficacious prevention programs.[25]

Rates of food insecurity were higher than the national average for underrepresented populations to include Hispanic households (26.2 %) and households with incomes below 185 percent of the poverty threshold (33.8%).[44] Presently, approximately one in four Hispanic adults over the age of 50 experience food insecurity.[45] In addition, 6.7% of Hispanic households with older adults faced *very low food security*, meaning that at least one member of the household had missed meals due

to absence of food.[46] Food insecure seniors are: more likely to have limitations with activities of daily living (ADLs);[47] 60% more likely to experience depression; 53% more likely to report history of a myocardial infarction; 52% more likely to develop asthma; and 40% more likely to report an occurrence of congestive heart failure, when compared to their food secure counterparts.[48] Owing to a number of resource-related factors, Hispanic older adults have difficulty accessing programs designed to fight hunger such as Supplemental Nutrition Assistance Program (SNAP), Commodity and Supplemental Foods, Child and Adult Care Food Program, Emergency Food Assistance Program, the Administration on Aging's (AoA) Elderly Nutrition Program (ENP), and the Senior Farmers' Market Nutrition Program (SFMNP); for example, only 35% of Hispanic older adults eligible for SNAP accessed the program.[46] This is compared with the 65% of all eligible working poor in the U.S. who participated in SNAP in 2010.[49]

For many Mexican immigrants, health status and eating patterns declined in quality (e.g. increased caloric, sodium, and total fat intake) after moving to the United States; a consequence that can be attributed to acculturation. Acculturation has been defined as a dynamic and multidimensional process of bidirectional change that occurs when two prominent ethno-cultural groups come into contact with one another.[50-52] There is relatively little understanding of the complexity of acculturation in regard to dietary patterns among MH individuals.[26] However, researchers have suggested that the healthfulness of the Hispanic diet deteriorates during the acculturation process.[53] For MH seniors, dietary patterns in the U.S. may be influenced by a number of factors including—but not limited to—availability of transportation,[54] acculturation,[52,53,55]

seasonal employment (e.g. migrant farm work),[56,57] retail food environment,[58] being monolingual (i.e. speaking only Spanish),[59,60] and acute health status.[61] In fact, the majority of Hispanic immigrants identified cultural and linguistic differences as the biggest barriers to receiving health care, nutrition advice, and social services; resulting in stress, fear, anxiety, poor compliance, and poor health outcomes.[7] These factors, in addition to numerous other nutritional and non-nutritional risk factors, may contribute to the problem of hunger and food insecurity within this population.

Efforts to reach and engage this population involve a number of challenges. Johnson and colleagues (2013) highlight some of these challenges which include: 1) establishing rapport and trust among participants and communities; 2) adapting protocol and instruments to maintain cultural appropriateness; 3) adapting to logistics-related challenges posed by participants (e.g. personal conflicts and transportation challenges); 4) capturing relative contextual factors for greater understanding of the population; and 5) conducting research in a manner that is respectful of and receptive to values, traditions, and social norms while maintaining scientific rigor.[62] These challenges have been widely addressed through the engagement of *promotoras de salud* (henceforth referred to as *promotoras*). *Promotoras,* also referred to as community health workers (CHWs), have been engaged in numerous community health promotion and grass-roots efforts that target hard-to-reach populations and other medically underserved communities.[26] *Promotoras* function as the gatekeepers or cultural brokers between research institutions, community organizations, healthcare agencies, and members of the community at large.[32,63] *Promotoras* have the collective task of functioning as educators,

community advocates and collaborators, counselors, and researchers, while gaining access and maintaining trust and respect within the community of study. "This unique and value-based position is increasingly empowering as *promotoras* build their capacity and confidence through active participation in community-based research and the acquisition and refinement of knowledge, skills, and collective strength."[64]

Promotoras and CHWs have gained national recognition for their work in addressing and eliminating health disparities. The U.S. Department of Health and Human Services announced the *Promotoras de Salud*/Community Health Workers Initiative (2011) to "recognize the important contributions of *promotoras* in reaching vulnerable, low income, and underserved members of Latino/Hispanic populations, and promote the increased engagement of *promotoras* to support health education and prevention efforts and access to health insurance programs."[65] There exists an iterative process in which *promotoras* positively affect the social and organizational conditions that define the health of the community by generating opportunities for community voice, advocacy, and action.[66] The *promotoras* who will be engaged in this study are indigenous to the study location and are State of Texas-certified CHWs trained in research methodologies. Team p*romotoras* (also known as *promotora*-researchers) are critical and essential components of our research team and will be invaluable to the completion of this project.

1.4. Significance

This study provides valuable information to local, state, and federal governments and nutrition and public health professionals on the status of hunger and food insecurity

in an under-represented and health disparate indigenous population of MH seniors. This dissertation offers insight into the lived experiences of this population and how they conceptualize, avert and/or manage acute and chronic hunger and food insecurity. By understanding the myriad of factors that influence hunger and food insecurity, community health educators and program planners can use the results provided in this document to establish appropriate interventions and curricula aimed at reducing the risk of hunger and food insecurity in this population.

This dissertation has theoretical and practical significance. The research is pragmatic in that it takes a holistic approach to address root causes of hunger and food insecurity from the perspectives of the priority population—beginning with an in-depth, narrative needs assessment. This research examined an extensive spectrum of factors that are well-cited in literature in addition to others that surfaced from inductive reasoning and narrative analysis. In addition, mixed methods research (MMR) was employed as a general framework that includes theoretical perspectives and naturalistic inquiry as well as confirmatory and exploratory questions. Numerous examples of successful MMR projects exist and are conducted throughout the social and behavioral sciences; producing combinations of data that benefit multiple stakeholders.[67] That said, engaging in mixed methodology research has encouraged stronger and more valid inferences from the data and the development of workable solutions to research challenges.[68]

Finally, this research helps fill the gap in understanding and addressing the prevalence of food insecurity among MH seniors residing in Texas-Mexico border

colonias. This study not only addressed the root causes of hunger and food insecurity as explained by the priority population, but formative work (addressed in papers 1 and 2 of this dissertation) led to the development of an innovative and relatively sustainable nutrition intervention to reduce the risk and presence of hunger and food insecurity among this population. This nutrition curriculum and intervention promoted and supported a robust sense of self-sufficiency among study participants and their families.

1.5. Objectives

The overarching goals of this doctoral research were to address the complexity of hunger and food insecurity and to understand the experiences and contextual issues surrounding food acquisition and consumption among MH seniors. Aside from complex nuances reported by interdisciplinary scholars, addressing the root causes of hunger and food insecurity results in multiple challenges and has numerous policy implications. New and innovative public health programs that address this public health concern are faced with the task of staying abreast of the threat posed by food insecurity on the greater society. The study objectives were established to answer three specific research questions that address hunger and food insecurity within the respective sub-population and setting. Each research question sets the stage for subsequent questions, they are as follows:

1. What is the meaning of food access and food security among Mexican-heritage seniors in South Texas border *colonias*?

2. How might the development and implementation of an innovative, home-based curriculum reduce the risk of hunger and food insecurity within this population?

3. Is an innovative, home-based curriculum, developed to reduce the risk of hunger and FI through increased nutrition knowledge and maximization of resources, both feasible and acceptable?

The first objective (Paper 1) of this study was to assess the meaning, experiences, and perceptions of food access and food security among MH seniors in South Texas border *colonias*. This guided us to novel ways of understanding senior issues related to hunger and food insecurity. To accomplish this, focus groups were conducted with MH seniors to identify perceptions, beliefs, and barriers regarding food availability and access. The second objective (Paper 2) was to develop and implement an innovative, home-based curriculum developed to increase nutrition knowledge and skills and maximize resources. The third and final objective (Paper 3) was to examine the feasibility and acceptability of the curriculum among MH seniors and their *promotora* educators.

2. REVIEW OF THE LITERATURE

2.1. Hunger and Food Insecurity

Hunger is a widely recognized condition, however succinct and consistent definitions of the word do not exist.[69] In a broad range of severity, *hunger* is generally recognized as the acute physiological responses or sensations caused by lack of food and may result in the diagnosis of prolonged clinical under-nutrition. *Food insecurity* has been defined as the "limited or uncertain access to nutritionally adequate and safe food or limited or uncertain ability to acquire foods in socially acceptable ways."[70] Conversely, *food secure* individuals and households have consistent and dependable access to adequate, appropriate, and safe diet of nutritious food and water to meet dietary needs and support an active, healthy life.[71,72] As of 2006, the USDA classified the degree of food security using the following labels (Table 2.1.): *High food security* (formerly labeled *Food security*); Marginal food security (formerly labeled *Food security)*; *Low food security* (formerly labeled *Food insecurity without hunger*), and *Very low food security* (formerly labeled *Food insecurity with hunger*).[73] Individuals who report no food access problems or limitations (i.e. *High food security*) differ from the marginally food secure, the low food secure, and very low food secure in that they possess no acute feelings of food access anxiety. The USDA ERS report on household food security (2014) indicates that one in six people (estimated 14.3% of households) in the U.S. were food insecure in 2013.[71] Approximately 6.8 million (5.6%) of food insecure households suffered *very low food insecurity*, making them more at risk of limited access to

nutritionally adequate food. The terms *hunger* and *food insecurity*, though distinctive and not interchangeable, are often used simultaneously to offer a widely descriptive interpretation of the feelings, experiences, and tangible deficits related to these unique phenomena.

Table 2.1. USDA ERS, Definitions of Food Security[74]

Ranges of Food Security: Descriptions
Food Security • *High Food Security:* Individuals within a household report no indications of problems or limitations with food access. • *Marginal Food Security:* Individuals within a household report one or two indications of problems or limitations with food access. Though little or no indication of changes in dietary intake is present, there is evident anxiety regarding food sufficiency or shortage within the home.
Food Insecurity • *Low Food Security:* Individuals within a household report reductions in quality, variety, or desirability of diet. However, there remains little or no indication of reduced dietary intake. • *Very Low Food Security:* Individuals within a household report multiple indications of disrupted dietary patterns and reductions in dietary intake.

Evidentiary data indicate the fact that hunger and food insecurity are not societal challenges limited to developing countries. Recent literature highlights the U.S. economic recession that began in 2007 and resulted in a poverty rate increase of 1.9% to 15.1% from 2008 to 2010.[75] The severity of this financial downturn remains evident as a prominent component of the increase in poverty is the subsequent increase in food insecurity and individuals who experience hunger.[41] In 2014, the ERS reported that 17.5

million U.S. households were food insecure and SNAP enrollment is at an all-time high.[76] The SNAP program serves as the largest federal food assistance program regulated by the USDA with a budget of just over $74 billion in fiscal year (FY) 2014.[77] This program acts as a safety net to minimize the pangs of hunger and improve the nutritional status of SNAP recipients by increasing the available resources to purchase food.[76] In 2014, 46.5 million people in the U.S. were enrolled in SNAP; an increase of 57% since the program's inception in 2007.[77] In FY 2013, nine percent of all SNAP beneficiaries were adults age 60 or older. In Texas Congressional District 28 (includes Hidalgo county), 30.1% of the households receiving SNAP had one or more people age 60 or older (2009-2011).[78] Due to immigration status, issues with reporting, general distrust, or desire for anonymity, the extent of food insecurity among MH seniors who reside in *colonias* is unclear. Though, studies specifically assessing issues of hunger and food insecurity among immigrants have reported astronomical rates.[56]

Food security research has historically focused on examining the phenomenon of hunger primarily in women and children;[79] but due to recent focus on the aging "baby boomer" generation, studies are trending in the direction of older adults.[80] *Healthy People 2020* includes an objective to reduce household food insecurity (and hunger, subsequently) to a target prevalence of 6%.[81] But despite the growing numbers of food insecure seniors, *Healthy People 2020: Topics and Objectives for Older Adults* does not include aims to reduce food insecurity within this population. Though the prevalence of food insecure older adults remains significantly lower than prevalence in children and

female headed households, the number of food insecure, low-income, minority older adults is on the rise.[3]

2.2. Measurement of Hunger and Food Insecurity

The demand for validated methods of measuring food security is growing, not only in policy development and research arenas, but in programs that aim to identify vulnerable populations for the purpose of improving food security and demonstrating impact.[10] In the 1990s, a concerted effort was made to develop benchmark data and statistically validate measurement instruments for food insecurity.[82] In response to the demand, the USDA Food and Nutrition Service (FNS) organized an interagency working group in1992 that developed initial measures and a subsequent guide to measuring household food security.[83] As previously indicated (Table 2.1.), USDA ERS measures food security and insecurity along a four range continuum from very low food security (VLFS) to high food security (HFS).[73] However, generalized measures such as these do not capture the *experience* nor do they assess the determinants that are crucial to addressing and combating food insecurity. Furthermore, little is known about the sensitivity of current survey measures that are widely used across population subgroups.

As previously stated, *hunger* is often described in conjunction with food insecurity, but the Committee on National Statistics (CNSTAT) recommended against this in a 2006 report;[84] the argument reflects a concern that *hunger* should be measured on an individual, physiological level versus food security which should continue to be measured as economic access to food at a household level. Presently, the Global Hunger

Index (GHI)[85] is utilized to measure hunger in children who reside in developing nations; however, no validated methods for measuring hunger in the U.S. exist.[69]

Qualitative measures assess food security status beyond quantifiable ranges of designation and incorporate experiences and perceptions of food insecurity. Qualitative methods are viewed as being more direct than other widely used proxy measures which prompted the development of the U.S. Household Food Security Survey Module (HFSSM); this measure has been field-tested in numerous settings globally and in the United States, but not in surveys targeted to older adults.[86,87] In addition to the widely utilized USDA measures, other dietary habits surveys, food behavior checklists, and dietary screeners have surfaced in attempt to respond to the need or adequate food security measures.[88]

The Older Americans Act Nutrition Program (OAANP) is a community-based nutrition assistance program that aims to reduce hunger and food insecurity among older adults by providing home-delivered meals, congregate meals, and other nutritional health services authorized under the Older Americans Act (OAA).[89] The OAA recently recommended the assessment of food security as an outcome measure which prompted utilization of the aforementioned HFSSM established by the USDA ERS.[90] The Core Food Security Module (CFSM) is also known as the 18-item "core module;" the model is also available in Spanish translation through the ERS. The core module has been utilized by several specialized national surveys including the USDA Continuing Survey of Food Intakes by Individuals (CSFII), and the National Health and Nutrition

Examination Survey (NHANES) conducted by the U.S. Department of Health and Human Services (DHHS).[83]

The HFSSM also includes a 10-item U.S. Adult Food Security Survey Module to be utilized for assessment of households without children. Responses to a series of questions and behaviors within these surveys determine the severity of food insecurity within a household and are widely utilized assessment tools. Each question in the two modules is qualified on the condition that negative outcomes are due to financial constraints. The 18-item module was developed to elicit responses on a Likert scale with questions such as "I worried whether my food would run out before I got money to buy more" and "My children were not eating enough because I just couldn't afford enough food." The 10-item module offers a three-stage design with screeners designed to reduce respondent burden. This module works best for households without children and has been modified to specifically assess food security among adults. The six-item short form classifies food insecurity into high or marginal food security, low food security, and very low food security based on the number of affirmative (or "yes") responses; more than two affirmatives indicates food insecurity.[91] The short form is used to decrease respondent burden compared to the 18-item and 10-item modules. However, the HFSSM tools may underestimate the level of food insecurity among older adults.[87] This result is likely because the module does not assess unique factors affecting older adults to include food utilization and access (e.g. social isolation and functional limitations), experiences, and perceptions.

Another widely utilized food security measurement tool is known as the *Radimer/Cornell scale.* The Radimer/Cornell was designed to reveal food insecurity experienced at the household level and including all age groups. Radimer (1990) developed her scale to measure more specific nutrition variables in effort to validly assess food insecurity within a household.[92] The Radimer/Cornell hunger and food insecurity scale has repeatedly been tested for validity and all indicators show satisfactory internal consistency. Despite these desirable outcomes, those who have utilized the Radimer/Cornell scale for the assessment of food security in Hispanic households with older adults have noted the necessity of further testing in unique and at-risk populations.[4,71,93-96]

We know that food ideology and the experience and meaning of food insecurity are very different for older adults.[97] According to scholars who study food insecurity in Hispanic populations, few studies have focused on food security status among Hispanic older adults and assessment tools for Spanish-speaking, low-literacy populations are lacking.[11,52,57,88] One would argue that the best method of capturing the experience of food insecurity in MH seniors is to engage in qualitative inquiry which applies elements of contextual analysis to assess food ideology and behaviors; and also gives a *voice* to individual experiences. Interpretive methodologies will also address the concepts of cultural food diversity that are excluded from most quantitative measures. Nonetheless, we must also incorporate rigorous quantitative measures in order to adequately gauge the extent of food insecurity. Use of two or more food security scales could be ideal as it is not clear that only one food security scale will measure the complexity of hunger in any

given locale.[10,70] Although the ERS 18-item core module and the Radimer/Cornell scale are widely used in food insecurity research, no benchmark measure for assessing food security has been established.

2.3. Nutritional and Non-Nutritional Factors Affecting Food Security

The root causes of food insecurity in an aging population are complex. According to Feeding America, the nation's largest hunger relief organization, older adults age 60 and older "are particularly vulnerable to the negative health and nutrition implications of food insecurity."[48] Several nutritional and non-nutritional factors have been associated with food security levels in households with older adults in the United States.[3] Notable risk factors for hunger and food insecurity include low socio-economic status and geographic-environmental limitations. According to the ERS (2014), "Rates of food insecurity were substantially higher than the national average for households with incomes near or below the Federal poverty line, households with children headed by single women or single men, and Black- and Hispanic-headed households."[71] System-level barriers such as: food environment resource deficiencies; consumer barriers to acquisition, preparation and consumption; and multiple resource inadequacies can negatively affect health outcomes in presently disparate populations.[98]

Findings from a recent wave of the NHANES were instrumental in helping investigators identify multi-level approaches to hunger and food insecurity (i.e. communities, state and local policy) as priority areas.[45] The Food and Agriculture Organization of the United Nations (FAO) World Summit report (1996) identified four pillars of global food security and its determinant factors: availability, access, utilization,

and stability.[99] Perhaps the most significant nutrition-related factor used to assess food security is *food access*—or the availability and accessibility of affordable, nutritious, and safe food sources. Food access is a dichotomous variable separated by distinctions between physical access and economic access to food and potable water supplies. Adequate market infrastructure and ample population incomes per capita lend to ease of food access. However, physical access can be negatively impacted by one's geographic location; in addition, the lack of reliable transportation, unpredictable regional food supply, proximity to food deserts, rural or urban area of residence, and food environment quality can negatively impact access.[27] Issues with physical access are further exacerbated where issues of economic access are involved. *Food utilization*—the use of food which is accessed and one's biological ability to process and absorb nutrients—depends upon household storage and processing resources, knowledge of food preparation, food sharing within a household, and the state of health of each individual within a household. Concerns regarding household food adequacy are compounded when food that is accessed is not adequately or appropriately utilized—further exacerbating food insecurity within a household.

Social and health disparities are even more prominent among MH seniors who live along the U.S.-Mexico border.[25] Research suggests that seniors of Mexican descent, both U.S. and foreign-born, may be more at risk for diet-related chronic disease due to acculturation and dietary patterns in the U.S.[100] For older adults, both poverty and food insecurity are predictive of poor nutrition and negative health outcomes.[3] When culturally appropriate food sources become less affordable and involuntary reductions in

dietary intake occur, access to convenience foods that are not desirable can encourage poor dietary intake and patterns.[56] Convenience food items are attractive to individuals with limited incomes due to accessibility and affordability of those items. Nonetheless, these foods have widely become staple items in an average American diet, regardless of socio-economic status. Research suggests that household composition (children in the home) and individual or family characteristics (age, employment status, education, household resources) were also associated with unhealthy eating behaviors.[100] Convenience food items generally contain high amounts of saturated fat, cholesterol, added sugar, and sodium and are energy dense; meaning, they contain a large caloric load and energy density per volume. High energy (calorie) consumption promotes increased body weight which leads way to overweight and obesity and associated co-morbidities. Affordability and accessibility of energy dense foods and beverages versus healthful, nutrient dense foods are areas of increasing concern, especially in regard to older adults on limited incomes. Though older individuals who acquired food and nutrition assistance through available programs such as SNAP reported lower incidence of food insecurity, food selection and dietary patterns were not improved overall.[76]

In addition to food access and the availability of a healthful and nutritious food and water supply, social determinants of health can affect the ability of older adults to achieve and maintain food security. Financial and economic barriers to food access remain the most frequently measured non-nutritional food security indicators due to the positive association between poverty and food insecurity. Adequate housing, transportation, social support systems, and access to healthcare and social services have

an incredible impact on food security. As it stands, minority populations tend to use healthcare less often and tend to be in poorer health than individuals from non-minority populations.[101] Other non-nutritional factors include socio-demographic indicators of food insecurity. The ERS found that education level, race, gender, marital status, citizenship status, disability, and employment status of the head of the household relate to the prevalence of food insecurity.[102] These results are substantiated by a study by Bartfield and Duniform (2006) which examined the individual factors and state level predictors that influence food insecurity in households using data from the USDA's Current Population Survey Food Security Supplements (CPS-FSS).[103]

One indicator that may mask the effects of low and very low food security are coping mechanisms or strategies. Coping strategies can be defined as the physical responses to crises on livelihood systems in the face of unwelcome incidences; they are considered short-term reactions.[104] In addition, the adaptive capacity of an individual is their level of ability to respond to these life changes through autonomous and organized adaptation over time. Referring to the work of Frankenberger (1992), Watts (1983), Corbet (1988), de Waal (1989), Davies (1996), and Maxwell (1999), use of coping strategies as indicators of food security are advocated due to the set of patterns and contexts in which they frame short and long-term food security status.[10] Self-reported measures of food security, including the ERS 18-question Core module, allude to coping behaviors and subjective perceptions within households but do not offer full disclosure of strategies. Examples of coping strategies include: a) altering the diet by means of purchasing less expensive, more affordable foods; b) engaging in food-seeking strategies

that will increase the amount of food available within the home (short-term); c) activating strategies to restructure the household, i.e. decrease the number of individuals within a household; d) engaging in rationing strategies to manage food insufficiency; and e) activating social networks to maximize resources and encourage food sharing or food seeking strategies. Other coping strategies may include the reliance upon strength from, and faith in, a religious deity. With MH individuals, social networks and support systems primarily have a great impact on coping strategies as indicated by cultural normative behaviors and expectations.[105]

2.4. Nutrition Curricula and Food Insecurity

The popularity of educational programs developed to intervene on chronic disease, encourage weight management, and increase physical activity are vast, but educational programs to assist low-income older adults in reducing risk of hunger and food insecurity are uncommon. A systematic review published in 2014[106] examined nutrition education studies that focused on older adults over the past two decades. Lyons' (2014) results show what other scholars have similarly reported—nutrition education and interventions tailored to older adults are scarce. In fact, these and other scholars have been urging nutrition educators to develop nutrition education curricula and strategies tailored to meet the needs of this growing population. It is important of note, however, that education alone without affective motivation and complex intervention strategies may not change long-term outcomes and behaviors.[107]

Nutrition education can be defined as "any combination of educational strategies designed to facilitate voluntary adoption of food choices and other food- and nutrition-

related behaviors conducive to health and well-being…nutrition education is delivered through multiple venues and involves activities at the individual, community, and policy levels."[108] Achieving food security will require access to nutritious foods and potable water sources, however all individuals must also have access to the appropriate knowledge, skills, and resources that promote self-sufficiency, action competency, and may ameliorate the influence of economic constraints.[109] Additionally, nutrition education curricula in the priority population must be developed in a manner that achieves cultural complexity and should be developed with guidance from the National Standards for Culturally and Linguistically Appropriate Services (CLAS) in Health and Health Care.[110] The national CLAS standards recommend that programs be designed and/or modified to be responsive to diverse beliefs and practices, preferred languages, health literacy, and other communication needs.[111]

Evidence-based practices in the intervention of hunger and food insecurity have historically adhered to a traditional paradigm of approaches. According to Dunst (2001), adaptations of evidence-based interventions within a traditional paradigm structure involve models that focus on: *treatment; professional expertise; deficit-based (weakness-focused); professional service-based;* and being *professionally-centered*.[112] Postmodern, alternative approaches to traditional didactic education programs are those which include practical applications, encourage active participation, skill improvement and self-management for enhanced autonomy, goals setting, problem solving, and social networking. State-of-the-art coordinated approaches for nutrition education are

necessary to reach immigrant and non-English speaking populations in the U.S. given the prominent language and cultural barriers.[61]

The *Dietary Guidelines for Americans* (DGA) are the cornerstone of federal nutrition policy and nutrition education activities[113] and were established to provide a framework for healthy eating for all Americans ages 2 and older. In addition to healthy eating patterns, the DGA provide recommendations for health promotion programs designed to offer nutrition education. Despite this and other campaigns to increase public awareness of the impact nutritional choices and dietary patterns, consistent healthy eating patterns have not transpired due to the convenience of high-fat food choices and food preferences, in addition to economic, social, cultural, and behavioral factors.[114] Nutrition education curricula and health promotion programs must be designed to adequately respond to the influx of ecological influences that alter and adulterate individual eating patterns. All this in mind, curricula developed to assist individuals who are food insecure must take in to account the difficulty with access and availability of recommended foods and the ease in which less desirable dietary patterns can be managed.

The majority of nutrition education programs for older adults offer some discussion/engagement with physical activity. As we age, functional and physiological maintenance is critical for autonomy and quality of life. Maintenance of cardiovascular health, muscular-skeletal strength, weight maintenance, and comprehensive health and wellness, require regular physical activity.[115] In the Hidalgo County *colonias* of South Texas adverse living conditions, unsafe streets or neighborhoods (largely due to

unleashed dogs and gang activity), and lack of recreational facilities create many barriers to obtaining adequate physical activity. In a study on health-related quality of life of *colonias* residents, living in a *colonia* for 10 years or more was a predictor of lower physical and mental health status.[25] Residents in these areas, even those fully informed and motivated, find it difficult to follow recommendations for healthy dietary and physical activity patterns. When developing nutrition education curricula for this population, one must take into account this and the multitude of other barriers, challenges, and dilemmas that can thwart any good intentions to achieve efficacious outcomes.

2.5. Limitations of Current Research and Practice

Much of the existing literature regarding hunger and food insecurity involves the effects on low-income women and children, given the elevated risk level among these groups.[116] Having at least one older adult (age 60 and older) within a household is associated with lower risk of food insecurity. In fact, older adults in the U.S. have food insecurity rates that are lower than the national average; paradoxically, older adults who are Hispanic, low-income, low-literacy and primarily Spanish-speaking have food insecurity rates well above the national average.[117] Despite this evidence, very few studies thoroughly examine the root causes, effects, and experiences of hunger in seniors, namely in MH individuals. In the U.S., more than six million senior citizens live in poverty and the number of food insecure seniors is expected to increase 50% by 2025.[46] Aims to reach this population with a holistic, home-based educational approach

will be validated, valuable, and culturally-grounded in effort to fill critical gaps within current literature and practice.[118]

Intervention science would benefit from innovative and alternative approaches to understanding the determinants and addressing the barriers and risks of hunger and food insecurity in MH seniors and in other populations of high-risk, hard-to-reach individuals. Among public health programs aimed combating hunger and food insecurity, face-to-face interventions conducted within the home are seldom used in research despite the fact that interpersonal and home environments play a crucial role in one's ability to adequately afford, access, store, and prepare safe and nutritious foods.[118] Intervention strategies that include a home-based education model may offer a greater reach and impact among populations of older community-dwelling adults. I believe an innovative and holistic home-based intervention will lead us to important insights on hunger and food insecurity among hard-to-reach and medically underserved populations—ultimately resulting in novel targets for the reduction of hunger and food insecurity.

3. PAPER 1: CHARACTERIZATIONS OF HUNGER AND FOOD INSECURITY AMONG SENIORS OF MEXICAN HERITAGE: FOCUS GROUP FINDINGS

3.1. Introduction

One in twelve senior adults (age 60 and older) in the Unites States is living with food insecurity and seniors of Hispanic origin are nearly twice as likely to experience hunger and food insecurity as the rest of the population.[44,45,48] *Food insecurity* has been defined as the "limited or uncertain access to nutritionally adequate and safe food or limited or uncertain ability to acquire foods in socially acceptable ways."[70] Conversely, *food secure* individuals and households have consistent and dependable access to adequate, appropriate, and safe diet of nutritious food and water to meet dietary needs and support an active, healthy life.[71,72] Four key components of food security are: economic access to food (i.e., having enough money to purchase food); physical access to food (i.e., ability to acquire safe, quality, appropriate food given available transport); access to safe, quality and appropriate foods necessary for health (includes foods that are socially and culturally appropriate); and having a sustainable supply of safe and nutritionally adequate foods.[119] The common denominator in these four components is *access*.

Food access—often characterized as either economic or physical access to food—can be defined as the availability and accessibility of affordable, nutritious, and safe food sources. Physical access can be negatively impacted by one's geographic location; in addition, the lack of reliable transportation, unpredictable regional food

supply, proximity to food deserts, rural or urban area of residence, and food environment quality can negatively impact access.[27] Issues with physical access are further exacerbated where issues of economic access are involved. Individuals who experience economic hardship, whether in acute occurrence or persistent poverty have limited economic resources necessary to access safe food items that are both nutritious and affordable. Specifically, seniors (age 60 and older) of ethnic minority are particularly vulnerable as they experience tremendous challenges to food access and a heightened prevalence of food insecurity due to limited financial and household resources.[11,48,120] Furthermore, lack of personal and/or public transportation leads to delayed and/or challenging access to affordable food supplies, decreased availability of healthful foods, higher food prices, and increased risk for poor nutritional health and engagement in poor dietary behaviors.

Though seniors in the U.S. are generally more food secure when compared to other subpopulations (e.g., children, adolescents, and single mothers), seniors of ethnic minority who live in poverty are at high risk for chronic food insecurity.[11,87,121,122] At present, approximately one in four Hispanic adults over the age of 50 experience food insecurity.[45] Many critical factors contribute to the threat of hunger and food insecurity among Hispanic seniors in the United States, yet they have yet to be well-defined in this population. Complex challenges to food access such as transportation, income, distance, physical mobility, and grocery store usage and access remain important issues for all community-dwelling seniors.[123] Specifically, seniors of Mexican heritage (MH, i.e., individuals who trace their origin or descent to Mexico) who reside in rural Texas-

Mexico border *colonias* have food access and security concerns that are unique to their cultural and social environments.

The purpose of this study was to utilize secondary data from the *Senior Hunger Project* to understand the meanings and manifestations of food access and food security from the perspective of MH seniors who reside in Texas-Mexico border *colonias*. This study involved an in-depth, qualitative examination of the experiences and conceptualizations of food access and food security among this at-risk and poverty-prone population. This approach delivers dense narrative and textured description of the studied phenomena, which cannot be achieved through quantitative analysis. Based on qualitative review of participant comments, the emergent themes were examined utilizing grounded theory.[124] These qualitative data enhance a growing body of evidence that interventions targeting food insecurity among MH seniors should focus on socio-cultural and ecological influences. This study enabled the assessment of the nature of participant experiences with food access and insecurity as well as the copious contributing factors; ultimately, to gain greater understanding and distinctive insights on the phenomena of hunger and food insecurity and work toward their prevention.

3.2. Methods

3.2.1. Focus Group Participants

MH seniors (n = 95) were recruited through door-to-door and word-of-mouth approaches by *promotora*-researchers for focus group (FG) discussions in four geographic areas of rural South Texas. Fourteen FGs were conducted from February 2012 through March 2012 in community locations in Alton, San Carlos, Progreso, and

Penitas, Texas. Participants were mostly female (n = 73, 73.8%) with an average education level between 1 and 9 years (n = 71, 74.7%) and a mean age of approximately 66 years (65.9 $\pm$ 10.8). Focus groups lasted an average of 52 minutes (40:30 to 67:25 minutes) and all participants gave oral consent and received a small monetary incentive after the FG was completed.

3.2.2. Qualitative Methodology

The purpose of the focus groups was to obtain information, experiences, and insights on hunger and food insecurity from representative members of the priority population; ultimately, aiding in the development of a hunger risk-reduction nutrition education and skill building curriculum for MH seniors. The formal, semi-structured FGs were moderated and observed by four female *promotora*-researchers (also known as *promotoras de salud* or community health workers) who completed training in FG facilitation. All study personnel completed human subjects' research Collaborative Institutional Training Initiative (CITI) training. All FG sessions were conducted in Spanish, as preferred by all participants. A 12-question FG interview guide was developed by experts on the study team (e.g., registered dietitian, expert in the field of nutrition and aging) in collaboration with community partners based on a review of current food insecurity literature (Appendix A). Formal pilot testing of the interview guide was undertaken with a representative sample prior to the initial FG. Discussion topics included current barriers/facilitators to food access, financial constraints, experiences with food insufficiency and feelings of hunger, financial trade-offs, coping mechanisms, meal preparation, nutrition-related knowledge/attitudes/behaviors, and

perceptions/awareness of community food resources. Each discussion topic included additional questions for *promotoras* to use for prompting additional discussion from participants. A brief Spanish-language survey to assess participant characteristics was administered prior to each FG. The FGs were digitally recorded, transcribed verbatim, then translated to English by the research team linguistic core; each transcript was reviewed for accuracy by study team transcriptionists.

3.2.3. Thematic Analysis

Focus group data were analyzed using an iterative process informed by grounded theory.[124] An inductive coding scheme was developed that addressed MH seniors' perspectives of food insecurity and hunger. A code book was systematically developed during the process of individual reading and re-reading of transcripts. Additionally, with the use of Atlas.ti version 7.0[125] qualitative analysis software, all FG data were coded and organized into thematic clusters with themes and subthemes identified and assigned. Participant narratives were also manually sorted and sifted[126] by one other research team member to identify similar phrases, patterns, themes, and common sequences. Multiple research team observers and use of software secured the process of triangulation by offering additional avenues for validation.[127] Selected quotes were general representations of participant narratives under select conceptual categories (Table 3.1).

The initial approach to the analysis of these data was inductive in nature, with no a priori hypotheses about the meaning of food access and food security among MH seniors who reside in Texas-Mexico border *colonias*. However, it was evident upon initial review of the transcripts that discussions related to food insecurity began to

manifest into three conceptual categories: 1) Characterizations of hunger and food insecurity; 2) Barriers to food access and food security; and 3) Management of hunger and food insecurity (Table 3.1.). In a second round of analysis, transcripts revealed that MH seniors engaged in a number of coping strategies and both customary and unconventional methods of acquiring food assistance. From this analysis, the role of coping strategies, food assistance programs, and socio-familial support in enhancing the food security of low-income households were elucidated. All study procedures were approved by the Institutional Review Board (IRB) at Texas A&M University in College Station.

Table 3.1. Manifestations of hunger and food insecurity among older adults of Mexican heritage

Categories	**Themes**
1. Characterizations of Hunger and Food Insecurity	Childhood experiences What it means to "have enough" Physiology and psychology of hunger
2. Barriers to Food Access and Food Security	Economic hardship Lack of interpersonal support systems Availability of Transportation Being a burden
3. Management of Hunger and Food Insecurity	Mechanisms of coping Interpersonal support systems Financial management strategies Financial & food assistance (formal/informal) Spirituality & faith-based coping strategies Nutrition-related factors of resource mgmt. Nutrition education and skills for resource maximization

3.3. Results

Most participants stated they were born in Mexico (91.6%, n = 87) with an average of 29 years (29.2 ± 17.7) residency in the U.S (Table 3.2.). Less than a quarter of the participants (21%, n = 20) indicated they live alone and nearly two-thirds (63.2%, n = 60) reported a monthly household income below $700. Over half of all participants receive Supplemental Nutrition Assistance Program (SNAP) benefits (56.8%, n = 54) and approximately one-third (35.8%, n = 34) receive food/meals from a local food pantry or church. Many participants reside in multi-generational households and some admitted to caring for young grandchildren as if they were their own.

3.3.1. Characterizations of Hunger and Food Insecurity

Four main themes were identified regarding participants' classifications and descriptions of hunger and food insecurity, they include: childhood experiences with hunger, what it means to "have enough," and physiological and psychological expressions of hunger.

Childhood Experiences with Hunger

When participants were asked to share their memories of childhood and experiences with hunger, many described a childhood where hunger and general deprivation were significant and chronic concerns. Although, some participants spoke of abundance through the growing of fruit and vegetables, gathering of wild plants (e.g., *nopales* [cactus pads], *tunas* [cactus fruit], *mezquite* [mesquite tree beans]), and raising their own cattle, goats, chickens, and pigs. One participant was proud of her abundant childhood

Table 3.2. Demographics of a cohort of 95 older adults of Mexican heritage participating in focus group data collection on food access and food security

Characteristic	%	N	Mean	S.D.
Gender				
Female	73.8	73		
Age (years)			65.9	± 10.8
Education (highest level completed)				
No school	17.9	17		
1- 9 years	74.7	71		
Ethnicity (self-identified)				
Hispanic or Latino	95.8	91		
Marital Status				
Married	55.8	53		
Nativity				
Mexico	91.6	87		
Length of time in U.S. (years)			29.2	± 17.7
Number of individuals in household			3.3	± 2.0
Live alone	21	20		
Monthly household income				
< $700/month	63.2	6		
Current employment status				
No one in the household is employed	22.1	21		
Food assistance programs				
SNAP (formerly known as Food Stamps)	56.8	54		
Senior congregate meals	24.2	23		
Food pantry and/or church	35.8	34		
Chronic health conditions				
Diabetes Mellitus (type 1 or 2)	35.8	34		
Heart disease	24.2	23		
Lung or respiratory	15.8	15		

food supply stating that all their food was homegrown and raised without the addition of preservatives and chemicals. She credits the American food supply for chronic disease, obesity, and illness. Similarly, another participant commented that she would eat more healthfully as a child because they consumed foods that were home-raised or planted: "Most all the things were natural. Not today, now everything is contaminated." One female participant noted that her mother taught her to eat from the land and what is "given by the earth." As a child, she and her family foraged for herbs and wild plants to eat and the participant believes this is the reason she has never been diagnosed with a chronic disease.

Despite reports of large families on average (i.e. greater than six children), the participants discussed memories of generally happy childhoods with some recollections of hunger, emotional trauma, and deprivation. A few participants expressed their pain in remembrance and while others just sobbed, "We better not talk about it. I don't like talking about that. It's a soap opera. A long story. It was a poor childhood…but at least it is over." One participant explained, "Our diets were poor. Mostly beans, potatoes, and *nopales*…but there was something to eat." One female participant noted that she did not have a normal childhood like other girls who were allowed to play. She said, "for us it was just work, we didn't go hungry, but we worked hard." One participant recollects that her father was an alcoholic and she and her family were frequently hungry throughout her childhood. She would tell her mother she was hungry: "My mom would say, 'Stand up and drink a glass.' I would drink water and I would relieve my hunger, it was very difficult."

Though many of the seniors in the study did recall the lack of material goods (e.g., toys, games), others recalled the lack of basic necessities such as adequate clothing, shoes, and beds/bedding/pillows. One participant noted that her chores involved tending to the family goats. She had no shoes of her own, so she would walk outside on cold mornings and place her bare feet underneath the sleeping goats just to keep her feet warm. Another participant stated that none of the family had beds to sleep on, so they slept on the dirt floor while using their leather sandals as pillows. One female participant spoke of her childhood experiences with poverty by saying that the only financial support her family received was the money earned from growing and selling bundles of cilantro. Most participants responded that *God, my Savior, or Jesus Christ* would never let children suffer; thus, they believed they were never without food and basic necessities. A few participants commented that they never experienced suffering and economic hardship until they were married (Note: many of the participants married very young, as teenagers). Interestingly, seniors found life in the United States to be more difficult in terms of finding adequate work and resources to 'make ends meet.'

What it Means to "Have Enough"

The participants in this study are mostly food insecure to some degree. However, food insecurity does not unsettle these seniors in that having "some food" or a "little of something" does not leave them entirely destitute. One male participant commented with a collective message: "It's good to have something, anything, even if it's just beans." A few of the seniors noted that having good health was more important than having adequate food, despite the fact that one precludes the other. Also of note is a culturally

familiar adage: “The food is falling out of the refrigerator.” A few participants commented that they organize themselves (e.g., budgeting, meal planning) in such a way that they maintain a moderate food supply for their families despite limited financial resources. However, they comment that a moderate food supply does not equate to abundancy where food is “falling out of the refrigerator.” If one is ever identified as having a surplus or more than enough to survive, their food supply is “falling out of the refrigerator.”

Physiology and Psychology of Hunger

Notably, the simple act of discussing food and food-related topics was difficult for some participants because it allowed them to conceptualize certain food items, which exacerbated physiological and psychological feelings of hunger. A few participants begged others to “stop talking about that [specific foods/meals]” and “please don’t say *bistek* or *barbacoa* [steak or barbequed meat]” simply to avoid the thought of not having immediate or proximal access to desirable food items. One participant admitted that when she experiences hunger, she mentally “ties up her guts into a knot” so that hunger becomes a tolerable sensation. Another participant mentioned that she would love to eat meat, but she has not been able to afford it. Therefore, she walks through the meat section of a grocery store and imagines herself purchasing her favorite cuts of meat, just to experience the thought of eating them.

A number of participants noted they undergo bouts of depression and/or anxiety when it is time to purchase groceries and the money is not available. These participants commented that they pay all the monthly bills first (e.g., electricity, water/septic, phone,

medications, rent) then whatever remains is budgeted for food; often, little to no money remains. A few participants admit to feelings of absolute desperation and food purchases tend to be the last household priority for these individuals. Most of the participants harbored mixed emotions about deprivation—those who confessed to recurrent feelings of depression and desperation also cited that they were comforted by their religious faith and an intrinsic spirit of optimism.

3.3.2. Barriers to Food Access and Food Security

The barriers listed in this category include individual hardships and lack of intrapersonal networks as well institutional barriers. The four main themes identified for this category include: economic hardship, lack of intrapersonal support systems, availability of transportation, and being a burden.

Economic Hardship

With few exceptions, all of the participants noted significant economic barriers to adequate food access and consumption. Discussions regarding financial hardship triggered a few participants to become emotional by wiping their eyes, sobbing, sniffling, or excusing themselves from the room/discussion. One female participant professed: "You suffer a lot when you immigrate." Most participants attributed their hardship to the lack of work and available jobs. One participant noted that many people in the community are forced to migrate north (i.e., northern-most states in the U.S.) in order to find work that is typically agricultural in nature. A female participant admitted her husband is jobless after twelve years with one company and he often tells her, "Let's go back to Mexico."

Some say the jobs just aren't available, but many others claim that even if the jobs were available, they are turned down for work because of their age. "My age, the age that I have, well even if I would want to work and this and that, they don't, don't need me, they don't need me anymore." Others mentioned that they "flat out tell you no" and "they tell you they can't hire you." Furthermore, physical impairment and disability as a result of age, poor health, or injury exacerbate this problem making it "difficult to go and earn money, to bring money home." This underlying barrier, the threat of ageism, was quite evident across participant narratives. Seniors in the population who were physically capable of completing job tasks were limited only by their age. Employers in their geographical area were looking to hire employees who were younger, stronger and in relatively better health. The seniors who had physical limitations were simply turned away from job opportunities and were left, as they say, "hopeless."

Without work, and the promise of little to no income, paying household bills is great challenge for many of the participants and often the money runs out before all bills can be paid; often resulting in an absence of food. "When I get the check [Social Security] and right away, right away I pay my bills, even if I don't have enough for food." This participant is not unlike many others who often have little to no money remaining after receiving various forms of financial assistance. One male participant stated: "The one who has money pays one thing and ends up owing another…that's how it is."

For the majority of the participants, coping with hardship and deprivation is a familiar way of life. "I know what it's like to live poor and which is what I've lived as

all my life. It's not that difficult for me." One female participant assures: "You know what, we are not going to die of hunger because if I didn't die of hunger, I tell you, right now I'm going to make beans with flour tortilla and that." One *promotora* asked a group of FG participants about the extent of financial need in their community. One participant replied: "Right now that's how we live, normally," three other participants nodded and responded in agreement.

For some participants, economic hardship equates to not being able to provide for their children and/or grandchildren. One participant stated her greatest fear is that her lack of money will encourage criminal activity in her teenage/young adult children, "I fear that my kids will take a wrong turn, that they will do things that they're not supposed to do but they will do those things just to get money or to have a new pair of jeans, a new shirt, or simply just to get out, I, I don't have the money…God knows well that I'm not lying, I don't have the money." It is well-documented that youth from low-income communities and familial-structures are more vulnerable to delinquency and high risk behavior, as they generally lack the opportunities and resources that lead to better outcomes.[128] In times of great hardship, participants admit they rely on socio-familial support such as family, friends, church, or *God* to provide for them. One participant mentioned she had a neighbor who was struggling financially. She cried as she said that she had to ask her daughter for money to give them because she could not help them herself.

Lack of Interpersonal Support Systems

Though socio-familial support was indicated by most participants as their sole source of relief from hunger and food insecurity, some participants commented that even if their family members or neighbors wanted to help financially, many of them feasibly cannot. One participant stated that her son has many children and he is limited on what he has to spend on groceries. The participant goes on to note that a few times she has had to give up what little she has to support her son and his family. Another participant tearfully admitted that she has eight children and none of them offer her financial support, nor do they stop by her house to visit her. Similarly, one female participant commented that she has fourteen children, but only three of them offer her any financial and/or social support: "It's doesn't matter that we have a hundred [children], but out of the one hundred we shouldn't count one hundred, we should only count the ones that help you out." Similar situations are reflected in the stories of other seniors who have numerous family members, but few offer financial assistance or social support.

A small number of participants admitted to not knowing or maintaining communication with community members or neighbors within their respective *colonia*. According to these participants, familiarity among neighbors was substantial enough to ask for help in the time of need, if necessary, but frequent communication and comradery were not consistently maintained. One participant stated, "Here almost no one, the one who has [food to eat], ate, and the one who doesn't, just [watches] [other people eat it]. Here there's none of this, "well [please] lend me or give me," none [of that]." The participants in this particular geographical area all agreed that they had

similar opinions and experiences within their respective *colonias* and the concept of communal food sharing was uncommon in their location.

Availability of Transportation

For many participants, having their own vehicle or at the very least a neighbor, friend or family member to ask for a ride to the grocery store allows for relative ease in accessing healthful, affordable foods. However, many of the seniors in this study did not own vehicles or have a valid state driver's license, nor did they have friends, family, or neighbors for whom they could rely to provide transportation: "For those of us who don't drive, we're just hoping for someone to drive us around and buy groceries." One participant commented that grocery stores were relatively close to her *colonia*, however: "You can't go walking here as well, transportation is always needed. Because you have to watch out with the dogs, because here there's more quantity of dogs than people." Others commented that it is also difficult to access their drinking water from the water mills without transportation. For those who owned vehicles, the high price of fuel became the topic of discussion and seniors would admittedly avoid driving to more affordable grocery stores, or avoid driving altogether, because of the cost.

Due to the rurality of most Texas-Mexico border *colonias*, most—if not all—of these neighborhoods are not within a safe and reasonable walking distance to an affordable grocery store. "We need a food store in this area…that can give reasonable prices." In addition to similar comments by many other participants, one male participant agreed: "We have just small ones [grocery stores] in the community…where everything is more expensive." And a third comment specific to access: "We need a

store close by so we can easily access food without no problems." While discussing the possibility of walking to a near-by grocery store, one male participant retorted: "How could you go out? You can't really walk far enough before you get tired, or you then have the police asking you, 'Where are you from? What are you doing? Why are you walking?' Right? You're immediately going to fail." Several participants commented about the need for an easily accessible farmers market. One female participant noted that a near-by community has a farmers' market that sells many low cost fruits and vegetables, she says: "That's also needed here." Throughout the FG discussions, it is evident that seniors who reside in *colonias* are aware of food access issues within their communities and desire affordable, safe transportation and proximal access to an affordable food supply.

Being a Burden

Though some of the participants had no reservations about reaching out to their social networks for financial assistance and food, others preferred not to burden others regardless their current level of hardship. One participant spoke of her neighbor who has a husband who is sick and blind. Her neighbor struggles financially because she cannot find work, however the neighbor never asks for nor accepts help even when the participant offers food and some financial assistance. Another participant admits that she and her husband are too proud to ask family members for financial assistance, even when they are desperately in need. Conversely, other participants say they are hesitant to ask for financial help but their spouses are forthright when asking for assistance from adult children or other family members, and vice versa. Some seniors in this study stated

they refuse to ask for or accept financial and/or food assistance—doing so is to place a burden on others. One male participant agreed: "Well the thing is that they [his children] have their own families and we shouldn't always bother them too much."

3.3.3. Management of Hunger and Food Insecurity

Seven main themes arose from the senior FGs that outline strategies used by the participants to manage feelings of hunger and/or limited food supply. These themes include: mechanisms of coping, interpersonal support systems, financial management strategies, acquisition of formal and informal financial assistance, spirituality or faith-based coping strategies, nutrition-related factors of resource management, and nutrition education and skills for resource maximization.

Mechanisms of Coping

From economic hardship rises entrepreneurialism—especially within the *colonias*. Many participants, who no longer work due to lack of jobs or disability, commented that in order to earn money, they utilized their knowledge and skills for commerce. For example, many of the females in this study prepare "food plates," *tamales, taquitos*, and *empanadas* to sell within their neighborhoods, churches, and local schools. One female participant commented that she taught herself how to do intricate needlework so she could sell her finished products (e.g., napkins, doilies, tablecloths) in the *pulgas* or flea markets. Some male participants disclosed that they pick up aluminum cans from roadsides and trash receptacles. Others mentioned they collect scrap metal (e.g., sheet metal, copper) and other recyclable materials for cash. Many of the female participants who no longer work will earn money from their adult children by caring for

grandchildren. “By babysitting my grandchildren, I can buy my groceries and pay my bills.”

A few participants commented that they coped with hardship by carefully budgeting their money each month in order to manage. One participant noted: “I buy the most necessary and if I have money left over I’ll buy meat, if not just potatoes and beans.” Other participants agreed that if bills were higher than usual on any given month, food purchases were limited to bare essentials—which for this population consists mostly of beans, rice, potatoes, *tortillas*, *nopales,* and drinking water. Despite dietary monotony, participants mentioned one method of coping with food insecurity was to purchase the least expensive (i.e., store brand), most shelf stable food items for consumption. As one female participant mentioned: “A pot of beans and it was always like that and the months went by and we never went hungry because we always figured a way out. It’s already been in my blood ever since I was in Mexico.” Another participant commented: “Right now sweetie, right now in the present time that we live in, there’s a lot of help. The one who…doesn’t want the help is because of pride. If you need food, if you need to feed your children, well hey, go for it…look for the resources.” Another participant proudly exclaims: “As for me, I know how to persevere… and everything I learned in my life, uhm, I learned it on my own because of the need that I had of looking for it. I was one of the first ones here who came to this *colonia*, I’ve been here for twenty-five years, and I’m still the same, persevering the same.” A few participants mentioned they use coupons for regularly purchased items in order to save more of their allotted food dollars. The majority of the participants stated they best coped with

economic hardship and food insecurity by reaching out to friends, family, neighbors, and other social networks for support.

Interpersonal Support Systems

Most participants in this study admitted they are unable to provide for themselves and must reach out to their greater social networks (e.g., friends, immediate and extended family, neighbors, churches, and community organizations) for financial support and/or meals. Some participants with adult children and grandchildren say they must ask for things they need, while others stated their children and grandchildren provided for them abundantly without reservation. One female participant stated: "My money lasts because people help me." And another proclaims: "Friends in my *colonia* see me and know I have need. I don't know where they get it, but they give me bags of food."

Most participants mentioned they give to others who are less fortunate than them, even when they are experiencing similar hardships: "I will give them ten dollars or something, but well, I also need it…It hurts you to see them suffer, but well you also don't have anything." One female participant proudly admitted: "You don't give because you have a lot leftover, but you give because you feel others people's necessity." Another female professed: "If I don't get enough food I'm happy, really happy that all the children [figure of speech] ate." A male participant agreed that it is socially requisite to share with others: "Well either way, since we're members of the same community, neighbors, well you have to share with the other." Another participant offers a story about assistance she provided to a young man and his family:

> "I told my daughter, 'Take this to the young man for me. He hasn't eaten in three days and he has his wife and his child without eating. I tell my niece, 'He's like us when we first arrived here and I have to help him.' I sent him canned food the following week and I gathered him a bit more things and I went and told him, 'Look, so that you won't have a hard time obtaining food."

Numerous stories of assistance, both given and received, from seniors in this study are indicative of the importance of social-familial support within and among community members.

Financial Management Strategies

Whether financial assistance and/or meals and provisions were provided, many seniors in this population have learned how to maximize their limited resources. Participants who receive government assistance (e.g., SNAP) and/or social security benefits discussed a variety of methods to "stretching" their "stamps" and monthly food dollars. Primarily, participants discussed that fresh beef and pork products are considered luxury items and are seldom purchased; chicken products and hot dogs are preferred because of the nominal price per pound. In addition to meat products, participants stated they make their food supply last longer by purchasing dry beans, rice, ramen noodle soup packages, and by preparing corn and flour tortillas and fresh *nopales* (i.e., cactus plant/pads) that grow locally.

Going out to eat at restaurants is not a common practice for most of the participants. The seniors in this study stated they would rather save what little money they have and purchase food items that would last versus paying the relatively large

expense to dine out. Most participants stated they only ate at restaurants when a friend or family member treated them to a meal. One participant informs her FG how she was taught to save money as a child, however current limitations in income make saving an impossibility: “You want to save money, you buy the most inexpensive things, you want to save up but it’s not possible.”

Most FG discussions included conversations regarding the management and organization of one’s household or self. The priority of monthly income overwhelmingly belonged to bills (e.g., electricity, water/septic, land/rent, unpaid taxes) and whatever remained was allocated among miscellaneous expenditures (e.g., food costs, medical visits, telephone, medication, transportation costs). In fact, many participants stated that paying their bills was more important than any other purchase, including food, toiletries, and clothing. In all, FG responses, both male and female participants discussed the importance of being parsimonious and exercising good financial management. Unfortunately for some, economic prudence can adversely affect health through lack of nutritional variety (as discussed previously) and inadequate healthcare. One female participant considers doctor appointments and some medications to be “a waste of money.” Similarly, another participant lamented: “For me, just purchasing medicine means wasting a lot of money, every month I have to buy seven medications and well the Medicaid only covers three. If I didn’t have enough [food], well I can do without it for more than a day, but I must never be without medication.” To that end, other participants complained about the cost of physician visits and medications in the U.S. versus the more affordable care offered in Mexico.

Formal and Informal Financial and Food Assistance

Local and federal food and nutrition assistance programs (e.g., food banks, church food pantries, Senior Centers, and SNAP are an immense help to this population of mostly food insecure seniors. Furthermore, social security administration (SSA) payments, Medicare, and Medicaid subsidies either supplement or wholly function as the livelihoods of the majority of the study participants. Though some of our participants were not legally eligible for federal assistance, such as SNAP and Food Bank resources, many of those who were had difficulty requesting and receiving benefits or were turned down for various reasons. In fact, of the more than 7 million seniors who are eligible for SNAP benefits, less than one-third of them actually receive benefits.[45] One participant proclaimed: "If they wouldn't give us that help, what would the people do?" Another participant stated she would not "make it through" without SNAP assistance. She further confirmed: "With my food I don't say, 'oh, junk food!' none of that…. we always have food, but we have only what we need."

For those who do not receive SNAP benefits, some of the participants discussed resource sharing with others. In other words, individuals who do receive SNAP benefits would share these benefits with others who do not. Other participants have said that their SNAP benefits are what keep them from going hungry every month. When asked if she receives financial assistance one participant responded: "I never go ask for help, because first of all, I don't know about it, and secondly, there's no one to take me, but I've never asked for help, thank my God that if I only have beans and *chile*, tomatoes, and onion, with that I'm, I'm rich." Another female participant proudly proclaimed that she still

works in the fields even though her employer and family members want her to stop. She refuses to seek government assistance while she has the ability to help herself: "I have to sweat in order to eat! Okay? That's how I buy my food."

Local senior centers also offer meals (i.e., breakfast and lunch) and services (e.g., transportation) to seniors and many of the participants frequent these centers. Generally, the participants who go to the senior centers are happy to be offered hot meals, however most are disappointed with the lack of flavor and methods of preparation. Many of the participants noted that they only eat the fresh fruits and vegetables that are provided because they dislike the meals. One female participant stated her husband encourages her to join him at the senior center for meals, but she responds that she is perfectly capable of cooking their own meals. To many, the most important service offered by the senior centers is transportation to medical appointments and supermarkets.

Additionally, one of the local community resource centers (CRCs) hosts a senior food bank distribution once a month. Some of the participants in our FGs commented that they receive food and toiletries from this service and that the benefit is significant. Other FG participants were surprised to know this service was available and were able to gain information about registering through discussions with those participants who receive food bank benefits. However, some participants noted that not everyone qualifies to receive these benefits and this introduces further limitations to individuals who seek food assistance. Others mentioned they attempted to receive benefits from the Food Bank of the Rio Grande Valley in McAllen, Texas, but did not qualify for assistance without valid proof of citizenship or a social security number; also known as having

"papers." As one female participant put it: "There are people that, that don't have documents right, and they are the ones that really suffer the most."

Spirituality or Faith-based Coping Strategies

Much of the resiliency and strength of the participants is attributed to their belief that "God will not deal you more than you can handle." The majority of the participants in this study commented that they rely on their religious faith to carry them through financial and emotional difficulties. In fact, religious faith was a prominent theme in each of the fourteen FGs. Many participants stated that *God, Jehovah God, Jesus,* or *Lord* is the reason they are able to eat, pay bills, remain in relatively good health, and survive. One female participant noted: "He gives us wisdom…to deal with whatever food we are left with." Another female participant declared: "I get depressed a lot…but no, I leave it to God and out of nowhere, before you know it, we have food." In another FG, a participant began to cry while sharing her stories of financial difficulty. The participant sitting next to her assured: "But God is going to help us." One female participant spoke of past hardship while trying to support her young children as a single mother of six: "I would stay thinking and, 'What am I going to give [my children] for breakfast before they leave [for school]?' Well if they don't leave having eaten something, they will not learn anything with an empty stomach, uhm, and but my word of all my life has been: 'God will provide.'" When asked how they are able to acquire food for consumption, several participants responded similarly, "from God, of course," and "God always provides what we need."

Additionally, participants believe that helping others who are in need will be recognized in the eyes of God, and therefore they will be equally or abundantly blessed. One female participant commented: "For me, the blessings I receive, I pass them on." Another female participant noted she was the recipient of such blessings: "A man who had just finished paying for his groceries comes over to me and gives me rolled up bills. He tells me, 'Here, this is yours.' And I said, 'Well, thank you, may God help you and fill you with blessings on my behalf.'

Nutrition-related Factors of Resource Management

Meal planning, food purchasing/selection, food preparation, and food storage are important elements of total dietary intake within this population. Some participants mentioned they preserve some foods similarly to how their parents preserved foods in Mexico, without refrigeration. Many seniors discussed the fact that they dry and 'pickle' their foods (e.g., herbs, meats, vegetables) to extend their shelf life with minimal risk of spoilage. One participant noted she could store food for months if it was marinated well in salt and lemon. Multiple others compared the foods they ate in Mexico to those they eat here in the U.S. and participants offered negative comments regarding the production of foods (e.g., meat products, vegetables, and fruit) here; they added that the food sources in Mexico were "fresh," "clean," and "more natural." One male participant commented that he eats beans every day, not because of financial hardship, but because "I really don't like prepared food from here [U.S.]." Many participants are convinced that processed foods made in the U.S. cause chronic disease and even early death and

nearly all participants commented that eating food prepared at home (i.e., cooking from scratch) is the preferred method of consumption.

Beans, potatoes, *nopales*, milk, and tortillas were identified as the most indispensable staples within FG participant households, though the cost of milk was considered too expensive for most. When asked about food selection and purchasing, one female participant responded: "Regularly we eat more vegetables…because at this age we don't have the luxury to, to eat a lot of greasy food." When asked a similar question, another female responded with:

> "Also for health, right! Also like me, my husband uhm had a heart attack and also now that he goes to the doctor and then he sends him right away to the nutritionist to see what types of foods he can eat, and that's what ***(M-*** *'Exactly.')* they advised us; more vegetables, more, not a lot of red meats and well even if you want to eat red meat you can't, right! You can't. I, I can eat it but, well, sometimes I don't buy it because well I feel bad that my husband would be looking at me [eating red meat]. I rather share what we eat. What one eats, the both will eat."

Another participant admits: "Vegetables were my enemy [referring to her hating vegetables] and now it's what I eat the most, just steamed vegetables." One male participant believes poor dietary choices and behaviors are the result of a lack of awareness and information. Furthermore, a few of the participants commented that more healthful foods were actually less expensive than red meats, fast-food items, and highly

processed products because among other reasons, they resulted in less illness and doctor visits.

Nutrition Education and Skills for Resource Maximization

Near the end of each FG session, participants were asked to provide insight on the types of nutrition-related education, information, and skills they desired. Participants widely agreed that nutrition education and skill-building sessions would be well-received by community members and are important "for people at our age." Seniors agreed that potential skill-building discussions should include strategies on how to budget their money, how to acquire and budget SNAP benefits, etc., as well as learning how to purchase, prepare, and store their food supply to make it last. Also, participants collectively believed that there exists a great deal of need for health and nutrition information within the *colonias*. One participant specifically asked for a nutritionist (or registered dietitian/nutritionist) by stating: "I want to talk with someone who has more experience than us in regards to food." Others admitted it would be beneficial to have tailored nutrition information; in particular, for chronic disease management (e.g., diabetes, hypertension, hypercholesterolemia).

A few participants mentioned they have received nutrition information from the senior centers, but one participant did not agree that this information was well-explained: "I don't know, if they do [provide explanation], they give us a small paper of the food pyramid." Another participant admitted that she and her husband went to a nutrition class and were taught how to read food labels: "This is all good information, but we don't know how to read." These individuals are not unlike many seniors in the *colonias*

who have experienced difficulties throughout the life-cycle due to illiteracy. Only one male participant admitted his illiteracy was the result of an exclusive education system in Mexico. In his hometown, families were asked to pay tuition (i.e., teacher salaries) for their children to go to school. Those who could not afford the education did not receive schooling and were often committed to labor. A solution to the illiteracy dilemma was offered by another participant who also lacked the ability to read and write: "If I can see what you are doing, I could do it too." Alluding to the point that hands-on education will be a critical element for developing nutrition education programs in this particular population.

Most participants agreed that group learning in a central location would be best as that particular setting would encourage group-think and is an opportunity for social interaction. One participant asserted: "There is a lot of need for information here. We talk as a way to distribute information to everyone [neighbors, family]. Why not, as how we are right now, have a place where we could all get together and talk about this [nutrition education], right?" In the same vein, a *promotora* FG facilitator said it best when she remarked:

> "We are creating a network of information here and that's important because I'm listening that there's an importance to having an open conversation between each other, so that way we can share interests, worries that we might have in our daily life, necessities, important things and all of that, for that I tell you that this is all very important. *(Female Voices- 'Yes' 'Yes.')* We are moving forward, and this is something very important."

Along the theme of resource-sharing and networking, one participant stated: "I didn't know that I could get my prescriptions from the *XYZ* Family Clinic. All this information came out by sharing in focus groups." Conversely, others were keen on the idea of having discussions within their homes as transportation would be a challenge. A few participants commented that cooking classes within their homes would also be beneficial and enjoyable. Most all participants agreed that education, guidance, and group discussions, whether in a home-based or community setting, are desired and necessary for this population. Per one female participant:

> "There should be a place, right, and to have someone teach us right, that they talk to us about nutrition, of how to prepare meals and everything like that. There must be someone that would come to knock on your door, "Look here's a [flyer]. Here is a place for you to go. There will be talks on nutrition, the foods that we should eat and the ones that we [should not]. The ones that we can," …That's very, to me that's very important, because at my age and uhm, I cannot eat as much. Yes, it is very important, to have someone, a place that they would talk to us, [people] at our age."

3.4. Discussion

The National Foundation to End Senior Hunger (NFESH) released a recent study (2015) entitled *State of Senior Hunger in America 2013: An Annual Report* highlighting the increased risk of hunger and food insecurity among racial or ethnic minorities, those with lower incomes and those between the ages of 60 and 69.[120] In addition to a growing body of evidence, recent initiatives to combat senior hunger (e.g., AARP (formerly the

American Association of Retired Persons) Foundation's *Drive to End Hunger*, and the *Texas Hunger Initiative*) emphasize the importance of addressing hunger and food insecurity with effective and sustainable approaches. Despite these efforts, hard-to-reach populations such as those residing in Texas-Mexico border *colonias*, remain largely disconnected to resources such as food assistance programs. Among the 95 individuals who participated in our FGs, only 54 (56.8%) indicated they receive SNAP benefits (Table 3.3). Local/community food resources also appear to be underutilized because approximately one-third (35.8%) of our participants responded that they receive food from a local food pantry/bank, or church. This considerable disconnect highlights the issue of limited food access and the current magnitude of hunger and food insecurity within under-represented and underserved populations such as the subgroup observed herein.

The results of this study have indicated that food access challenges within this population are largely mitigated by galvanizing individual social networks, communal associations, and other informal means of gaining access to food. Recent literature highlights the importance of *social capital* and *informal social exchange* to supplement household income and formal means of financial assistance in effort to reduce hunger.[129] A multidimensional construct, social capital accounts for the social support and interpersonal relationships that deliver expressive and tangible resources.[130] A common trend in the FG narratives is that adult children and grandchildren of the participants offer financial assistance and other means of support as an "obligation" they have to their aging parents.

Reciprocal altruism or interpersonal *food sharing* is a socio-behavioral concept that predates modern human societies.[131] As an alternative form of income and wealth redistribution, food sharing among this population is a prominent subtheme of socio-familial support. As made evident by the majority of the FG participants, sharing of food with the less fortunate is an expectation of cultural and religious convention. The statements given by participants in this study revealed the importance of social-familial support and social capital in reducing risk of hunger through coping strategies of food sharing, resource/information sharing, and spiritual beliefs/strength. Furthermore, this study offers indications of the capacity of MH seniors to increase food security within their households. The FG discussions provided an effective venue for the exploration of individual experiences, sharing of information, resource identification, and the determination of potential interpersonal and community strategies for hunger risk-reduction. Understanding contextual resources and barriers are key for reducing the risk of hunger and increasing nutrition-related knowledge, attitude, and behaviors of MH seniors.

Seniors in this study frequently imply resistance to acculturation in terms of food acquisition, choice, and preparation. Dietary acculturation is defined as "the process that occurs when members of a minority group adopt the eating patterns and/or food choices of the host country."[132] Most of the participants mentioned how much they dislike the processed, pre-prepared foods that are prolific in the U.S. in comparison to the traditional foods they prepare or were raised upon. Thus, it would be valuable to examine hunger and food insecurity among MH seniors with different levels of dietary

acculturation. Consequently, it is important to consider culturally competent approaches when aiming to combat hunger and food insecurity in this population. Furthermore, spirituality and religious faith remain at high importance within this population and must also be considered in the development of future initiatives.

Despite engaging in adaptive mechanisms to cope with hunger and food insecurity, barriers to food access and security are largely environmental and are external to individual control within low-income communities. It is evident that not all individuals have adequate household resources, ideal socio-environmental compositions, and the requisite community and political infrastructure necessary to achieve and maintain food security. Food variety, choice, and meal frequency are limited options within this population as many participants stated, "Whatever there is, that's what we are going to eat." We must take these barriers and challenges into consideration prior to planning and developing public health messages, programs, and interventions for food insecure communities, especially those of ethnic minority.

Additionally, results from the FG analysis offer insights and interpretations of the concerns and issues related to food insecurity among MH seniors. These data describe critical experiences as they relate to understanding the significance of food access and food security. This qualitative process also offers insight on the intrinsic influences and root causes of food insecurity among MH seniors. Furthermore, achieving a clear understanding of the food environment within population subsets is essential when discussing intervention strategies and access to food assistance programs. Clearly, identifying ways to help MH seniors meet their basic dietary needs will be of great

importance in the near future as our population of adults over the age of 60 increases exponentially.

This study has some limitations. First, qualitative and naturalistic inquiry are most appropriate for hypothesis generation and not for confirmation of findings and/or generalizability. Second, the *promotoras* as FG facilitators encouraged equitable participation within the group, however some participant statements may have been over-represented or repetitive. Third, personal judgements of the research team were used to categorize participants' statements into select categories, themes, and subthemes. Fourth, a non-Mexican comparison group was not included to assess whether similar constructs, themes, and experiences reflect regional and/or cultural dynamics. However, with a sample size of 95 seniors in this study, narratives were substantial in length and description, and multiple levels of analyses indicated a saturation of data that can be viewed as generalizable to the larger MH population of seniors in South Texas *colonias*.

4. PAPER 2: DEVELOPMENT AND IMPLEMENTATION OF A SENIOR HUNGER CURRICULUM

4.1. Introduction

The popularity of educational programs developed to intervene on chronic disease, encourage weight management, and increase physical activity is vast, but educational programs to assist low-income older adults in reducing risk of hunger and food insecurity are non-existent—mostly due to the extensive foci on younger populations and concerted policy efforts. In fact, it was only 2008 when the first comprehensive national study to examine and understand hunger among older adults was undertaken.[45] A systematic review published in 2014[106] examined nutrition education studies that focused on older adults over the past two decades. Lyons' (2014) results show what other scholars have similarly reported—nutrition education and interventions tailored to senior adults are scarce. In fact, these and other scholars have been urging nutrition educators to develop nutrition education curricula and strategies tailored to meet the needs of this growing population. It is important of note, however, that education alone, without affective motivation and complex intervention strategies, may not change long-term outcomes and behaviors.[107]

Nutrition education can be defined as "any combination of educational strategies designed to facilitate voluntary adoption of food choices and other food- and nutrition-related behaviors conducive to health and well-being…nutrition education is delivered through multiple venues and involves activities at the individual, community, and policy

levels."[108] Achieving food security will require access to nutritious foods and potable water sources; however, all individuals must also have access to the appropriate knowledge, skills, and resources that promote self-sufficiency, action competency, and may ameliorate the influence of economic and physical constraints.[109] Additionally, nutrition education curricula in the priority population must be developed in a manner that achieves cultural complexity and should be conceived with guidance from the National Standards for Culturally and Linguistically Appropriate Services (CLAS) in Health and Health Care.[110] The national CLAS standards recommend that programs be designed and/or modified to be responsive to diverse beliefs and practices, preferred languages, health literacy, and other communication needs.[111]

Evidence-based practices in the intervention of hunger and food insecurity have historically adhered to a traditional paradigm of approaches. According to Dunst (2001), adaptations of evidence-based interventions within a traditional paradigm structure involve models that focus on: *treatment; professional expertise; deficit-based (weakness-focused); professional service-based;* and being *professionally-centered*.[112] Postmodern, alternative approaches to traditional didactic education programs are those which include practical applications, active participation, skill improvement and self-management for enhanced autonomy, goal setting, problem solving, and social networking.[19,108,133,134] State-of-the-art coordinated approaches for nutrition education are necessary to reach immigrant and non-English speaking populations in the U.S. given the prominent language and cultural barriers.[61,135]

All this in mind, curricula developed to assist individuals who are at risk for severe forms of food insecurity must take in to account the difficulty with access and availability of recommended foods and the ease in which less desirable dietary patterns can be managed. When developing nutrition education curricula for this population, one must consider the multitude of barriers, challenges, and dilemmas that can thwart any good intentions to achieve desired intervention outcomes.

4.1.1. Study Population

There is an increased need for ethnic minorities in public health research,[16,136] and the quantity of research on senior adults is modest compared with people in other stages of life.[137] Seniors living in Texas-Mexico border areas known as *colonias* are primarily of Mexican heritage (MH, i.e., individuals who trace their origin or descent to Mexico) and are one of the most disadvantaged, hard-to-reach groups in the United States.[25] C*olonias* are often substandard residential areas with variable housing conditions, inadequate roads and basic infrastructure, and limited access to adequate sewer systems and safe, potable water sources.[26] In these areas, MH seniors experience numerous nutrition-related health disparities and encounter many barriers to adopting and maintaining healthy behaviors. For the most part, adult *colonia* residents are monolingual Spanish and have significant financial constraints, limited education, and few health-supporting resources such as access to healthful foods, affordable healthcare, health information, and efficacious primary prevention programs.[25,26,30-32] MH seniors in the *colonias* experience the critical and complex, interrelated problems of food

insecurity and hunger, overweight or obesity, and chronic disease disproportionately to their ethnic counterparts.[31,138]

4.1.2. Study Objectives

Numerous evidence-based education programs and curricula aimed at informing students, professionals, and the lay public about international hunger and food insecurity exist. However, to our knowledge, there are no established curricula with a priority to assist food insecure individuals on how to engage in risk-reduction strategies, coping mechanisms, and resource maximization that do not have negative, unintended consequences. Building on previous needs assessments and extant literature, we chose to develop, implement, and evaluate *No Más Hambre* [No More Hunger], an interactive, culturally-appropriate, *promotora*-guided, learner-based nutrition curriculum to: 1) increase nutrition-related knowledge and skills; and 2) aid in reducing the risk and presence of hunger and food insecurity among MH seniors in Texas-Mexico border *colonias*. Using an *intervention mapping*[139] approach, specific study objectives were developed to (1) assess the resource and educational needs of MH seniors and address barriers to hunger and food insecurity risk-reduction; (2) address individual capacity for curriculum adoption and resource maximization; (3) apply theory-based methods and practical strategies for individual hunger risk reduction; (4) develop a culturally-sensitive, needs-based nutrition curriculum; (5) implement the curriculum; (6) establish an evaluation plan; and (7) assess the feasibility and acceptability of the curriculum.

Considering the needs and barriers identified by our priority population, in addition to the identification of coping mechanisms and individual capacity, we opted to

focus on resource maximization at the individual, interpersonal, and community levels. Furthermore, we postulated that the curriculum would enhance the individual capacity and self-efficacy of MH seniors to make healthful and affordable food selections while maximizing household resources through *promotora*-guided education and hands-on skill building activities. *Promotoras* (also known as *promotoras de salud*, *promotora*-researchers, or community health workers) are native to the study area, certified by the state of Texas, and are closely-knit to the communities they serve. The *promotoras* on our research team were extensively trained as the program educators and were actively involved in recruitment, retention, formative evaluation, curriculum development, and delivery of all curriculum lessons. The purpose of this paper is to delineate this educational program, specifically: 1) theoretical and cultural rationale of the curriculum; 2) processes used to develop and evaluate the curriculum; 3) curriculum components; and 4) lessons learned.

4.2. Methods

4.2.1. Theoretical and Cultural Rationale for the Curriculum

By employing a multi-theoretical approach, we developed the curriculum using various theoretical frameworks of pedagogy and human behavior. Elements of *Adult Learning Theory* (ALT),[19] specifically the social theories of learning, were utilized. According to Lave & Wenger (1991, 1998), a learner's experience is shaped by context and community.[140,141] The assumptions are: 1) learning and thinking are social activities; 2) learning and thinking are situational; and 3) thinking is influenced by the context and location in which learning occurs.[142] Being that the participants in our *Senior Focus*

Groups identified the importance of social interaction and learning in a comfortable environment, social theories of learning were employed in the planning phases of curriculum development.

Since its inception in 1956, numerous educators have utilized Bloom's Taxonomy,[143] the classifications of levels of intellectual behavior in learning, in the development and delivery of curricula. Benjamin Bloom postulated that learning fits into three psychological domains: 1) cognitive (e.g., knowledge, mental skills); 2) affective (e.g., attitudes, emotions, feelings); and 3) psychomotor (e.g., physical skills, manual or manipulative skills).[143] The most recent version, Bloom's Revised Taxonomy (2001), was utilized in the development of lesson objectives for the *No Más Hambre* curriculum. This revised version categorized each of Bloom's cognitive domain[144] sub-categories (i.e., *remembering, understanding, applying, analyzing, evaluating,* and *creating*) into lower (LOTS) and higher order thinking skills (HOTS), respectively.[145,146] Keeping with the Bloom's Taxonomy framework, an affective element of self-reflection was built into the curriculum that required participants and *promotoras* to write (or have someone assist them in writing) in a reflexive journal. This curriculum component was guided by the *reflective-change model* of learning which implies that self-reflection leads to action and subsequent change.[147,148] By using reflection and feedback, educators and learners alike can utilize their own valuable insights to develop knowledge and skills and encourage autonomous learning.[142]

According to Broyles and colleagues, "The ethical and practical implications of applying promising [cultural] practices to reach more diverse groups is a defensible

rationale."[135] Many researchers who develop nutrition curricula for diverse populations agree that cultural considerations involve the employment of language and ethnically-matched educators and consider "deep-structure" cultural characteristics—including population sub-groups, values, traditions, practices, and acculturation levels.[24,105,118,135,149,150] Though some researchers find it critical to hire interviewers that "look like, talk like" the study respondents, recent evidence suggests that culturally-competent educators (regardless of identity) gain trust by using empathy, respect, and by adapting their approaches to the corresponding cultural climate.[151] Similarly, the concept of trust is an incredibly important factor when developing and delivering educational programs to seniors who are considered a vulnerable population.[152]

Development or modification of culturally-sensitive nutrition education programs requires the program developer(s) to begin with a firm understanding and appreciation for the population they wish to study. Having a general knowledge of Mexican heritage does not equip a researcher with the necessary comprehension and awareness of regional differences and idiosyncrasies of this specified segment of the population. The *No Más Hambre* curriculum was developed in a manner that achieves cultural complexity through awareness, knowledge, skills, and desires, and with guidance from the national CLAS standards.[110]

Program sites and study populations are influenced by cultural derivatives of race and ethnicity as well as broader concepts, including the norms, values, and beliefs that are shared or adopted over time.[153] Effective health promotion programs and interventions must be attuned to these cultural elements, as well as integrate the ability to

respect, understand, and work harmoniously with differences. During pre-testing phases 1 and 2, we encouraged the program participants, *promotoras*, and research team members to offer insight and instruction on culture and customs in the formative stages of curriculum development. This collaborative effort allowed us to build rapport and trust, as well as offer genuine stakeholder benefits and buy-in. Maintenance of cultural-sensitivity in a public health curriculum can be achieved through proper governance, leadership, communication, language assistance, engagement, evaluation, continuous improvement, and accountability.[111] Though explicit protocols, principles, and guidelines are in place for evidence-based programs, some flexibility in design and implementation of our curriculum guided us to develop a specially-tailored, culturally- and linguistically-centered program.

The curriculum development process was based on the Multilevel Approaches Toward Community Health (MATCH) model.[154] This model provides a representation of the socio-ecological framework[17,155,156] in conjunction with the development, implementation, and evaluation stages of community education program planning. Though the model aims at three levels of influence (individual, organizational, and governmental), its primary purpose is to be an "organizing framework" that is applied following the identification of risk factors and priorities for action within a priority population. Table 4.1. depicts our adaptation of the MATCH model description for program planning.[157]

Table 4.1 Phases of the *No Más Hambre* curriculum development process using an adapted MATCH model strategy

Developmental Phase	**Step**
1. Goal Selection	1. Population at risk: Mexican-heritage seniors (ages 60 and over) residing in Texas-Mexico border *colonias*. 2. Health status goal- Reduce risk of hunger and food insecurity. 3. Behavioral goals- Apply knowledge and skills for resource maximization; strengthen use of coping mechanisms. 4. Environmental constraints: transportation, food access (availability and affordability), economic hardship, and lack of interpersonal support systems.
2. Curriculum Planning	1. Create learning objectives. 2. Develop a curriculum framework and logic model. 3. Identify curriculum/intervention approaches.
3. Curriculum Development	1. Main curriculum components are identified. 2. Lesson plans are developed. 3. Materials, supplies, 'tool kits,' and other supplementary resources are gathered.
4. Implementation Preparation	1. Maintain community support structure. 2. All personnel involved in curriculum implementation are trained.
5. Evaluation	1. Conduct formative evaluation- an iterative process beginning with understanding needs assessment data to aid curriculum development. 2. Conduct process evaluation- assess why and how curriculum worked; outline constructive and conclusive functions; included in feasibility and acceptability discussion. 3. Conduct impact evaluation- assess immediate effects (e.g. change in knowledge, attitudes, and behaviors); included in feasibility and acceptability discussion.

4.2.2. Participant Recruitment

The pre- and pilot-testing phases of curriculum implementation involved low-income MH seniors residing in rural *colonias* in four geographical areas (Alton, San Carlos, Progreso, and Penitas) in Hidalgo County in the Lower Rio Grande Valley of Texas. Due to the nature of this study, we recruited purposive samples of MH seniors using convenience sampling strategies (i.e., door-to-door) which increased the possibility of recruiting individuals within our priority population who met the inclusion criteria. Inclusion criteria for this study were: 1) seniors ages 60 or older; 2) lived alone or with a spouse; 3) did not have a provider (i.e., care-taker or home health nurse) to care for them or offer general assistance; and 4) were able to read and write (in Spanish, English, or both). We recruited MH seniors in these geographical areas because: 1) MH seniors who reside in *colonias* are ubiquitous in these areas, and 2) we have long-standing community partnerships with stakeholders and community residents within this geographical region.

Two phases of curriculum pre-testing were conducted (the first in March 2014 and the second in May 2014) and six participants (i.e., two active and one reserve participant per *promotora* team) were recruited for each pre-test. Following constructive process evaluations of each pre-test and subsequent curriculum modifications, the pilot test was conducted (June 2014) and 12 participants (five active and one reserve participant per *promotora* team) were recruited for this phase. All pre- and pilot-test participants received all curriculum materials, handouts, and interactive tool kits in addition to a small monetary stipend for their participation.

4.2.3. Curriculum Development Process

Subsequent to conducting a number of formal and informal needs assessments with MH seniors in the priority population, a framework for the development of the curriculum took shape; see the curriculum logic model (Figure 4.1.). An extensive review of the literature and existing curricula tailored primarily to older adult populations and MH communities was conducted. Evidence-based pedagogical resources provided a substantial framework for structure and context in the developmental and implementation stages of the curriculum. Careful consideration was given to culture, language/syntax, and pragmatism in every aspect of lesson development and modification. Spanish/English linguistic experts and native *promotoras* on our research team were consulted to ensure semantic and conceptual equivalence. The curriculum was developed in English, translated into Spanish, cross-checked for accuracy, and delivered with the application of adult learning strategies and techniques such as interactive instructional lessons and case-based discussions to guide resource-dependent education.

The curriculum was informed by: 1) formative research that included 14 *Senior Focus Groups* and approximately 570 *Senior Hunger Surveys* with MH seniors residing in the four identified geographical areas; 2) collaborative discussions and group-think activities with university-based nutrition and public health researchers, registered dietitians, and local *promotoras*; and 3) the United States Department of Agriculture (USDA) Dietary Guidelines for Americans (DGA), 2010.[113] The lead author guided the curriculum development team, who collaborated on all stages of curriculum planning,

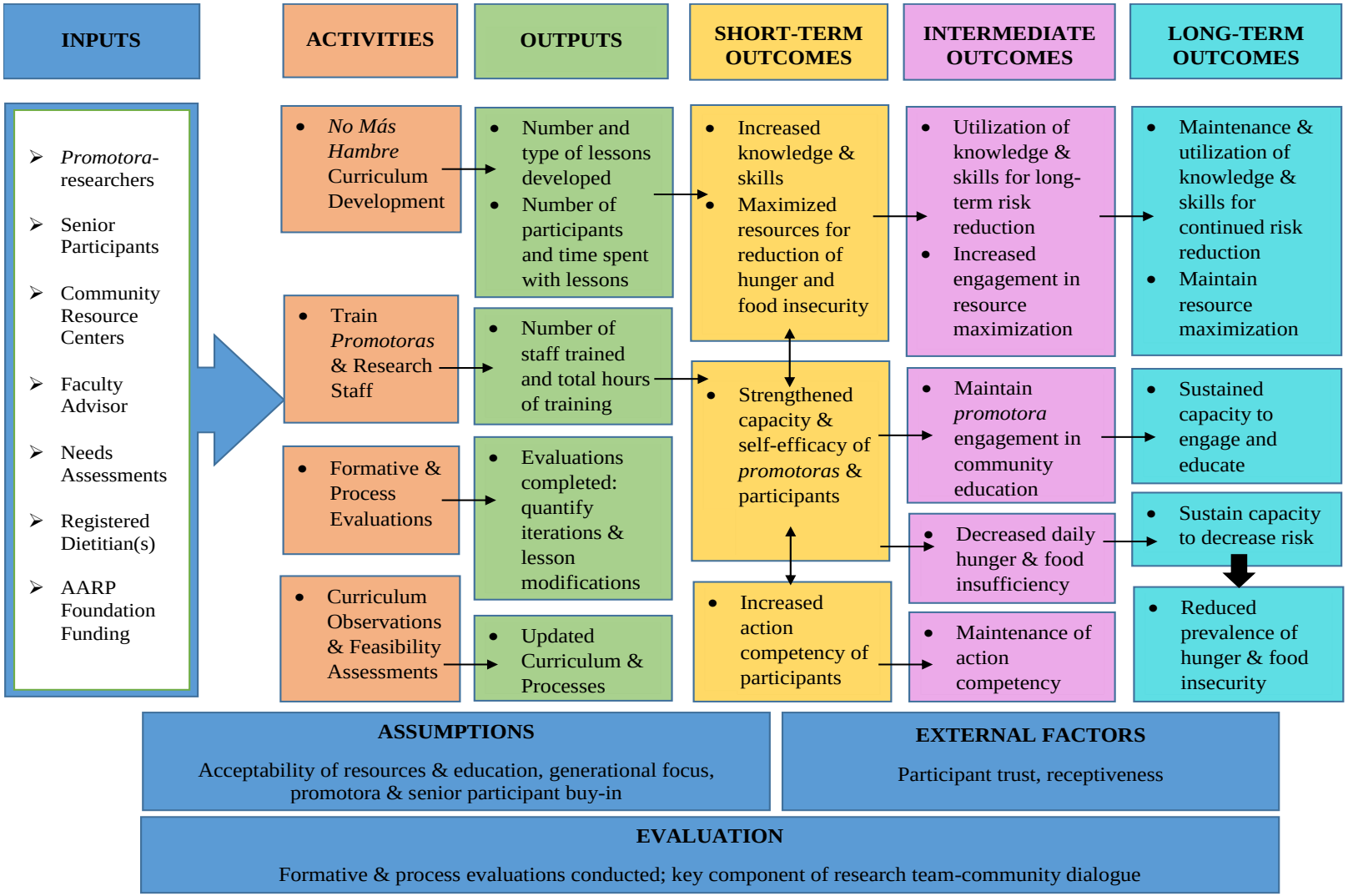

Figure 4.1. Logic model for the *No Más Hambre* project.

development, evaluation, implementation, and feasibility and acceptability assessments.

The development of the curriculum occurred in six phases. Formative evaluation guided multiple iterations of the evolving curriculum. A chronological pictorial best illustrates the six-phase curriculum development and implementation process (Figure 4.2.). First, information obtained from the *Senior Focus Groups* helped to identify community and individual needs and barriers regarding hunger and food insecurity. Second, data obtained from the *Senior Hunger Surveys* further elucidated the issue of economic deprivation, hardship, and the need for resource awareness, education, and skills for resource maximization. Thirdly, the curriculum began to take shape subsequent to research team discussions and group-think activities. After extensive evaluation and review of pedagogical literature, seven lessons emerged that were translated from English to Spanish, then tested for cultural appropriateness and comprehension. In the fourth phase, *promotora*-researchers committed to two days of intensive, face-to-face curriculum training after having studied the completed curriculum and lesson guides. Remaining questions, comments, and concerns of the *promotora*-researchers regarding lesson content were addressed at that time, and necessary editing of the curriculum was completed. Next, two curriculum pre-tests were conducted, one in March 2014 and the other in May 2014. Each pre-test included a staff of four *promotoras*—two *promotoras* per team for each selected geographic area—and six senior participants (age 60 and older). Pre-tests (i.e., delivery of curriculum lessons to participants) were conducted within each participant's home in a face-to-face, individual learning fashion. Following each pre-test, research team observations were compiled for discussion, and potential

curriculum modifications were negotiated. Furthermore, each participant and each *promotora* were asked to keep and maintain a reflexive journal to document feelings, thoughts, concerns, and general interpretations of the educational process. *Promotoras* shared many of these journal entries; their comments, suggestions, and concerns were utilized in the evaluation process as suggestions for improvement. Finally, a pilot-test of the curriculum was conducted in June 2014 and we employed the same four *promotoras* to deliver the education by utilizing the final revised and improved curriculum.

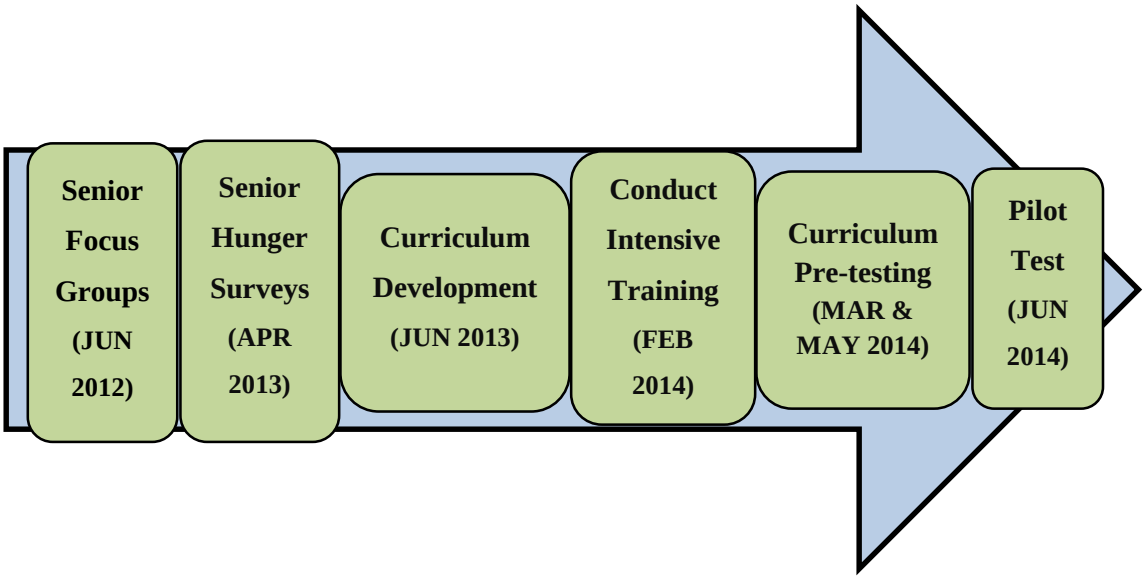

Figure 4.2. Chronological process of development and implementation of the *No Más Hambre* curriculum.

4.2.4. Curriculum Components

The *No Más Hambre* curriculum consisted of seven lessons, each designed to provide approximately one hour of interactive and individualized education coupled with hands-on activities each week for seven weeks. Table 4.2. summarizes the seven lesson

topics and learning objectives focused on creating awareness of the links between food security and good nutritional health. Interactive lesson activities represent four learning styles: 1) visual (or seeing); 2) kinesthetic (or tactile, doing); 3) affective (or emotional feeling/sensing); and 4) cognitive (or thinking).[158] A registered and licensed dietitian led the development, evaluation, and modification of each nutrition education lesson in face-to-face, group-process discussions with team researchers and *promotoras*. These lessons were not developed with a didactic structure in mind. Instead, we included learner-based discussions and tactile activities which targeted knowledge and skills with the intended result of resource maximization for increased food security.

The complex curriculum structure was divided into independent educational lessons that focused on evidence-based components of nutritional science, household food security, and healthy aging. The curriculum developer was careful to refrain from introducing concepts and technical language or jargon that would not be easily understood and/or lost in translation. Each lesson was developed to include nutrition educational lessons that accommodate various learning styles from engaging discussions, to visual and tactile activities, in addition to a significant quantity of reproducible, Spanish-language, attractively-colored educational resource documents. Each of the seven lessons was presented with a "from curriculum to community" approach—meaning each educational lesson (including lesson materials) was presented with applicable knowledge that participants can easily share with their family members, friends, neighbors, and other community members. The lessons focused on a variety of resource-based nutritional health topics (Table 4.2) that were identified by MH seniors

during initial needs assessments (i.e., *Senior Focus Groups*). Skills such as food purchasing and preparation using limited resources, budgeting for healthful food items, and keeping foods safe in the home, were taught with the expectation that these skills would be practiced and used successfully to encourage behavior change for resource maximization. In addition to the supplementary resources (organized by lesson in a curriculum binder), each participant and *promotora* received a "tool kit" to be used during each lesson to facilitate learning, interaction, and skill-building. The tool kits (i.e., clear, plastic storage containers) included items such as food and refrigerator thermometers, plastic cutting boards, measuring cups and spoons, hand soap, a reflexive journal, a shopping list tear pad, kitchen cloths, a magnifying glass (for the vision-impaired), and small food storage containers. Each item in the kit was addressed and utilized in the lessons.

Based on the understanding that most of the needs assessment (i.e., *Senior Focus Groups*) participants had little to no formal education and many were unable to read and write, most of the content in the final iteration of the curriculum was set at a minimum reading level. However, there was some variability in the readability scores across the lessons, ranging between 4^{th}- (e.g., tips for healthy eating) and 12^{th}-grade (e.g., nutrient names, food label reading). Lessons were delivered at one-week intervals to allow enough time for participants to process their new knowledge, put the knowledge into action, and reflect upon the experience.

Table 4.2. *No Más Hambre* curriculum lessons, objectives, and activities

Lesson	Learning Objectives & Activities
1. General Nutrition, part 1	• Explain what good nutrition means to them. • Understand how good nutrition leads to improved health. • Understand how energy and essential nutrients are necessary for life and living well.
2. General Nutrition, part 2	• Read and understand the main sections of a food label. • Know how to build a better plate (*MiPlato* [MyPlate]) according to the Dietary Guidelines for Americans (2010). • Discuss key nutrition messages and use them to form healthy dietary goals.
3. Nutrition for Seniors	• Identify and discuss the signs of aging. • Identify and discuss the challenges of aging. • Describe the essential nutrients for older adults. • Discuss the importance of adequate hydration.
4. Food Budgeting	• Prepare a feasible food budget that will allow them to make healthful food and beverage choices. • Identify the resources and food assistance programs available to them (e.g. SNAP, local food bank/pantry). • Discuss the economic importance of purchasing seasonal produce. • Discuss how and when to use coupons and store specials to save money on food purchases.
5. Food Shopping	• Understand how to shop smart and economically for healthful foods. • Explain food and grocery store marketing and how they affect our food purchases.
6. Food Safety & Preparation, part 1	• Understand food borne illness and how it occurs. • Explain and demonstrate proper hand washing and good personal hygiene. • Describe adequate food preparation and holding temperatures and how to use a thermometer. • Identify unsafe food handling practices.
7. Food Safety & Preparation, part 2	• Discuss *Clean, Separate, Cook, and Chill* and the importance of these steps for safe food preparation. • Demonstrate how to safely store foods. • Discuss cross-contamination and why it is important to avoid when preparing food. • Define *safe cooking* and the importance of temperature and cleanliness.

4.2.5. Framework for Curriculum Evaluation

The *No Más Hambre* curriculum evaluation had several components that were conducted in various stages throughout the lifespan of the program. Methods included formative, process, and impact evaluation strategies. The formative evaluation began with previously discussed needs assessments that included the *Senior Focus Groups*, research team brainstorming and group-think sessions, and an extensive literature review. Curriculum program objectives and strategies were developed and refined. Evaluation components were developed and curriculum/educational materials were pre- and pilot-tested for content, comprehension, cultural-sensitivity, and linguistic appropriateness. During the two pre-tests and final pilot-test, observations and field notes were completed by two team evaluators. In addition, each evaluator met with their assigned team of *promotoras* after each lesson to de-brief and identify strengths and weaknesses of the lesson format, content, supplementary materials and activities, and instruction/delivery. Research team de-briefings also aided in the identification of participant problems and barriers (e.g., literacy, language/translation, interpretation of information provided, and cultural-appropriateness of lesson materials). Curriculum lessons were modified as indicated by the project PI, curriculum developer, curriculum evaluators, and *promotoras*. Process and impact evaluation strategies, including constructive and conclusive evaluation functions, are addressed in a subsequent feasibility and acceptability study of the curriculum.

During the initial stages of curriculum development, formative evaluation questions were developed to aid in the improvement of the final curriculum and all supplementary materials. The evaluation questions included:

- What do *promotoras* know about nutrition and nutrition-related topics?
- What nutrition concerns are most common among MH seniors?
- What types of food assistance programs, health services, and information are currently available in the priority communities?
- What are the overall social, economic, and political characteristics of the community?
- How do these characteristics affect individual and community health status?
- How will the curriculum lessons be created (and in what sequence) in order to provide education and skills that meet the needs and demands of MH seniors?

Two research team evaluators/observers were utilized throughout the process of conducting two curriculum pre-tests and one pilot implementation. The evaluators/observers were divided so that each two-*promotora* team and their respective participants could be observed during implementation. The evaluators did not speak (unless spoken to) or play an active role in the lessons during which the curriculum was being delivered. During observation, the evaluators paid close attention to contextual aspects of the curriculum, participant engagement, and the delivery by *promotoras*. Evaluator notes were guided by questions, such as:

- Were curriculum lessons delivered in a manner that was organic and conversational rather than directive?

- How did the senior participants respond to the lessons? Were they receptive or disengaged?
- Which elements of the lessons were senior participants most engaged (e.g., hands-on activities and use of "tool kits," discussions accompanied by color handouts)?
- Did the *promotoras* deliver the lessons with fidelity? How often did *promotoras* diverge from the established lessons?
- To what extent were the learning objectives met for each lesson?
- Were the lessons developed and sequenced appropriately in order to provide the education/knowledge that is most pressing?

All evaluation notes arising from the observations were utilized for lesson modifications, training, and professional development for *promotoras*. Oral feedback from the *promotoras* and participants allowed the research team to revise and improve the curriculum when necessary in an iterative process. All protocols were approved by the Texas A&M University Institutional Review Board.

4.3. Results

During the pilot-test phase, 63 total lessons were delivered, during which 9 MH seniors participated (mean age = 66 years, range = 60-75 years). Of the 12 participants recruited, 9 participants (8 females, 1 male) agreed to the study and completed all seven lessons. Of the three participants who attrited, two declined to participate citing personal reasons, and one completed all but the final lesson and post-intervention interview because she migrated north when work became available. The lessons lasted an average

of 68.7 minutes each (range = 35-143 minutes). Two-thirds of the participants were born in Mexico (n = 6) and none of the participants received formal education beyond the sixth grade. Monthly household incomes reported by the participants ranged from less than $500 to $1000 - $1200. Of the nine participants, only two reported they did not receive SNAP benefits. However, these two participants reported they sought fresh and processed food items from a local church or food pantry. All but two participants reported they owned an automobile; the two without reported they received transportation from family members. Three of the participants self-reported being overweight or obese and two-thirds of all participants reported their general health as "poor" or "bad."

4.3.1. Observations & Reflexive Journals

A recurrent theme that surfaced throughout the pre-and pilot-testing was the importance of shared learning. MH seniors preferred group learning though individual instruction was completed to best assess curriculum feasibility. Despite informing each participant that the education was limited to them alone (for feasibility testing purposes), many of the participants were joined by spouses, immediate and extended family members, and neighbors. Desire for communal learning and information sharing was a prominent subtheme in the *Senior Focus Groups* and this assertion was elucidated during the pre-and pilot-testing of the lessons.

Most of the participants had a difficult time remembering to write in their reflexive journals from one lesson to the next and often had to request assistance from their *promotora* educators or from family members and friends. Much of the participant

reflexive journals contained nutrition-related goals and ideas for adopting and/or maintaining coping strategies and maximization of resources. Only one participant was avid about writing in her journal on a daily basis, and she offered a wealth of insight into her thoughts of each lesson, personal goals, and self-reflections on improved food security and health. The *promotora* educators were also encouraged to write in their reflexive journals, as well as share some of their journal passages during team meetings and lesson de-briefings. A few of the *promotoras* expressed apprehension regarding their own knowledge and abilities to deliver the lessons, though responses were mostly positive:

> "I feel much better and I thank God…I feel good about this week."
>
> "I am motivated to study [curriculum lessons] more now than before."
>
> "I am glad we are in a project where we can teach the people."
>
> "I loved the practice and confidence. I have confidence in the team and in teaching the classes [lessons]."
>
> "I like that we give many important tips for change."

These shared experiences provided invaluable opportunities for the improvement of the curriculum in addition to satisfying a critical element in the formative evaluation process.

Observations by the evaluator/observers were also important elements of data in the reflection process. Important of note, participants were mostly excited to be connected with information and given the skills to make the most of limited resources. The importance of frequent social support and social interaction was another critical

observation point made by the observers. Though we limited each individual lesson delivered to just one participant, most pre- and pilot-test participants were eager to invite others (e.g., friends, neighbors, family) to listen in and receive the education. Illiteracy was an excluding factor; however, one participant later admitted she was embarrassed initially to admit she was unable to read or write. Therefore, the participant was joined by her young grand-daughter (age 11) who happily assisted her with the lesson materials, journal writing, and reading of supplementary handouts. Examples such as this gave observers the impression that group learning, whether in a community or private residence setting, is likely the ideal method of delivery within this population.

4.4. Discussion

This work adds to a growing body of literature by describing innovative concepts of applying post-modern pedagogical theories of curriculum development and novel methods of applying cultural tenets to programs designed to improve nutrition knowledge, skills, and behaviors, in an effort to reduce hunger risks and encourage resource maximization. Special consideration was given in the curriculum content to the financial hardships and access challenges of MH seniors within the target geographical areas. *Promotoras* and participants were encouraged to share their new knowledge, skills, and resources within their social networks (e.g., family members, friends, neighbors, church groups, senior center peers) because behavior change is achieved when learners hear consistent messages from different people in different contexts.[133]

Complete standardization of curriculum is an archaic pedagogical practice. Though a few of the *promotoras* diverged from the curriculum lesson plans, each

promotora had her own unique method of delivery, and we encouraged this display of autonomy. However, team de-briefings were put into place—not only as an element of formative evaluation—to identify areas of concern if the delivery was straying too far from the core lesson concepts. Content validity and reliability were not measured in this study, as we only aimed to examine the feasibility and acceptability, not curriculum effectiveness and outcomes.

This study has some limitations. The sample size for the pilot intervention was small and was a convenience sample. Additionally, one of the evaluator/observers developed the curriculum and supplemental materials; this could have introduced bias. A limitation of the observations is that the participants may have interacted with *promotoras* in an atypical fashion because they knew they were being observed. Furthermore, the *promotoras* knew they were being observed as well, which may have impacted their method of delivery and adherence to the curriculum. Having only one evaluator/observer per *promotora* team limited recorded data to the perceptions of only one observer. However, curriculum feasibility and reliability assessments included in-depth interviews in addition to the evaluators' observations which do increase the validity of the data. Finally, because this was a pilot intervention focused on development, formative evaluation, and implementation of *No Más Hambre*, the units of analyses were the participants (i.e., non-verbal responses, behaviors) and *promotoras* and their perceptions and suggestions regarding the curriculum. The next stages of evaluation involved data collection of participant responses (i.e., in-depth interviews)

and *promotora* insights (i.e., focus group) regarding the curriculum, and assessment of theoretical constructs.

Not unlike the goals of numerous organizations whose missions are to address and combat hunger and food insecurity, we seek to reduce the incidence and prevalence of hunger and food insecurity through pragmatic and sustainable solutions. Development of learner-based educational programs that include considerations of socio-ecological context, cultural and linguistic factors, and address needs and root causes may be successful in achieving community food security in underserved and marginalized populations. Furthermore, successful grass-roots and community-based efforts may lead to policy initiation and reformations that achieve a wide-spread, population-level reach and address and combat hunger and food insecurity across all sub-populations and communities at risk.

4.4.1. Lessons Learned

The employment of *promotoras* in the curriculum development process, and later as community educators, elucidated information and cultural insight for how the final curriculum should be structured and implemented. We encouraged *promotoras* to be flexible and energetic versus robotic in guiding their lessons, though we urged them to drive home key objectives highlighted in each lesson. Variations in lesson delivery (e.g., time, depth, activities) were unique to each *promotora* educator. The project evaluator/observers noticed that, in a few of the lessons, some *promotoras* neglected to follow a complete lesson plan, either by omitting parts or by adding extraneous information to the discussion. Researchers who implemented a similar program within a

low-income Hispanic population reported similar findings for nutrition education programs guided by peers.[159] Though the fidelity of the curriculum delivery may be impeded, within this particular cultural setting, flexibility of delivery and contextual focus may be essential to a *promotora* educator. While delivering the lessons, *promotoras* enjoyed offering personal examples of their own struggles, successes, and behavior modifications.

Recruitment and selection of *promotoras* is an important element to the success of this curriculum because lesson delivery, teaching styles, enthusiasm, and general interest in the lesson topics can impact how a participant learns and absorbs the knowledge and skills. It is also important for the *promotora* educators to be conversational and self-reflective when delivering lessons, as well as to develop and maintain their own knowledge of the nutrition-related topics addressed in lesson plans. Training and preparation of *promotoras* and program staff must be conducted in a manner that allows for adequate peer-to-peer lesson "rehearsals," the opportunity to ask questions, and have refresher courses or continuing education opportunities as the intervention progresses. Both *promotoras* and participants requested more training and educational opportunities in the future. A few participants noted they would like to teach their peers in the community about the information they learned and wanted the opportunity to do so.

5. PAPER 3: FEASIBILITY AND ACCEPTABILITY OF A SENIOR HUNGER CURRICULUM

5.1. Introduction

Older adults living in Texas-Mexico border areas known as *colonias* are primarily of Mexican heritage and are one of the most disadvantaged, hard-to-reach groups in the United States.[25] C*olonias* are often substandard residential areas with variable housing conditions, inadequate roads and basic infrastructure, limited access to adequate sewer systems and safe, potable water sources.[26] In these areas, Mexican-heritage (MH, i.e., individuals who trace their origin or descent to Mexico) seniors experience numerous nutrition-related health disparities and encounter many barriers to adopting and maintaining healthy behaviors. For the most part, *colonias* residents are monolingual Spanish and have significant financial constraints, limited education, and few health-supporting resources such as access to affordable healthful foods, healthcare, health information, and efficacious primary prevention programs.[25,26,30-32] MH seniors in the *colonias* experience the critical problems of food insecurity and hunger, overweight or obesity, and chronic disease disproportionately to their ethnic counterparts.[31,138]

Culturally-grounded nutrition education programs have gained popularity over the last decade as an effective and feasible method of deploying behavior modification strategies among ethnic minority populations.[118,149,160-163] These programs not only highlight the importance of nutritional health, but they increase knowledge and skills-based behaviors through experiential learning. Though numerous nutrition education interventions are currently being implemented in community settings nationwide, none

of these programs have specifically identified seniors (ages 60 and older) from low-income, MH populations who experience frequent hunger and/or food insecurity as a priority population, per extant literature. Good nutritional health is a critical element to healthy aging, yet many older adults experience chronic malnutrition and increased risk of hunger. In fact, in 2011 researcher Craig Gundersen found that, "8.35 percent of Americans over age 60 faced the threat of hunger," which translates to approximately 4.8 million people.[164] Though numerous hunger and food insecurity interventions focus on combating the problem at the institutional and policy sectors, community grass-roots efforts that focus on individuals and households have the opportunity to have lasting intrinsic impacts. There are neither published studies nor existing data, to our knowledge, on individualized, home-based intervention strategies to reduce the risk for hunger.

Though there are numerous peer-reviewed feasibility studies, very little published literature offers recommendations to guide the design and evaluation of feasibility research. Feasibility studies can be defined as studies which are designed to establish a foundation for a designed intervention study.[165,166] Though not unusual in community health interventions, feasibility studies are more commonly found in drug efficacy trials and are typically designed as efficacy and/or randomized controlled trials (RCTs).[165] According to Bowen and colleagues (2009), "Feasibility studies encompass any sort of study that can help investigators prepare for full-scale research leading to an intervention…and are relied on to produce a set of findings that help determine whether an intervention is relevant, sustainable, and should be recommended for efficacy

testing."[166] Feasibility studies are set into motion in an effort to answer the question, "Can this study be done?" Of the previously published studies that examine the feasibility of a curriculum, few have employed an intervention strategy similar to that of the *No Más Hambre* [No More Hunger] curriculum. Additionally, our hard-to-reach population has been shown empirically to necessitate consideration and innovative intervention strategies.

The literature on home-based, nutrition interventions tailored to families with infants and children is sizeable; however, limited evidence on home-based interventions for seniors exists.[167] Following extensive formative and process evaluation in the early stages of curriculum development, data from participants confirmed the preference for a home-based program that would accommodate their needs. Home-based interventions are essential for seniors in this population as many of them have limited safe and reliable transportation options that would allow them the freedom to attend community-based programs.[25,42] Other senior adults have functional limitations that would inhibit their opportunity to attend events outside of their homes, warranting the need for home-based programs.[168] Furthermore, home-based interventions for seniors may reduce future costs of healthcare.[167] Unfortunately, of the few home-based studies which include senior adults, the majority are randomized controlled trials which limit the argument for practical applicability. According to Sanson-Fischer and colleagues, "Commitment to randomized controlled trial may limit innovation in population-based health interventions…other research designs may be more practical for a wider variety of interventions."[169] Therefore, we designed a home-based curriculum, tailored to the home

environment and to meet the needs of our priority population, which provides nutrition knowledge and skills in a practical and real-world setting.

The purpose of this paper is to provide the results of the feasibility and acceptability testing of the *No Más Hambre* curriculum among MH seniors (ages 60 and older) who reside in Texas-Mexico border *colonias*. With the overarching goals of establishing feasibility and acceptability, we hypothesized that the development and implementation of *No Más Hambre*, a culturally- and linguistically-focused, home-based nutrition curriculum, will: 1) be feasible, 2) be acceptable, and 3) aid in reducing the risk and presence of hunger among MH seniors in Texas-Mexico border *colonias*.

5.2. Methods

The work of Bowen and colleagues[166] inspired the guidelines used to assess the feasibility of this study. Our study was not powered to measure outcomes, rather we sought to address the feasibility and acceptability of the curriculum, specifically with regard to the following questions:

- Will limited participant recruitment allow for a meaningful assessment of the feasibility and acceptability of the curriculum?
- What collaborators and resources are necessary?
- Are there other data collection and analysis techniques specific to answering our research questions that must be identified and utilized?
- Should this intervention be subject to greater efficacy and effectiveness studies?

5.2.1 Participant Recruitment

Study recruitment lasted 12 non-consecutive weeks (between January 2014 and May 2014). Eligible participants were low-income MH seniors residing in functionally-rural *colonias* in four geographical areas (Alton, San Carlos, Progreso, and Penitas) in Hidalgo County in the Lower Rio Grande Valley of Texas. Due to the nature of this study, we recruited purposive samples of MH seniors using convenience sampling strategies (i.e. door-to-door) which increased the possibility of recruiting individuals within our priority population who met the inclusion criteria. Inclusion criteria for this study were seniors who: 1) were age 60 or older at the time of recruitment; 2) lived alone or with a spouse; 3) did not have a provider (i.e., care-taker or home health nurse) to care for them or offer general assistance; and 4) were able to read and write (in Spanish, English, or both). We recruited MH seniors in these geographical areas because: 1) MH seniors who reside in *colonias* are ubiquitous in these areas, and 2) we have long-standing community partnerships with stakeholders and community residents within this geographical region.

5.2.2. Study Design and Curriculum Overview

Subsequent to conducting a number of formal and informal needs assessments with MH seniors in the target population, a framework for the development of the curriculum took shape; see the project logic model (Figure 5.1.). An extensive review of the literature and existing curricula tailored primarily to senior populations and MH communities was conducted. Evidence-based pedagogical resources provided a substantial framework for structure and context in the developmental and

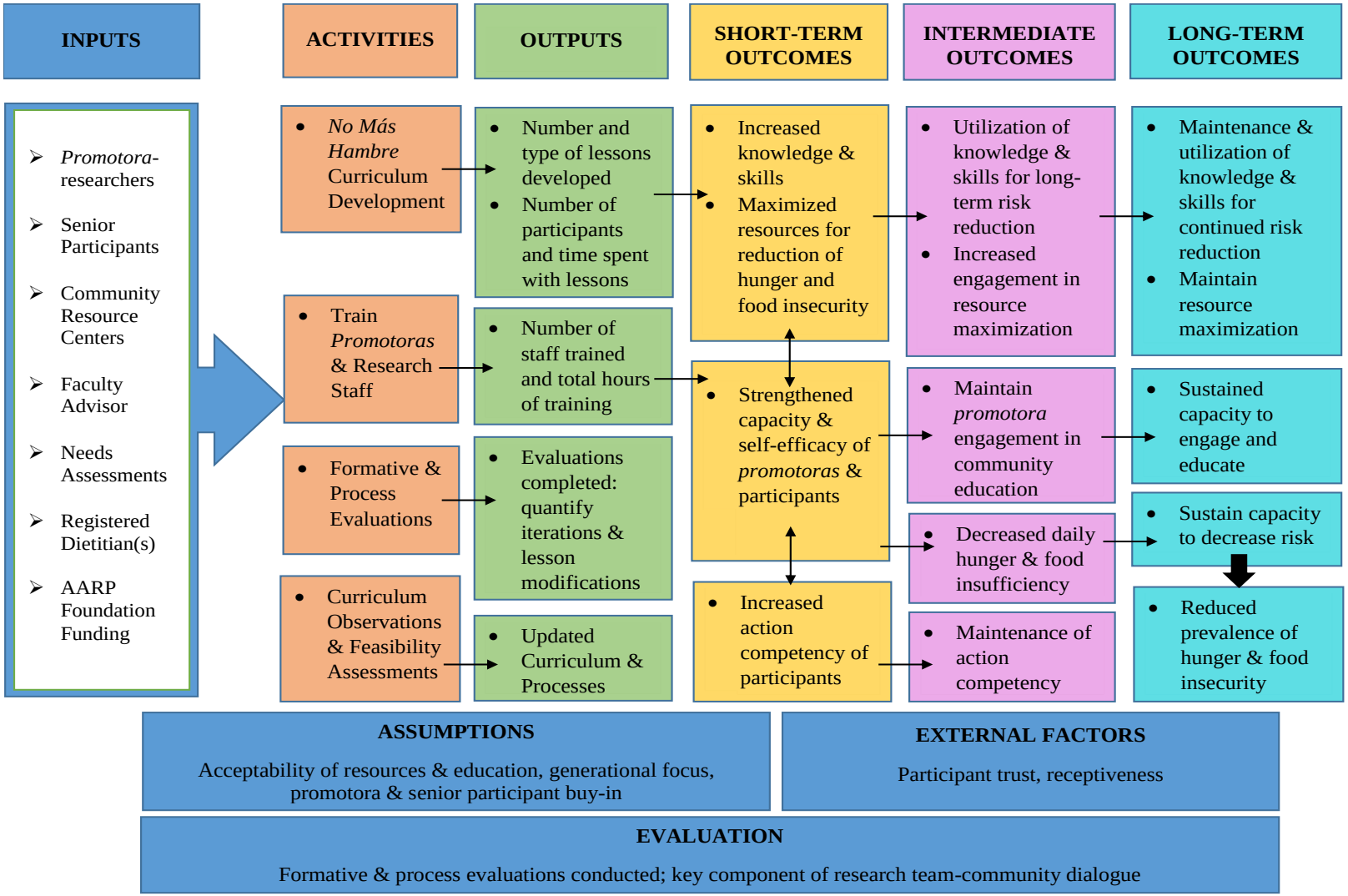

Figure 5.1. Logic model for the *No Más Hambre* project.

implementation stages of the curriculum. Following constructive process evaluations of each curriculum pre-test and subsequent modifications, the pilot intervention (*No Más Hambre*) was conducted in June 2014 and 12 participants (five active participants and one back-up participant per *promotora* team,) were recruited for this phase; we employed two *promotora* teams, two *promotoras* per team. *Promotoras* (also known as *promotoras de salud,*[32,162,170-172] *promotora*-researchers,[58,173,174] or community health workers[5,65,175,176]) are native to the study area, certified by the state of Texas, and are closely-knit to the communities they serve. The *promotoras* on our research and outreach team were extensively trained as the program educators and were actively involved in recruitment, retention, process evaluation, curriculum development, and delivery of all curriculum lessons. A detailed curriculum manual was developed for use by *promotoras* and research personnel for delivery of lessons. *Promotoras* studied the completed curriculum and lesson guides, then completed two days of intensive, face-to-face curriculum training. Training and preparation of *promotoras* and program staff were conducted in a manner that allowed for adequate peer-to-peer lesson "rehearsals," the opportunity to ask questions, and included refresher courses as the intervention progressed. This extensive training regimen included discussions on participant recruitment and informed consent, senior nutrition, adult/peer education, teaching and lesson delivery, reflexive journaling, and observational data collection. In addition to *promotoras*, trained research personnel were utilized to deliver in-depth interviews to assess feasibility and acceptability and to record observations throughout the course of the study. The Texas A&M Institutional Review Board approved this study and all

research personnel completed training in the protection of human subjects and the study protocol.

No Más Hambre was developed for MH seniors using several cultural adaptation strategies.[24] Careful consideration was given to culture, language/syntax, and pragmatism in every aspect of lesson development and modification. Spanish/English linguistic experts and native *promotoras* on our research team were consulted to ensure semantic and conceptual equivalence. The curriculum was developed in English, translated into Spanish, and delivered with the application of adult learning strategies and techniques, such as interactive instructional lessons and case-based discussions to guide resource-dependent education.

This study began as a mixed-methods, single group, pre- and post-test design; however, due to participant difficulties with pre- and post-test knowledge assessments, only qualitative data are reported. The curriculum was informed by: 1) formative research that included 14 *Senior Focus Groups* and 578 *Senior Hunger Surveys* with MH seniors residing in the intended geographical areas; 2) collaborative discussions and group-think activities with university-based nutrition and public health researchers, registered dietitians, and native *promotoras*; and 3) the United States Department of Agriculture (USDA) Dietary Guidelines for Americans (DGA), 2010.[113] The lead author guided the curriculum development team who collaborated on all stages of curriculum planning, development, process evaluation, implementation, and feasibility and acceptability assessments. Feasibility study planning began in the initial phase of curriculum developing the curriculum. Three intervention design questions we aimed to

address were: 1) can it work? 2) does it work? and 3) will it work? In other words, is there evidence that the curriculum can be implemented in real-world conditions given current cultural and socio-ecological contexts, considerations, and settings?

The *No Más Hambre* curriculum consisted of seven lessons, each designed to provide approximately one hour of interactive and individualized education, coupled with hands-on activities each week for seven weeks with an interval of seven days between each lesson. All participants received all curriculum materials, handouts, and interactive tool kits, in addition to a small monetary stipend for their participation. The tool kits (i.e. clear, plastic storage containers) included items such as food and refrigerator thermometers, plastic cutting boards, measuring cups and spoons, hand soap, a reflexive journal, a shopping list tear pad, kitchen cloths, a magnifying glass (for the vision-impaired), and small food storage containers. Tool kits provided were incorporated into the curriculum and utilized by all participants. The purpose of the kits was to provide items that could be utilized to enhance participants' abilities and skills in relation to resource management. For example, magnifying glasses were provided to allow participants with vision impairments to read food labels, coupons, and grocery ads easily. Other items such as thermometers, hand soap, and storage containers were included to encourage safe cooking, handling, and storage of food within the home. Journals and pens for reflexive writing were also included in the kits to allow participants to record their weekly goals, barriers with applying lessons, positive outcomes resulting from lessons, knowledge shared with others, and so forth. Participants were encouraged to utilize their journals over the course of the study and

were encouraged to continue after the lessons had concluded. Cost of each kit was approximately $20, and items can be easily found in discount or dollar stores.

Table 5.1 summarizes the seven lesson topics and learning objectives, which focused on creating awareness of the links between food security (i.e., having enough food in the home) and good nutritional health. Interactive lesson activities represent four learning styles: 1) visual (or seeing); 2) kinesthetic (or tactile, doing); 3) affective (or emotional feeling/sensing); and 4) cognitive (or thinking).[158] Each nutrition education lesson was developed, evaluated using a constructive process evaluation approach, and modified by a registered and licensed dietitian following face-to-face, group process discussions with the research team. The curriculum was not developed with a didactic structure in mind; rather, lessons included learner-based discussions and tactile activities (e.g., physical activity breaks, recipe preparation) which targeted knowledge and skills with the intended result of resource maximization for increased food security. The final phase of curriculum development and implementation was to pilot test the curriculum (June 2014) for feasibility.

5.2.3. D*ata Collection & Analysis*

A mixed-methods approach, using qualitative and quantitative methods, was used for data collection. Data from post-intervention evaluation of acceptability were collected from participants in the form of semi-structured interviews and from *promotoras* in the form of observational notes and a focus group. Though participant pre- and post-curriculum knowledge assessments were collected, they were utilized only for process evaluation and were not utilized for outcome data. The pre- and post-

Table 5.1. *No Más Hambre* curriculum overview

Lesson	Learning Objectives & Activities
1. General Nutrition, part 1	• Explain what good nutrition means to them. • Understand how good nutrition leads to improved health. • Understand how energy and essential nutrients are necessary for life and living well.
2. General Nutrition, part 2	• Read and understand the main sections of a food label. • Know how to build a better plate (*MiPlato* [MyPlate]) according to the Dietary Guidelines for Americans (2010). • Discuss key nutrition messages and use them to form healthy dietary goals.
3. Nutrition for Seniors	• Identify and discuss the signs of aging. • Identify and discuss the challenges of aging. • Describe the essential nutrients for older adults. • Discuss the importance of adequate hydration.
4. Food Budgeting	• Prepare a feasible food budget that will allow them to make healthful food and beverage choices. • Identify the resources and food assistance programs available to them (e.g. SNAP, local food bank/pantry). • Discuss the economic importance of purchasing seasonal produce. • Discuss how and when to use coupons and store specials to save money on food purchases.
5. Food Shopping	• Understand how to shop smart and economically for healthful foods. • Explain food and grocery store marketing and how they affect our food purchases.
6. Food Safety & Preparation, part 1	• Understand food borne illness and how it occurs. • Explain and demonstrate proper hand washing and good personal hygiene. • Describe adequate food preparation and holding temperatures and how to use a thermometer. • Identify unsafe food handling practices.
7. Food Safety & Preparation, part 2	• Discuss *Clean, Separate, Cook, and Chill* and the importance of these steps for safe food preparation. • Demonstrate how to safely store foods. • Discuss cross-contamination and why it is important to avoid when preparing food. • Define *safe cooking* and the importance of temperature and cleanliness.

curriculum evaluation was improved iteratively during process evaluation of the study pre-tests. However, participants in the curriculum pilot test had numerous difficulties with assessment tools (e.g., literacy issues, difficulty with comprehension, verbalized test anxiety).

The examination of feasibility and acceptability is best approached through qualitative research.[166] For this study, notes were taken by two team observers in real time direct observation of each lesson delivered. Observational notes also included reflexive discussions with *promotoras* regarding the study curriculum, study participants, and self-reflection. Semi-structured, post-intervention interviews with participants were recorded with a digital recording device, transcribed verbatim, and then translated to English for analysis. All interviews were conducted in Spanish with the exception of one; this participant was more comfortable speaking "Spanglish", an interchangeable mix of English and Spanish. Participant satisfaction with the *promotoras*, lesson format and delivery, lesson materials, and the overall project were also assessed through qualitative inquiry. In-depth perspectives of the participants were collected through semi-structured interviews. The interview guide was developed by team researchers and included questions that elicited participants' experiences throughout the study; interviews lasted an average of 57.5 minutes. The transcribed interviews were subsequently translated from Spanish to English. Multiple members of the research team identified positive and negative aspects of the curriculum. One researcher compiled all team notes and transcripts then independently coded the transcripts using conventional content analysis.[177] Thematic analysis[178-181] allowed the

research team to identify emerging concepts relating to feasibility and acceptability. Data were organized into categorical themes and subthemes, using quotes from participants and *promotoras*, for analysis and synthesis.

5.3. Results

5.3.1. Participant Demographics

During the pilot-test phase, 63 total lessons were delivered, during which 8 MH seniors participated (mean age = 66 years, range = 60-75 years). Of the 12 participants recruited, nine participants (8 females, 1 male) agreed to the study and completed all seven lessons. The lessons lasted an average of 68.75 minutes each (range = 35-143 minutes). Of the three participants who did not complete the study, two cited medical reasons for not being able to participate or complete the lessons, and the others mentioned they needed to migrate to find work. Many of the participants we recruited throughout the life of the study migrated to Northern U.S. states with their families to find summer agricultural work. This affected the ability for two of the recruited seniors to participate in the summer pilot test.

Six of the nine participants were born in Mexico, and none of the participants received formal education beyond the sixth grade (range 2nd to 6th grade). Monthly household incomes reported by the participants ranged from less than $500 to $1000 - $1200. Of the nine participants, only two reported they did not receive Supplemental Nutrition Assistance Program (SNAP) benefits; however, these two participants sought fresh and processed food items from a local church pantry. All but two participants reported they owned an automobile; the two without reported they received

transportation from family members. Three of the participants self-reported being overweight or obese and six of the nine participants reported their general health as "poor" or "bad."

5.3.2. In-depth Interviews with Participants

Sharing of Knowledge

Participants were proud to admit they shared the information they were learning with others (i.e., children, grandchildren, neighbors, friends at church, physicians/doctors, and senior center friends). One participant stated her husband now goes to the gym and takes care with what he eats, "He learned everything from me." The same participant says she has maintained her weight since the program began. Another participant stated, "I think that, that other people deserve to be taught." A few of the participants mentioned they would like to see lessons that involve the entire family. This was evident during a few of the lesson visits as participants would invite family members, friends, and neighbors to sit around the *promotoras* and listen. Most of the participants commented that this information is important for mothers of young children. One participant stated that "I've raised my kids well about nutrition. I think that if they take that information to the mothers who have small children, they can, learn how to discipline their children in regards to food and nutrition." Also, "I already eat with pleasure and I enjoy vegetables…if the mothers discipline themselves, they will get used to [*eating and feeding vegetables]*." Another participant was proud to declare that she shared her new knowledge with her grandchildren each week.

One participant stated she was going to start her own shared knowledge meetings and call them, "*Compartiendo Talentos* [Sharing Talents]." This participant noted that she already had healthful recipes to share for her initial meetings. "We should be teaching each other," stated another participant. Two participants shared their curriculum notebooks as well as some of their new knowledge with their physicians. Another participant mentioned she "practices" her learned knowledge and skills with her friends and family. She tells them, "Look, this is how I learned this, and it's better like this, better for all of us." Another participant is proud of the fact that she is sharing her new knowledge for good. She goes to visit a friend with diabetes and she tells her, "*'Comadre* [close female friend], that does you harm. Look, this is better.' I believe that it's…I'm doing good to everyone, to their health, to their person." Another participant loves to share her new knowledge with friends and said she is honored to do so, "because I don't want other people to get sick like me." Two participants (1 male, 1 female) recommended the curriculum notebooks be widely distributed within the community and "should be in each home."

Most Important Lessons Learned

Participants stated the most important lessons they learned included the lessons on the MyPlate or *MiPlato* and lessons on food labels. However, learning the food label was also identified as the most difficult lesson for the majority of participants. One participant stated that she never used to pay attention to the food labels because they looked too confusing. She admitted to feeling more confident about reading food labels as a result of the lessons. Another participant confessed she did not find the labels

difficult to understand, however they were difficult to read because of the small print. Another participant declared, "I did not used to pay attention to the labels before…now that they are explained to me I have a better understanding."

Most participants admitted they "learn more by doing things" such as writing goals and participating in lesson activities. One participant stated the lessons allowed her to pay better attention to her food purchases, "I used to just throw groceries in [the cart] and I always went over my budget and had to put things back. No, now we pay attention and have money left over." All the participants stated the lessons were all very important to their health and wellness and no changes to the lessons were recommended by any of the participants.

Thoughts on Curriculum Materials

Though a few participants enjoyed writing in their reflexive journals, journaling was apparently difficult for most of the participants. Literacy concerns and difficulties with memory prevented many of the participants from maintaining their reflexive journals through the life of the project. Issues with literacy (i.e., inability to read or read well, difficulty writing) were excluding factors for this study; however, some participants reported no problems with literacy even when these issues did exist. We noted that at least four of the participants did not personally write in their reflexive journals and tasked others to read and write for them.

All of the participants were excited to be provided with the curriculum tool kit which led to the increase of interest in learning. One participant stated she had never used measuring cups before because she learned how to measure approximate volumes

by using her hands. She was excited to have measuring cups for cooking and for portion control. Another participant, with a diagnosis of type 2 diabetes, utilized her new measuring cups to determine her carbohydrate servings and exchanges. One female participant admitted to never having used a meat thermometer to check her temperatures. She loved her new meat thermometer because she admitted she would often prepare meat products that were visibly undercooked. One participant commented that she was happy to find a magnifying glass in the tool kit. Her vision was a limiting factor for her and this magnifying glass helped her to complete her journal, read her handouts, and examine food labels while shopping. Another participant mentioned she uses something from her tool kit every day.

Notable Challenges Faced by Participants

Some challenges that limited participants from fully engaging in the curriculum included mobility issues, literacy difficulties, anxiety with pre-post-assessments, and loss of memory. Physical activity breaks were incorporated into the curriculum, but some of the participants were concerned about their mobility. Most of the participants enjoyed the opportunity for physical activity breaks that were built into the curriculum, however a few participants had difficulty with movement and felt less excited about engaging in activity. Additionally, participants had difficulty with the pre-post-assessments and stated that the questions were somewhat confusing and difficult to answer. Despite multiple revisions, pre-post-tests continued to be challenging and remained a source of anxiety for the participants. Face validity of the tests were seemingly high after final revisions, however participants were intimidated by the testing

process and had difficulty with answers. *Promotoras* responded to this challenge by assisting the participants with each of the pre-post-assessments, but most participants stated they would rather not complete this step of the curriculum.

Another notable challenge for participants was difficulty remembering lessons. One participant mentioned she would not be able to tell you what was learned in the first lesson, "It just didn't stick." Another participant mentioned, "My mind is not so well right now…I'm a slow learner." One female participant mentioned her husband recently passed away and she finds herself frequently lost in thought, "I lose my thoughts, I don't have a good memory and I forget things, but I put in an effort to continue moving forward." Another participant mentioned she would review her curriculum notebook several times in the evenings because she would easily forget her lessons. Only one participant admitted she had no difficulty remembering the lessons.

Promotoras as Interventionists

When asked about the comfort with *promotoras* teaching, one participant answered, "We were comfortable with each other right away." One participant mentioned that programs that utilize *promotoras* are advantageous because *promotoras* are beneficial, essential, patient, and "bring information all the way to your home." Others commented that learning with the assistance of *promotoras* was much more fun and effective. One participant mentioned that the *promotoras* made her feel that they were listening and that they expressed what was important to her. Two of the female participants said they felt like they were among friends and family, and they looked forward to visiting with the *promotoras* each week.

Most participants commented that all lessons were taught well and all questions were answered. One participant was impressed by the knowledge of the *promotoras*, "I know they studied before they went out to the people. It's important they come trained and know what they are talking about, I liked that." Another participant agreed that "not everyone can give your lessons…you have to first study your material to be able to teach." One participant noted that if not for the *promotoras* explaining everything so well, she would have "lost the motivation and would've stopped from receiving the lessons…I congratulate the [*promotoras*] for bringing me these lessons…and I congratulate myself for the effort I made." When asked what changes the *promotoras* could make in order to improve the delivery of the lessons, all participants responded that they would not change one thing. Interestingly, three participants (one male, two females) commented that they appreciated the way the *promotoras* "behaved themselves" while in their homes. Another stated she was interested in becoming a *promotora* and wished to emulate the passion the *promotoras* have for teaching others. This participant also wanted to be reassured she could keep her curriculum notebook so she could use it to teach others.

Curriculum Benefits

All participants stated the lessons were of interest and were quite enjoyable and that they had learned a great deal of information. Most of the participants commented on the many changes they have initiated since they began their lessons. One participant proudly admitted that she no longer must take her diabetes and blood pressure pills because of the changes she has made as a result of her participation in this program.

Another participant mentioned, “I’m eating healthier, I am going to buy one hundred percent whole wheat bread…I have never bought that before.” One participant stated, “Because of this program, of nutrition, the government is starting to care about people.” “These lessons have given me discipline…I pay more attention to everything now,” stated one proud participant. Another participant admitted she initially agreed to participate in the study because of the compensation; however, once she completed the lessons, she was happy with what she learned. In fact, she told her medical doctor that the lessons she learned were a “blessing to [her] health.” Another participant told a story of her life and how education such as this should be required for younger generations, “I worked in the sugar beet fields…poor people, this is how we work. Younger [generations] need…they need lessons like this.” Most of the participants felt this information would benefit people of all ages, yet were concerned that younger generations would not understand the importance.

One female participant stated the program had benefitted her a lot and she was going to miss the education she received each week. She requested that we consider her again for future programs because she found great value in the content. Another participant encouraged the research team to continue the lessons within the community, “Keep moving forward, keep doing this because it’s very good what they are doing…I tell you I feel more comfortable, more aware, I see the way to do things and everything is perfect.” One participant held up her compensation, tool kit, and patted her lesson handbook as she said, “You have to continue this, because [the intervention] is worth more than this, I want you to know that. My health, what you…they taught me, is my

reward." Notably, one female participant confessed to battling depression for many years. She admitted she lost most of her motivation to exercise, maintain her social networks, and manage her health. She said her participation in this study allowed her to communicate and connect with the *promotoras*; slowly, she began to build her strength or "energy" to fight depression daily through exercise and self-care. During the interview, this participant stated she appreciated the lessons because, "of the energy they give to you…how to spend time together, how to appreciate life, by motivating you to begin again."

Suggestions to Improve the Curriculum Pilot

Participants and *promotoras* enjoyed the opportunity to engage in a learning process that encouraged resource maximization, improved nutrition knowledge and skill building, and healthy lifestyles. Both participants and *promotoras* valued the learning materials (i.e., curriculum notebooks, lesson handouts, lesson kits) and enjoyed sharing them, along with new knowledge, with friends, family members, and neighbors. For most participants, involvement in this project empowered them to improve their health through resource maximization, physical activity, and the utilization of nutrition knowledge and skills. Participants and *promotoras* offered suggestions to improve the program and these suggestions are presented in Table 5.2.

5.4. Discussion

Feasibility studies are evolving, dynamic processes that require time, precision of evaluation, comprehensiveness and depth, and should result in improvements upon research design and procedures.[182] This feasibility pilot study determined that

Table 5.2. Participant and *promotora* perspectives: opportunities for improvement

Curriculum Component	Lessons Learned
Overall	1. Participants has a difficult time remembering what was discussed/learned in previous weeks 2. One *promotora* recommended focusing on younger populations of adults (<60 years of age) 3. The final in-depth interview was intimidating for some participants; they were nervous about being "questioned" 4. Deliver all lessons in the mornings when participants are more alert and engaged
Senior Lessons	1. Repetition/reiteration in lesson content was often frustrating for participants and *promotoras* 2. Some curriculum topics could be further simplified 3. Font size of reading materials was too small for some participants 4. *Promotoras* want more activities for each lesson 5. Participants want more recipes with the lesson binders 6. Pre-and post-tests of knowledge were intimidating for the participants; find other ways of measuring outcomes with this population 7. Some of the pre- post-test questions were confusing to the participants

implementing *No Más Hambre,* a culturally- and linguistically-focused, learner-based nutrition curriculum, is feasible and acceptable among MH seniors within an individualized, home-based setting. Our innovative multimodal approach that utilized trained *promotoras* was acceptable to all participants and netted overall high satisfaction with the curriculum. The rich qualitative data from this study offered a greater understanding of how MH seniors experienced a home-based, nutrition curriculum. Though the larger aim of the curriculum was to decrease the risk of hunger within our population, secondary outcomes included self-reported improvements in physical activity and dietary patterns in most participants; these notable improvements should

provide focus for future studies. Though none of the participants alluded to the notion they were more food secure as a result of the curriculum, we addressed known protective factors that reduce the risk of hunger to include social bonding (e.g., shared knowledge, *promotora* presence), skills training (e.g. curriculum and lesson kits), inspiring healthy beliefs (e.g., lesson objectives), and having positive role models (e.g., *promotora* presence).[183,184] Furthermore, the self-reported impacts of the curriculum on participants' lives suggest they received great personal gain from the lessons. Qualitative results also revealed that structured programs or opportunities such as *No Más Hambre* were not previously available to this population; three of the participants mentioned that there are no similar programs (to their knowledge) that exist in their respective areas.

In concert with other interventions, we found seniors enjoyed and found value in practical nutrition knowledge and skill-building opportunities.[22,90,106,109,185-187] Similar to our results, one intervention also found that older adults prefer not to take "examinations" or be quizzed about their knowledge and current health status.[109] Another home-based study utilized Social Marketing Theory (SMT)[188,189] as an alternative approach to developing an intervention for senior adults. This study found that seniors prefer lessons and lesson materials that are easy to read, less confusing, have large font sizes (16 or higher), colored handouts, and are compiled in a binder or notebook.[190] Other studies that utilized *promotoras* to deliver nutrition education within MH communities were also found to be effective, acceptable, and feasible.[5,32,58,62,65,170,171,176] Though our study had many similarities to others that offered nutrition knowledge and skills for seniors, the home-based nature of our study was

unique and few comparison studies are available within current literature. Unlike group nutrition classes conducted a community location, the home-based approach in this study capitalized on tailoring the curriculum and presentation to the home context in which seniors reside.

Ideally, future directions of this research would include the development of an efficacy study within this population, however this may limit practical applicability. Though most evidence-based interventions are derived from efficacy trials that are highly controlled, the "focus on internal validity can reduce external relevance."[166] Therefore, feasibility studies such as the one described here must continue to be tested to fit practical, real-world settings. Any curriculum adaptations must be needs-based and focus on foundations of *deep structure* cultural sensitivity[24] balanced with implementation fidelity. Pre- and pilot-testing of the *No Más Hambre* curriculum revealed the limits to which standardization of lessons across populations is feasible and offered greater awareness of the need to fuse fidelity of curriculum delivery by *promotoras* with flexibility to support its implementation.

Feedback received through process evaluation provided important insight for revisions to each of the curriculum components. Initially, each lesson included a significant amount of information that *promotoras* deemed excessive and possibly overwhelming to participants. Lessons were modified for brevity to simplify the message and limit the amount of learning objectives per lesson. As a result, each lesson has been developed in such a way that it can be deconstructed and taught in segments if participants are limited on time or attention span.

Despite several strengths, this feasibility pilot has some limitations. First, this study had a small sample size. However, as this was a feasibility and pilot study, large sample sizes are not expected; thus, the small number of recruited participants did allow for a meaningful evaluation of the feasibility and acceptability of the curriculum. Second, participants were asked to maintain a reflexive journal to document goals, questions, difficulties/barriers, important lesson notes, etc. At least half of the participants stated that maintenance of these journals was cumbersome due to poor vision and literacy concerns. Third, because we did not collect quantitative baseline or outcomes data, we could not measure changes in knowledge, skills, or anthropometric measurements. Future studies would benefit from assessment of nutrition knowledge and skills in control or comparison groups. Another limitation was the attrition rate. All seniors we recruited were motivated to participate; however, conflicting medical appointments or illness and work-related migration negatively influenced participation.

The results of this pilot feasibility and acceptability study were used to validate and further refine the *No Más Hambre* senior hunger curriculum. Future implications for this intervention include implementation of the curriculum with a comparison group to assess feasibility and acceptability in other locations and diverse populations. Another implication of our findings is that more interventions are needed in this geographical location for all ages, especially for youth and parents of young children. This intervention should be subject to greater effectiveness studies, but must be offered to a wide audience irrespective of age.

This is the first examination of perspectives and experiences of a home-based, nutrition education program for MH seniors who experience acute hunger and food insecurity. This research demonstrates that an innovative and alternative approach to tackling the risk of hunger and food insecurity among senior adults is acceptable and can be feasibly executed. With mounting concerns regarding senior hunger and food insecurity, examination and implementation of innovative programs that focus on coping strategies and resource maximization for this ever-growing population are imperative. Promoting healthful behaviors to low-income seniors through educational activities will not only facilitate hands-on skill-building, but it has great potential to impact the trajectory of hunger and food insecurity as a protective factor that may reduce risk. Community collaborations and employment of *promotoras* were essential to the success of this project, and they contributed vital resources that bolstered the impact of the curriculum. Using a home-based setting for this curriculum has the potential for a far-reaching impact on this population as many seniors do not own or no longer drive an automobile, have unique needs and assets in their home environment, do not have access to personal or public transportation, are homebound, or prefer to remain in close-knit and familiar settings. Results of the *promotoras'* feedback and post-intervention interviews with study participants indicated the program to be feasible, acceptable, and desirable in this under-represented and vulnerable senior population.

6. CONCLUSION

The overarching goals of this doctoral research were to address the complexity of hunger and food insecurity and to understand the experiences and contextual issues surrounding food acquisition and consumption among MH seniors. Aside from complex nuances reported by interdisciplinary scholars, addressing the root causes of hunger and food insecurity results in multiple challenges and has numerous policy implications. New and innovative public health programs that address this public health concern are faced with the task of staying abreast of the threat posed by food insecurity on the greater society. We addressed hunger and food insecurity in our population by initially defining hunger and food insecurity as they exist among MH seniors. Second, we identified unique and innovative strategies and tactics for reducing risk of hunger and food insecurity in this population. Third, we developed and implemented a theoretically-driven, evidence-based curriculum that is culturally and linguistically centered, based on identified risks and protective factors. Finally, we determined the feasibility and acceptability of the curriculum through interpretive, naturalistic inquiry.

In particular, this research sought to address gaps in the current literature with regard to hunger and food insecurity within this priority population. Older MH adults who are low-income, low-literacy, and primarily Spanish-speaking have food insecurity rates well above the national average, however very few studies examine hunger and food insecurity in this population.[117] Interventions aimed at reducing hunger and food insecurity in MH populations are predominantly geared toward risk reduction among

women and children due to the large body of literature indicating households with children are at greatest risk.[79,94,102,103,116] Noteworthy is a systematic review published 2014 that showed what other scholars have similarly reported—nutrition education and interventions designed for seniors are limited.[106] Various scholars have urged the development of nutrition education curricula and innovative strategies tailored to meet the needs of this prominent, growing population. Furthermore, face-to-face interventions conducted within the home are seldom used in research despite the fact that interpersonal and home environments play a crucial role in one's ability to adequately afford, access, store, and prepare safe and nutritious foods.[118] The feasibility and acceptability of our home-based approach contributes important insights to the literature that few studies have previously.

To address the gaps, we employed a holistic approach to the problem by examining varied aspects of the lives of MH seniors to include psychological and social factors that affect the whole person and not just one's propensity to hunger and food insecurity. The initial senior focus groups (Paper 1) illuminated the importance of centering interventions on the premises of coping strategies, resource management, and social capital. Participants in our senior focus groups widely engaged in food sharing and informal social exchange in order to supplement household income and other means of income in effort to reduce hunger and acute food insecurity. Notable quotations by focus group participants indicated the importance of social-familial support, social capital, and resource and information sharing. Despite these results, many of the senior participants lacked adequate household resources, resource management skills, and

coping strategies, and were disconnected from social networks that are evident in reducing barriers to food insecurity. These results spurred the development and implementation of our senior hunger curriculum, *No Más Hambre*, (Paper 2) which introduced novel methods of providing nutrition education and skill building in effort to reduce the risk of hunger and food insecurity through resource maximization. By way of extensive formative and process evaluations, the senior hunger curriculum emerged as a complex framework of *promotora*-led lessons and discussions, learner-based tactile activities, and culturally-sensitive resources and lesson materials—all delivered within the home of each participant. Resource maximization skills, such as food purchasing and preparation with limited resources, budgeting for healthful food items, and keeping foods safe in the home, were taught with the expectation that these skills would be practiced and used successfully to encourage behavior change for resource maximization. Furthermore, participants were encouraged to share their new knowledge, skills, and resources within new and established social networks. To test the feasibility and acceptability of the *No Más Hambre* curriculum, we engaged the *promotoras* and participants in process discussions and in-depth interviews (Paper 3). This feasibility and acceptability study is the first of its kind in that we examined perspectives and experiences of MH seniors who endure acute hunger and food insecurity through the use of a home-based nutrition education curriculum. We determined the curriculum to be both feasible and acceptable, however we found no indication that the curriculum would aid in reducing hunger and food insecurity. Though we did not assess empirical outcomes, we determined through interpretive analysis that secondary outcomes (i.e.,

self-reported impacts), such as social bonding, learned knowledge and skills, and improved health beliefs and behaviors, were valued and the lessons were enjoyable and indispensable to all participants. Results of the promotoras' feedback and post-intervention interviews with study participants indicated the program to be feasible, acceptable, and desirable in this underrepresented and vulnerable senior population.

By employing multiple theoretical and conceptual approaches, this research contributes to understanding the components of an innovative, home-based curriculum intervention aimed at reducing the risk of hunger and food insecurity among MH seniors through resource management and coping strategies. An important contribution of this study is the focus on conceptualization of the curriculum implementation process as consisting of not only the lessons delivered by *promotoras*, but the experiences and education as it is received by MH seniors. Future efforts include applying the *No Más Hambre* curriculum to efficacy studies as well as practical, real-world applications. Establishing sustainability of the curriculum will require additional research, application, and considerable time and effort. Further studies that utilize innovative and holistic home-based interventions, such as *No Más Hambre,* will lead us to important insights on how to best address hunger and food insecurity among hard-to-reach and underserved populations—ultimately resulting in novel targets for the reduction of hunger and food insecurity.

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APPENDIX A

Senior Hunger Project
Focus Group Guide

Focused Conversation:

1. **Please tell us how you get food to eat at home.**
   PROMPT: Does anyone help you with getting your food? Do you pay someone to get food for you?
   PROMPT: Do you have any health problems that stop you from doing your own shopping for food?

2. **Please tell us what it is like when you do not have enough money.**
   PROMPT: What are some of the things you do to make your money last longer?
   PROMPT: Do you buy different amounts and types of food?
   PROMPT: Do you eat less?
   PROMPT: Do you work for money?
   PROMPT: Do you ever delay paying a bill?
   PROMPT: Do you know someone who does not have enough money?
   PROMPT: What are some of the things they do?

3. **Please tell us what it is like when you do not have enough food.**
   PROMPT: What are some of the things you do when you do not have enough food?
   PROMPT: Do you ever eat smaller amounts or cut the meal size to make sure you have food for later?
   PROMPT: Are there any special ways you prepare food to make your food last longer, or to get yourself through hard times?
   PROMPT: Do you share your meal with someone?
   PROMPT: Is it important to you to have certain types of food?
   PROMPT: Where do you cut back first? Why?
   PROMPT: Do you ever ask for help? Who?
   PROMPT: What prevents you from getting assistance such as food bank?
   PROMPT: Do you know someone who does not have enough food?
   PROMPT: What are some of the things they do to obtain food?
   PROMPT: What do you think prevents them from getting assistance?

4. **What are your major concerns about having enough food?**
   PROMPT: Can you tell us about concerns other people your age have about having enough food?
   PROMPT: Do you think most people your age have difficulty having enough food?
   PROMPT: Do you plan for food shortages to take care of yourself?

5. What things have been particularly difficult for you when not having enough food? PROMPT: Tell us about your experience with government programs.
6. How do you handle the hard times when you do not have enough food? PROMPT: How do you manage your food? PROMPT: How do you manage your health? PROMPT: How do you manage your money? PROMPT: Do your children or relatives share money or food with you? PROMPT: Do friends or neighbors share food with you?
7. Tell us about your childhood experience. PROMPT: How did your family handle shortages of food? PROMPT: How did you as a child handle food shortages?
8. Tell us about your experiences feeding yourself and your family when you first started a family. PROMPT: How did your family handle shortages of food? PROMPT: How have things changed in the way you obtain and prepare food between then and now?
9. When you think about making a meal, what and who do you take into consideration? PROMPT: What types of food do you prepare? PROMPT: How is the food prepared? PROMPT: Do you prepare the same foods each day? PROMPT: Do you ever get food that is prepared by someone else? Do you pay for this?
10. What do you think would be the best way to give you useful information about food, cooking, and nutrition? PROMPT: What type of information about having enough food would you like to get? PROMPT: What type of information food preparation would you like to get? PROMPT: How would you prefer to get information about food and cooking? PROMPT: Would you like to receive written recipes? PROMPT: Would you like to attend a cooking class?
11. When you think about food resources in your community, what comes to mind? PROMPT: Places to purchase food PROMPT: Places to go that provide prepared meals, such as Senior Centers PROMPT: How have things changed in the past year?
12. If you were in charge of getting the word out to others about having enough food on a limited amount of money, what would you do to make sure everybody knew about this? -END OF GUIDE-

APPENDIX B

GENERAL NUTRITION **Lesson #1**
Part I

Objectives
By the end of this lesson, participants will be able to:

- Explain what good nutrition means to them.
- Understand how following the Dietary Guidelines may lead to improved health.
- Discuss why weight control is important to good health.
- Understand how energy and essential nutrients are necessary for life and living well.

Materials and Supplies
Promotora training kits and manuals, participant waivers, aprons or other protective clothing, hair ties or covers (hats) to restrain hair (*promotoras* must explain to participants the necessity for this), first aid kit, voice recorder, writing pads or paper, pens, calculators, 1 apple, 1 pear, food labels from a variety of foods. *In training kits, if necessary*: pot holders, soap and dish detergent, anti-bacterial wipes, dish towels/wash cloths, paper towels, foil or plastic wrap.

Handouts:

- Dietary Guidelines for Americans (DG) brochure
- DG Be Active Adults
- DG Add More Vegetables
- DG Liven Up Your Meals with Vegetables
- DG Focus on Fruits
- DG Choosing Whole Grains
- DG Protein Foods
- DG Salt and Sodium
- Good Fats, Bad Fats
- Fiber Facts & High Fiber Foods
- DG Healthy Eating for an Active Lifestyle

***Recommend each *promotora* be 'pre-equipped' with information regarding each individual senior and what is available, in terms of resources, within each residence. It will be the responsibility of the *promotora* team to modify the education and skill delivery based on existing knowledge of each participant.**

Introductory Statement
(e.g. "Thank you for allowing us to join you in your home today for a discussion about nutrition. Today we are going to talk with you and show you about good nutrition,

healthy body weight, and we are going to help you set some goals for good health. But before we begin, please read and sign this participation waiver.") *Waiver will be explained and signed by participant **before** the first lesson begins.

Knowledge & Skills Pre-test

"*Now, we would like for you to answer the questions in this short pre-test. It is okay if you do not know the answers, just do the best you can."* This is a brief pre-test that can be guided by *promotoras* for those with literacy, vision, writing, and other related concerns.

I. What is Nutrition?

"In your own words, give me your definition of nutrition and what good nutrition is to you."

- Have the participant write down (or verbalize) their definition of nutrition and/or what "good nutrition" means to them. Ask them to share their definition.

II. Dietary Guidelines for Americans (*Use the DG handouts to briefly discuss the three major goals*)

- Briefly define and discuss the guidelines (*DG brochure*)
- Three major goals:
  1. Balance calories with physical activity to manage weight.
  2. Consume more of certain foods and nutrients such as fruits, vegetables, whole grains, fat-free and low-fat dairy products, and seafood.
  3. Consume fewer foods with sodium (salt), saturated fats, *trans* fats, cholesterol, added sugars, and refined grains.

What does this mean?

III. Body Basics: What is a Healthy Weight?

- "*American Heart Association states that of Mexicans over 20 years of age: 77.5% of men and 75.1% of women are overweight or obese; and only 14.4% of Hispanic or Latinos age 18 or older met recent guidelines for physical activity."*
- Discuss the fact that our weight is expected to increase as we age due to decreases in muscle mass, increases in fatty tissue, and decreased metabolism.
- *Apples & Pears Activity*
  - Discuss risks of abdominal fat; obesity & overweight
    - Use an apple and a pear to show body types
      - Ask them, "*Which do you think is most dangerous?"*
    - *Imagine exercise*: Have the participant hold a bag of sugar (~5 lbs.) to have them visualize carrying an additional 5 pounds of sugar on their body.

IV. Energy Basics

- Calories = energy; "*When we do not eat enough, our bodies can feel tired because we have little energy. When we eat too much, our bodies will store the energy that is not used. This storage leads to weight gain over time."*
- Ask the participant, *"Why do you think calorie needs are different for everyone?"*
    - Age, genetics (inherited body types), muscle mass, gender, body temperature, dietary patterns, physical activity
- Energy Balance: calories in versus calories out ~~(*handout*)~~
    - *3,500kcals in excess of what your body uses as energy = 1 lb. gain in body fat*
        - Use an example (e.g. food label on soda, *gamesas*, cereal) to show how quickly calories add up.
    - A healthy weight loss is 2-3 pounds per week
- Physical Activity
    - Ask the participant, "*How physically active are you?"*
    - Have a discussion with them regarding their daily routine
    - Tell them, "*Physical activity is very important as we age. It is necessary for us to keep our muscles strong and flexible, our minds healthy, our bones strong, and helps us maintain a healthy weight. Physical activity also helps us to use the energy we consume in food and drinks."*

V. ***Physical Activity Break (5-10 minutes)***

VI. Essential Nutrients

- Ask the participants if they know the 6 essential nutrients to life*;* in other words, what our bodies <u>need</u> in order to live and to live well.
- Six essential nutrients:
    - Vitamins (no calories/energy)
    - Minerals (no calories/energy)
    - Water (no calories/energy)
    - Protein (4 calories/gram)
    - Carbohydrates (4 calories/gram)
    - Fat (9 calories/gram)
- Dietary fiber (*handout with high fiber foods*): Tell the participants, *"It is important as we age to eat plenty of fiber because it helps our bodies to digest food. Constipation can become more common as we age and fiber can help relieve some of the discomfort."*
- *Food Exercise*: place the foods to the nutrients. Ask the participant if it would be okay if you use some of the foods they have available in their residence. Then ask them which of the nutrients (explained earlier) are in the foods they regularly eat.
    - Use *Dietary Guidelines* to discuss lean protein, light and fat-free dairy (ASK: W*hat are the differences? Similarities?*), the importance of

fruit and vegetables (antioxidants, minerals, and vitamins), whole grains (fiber), and so forth.

VII. Goal Setting Activity

***We will review these goals at our next session together*

1. Dietary Guidelines
    a. Physical Activity- Help the participant set goals for activity and movement. Consider any physical and/or environmental barriers.
    b. Dietary Patterns- Help the participant set goals for better eating habits and food choices.
2. Nutrient Focus
    a. Hydration- ASK: *How much <u>water</u> do you drink every day*? If not enough, help them set goals for increasing water consumption. Are there barriers that exist for this participant?
    b. Fiber- ASK: *How often do you eat foods that are high in fiber*? If not enough, help them set goals for increasing water consumption. Are there barriers that exist for this participant?
3. Reflexive Journal
    a. *Now, we are giving you notebook that will help us understand how you are doing and it will help you meet your goals. Also, we want you to write down your thoughts and feelings in this notebook.*
    b. *For example, "I am trying to eat healthier foods, but I am having a hard time getting to a store that sells affordable fruit and vegetables." Or, "I am so proud of myself! I was able to walk ten times around my neighborhood today without stopping. The exercise makes me feel good."*

VIII. Comments/ Questions

Ask the participant if they have any questions about what you discussed with them today.

IX. Post- Survey & Farewell

Senior Hunger Curriculum
Participation Waiver

Participation Waiver and Release
Please read, and if you agree to the statement, please initial each section on the lines below. Sign and date at the bottom of the page.

Participation Waiver
Liability Waiver: I want to participate in this project, and recognize that it could present potential cooking hazards including but not limited to: cuts, burns, slips, falls, allergic reactions, and other injuries as a result of activities, products, and equipment used. I release the Texas A&M University Health Science Center, *promotora*-researchers, its agents, representatives, employees, volunteers, and any sponsors from any and all damages, causes of action, claims, and liability that might arise from my participation in this project.
Initials _____

Media Release
I consent to and allow any use and reproduction by the Texas A&M University Health Science Center, or *promotora*-researchers of any and all photographs taken of me and my family during my participation in this project. I understand that the Texas A&M University Health Science Center, and *promotora*-researchers will own the photographs and the right to use or reproduce such photographs in any media, as well as the right to edit them or prepare derivative works, for the purposes of promotion, advertising, and public relations. I hereby consent to the Texas A&M University Health Science Center, and *promotora*-researchers use of my name, likeness, or voice, and I agree that such use will not result in any liability to these parties for payment to any person or organization, including myself.
Initials _____

I further acknowledge that I am at least 18 years of age.

_____
Signature Date

_____
Name (please print)

GENERAL NUTRITION, *Part I*
PRE/POST-TEST

Please circle the best answer.

1. Staying active is good for my bones, joints, and muscles.
    a. True
    b. False
    c. I do not know

2. As we age (older than 40 years), we need to eat more calories.
    a. True
    b. False
    c. I do not know

3. Which of the following is one of the essential nutrients to life?
    a. Vitamins
    b. Minerals
    c. Water
    d. Protein
    e. Carbohydrates
    f. All of the above

4. One of the best ways to lose weight is to burn more calories than you take in.
    a. True
    b. False
    c. I do not know

5. It is NOT important for me to eat a variety of food every day, to include fruit and vegetables.
    a. True
    b. False
    c. I do not know

GENERAL NUTRITION **Lesson #2**
Part II

Objectives
By the end of this lesson, participants will be able to:

- Read and describe the main sections of a food label.
- Discuss the importance of servings and portions.
- Know how to build a better plate in relation to the Dietary Guidelines for Americans (2010).
- Discuss key nutrition messages and use them to form healthy dietary goals.

Materials and Supplies
Promotora training kits and manuals, aprons or other protective clothing, hair ties or covers (hats) to restrain hair (*promotoras* must explain to participants the necessity for this), first aid kit, writing pads or paper, pens, voice recorder, calculators, food labels from a variety of foods. *In training kits, if necessary*: pot holders, soap and dish detergent, anti-bacterial wipes, dish towels/wash cloths, paper towels, foil or plastic wrap.

Handouts:

- Food Label Fact Sheet
- Nutrition Facts Label
- FDA Food Label Reading for Seniors
- Portion Sizes
- Choose MyPlate Tip Sheet
- MyPlate Mini Poster

***Recommend each *promotora* be 'pre-equipped' with information regarding each individual senior and what is available, in terms of resources, within each residence. It will be the responsibility of the *promotora* team to modify the education and skill delivery based on existing knowledge of each participant.**

Introductory Statement
(e.g. "Thank you for allowing us to join you in your home again today for another discussion about nutrition. Today we are going to talk with you about your goals, the labels on food, and how to improve your nutrition.")

Knowledge & Skills Pre-test
"*First, we would like for you to answer the questions in this short pre-test. It is okay if you do not know the answers, just do the best you can."* This is a brief pre-test that can be guided by *promotoras* for those with literacy, vision, writing, and other related concerns.

I. Discuss Goals from Last Session

*In this section, the participants should share what challenges they face and what you (*promotora*) can do to help them with solutions.

a. Dietary Guidelines
    i. Physical Activity
    ii. Dietary Patterns
b. Nutrient Focus
    i. Hydration
    ii. Fiber
c. Reflexive Journal
    i. Have the participant share what they have written in the journal since your last meeting.
d. Discussion: "*What were the goals we talked about last time? Did you meet any of these goals and/or make positive changes? What should we change about your goals?"*

II. Food Labels (*handouts*)

- Use handouts for discussion and spend plenty of time on this section.
- Ask the participant, "*Have you ever read and understood a food label on a package of food*?"
- *"Reading a food label can help you make the best choices about the foods you eat*."
- Use a variety of food labels (including those on the foods the participant eats/drinks regularly) and discuss, using examples and asking questions.
    - Nutrition Facts Label
        - Start at the top and work down.
    - Serving Size
        - Discuss what a 'serving' is and how it is necessary in order to understand a food label
    - Calories
        - Remind the participant of the nutrient discussion
    - Percent Daily Values
    - Discuss Nutrients on Label

III. Planning to Eat Smart: Servings & Portions (*handouts*)

a. *"What is the difference between a <u>serving on a food label</u> and a <u>portion size</u>?"*
    i. Talk about the recommended food groups (MyPlate/MiPlato) and discuss recommended servings for each. Remember to recommend use of smaller plates, cups and bowls, *if available*, eat slowly, and minimize the urge to go for 'seconds.'
    ii. Discuss the handouts and ask the participant what they think about the recommendations. Do they think about how much (or how little) they are eating when they have meal?

IV. ***Physical Activity Break (5-10 minutes)***

V. **Build a Better Plate (*handouts*)**

a. *MyPlate/MiPlato* exercise
    i. Show the participant the *MiPlato handouts* (*and instructional plate*) and discuss what each section of the plate represents. Remember to tell them, "*the more color on your plate, the better!*"
b. Use foods within the participant's home (or examples from your tool kit) to have the participant *build a better plate.* Help them by discussing the foods they often consume or have available within their means.

VI. **Key Nutrition Messages**

**Remind them what healthier choices look like and why they should eat these foods (the benefits).*

a. Do your best to eat from every *MiPlato* food group, every day.
b. Do your best to eat a variety of fruit and vegetables, and eat what is in season.
c. Eat high fiber foods as often as you can.
d. Read your food labels to make healthier choices.
    i. Remember that some of the healthiest foods do not come with labels (e.g. fruit, vegetables)

VII. **Goal Setting Activity**

a. What will you add and/or change about your goals for next session?
b. Anything new to add from our discussion today?

VIII. **Comments/ Questions**

Ask the participant if they have any questions about what you discussed with them today.

IX. **Post- Survey & Farewell**

GENERAL NUTRITION, *Part II*
PRE/POST-TEST

Please circle the best answer.

1. If a food says that it has *no cholesterol*, it means it is a healthy food.
    a. True
    b. False
    c. I do not know

2. The more color I have on my plate when I eat, the healthier my meal will be.
    a. True
    b. False
    c. I do not know

3. Reading the food labels will help me make healthier choices.
    a. True
    b. False
    c. I do not know

4. It does not matter how large my portions are. Eating large portions of food will not affect my health.
    a. True
    b. False
    c. I do not know

5. I should have more fruits and vegetables on my plate than any other foods.
    a. True
    b. False
    c. I do not know

NUTRITION AND AGING **Lesson #3**

Objectives
By the end of this lesson, participants will be able to:

- Identify and discuss the signs of aging.
- Identify and discuss the challenges of aging.
- Describe the essential nutrients for older adults.
- Discuss the importance of hydration.
- Discuss the importance of choosing food over supplements.

Materials and Supplies
Promotora training kits and manuals, voice recorder; shopping list [see the *recommended foods* listed under **Section IV: Essential Nutrients for Older Adults**; bring a few of the recommended foods as well as utilize what is currently in the participant's home] *In training kits, if necessary*: pot holders, soap and dish detergent, anti-bacterial wipes, dish towels/wash cloths, paper towels, foil or plastic wrap.

Handouts:

- Better Beverages
- Dietary Supplements: What You Need to Know (*only if the participant has a high reading level*)

***Recommend each *promotora* be 'pre-equipped' with information regarding each individual senior and what is available, in terms of resources, within each residence. It will be the responsibility of the *promotora* team to modify the education and skill delivery based on existing knowledge of each participant.**

Introductory Statement
(e.g. "Thank you for allowing us to join you in your home again today for a discussion about nutrition. Today we are going to talk with you about what is important for our health as we get older.")

Knowledge & Skills Pre-test
"*First, we would like for you to answer the questions in this short pre-test. It is okay if you do not know the answers, just do the best you can."* This is a brief pre-test that can be guided by *promotoras* for those with literacy, vision, writing, and other related concerns.

I. Discuss Goals from Last Session
*In this section, the participants should share what challenges they face and what you (promotora) can do to help them with solutions.

a. Reflexive Journal

i. Have the participant share what they have written in the journal since your last meeting.

b. Questions you may ask*: How well are you doing at achieving your goals? Are there any difficulties you are having up to this point?*

II. Signs of Aging

a. "*Let's talk a little about what happens when we get older*."
   i. Muscle & strength (<2-3% lean muscle every 10 years)
   ii. Metabolism weakens- rate at which the body uses energy
   iii. Body fat increases- the amount of fat within our bodies
   iv. Bone strength- discuss osteoporosis and falls prevention
   v. Bad cholesterol in the blood can increase, good cholesterol decreases
   vi. Blood sugar- our bodies cannot control blood sugar as well when we age
   vii. Body's thermostat- our body does not control temperature (hot & cold) as well when we age. We have greater sensitivity to outside temperature.
   viii. Breathing becomes more difficult and our heart muscle weakens
   ix. Our need for energy (calories) is decreased.

b. "*We can slow the signs of aging with healthy eating, physical activity, by not smoking, and by drinking moderate amounts of alcoholic beverages."*

III. Challenges of Aging *"Some of the challenges we face as we age make it difficult for us to remain healthy and well. These challenges include…"*

a. Having the same nutrient needs (protein, fat, carbohydrates) with fewer needed calories
b. Bad teeth or no teeth
c. Constipation- medication and lack of fiber in the diet can cause this
d. Dehydration- we drink <u>less</u> water as we age, but often <u>need</u> <u>more</u> as we get older
e. Difficulty swallowing
f. Daily activities- such as brushing teeth, bathing, and preparing food
g. Concerns about money- little to no income and no retirement fund

IV. Essential Nutrients for Older Adults

a. ASK: "*Do you remember our last session when we talked about the important nutrients for life? Now we will talk about those that are important as we age and why we need them."*
b. **Protein**- necessary for muscle and bone structure repair, skin integrity, teeth
   i. *Recommended foods*: eggs, legumes, peanut butter, dairy, milk, cheese, yogurt
c. **Calcium**- increase consumption when you are 50 years and older for strong bones, teeth, and muscles
   i. Osteoporosis risk increases with age

ii. *Maintenance*- weight bearing exercise e.g. walking
iii. You STILL can reduce your risk of bone fractures (broken bones) as you age
iv. *Recommended foods*: milk, green leafy veggies, calcium-fortified foods (e.g. orange juice)

d. **Vitamin D**- helps with absorption of calcium
   i. Sunlight helps our bodies to make vitamin D: 20-30 minutes of sun on hands and face 2-3x/week (without sunscreen)
   ii. With age, the body doesn't make Vitamin D from sunlight as easily
   iii. High doses of vitamin D can be harmful so be careful with supplements!
   iv. *Recommended foods*: orange juice, milk, cheese, egg yolk, fatty fish
e. **Vitamin C**- helps our body to take in iron body temperature and can help with immunity to some colds and illnesses
   i. *Recommended foods* (vitamin C): citrus fruit, peppers, and berries
   ii. *Recommended foods* (iron): enriched cereals, beans, whole grains; lean ground beef, eggs, liver
f. **Vitamin A**- will not cure bad eyesight, but too little could make eyesight worse
   i. *Recommended foods*: deep-green leafy and deep yellow veggies and fruit
g. **Folate**- helps prevent heart disease and low iron levels in the blood
   i. *Recommended foods*: leafy green veggies, legumes, some fruit, fortified cereals
h. **Vitamin B12**- low vitamin B12 leads to low blood iron and increased heart disease risk; low vitamin B12 is also linked to memory loss and Alzheimer's disease
   i. *Recommended foods*: meat, poultry, fish, eggs, dairy
i. **Zinc**- helps to fight infections and repair body tissue, can also improve taste slightly; absorption of zinc decreases with age
   i. *Recommended foods*: Beef, whole grains, and milk
j. **WATER**- (*handout*)

The average adult <u>uses</u> 2 ½ quarts of fluid/day (a little over one gallon, use a visual); the body holds less water with age and you become less thirsty

i. Low fluid=increased constipation
ii. Dehydration (what happens when the body does not have all the water it needs) can cause problems with kidneys
iii. With age, there is less saliva to aid in chewing and swallowing
iv. Some medications can cause the body to lose water
v. Dehydration can cause symptoms that seem like dementia (memory loss)

k. **Discuss Supplements (*offer handout only if they have a high reading level*)**
   i. ASK: "*Do you take any supplements for diet or health such as vitamins or diet pills*?" Talk with the participant about the dangers of

dietary supplements that are not tested or regulated by the government. If the participant is taking dietary supplements, try to help them find alternative food-based substitutes, if possible.

ii. Remind the participant that good health comes when you get all the important nutrients through FOOD FIRST.

V. ***Physical Activity Break (5-10 minutes)***

VI. Healthy Aging Goal Setting

"The last thing we will discuss today are some goals for healthy aging."

a. If possible, eat more than 2 small meals per day
b. Try to eat as many fruit and vegetables as possible (the more color on your plate, the better!)
c. Try to drink low-fat milk, at least one glass per day
d. Avoid drinking high amounts of alcohol (beer, wine, liquor)
e. Seek help with tooth or mouth problems
f. Keep food in your home safe (cooking & storage)
g. If you take more than 3 prescriptions daily, make sure you follow-up with a doctor
h. If you have an unexplained weight gain or loss (6 months), follow-up with a doctor
i. If you have a physical disability, seek help from family, friends, neighbors or local resources
j. *DICUSSION*: *"Do you think you will have difficulty with any of these goals? Why, why not? What can I do as a promotora to help you meet these goals?"*

VII. Comments/Questions

Ask the participant if they have any questions about what you discussed with them today.

VIII. Post-survey

NUTRITION AND AGING
PRE/POST-TEST

Please circle the best answer.

1. As we age (over 40 years), we should eat less calories.
    a. True
    b. False
    c. I don't know

2. As we age (over 40 years), our bodies need less water.
    a. True
    b. False
    c. I don't know

3. When we get older, our bodies gradually lose muscle.
    a. True
    b. False
    c. I don't know

4. It is not important for us to worry about what we eat once we are over the age of 50.
    a. True
    b. False
    c. I don't know

FOOD BUDGETING **Lesson #4**

Objectives
By the end of this lesson, participants will be able to:

- Prepare a food budget that will be feasible and allow them to make healthful food and beverage choices.
- Identify the resources available to them (e.g. SNAP, local food bank/pantry).
- Discuss the importance of purchasing fresh foods 'in season.'
- Discuss how and when to use coupons to purchase food items.

Materials and Supplies
Promotora training kits and manuals, shopping list (purchase demonstration items), food and marketing items from local grocery stores and markets (e.g. weekly advertisements, health-related periodicals/publications), product and in-store coupons, and food labels. *In training kits, if necessary*: pot holders, soap and dish detergent, anti-bacterial wipes, dish towels/wash cloths, paper towels, foil or plastic wrap.

Handouts:

- USDA's Eat Right When Money's Tight
- Eating Better on a Budget
- Better Beverage Choices
- Smart Shopping for Fruits and Veggies

***Recommend each *promotora* be 'pre-equipped' with information regarding each individual senior and what is available, in terms of resources, within each residence. It will be the responsibility of the *promotora* team to modify the education and skill delivery based on existing knowledge of each participant.**

Introductory Statement
(e.g. "Thank you for allowing us to join you again in your home today for a discussion about nutrition. Today we are going to talk with you and show you how you can prepare a budget for healthier foods.")

Knowledge & Skills Pre-test
"*First, we would like for you to answer the questions in this short pre-test. It is okay if you do not know the answers, just do the best you can."* This is a brief pre-test that can be guided by *promotoras* for those with literacy, vision, writing, and other related concerns.

I. Discuss Goals from Last Session
*In this section, the participants should share what challenges they face and what you (promotora) can do to help them with solutions.

a. Reflexive Journal

i. Have the participant share what they have written in the journal since your last meeting.

b. Questions you may ask*: "Have you made any changes to your exercise or food choices and eating since our last session? Let's talk briefly about your changes (if any) and any concerns or comments you have."*

II. Meal Budgets: Making your meal dollars count

- **Discussion:** *What factors affect you and/or your family's food budget?*
    - Money available for a *budget* depends upon income (money coming in) versus expenses (money going out)
    - *Difficulties with budgeting*: unreliable income (e.g. hourly pay instead of salary, money promised by family or friends), number of non-income earning individuals in a household, expenses outnumber the amount of income.
    - *Balancing needs and wants:* such as necessary food items vs. candy, sodas, snack foods –even cigarettes and alcohol; unnecessary purchases (e.g. entertainment, 'wants') versus necessary purchases (e.g. food, utilities, medications, 'needs').
    - *Impulse buying*: this is what we do when we do not follow a grocery list or go to the store not knowing what we intend to buy.

III. Food Budget Basics (*handout*)

a. Know how much money you have for food each month. *Does your income vary from week-to-week and month-to-month (i.e. migrant farm work, contract (day-to-day) work, seasonal work)?*

b. Make shopping lists that include foods that are on sale/special and in-season. Stick to the list!

c. Know your resources. If you are not able to keep foods fresh or use them before they spoil, chose canned or other packaged options.

d. Planning is very important. Know what you have at home and what you will be able to buy with the money you have available. Do not plan for expensive meals if the money will cover all the food you will need. Try cleaning your pantry and refrigerator BEFORE going shopping. Make a list of what you will need and only purchase what is on the list—unless you find items on sale that you eat/use regularly.

e. **BEST BUYS**:
    i. Frozen fruit and vegetables
    ii. Larger containers of dairy cost less per serving, but make certain you will eat it all before it spoils or this is money wasted.
    iii. Look for specials/sales on meat products. These are usually very expensive.
    iv. Buy fresh fruit and vegetables when they are IN SEASON. They will be cheaper and taste better.

v. Buy dried beans. They are usually cheaper and will last longer without spoiling.
vi. Do not spend money on bottled water if you have good, drinkable tap water at home. Also, the cost for sodas can add up. Buy soft drinks only for special occasions.
vii. Avoid junk food. Chips, cookies, and candy will only last so long and you can easily use up your food dollars on unhealthy food items.

IV. Food Assistance

a. ASK: "*Do you receive any food or money for food from friends, family, food bank, senior center, or government agency (SNAP)? If so, how much help does this provide?"*
b. If the participant answers "No" ask them if they need assistance finding resources that can help them get food.

V. *Physical Activity Break (5-10 minutes)*

VI. *Eating better on a Budget* *(handout)*

a. Use and explain visuals such as unit pricing sheets found at all grocery stores.
b. *Better beverage choices (handout)*

VII. *Smart Shopping for Fruits and Veggies* (*handout*)

a. Fruit and Vegetables- fresh, frozen and canned; ask what the participant purchases/uses most in their home and discuss the differences of each option.
b. Discuss the differences between all canned foods (no sugar, salt or fat added, low sodium, low fat; *Fruit*: own syrup, light syrup, heavy syrup, no sugar added).

VIII. Coupons & Sales

a. *"Do you use coupons to buy food? Why or why not?" (Producers of many ethnic foods do not offer coupons)*
b. Discuss the use of coupons for items that are not used or necessary to the participant.
c. Coupon activity: Use local store coupons and a few clipped from a local newspaper to use as examples. Guide the participant through each of your example coupons. Remind them to be aware of which coupons NOT to use and those that are "gimmicks."
d. "*Do you shop for food that is on sale? Do you compare prices for different foods*?"
e. Discuss the importance of purchasing sale items, but warn the participant not to be lured by sales on items that they have never tried or do not eat regularly. It is easy to waste food when items are purchased near the "Sell by" dates.

IX. Food Supply

a. Discuss differences in food cost throughout the year(s) as a result of supply and demand, unpredictable weather disasters, and what the farmers are able to successfully produce.
b. Discuss the importance of buying fresh foods that are IN SEASON, to ensure the best price and flavor. Fresh, in season foods can be frozen or preserved for use throughout the year (if freezer and other resources are available).

X. Goal Setting Activity

a. Have a discussion with the participant about their concerns and barriers with budgeting and selection of healthful, affordable foods. Ask how you, as a *promotora*, can assist with these barriers and concerns.
b. ***What are the NEW goals that will be made after this session?***

XI. Comments/Questions

Ask the participant if they have any questions about what you discussed with them today.

XII. Post-Survey

FOOD BUDGETING
PRE/POST-TEST

Please circle the best answer.

1. Frozen fruits and vegetables (when kept frozen) last longer than fresh fruits and vegetables.
    a. True
    b. False
    c. I don't know

2. It is okay to shop for food when you are hungry.
    a. True
    b. False
    c. I don't know

3. Buying fresh food that is "in season" will save me money.
    a. True
    b. False
    c. I don't know

4. Tap water is safe to drink.
    a. True
    b. False
    c. I don't know

FOOD SHOPPING **Lesson #5**

Objectives
By the end of this lesson, participants will be able to:

- Visualize and understand the amount of sugar, fat, and salt in popular foods.
- Understand how to shop smart for healthful foods.
- Explain food and grocery store marketing and how they affect food purchases.

Materials and Supplies
Promotora training kits and manuals, shopping list (purchase demonstration items), food and marketing items from local grocery stores and markets (e.g. weekly advertisements, health-related periodicals/publications), product and in-store coupons, and food labels. *In training kits, if necessary*: pot holders, soap and dish detergent, anti-bacterial wipes, dish towels/wash cloths, paper towels, foil or plastic wrap.

Handouts:

- Smart Shopping

***Recommend each *promotora* be 'pre-equipped' with information regarding each individual senior and what is available, in terms of resources, within each residence. It will be the responsibility of the *promotora* team to modify the education and skill delivery based on existing knowledge of each participant.**

Introductory Statement
(e.g. "Thank you for allowing us to join you again in your home today for a discussion about nutrition. Today we are going to talk with you and show you how you can shop for healthier foods.")

Knowledge & Skills Pre-test
"*First, we would like for you to answer the questions in this short pre-test. It is okay if you do not know the answers, just do the best you can."* This is a brief pre-test that can be guided by *promotoras* for those with literacy, vision, writing, and other related concerns.

I. Discuss Goals from Last Session
*In this section, the participants should share what challenges they face and what you (promotora) can do to help them with solutions.

a. Reflexive Journal
    i. Have the participant share what they have written in the journal since your last meeting.
b. Questions you may ask*: "Have you made any changes to how you budget for food since our last session? Let's talk briefly about your changes (if any) and any concerns or comments you have. How are your other nutrition goals coming along?"*

II. 'Shopping for Health' Activity

a. *"This activity will help you to understand the amount of sugar, fat, and salt (sodium) in some of your favorite foods."* Ask the participant to display some of their favorite foods from within their homes. [*Note*: For this exercise, only use foods that have food labels. Here, you should help the participant read the food labels and determine how much sugar, fat, and salt are in those foods. Then, you will demonstrate by measuring actual sugar, fat, and salt content to use as a visual.]

i. Visuals and discussion:

1. Sugar = 4 grams per 1 teaspoon = 16 calories
    a. Coca Cola (12 oz.) = 150 calories = 10 teaspoons sugar
    b. *Jumex* Orange Juice (7 oz.) = 88 calories = 6 teaspoons sugar
    c. *Gamesa Arcoiris* (1 sm. pkg.) = 200 calories = 6 teaspoons sugar
2. Salt = 2300 mg per teaspoon (upper limit recommendation)
    a. Maruchan Ramen (1 packet) 1434mg
    b. *Chicharrones* (1/2 gram) ~300mg
    c. V8 juice (9 oz.) 420mg
3. Fat: discuss solid versus liquid fat
    a. Ask: *Which is the healthier fat?* Talk about the importance of consuming healthier fats to protect the heart and blood.

III. Smart Shopping (*handout)*

Discuss each of the recommendations if they can be made into goals

IV. Food Label Reading Review & Activity

a. Distribute Nutrition Facts label handouts. Review each MAIN component (outlined in *promotora* guidebook) of the food label.
b. Use some of the participant foods OR foods that you brought for training to ask them questions (verbal quiz) about their food labels. *Note*: Make certain to document in field notes if the participant has any barriers to this activity such as poor eyesight, illiteracy, difficulty with comprehension, etc.

V. *Physical Activity Break (5-10 minutes)*

VI. Budget Activity:

Have the 'kit' for this activity in presentation box.

VII. Marketing Discussion

a. Food producer and grocery store marketing; what you see (package/labeling) is not always what you get (what is inside/Nutrition Facts).

i. Discuss package marketing and why reading the front of a food package is not enough.
    1. Example: discuss the use of the words “100% natural”; “Made with whole grain” versus “Made with 100% whole grain”; “100% Vitamin C” versus “100% juice” …and so forth.
ii. Discuss grocery store sales and specials

VIII. Goal Setting Activity

a. Have a discussion with the participant about their concerns and barriers with budgeting and selection of healthful, affordable foods. Ask how you, as a *promotora*, can assist with these barriers and concerns.
b. *“What are the NEW goals that will be made after this session?”*

IX. Comments/Questions

Ask the participant if they have any questions about what you discussed with them today.

X. Post-Survey

FOOD SHOPPING
PRE/POST-TEST

Please circle the best answer.

1. It is important to look at the nutrition labels before purchasing foods.
    a. True
    b. False
    c. I don't know

2. Making a grocery list will help me save money.
    a. True
    b. False
    c. I don't know

3. I believe I am getting a good deal when I buy something on sale, so I do not have to compare prices.
    a. True
    b. False
    c. I don't know

4. I should plan a food budget before I shop for groceries. With a budget, I can buy only what I need and make it last.
    a. True
    b. False
    c. I don't know

FOOD SAFETY **Lesson #6**

Objectives
By the end of this lesson, participants will be able to:

- Describe food borne illness and how it occurs.
- Explain and demonstrate proper hand washing and good personal hygiene.
- Describe adequate food temperatures and how to use a thermometer.
- Identify unsafe food handling practices.

Materials and Supplies
Promotora training kits and manuals, sink (in or outside of participant's home) for hand washing, soap and paper towels (bring to use if none in the home), nailbrush (optional, for demonstration), hand sanitizer (optional, for demonstration), refrigerator thermometers, food thermometers, access to the resident's refrigerator (if possible), hand towel, knife, cutting board, food items for activities and visuals. *In training kits, if necessary*: pot holders, soap and dish detergent, anti-bacterial wipes, dish towels/wash cloths, paper towels, foil or plastic wrap.

Handouts:

- To Your Health! Food Safety for Seniors
- Keep Hands Clean
- Danger Zone

***Recommend each *promotora* be 'pre-equipped' with information regarding each individual senior and what is available, in terms of resources, within each residence. It will be the responsibility of the *promotora* team to modify the education and skill delivery based on existing knowledge of each participant.**

Introductory Statement
(e.g. "Thank you for allowing us to join you in your home today for another discussion about nutrition. Today we are going to talk with you about how you can safely prepare and store your food.")

Knowledge & Skills Pre-test
"*First, we would like for you to answer the questions in this short pre-test. It is okay if you do not know the answers, just do the best you can."* This is a brief pre-test that can be guided by *promotoras* for those with literacy, vision, writing, and other related concerns.

I. Review Goals from Last Session
*In this section, the participants should share what challenges they face and what you (promotora) can do to help them with solutions.

a. Reflexive Journal

i. Have the participant share what they have written in the journal since your last meeting.

b. Questions you may ask*: "Have you shopped for food since our last session? Did you make any of the changes we discussed? If so, tell me about them. Have you had a difficult time meeting any of your goals to this point?"*

II. Foodborne Illness OR Food Poisoning *(Food Safety for Seniors handout)*

Foodborne illness or food poisoning (getting sick from eating/drinking) are caused from eating/drinking contaminated (or 'dirty') food or beverages. Many different disease-causing germs, can contaminate what you eat and drink. Poisonous chemicals, such as cleaning supplies and pest sprays/poisons, can also cause sickness if they are in the food you eat. Each year in the U.S., over 5,000 people die from poisonous germs in food.

i. The symptoms usually do not begin immediately after eating a food. There is a period of time, before illness begins to show, that may range from a few hours to several days.

ii. The symptoms and the amount of time a person is sick can depend on what type of bacteria or viruses contaminated the food. Some symptoms are: Diarrhea, Fever, Vomiting, Jaundice (yellowing of the skin and eyes), or sore throat with fever

III. Hand Washing & Personal Hygiene *(Keep Hands Clean handout)*

"Germs are invisible to us. However, they may be on your hands if you do not wash them well enough, especially after using the restroom. Even with proper hand washing, all germs may not be removed from your hands. Bacteria, or germs, can hide in your fingernails (use nail brush for demonstration) and jewelry."

1. Hands should be washed for at least 10-15 seconds and up to 20 seconds to remove harmful germs.
2. Use a nailbrush to help clean under your fingernails. Especially if you work on automobiles, farming or ranching, or working with your hands in dirt.
3. Use only clean kitchen towels to dry your hands. Drying your hands on a common towel or your apron may contaminate them. Keep all kitchen towels clean.
4. Hand sanitizers may be used as an added step in the hand washing procedure. **Hand sanitizers should not replace proper hand washing**.

IV. Hand washing activity

Demonstrate proper hand washing procedures and have them wash their hands with you.

- Turn on faucet, lather hands and exposed portions of arms with soap for 10-20 seconds. To assist you in knowing how long that is, set a timer or watch clock for about 10-20 seconds or sing "Happy Birthday" ("*Feliz Cumpleanos")* once while hand washing.
- Rinse hands.

- Dry hands with a single use towel.
- Turn off faucet with the single use towel or something other than a bare hand.

V. Explain good personal hygiene practices.

a. Dirty clothing may hold bacteria that can be passed onto food. Keeping a clean appearance may prevent the possibility of making yourself or others sick.
b. Keep your home clean. Dirty homes, especially dirty kitchens, attract bugs, mice, rats, and other unwanted 'guests.'
c. *Explain* why it is dangerous to prepare food while sick
d. Hold back loose hair to prevent from getting into food
e. Use of dirty dishes or unclean cooking utensils and towels can lead to illness from bacteria.
f. Roaches, mice, rats, and other pests carry germs that can cause illness, disease, and even death. Even pets kept inside the house can carry unwanted bugs and germs. Keeping these creatures out of your home and away from your food will help prevent illness and possible disease.
g. Keep your home and yourself clean to prevent illness and possible disease.
h. Wash hands often
    i. *Help the participant to understand the link between handwashing, poor personal hygiene, and foodborne illness*.

VI. *Physical Activity Break (5-10 minutes)*

VII. Food Temperature (*Danger Zone handout*)

"*Now we are going to talk about the importance of keeping your foods at the right temperatures to prevent illness. Foods held in the DANGER ZONE - between 41°F and 139°F for more than two hours can become unsafe to eat because bacteria will grow quickly between these temperatures. By keeping your hot foods hot (more than 139°F), and cold foods cold (less than 41°F) food temperatures, you may be able to prevent a foodborne illness. Also, by keeping food at safe temperatures, you can reduce waste."*

- NOTE: If the participant has a refrigerator in their house, make sure to check the temperature (fridge thermometer). If the temperature is greater than 40°*F* tell the participant about the dangers of this and adjust their refrigerator temperature gauge, if possible.

VIII. Activity

Discuss provided scenarios with participants using lessons learned:

1. Someone sneezed and wiped her nose then wiped her hands on her clothes/apron; returned to slicing ready-to-eat vegetables.
2. Someone dried his hands on his dirty kitchen towel after washing his hands

3. Personal belongings (e.g. shoes, purses) were stored directly on top of kitchen countertop and near raw foods.
4. Using cell phone or other unclean item while preparing food (texting, talking, etc.)

IX. Goal Setting Activity

a. Discuss some goals that can be made from what was learned in this session.
    i. Make sure that you and your kitchen are clean.
    ii. Always wash your hands before and after you touch food. Use warm water and soap.
    iii. Wash your cutting boards, knives, and other utensils before and after use and before it touches other foods.
    iv. Wash fresh fruit and vegetables under warm water to wash away dirt and germs.
    v. Keep kitchen towels clean.
b. *"How will these new goals help you achieve the other goals you have* set?"

X. Comments/Questions

Ask the participant if they have any questions about what you discussed with them today.

XI. Post-Survey

FOOD SAFETY
PRE/POST-TEST

Please circle the best answer.

1. Food poisoning is caused by drinking and/or eating contaminated food or drinks.
    a. True
    b. False
    c. I don't know

2. One of the best ways to avoid food poisoning is to keep your hands washed and clean.
    a. True
    b. False
    c. I don't know

3. It is okay to leave my food on the stove all night long and eat it the next day.
    a. True
    b. False
    c. I don't know

4. It is okay to touch your face, hair, or other objects while cooking.
    a. True
    b. False
    c. I don't know

5. I should always keep my kitchen towels, countertop, and food preparation surfaces clean to avoid contamination.
    a. True
    b. False
    c. I don't know

FOOD PREPARATION **Lesson #7**

Objectives
By the end of this lesson, participants will be able to:

- Discuss Clean, Separate, Cook, and Chill and the importance of these steps for safe food preparation.
- Demonstrate how to safely store foods.
- Discuss cross-contamination and why it is important to avoid when preparing food.
- Define *safe cooking* and the importance of temperature and cleanliness.

Materials and Supplies
Promotora training kits and manuals, sink (in or outside of participant's home) for hand washing, soap and paper towels (bring to use if none in the home), nailbrush (optional, for demonstration), hand sanitizer (optional, for demonstration), refrigerator thermometers, access to the resident's refrigerator (if possible), hand towel, knife, cutting board, food items for activities and visuals. *In training kits, if necessary*: pot holders, soap and dish detergent, anti-bacterial wipes, dish towels/wash cloths, paper towels, foil or plastic wrap.

Handouts:

- Be Food Safe
- Be Food Safe (*poster*)
- Combat BAC
- Basics for Safe Food Handling
- Freezing and Food Safety
- The Big Thaw

***Recommend each *promotora* be 'pre-equipped' with information regarding each individual senior and what is available, in terms of resources, within each residence. It will be the responsibility of the *promotora* team to modify the education and skill delivery based on existing knowledge of each participant.**

Introductory Statement
(e.g. "Thank you for allowing us to join you in your home today for another discussion about nutrition. Today we are going to talk with you about how you can safely prepare and store your food.")

Knowledge & Skills Pre-test
"*First, we would like for you to answer the questions in this short pre-test. It is okay if you do not know the answers, just do the best you can."* This is a brief pre-test that can be guided by *promotoras* for those with literacy, vision, writing, and other related concerns.

I. Review Goals from Last Session

*In this section, the participants should share what challenges they face and what you (promotora) can do to help them with solutions.

a. Reflexive Journal
    i. Have the participant share what they have written in the journal since your last meeting.
b. Questions you may ask*: "What changes have you made to ensure food safety in your home since our last session? Did you make any of the changes we discussed? If so, tell me about them. Have you had a difficult time meeting any of your goals to this point?*

II. *Clean, Separate, Cook, Chill* *(Be Food Safe handout and poster)*

a. Review the last discussion on food safety and hand hygiene
b. Distribute and discuss handout on *Clean, Separate, Cook, Chill*
c. *Cleaning*: Utensils, kitchens, countertops, all appliances used in food preparation

III. Raw Animal foods & Ready-to-Eat foods *(Combat BAC handout)*

"*Now let's discuss storage and preparation of raw animal foods and ready-to-eat foods.*"

1. Uncooked animal foods such as eggs, fish, meat, chicken, and other foods containing these *raw animal foods*.
2. Ready-to-eat food is food that may be safely eaten without additional preparation (e.g. chips, candy, fresh fruit).
3. Foodborne illness can occur if juices from *raw animal foods* get into other foods.
4. Cross-contamination can happen easily between *raw animal foods* and ready-to-eat foods.
5. Unwashed hands or contaminated (dirty) utensils and places that are in contact with food can transfer harmful germs from *raw animal foods* to other foods.
6. Cross-contamination may also occur when raw unwashed vegetables contact ready-to-eat food.
7. *Cross-contamination Activity*:

Demonstrate to the participant how cross-contamination happens by using the following examples:

a. Cutting raw chicken then lettuce without washing the cutting board (or surface) in-between.
b. Handling raw meat with bare hands and then cutting fresh fruit with the same hands.
c. Using the same knife to cut raw fish and ready-to-eat sandwiches without washing the knife in-between uses.

d. Raw unwashed vegetables were cut and added to a ready-to-eat salad.

8. Thoroughly wash hands after handling raw meat.
9. Properly clean all kitchen surfaces and utensils before and after use.
10. Discard any worn or old wooden cutting boards, as they breed bacteria. Use clean plastic cutting boards.

IV. Safe Cooking *(Basics for Safe Food Handling handout)*

a. *Activity*: If the participant agrees, your team may prepare a quick, low-cost, healthy snack. The importance of this activity is repetition. Remind them step-by-step how to prepare safe and healthful foods while using the discussion points previously mentioned in the modules. For example: have them begin by washing their hands properly; discuss the importance of washing raw fruit and veggies; remind them about cross-contamination; check to see that the food was stored properly in the refrigerator and at the correct temperatures; remind them how to properly store any left-overs.

b. Describe potential hazards of eating food that has not been safely cooked.

"*Raw animal foods such as beef, pork, poultry, fish, and eggs can contain disease-causing germs, some examples of common bacteria are E. coli in ground beef or Salmonella in poultry. Eating foods before they are cooked to a safe temperature may result in someone becoming very sick. By cooking Raw animal foods to safe temperatures, disease-causing germs can be reduced to safe levels or killed."*

b. Some information you may choose to use for discussion:

i. A Kansas State University study showed that 40% of hamburgers "brown in the middle" were actually below the required temperature of 155°F that kills *E. coli* bacteria.
ii. You cannot tell if a food is fully cooked by smelling it or looking at it. Checking the temperature with a thermometer is the only way to guarantee safety.
iii. Final cook temperatures are different for various types of foods.
iv. When using a microwave for cooking the food should be stirred, if possible, during cooking, and allowed to stand covered for 2 minutes.

Questions to ask:

1. *What are some of the dangers of eating food that has not been safely cooked?*
2. *What is the best way to tell if a food has been cooked to a safe temperature*?

V. *Physical Activity Break (5-10 minutes)*

VI. Hot and Cold Foods

"*WHEN IN DOUBT, THROW IT OUT: If you are unsure about how long a food item has been sitting out, throw it away. If you do not want to waste food or get sick from your food, make sure you store it properly*."

a. Foods that spoil easily and if not stored properly can cause foodborne illness are:
    1. Meat, Gravies, Eggs
    2. Poultry, Soups, Milk
    3. Fish, Meat Sauces
    4. Cream-filled baked goods
    5. Custards and creamy salads with meat or eggs

b. Food should be thrown away if in the <u>danger zone</u> for more than 2 hours (without being kept hot/cold). During this time, disease-causing bacteria/germs may grow to levels high enough to cause illness.

c. *"If you are unsure how long a food item has been at an unsafe temperature, throw it away. It's better to be safe than sick. WHEN IN DOUBT, THROW IT OUT. Just because a food looks and smells OK, does not mean it is safe to eat."*

VII. Storage Activity

"*Do you mind if we can use your refrigerator for our next activity?" (*NOTE: do not conduct this activity if the participant does not have a refrigerator, but ask them if they use a neighbor's or some other form of refrigeration, then move forward with the activity*). I will help you store foods the correct way and we will discuss why this is important.*"

- Top Shelf: Ready-to-eat foods and Fully Cooked Foods
- Bottom Shelves: Raw Seafood, Fish, and Eggs, Raw Steak (beef, not ground), Raw Pork (ham, bacon, pork chops), Raw Ground Meat (hamburger, chorizo), Raw Poultry (chicken, turkey)

*Store *raw animal foods* in leak-proof containers or in plastic bags with no holes to prevent juices from dripping onto other products or the floor.

VIII. Reheating/Leftovers (*Freezing and Food Safety, The Big Thaw handouts)*

a. ASK: *"Do you frequently store and/or eat leftover food?"*
b. If NO, ask them why they choose not to and <u>make certain to document this explanation</u>.
c. If YES, explain the importance of thoroughly storing and reheating leftovers.

"*Thoroughly reheating food is important to kill disease-causing bacteria/germs. Even when foods are cooked properly, germs can be present. If food is "left out" for over 2 hours, it may reach temperatures where harmful germs love to grow. Proper storage and reheating will help you prevent a foodborne illness."*

d. Put leftovers in <u>fully sealed/covered containers</u> and place in the refrigerator or freezer as soon as you have finished eating.
e. Eat refrigerated leftovers within the next 2-3 days before they go bad.
f. Frozen leftovers can be held for longer than a few days.

IX. Goal Setting Activity

a. *"This is our last session! Do you think you will be able to continue all the changes you have made to this point?"*

b. *"Will you continue to try and meet the goals you have set?"*
c. *"What difficulties will you face in meeting your goals in the future?"*

X. Comments/Questions

Ask the participant if they have any final questions about this or any of the lessons.

XI. Post-Survey

XII. Final Farewell

*Have participant turn in their Reflexive Journals and present them with a certificate of completion.

FOOD PREPARATION
PRE/POST-TEST

Please circle the best answer.

1. It is okay to cut my vegetables on the same cutting board that I cut my raw chicken, without washing the board.
    a. True
    b. False
    c. I don't know

2. I always know when my beef or chicken is cooked just by looking at it.
    a. True
    b. False
    c. I don't know

3. If I place my food in the refrigerator without covering it, there is a chance it can be contaminated.
    a. True
    b. False
    c. I don't know

4. Having pests such as roaches and mice in my house can increase my risk of eating contaminated food.
    a. True
    b. False
    c. I don't know

APPENDIX C

Interview Guide for *No Más Hambre* Participants

Introduction:

- Introduce self and all present observers.
- Thank the participant for volunteering and explain what will occur during the interview (i.e. use of recording device, verbal consent, confidentiality)
- Inform the participant that there are no right or wrong answers and they are encouraged to be honest and candid. They can also refuse to answer any of the questions.

Theme 1: Lessons

We will begin by talking about the lessons (nutrition information and activities) you received the past 7 weeks.

- Why did you choose to participate in this project?
- Tell me about the amount of time allowed for each lesson.
    - PROBE: too long? too short? just right?
    - PROBE: amount of time for lesson information compared with lesson activity.
- How often did you read or share the handouts that were provided?
- How often do you use the materials/items provided in your lesson kit?
- Tell me about the ease or difficulty of the lessons.
    - Please describe any difficulty you had understanding any of the information.
    - What could we have done to make it easier to understand?
- What stands out in your mind as the LEAST important lesson or piece of information?
    - Why?
- What stands out in your mind as the MOST important lesson or piece of information?
    - Why?
- What can we do to make these lessons better? What needs to change?
- Have you shared any of the information you learned in the lessons with family, friends, neighbors, etc.? If so, tell me about what you have shared. Did the people that you shared information with find the information interesting and/or helpful?
- In what other ways would you like to receive information?
- What information would you have liked to learn that you didn't?

Theme 2: Promotora instructors

Let's talk about the promotoras who instructed you.

- How important is the role of the *promotoras* as health educators (or teachers, instructors) in your community?
    - In what other ways could *promotoras* benefit you, your family, and the community? PROBE.
- Who else in the community could deliver the lessons?
- How was your interaction with the *promotoras*?
    - Did they teach in a manner that helped you to learn? Give me some examples.
- What recommendations would you give the *promotoras* to improve how lessons are taught?
    - May need to probe or offer more guidance with this question.
- If you were asked to participate in another project that uses *promotoras* as educators, how would you respond?

Theme 3: Value & Community

- How have these lessons affected your life? PROBE:
    - What are some of the changes you made, if any?
    - Did you meet any of the goals you set? What were they?
        - PROBE: improvements to physical activity? Improvements to dietary behaviors? Food preparation/storage? Food safety?
- Tell me about any personal struggles that might make it difficult for you to meet and continue your goals.
- How important will this information be to you one year from now? Five years from now?
- How do you think the information you learned would help other older adults in your community?
- Where do you go to get trusted health information?
    - Have you ever contacted a *promotora* to ask a health-related question?
- Do you think your community is supportive of projects like this? Tell me why/why not.
- What changes would you like to see made in your community that could improve health for all?

If we asked others to participate in this project, would you recommend they participate? Why or why not?